California Energy Commission
November 18, 2026 Business Meeting
Backup Materials for PSGM3, LLC

The following backup materials for the above-referenced agenda item are available in this PDF packet as listed below:

1. Proposed Resolution
2. Grant Amendment Request Form
3. Scope of Work
4. EIR Addendum
5. Links to Supporting Environmental Documents

CALIFORNIA ENERGY COMMISSION

PROPOSED RESOLUTION: PSGM3, LLC

RESOLUTION NO: 26-1118-XX

WHEREAS, the State Energy Resources Conservation and Development Commission (CEC) is considering proposed amendment number 1 to agreement LDS-24-002 with PSGM3, LLC (PSG) for the deployment of a 32 MWh non-lithium-ion long-duration energy storage system (LDES Addition) serving PSG's planned zero process emission steel mill near Mojave (Micro Mill Project) to modify the Scope of Work to change the project battery technology from a zinc-hybrid battery to a vanadium flow battery;

WHEREAS, Kern County (County) is the California Environmental Quality Act (CEQA) Lead Agency for PSG's Micro Mill Project and the CEC is a Responsible Agency considering the proposed amendment;

WHEREAS, the County certified the Final Environmental Impact Report for the Mojave Micro Mill Project (EIR) on March 19, 2024, concurrent with approval of the project, including approval of General Plan Amendment No. 3, Map No. 213; Zone Change Case No. 62, Map No.213; Conditional Use Permit Nos. 71 and 72, Map No. 213; Precise Development Plan No. 3, Map 213; Zone Variance Nos. 24 and 25, Map No. 213, and Resolutions associated therewith, copies of which are on file with the CEC;

WHEREAS, along with the EIR, the County adopted mitigation measures and a Mitigation Monitoring and Reporting Program (MMRP), Findings of Fact pursuant to CEQA Guidelines Section 15091, and a Statement of Overriding Considerations pursuant to Section 15093, and filed a Notice of Determination (NOD) for the project approval with the State Clearinghouse (SCH# 2022100646) and the County Clerk's office on March 21, 2024 (collectively, the County CEQA Documents), copies of which are on file with the CEC;

WHEREAS, the County approved Minor Modification No.1 to Precise Development Plan No. 3, Map No. 213 on December 9, 2024 (as amended, PD Plan) to include, among other things, the construction of the LDES Addition, a copy of which is on file with the CEC;

WHEREAS, pursuant to CEC Resolution No. 25-0121-08, the CEC prepared and approved that certain Addendum to the Mojave Micro Mill Project Final Environmental Impact Report for the Addition of a Long-Duration Battery Storage System (First Addendum) focused on the LDES Addition, made CEQA findings pursuant to Section 15096, adopted the County's MMRP to the extent relevant to the LDES Addition, adopted a Statement of Overriding Considerations, and approved agreement LDS-24-002;

WHEREAS, in connection with proposed amendment 1, the CEC has prepared that certain Vanadium Flow Battery Addendum to the EIR (VFB Addendum) in accordance with Section 15164 that requires a lead agency or responsible agency to prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 have occurred, a copy of which VFB Addendum is on file with the CEC;

WHEREAS, the CEC has independently reviewed and considered the County CEQA Documents, the PD Plan, Resolutions approving the Micro Mill Project, other County documents approving the Micro Mill Project and the findings contained therein, the First Addendum, the Second Addendum and the CEC's findings that are contained therein; and

WHEREAS, prior to acting on the proposed amendment 1 to agreement LDS-24-002, the CEC desires to make certain findings pursuant to the CEQA Guidelines Section 15096.

THEREFORE, THE CALIFORNIA ENERGY COMMISSION FINDS:

With regard to CEQA:

- The information presented in the VFB Addendum demonstrates the mitigation requirements identified in the EIR remain substantively unchanged by the modification of the LDES Addition to include vanadium flow batteries and work under the project presents no new or substantially more severe environmental impacts beyond those already considered and mitigated;

- None of the circumstances within CEQA Guidelines Section 15162 are present and there have been no substantial project changes and no substantial changes in the project circumstances that would require major revisions to the EIR, either due to the involvement of new significant environmental effects or to an increase in the severity of previously identified significant impacts, and there is no new information of substantial importance that would change the conclusion set forth in the EIR; and

- The Energy Commission has reviewed and considered the County CEQA Documents, the County's documents approving the Micro Mill Project, the EIR Addendum and the VFB Addendum, and finds that these documents are adequate for its use as the decision-making body for its consideration of amendment 1 to agreement LDS-24-002.

NOW, THEREFORE, BE IT RESOLVED, that the Energy Commission approves the VFB Addendum and its findings contained therein;

FURTHER RESOLVED, that the Energy Commission approves amendment 1 to agreement LDS-24-002; and

FURTHER RESOLVED, that this document authorizes the Executive Director or his or her designee to execute the same on behalf of the Energy Commission.

APPROVED AND ADOPTED this 18th day of November 2026, by the following vote:

AYE:
NAY:
ABSENT:
ABSTAIN:

CERTIFICATION

The undersigned Secretariat to the CEC does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly approved and adopted by the affirmative vote of the CEC at a meeting held on November 18, 2026.

Kim Todd
Secretariat

STATE OF CALIFORNIA

GRANT AMENDMENT REQUEST FORM (GARF)

CEC-277 (Revised 01/2026) CALIFORNIA ENERGY COMMISSION

Original Agreement # LDS-24-002 Amendment # 1

Division	Agreement Manager:	MS-	Phone
ERDD	Birdy Lin Planchard		

Recipient's Legal Name
PSGM3, LLC

Revisions: (check all that apply)	Additional Requirements
☐ Term Extension New End Date:	Include revised schedule and complete items A through G below (as applicable).
☐ Budget Augmentation Amendment Amount: $ 0	Include revised budget and complete items A through G below (as applicable)
☒ Budget Reallocation	Include revised budget and complete items A through G below (as applicable)
☒ Scope of Work Revision	Include revised scope of work and complete items A through G below (as applicable)
☐ Change in Project Location or Demonstration Site	Include revised scope of work and complete items A through G below (as applicable)
☐ Novation/Name Change of Prime Recipient	Include novation documentation and complete items A through G below (as applicable)
☐ Terms and Conditions Modification	Include applicable exhibits with bold/underline/ strikeout and complete items A through G below (as applicable)

A) Business Meeting Information

Business Meeting approval is not required for the following types of Agreements:

☐ Minor amendments delegated to Executive Director per December 2013 Resolution

Proposed Business Meeting Date 11/18/2026 ☒ Consent ☐ Discussion

Business Meeting Presenter N/A Time Needed: 0 minutes

Please select one list serve. Long Duration Energy Storage (LDES)

Project Description:

PSGM3, LLC. Proposed resolution adopting CEQA findings for PSGM3, LLC's (PSG) Electrified Steel Mill Long Duration Energy Storage Demonstration and approving amendment 1 to agreement LDS-24-002 with PSG. (LDES funding) Contact: Birdy Lin Planchard

a. CEQA. Findings that, based on the lead agency Kern County's Environmental Impact Report (EIR) certified on March 19, 2024, adopted Mitigation, Monitoring and Reporting Program, adopted Statement of Overriding Consideration,

Resolution No. 8-24, approved modification to Precise Development Plan No. 3, Map 213, the CEC's 2025 Addendum to the EIR, and the CEC's Vanadium Flow Battery Addendum, work under the project presents no new or substantially more severe environmental impacts beyond those already considered and mitigated.

b. PSG's Electrified Steel Mill Long Duration Energy Storage Demonstration. Proposed approval of amendment 1 to agreement LDS-24-002. This amendment will modify the SOW to change the project battery technology from a zinc-hybrid battery to a vanadium flow battery. This change in battery does not impact the total system size or function.

B) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	**Budget**
Hatch Associates Consultants, Inc.	$ 0 (Match Only)
R.E. WARNER & ASSOCIATES INC.	$ 0 (Match Only)
Invinity Energy Systems (US) Corporation	$ 12,047,904
	$
	$
	$
	$
	$
	$
	$

C) List all key partners: (attach additional sheets as necessary)

Legal Company Name:

D) Budget Information (only include amendment amount information)

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
			$
			$
			$
			$
			$
			$

R&D Program Area: ESTB: ETSI TOTAL: $ 0

Explanation for "Other" selection

Federal Agreement #:

E) California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?
   ☒ Yes (skip to question 2)
   ☐ No (complete the following (PRC 21065 and 14 CCR 15378)):

   Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:
   a) ☐ Agreement **IS** exempt.
      ☐ Statutory Exemption. List PRC and/or CCR section number:
      ☐ Categorical Exemption. List CCR section number:
      ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

      Explain reason why Agreement is exempt under the above section:

   b) ☒ Agreement **IS NOT** exempt. (consult with the legal office to determine next steps)

      Check all that apply
      ☐ Initial Study
      ☐ Negative Declaration
      ☐ Mitigated Negative Declaration
      ☒ Environmental Impact Report
      ☐ Statement of Overriding Considerations

F) Is this project considered "Infrastructure"? Yes

G) The following items should be attached to this GARF (as applicable)

1.	Schedule of Products	☐ N/A	☒ Attached
2.	Exhibit A, Scope of Work	☐ N/A	☒ Attached
3.	Exhibit B, Budget Detail	☐ N/A	☒ Attached
4.	CEQA Documentation	☐ N/A	☒ Attached
5.	Novation Documentation	☒ N/A	☐ Attached
6.	CEC 105, Questionnaire for Identifying Conflicts		☐ Attached
7.	Terms and Conditions	☒ N/A	☐ Attached

Birdy Lin Planchard — **10/28/26**
Agreement Manager — **Date**

Cody Taylor — **10/30/26**
Branch Manager — **Date**

Jonah Steinbuck Delegated to the Branch Manager — **N/A**
Director — **Date**

Exhibit A
Scope of Work

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2		Develop Energy Storage System Design for Integrating LDES Technologies
3		Procure Equipment and Materials for LDES System
4	X	Installation and Pre-energization Testing of LDES Technologies and Energy Storage System Components
5		Functionally Test and Commission the LDES System for Final Acceptance
6	X	Operate LDES to Utilize On-site Solar and to Reduce Load During Scarce Grid Conditions
7		Monitoring, Verification, and Performance Evaluation
8		Evaluation of Project Benefits
9		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
AHJ	Authority Having Jurisdiction
BESS	Battery Energy Storage System
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
Commissioning	Full charge and discharge at 4MW for 8hrs for the combined LDES technologies during PSPS, other outage events, or for load reduction at times of peak demand
CPR	Critical Project Review
GHG	Greenhouse Gas
kV	Kilovolt
LDES	Long Duration Energy Storage
MW	Megawatt
MWh	Megawatt-hour
Mechanical completion of LDES systems	Point at which (a) structural installation of the applicable project system(s) has occurred and (b) the project(s) is mechanically, electrically, and functionally complete to the extent necessary to be ready for initial commissioning, adjustment, and testing
PSG	Pacific Steel Group
PSPS	Public Safety Power Shut Off
TAC	Technical Advisory Committee

[1] Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

Exhibit A
Scope of Work

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to fund the deployment of a 4 MW over 8 hours (4 MW/32 MWh) non-lithium-ion long duration energy storage (LDES) system in support of the recipient's planned $630M first-of-its-kind zero process emission rebar steel mill. This LDES system will be integrated with the recipient's steel mill construction, commissioning and operations, and utilize approximately 50 MW of on-site solar photovoltaics. The project aims to demonstrate the ability of the energy storage system to optimize the use of on-site solar energy, support critical operations at the steel mill during periods of high energy demand and outages, and contribute to the overall energy management strategy of the facility.

B. Problem/ Solution Statement

Problem

LDES technologies capable of storing and discharging electricity for eight hours or longer can play an important role in supporting electric reliability and resilience with high levels of renewable generation. However, the majority of storage systems deployed in California today are short-duration lithium-ion batteries and LDES technologies have only been demonstrated at relatively small scales generally below 1 MW.

Solution

Public Resources Code section 25641 provides that the CEC:

> Shall establish and implement the Long-Duration Energy Storage Program to provide financial incentives for eligible projects,[2] located at eligible storage facilities,[3] that have power ratings of at least one megawatt and are capable of reaching a target of at least eight hours of continuous discharge of electricity at that power rating in order to deploy innovative energy storage systems to the electrical grid for purposes of providing critical capacity and grid services.[4]

This project will deploy a long-duration energy storage system as part of a behind-the-meter microgrid at the recipient's cutting-edge zero process emissions steel mill. The LDES system will utilize ~~zinc hybrid cathode~~ **vanadium flow** battery technology, providing a total capacity of 32 MWh, integrated with **on-site** ~~approximately 50 MW of~~ solar photovoltaics. This microgrid can be rapidly deployed and configured to support construction and commissioning of the steel mill and optimize the energy management strategy of ongoing steel operations. The LDES system and microgrid will be capable of powering critical facilities during Public Safety Power Shutoff (PSPS)

[2] Under Public Resources Code section 25642, an "eligible project" shall include, but not be limited to, an eligible storage facility that includes any of the following: (i) Compressed air or liquid air technologies; (ii) Flow batteries, advanced chemistry batteries, or mechanical energy storage; (iii) Thermal storage or aqueous battery systems; or (iv) A hydrogen demonstration project. "Eligible project" shall not include a pumped storage project or lithium-ion-based storage technology. Cal. Pub. Res. Code § 25642 (b)(2)(A).
[3] "Eligible storage facility" shall include, but not be limited to, an energy storage system that is interconnected to the electrical grid in California or to a California balancing authority. Cal. Pub. Res. Code § 25642.
[4] Cal. Pub. Res. Code § 25641.

events or other outage scenarios, delivering power quality that meets or exceeds current facility standards.

C. Goals and Objectives of the Agreement

Agreement Goals
The goals of this Agreement are to:

- Deploy a 4 MW/32 MWh energy storage system to support the dynamic electricity requirements of recipient's innovative zero process emissions steel mill throughout construction, commissioning, and operations.
- Increase the scale of LDES technology deployments to support California's clean energy objectives and inform future deployments.
- Demonstrate the performance of LDES technology in energy-intensive heavy manufacturing with high cycling and performance requirements.
- Increase knowledge about how LDES technology can support a cost-effective zero-carbon renewable energy storage solution to meet the challenges to:
    - Integrate and fully utilize on-site solar energy for use in manufacturing, with cyclical operations
    - Provide operational energy management for plant operations in response to price signals based on energy grid scarcity
    - Provide energy to critical operations during outages
- Enable electric resilience during power outages for environmental, health, and safety considerations.

This project will support the overall advancement of LDES technology deployment.

Agreement Objectives
The objectives of this Agreement are to:

- Demonstrate how large-scale non-lithium-ion LDES can be the key to unlocking 100 percent renewables in California while strengthening grid resilience.
- Identify all barriers to the scaling and implementation of large-scale LDES.
- Provide a clear path for expansion of large-scale LDES solutions through California.
- Enable and inform future industrial electrification applications of LDES as a pioneering example of industrial application.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). Products that require a draft version are indicated by marking **"(draft and final)"** after the product name in the "Products" section of the task/subtask. If "(draft and

final)" does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, **"days"** means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.
- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following:

Instructions for Submitting Electronic Files and Developing Software:

- **Electronic File Format**
  - Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the California Energy Commission's (CEC) software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick.

  The following describes the accepted formats for electronic data and documents provided to the CEC as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:
  - Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
  - Text documents will be in MS Word file format, version 2007 or later.
  - Project management documents will be in Microsoft Project file format, version 2007 or later.

- **Software Application Development**
  Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open-source programs:
  - Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
  - Microsoft Internet Information Services (IIS), (version 6 and up)

Recommend 7.5.
- Visual Studio.NET (version 2008 and up). Recommend 2010.
- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the CEC's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other CEC staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The administrative portion of the meeting will include discussion of the following:
  - Terms and conditions of the Agreement;
  - Invoicing and auditing procedures;
  - Administrative products (subtask 1.1);
  - CPR meetings (subtask 1.3);
  - Match fund documentation (subtask 1.7);
  - Permit documentation (subtask 1.8);
  - Subcontracts (subtask 1.9); and
  - Any other relevant topics.

  The technical portion of the meeting will include discussion of the following:
  - The CAM's expectations for accomplishing tasks described in the Scope of Work;
  - An updated Project Schedule;
  - Technical products (subtask 1.1);
  - Progress reports (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
  - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
  - Project schedule that identifies milestones

- List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, as needed to reflect any changes in the documents.

The CAM shall:
- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:
- Kick-off Meeting Presentation
- Updated Project Schedule *(if applicable)*
- Match Funds Status Letter (subtask 1.7) *(if applicable)*
- Permit Status Letter (subtask 1.8) *(if applicable)*

CAM Product:
- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings
The goal of this subtask is to determine if the project should continue to receive CEC funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the CEC and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient and may include the CAO and any other individuals selected by the CAM to provide support to the CEC.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit.
However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the CEC, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:
- Prepare and submit a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:
- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* with a list of expected CPR participants in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.

- Conduct and make a record of each CPR meeting. Provide the Recipient with a schedule for providing a Progress Determination on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:
- CPR Report(s)

CAM Products:
- CPR Agenda(s)
- Progress Determination

Subtask 1.4 Final Meeting
The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:
- Meet with CEC staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

  The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.
  - The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
  - The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
    - Disposition of any procured equipment.
    - The CEC's request for specific "generated" data (not already provided in Agreement products).
    - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
    - "Surviving" Agreement provisions such as repayment provisions and confidential products.
    - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:
- Final Meeting Agreement Summary *(if applicable)*

- Schedule for Completing Agreement Closeout Activities
- All Final Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
  - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the "Payment of Funds" section of the terms and conditions, including a financial report on Match Funds and in-state expenditures.
- In no event shall any individual providing direct labor under this Agreement, and combined with any other active or future Agreement with the CEC, invoice more than 1800 hours of direct labor per year without prior CAM written approval, regardless of the maximum number of hours permitted within any Budget.

Products:

- Progress Reports
- Invoices
- Monthly Time Tracking Report

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Energy Commission Style Manual* provided by the CAM.

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Energy Commission Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Energy Commission Style Manual, and Final Report Template provided by the CAM with the following considerations:
  - Ensure that the report includes the following items, in the following order:
    - Cover page (**required**)
    - Credits page on the reverse side of cover with legal disclaimer (**required**)
    - Acknowledgements page (optional)
    - Preface (**required**)
    - Abstract, keywords, and citation page (**required**)
    - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)
    - Executive summary (**required**)
    - Body of the report (**required**)
    - References (if applicable)
    - Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
    - Bibliography (if applicable)
    - Appendices (if applicable) (Create a separate volume if very large.)
    - Attachments (if applicable)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments on Draft Final Report* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:
  - Comments the recipient proposes to incorporate.
  - Comments the recipient does not propose to incorporate and an explanation for why.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:

- Summary of TAC Comments on Draft Final Report
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this

Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of CEC funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the CEC awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

  If match funds were a part of the proposal that led to the CEC awarding this Agreement, then provide in the letter:
  - A list of the match funds that identifies:
    - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
    - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
    - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter *(if applicable)*
- Match Funds Reduction Notification Letter *(if applicable)*

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be

identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
    - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
    - The schedule the Recipient will follow in applying for and obtaining the permits.

  The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.
- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits *(if applicable)*
- Updated Schedule for Acquiring Permits *(if applicable)*
- Copy of Each Approved Permit *(if applicable)*

Subtask 1.9 Obtain and Execute Subawards and Agreements with Site Hosts

The goal of this task is to ensure quality products and to execute subrecipients and site host agreements, as applicable, required to carry out the tasks under this Agreement consistent with the Agreement Terms and Conditions and the Recipient's own procurement and contracting policies and procedures.

The Recipient shall:

- Execute and manage subawards and coordinate subrecipient activities.
- Execute and manage site host agreements, and ensure the right to use the project site throughout the term of the Agreement, as applicable. A site host agreement is not required if the Recipient is the site host.
- Notify the CEC in writing immediately, but no later than five calendar days, if there is a reasonable likelihood the project site cannot be acquired or can no longer be used for the project.
- Submit a letter to the CAM describing the subawards and any site host agreement needed or stating that no subawards or site host agreements are required.
- If requested by the CAM, submit a draft of each subaward and any site host agreement required to conduct the work under this Agreement to the CAM for review.
- If requested by the CAM, submit a final copy of each executed subaward and any site host agreement.

- If Recipient intends to add new subrecipients or change subrecipients, then the Recipient shall notify the CAM.

Products:

- Letter describing the subawards needed, or stating that no subawards are required
- Draft subaward (if requested)
- Final subaward (if requested)
- Draft site host agreement (if requested)
- Final site host agreement (if requested)

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
  - Technical area expertise;
  - Knowledge of market applications; or
  - Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.
- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate, to the extent the TAC members feel is appropriate, on behalf of the project in its effort to build partnerships, governmental support, and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;

- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.
- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.

- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:
- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

Subtask 1.12 Project Performance Metrics
The goal of this subtask is to finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:
- Complete and submit the project performance metrics section of the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task, to the CAM.
- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
    - TAC comments the Recipient proposes to incorporate into the *Initial Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
    - TAC comments the Recipient does not propose to incorporate with and explanation why.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the Recipient met each of the performance metrics in the *Final Project Benefits Questionnaire*, developed in the Evaluation of Project Benefits task.
- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:
- TAC Performance Metrics Summary
- Project Performance Metrics Results

Exhibit A
Scope of Work

IV. TECHNICAL TASKS

*Products that require a draft version are indicated by marking **"(draft and final)"** after the product name in the "Products" section of the task/subtask. If "(draft and final)" does not appear after the product name, only a final version of the product is required. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.*

TASK 2: DEVELOP ENERGY STORAGE SYSTEM DESIGN FOR INTEGRATING LDES TECHNOLOGIES

The goal of this task is to complete the engineering design for installation and integration of the LDES technologies and energy storage system components including all electrical, structural, and miscellaneous items required to develop a complete Issued for Construction set of design drawings.

The Recipient shall:

- Develop and submit *Issued for Construction Drawings* for review that include but are not limited to the following:
    - Hardware design and specifications for the LDES technologies and energy storage system components
    - Anticipated construction and interconnection timelines
    - All necessary permits filed for building, interconnection, and back up generation
- Conduct TAC Meeting #1 per subtask 1.10
    - Document, submit, and discuss these tasks and lessons learned during the TAC meeting with the TAC and the CAM
- Prepare a *Design Report* that includes but is not limited to the following.
    - Summary of all planned operational use cases for the energy storage system over the course of the project
    - Schematics and integration details
    - Electrical design
    - Definition of schematic symbols and data entry types
    - Documentation of the capabilities of the battery management system(s)
    - System documentation
- Obtain approval and provide a *Copy of Notice to Proceed* from the authorities having jurisdiction (AHJ)
- Prepare a *Design Report Presentation (PowerPoint)* which will include the design plans and summarize and highlight the *Design Report* and present at a Design Report meeting.

Products:

- Issued for Construction Drawings
- Design Report (Draft and Final)
- Copy of Notice to Proceed
- Design Report Presentation (PowerPoint)

TASK 3: PROCURE EQUIPMENT AND MATERIALS FOR LDES SYSTEM

The goal of this task is to procure, track, and manage logistics for the delivery of the 4 MW/32 MWh LDES technologies to the recipient's demonstration site.

The Recipient shall:

- Develop a detailed *Master List of Equipment and Materials* for the 4 MW/32 MWh LDES technologies, including the ~~zinc hybrid~~ **vanadium flow** battery cells and modules, and associated infrastructure.

- Receive written approval of Master List of Equipment and Materials from CAM before executing purchase contract for LDES technologies
- Create purchase contract based on approved Master List of Equipment and Materials
- Coordinate logistics and track delivery of LDES technologies to the project demonstration site
- Confirm and document receipt of the LDES technologies to California distribution yard and facility
- **Develop and submit *Supplier-Specific Payment Schedules* for written approval by**
- **CAM reflecting a milestone process for purchasing technologies and associated equipment. This will include an explicit schedule for reimbursement of specific retention costs.**
- **Assume ownership of all systems, equipment, and materials ("Project") upon verification of successful systems commissioning and project operation.**
- All equipment reimbursed under this grant will be encumbered by the CEC and shall not be encumbered as set forth in Exhibit C, Terms and Conditions, until Mechanical Completion of the LDES systems. “Mechanical Completion” means (a) structural installation of the applicable project system(s) has occurred and (b) the project(s) is mechanically, electrically, and functionally complete to the extent necessary to be ready for initial commissioning, adjustment, and testing.

Products:

- Master List of Equipment and Materials
- **Supplier-Specific Payment Schedules**

TASK 4: INSTALLATION AND PRE-ENERGIZATION TESTING OF LDES TECHNOLOGIES AND ENERGY STORAGE SYSTEM COMPONENTS

The goal of this task is to install a 4 MW/32 MWh LDES system capable of integrating with steel mill load and on-site solar photovoltaic generation and establish all necessary energy storage systems at recipient's facility.

The Recipient shall:

- Install all necessary equipment at the steel mill site, including but not limited to the LDES technologies and required microgrid infrastructure.
- Make appropriate electrical connections to recipient’s plant substation.
- Receive final approval for interconnection from the utility providing service, ensuring that the system meets all regulatory and operational standards.
    - ~~Phase 1 LDES deployment will provide 8 MWh of storage capacity, capable of discharging 1 MW over 8 hours, supporting the steel mill's construction and commissioning.~~
    - ~~Phase 2 LDES deployment will enhance the system with an additional 24 MWh of storage capacity, capable of discharging at 3 MW over 8 hours, serving as a local resilience asset and optimizing energy management.~~
- Prepare an *Equipment Testing and Readiness Report* that includes but is not limited to the following:
    - Specific pre-energization testing and evaluation performed on all components to confirm proper functionality

  - Testing data sheets that verify all equipment was evaluated and tested according to established procedures to ensure all equipment and individual system components are safe to energize and will function as designed
- Participate in final inspection and obtain *Final Installation Inspection Letter* from the AHJ or its representative, confirming Mechanical Completion and System Readiness
- Prepare a *CPR Report #1* and participate in CPR Meeting, per subtask 1.3.

Products:
- Equipment Testing and Readiness Report
- Final Installation Inspection Letter
- CPR Report #1

TASK 5: FUNCTIONALLY TEST AND COMMISSION THE LDES SYSTEM FOR FINAL ACCEPTANCE
The goals of this task are to test each LDES system individually and then together as one entire LDES system, to complete commissioning, and to receive permission to operate.

The Recipient shall:
- Develop a *LDES Functional Acceptance Testing and Commissioning Plan,* prior to completion of installation of the system deployment, that includes but is not limited to the following.
  - LDES subsystems and systems to be functionally tested and details of testing plans
  - Sequence of LDES system functional testing and startup period
  - Goals and expected outcomes of each functional test and overall process
  - Definition of successful results, for example cell, module, and unit balancing, full control and monitoring capability, verification of inverter inputs and outputs
  - Roles and responsibilities of the parties
- Prepare a *LDES Performance and Acceptance Test Result(s) Report(s)* that includes but is not limited to the following.
  - Results of subsystem and system verification tests identified in the Functional Testing and Commissioning Plan
  - Acceptance Test results for each LDES subsystem individually at the single container level
  - Acceptance Test results for the LDES system at the level of multiple containers connected to a common electrical node
  - Test results of full system performance verification
  - Test results of a full systems readiness evaluation verifying that the full system will operate as designed in a microgrid application
- Provide a *Systems Readiness Certification*
- Achieve *Authority to Operate* by the AHJ or its representative and provide a copy of approval documentation.
- Conduct TAC Meeting #2 per subtask 1.10
  - Document, submit, and discuss lessons learned during the TAC meeting with the TAC and the CAM.

Products:
- LDES Functional Acceptance Testing and Commissioning Plan
- LDES Performance and Acceptance Test Results Report

- Systems Readiness Certification
- Authority to Operate

TASK 6: OPERATE LDES TO UTILIZE ON-SITE SOLAR AND TO REDUCE LOAD DURING SCARCE GRID CONDITIONS

The goal of this task is to operate the energy storage system to demonstrate multiple use cases and demonstrate the ability to for full utilization of on-site solar production for steel mill requirements and to dispatch the LDES system in response to scarce grid conditions.

The Recipient shall:

- Develop an *Energy Storage System Testing and Commissioning Plan,* prior to completion of installation, that includes the following at a minimum:
  - Energy storage subsystems to be tested
  - Sequence of system testing and startup period
  - Goals and expected functionality of the energy storage system
  - Definition of successful results to demonstrate utilization of on-site solar and to reduce loads during scarce grid conditions
  - Roles and responsibilities of the parties
- Test the energy storage system under the following use cases:
  - Discharge of 4 MW for 8 hours, utilizing the combined capacity of the LDES system ~~(8 MWh from Phase 1 and an additional 24 MWh from Phase 2)~~.
  - **Supporting the steel mill's construction and commissioning and ramp up operational activities.**
  - Reduction in grid load during times of grid scarcity or peak electrical grid demand.
    - Track data on voluntary load reductions during scarce grid conditions and report on participation in the Emergency Load Reduction Program, Base Interruptible Program, or other demand response programs.
- Prepare an *Energy Storage System Operations and Analysis Report* with the results of testing for each Use Cases.
- Prepare an *Energy Storage System Performance Presentation* with the results of the Use Cases test
- Prepare a *CPR Report #2* and participate in CPR Meeting, per subtask 1.3

Products:

- Energy Storage System Testing and Commissioning Plan
- Energy Storage System Operations and Analysis Report
- Energy Storage System Performance Presentation
- CPR Report #2

TASK 7: MONITORING, VERIFICATION, AND PERFORMANCE EVALUATION

The team will measure and verify the performance of the energy storage system and compare to projected performance. The goal of this task is to conduct measurement and validation of the energy storage system, to periodically evaluate and report on their performance in a number of use cases, and to report the benefits resulting from this project by performing measurement and verification (M&V) of greenhouse gas (GHG) and energy consumption reduction. The specific load profile of the plant will not be required from the Recipient per this task.

The Recipient shall:

- Enter into an agreement with M&V subcontractor per Task 1.9 (if using an outside vendor)
  - Coordinate site visits with the M&V subcontractor at the demonstration site(s)

Exhibit A
Scope of Work

- Develop a *Measurement, Verification & Performance Evaluation Plan,* prior to initiating measurement period, that includes but is not limited to the following.
    - A description of the monitoring equipment and instrumentation which will be used.
    - Set up of measurement devices and data collection platform
    - A data collection schedule, including length of measurement and verification period
    - A description of the key input parameters and output metrics that will be measured and that will be used validate cost effectiveness and performance including but not limited to.
        - Number of MWh provided during PSPS or other outage events
        - Number and time of MW load reduction and duration provided during times of peak demand
    - A description of the M&V protocol, analysis, and collection methods to be employed.
    - Definition of analytical methods for processing data
    - Expected results prior to measurement period
    - A description of the independent, third-party M&V services to be employed, if applicable.
- Develop M&V protocol for *post-installation* measurements (and calculations) of:
    - Electric, natural gas and/or other fossil fuel consumption, and GHG emissions of the equipment/process/system(s)/sub-system(s) that will be upgraded and/or replaced and/or modified. Factors and metrics to be approved by the CAM.
- Perform at least six months or two seasons, for seasonal facilities, (or a shorter period as approved in writing by the CAM) of post-installation measurements based on M&V protocol for post-installation.
- Provide a summary of post-installation M&V progress in Progress Report(s) (see subtask 1.5) which shall include but not be limited to:
    - A narrative on operational highlights from the reporting period, including any stoppages in operation and why; and
    - A summary of M&V findings from the reporting period.
- Analyze post-installation electrical, natural gas and/or other fossil fuel consumption, and GHG emissions.
- Provide all key assumptions used to estimate and determine energy and GHG reductions (and additions, if applicable).
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations.
- Submit updated *Measurement, Verification & Performance Evaluation Reports* per the frequency listed in the terms and conditions summarizing performance of the energy storage system, including but not limited to the following.
    - Measured LDES performance relative to nameplate guarantees; MWh throughput (subtotal and total); roundtrip efficiency; auxiliary load reports; generation mix reports; subsystem and system availability and reliability metrics; costs and economic savings; and summary statistics on utility distribution grid performance including outages, voltage, and frequency monitoring.
    - GGRF data and benefits per the metrics listed in the terms and conditions and as provided by CARB guidance.
- Conduct TAC Meeting #3 per subtask 1.10

- Document, submit, and discuss lessons learned during the TAC meeting with the TAC and the CAM.

Products:

- Measurement, Verification & Performance Evaluation Plan
- Measurement, Verification & Performance Evaluation Report

TASK 8: EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete *the Initial Project Benefits Questionnaire*. The Initial Project Benefits Questionnaire shall be initially completed by the Recipient with 'Kick-off' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Complete the *Annual Survey* by January 31st of each year. The Annual Survey includes but is not limited to the following information:
  - Technology commercialization progress
  - New media and publications
  - Company growth
  - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire*. The Final Project Benefits Questionnaire shall be completed by the Recipient with 'Final' selected for the 'Relevant data collection period' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Complete and update the project profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Organization Profile on EnergizeInnovation.fund*, including the profile link.

Products:

- Initial Project Benefits Questionnaire
- Annual Survey(s)
- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

TASK 9: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to ensure the technological learning that resulted from the demonstration(s) is captured and disseminated to the range of professions that will be responsible for future deployments of this technology or similar technologies.

The Recipient Shall:

- Develop and submit a *Project Case Study Plan* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The Project Case Study Plan should include:
  - An outline of the objectives, goals, and activities of the case study.

  - The organization that will be conducting the case study and the plan for conducting it.
  - A list of professions and practitioners involved in the technology's deployment.
  - Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
  - Presentations/webinars/training events to disseminate the results of the case study.
- Present the draft *Project Case Study Plan* to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the draft *Project Case Study Plan*. This document will identify:
  - TAC comments the recipient proposes to incorporate into the final *Technology Transfer Plan*.
  - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the final *Project Case Study Plan* to the CAM for approval.
- Execute the final Project Case Study Plan and develop and submit a Project Case Study.
- When directed by the CAM, develop presentation materials for a CEC sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in knowledge sharing event(s) sponsored by the California CEC.
- Provide at least (6) six High Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

Products:

- Project Case Study Plan (Draft and Final)
- Summary of TAC Comments
- Project Case Study (Draft and Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

VANADIUM FLOW BATTERY ADDENDUM

to the

Mojave Micro Mill Project
Final Environmental Impact Report
SCH # 2022100646

for the

Long-Duration
Battery Storage System

Prepared for

California Energy Commission

Submitted by

Aspen environmental group

November 2026

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1. Introduction

The Final Environmental Impact Report (EIR) for the Mojave Micro Mill Project (Micro Mill Project) proposed by PSGM3 LLC (Pacific Steel Group, or PSG) was certified by the Kern County Board of Supervisors on March 19, 2024, concurrent with approval of the project. A Notice of Determination for the project approval was filed with the State Clearinghouse (SCH# 2022100646) and the Kern County Clerk's office on March 21, 2024.

The micro mill facility and associated infrastructure evaluated in the EIR will produce reinforcing bar (rebar) from recycled scrap metal (e.g., shredded automobiles, appliances, structural and sheet metal, and other pre-processed steel bundles). The project will include an approximate 489,200 square-foot steel mill facility with an additional 61,721 square feet of accessory buildings and structures, for a total of 550,921 square feet. As originally planned, the project will include an approximate 63-acre accessory solar array on the 174 total acres at the project site. Outdoor storage for scrap materials and staging is also included as part of the project. In total, the mill would be made up of 13 attached and detached buildings and 7 ancillary structures.

After certification of the EIR and approval of the project by Kern County, PSG submitted Minor Modification No. 1 to the Precise Development Plan No. 3, Map 213. Minor Modification No. 1 allowed two separate battery energy storage system (BESS) facilities within the solar field as part of the project. These storage systems included an approximate 4-megawatt (MW), 32-megawatt hours (MWhs) of a non-lithium battery LDES installation located on 2 acres, and a separate 94 MWh lithium-ion battery installation located on 2.26 acres south of the LDES installation. On December 9, 2024, Kern County approved Minor Modification No. 1 and determined that this modification continues to comply with the approved Micro Mill Project and additional evaluation by Kern County was not required.

The California Energy Commission (Commission, or CEC), as a responsible agency, considered a discretionary action to award PSG grant funding for the 4 MW, 32 MWh non-lithium battery storage system as part of the CEC's Long Duration Energy Storage (LDES) program (Public Resources Code section 25641). Development of the Micro Mill Project, including installation of the BESS facilities, is not subject to regulatory approval by the CEC. The project's LDES facility would consist of non-lithium batteries and associated infrastructure installed where PSG planned a non-lithium BESS, as described in Minor Modification No. 1. Awarding grant funding in support of the LDES facility is a discretionary action on the part of the Commission and subject to the California Environmental Quality Act (CEQA). As part of the CEC's LDES program, the Commission is prohibited from funding lithium battery energy storage systems (PRC section 25642(b)(2)(B)) and the CEC has no role in reviewing or approving the lithium BESS.

As a responsible agency, the CEC has the responsibility for mitigating and avoiding only the direct and indirect environmental effects of those parts of the project which it decides to finance. To comply with the requirements of CEQA for the grant funding, the Commission prepared an addendum (the 2025 EIR Addendum) to the previously certified

EIR for the Mojave Micro Mill Project (SCH #2022100646) focused on the zinc-hybrid LDES facility it was considering funding. The addendum was prepared in accordance with the CEQA Guidelines Section 15164 that requires a lead agency or responsible agency to prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in CEQA Guidelines Section 15162 have occurred. In accordance with CEQA Guidelines Section 15162, changes to the approved project addressed in the 2025 EIR Addendum would not result in new significant environmental effects or a substantial increase in the severity of previously identified significant effects, as described therein. The 2025 Addendum was considered by the CEC when it adopted Resolution No. 20-0121-08 authorizing the grant funding.

The County-approved Micro Mill Project, including the BESS facilities, can proceed without Commission approval. Since the adoption of Resolution No. 20-0121-08 authorizing the grant by the CEC, the engineering design for the project has proceeded, establishing a more refined concept for the physical and procedural aspects of certain components of the approved project than was available at the time of the preparation and consideration of the Certified EIR and 2025 EIR Addendum. The project sponsor has decided not to pursue use of a lithium-ion battery BESS at this time and to change the LDES BESS from a zinc hybrid-based battery to a vanadium flow battery (VFB).

The Commission has determined that the implementation of these project revisions again warrant preparation of an addendum to the original EIR and the 2025 EIR Addendum. The information presented in this addendum demonstrates that the impacts and mitigation requirements identified in the March 2024 EIR, and addressed in the 2025 Addendum, remain substantively unchanged by the modification of the project to use a vanadium flow battery compared to the prior zinc-hybrid battery. This Addendum supports the finding that the change in LDES batteries from a zinc-hybrid battery to a VFB battery and postponing the installation of the 94-MWh lithium-ion BESS does not raise any new issues and any associated impacts do not exceed the level of impacts identified in the 2024 EIR.

The following sections provide additional details regarding the modifications and findings.

2. Background

The Certified EIR found the Micro Mill Project to have **less than significant** impacts (both project and cumulative) to agricultural and forestry, greenhouse gas emissions, mineral resources, and recreation. The EIR found that the project would have **less than significant but mitigable environmental impacts** to biological resources (project only), cultural resources, energy, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, population and housing, public services, transportation and traffic, tribal cultural resources, utilities and service systems, and wildfire (project only). The EIR also found that some project and cumulative impacts to aesthetics, air quality, and noise would remain **significant and unavoidable even with mitigation**, as would the cumulative impacts to biological resources and wildfire.

As noted in the EIR, California Senate Bill (SB) 350 requires California utilities to ensure that 50 percent of energy supplied to their customers is generated from renewable sources by December 31, 2030. In support of this law and other California requirements for use of renewable energy, the project developers planned to develop approximately 63 acres of solar arrays at its proposed state-of-the-art zero process carbon emissions steel recycling reinforcing bar mill. However, to provide renewable power during periods when sunlight is unavailable, the project proposed under Minor Modification No.1 to install utility-scale BESS facilities in 4.6 acres of the solar field. The proposed 2-acre LDES BESS facility, as currently conceived, would use VFBs rather than zinc-hybrid batteries to provide long-duration energy storage. Although lithium-ion batteries were also proposed in Minor Modification No.1 their use is not being pursued at this time. The 2.26-acre lithium BESS area is being reserved for possible future development, leaving 58.7 acres of solar arrays. The VFB BESS, when fully installed, would provide 4 megawatts (MWs) of power with a storage capacity of 32 MWh. When fully charged, the system can discharge power continuously for 8 hours.

Like the zinc-hybrid BESS, the VFB BESS would be subject to all General Practices listed for environmental protection in the EIR (refer to EIR Section 1.2.1), as well as subject to the adopted Mitigation Monitoring and Reporting Program, approved as part of the Final EIR. All permits and authorizations required for the Mojave Micro Mill Project activities on federal, state, and unincorporated lands would also apply to the BESS modifications.

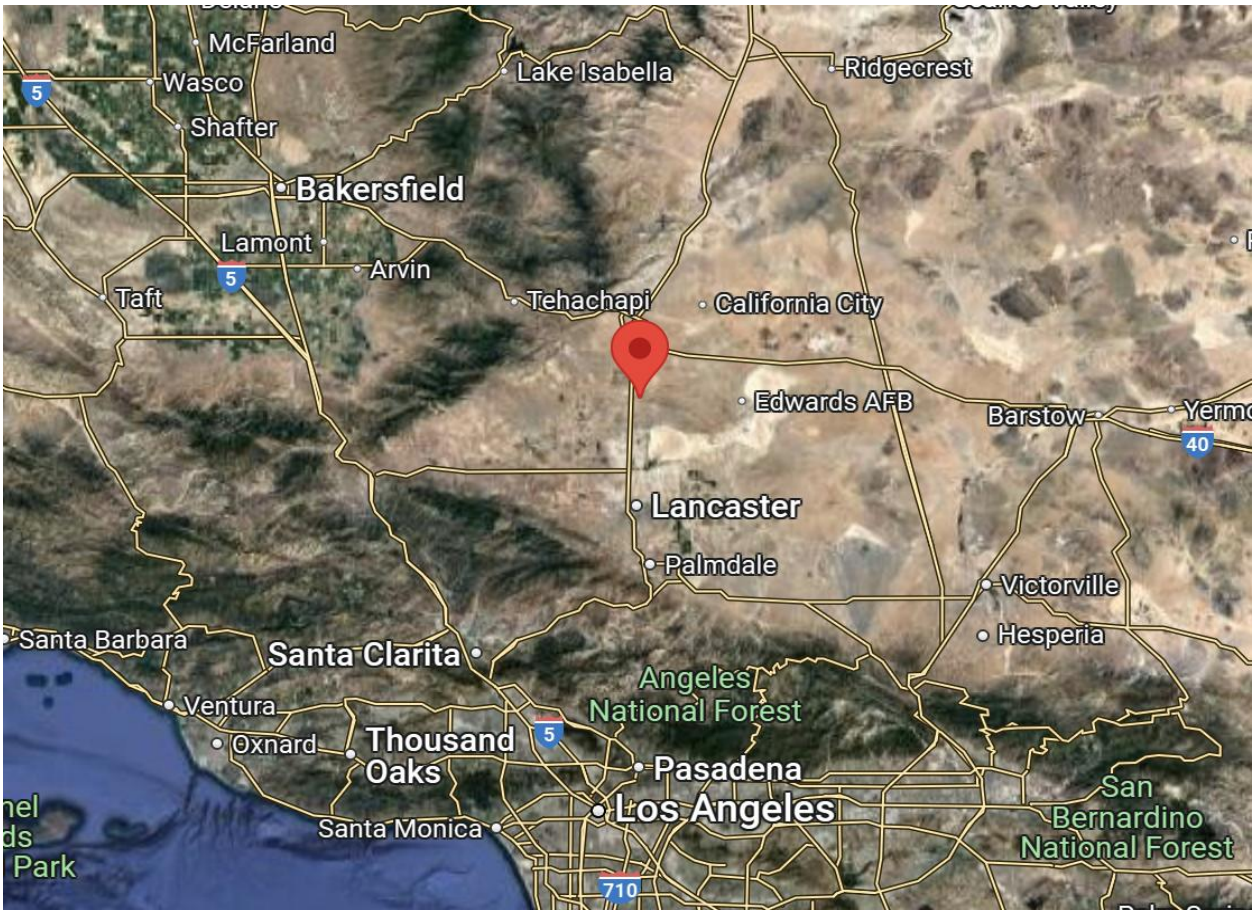
As stated in CEQA Guidelines Section 15150(a), an EIR may incorporate by reference all, or portions of, another document that has been made part of the public record. This approach is suitable for public agencies to reduce delay and paperwork (CEQA Guidelines Section 15006(t)). All documents pertaining to the approval and adoption of the Mojave Micro Mill Project are hereby incorporated by reference and made a part hereof.

3. Description of Proposed LDES System

Pacific Steel Group (PSG) proposes to install a utility-scale LDES BESS using vanadium flow batteries at its planned steel recycling reinforcing bar mill (Micro Mill) near Mojave, California. (See **Figure 3-1, Regional Location Map**). The VFB BESS would provide 4 MWs of power with a storage capacity of 32 MWh. When fully charged, the system could discharge power continuously for 8 hours. It would be connected to the grid through PSG's 66-kV substation on the property.

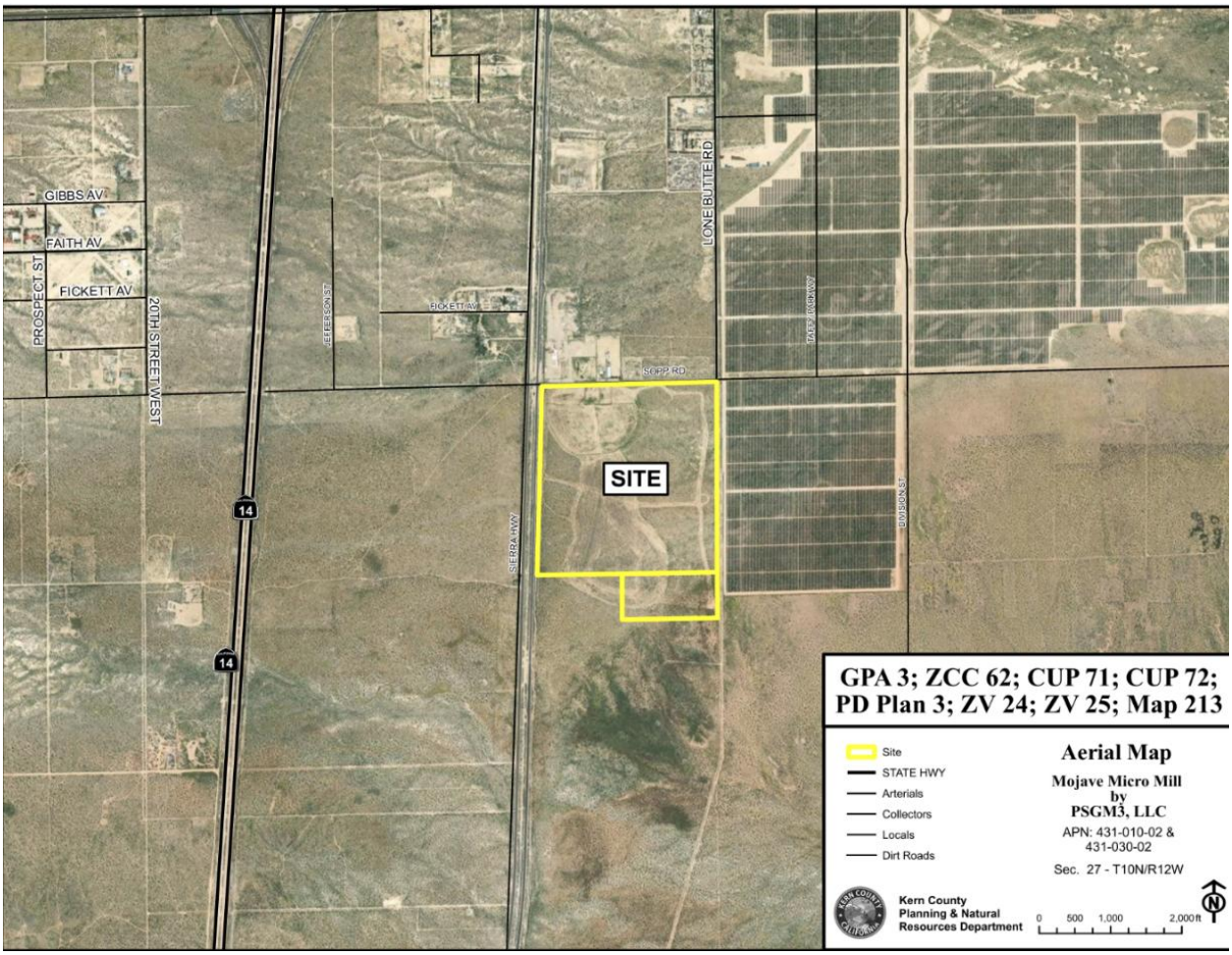
The Micro Mill Project site is in unincorporated southeastern Kern County, California, in the Mojave Desert. The site is approximately 57 miles southeast of the City of Bakersfield, 4 miles north of the community of Rosamond, and 8 miles south of Mojave. The Mill project would be developed on two parcels (Assessor's Parcel Number [APN] 431-010-02 and 431-030-02) totaling approximately 174 acres located at 506 Sopp Road, Mojave, California, adjacent to the east side of Sierra Highway. (See **Figure 3-2, Project Site**). Within the site, 63 acres are to be used for onsite renewable energy generation and energy storage. Sierra Highway provides access to the project site, including the LDES BESS facility location.

Figure 3-1. Regional Location Map



Source: PSG

Figure 3-2. Project Site



Source: PSG

As presently conceived, the LDES BESS would use VFB technology with the ability to store and discharge energy efficiently over long durations. The operating temperature range is between 14°F to 113°F (-10°C to 45°C). The water based, and non-flammable electrolyte in the batteries has a pH of 2, making it acidic. Multiple batteries will be contained in a modular unit similar to a standard shipping container. During the operation, the battery system will generate heat. The heat will be expelled from containment units using fans.

Vanadium flow batteries are not subject to thermal runaway. Previous generations of the VFB technology were certified to UL 1973, tested in accordance with UL 9540A, and underwent field compliance to UL 9540. The latest generation to be deployed at this site is currently in the process of gaining these certifications, as well as additional certifications related to safety and performance standards, and will obtain these certifications prior to delivery. In addition, the BESS will be operated in conformance with 2022 California Fire Code, Title 24, Part 9, and the National Fire Protection Association (NFPA) Standard 855 for energy storage systems. As such, there is no increase in fire risk from that addressed in the EIR that would result of the operation of the VFB technology.

The selected Invinity Endurium XL technology is a fully containerized battery module, in which the main components consist of two electrolyte tanks, two fluid pumps, and 12 cell-stacks. Each stack consists of 50 individual cells. Each cell within a stack contains two electrodes, which facilitate the electrochemical reactions needed for storing and discharging electricity. The tanks are filled with a water-based non-flammable acidic electrolyte, which is pumped through the stacks during operation. Each module is a factory-built, enclosed unit approximately 20 feet long, 8.5 feet wide and 9.5 feet high, and weighing about 80,000 pounds. The modules, arrive on-site already filled with electrolyte.

Each module has an integrated secondary containment liner in the enclosure to contain any electrolyte leaks that may occur. All of the plumbing, stacks, and primary containment tank drain by gravity into the secondary containment and any leak is designed to remain within the secondary containment. The capacity of the secondary containment is in excess of 130 percent of electrolyte volume and is composed of a polyethylene/polypropylene blended material commonly used in chemical spill containment. In the event of an internal system leak (tanks, stack, or plumbing), the tank level may eventually drop below the pump supply hose from the tank (nominally 5 percent electrolyte loss), at which point the pumps stop operating and a fault notification is generated by the system.

The VFB BESS system will include power conversion capability designed to allow dynamic charge rates and quicker discharge to meet the operational needs of the steel production facility. This flexibility allows the system to meet varying operational demands and optimize performance according to the specific needs of the Micro Mill and to fully use on-site generated solar energy. The system is sized to capture the highest anticipated daily surplus solar energy that is in excess of the steel mill's real time electricity requirements. However, the solar and BESS facilities will be connected to the Southern California Edison (SCE) electrical grid to provide operational flexibility through PSG's on-site substation.

The ratio of discharged to charged energy over the course of one full cycle (i.e., round-trip efficiency) is approximately 67 percent. This round-trip efficiency considers losses from power conversion within the battery, auxiliary loads at defined system operating conditions (14°F to 113°F; -10°C to 45°C), and conversion losses from the battery to the Medium Voltage terminals of the Power Conversion System. The battery chemistry is extremely stable and the stability of the reaction means that there is no possibility of thermal runaway. The primary loss of energy is due to internal power conversion.

The VFB BESS technology is designed to operate quietly, creating noise levels of approximately 50 decibels (dBA) measured at one meter from the module. This is achieved through a thermal management system design that ensures sufficient airflow to dissipate waste heat using a rear intake fan and front-of-container exhausts.

The VFB BESS would be located within the western solar fields on the Mill project site and would cover an approximate 20,000 square-foot rectangle within the 2-acre area. It would be located approximately 300 feet west of the PSG plant substation, more than 300 feet east of Sierra Highway, and 300 feet north of the area reserved for the lithium

BESS (see **Figure 3-3, Site Plan** and **Figure 3-4, Detailed View of Proposed Battery System Location**). It would require minor trenching to connect the modules to the substation.

The VFB BESS site would be surfaced with gravel and with hard stand/concrete where required for service access. The system would use 68 to 72 Invinity Endurium XL vanadium flow battery modules. The modules would be installed in two-high stacks, about 19 feet 4 inches tall. Four modules plus one String Control Unit make up a "string," and there would be 17 strings in total, with front and rear access for ventilation and maintenance. Close spacing is possible because of the fire safety of the system (zero thermal runaway risk). The modules would sit on concrete foundations (footings) designed to Invinity's installation requirements.

The VFB BESS would be built as one deployment and not in phases as was proposed for the zinc-hybrid BESS. It would provide 4 MW of nominal AC power and 32 MWh of AC storage capacity, enough to discharge 4 MW continuously for 8 hours. The battery is sized at 4.3 MW, 33.5 MWh DC nameplate and is arranged as arrays with each string 1 to 1.5 MWs. Vanadium flow technology has no cycling limit, with an expected degradation of the battery components of less than 0.2 percent per year, and a design life of 30+ years. That makes it suited to the high, manufacturing-driven cycling of an electric arc furnace mill.

The VRB BESS may support the Micro Mill's construction, commissioning, and ramp-up operations. Commissioning starts with hot commissioning of the rolling mill, followed by the melt shop. Production then ramps up gradually to full rate. During this period, the BESS would be charged by on-site solar and would supply stored energy to the mill. This reduces the mill's dependence on the timing of its grid interconnection and on temporary diesel generation.

Invinity would deliver the battery equipment to the site in three tranches. BESS installation and commissioning would follow delivery. The BESS and the on-site solar array would be connected on the direct current (DC) side, an arrangement called DC coupling. The Invinity arrays would share a combined inverter (power conversion system) with the solar arrays. The inverter output would be stepped up to 13.8 kV and connected to an existing 13.8 kV breaker in the PSG plant substation.

The VFB BESS will receive regular maintenance and undergo annual testing procedures to ensure its reliability and performance. PSG staff will be on-site to oversee construction, commissioning, and ongoing operations.

Figure 3-3. Site Plan

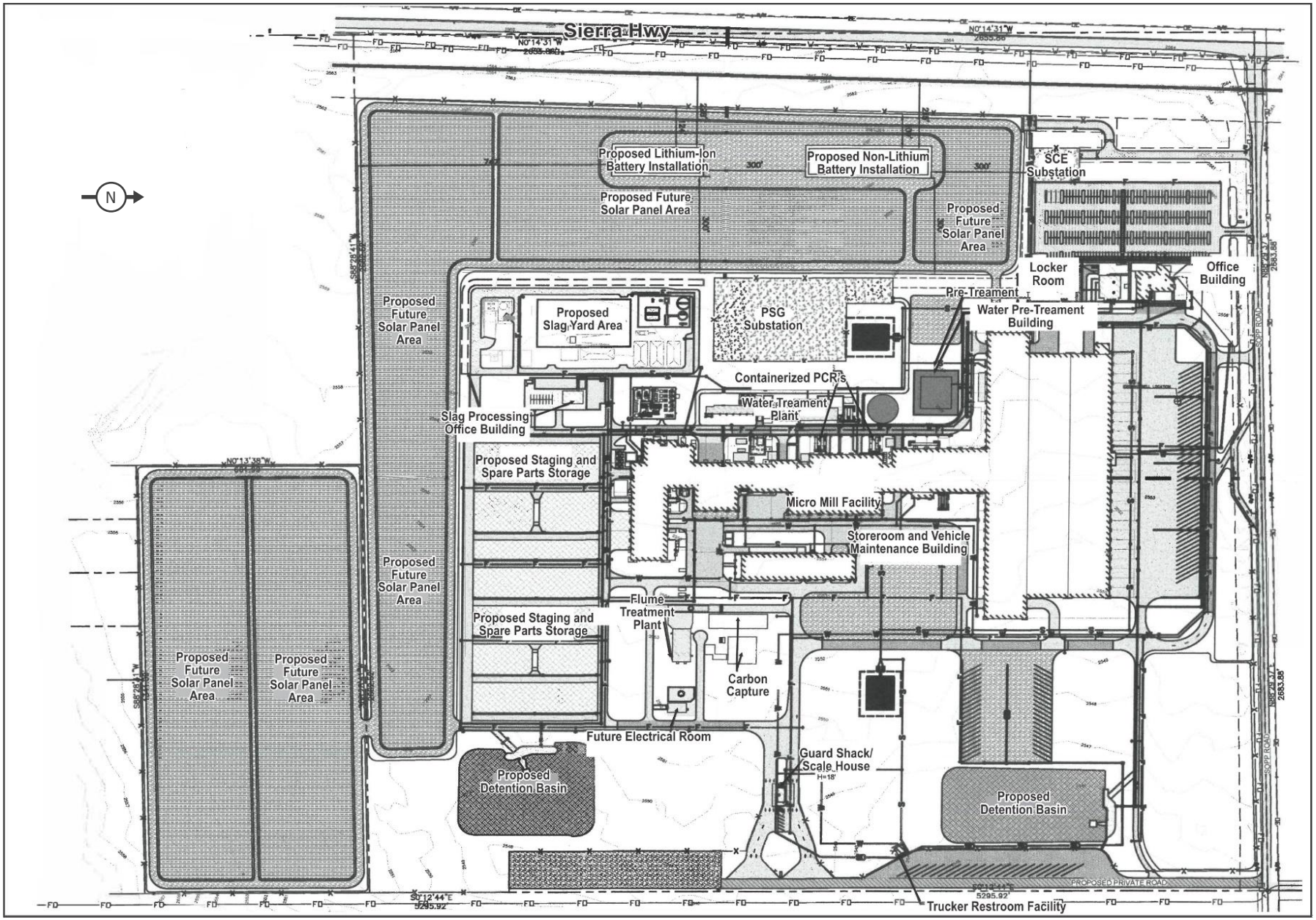
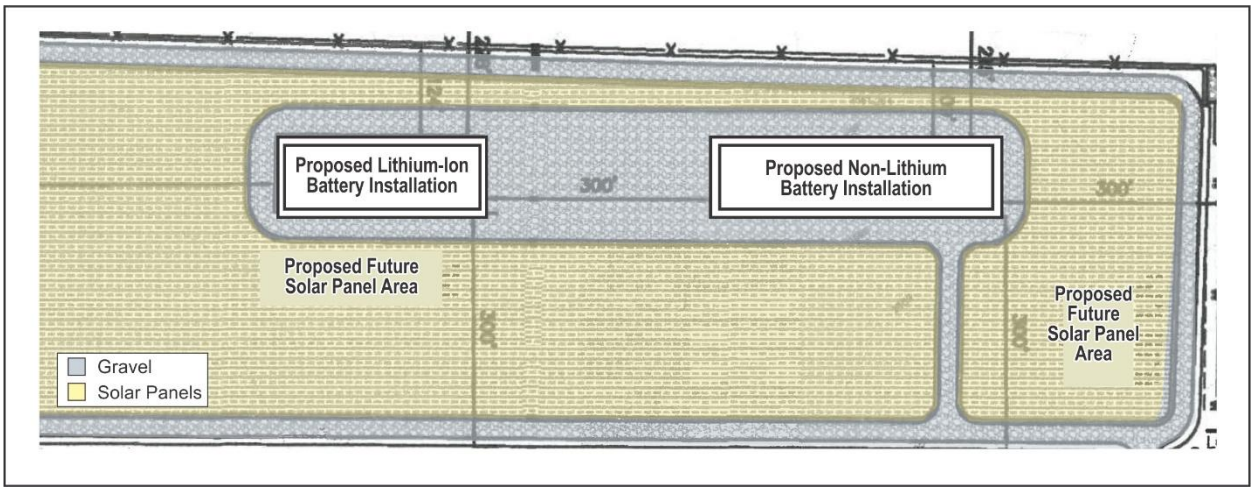


Figure 3-4. Detailed View of Proposed Battery System Locations



3.1. Project Location

The Micro Mill Project site is in unincorporated southeastern Kern County, in the Mojave Desert. It is approximately 57 miles southeast of the City of Bakersfield, approximately 4 miles north of the community of Rosamond and 8 miles south of Mojave. (See **Figure 3-2, Project Site**). The Micro Mill site can be accessed via Sierra Highway. Surrounding land uses include undeveloped areas, rural residences, and agricultural land.

3.2. LDES Project Objectives

The proposed VFB BESS is designed to support the CEC's LDES program goals by achieving the following project objectives:

- Deploy a 4-MW/32-MWh energy storage system to support the dynamic electricity requirements of PSG's innovative zero process emissions steel mill throughout construction, commissioning, and operations.
- Increase the scale of LDES technology deployments to support California's clean energy objectives and inform future deployments.
- Demonstrate the performance of LDES technology in energy-intensive heavy manufacturing with high cycling and performance requirements.
- Increase knowledge about how LDES technology can support a cost-effective zero-carbon renewable energy storage solution to meet the challenges to:
    - Integrate and fully use on-site solar energy in manufacturing, with cyclical operations in export-constrained grid areas;
    - Provide operational energy management for plant operations in response to price signals based on energy grid scarcity; and
    - Enable electric resilience during power outages for environmental, health, and safety considerations.

3.3. Project Overview

The VFB BESS would be located on PSG-owned land and will be connected to the grid through PSG's 66-kV substation on the property **(**See **Figure 3-3, Site Plan).**

VFB BESS Deployment

The VFB BESS will be integrated with both PSG's on-site solar field once the solar field is operational, and with the electrical grid. The BESS and solar photovoltaic system design ensures flexibility in charge and discharge rates, with the ability to provide continuous power over 8 hours and to adjust BESS charge rates to capture on-site solar generated power that is in excess of variable steel mill load requirements.

Generally, the LDES batteries would be charged by the on-site solar panels during times of the day when the California Independent System Operator's day-ahead prices are low (typically during periods of high solar production, such as midday) and would be discharged when the day-ahead prices are high (typically early morning and late evening).

The LDES batteries would involve the design, construction, installation, operation, and decommissioning/removal (at the end of the project) of the following facilities:

1. **Battery Enclosures/Containers:**
    - Preliminary plans call for up to 72 battery modules.
    - The energy storage site would be located about 300 feet west of the PSG substation.
2. **Direct Current Voltage Networking:**
    - The battery system is planned to operate at 480V direct current.
    - Inverters and step-up transformers would be used to integrate the VFB BESS system with the PSG substation at 66 kV.
3. **Energy Management System:**
    - A control system would be implemented to optimize battery dispatch for energy demand shifting, solar integration, and backup power applications.
4. **Electrical Infrastructure:**
    - Cabling, transformers, and switchgear would be installed to interconnect the batteries with the solar farm and the grid.
5. **Civil/Structural Components:**
    - Concrete footings and foundations would be constructed to securely install the battery modules.

3.4. Facility Construction

3.4.1. VFB BESS Schedule

Construction of the VFB BESS would be organized into the following activities:

Design:

- January 2027: Integration engineering and design

Procurement:

- January 2027: Order battery equipment
- January 2027: Order critical equipment (inverters, transformer, circuit breaker)

Site Work:

- April 2027: Site work begins on the VFB BESS (civil work, foundations, trenching, installation, fencing, gravel) concurrently with construction of the Micro Mill facility

Installation and Commissioning:

- August 2027: Battery equipment delivery
- August 2027: Critical equipment (inverters, transformer, circuit breaker) delivery
- September 2027: Installation and commissioning
- September 2027: Energization of battery system

3.4.2. Workforce

For the VFB BESS, the average daily construction workforce would vary between 5 and 10 workers, with a peak workforce of up to 10 workers (they would be in addition to the workforce supporting the construction of the Micro Mill facility). During commissioning, some project workers and utility personnel would be required to connect the VFB BESS to the substation and ensure it is functioning properly. The commissioning workforce would be onsite for up to 10 weeks, with an average of 5 workers and a peak workforce of 10 workers. Parking for the construction workforce would be in the construction office parking area.

The vehicle trips generated from construction of the VFB BESS assumes 10 workers would commute individually for a total of 10 daily round trips. Additionally, construction activity trips would include trucks arriving and departing the site each day to deliver supplies, equipment, and materials.

3.4.3. Site Grading and Preparation

Before initial construction mobilization, any required sediment and erosion control measures would be implemented in accordance with an approved Storm Water Pollution Prevention Plan (SWPPP), as required by mitigation measure EIR MM 4.10-2. To ensure proper grading and effective drainage, the site's topography will be accessed, and a

grading plan will be provided to facilitate efficient water runoff. Regular monitoring and adjustments will be carried out throughout the grading process to meet drainage requirements, preventing erosion and flooding issues in the future.

3.4.4. System Installation

Grading, excavation, and trenching would be required for the installation of piping, electrical conduit, and module footings. This would require the use of excavators, compaction equipment, and water trucks. Excavation depths would be determined based on the results of the geotechnical investigation.

Concrete required for foundations or equipment pads would be provided by a supplier and trucked to the project site. Whether the concrete would be mixed on-site or pre-mixed off-site will depend on the preferences and specifications of the engineering, procurement, and construction (EPC) contractor. Similarly, the water supply for making concrete would also be determined by the EPC supplier. Electrical equipment would be mounted or installed in-place and interconnected to SCE's electrical distribution system.

3.4.5. Substation Upgrades

The VFB BESS would be connected to the planned PSG substation at 13.8 kV and subsequently stepped up to 66 kV, which allows integration of solar and battery technologies in the substation design. Inverters, step up transformers, relays, and breakers will be required.

3.4.6. Commissioning

At the conclusion of the VFB BESS construction and installation phases, the system would go through a commissioning phase to ensure it is operating properly. Commissioning of the VFB BESS is expected to take approximately four weeks, with four workers on average. The vanadium flow BESS modules are delivered pre-filled with electrolyte. Each module includes full secondary containment holding 130 percent of the electrolyte. No electrolyte is released during the operation of the system. Workers would wear appropriate personal protective equipment (PPE) during any commissioning activities. PSG personnel and contractors would connect the VFB BESS to the PSG substation. Battery supplier employees and qualified contractors would adjust the battery storage system to ensure it is functioning properly.

3.5. Operations and Maintenance

The VFB BESS will undergo regular maintenance and preventative care over its operational life. PSG will contract with the battery supplier, or another qualified firm, to oversee the operation and maintenance of the system. The facility will be remotely operated and monitored via a Supervisory Control and Data Acquisition (SCADA) system, with PSG staff on-site to perform routine monitoring. Additionally, staff provided by the battery supplier, or a qualified third party, will be on call to respond to any alerts. These staff will visit the site annually, or as needed, to perform the necessary maintenance tasks.

Annual maintenance will include the following activities:

- **Visual Inspection:** Inspect battery modules, control cabinet internals, and general site conditions for water penetration, corrosion, and other issues. Inspect door mechanisms and verify proper torque on wiring connections.
- **Fan Operation Check:** Ensure fans are operational, listening for abnormal noises and confirming correct rotation.
- **Fuse Inspection:** Visually inspect fuses for continuity and heat stress, and replace as needed.
- **DC Switch Operation:** Operate DC switches and disconnects to verify proper functionality.
- **Fast Stop Test:** Test the Fast Stop operation to confirm all contactors[1] open correctly.
- **Control Voltage Check:** Inspect control voltages (24VDC, 5VDC, 3.5VDC) to ensure they are within specifications.
- **Uninterruptible Power Supply (UPS) Backup Check:** Confirm UPS backups are operational and functioning as designed.
- **Cleaning:** Clean air vents in battery modules and control cabinets to prevent obstruction or overheating.
- **Air Filter Maintenance:** Clean or replace air filters per manufacturer's warranty guidelines.
- **Thermal Imaging:** Use thermal imaging to inspect DC power circuitry connections during normal operation to identify any potential issues.
- **Capacity and Efficiency Test:** Conduct a full cycle test to assess battery performance and efficiency, recording all data.
- **Documentation:** Record preventive maintenance work, observations, and test results.
- **Ground Fault Detection Test:** Test ground fault detection systems if installed at the inverter level.
- **Electrolyte Valence Balancing:** Electrolyte valence can shift through operation, eventually resulting in reduced capacity if left unchecked. This is easily adjusted during annual maintenance.

Replacement parts and components will be warehoused off-site and deployed as needed

[1] A fast stop contactor is a high-current, electromagnetically actuated switch designed to rapidly disconnect a load from its power source when triggered by a control signal, typically for emergency or safety shutdown.

3.5.1. Site Security

Minimal lighting would be used for operations and would be limited to safety and security functions. Motion-sensitive, directional security lights would be installed to provide adequate illumination at points of ingress and egress. All lighting would be directed downward and shielded to focus illumination on the desired areas only and to minimize light trespass in accordance with applicable County requirements. If additional temporary lighting were to be required for nighttime maintenance, portable lighting equipment would be used and removed from the site at the end of the maintenance work.

3.6. Decommissioning and Demolition

The estimated life of the VFB BESS is approximately 30+ years; however, the facility could stay online past the initial 30-year period if it is in good condition and operating satisfactorily. Once the VFB BESS has completed its useful life, it will undergo decommissioning, upgrading, or replacement with new battery equipment. If decommissioned, demolition would take 6 to 12 months, during which aboveground facilities and structures would be removed. Underground cables would either be removed or abandoned in place, and electrical connections to the substation would be terminated.

Demolition would likely involve a combination of salvage or disposal performed in accordance with applicable federal, state, and local regulations. The battery is composed of standard recyclable materials. LDES battery suppliers are actively engaged in developing the supply chain required for end-of-life material management and a circular use framework, which would result in recycling pathways and offtakes for approximately 80 percent by weight of end-of-life materials.

The electrolyte in the VFB batteries would be drained by qualified environmental contractors and the battery containers would be processed to separate the module, auxiliary equipment, and plumbing materials for recycling. Electrolyte can be reprocessed, either for use within the battery supplier's supply chain for additional battery deployments, or for third-party commercial use in caustic wastewater management, or as inputs in chemical industries.

Auxiliary equipment would be processed for scrap metal; where appropriate, motors or equipment can be resold. Plumbing parts, composed primarily of HDPE piping, could be processed as plastics recycling.

Battery modules would undergo a second advanced processing step to separate the anode, electrodes, and packaging and direct materials to steelmaking, scrap metals, and plastic recycling markets. Enclosures could be recycled as scrap metal.

Balance of plant equipment has standard electronics and equipment recycling pathways to scrap metal markets.

Project-level infrastructure, including concrete, piping, and electricals/conduit could be managed via site level demolition/construction recycling processes for aggregate waste.

At end-of-life, the project site would be evaluated for deployment of new energy resource technologies or be returned to a state specified in relevant contracting and project approval conditions.

4. Environmental Assessment

The Micro Mill Final EIR analyzed project impacts to 20 resource areas. None of these resources areas would experience any increase to the type or severity of impact as a result of the proposed VFB BESS at the Micro Mill project site. However, the Micro Mill Project EIR identified three areas (aesthetics, air quality, and noise) that had both project and cumulative impacts that were significant and unavoidable Two areas (biological resources and wildfire) had significant and unavoidable cumulative impacts.

Table 4-1 provides a brief overview and analysis of the differences between the zinc-hybrid batteries and the vanadium batteries in those technical areas that were addressed in the 2025 Addendum. The use of the vanadium batteries would include the transportation and use of an acidic electrolyte solution, which is addressed in more detail in the Hazards and Hazardous Materials, and Transportation and Traffic sections of this addendum. Because of the increase in number of batteries (from 58 zinc-hybrid batteries to between 68 to 72 VFBs) Noise has also been analyzed. For the remaining resource areas, and cumulative impacts, the proposed VFB BESS would have no change to either the type or severity of impacts as analyzed in the Micro Mill Final EIR, or the 2025 Addendum. Therefore, they are not addressed in this addendum.

4.1. Hazards and Hazardous Materials

Baseline Conditions

The Micro Mill Project site is approximately 174 acres of predominantly vacant land across two adjacent parcels, located at the southeast corner of the intersection of Sopp Road and Sierra Highway. Regionally, the site is approximately 57 miles southeast of Bakersfield in the desert region near the unincorporated communities of Rosamond and Mojave and is about 1.25 miles southeast of the State Route 14 (SR 14) and Backus Road exit. Regional access to the project site is provided by SR 14 by way of Backus Road one mile north of the project site, from Sierra Highway to the east off of SR 14.

The land immediately surrounding the Micro Mill Project site is sparsely developed with the vast majority of land being vacant and zoned for agricultural production. The nearest residence (R2) is located approximately 440 feet north of the Micro Mill property boundary. The nearest school is Rosamond High School, located approximately 5 miles south of the Micro Mill Project site. The nearest airports are the Rosamond Sky Park located approximately 5.5 miles southwest of the Micro Mill site and the Mojave Air and Space Port located approximately 8 miles north of the Micro Mill site. The Micro Mill Project site is not located within an Airport Sphere of Influence of any existing airport.

Senate Bill 38 requires each battery energy storage facility located in California to have an emergency response and emergency action plan that covers the premises of the battery energy storage facility. The bill requires the owner or operator of the facility, in developing the plan, to coordinate with local emergency management agencies, unified program agencies, and local first response agencies.

Table 4-1. Summary of Topic Areas in the 2025 Addendum Comparing the Zinc-hybrid Batteries to the Vanadium Batteries

Topic Area	Zinc-hybrid BESS	Vanadium BESS	Analysis
Aesthetics	Would replace approximately two acres of blue or black solar panels (including surrounding graveled area) that are up to 9 feet in height with shipping containers that are about 8.5 feet high.	Would replace the 58, 9-foot-tall shipping containers with up to 72 shipping containers formed into 17 strings about 19 feet 4 inches tall.	One or more rows of solar panels would remain between Sierra Highway and the BESS area. The area covered by the VFB BESS would be smaller than that covered by the zinc-hybrid BESS but taller. The site would remain an industrial area. The EIR's conclusion that project's contribution to significant impacts associated with visual character in the Antelope Valley would be both project-specific and cumulatively significant and unavoidable. This conclusion would not change.
Air Quality	Because the Micro Mill construction is projected to emit a total of 13.92 tons/year of NOx and 2.76 tons/year of ROG, both with an annual threshold of 25 tons/year, the additional emissions (if any) from the 58 zinc-hybrid-based LDES units would not exceed the applicable significance thresholds.	Would replace 58, 40-foot-long shipping containers with up to 72, 20-foot-long shipping containers.	With the inclusion of the BESS, the project would be contained in the same footprint as that analyzed in the EIR, the severity of impacts would not change. The land near the on-site PSG substation that would be exchanged for the BESS units has already been analyzed in CalEEMod with much of the same equipment that would be required for installing the BESS units. The general practice in analyzing air quality impacts is to be conservative in the analysis by considering a broader area of land instead of the exact square footage of every feature as construction vehicles tend to move over greater distances for maneuvering as well as running equipment for longer durations than they would be in real-time. Therefore, actual project emissions would be less than what was analyzed in the EIR air quality assessment.

Topic Area	Zinc-hybrid BESS	Vanadium BESS	Analysis
Biological Resources	Area affected by the zinc-hybrid BESS would be approximately 2.0 acres.	Area affected by the VFB BESS would be approximately 2.0 acres.	The total amount of temporary and permanent disturbance would remain unchanged compared to the originally approved Micro Mill Final EIR. Thus, the potential direct and indirect impacts to the sensitive species would remain unchanged. The inclusion of the BESS would not directly affect any of those sensitive species. The impact conclusions for operations and maintenance activities would remain the same as identified in the Final EIR, and no new significant impacts would occur.
Hazards and Hazardous Materials	58 battery modules containing an electrolyte with a pH of 2.	Up to 72 battery modules containing an electrolyte with a pH of 2.	See detailed analysis in Section 4.1
Noise	Each of the zinc-hybrid units would generate a noise level of 75 dBA Leq at a distance of 1 meter.	Each of the VRB units would generate a noise level of 50 dBA Leq at a distance of 1 meter	See detailed analysis in Section 4.2
Transportation and Traffic	The zinc-hybrid BESS would require 58 haul trips of containers 8.5 feet high by 8.5 feet wide by 40 feet long, plus separate tanker truck trips for the electrolyte, which would have been spread out over two phases and several days within each phase.	The VFB BESS would add up to 72 haul trips for the battery shipping containers, with dimensions equal to 9.5 feet high by 8.5 feet wide by 20 feet long, spread out over a month	See detailed analysis in Section 4.3

Topic Area	Zinc-hybrid BESS	Vanadium BESS	Analysis
Wildfire	The zinc-hybrid battery modules are not subject to thermal runaway. Regardless, there is a minimum of 300-feet separation between the LDES BESS, the lithium BESS, the PSG substation, and Sierra Highway.	The VFB modules are not subject to thermal runaway. Regardless, there is a minimum of 300-feet separation between the LDES BESS, the lithium BESS area, the PSG substation, and Sierra Highway.	With implementation of MM 4.9-1 through MM 4.9-12, compliance with the requirements of SB 38 (Emergency Response and Emergency Action Plan), and operating in conformance with 2022 California Fire Code, Title 24, Part 9, and the NFPA Standard 855 for energy storage systems, and implementation of the county's requirements of a 300-foot-setback from critical uses, operational impacts from the LDES Addition would be less than significant with mitigation incorporated.

Summary of Final EIR Impact Conclusions

The Micro Mill Project impacts associated with hazards and hazardous materials are addressed in Section 4.9 of the EIR. That section addresses the baseline conditions related to hazards and hazardous materials in the Micro Mill Project area and describes the environmental setting for hazardous materials and waste, airports, electromagnetic fields, and wildfire hazards. Other sensitive receptors, such as residences and schools, are also described because their proximity to the Micro Mill Project site could affect their exposure to the potential hazards.

During construction of the Micro Mill facilities, hazardous materials such as petroleum fuels and lubricants used by field equipment would be subject to the Material Disposal and Solid Waste Management Plan and other measures that seek to limit releases of hazardous materials and wastes as described in the Hydrology and Water Quality section of the EIR (Section 4.10). The disposal of all oils, lubricants, and spent filters would be performed in accordance with all applicable regulations including the requirements of licensed receiving facilities. During construction, the relatively limited use and small quantities of hazardous materials, and subsequent transport and disposal of such materials, would be controlled through compliance with applicable regulations including the Kern County and Incorporated Cities Hazardous Waste Management Plan. Thus, impacts during construction would be **less than significant** (EIR, pp. 4.9-21 and 4.9-22).

Scrap metal can contain toxic materials such as lead, mercury, and cadmium that can be released into the environment when it is recycled or disposed of improperly. One such hazardous material that would be a byproduct of the rebar making process is Electric Arc Furnace (EAF) dust, which is considered a hazardous waste. Therefore, it will be collected in a bag filter, transported in an enclosed conveyor to a silo and, in a completely enclosed process and with a dustless spout, the trucks will be loaded from the silo to be trucked out of the plant (EIR, p. 4.9-22).

Operational activities of the micro mill would also use other hazardous materials through the maintenance of its equipment, and other equipment, and vehicles on-site. To mitigate any potential impacts of the use of hazardous materials, MM 4.9-1, which requires the preparation of a Hazardous Materials Business Plan, would describe proper handling, storage, transport, and disposal techniques and methods to be used to avoid spills and minimize impacts in the event of a spill, would ensure that all handling, storage, and disposal of hazardous materials would be conducted in accordance with proven practices to minimize exposure to maintenance workers and/or the public (EIR, p. 4.9-24).

The photovoltaic (PV) modules that would be installed on the project site use cadmium telluride (CdTe), thin film, or crystalline silicon technology. PV modules are constructed as solid-state monolithic devices to achieve long-term field durability to withstand harsh environmental conditions for 25 years or more. The Final EIR concludes that the use of a CdTe PV system would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials during normal operations (EIR, p. 4.9-36). The Final EIR also concluded that crystalline silicon and thin

film CdTe PV technologies do not present a health risk in the event of fire or breakage, with regard to their use of lead and cadmium compounds, respectively (EIR, p. 4.9-3).

Overall, adherence to regulations and standard protocols during the storage, transportation, and usage of any hazardous materials, and implementation of MM 4.9-1 through MM 4.9-10 would minimize or reduce potential impacts related to reasonably foreseeable upset and accident conditions involving the release of hazardous materials, to a **less-than-significant** level (EIR, p. 4.9-30).

Consideration of Changes to Impact Conclusions

The 4 MW VFB BESS will use between 68 to 72 modified shipping container modules as compared to 58 zinc-hybrid modules, both having a total capacity of 32 MWh. The electrolyte in both the zinc-hybrid batteries and the VFB batteries have a pH that is below 2, making it acidic. In both cases, construction of the BESS would require the use of standard construction equipment similar to that used to construct the Micro Mill facility and solar field. Potential Hazards and Hazardous Material impacts are described below.

Construction

During construction, the VFB batteries would be shipped in modified shipping containers with dimensions equal to 9.5 feet high by 8.5 feet wide by 20 feet long. Each container will require its own truck, and delivery frequency will depend on laydown/staging capabilities and site readiness. The modular and pre-filled design (i.e., the electrolyte will be shipped in the module) of the VFB means that module placement is quick, and does not require specialist equipment or training. By comparison, the zinc-hybrid batteries are shipped empty and filled at the project site. To ensure that transport of the VFB modules would not pose a significant risk to the public, the VFB modules would be shipped from the factory in Carlsbad, California to the project site using the following route:

From Loker Ave W, take Palomar Airport Rd east
Continue onto W San Marcos Blvd
Merge onto CA-78 East toward Escondido
Take I-15 North toward Riverside
Take CA-91 West briefly, then exit onto CA-71 North toward Pomona/Ontario
Merge onto CA-57 North
Merge onto I-210 West toward Pasadena
Continue on I-210 West, then merge onto I-5 North toward Sacramento
Take CA-14 North toward Palmdale/Lancaster
Continue on CA-14 North past Palmdale and Lancaster
Take Exit 61 (Backus Rd)
Turn right on Backus Rd
Turn right on Sierra Hwy
Turn left on Sopp Rd
Continue about 0.2 mile to 506 Sopp Rd

Aside from the electrolyte, only a minimal amount of hazardous material (i.e., petroleum products) would be used during construction. As with construction of the Micro Mill

facilities, implementation of established construction controls would reduce the risk of hazardous materials spills and releases during project construction. Implementation of best management practices would ensure that hazardous materials used on-site during operation would neither be released into the environment nor expose operational personnel to hazardous materials.

Potential impacts that may result from construction of the BESS include the accidental release of materials, such as petroleum products including lubricants, fuels, and solvents or electrolyte. To mitigate any potential impacts of the use of hazardous materials during construction or operation, MM 4.9-1 requires the preparation of a Hazardous Materials Business Plan. The Plan would describe proper handling, storage, transport, and disposal techniques and methods to be used to avoid spills and minimize impacts in the event of a spill. It would ensure that all handling, storage, and disposal of hazardous materials would be conducted in accordance with proven practices to minimize exposure to maintenance workers and/or the public. With implementation of MM 4.9-1, construction impacts from the LDES BESS would be **less than significant** (EIR, p. 4.9-25).

Operation

The only hazardous material during operation of the VFB BESS would be contained within the VFB units and consist of a battery electrolyte. All chemical reaction batteries use an electrolyte that creates a small amount of heat during the reaction while producing electricity, and upon recharging. Thus, each module uses a thermal management system design that ensures sufficient airflow to dissipate waste heat using a rear intake fan and front-of-container exhausts.

Like most aqueous batteries, very small amounts of hydrogen gas can be generated during normal operation of the VFB as a result of the hydrogen evolution reaction. The Endurium battery module does not rely on hydrogen gas detectors or an active exhaust fan for hydrogen safety. The module incorporates a gas management system that directs gas evolved from the battery outside the enclosure, as well as passive ventilation through the enclosure louvers. The design has been evaluated in accordance with UL 1973 and IEC 60079-10-1 to demonstrate that hydrogen concentrations remain below safe levels, including under evaluated abnormal conditions. While the module includes a centrifugal fan for thermal management, the hydrogen safety assessment assumes this fan is off and demonstrates adequate dilution through natural ventilation.

UL Solutions, formerly known as Underwriters Laboratory, researches safety and development of standards that are mainly concerned with the risk from fires and electric shocks (UL Solutions, 2023). The Federal Occupational Safety and Health Administration (OSHA) and Cal OSHA both require that almost all electrical devices and cables in workplaces meet the relevant UL standards. UL9540A is used to suggest mitigations to prevent flammable gases released during fire, battery overcharging, and other abnormal operating conditions within the energy storage system from creating an explosion. Results from the UL 9540A Test Method are used to address battery installation instructions, ventilation requirements, effectiveness of proposed fire protection systems, and fire service response strategy and tactics. Previous product generations of the VFB technology to be used in

this project were certified to UL 1973, tested in accordance with UL 9540A, and underwent field compliance to UL 9540. The latest generation to be deployed at this site is currently in the process of gaining these certifications, as well as additional certifications related to safety and performance standards. It is anticipated that these certifications will be obtained prior to delivery.

In addition, the VFB BESS will be operated in conformance with 2022 California Fire Code, Title 24, Part 9, and the National Fire Protection Association (NFPA) Standard 855 for energy storage systems. As such, there is no increase in fire risk as a result of the operation of the VFB BESS. In addition, Kern County requires that the VFB BESS be located at least 300 feet from the lithium-ion BESS, as well as the PSG Substation, and Sierra Highway as shown in **Figures 3-3 and 3-4**.

With implementation of MM 4.9-1 through MM 4.9-10, adherence to regulations and standard protocols during the transportation, storage, and use of any hazardous materials, compliance with the requirements of SB 38 (Emergency Response and Emergency Action Plan), and operating in conformance with 2022 California Fire Code, Title 24, Part 9, and the National Fire Protection Association (NFPA) Standard 855 for energy storage systems, operational impacts from the VFB BESS would be **less than significant with mitigation incorporated** (EIR, p. 4.9-27).

Summary of Findings

Among other topics, the Micro Mill EIR addressed the project impacts related to hazards and hazardous materials in the project area and the hazardous materials and waste, airports, electromagnetic fields, and wildfire hazards. Except as described above, there would be no changes to potential impacts (construction or operation) as analyzed in the Micro Mill EIR, and confirmed in the 2025 EIR Addendum, from development and operation of the VFB BESS. With implementation of MM 4.9-1 through MM 4.9-12, compliance with the requirements of SB 38 (Emergency Response and Emergency Action Plan), and operating in conformance with 2022 California Fire Code, Title 24, Part 9, and the NFPA Standard 855 for energy storage systems, and implementation of the county's requirements of a 300-foot-setback from critical uses, operational impacts from the VFB BESS would be **less than significant with mitigation incorporated** (EIR, p. 4.9-27).

4.2. Noise

Baseline Conditions

Existing baseline conditions would be consistent with those identified in the Micro Mill EIR. The site vicinity, and much of the region, consists largely of vacant undeveloped land uses, with a few rural single-family residences spread far apart. North of the site is a food storage facility and an outdoor storage area for a stone manufacturing facility. East of the site is Edwards Air Force Base and its solar facility. Directly west of the site lies the Union Pacific Railroad, with the Sierra Highway just beyond, both running north-south and parallel to one another. The nearest sensitive receptor (R2) is a rural single-family residence located about 440 feet north of the mill site boundary on Dobbs Road.

Ambient noise levels surrounding the project site were derived from short-term noise measurements taken at three locations, two near the project site and one along the off-site improvements path in the community of Rosamond located south of the site. Baseline measurements (see EIR Table 4.13-3 *Summary of Short-Term Ambient Noise Measurements at the Project Site*) indicate the existing ambient noise levels in the project vicinity range from 53.7 dBA Leq (in Rosamond) to 68.9 dBA Leq (R1 a residence along Sierra Highway approximately 1,060 feet north of the project site). Roadway noise levels surrounding the project site (taken from 50 feet from the centerline) range from 59.8 to 67.6 dBA CNEL on Backus Road between Sierra Highway and SR 14, respectfully; 67.1 dBA CNEL along Sierra Highway between Backus Road and Sopp Road; 64.3 dBA CNEL on Sopp Road between Sierra Highway and Line Butte Road (roadway segment containing the site's northern boundary); and 54 dBA CNEL along Rosamond Boulevard in Rosamond (off-site improvements roadway segment). The site is comprised of vacant, undisturbed land, with no existing anthropogenically induced sources of noise emissions generated onsite.

Summary of Final EIR Impact Conclusions

The Final EIS analysis of potential noise and vibrational impacts is based on changes to the existing ambient noise in the project vicinity and the generation of vibrations as a direct result of the construction and operation of the Micro Mill Project and as identified in the Noise and Vibration Impact Study and the supplemental technical memorandum Noise and Vibration Analysis of Off-Site Power Utilities. The significance criteria used for this section of the Final Micro Mill EIR were based on those found in Appendix G of the CEQA Guidelines:

- Would the project generate a substantial temporary or permanent increase in the ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies;
- Would the project generate excessive groundborne vibration or groundborne noise levels;
- Would the project result in a permanent increase in ambient noise levels in the project vicinity above levels existing without the project; or
- For a project located within the Kern County Airport Land Use Compatibility Plan, would the project expose people residing or working in the project area to excessive noise levels?

The threshold of significance used to analyze potential temporary or permanent noise impacts in the vicinity of the project was an increase of 5 dBA Leq above the existing ambient noise environment. Temporary construction activities required to build the Micro Mill and conduct the off-site transmission line improvements would require several phases of construction comprising several pieces of equipment. The combined noise level for all equipment in each phase of onsite construction was analyzed at the two distances 1,060 feet (R1) and 440 feet (R2). Due to the potential of phases overlapping, the EIR analysis combined the calculated noise levels of all phases to produce a total project

construction noise level experienced at each receptor. The analysis established an exceedance of the 5 dBA Leq above ambient noise levels for project onsite construction noise experienced by R2, but did not exceed this threshold at R1. However, **with the implementation of MM 4.13-1 and MM 4.13-2 this impact would be less than significant**. MM 4.13-1 requires equipment staging and laydown practices and MM 4.13-2 requires noise reducing measures such as acoustical barriers, mufflers, and orientating equipment away from receptors (EIR, p. 4.13-23).

Off-site construction noise due to vehicle trips was analyzed and compared to the existing ambient noise levels of project vicinity roadway segments listed in Table 4.13-12 Existing Roadway with Construction Noise Levels of the EIR/EIS. As indicated, none of the project roadways would experience an increase in traffic as a consequence of project construction that would result in the exceedance of 5 dBA CNEL above existing ambient noise levels. Thus, this impact was found to be **less than significant** (EIR, p. 4.13-24).

For off-site traffic impacts on roadways in the project vicinity, a 5 dBA over existing ambient noise levels was the threshold used in the EIR analysis. Traffic noise during construction was analyzed using the projected number of worker trips and haul truck trips during the temporary construction period. The project would generate a maximum of 1,030 worker trips per day, 101 vendor trips, and 67 haul truck trips. The increase in project vicinity roadways as a result of this increase in traffic would generate a noise level increase of 5.9 dBA above existing conditions on Backus Road between SR-14 and Sierra Highway. The EIR did not provide a recommended mitigation measure to reduce traffic on this roadway segment; therefore, the predicted 5.9 dBA increase was determined to result in a **significant and unavoidable impact** (EIR, p. 4.13-26).

Operational noise impacts were analyzed in the EIR by calculating the noise emissions of each of the proposed pieces of equipment that would generate relatively high noise levels. The combined equivalent continuous noise level from these pieces of equipment was projected to result in a noise level of 86.2 dBA Leq at a distance of 50 feet. When extrapolated out to the sensitive receptors and combined with noise from the 72 VFB BESS units, the resulting noise level would be approximately 70.1 dBA Leq at R2 and much less at R1. This would be below the existing ambient-based noise thresholds of 73.9 dBA Leq at R1 and 70.6 dBA Leq at R2. Therefore, the operational noise impact would remain **less than significant** (EIR, p. 4.13-30 and 4.13-40).

For operational traffic on project vicinity roadways, the increase in traffic was found to increase noise levels between 2.0 to 8.3 dBA compared to baseline conditions (EIR Table 4.13-13 *Existing Roadway with Proposed Project Noise Levels*). The increase of noise on the project vicinity roadways during the first year of opening was indicated in EIR Table 4.13-14 *Year 2026 Roadway with Proposed Project Noise Levels*. In both scenarios, only two out of the four roadways would experience an increase in noise that would exceed the 5 dBA increase over existing conditions threshold, and only one (Backus Road between SR-14 NB Ramps and Sierra Highway) has existing residences. The impact from the increase in noise levels over the existing and projected ambient noise environment, as a result project operations, was found to be **significant and unavoidable**. Until the

county adopts a mechanism to collect fees for roadway improvements for Dawn Road (a dirt road that could be an alternative route for future project trips), there are no feasible measures available to reduce this impact (EIR, p. 4.13-31 and 4.13-32).

As the proposed mill would generate very little on-site activity beyond the actual mill operation (e.g., from customers visiting the site and the noise produced by their vehicles and conversations), the anticipated noise levels would be attenuated to approximately 36 to 49 dBA at 1,000 feet. Considering the Kern County Code regarding noise-generating events lasting more than one minute, none of the stationary noise sources on the project site would result in an exceedance of the 70 dBA daytime or 60 dBA nighttime thresholds. This impact would be **less than significant**. Additionally, as the proposed Micro Mill facility is not considered to be a sensitive land use, there would be **no impacts** to the interior operations from traffic noise. Finally, the off-site power and telecommunication lines represent an infrastructure project that, once constructed, would not generate any substantial noise levels. Therefore, off-site operational noise generated from these lines would not result in temporary or permanent substantial increases and noise and this impact was found to be **less than significant** (EIR, p. 4.13-32 and 4.13-33).

Impacts associated with vibrations generated on- and off-site and experienced by the nearby sensitive receptors were analyzed using typical vibration levels of equipment and thresholds outlined in the Federal Transit Administration's Transit Noise and Vibration Impact Assessment. The two criteria used for the EIR analysis were impacts related to structural damage and human annoyance. As indicated in EIR Table 4.13-15, *Vibration Source Amplitude for Construction Equipment* and EIR Table 4.13-16, *Summary of Construction Equipment and Activity Vibration*, none of the pieces of construction equipment would generate vibrations above the structural damage thresholds of either 0.5 in/sec peak particle velocity (PPV) [102 vibration decibels, VdB] or 0.2 in/sec PPV (94 VdB). Furthermore, no vibrations would exceed the FTA's 78 VdB threshold at the nearest noise-sensitive receptor location during daytime hours or the FTA's 84 VdB threshold for annoyance of occupants in residential buildings. Thus, impacts from construction vibrations were found to be **less than significant**. Lastly, as the Micro Mill facility would not include any development of industrial uses that would generate substantial ground vibration, there would be **no impacts** in this area (EIR, p. 4.13-36 and 4.13-37).

Consideration of Changes to Impact Conclusions

As with the zinc-hybrid BESS, construction of the VFB BESS would displace construction of some solar PV panels but would increase construction activities that would include the use of heavy equipment to construct foundations; use of a backhoe to trench electrical facilities; use of flatbed trucks to bring the battery modules to the project site; use of a crane to place the modules on top of their foundations. However, like the zinc-hybrid BESS, construction of the VFB BESS would occur concurrently with construction of the Micro Mill facility. Therefore, the battery system additions could increase noise levels generated on-site that would be experienced by the nearby receptors. Nonetheless, with the implementation of MM 4.13-1 and MM 4.13-2, this impact would remain the same as analyzed in the EIR, that is, **less than significant with mitigation incorporated** (EIR, p. 4.13-33 and 4.13-34). Additionally, there would be no off-site construction required

for the installation of the VFB BESS. As with the zinc-hybrid BESS, the increase in worker, vendor, and haul truck trips associated with the VFB BESS would temporarily increase roadway noise levels beyond what was analyzed in the EIR. However, as the Micro Mill would result in off-site traffic impacts being **significant and unavoidable**, this increase in VFB BESS-related trips during construction would not alter the impact concluded in the EIR (EIR p. 4.13-34).

During operation of the VFB BESS, the noise generated by the battery system would be minor in comparison to the noise of the Micro Mill facility itself. Each of the VRB units would generate a noise level of 50 dBA Leq at a distance of 1 meter (compared to the 75 dBA for the prior zinc-hybrid batteries). Noise would be attenuated over the distance of 440 feet (distance from the project's property line to the nearest sensitive receptor), the nearest sensitive receptor would experience noise levels of approximately 15.5 dBA Leq (or 21.9 dBA Ldn). This increase would not change the calculated noise level of the Micro Mill facility from 67.4 dBA Leq (or 73.8 dBA Ldn). (The main source of noise would come from the mill itself, thus the project' VFB BESS would be miniscule additions and therefore similar in the total output of the project). The VFB BESS would not cause total project operational noise, including traffic noise and existing ambient conditions, to exceed the applicable local noise thresholds of 73.9 dBA Leq at R1 and 70.6 dBA Leq at R2, equivalent to 80.3 dBA Ldn and 77.0 dBA Ldn, respectively. The impact from the batteries would remain **less than significant**, as was analyzed in the EIR (EIR, p. 4.13-30) and 2025 Addendum. As with the zinc-hybrid BESS, the increase in traffic noise from operating the VFB BESS system would be from a few trips per month as the system would be remotely controlled. Regardless, the Final EIR determined that operational traffic noise would be **significant and unavoidable with no feasible mitigation to reduce impacts** (EIR, p. 4.13-31).

With respect to the vibrations emitted by the VFB BESS (which would be similar to the zinc-hybrid BESS) , there would be no change in impact severity from what was analyzed in the EIR. The battery containers would sit on concrete footings, with no pile driving activities required during the construction phases, nor any use of other pieces of equipment that would result in vibrations experienced by the nearby sensitive receptors above the FTA's established groundborne vibration thresholds. This impact would remain **less than significant**, as was analyzed in the EIR (EIR, p. 4.13-36) and 2025 Addendum. Furthermore, the batteries themselves would not emit groundborne vibrations during their operation. Therefore, there would be **no impact**, as was analyzed in the EIR for onsite noise-generating equipment (EIR, p. 4.13-37).

Summary of Findings

In general, like the zinc-hybrid BESS, the use of the VFB BESS would not result in any substantial changes to the project that would alter the impacts and conclusions addressed in the EIR. The increase in construction equipment required for site preparation and installation of VFB modules would be minor, as much of the construction equipment would already be on-site and noise levels generated by those pieces of equipment during the construction period were previously analyzed in the EIR; and done so conservatively.

With the **implementation of MM 4.13-1 and MM 4.13-2, on-site construction noise impacts would remain less than significant.**

As with the zinc-hybrid BESS, noise generated by the VFB BESS during operation would be minor. Each of the VRB units would generate a noise level of 50 dBA Leq at a distance of 1 meter, compared to the 75 dBA at a distance of 1 meter for the prior zinc-hybrid batteries. When extrapolated out to the sensitive receptors and combined with noise from the 72 VFB BESS units, the resulting noise level would be approximately 70.1 dBA Leq at R2 and much less at R1. With the zinc-hybrid BESS, when extrapolated out to the sensitive receptors, the noise experienced at these locations would be attenuated below 67.2 dBA Leq. In both cases, noise levels at the sensitive receptors would be below the existing ambient-based noise thresholds of 73.9 dBA Leq at R1 and 70.6 dBA Leq at R2.

The proposed location of the BESS units, in comparison to other operational features, would result in a slight increase in noise levels generated by the facility and this impact would **remain less than significant**. The VFB BESS (as with the zinc-hybrid BESS) would add few trips to the total construction trip count, and only a handful of trips per month during operations. However, both construction and operations of the BESS could result in increases to traffic on project vicinity roadways that could result in an increase of 5 dBA or more and impacts would **remain significant and unavoidable with no feasible mitigations available.**

4.3. Transportation and Traffic

Baseline Conditions

The circulation system in the vicinity of the project site includes a combination of state and county facilities. The Micro Mill Project site is located near two highways that would provide access to the general vicinity of the project during the construction and operation phases. Sierra Highway borders the western boundary of the project site just west of the Union Pacific Railroad. SR 14 runs parallel approximately 0.75 miles west of the project site (EIR, p. 4.17-1).

Local roads include Sopp Road, a two-lane local road at the north side of the Project and Lone Butte Road, a two-lane local road that extends north from Sopp Road at the northeast corner of the project site. Backus Road and Dawn Road are both two-lane local roads running east-west roughly 1 mile north and 2 miles south of the project, respectively. These roads both provide access to SR 14 via full diamond interchanges (EIR, p. 4.17-2).

Summary of Final EIR Impact Conclusions

At the time of preparation of the Traffic Impact Study, the Micro Mill Project's construction phase was expected to last approximately 24 months from 2023 to 2025, with the operational phase beginning immediately after and lasting until 2042. Switching to the VFB BESS, has resulted in the schedule been delayed about two years. Based on the information provided and the analysis completed in the Traffic Impact Study, the construction phase of the proposed project would degrade the level of service (LOS) to a

level below the LOS set by the Kern County General Plan at one intersection while the remaining intersections would not be below LOS D. The PM Peak Hour LOS at the intersection of Backus Road and SR 14 northbound ramps would drop from LOS C in 2023 and LOS D in 2025 to LOS F for the construction years (EIR pp. 4.17-16 and 4.17-17).

To mitigate this potential impact, MM 4.17-1 and MM 4.17-2 would be implemented. MM 4.17-1 would require, prior to the issuance of construction or building permits, the project proponent to implement measures to ensure peak hour construction worker vehicle limits are maintained during the AM and PM peak hours to maintain LOS D or better at the study intersections. MM 4.17-2 would require the project proponent to prepare and submit a Construction Traffic Control Plan to the Kern County Public Works Department-Development Review and the Caltrans offices for District 9 for approval. By implementing these mitigation measures, impacts would be reduced to **less than significant** (EIR p. 4.17-17).

During the operations phase, with mitigation measures implemented, including MM 4.17-3 requiring installation of a traffic signal and road widening at the SR 14 northbound at Backus Road intersection by "opening day" and a traffic signal at southbound ramp and Backus Road intersections by 2042, the LOS would then be adjusted to LOS B, which is above the LOS standard of LOS D. Therefore, impacts would be **less than significant** (EIR, p. 4.17-29). Although the proposed project traffic would result in a degradation of the LOS below the standard LOS D, as set in the Kern County General Plan, with implementation of MM 4.17-1 through MM 4.17-3, the impacts would be **less than significant with mitigation incorporated** (EIR, p. 4.17-33).

Consideration of Changes to Impact Conclusions

The change from a zinc-hybrid BESS to a VFB BESS at the Mojave Micro Mill Project site would not be noticeable when compared to the Micro Mill Project impacts overall. During construction, the VFB BESS would add up to 72 haul trips for the battery shipping containers, with dimensions equal to 9.5 feet high by 8.5 feet wide by 20 feet long, spread out over a month. The zinc-hybrid BESS would require 58 haul trips of containers 8.5 feet high by 8.5 feet wide by 40 feet long, plus separate tanker truck trips for the electrolyte, which would have been spread out over two phases and several days within each phase. Although the VFB truck trips would be more concentrated than the zinc-hybrid batteries, being spread out over a month would not create a significant increase in truck traffic when compared to the daily 101 vendor trips and 67 haul trips during construction of the mill (EIR, p. 4.13-23). The construction of either BESS would reduce the number of truck deliveries associated with the development of the solar field because the solar field would be 4.26 acres smaller than originally planned.

The construction workforce for both the zinc-hybrid and VFB BESS would add up to 10 additional employee trips per day compared to the estimated 872 daily trips from the mill workforce (EIR, p, 4.17-34). The LDES construction workforce would be subject to the Construction Traffic Control Plan (MM 4.17-2). Therefore, like the zinc-hybrid BESS, the VFB BESS would not create any significant new Transportation and Traffic impacts, or significant changes to the impact analysis methodology and conclusions presented in

the Final EIR. Impacts from the VFB BESS would be the same type as those disclosed in the Final EIR, but substantially less. During the construction phase of the project, at the PM Peak Hour, the LOS at the intersection of Backus Road and SR 14 northbound ramps would drop from a LOS A to an LOS F. However, with the implementation of MM 4.17-1 and MM 4.17-2 impacts would be considered **less than significant with mitigation incorporated** (EIR, p. 4.147-39).

When compared to the Micro Mill plant's anticipated operational workforce of approximately 440 workers (EIR, p. 1-13), the addition of 5 to 10 periodic maintenance workers, which would be the same for both the zinc-hybrid and VRB systems, would not have a noticeable effect on traffic. For the operational phase of the Micro Mill, two intersections would drop below the minimum standard of LOS D: Backus Road and SR 14 northbound ramps and Backus Road and SR 14 southbound ramps. With the implementation of MM 4.17-1 and MM 4.17-2, as well as MM 4.17-3 requiring installation of a traffic signal and road widening at the SR 14 northbound at Backus Road intersection by "opening day," and a traffic signal at southbound ramp and Backus Road intersections by 2042, the LOS would then be adjusted to LOS B.

Summary of Findings

In comparison to the zinc-hybrid BESS, the VFB BESS would not add a significant amount of traffic to the roads and intersections surrounding and leading to the project site. Similarly, the 5 to 10 additional workers involved in construction of the VFB BESS would be an insignificant addition to the 515 workers constructing the mill facility (EIR, p. 1-13). During operations, 5 to 10 workers would be needed for periodic maintenance. They would not have a noticeable effect on operational traffic when combined with the 440 operational workers for the mill. Consequently, with implementation of MM 4.17-1 through MM 4.17-3, the cumulative traffic impacts from construction and operations would be **less than significant with mitigation incorporated** (EIR, p. 4.17-40).

5. Summary/Conclusion

The potential impacts from the VFB BESS would not differ substantially from the impacts of the zinc-hybrid BESS and would be insignificant when considered as part of the overall Micro Mill Project. As with the zinc-hybrid BESS, the VFB BESS would not create any new significant environmental effects or a substantial increase in the severity of previously identified significant effects. It would not create any potential impacts that could not be mitigated by the measures set forth in the EIR. In addition, the VFB BESS does not create substantial changes with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR. None of the conditions described in Section 15162 of the CEQA Guidelines calling for preparation of a subsequent EIR have occurred.

6. References

UL Solutions. 2023. UL 9540A Test Method. Available online at: https://www.ul.com/services/ul-9540a-test-method. Accessed in September 2024.

Links to Supporting Environmental Documents

1. Kern County's Final Environmental Impact Report for the Mojave Micro Mill Project (EIR) (SCH# 2022100646): https://kernplanning.com/environmental-doc/mojave-micro-mill-project/
2. Kern County's Mojave Micro Mill Project approvals including Resolutions, CEQA findings, Statement of Overriding Considerations and Mitigation Monitoring and Reporting Program: https://psbweb.kerncounty.com/UtilityPages/Planning/StaffReports/BOSHearings/StaffReport/2024/031924_Mojave_Micro_Mill_Project_PSGM3_Holdings_Corp_by_Pacific_Seel_Group.pdf
3. Kern County's Notice of Determination for the Mojave Micro Mill Project: https://ceqanet.opr.ca.gov/2022100646/4/Attachment/Egjtnl
4. Minor Modification 1 to Precise Development Plan No. 3, Map. 213: 2024-12-09 PD 3 Map 213 - Modification 1.pdf
5. CEC's Addendum to the Mojave Micro Mill Project Final Environmental Impact Report for the Addition of a Long-Duration Energy Storage System (included in supporting materials for CEC's January 21, 2025 Business Meeting): https://www.energy.ca.gov/filebrowser/download/6926?fid=6926