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Comments on Staff Assessment Section 4-4 Worker Safety and Fire Protection

See Attached Comment Letter

Additional submitted attachment is included below.

COMMENTS ON SECTION 4.4 - WORKER SAFETY AND FIRE PROTECTION CORBY BATTERY ENERGY STORAGE SYSTEM PROJECT

To the California Energy Commission:

I submit these comments regarding Section 4.4, Worker Safety and Fire Protection, of the Staff Assessment for the proposed Corby Battery Energy Storage System Project.

This section presents an unusual situation.

Staff does not dispute that a large-scale battery energy storage facility presents meaningful fire, explosion, toxic-gas, and emergency-response risks. Staff expressly recognizes that thermal runaway may release flammable and toxic gases, that fires may burn for extended periods, that emergency responders may need to remain at substantial distances from the affected equipment, and that the proposed Project therefore requires extensive additional safety measures. Staff ultimately concludes that the Project's risks can be reduced to less than significant through Conditions of Certification.

Staff goes further: in its discussion of potential BESS safety hazards, Staff concludes that the Corby BESS would present a significant risk that should be mitigated. That makes the adequacy and enforceability of the conditions on which Staff relies central to the Commission's decision.

My concern is whether several of the most important measures upon which that conclusion depends are actually defined sufficiently before Project approval.

In particular, Staff itself concludes that the applicant's proposed 24,000-gallon fire-water supply may be inadequate. The final quantity and configuration of that water supply remain to be determined later in consultation with the Dixon Fire Department. At the same time, Staff relies upon future containment measures to prevent contaminated firefighting water from affecting groundwater and surrounding property.

Staff also relies upon a future emergency-response plan, a future site-specific fire protection system design, a mobile incident-command location that may begin at approximately 330 feet from the BESS, and a drone-based toxic-gas monitoring system whose operational performance standards are not presently defined.

These matters warrant resolution before the Commission determines that the acknowledged fire and emergency-response risks have been reduced to less than significant.

I. STAFF ITSELF CONCLUDES THAT THE APPLICANT'S PROPOSED 24,000-GALLON FIRE-WATER SUPPLY MAY BE INADEQUATE

This is perhaps the clearest issue in Section 4.4.

The applicant proposes a 24,000-gallon onsite water tank for firefighting and life-safety purposes. Staff explains that Dixon Fire Department indicated that approximately 1,200 gallons per minute could be needed during an emergency, particularly for cooling adjacent BESS units.

Staff then states directly that it is concerned that 24,000 gallons may not be adequate.

At 1,200 gallons per minute, 24,000 gallons represents only approximately 20 minutes of water supply if the full indicated fire flow were required.

I recognize that this does not necessarily mean that 1,200 gallons per minute would be applied continuously during every BESS incident. Firefighting strategy may vary substantially depending upon whether responders are protecting exposures, cooling adjacent containers, protecting structures, controlling an ancillary fire, or allowing an affected battery unit to burn while preventing propagation.

But that is exactly why the required water supply should be established through an engineering and fire-response analysis rather than left undefined.

WORKER SAFETY-7 is more specific than a simple promise to consult. It requires consultation with Dixon Fire Department, compliance with NFPA 1142, and whatever DFD-required infrastructure is ultimately determined necessary, including additional water tanks, hydrants, fittings, fire-water monitors, and water tenders. Those are meaningful safeguards. Yet the condition still does not itself specify:

- the minimum onsite fire-water storage volume;
- the minimum fire-flow rate;
- the duration for which that flow must be sustained;
- required reserve capacity;
- replenishment requirements;
- whether supplemental tanker or mutual-aid water is assumed;
- the number and size of tanks;
- required hydrant or monitor locations; or
- the design emergency upon which the final water requirement must be based.

Staff therefore reaches a less-than-significant conclusion while simultaneously acknowledging that the currently proposed water supply may be inadequate and leaving the determination of the actually adequate water supply until later.

The Commission should establish the controlling fire-water performance standard before Project approval.

The concern is therefore not that WORKER SAFETY-7 contains no fire-water requirement. It is that the quantitative design basis - the volume, flow, duration, reserve and replenishment assumptions that determine whether the supply is actually adequate - remains to be established after certification through later DFD consultation and final fire-protection specifications.

II. STAFF CANNOT DETERMINE FIREWATER-CONTAINMENT CAPACITY BEFORE DETERMINING HOW MUCH FIREFIGHTING WATER MAY BE USED

This issue also intersects directly with Section 5.16, Water Resources.

Staff recognizes that water used during a BESS emergency may become contaminated and potentially affect shallow groundwater. Section 4.4 relies in part upon a future Water Quality Control Plan and states that the Project's stormwater-retention facilities would have sufficient capacity to contain water associated with a fire event.

But there is a basic sequencing problem.

How can the Commission determine that adequate containment capacity exists before it determines how much emergency water may need to be used?

If 24,000 gallons is inadequate - as Staff itself suggests - then the contaminated-firewater volume used in the containment analysis cannot simply be assumed to be 24,000 gallons.

This is especially important because Section 5.16 simultaneously relies upon unlined detention basins to infiltrate stormwater into the shallow groundwater aquifer. The fire-protection design and the water-quality containment design therefore cannot be treated as independent future exercises; the water volume produced by the former determines the containment burden imposed on the latter.

If the final firefighting system instead must support 1,200 gallons per minute for some longer period, the potential emergency-water volume changes dramatically.

And the situation may be more complicated if a fire occurs during a storm, when stormwater facilities may already contain water.

The Staff Assessment should therefore identify:

1. the reasonably foreseeable maximum fire-flow rate;
2. the duration of defensive cooling or exposure protection used for design purposes;
3. the resulting reasonably foreseeable emergency-water volume;
4. the available containment volume when the detention system already contains stormwater;
5. how contaminated firewater is physically isolated from ordinary stormwater and the unlined infiltration basins; and
6. what happens if the containment design capacity is exceeded.

This is not a request for every final plumbing detail.

It is a request for the basic quantitative assumptions necessary to support Staff's present environmental conclusion.

III. IMPORTANT EMERGENCY-RESPONSE DECISIONS REMAIN DEPENDENT UPON A FUTURE PLAN

California law now expressly requires battery energy storage facilities to maintain emergency response and emergency action plans protecting employees, emergency responders, surrounding residents, neighboring properties, and the environment. Those plans must be developed in consultation with local emergency-management and first-response agencies and may address offsite air-quality impacts, water runoff, shelter-in-place orders, and road closures.

Section 4.4 recognizes these requirements.

Staff proposes that the applicant prepare final emergency plans for later review by the CEC Compliance Project Manager and by Dixon Fire Department.

I do not suggest that every operational detail of an emergency-response manual must be finalized before the Commission acts.

However, several matters are sufficiently important to the environmental analysis that the underlying performance standards should be established now.

What toxic-gas concentration triggers shelter-in-place rather than evacuation?

Who makes that determination?

How are nearby residents notified?

At what distance are roads closed?

How will an evacuation or shelter order account for wind direction and changing plume conditions?

Where will emergency responders stage before reliable plume measurements are available?

What happens if the primary access road is unavailable?

What mutual-aid resources are assumed in Staff's response analysis?

The importance of these questions is demonstrated by the statute itself. Public Utilities Code section 761.3 specifically requires procedures addressing surrounding residents and neighboring properties, not merely onsite workers.

The Commission should therefore distinguish between details that may properly be refined later and the substantive emergency-response criteria upon which Staff's present less-than-significant conclusion depends.

IV. THE 330-FOOT INCIDENT-COMMAND ASSUMPTION SHOULD BE RECONCILED WITH STAFF'S OWN DISPERSION ANALYSIS

WORKER SAFETY-7 calls for a mobile Command and Control Center to be established at a safe distance from the BESS and describes a location generally more than approximately 330 feet from the facility, with the ability to relocate if necessary.

That may be entirely adequate under some incident conditions.

But other portions of the Staff Assessment's fire-dispersion analysis identify modeled effects substantially farther from the BESS. The record identifies a modeled one-hour NO₂ AEGL-1 exceedance affecting the closest receptors within approximately 2,029 feet under the modeled fire scenario.

I am not suggesting that these two distances are directly interchangeable.

An AEGL-1 contour does not automatically establish an exclusion zone for trained emergency personnel, and plume impacts vary substantially with wind direction, meteorology, release conditions and protective equipment.

But the difference deserves explanation.

The Commission should identify the technical basis for the approximately 330-foot presumptive incident-command distance and explain how the command location will be selected when the direction and extent of the toxic plume are not yet known.

WORKER SAFETY-7 also requires the mobile Command and Control Center to be established within 15 minutes of a warning that a cell is undergoing rapid temperature rise. That is a useful response-time requirement, but it increases the importance of having a pre-established method for selecting a safe upwind location before complete plume data are available.

An incident commander cannot rely upon plume measurements that have not yet been taken.

That leads directly to the next concern.

V. STAFF'S DRONE-BASED TOXIC-GAS MONITORING SYSTEM NEEDS MEASURABLE PERFORMANCE STANDARDS AND A DEFINED BACKUP ROLE

Staff's discussion of toxic-gas monitoring is unusually specific.

Staff considered several monitoring approaches, including fixed sensors, perimeter monitoring, open-path systems, and handheld instruments. Staff ultimately determined that a sensor-equipped drone would be the preferred method for assessing airborne contaminants during suspected off-gassing or a BESS fire.

WORKER SAFETY-10 therefore requires the Project owner to purchase and provide Dixon Fire Department with a drone capable of detecting pollutants including NO₂, CO, and HF, together with software, routine maintenance and replacement during the life of the Project.

This may prove to be a useful emergency-response tool.

The problem is not the use of a drone.

The problem is that if the drone is an important component of the system relied upon to determine whether emergency responders and surrounding residents are exposed to hazardous gases, its required performance should be defined.

The present condition does not appear to establish:

- minimum detection limits for each required gas;
- required measurement accuracy;
- maximum time between a BESS alarm and airborne sampling;
- minimum operating wind conditions;
- nighttime operating capability;
- weather limitations;
- required battery endurance;
- availability of a trained operator at all times;
- backup equipment if the primary drone is unavailable;
- the relationship between the drone and the hand-held CO, NO₂, and HF detectors already required by WORKER SAFETY-7, including when each system is to be used;
- required sampling locations;
- how frequently readings must be updated;
- who receives the data in real time; or
- which measured concentrations trigger evacuation, shelter-in-place, road closure or changes in responder staging.

Those details matter because the purpose of monitoring is not simply to collect interesting environmental data after an incident.

It is to make time-sensitive protective decisions during the incident.

WORKER SAFETY-7 already requires hand-held gas detectors for Dixon and Vacaville fire stations, and that should be acknowledged. But hand-held instruments are not automatically equivalent to an airborne plume-mapping system: using them may require responders to approach or enter areas whose plume conditions are not yet known. If Staff believes drone-based monitoring is the best available method, WORKER SAFETY-10 should establish measurable performance requirements and explain how the hand-held instruments, or another method, will provide timely and safe monitoring when the drone cannot promptly be deployed.

VI. CURRENT INDUSTRY LESSONS REGARDING HIGH STATE OF CHARGE SHOULD BE ADDRESSED FOR CORBY

Section 4.4 appropriately recognizes that BESS safety standards continue to evolve and discusses lessons learned from recent incidents, including the January 2025 Moss Landing fire.

Since that incident, WECC, working with FERC, NERC, and CAISO, issued its December 2025 Moss Landing BESS Fire Report. Among its recommended actions, WECC calls for safe operating parameters

including a maximum state of charge, controlled operating temperatures, and limited frequency of capacity tests, and notes that many owners/operators choose to limit SOC below the capability of the site. The report explains that high state of charge increases the amount of stored energy available to be released if a fault occurs.

This is particularly relevant because Corby is proposed as a very large 300 MW/1,200 MWh facility.

The Commission should therefore explain:

What maximum state of charge will Corby be permitted to maintain during normal operation?

Will Corby routinely operate at 100 percent SOC?

Are additional restrictions imposed during periods of extreme heat?

What safeguards apply when capacity testing requires operation at or near maximum SOC?

Are those restrictions enforceable Conditions of Certification or merely operational recommendations?

I recognize that the Moss Landing installation differed substantially from Corby. Moss Landing used an older indoor configuration, whereas Corby proposes outdoor containerized LFP batteries and current fire-safety standards.

That distinction should be acknowledged.

But Staff itself properly relies upon lessons from historical BESS incidents to inform current Project safety. It should therefore explain whether the most recent industry recommendation regarding maximum SOC has been incorporated into the Corby operating requirements.

VII. STAFF SHOULD RECONCILE THE FIRE-TEST CONFIGURATION WITH THE EQUIPMENT ACTUALLY PROPOSED FOR CORBY

Staff relies substantially upon standardized fire testing in concluding that thermal runaway within a Corby battery enclosure is unlikely to propagate to adjacent enclosures. I recognize that this testing is meaningful evidence and do not suggest that the testing was not performed or was withheld from the record.

However, the equipment actually tested must be representative of the equipment and installation upon which Staff's safety conclusions depend.

The filed UL 9540A unit-level report, TN 268368, identifies the tested unit as model NR27N414L_P15190NB3. It describes a unit containing 14 modules, with 120 cells per module, and identifies the intended installation as "Non-Residential indoor floor mounted." The report also states that the unit does not have an integral fire suppression system.

The current Corby design documentation describes the proposed outdoor JF2 M-LINK enclosure differently: two racks, each containing 14 modules, for a total of 28 modules per enclosure, with 120 cells per module.

Staff's own Section 4.4 description appears different from both. Staff describes a representative container with three vertical racks, each containing 14 modules, for a total of 42 modules, and elsewhere refers to 104 cells per module.

The Commission should reconcile these descriptions and identify exactly which tested configuration supports Staff's conclusions concerning propagation, toxic-gas release, responder safety, and emergency setbacks.

The filed UL 9540A report further states that installation-level testing was not required because the unit-level criteria were met. The form provision concerning use of indoor floor-mounted testing to represent outdoor ground-mounted installations is marked N/A, with the remark that the BESS unit is intended for indoor use.

That may comply with the applicable UL 9540A testing protocol. But compliance with the test protocol is a different question from whether that particular test article adequately represents the as-built outdoor Corby installation upon which Staff's less-than-significant fire-risk conclusion depends.

I also recognize that the record contains a separate January 2025 large-scale burn test involving full JF2 DC LINK units and adjacent target units, and that the applicant reports no propagation to adjacent enclosures during that test. The issue therefore is not that no relevant large-scale testing exists.

The issue is which test supports which safety conclusion, and whether the combination of tests actually represents the final outdoor Corby configuration, including enclosure design, spacing, rack and module arrangement, ventilation, fire detection, thermal management, deflagration protection, and other features relevant to propagation and release behavior.

If the existing testing does not directly represent the final as-built outdoor configuration, the Commission should require installation-level testing, or equivalent large-scale testing, of the as-built configuration and spacing before operation.

This question also bears upon Staff's emergency-response assumptions, including the approximately 330-foot presumptive incident-command distance. If Staff's assumptions concerning fire propagation and release behavior are derived from testing of a materially different configuration, the Commission should explain why those assumptions remain protective of responders positioned near the facility.

The Project actually constructed should match the safety basis upon which Staff relies.

VIII. FUTURE DIXON FIRE STATION 82 SHOULD NOT BE TREATED AS AN EXISTING RESPONSE RESOURCE

Section 4.4 states that Dixon Fire Department presently would respond from Station 81, approximately 5.3 miles from the Project, and gives an estimated response time of approximately six minutes. It also notes that proposed Station 82 would be closer to the site once completed.

Current City of Dixon contracting information confirms that Station 82 remains a future facility. Bidding closed on August 6, 2026, for a proposed 7,504-square-foot station at 653 Pitt School Road, and the City's bid notice identified September 15, 2026 as the anticipated City Council award date. It therefore should not be treated as an existing response resource in the present environmental analysis.

I therefore do not contend that the Project presently lacks fire protection simply because Station 82 has not yet been built. Staff's stated response-time analysis is based upon existing Station 81.

But the Commission should make clear that its less-than-significant conclusion does not depend upon Station 82 being completed, staffed, equipped, or operational by any particular date unless that assumption is made enforceable.

The Project should be demonstrated safe using fire-response resources that actually exist or are otherwise firmly committed.

IX. COMPARISON TO UNRELATED EVERYDAY RISKS DOES NOT ESTABLISH THE SIGNIFICANCE OF CORBY'S FIRE RISK

Section 4.4 includes a discussion comparing BESS risks to various other hazards, including automobile accidents, residential fires, wildfire, natural-gas pipeline accidents and earthquakes.

I question the relevance of this comparison.

A person may indeed face a greater lifetime risk of being involved in an automobile collision than of experiencing a BESS thermal-runaway event.

But that does not answer the environmental-review question before the Commission.

The question is not whether other risks exist in ordinary life.

The question is whether the incremental fire, explosion, toxic-gas and emergency-response risks created by this Project at this location have been adequately analyzed and reduced to a less-than-significant level.

The frequency of unrelated hazards should not substitute for a project-specific significance analysis.

X. STAFF'S CONCLUSION DEPENDS UPON THE CONDITIONS ACTUALLY PERFORMING AS ASSUMED

Section 4.4 ultimately concludes that implementation of WORKER SAFETY-1 through WORKER SAFETY-10 will reduce the Project's Worker Safety and Fire Protection impacts sufficiently and that the Project will not contribute to a cumulatively considerable impact.

Several of those conditions are substantial improvements over the Project as originally proposed.

Staff, for example, requires backup power for critical detection and control equipment, remote fire sensors, thermal-imaging cameras, a command-and-control protocol, enhanced access provisions, annual fire-department training, and toxic-gas monitoring capability.

Those measures should be acknowledged.

But the strongest safety conditions still depend upon several unresolved quantitative questions:

How much firewater is enough?

How long must it last?

How much contaminated firewater must be contained?

How are emergency shelter or evacuation decisions made?

Where may responders safely establish command before plume conditions are known?

How quickly must toxic-gas monitoring become operational?

How will safe plume monitoring continue if the drone cannot fly or cannot promptly be deployed?

What maximum state of charge will be permitted?

Those are not objections to requiring safety plans.

They are questions about the performance standards that those plans must satisfy.

XI. QUESTIONS REQUIRING A WRITTEN RESPONSE

I respectfully request that the Commission address the following questions:

1. What minimum onsite fire-water volume will the Project be required to maintain?
2. What minimum flow rate and duration form the design basis for that requirement?
3. If Dixon Fire Department indicated that as much as 1,200 gallons per minute may be needed, what duration has Staff assumed for that flow?
4. If 24,000 gallons is inadequate, what quantity is adequate?
5. Does the analysis rely upon tanker refill, hydrants, mutual aid or another offsite water source, and what response and refill times were assumed?
6. What maximum contaminated-firewater volume was used in determining containment capacity?
7. Does that volume correspond to the same fire-water quantity ultimately required under WORKER SAFETY-7?
8. How will contaminated firewater be prevented from entering the Project's unlined stormwater-infiltration basins?
9. What happens if a BESS emergency occurs while detention basins already contain stormwater?
10. What quantitative toxic-gas concentrations trigger shelter-in-place, evacuation, road closure or relocation of the incident command post?
11. What technical basis supports the approximately 330-foot presumptive Command and Control Center distance when Staff's dispersion analysis identifies modeled effects at substantially greater distances under some conditions?
12. How will responders select a safe command location before reliable real-time plume measurements are available?
13. What minimum detection limits, response times, weather capability and operator-availability requirements apply to the drone required under WORKER SAFETY-10?
14. If the drone cannot be deployed, how will the WORKER SAFETY-7 hand-held detectors be used without requiring responders to enter an uncharacterized plume, and what additional backup monitoring, if any, is required?
15. Who interprets the drone measurements and converts them into evacuation, shelter-in-place and responder-safety decisions?
16. What maximum state of charge will Corby be permitted to maintain during normal operation?
17. What additional safeguards or operating restrictions apply during full-SOC capacity testing?
18. Does Staff's safety conclusion depend in any respect upon completion or staffing of future Dixon Fire Station 82?
19. How does Staff reconcile TN 268368's 14-module, 120-cell-per-module indoor floor-mounted test article with the proposed 28-module outdoor Corby enclosure and Staff's separate description of a 42-module representative container?
20. Which specific test configuration supports Staff's assumptions concerning propagation, toxic-gas release, responder safety, and the approximately 330-foot presumptive incident-command distance?
21. What Project changes would require renewed UL 9540A or large-scale propagation analysis?
22. Most importantly, how can the Commission determine now that the acknowledged significant BESS fire risk has been reduced to less than significant when Staff itself concludes that the currently proposed fire-water supply may be inadequate and several of the emergency-response performance standards remain to be established after approval?

XII. CONCLUSION

Section 4.4 is not a case in which Staff failed to recognize the existence of BESS fire hazards.

Staff recognizes them.

Staff discusses thermal runaway, toxic gases, fire propagation, recent BESS incidents, emergency-response limitations and lessons learned throughout the industry. Staff deserves credit for proposing a number of additional safety requirements beyond those originally described by the applicant.

But recognition of a hazard and proof that it has been adequately mitigated are different things.

The clearest example is firewater.

Staff itself states that the applicant's proposed 24,000-gallon supply may be inadequate. Yet the Commission is asked to reach a less-than-significant conclusion before the required replacement volume, flow rate, duration and replenishment assumptions have been established.

That unresolved quantity then affects another environmental question: how much contaminated firewater must the Project be capable of containing?

Similarly, Staff's emergency-response conclusions depend upon future decisions concerning toxic-gas monitoring, incident-command location, public notification, shelter or evacuation, and responder protection.

Those matters do not require final construction drawings before Project approval.

They do require sufficiently clear and enforceable performance standards so that the Commission and the public can determine what the Project must actually accomplish.

The same principle applies to Staff's proposed drone monitoring system. Providing Dixon Fire Department with a drone may be valuable, and WORKER SAFETY-7's hand-held gas detectors provide an additional tool. But if these systems are relied upon to make real-time decisions protecting responders and nearby residents from toxic gases, the drone's required detection capability, availability, response time and operating limitations should be established, and the Commission should explain how safe monitoring will continue when airborne sampling is unavailable.

Finally, current lessons from the Moss Landing investigation demonstrate that BESS safety continues to evolve. The Commission should explain how current recommendations concerning maximum state of charge and capacity testing have been considered for this Project rather than assuming that compliance with existing equipment standards alone answers every operating-risk question.

The Commission should also reconcile the material differences among the filed UL 9540A unit-level test article, Staff's description of the representative tested equipment, and the outdoor configuration actually proposed for Corby, and should identify which testing supports the responder-safety assumptions used in Section 4.4.

The Commission should resolve these matters before determining that the Corby BESS Project's acknowledged fire and emergency-response risks have been reduced to less than significant. On the present record, I do not support approval of the Corby BESS at the proposed Kilkenny Road location. Where a feasible industrial alternative can reduce the interface between a large BESS emergency and nearby rural residences, agricultural property, road users, shallow groundwater, and rural emergency-response resources, that siting alternative should be fully considered before certification.

In addition to these comments, I formally incorporate by reference and fully support the technical comment letter submitted by Keep Vacaville Safe.

Respectfully submitted,

Michael Geller

Member of the Public

Solano County, California