

Justin S. Green
Commissioner, District 1

Anna Hansen
Commissioner, District 2

Camilla Bustamante
Commissioner, District 3



Anna T. Hamilton
Commissioner, District 4

Hank Hughes
Commissioner, District 5

Gregory S. Shaffer
County Manager

Santa Fe County Fire Department

Fire Prevention Division

Conditional Use Permit Plan Review

Date	October 11, 2024	Reviewer	J. Blay
Project Name	Rancho Viejo Solar Project in Santa Fe County, New Mexico		
Project Location	4152 NM HWY 14 Santa Fe, NM 87508		
Description	A 96-megawatt (MW) solar facility, a 48-megawatt (MW) battery energy storage system (BESS), a substation, a generation tie-in line, an access road, an aboveground water storage tank, and an operations building		
Applicant Name	Joshua Mayer	Case Manager	Jessica Gonzales
Applicant Address	282 Century Place, Suite 2000Louisville CO 80027	County Case #	24-5200
Applicant Phone	(720) 514-2957	Fire District	Turquoise Trail

This conditional use permit application is deemed complete by the Santa Fe County Fire Department based on the following considerations:

Atar Fire has performed a detailed review of the following project documents provided to them electronically:

- *'SRA01b_PreIncidentPlan_EIR_AppxB' (Pre-Incident Plan)*
- *'SRA01g_FirstResponder_EIR_AppxG' (Emergency Response Plan)*
- *'SRA01h_PreliminaryHMAREDACTED_EIR_AppxH' (Hazard Mitigation Analysis)*
- *'11_SiteDevelopmentPlan_CUP_RanchoViejo' (Project Drawings)*
- *'Proprietary_CEN-E5S Enclosure Deflagration Test Report – 522'*
- *'Proprietary_CEN-E5S Enclosure UL 9540A Test report – 523'*
- *'Proprietary_DRAFT_Report_TR_230499RECO01_CEN_UL9540'*
- *'Proprietary_E5_UL9540A Cell Report 127'*
- *'Proprietary_E5S UL 9540A Module Test Report 128'*
- *'Proprietary_E5S 9540A Unit Test Report – 129'*
- *'Proprietary_Preliminary_Dispersion and Deflagration Modeling Progress Report'*
- *'Proprietary_Vigilex_CEN-E5S_NFPA68_DesignCalcs_OD730636AV02'*

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The documents were reviewed in accordance with the following Codes and Standards as adopted in Santa Fe County, New Mexico:

- *International Fire Code, 2021 Edition*
- *NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2023 Edition*

Where other Codes and Standards are referenced in applicable sections of the aforementioned Codes and Standards, they have been reviewed to the extent they apply.

Based on Atar Fire's detailed review letter, both Atar Fire and Santa Fe County Fire Department have concluded that a sufficient level of information has been provided to validate the issuance of a Conditional Use Permit, as it pertains to the reviewed fire and life safety codes. However, all of the items in this review letter must be satisfactorily addressed prior to commissioning of the facility. Atar Fire review does not constitute all possible recommendations associated with this installation, as deferred submittals and additional documentation is required prior to the commissioning of this facility, should a CUP approval be granted.

Atar Fire review letter is attached.

Reviewed by:

Jaome R. Blay

Santa Fe County Fire Marshal

October 11, 2024

Date



October 9, 2024

Delivered by Email

Mr. Jaome Blay
Fire Marshal
Santa Fe County
jblay@santafecountynm.gov

RE: Atar Fire Review of AES CUP Application Resubmittal (Project Name: Rancho Viejo Solar Project)

Dear Mr. Blay,

Atar Fire has performed a review of the following project documents provided to us electronically:

- 'SRA01b_PreIncidentPlan_EIR_AppxB' (Pre-Incident Plan)
- 'SRA01g_FirstResponder_EIR_AppxG' (Emergency Response Plan)
- 'SRA01h_PreliminaryHMAredacted_EIR_AppxH' (Hazard Mitigation Analysis)
- '11_SiteDevelopmentPlan_CUP_RanchoViejo' (Project Drawings)
- 'Proprietary_CEN-E5S Enclosure Deflagration Test Report – 522
- 'Proprietary_CEN-E5S Enclosure UL 9540A Test report – 523'
- 'Proprietary_DRAFT_Report_TR_230499RECO01_CEN_UL9540'
- 'Proprietary_E5_UL9540A Cell Report 127'
- 'Proprietary_E5S UL 9540A Module Test Report 128'
- 'Proprietary_E5S 9540A Unit Test Report – 129'
- 'Proprietary_Preliminary_Dispersion and Deflagration Modeling Progress Report'
- 'Proprietary_Vigilex_CEN-E5S_NFPA68_DesignCalcs_OD730636AV02'

The documents were reviewed in accordance with the following Codes and Standards as adopted in Santa Fe County, New Mexico:

- International Fire Code, 2021 Edition
- NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, 2023 Edition

Where other Codes and Standards are referenced in applicable sections of the aforementioned Codes and Standards, they have been reviewed to the extent they apply.

Each review item is categorized. The categories are Code Citations and Clarifications and/or Miscellaneous Update Requests.

Based on the documents listed above, this review has concluded that a sufficient level of information has been provided to validate the issuance of a Conditional Use Permit, as it pertains to the reviewed fire and life safety codes. However, all of the items in this review letter must be satisfactorily addressed prior to commissioning of the facility.



This detailed review has been performed by Atar Fire LLC utilizing the supplied documents, the applicable Codes and Standards, as well as engineering judgement. Atar Fire LLC assumes no liability for any errors, omissions or oversights as part of this review process. Every possible attempt has been made to thoroughly review all supplied documents and provide a review to the greatest extent possible. Our review does not constitute all possible recommendations associated with this installation, as deferred submittals and additional documentation is required prior to the commissioning of this facility, should a CUP approval be granted. Final approval of the proposed project must be issued by the County of Santa Fe, New Mexico.

Sincerely,

Nicholas Bartlett, P.E.
Professional Engineer
New Mexico License 28733
Expiration 12/31/2025

Todd LaBerge, P.E.
Professional Engineer
New Mexico License 29658
Expiration 12/ 31/ 2024

Nicholas Bartlett

Digitally signed by
Nicholas Bartlett
DN: C=US,
E=nick@atarfire.com,
O=Atar Fire,
CN=Nicholas Bartlett
Date: 2024.10.09
20:53:49-06'00'



Todd LaBerge

Digitally signed by Todd LaBerge
DN: C=US, E=todd@tlbpe.com,
O="TLB Fire Protection
Engineering, Inc.", CN=Todd
LaBerge
Reason: I have reviewed this
document
Date: 2024.10.09
19:36:22-07'00'



Comment No.	Document	Page/Drawing	Comment	Code Citation, Clarification or Misc. Update Request	Open/Closed
1	Deflagration Testing	N/A	<p>It is unclear if the provided NFPA 68 deflagration vent design from Vigilex (including the required vent area) is correlated with the deflagration testing performed by CSA. Cannot confirm if the CSA testing substantiated the installed vent size, or the opposite. Provide a rationale affirming if the CSA testing validates that the provided area, calculated prescriptively per NFPA 68, with discussion of how this relates back to the UL 9540A cell level test data, is adequate.</p> <p>Alternatively, with the understanding that an NFPA 69 combustible concentration reduction system will be provided, provide updated NFPA 68 calculation at the partial volume, demonstrating the provided design exceeds the required partial volume area.</p>	NFPA 855, Section 4.2.1.3 (3)	Open
2	UL9540	N/A	A draft copy of the UL 9540 listing report has been reviewed. Certification is not complete. Completion of this project is contingent upon successful UL 9540 certification/listing.	NFPA 855, Sections 4.2.1.1 (4), 4.6.1, & 9.1.5.2.1	Open
3	N/A	N/A	<p>The submittal did not include product cutsheets, including but not limited to:</p> <ol style="list-style-type: none"> 1) BESS Product Cutsheets 2) Gas Detectors (CO and LEL Detectors) 3) Fire Alarm Components (FACP, smoke detectors, pull stations, horn/strobes, etc.) <p>Please provide product cutsheets.</p>	NFPA 855, Section 4.2.1.1 (7)	Open
4	N/A	N/A	A commissioning plan has not been submitted. Submit commissioning plan for review.	NFPA 855, Sections 4.2.4 & 6.1.3	Open



5	N/A	N/A	<p>There are no shop drawings for the fire alarm system to verify NFPA 72 compliance. Provide container level drawings as well as a site diagram showing the interconnected panels.</p> <p>Drawings shall include items such as: One line diagram Battery Backup Calculations for fire alarm and gas detection Wire Type/Size Sequence of Operations Detector locations Lighting protection between containers; cabling means and methods between containers Circuit class And other items required by NFPA 72</p>	NFPA 855, Section 4.2.1.1 (7); NFPA 72 Chapter 7; IFC Section 907.1.2	Open
6	N/A	N/A	<p>There are no shop drawings for the gas detection system. Provide shop drawings for the gas detection system, if not otherwise included in the fire alarm drawings.</p>	NFPA 855, Section 4.2.1.1 (7); NFPA 72 Chapter 7; IFC Section 907.1.2; IFC 916.2.1	Open
7	Drawings	N/A	<p>There is no information or drawing on project signage, located on the container, near the container, and at the perimeter. Include a sheet detailing the content of the signs, and the locations, per NFPA 855 and NFPA 70. Also include signage that will be posted at the ROCC.</p>	NFPA 855, 4.2.1.1 (6) & 4.7.4; NFPA 70 Article 706.15 (B) and (C); NFPA 855 4.7.10.	Open
8	HMA and Drawings	-	<p>The drawings and HMA reference 'fire separation' within the container; however, details are not provided. Provide more detailed information on the construction of this fire separation.</p>	NFPA 855, 4.2.1.1 (2)	Open



9	HMA	-	Fire separation within each container is credited in the HMA as a mitigating measure. Please provide the design basis. Is there a design fire and anticipated duration? Have hand calculations or a computer model been completed which demonstrate the barrier's effectiveness in preventing fire spread for a specific design fire?	Clarification Request	Open
10	N/A	N/A	Provide information on charge controllers, if provided, to confirm compliance with NFPA 855.	NFPA 855, Section 4.6.8	Open
11	N/A	N/A	Provide information on inverters and converters, if provided, to confirm compliance with NFPA 855.	NFPA 855, Section 4.6.9	Open
12	Drawings	N/A	Confirm if there are any site egress doors, if these doors have panic hardware, and if there is any associated emergency lighting.	NFPA 855, Section 4.7.8	Open
13	Drawings	N/A	Confirm the location of the disconnects to confirm NFPA 855 and NFPA 70 compliance. Ensure there is a remotely accessible disconnect. Coordinate disconnect locations with pre-incident plan and ERP.	NFPA 855 Section 5.2 and G.7.6.2; NFPA 70 Article 706.15;	Open
14	HMA and Drawings	ES-C-.02.01	The actual kWh rating of each container is unclear. The HMA says 192 MWh (Table 3, Page 3). However, it also says 8.068 MWh per enclosure which is 258 MWh (Section 3.0). Lastly, Sheet ES-C.02.01 states 277.8 MWh Provide the nameplate rating for each container and ensure all documentation (HMA, drawings, etc.) reflects this.	Clarification and Misc. Update Request	Open
15	HMA		The HMA bow tie analysis, starting with Section 5.1, relies heavily on the EPRI HMA Titled 'ESIC Energy Storage Reference Fire Hazard Mitigation Analysis' Dated December 2021. In some	Clarification and Misc. Update Request	Open

			instances, the same threats, consequences, and summary tables are used but reordered or slightly rephrased. In other instances, italics are used (see Page C-4 Table 1) which appear to be from the EPRI HMA. There is no citation provided for the EPRI document. To avoid copyright issues, please reference the EPRI document. Some language is also taken from NFPA 855, Annex G.4. (see Section 5.2.1 of HMA 'defined as a single cell failure which begins to propagate through the system' which is from NFPA 855 G.4.1). Suggest also referencing NFPA 855 where language is used directly.		
16	HMA	Section 5.2.1	Whereas the EPRI HMA utilizes a top event of a single cell failure or thermal runaway (ref EPRI HMA pages 2-2 and 3-2), and NFPA 855 Annex G.4.1 states a 'single cell failure which begins to propagate', this review recommends use of single cell failure as the top event. A single cell failure will more often than not result in either off gassing, fire, explosion, or propagation, so we want to avoid single cell failure. Please use of a single cell failure as the top event.	Clarification and Misc. Update Request	Open
17	Drawings	PV-G.01.01	Update NFPA 70 to the correct Edition. It currently shows 2017 Edition. The 2023 NFPA 855 references the 2023 NFPA 70. Note the 2021 IFC references the 2020 NFPA 70.	Misc. Update Request	Open
18	Drawings	PV-G.01.01	Add the 2021 IFC as an applicable code and standard	Misc. Update Request	Open
19	Drawings	PV-G.01.01	Break out 'NFPA' into the actual codes and editions that apply (NFPA 855 – 2023, NFPA 72, NFPA 68, NFPA 22 etc).	Misc. Update Request	Open

20	Drawings	PV-C-09.03	The fire protection water storage tank must be designed to NFPA 22. Provide a design that complies with NFPA 22.	2021 IFC 507.2.2	Open
21	Drawings	ES-C.02.01	Provide a list of acronyms in the drawing package. There are acronyms such as BOL and EOL that are not defined.	Misc. Update Request	Open
22	Emergency Response Plan	Page 5 of 20	There are knock boxes on the gates (shown on Drawings PV-E.04.01), but the response plan indicates to wait outside the gate. Provide direct guidance for where first responders should go and when/how to use the knock box.	Clarification and Misc Update Request	Open
23	Emergency Response Plan		Indicate the hours that the building on site is staffed in the response plan. In the CUP application, it says 7AM-7PM. Please confirm.	Clarification and Misc Update Request	Open
24	HMA	N/A	The deflagration vents appear to be rooftop mounted. How will they remain clear in the event of snow loads?	NFPA 68, Section 6.5.2.3	Open
25	HMA, Drawings, ERP	-	The HMA and the Drawings do not appear to show the location of the site FACP. Please indicate the location of the FACP and the strategy behind the location.	NFPA 855, Section 4.7.10 & 4.3.2.1.2	Open
26	HMA and Drawings	-	Provide details on the separation of the support enclosure (containing fire panel, etc) from the battery enclosures. Is this thermally isolated? Is this a fire barrier?	Clarification and Misc Update Request	Open
27	Drawings	-	Provide details on bracing of battery containers per local building code.	NFPA 855, Sections 4.7.2 and 4.7.3	Open
28	HMA	Page iv	Under section 'Installed per Code' delete the word 'maintained'. Maintenance is covered in the previous paragraph.	Misc Update Request	Open
29	HMA	Page 1	The NFPA 68 reference shows the 2013 Edition. NFPA 855 (2023) reference the 2018 NFPA 68. Update accordingly.	Misc Update Request	Open



30	HMA	Page 1	The NFPA 72 reference shows the 2019 Edition. NFPA 855 (2023) reference the 2022 NFPA 72. Update accordingly or seek approval to use an older edition.	Misc Update Request	Open
31	HMA	Page 1	The NFPA 2001 reference shows the 2018 Edition. NFPA 855 (2023) reference the 2022 NFPA 2001. Update accordingly or seek approval to use an older edition.	Misc Update Request	Open
32	HMA	Page 2	Table 1 and Table 2. Please include all of the failure modes and acceptance criteria, and where not applicable, state this, to provide a complete picture. For example, in Table 2, IFC 1207.1.4.2#3.	Misc Update Request	Open
33	HMA	Page 4	Figure 4. Sides A & B are referenced in the text (Section 3.1), but not in the image. Update document graphically show Sides A & B.	Misc Update Request	Open
34	Drawings/HMA	N/A	It is unclear if the coolant system is designed in accordance with the International Plumbing Code. Update HMA/Drawings with the required design information, including applicable code of record.	NFPA 855, Section 5.3.7	Open
35	N/A	N/A	Confirm that the gas sensors are compatible with the FACP	IFC 916.10	Open
36	Drawings/HMA	HMA Page 6 Section 3.2.5	Provide separate horn/strobes, with different colors, for gas detection and fire alarm. 2021 IFC: "Audible and visible alarms associated with a gas detection alarm shall be distinct from fire alarm and carbon monoxide alarm signals". Label the strobes indicating the function. For example, 'GAS DETECTION' and 'FIRE ALARM'.	IFC 916.8; NFPA 72 Section 10.10	Open
37	HMA	HMA Page 6 Section 3.2.5	Define 'low' gas level. Please provide the alarm levels for LEL and CO detectors (in % LFL or ppm).	Misc Update Request	Open



38	Drawings	N/A	Provide location for notification appliances. Coordinate location with ERP to ensure first responder visibility.	Misc Update Request	Open
39	HMA	Page 13 Section 3.2.6	This section utilizes the title 'fire suppression'. A fire suppression system needs to comply with NFPA 855, 4.9.3, including testing per 9.1.5. Provide documentation demonstrating this system complies with applicable requirements for a fire suppression system.	NFPA 855 4.9.3, and 9.1.5. Misc Update Request	Open
40	HMA	Page 13 Section 3.2.6	Please clarify the intent and application of NFPA 855 to this system. It cannot be determined if the system is for suppression or for thermal runaway propagation prevention. If this is not a fire suppression system, specifically invoke AHJ approval for omission of fire suppression system per NFPA 855 Section 9.5.2.5		
41	HMA	Section 3.2.6	If the NOVEC 1230 system is a thermal runaway propagation prevention system, provide a separate report interpreting the test results, defining the applicable codes and standards, and validating the use and limitations.	NFPA 855, 9.1.5.2.2	Open
42	HMA or Drawings	N/A	Confirm that each FACP will have a unique identifier, and that each container will be labeled accordingly. For example, if an alarm signal states 'CONTAINER 19', then the number '19' should be on each container in large letters viewable at 100 feet from the anticipated side that the fire department will approach	2021 IBC 502.1; 2021 IFC 907.6.3; NFPA 855 G.1.4.2.1.1, G1.4.2.1.2	Open
43	HMA	Section 5.2.1 & Page 11	All of the items in Table 5 appear to be threats except the first two. 'Single Cell Thermal Runaway' and 'Multi Cell Thermal Runaway'. These are Consequences and/or Top Events. Also	Misc Update Request	Open

			refer to sample EPRI HMA (Table 2-2 & 3-2). Update HMA accordingly.		
44	HMA	Page 12	The Direct Injection System is credited as a preventative barrier. This system requires a fire or cell failure (utilizing smoke detection) to operate. Please determine if this is a mitigative or preventative barrier, based on if BMS signals are also utilized to trigger it. Revise or confirm as appropriate.	Misc Update Request	Open
45	HMA	Page 13	Table 7. Combine 'Cell Off-Gassing/Explosions' and 'Accumulation of Off Gasses/ Delayed Explosions'. Accumulation will always occur even with a single cell that off gasses, where an NFPA 68 system is used. In addition, more cells do not always create a worse explosion. More cells can lead to a less than stoichiometric condition inside the container. A single cell can lead to a partial volume deflagration.	Misc Update Request	Open
46	HMA	Page 14	Thermal Isolation for both the 'Enclosure Insulation' and 'Module/Rack Separation' is credited. However, details are not provided on these, so it is unclear how/why these are being credited as a mitigative barrier. Please provide more descriptive detail on why these are credited as a mitigating barrier and any date to support the analysis.	Clarification and Misc Update Request	Open
47	HMA	Page 15	The diagrams are difficult to review. Please provide more clear diagrams.	Misc Update Request	Open
48		Page 15	Figure 6/7/8. Under the line 'Cell Off Gassing/Explosions', deflagration venting is missing as a mitigating measure.	Misc Update Request	Open
49	HMA	Page 16/17	The terms 'depending upon final site installation/conditions' is repeated. The HMA	Misc Update Request	Open

			must reflect this specific installation and dictate all required parameters. Please revised and clarify.		
50	HMA	Page 16	The statement 'in effect acts to increase the effectiveness of the smoke and gas detection systems by providing an increased amount of time for event detection prior to the development of untenable conditions.' is not accurate, as it pertains to the direct injection system. The direct injection system activates on smoke according to the HMA. It will do nothing to increase the amount of time for event detection. Please update.	Misc Update Request	Open
51	HMA	Page 17, Section 5.3.2	The sentence 'The effectiveness of the system/disconnect capability may be subject to site conditions.' must be defined for this specific site. Please update to specifically address site installation.	Clarification Request	Open
52	HMA	Page 17, Section 5.3.3	The sentence 'Failure of any of the above listed system' is incorrect without further documentation. This review could not confirm the Listings on the direct injection system, the gas sensors, the deflagration panels, or the fire alarm system. Provide Listing information to validate the statement.	Misc Update Request	Open
53	HMA	Page 18	The statement that the 'strength of gas detection system and direct injection is conditional based on the quality and use of the emergency response plan' is a very loose association. Please clarify how these systems are conditional based on the quality and use of the ERP, or remove.	Misc Update Request	Open



54	HMA	Page 18, Section 5.3.5	The word 'can' is used in the sentence 'insulation monitoring can also serve...'. Please detail whether there is insulation monitoring or not, and the purpose/benefit.	Clarification & Misc Update Request	Open
55	ERP		Confirm the planned location of the ERP. Indicate this location in the ERP.	NFPA 855 4.3.2.1.2	Open
56	ERP	Section 4.1	The second paragraph in Section 4.1 is duplicated. It is the same as the second sentence of the first paragraph.	Misc Update Request	Open
57	ERP	Page 5 of 20	Move Page 5 of 20 to Page 2. After the cover page, this is the most important page and will be used as a quick reference for responders. They should not be searching through a table of contents, revision log, etc, to find this.	Misc Update Request	Open
58	ERP	Page 5 of 20	Put the contact number of AES responders/personnel right up front. For example: "REMAIN OUTSIDE THE FRONT GATE UNTIL ENTRY IS GRANTED BY AES PERSONNEL. IF AES PERSONNEL ARE NOT PRESENT, CALL	Misc Update Request	Open

			EMERGENCY LINE AT XXX-XXX-XXXX TO BEGIN COORDINATION'		
59	ERP	Page 5 of 20	Following the content in comment 61 above, add sentence stating something like 'DO NOT OPEN CONTAINER DOORS – EXPLOSION HAZARD MAY OCCUR'. It is imperative this message is conveyed clearly.	Misc Update Request	Open
60	ERP	Page 5 of 20	Item 4. Change to 'First responders <u>must</u> wear PPE' on scene. It is not an option and needs to be explicit.	Misc Update Request	Open
61	ERP, HMA	N/A	It is understood that the gas sensor signals will go to the AES 24/7 monitoring service (and will not be transmitted via the fire alarm system). Please confirm this, the intended response by various parties, and clarify in the ERP and HMA.	NFPA 855, 4.3.2.1.4 (3)	Open
62	ERP	N/A	Once comments 36/38 are addressed, ensure the final ERP has photos of the gas sensor and the fire alarm strobe for visual representation.	Misc Update Request	Open

63	ERP	Page 9 of 20	The sentence 'The BESS containers are adequately separated by approximately 22 feet...' is not consistent with the project documents, which notes the containers are 3.5 feet apart.	Misc Update Request	Open
64	HMA and ERP	Page 9 of 20	The ERP references FM 5-33 (See Page 9 of 20). However, the HMA and design documents not appear to be written or intended to comply with FM 5-33. Is the installation intended to comply with FM 5-33? Please confirm. The use of FMDS 5-33 requires approval as an Alternative Means and Methods per IFC Section 104.	Clarification Request	Open
65	ERP	Section 4.1.1	The last paragraph of Section 4.1.1 refers to NOVEC suppression for the container. Confirm if container based NOVEC is being provided or if it is direct injection thermal runaway propagation prevention system. The ERP and HMA contain conflicting information.	Misc Update Request	Open
66	ERP	Section 5.1	Change the word 'should' in the following sentence to 'must' or 'shall': 'Due to the various gases present (listed above) appropriate PPE, including SCBA, <u>should</u> be worn.'	Misc Update Request	Open

67	ERP	Section 5.3	This section notes that the deflagration panels will release to the sides. It is our understanding the deflagration panels are roof mounted, as described in the HMA. Please clarify and coordinate.	Misc Update Request	Open
68	ERP	Page 13 of 20	There is an incomplete sentence: 'Upon notification of an incident at, '. Please correct/resolve.	Misc Update Request	Open
69	ERP	Page 13 of 20	The status of the gas detection system must also be considered in the following section: 'Has the Suppression System or Fire Detection System activated'. Revise to include gas detection.	Misc Update Request	Open
70	ERP	Page 14 of 20	The language of 'Initial Entry' must clearly detail the container doors are not to be opened by first responders.	Misc Update Request	Open
71	ERP	Page 14 of 20	Clarify the intent regarding the NOVEC system in the section titled 'BESS Fire Protection System'. See other comments on this topic such as Comment 65. Coordinate any changes.	Misc Update Request	Open



72	ERP	Page 15 of 20	Road labels are illegible on the current map. Revise to more clearly label the roads for ease of identification.	Misc Update Request	Open
73	ERP	Page 16 of 20	Figure 2 does not clearly and legibly identify the site infrastructure and details. Revise the map to more completely detail the facility layout, such as transformers, water tanks, roads, PV arrays, etc.	Misc Update Request	Open
74	ERP	Page 18 of 20	The schematic shows two horn strobes. Other references to notification device(s) in the HMA indicate there is only one. Please clarify and coordinate. See also comment 36/38 related to providing separate gas detection/fire alarm horn strobes. Spell out acronyms HFR and LFR.	Clarification & Misc Update Request	Open
75	ERP	Page 12 of 20	Site familiarization and tours must include other potential responders, which could include Federal Agencies (EPA), County Haz Mat, Environmental, and Emergency Management, and others that could conceivably respond to an incident. Section 6.1 only refers to the Fire Department.	Misc Update Request	Open



76	ERP	General	The ERP does not mention the water tank. Include information regarding the location, size, and purpose of the water tank in the ERP.	Misc Update Request	Open
77	ERP	Page 7 of 20	In Table 2, it states 'Deflagration Wall Panels'. Based on the HMA (see Section 3.2.2 of HMA), these are rooftop panels. Please update/coordinate.	Clarification & Misc Update Request	Open
78	ERP	General	The ERP must clearly define the meeting/convergence point, if present.	Clarification & Misc Update Request	Open
79	Pre-Plan	N/A	Provide language clarifying 'CENS' as this is not common language for first responders	Misc Update Request	Open
80	Pre-Plan	N/A	Same comment as 41/65/71 regarding the 'Novac Suppression', but for the pre incident plan. Additional information is required about the NOVEC system. Clearly define the suppression system and associated hazards in the ERP.	Clarification & Misc Update Request	Open



81	Pre-Plan	N/A	Provide annotations on the map for PV arrays, BESS containers, Operations Building, Water Supply, and access road.	Clarification & Misc Update Request	Open
82	Pre-Plan	N/A	Under 'Special Conditions and Hazards' after **Lithium Ion Batteries & High Voltage** include a line stating in capital letters 'EXPLOSION HAZARD' or 'EXPLOSION HAZARD – DO NOT OPEN DOORS'.	Misc Update Request	Open
83	N/A	N/A	Provide a maintenance plan, including tasks and requisite intervals, for BESS maintenance functions, NFPA 68, NFPA 72, and direct injection maintenance items.	NFPA 855, 7.1.2 and G.10.2.1	Open
84	HMA	N/A	Confirm how and if BMS alarms are being monitored 24/7. Current industry practice is moving toward ensuring this data is monitored by a Network Operations Center. Refer to New York State Interagency Fire Safety Work Group Fire Code Recommendations July 2024	Clarification Request	Open
85	Drawings	N/A	Place large signage on containers stating "EXPLOSION HAZARD WHEN IN ALARM. STAND BACK". Signage to be viewable from 100 feet away. Provide signage that is legible at night	NFPA 855 G.1.4.2.1.1	Open

86	Drawings/HMA	N/A	Provide a visual annunciation/beacon at the entry to the BESS area to indicate potentially hazardous conditions that could exist, including BMS, Gas, and Smoke alarms.	NFPA 855, 9.2.3.3	Open
87	N/A	N/A	Confirm AES capabilities for air monitoring during a large-scale incident to inform need for public protective measures.	Clarification Request	Open
88	Draft UL 9540 Report	N/A	Section 19.2 indicates N/A for ASME B31 (or equivalent) for piping carrying fluids. Confirm what piping standards the coolant and the NOVEC are constructed to, or have SGS explain why this is an 'N/A'.	Clarification Request	Open
89	Draft UL 9540 Report		Provide a copy of the following documents for review: 1) FMEA for UL 9540 2) UL 60730-1 Evaluation	Clarification Request	Open
90	Drawings		Provide shop drawings for the NOVEC system for review.	NFPA 855, 4.2.1.1 (7)	Open



91	N/A		Provide complete NFPA 69 compliant combustible concentration reduction system, including all necessary support documentation.		Open
92	N/A		The CSA deflagration report concludes the internal divider wall collapsed during testing (page 13 of 22). NFPA 68 (2023) Section 7.2.5.11 requires interior partitions that cannot withstand the expected pressure not be considered part of the calculations. Please provide an interpretation, in the light of the CSA testing results that indicate interior partition collapse, the Vigilex Calculations based on an approximately 20 ft container length, and this NFPA 68 requirement, if the vent panel design is still appropriate.	NFPA 68, 7.2.5.11	Open
93	HMA		The HMA should discuss that the NOVEC system, which has been tested as part of UL 9540A Unit and Installation Level tests, is required for compliance with NFPA 855, Section 9.1.5.1.2, and via UL 9540A Section 9.1.7. This system is being used to demonstrate that fire in one unit will not propagate to another unit. Without this system, the UL 9540A unit/installation testing is no longer valid (per UL 9540A Section 9.1.7 and NFPA 855, 9.1.5.1.2 and 9.1.5.1.3) and a large-scale fire test would be necessary. The HMA should clarify this so the purpose, limitations, and application of code are understood. In addition, because this system is not an NFPA 2001 system per NFPA 855 4.9.3.2, it cannot be	Clarification Request	Open



ATAR FIRE

			called a fire suppression system (see other comments related to this).		
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July 31, 2025

Delivered by Email

Mr. Dominic Sisneros
Building and Development Supervisor
Santa Fe County
djsisneros@santafecountynm.gov

RE: Atar Fire Review of Plume Study (Project Name: Rancho Viejo Solar Project)

Dear Mr. Sisneros,

Atar Fire has performed a review of the following project documents provided to us electronically:

- 'Plume Analysis. Rancho Viejo Battery Energy Storage System. Santa Fe County, New Mexico'. Coffman Engineers. July 14, 2025.

Plume models are not required by the following Codes and Standards adopted in Santa Fe County, New Mexico, which are applicable to this project:

- International Fire Code, 2021 Edition
- NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, 2023 Edition

Accordingly, in the absence of explicit code requirements, this review relied upon Atar Fire experience with best practices associated with hazard analysis and plume modeling.

Based on the document listed above, this review has determined that an acceptable level of rigor and technical competency has been utilized in the development of the plume model, consistent with engineering Standard of Care. However, some items should be addressed to provide additional clarity and refinement.

This review has been performed by Atar Fire LLC utilizing the supplied documents. Atar Fire LLC assumes no liability for any errors, omissions or oversights as part of this review process. Every possible attempt has been made to thoroughly review all supplied documents and provide a review to the greatest extent possible, consistent with engineering Standard of Care. Our review does not constitute all possible recommendations that could be associated with this installation. Our review does not constitute an approval or rejection of the conclusions made by the plume study. Final approval of the plume study, and associated use of this document, is at the discretion of the County of Santa Fe, New Mexico.

Sincerely,

Nicholas Bartlett, P.E.
Fire Protection Engineer
New Mexico License 28733
Expiration 12/31/2025

Comment No.	Page	Section, Reference Text, or Topic (as applicable)	Comment	Open/Closed
1	Multiple	5.2; 5.5; etc.	The release height, rise, and deposition velocity may not be as conservative as they should be. A conservative assumption would be ground level and neutrally buoyant. Additionally, confirm if deposition velocity was used in the modeling.	Open
2	iii	Executive Summary: <i>The potential explosion overpressure was evaluated at the 0.1 barg, 0.2 barg and 0.3 barg limits</i>	Blast overpressure should be measured at 1.0, 3.5, and 8.0 psi respectively. The minimum value used in this analysis is 1.45 psi. This may not be conservative. Please include analysis down to 1.0 psi overpressure. Refer to https://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/resources/overpressure-levels-concern.html and EPA RMP guidance.	Open
3	4	<i>When ignition of the gases released during the initial thermal runaway event occurs, the resulting fire tends to consume a large amount of the flammable gases but the combustion of thermal runaway gases is expected to produce several toxic gas species, including, but not limited to hydrogen fluoride (HF), carbon monoxide, sulfur dioxide (SO2), hydrogen cyanide (HCN), nitric oxide (NO) and hydrogen chloride (HCl)</i>	Combustion of the electrolyte (often containing Fluorine), plastics, and metals enclosing the battery lead to HF, HCN, NO, etc. The H ₂ , CO, and CO ₂ from cells do not combust to form those alone. They support a fire/explosion and the subsequent burning/release of toxic components of the battery. Suggest re-wording this section to clarify.	
4	6	4.1 – Software Selection	Confirm the other two softwares that were evaluated? Also, why is the dense gas feature mentioned in the selection criteria but not used or discussed in the analysis of the mixtures? Please clarify if dense gas calculations were used.	

6	7	5.1.2 – Scenario #2	<p>Scenario #2 has 132 modules and scenario #3 has 252 modules. Does the fire separation not create an equal split (i.e. 126 modules)? Please clarify.</p> <p>Also, please add an explanation as to why the under-ventilated adjustments were chosen for the BESS and confirm if use of this increases emissions.</p>	
6	8	5.1.3 – Scenario #3	This section states ‘entire module’. Confirm if ‘entire enclosure’ or similar is meant.	
7	9	5.3 - Atmospheric Conditions	Clarify what was the average over (for example, over a specific period of time, using a certain percentile worst case). Most references such as the EPA RMP require F stability with 1.5 m/s or the 95 percentile worst case from historical data over five years. A-D stability is incorrect; it goes to at least F stability.	
8	10	5.3 - <i>“This is also generally in alignment with the guidance provided in the EPRA Risk Management Guidance for Offsite Consequence Analysis document”</i>	Editorial Correction: Correct EPRA to state EPA	
9	12	6.1 - <i>“AGEL values are not available for all materials considered in this analysis. Therefore, the Protective Action Criteria (PACs) values will be used.”</i>	<p>Clarification Request: AEGLs are part of the PAC database. The PAC database uses the AEGL value as a primary preference, then the ERPGs as a secondary preference, and then the TEELs as the final. ERPG is misspelled throughout the document. ERPGs do include sensitive receptors in the health risk assessment, they are just developed by a different agency. PAC = 3300+ chemicals. AEGLs are in place for ~150 chemicals, ERPGs for ~150 chemicals, and TEELs (much less rigorous than AEGL/ERPG in development) for 3000+ chemicals. Please clarify and coordinate as needed.</p>	



10	14	6.1 - Table 7	How were equations 5 and 6 used to derive the exposure limits for scenarios 2 and 3 in Table 7? How was the mole fraction developed for each toxic gas? Please clarify.	
11	15	6.3 – Vapor Cloud Explosion	Table 8 contains an error. The indoor population for 2.5% should be between 0.2 barg and 0.1 barg. Please correct.	
12	19	6.3 - Vapor Cloud Explosion	The minimum value used in this analysis is 1.45 psi. This may not be conservative. Please include analysis down to 1.0 psi overpressure. At minimum, consider checking over pressure using TNT equivalency explained in EPA RPM (10% yield recommended) document and using the NRC calculator: https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1805/s1/15-explosion-calculations-sup1.xls	
13	19	6.3 - Vapor Cloud Explosion	Please clarify in the analysis what volume of gas was used in the vapor cloud explosion calculations.	