BEFORE THE SUSTAINABLE LAND DEVELOPMENT CODE
HEARING OFFICER OF SANTA FE COUNTY

CASE NO. 24-5200
RANCHO VIEJO SOLAR LLC
AES CLEAN ENERGY DEVELOPMENT LLC, APPLICANTS
CONDITIONAL USE PERMIT

TESTIMONY
IN OPPOSITION TO THE CONDITIONAL USE PERMIT APPLICATION FOR THE RANCHO VIEJO SOLAR PROJECT

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I. SUMMARY OF OPPOSITION

My wife and I are residents of the Eldorado subdivision in Santa Fe County, which is located approximately one mile east of the site where Rancho Viejo Solar, LLC and AES Clean Energy Development, LLC (collectively the "Applicants")[1] seek to build a 680-acre solar farm and a 3-acre complex of lithium-ion battery storage facilities.[2] The project would also include a 1-acre collector substation and a 2.3-mile transmission line connecting the solar farm, battery storage facilities and substation to a transmission line of Public Service Company of New Mexico.

The exact distance between the perimeter of the project and Eldorado is unclear. Citizen measurements place the distance at one mile or less. The Environmental Impact Report submitted by AES with its August 2024 Application states that the Eldorado subdivision is located 1.3 miles east of the "main solar facility," but AES has not submitted a clear map drawn to scale that would show the distance between the eastern perimeter of the 680-acre site and the edge of the Eldorado subdivision. The AES review also states that Eldorado is 0.3 miles south of the proposed transmission line.[3]

We oppose AES's request to include the four-acre 48 MW lithium-ion battery storage complex in the Rancho Viejo Solar Energy Project.[4]

Since the facilities the Applicants seek to build are not permitted as of right in the zoning district in which it wants to build the facilities, the Applicants have filed an Application for a Conditional Use Permit with the County. The Application at issue was filed on August 30, 2024. It follows a previous application that was filed on January 26, 2023 but was withdrawn after the County determined on February 29, 2024 that the application was incomplete.

Before issuing such a permit, the SLDC requires the Applicants to prove and the County to determine that the proposed use will satisfy seven criteria. The three criteria most relevant here are that the proposed use (i) will not "be detrimental to the health, safety and general welfare of the area," (ii) will not "create a potential hazard for fire, panic, or other danger," and (iii) will not be inconsistent with the spirit and intent of the SLDC or the County's Sustainable Growth Management Plan (SGMP).[5]

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[1]The identity of the applicant is actually unclear. The Development Permit Application identifies "Warren Thompson, Rancho Viejo Limited Partnership" as the applicant. The Notarized Letter of Consent also authorizes Joshua Mayer and Matthew Gordon of "AES Clean Energy" as agents for Rancho Viejo Limited Partnership, and it identifies the property as "Rancho Viejo Solar, LLC." The Pre-Application Meeting Summary refers simply to "AES." Section 1.1.1 of the "Application Written Report" identifies Rancho Viejo Solar, LLC and AES Clean Energy Development, LLC as the "Applicant or Authorized Representative." The Site Development Plan identifies "AES" as the "Owner." The Environmental Impact Report identifies Rancho Viejo Solar, LLC as the Applicant.

[2]Exhibit 1 attached hereto provides the background and qualifications for my testimony.

[3]Environmental Impact Report for the Rancho Viejo Solar Project, July 2024, at 3-40.

[4] My Qualifications to submit this testimony are attached as Exhibit 1. The Hearing Officer's October 16, 2024 Order granting my Motion to Intervene is attached as Exhibit 2.

[5]SLDC, section 4.9.6.5.

Utility-scale lithium-ion batteries as proposed by the Applicants pose a demonstrated fire, explosion and toxic gas risk. And the issuance of a Conditional Use Permit to allow its construction and operation will be inconsistent with the SGMP because the County lacks the emergency response infrastructure to safely address a thermal runaway incident that results in any of the demonstrated hazards.

In 2021, the Electric Power Research Institute (EPRI), an independent nonprofit organization that conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public,[6] published a report titled "Lessons Learned: Lithium Ion Battery Storage Fire Prevention and Mitigation – 2021." The report found that, over the four years preceding the report, at least 30 large-scale battery energy storage sites (BESS) with lithium-ion storage systems globally experienced failures that resulted in destructive fires.

AES lithium-ion battery facilities have been involved in at least three fires. A 2 MW facility built by AES in Surprise, Arizona exploded on April 19, 2019, injuring eight firefighters, and continued burning for two weeks. A 10 MW AES facility in Chandler, Arizona experienced a thermal runaway in April 2022 that led to a fire that burned for almost two weeks, closing the nearest freeway and causing the city to ask nearby businesses to evacuate. And, only weeks ago, a 30 MW facility built by an AES subsidiary in Escondido, California caught fire and burned for two days, prompting an evacuation order for 500 businesses, school closures and shelter-in-place recommendations for residents.

All three facilities are smaller than the 48 MW battery facility AES is proposing for Santa Fe County.

The risks of fire and toxic gases at the site proposed here presents an unacceptable risk to me, my wife and other residents of Eldorado. The Applicants propose to site the project in grasslands which can rapidly transmit a fire at the site to neighboring residents. The greenbelt next to our home is downwind from the proposed site and has two- to three-foot high weeds and other vegetation that can readily channel a fire to our house.

According to the Western Fire Chiefs Association and others, wildfires, especially in grasslands, can travel at up to 14 miles per hour.[7] At 14 miles per hour, a grass fire starting at the battery site could reach homes 1.5 miles away in less than seven minutes. At 7 miles per hour, a fire could reach those homes in less than 15 minutes. The area is also notorious for its wind speeds, which can accelerate the progress of such a fire.

The response times for local emergency responders are not fast enough to address the risks, and County responders are often dealing with more than one fire at a time. Santa Fe County does not have a Hazardous Materials response team. It relies on a team from the City of

[6]EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, affordability, health, safety and the environment. EPRI members represent 90% of the electricity generated and delivered in the United States with international participation extending to nearly 40 countries. EPRI's principal offices and laboratories are located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; Dallas, Texas; Lenox, Mass.; and Washington, D.C.
[7]How Fast Do Wildfires Spread? Western Fire Chiefs Association, November 1, 2022.

Santa Fe, which, when available, has an estimated travel time of 24 minutes (16 miles) to the proposed site. If the City's team is not available, the County will seek help from Hazardous Materials response teams in Los Alamos, 49.3 miles from the site (estimated 55 minutes), and/or Albuquerque, 56.5 miles from the site (estimated 53 minutes).

The resources and response times for local fire responders, counting only the time to travel from their assigned stations (once they have assembled their manpower and resources) are also inadequate:

-- Station # 60 located at 39 Rancho Viejo Blvd, 5.7 miles/8 minutes with four personnel including one engine and a medic.

-- Station # 61 located at 58 County Road 62, 10.9 miles/15 minutes, will respond as requested.[8]

The major points addressed below are the following:

1. The proposed lithium-ion battery complex presents an unacceptable risk of fire, explosion and toxic gases to adjacent residential land uses.

2. AES's application is inconsistent with the spirit and intent of the County's Sustainable Growth Management Plan.

3. AES's Application violates the requirements of the County's Sustainable Land Development Code (SLDC), Ordinance 2023-09 and the 2023 update (Annex G) to the National Fire Protection Association Standard for the Installation of Stationary Energy Storage Systems (NFPA 855).

II. STANDARDS FOR ISSUANCE OF CONDITIONAL USE PERMITS

A. When considering AES's request for a Conditional Use permit, the County is required to conduct a discretionary review that explicitly considers the "unique characteristics" of AES's project and the "potential impacts on adjacent land uses." The County cannot simply conduct a ministerial "check-the-box" review.

The issue for Santa Fe County is a question of land use and appropriate siting under the County's Sustainable Land Development Code (SLDC). Under the SLDC, AES does not have an unconditional legal right to locate the project in the location it proposes within the "Rural Fringe" zoning district at issue here.

The AES project can be approved within a Rural Fringe zoning district only as a "Conditional Use." Conditional Use permits are considered under the SLDC "for certain uses that, because of unique characteristics or potential impacts on adjacent land uses, are not permitted in zoning districts as a matter of right" but which may be approved under a case-by-

[8]Id.

case review that considers factors set forth in the SLDC[9] (emphasis added). The county must make a number of determinations, including that the proposed use will not "be detrimental to the health, safety and general welfare of the area" and will not "create a potential hazard for fire, panic, or other danger."[10]

The SLDC requires that the County explicitly consider and conduct a case-specific review of the "unique characteristics" of the AES project and the "potential impacts on adjacent land uses." The County's review must explicitly examine and determine in regard to the specific battery storage units and adjacent land uses at issue here whether fire risks will be created, what their impact on San Marcos, Eldorado and other adjacent lands may be, whether the project will "be detrimental to the health, safety and general welfare of the area" and whether the project will "create a potential hazard for fire, panic, or other danger" in the adjacent lands.

As a Conditional Use request, the County's review cannot simply be a "check-the-box" review where the County determines that an application is "complete" and issues a permit with conditions requiring the applicant to prove at a later time that its project will be safe. Because the project is not permitted as of right, there are no prescribed or standard "boxes" that can be checked to qualify for the requested approval.

Unlike the approval of uses that are permitted as of right in a particular zoning district, conditional use permits require the exercise of judgment and discretion.[11] The SLDC states that quasi-judicial proceedings require an exercise of discretion in applying the requirements and standards of the SLDC, state and federal law:

> In making quasi-judicial decisions, the Board, Planning Commission or Hearing Officer shall investigate facts or ascertain the existence of facts, hold hearings, weigh evidence, make written findings of fact, conclusions of law and recommendations and exercise discretion of a judicial nature. In the land-use context, these quasi-judicial decisions generally involve the application of land-use policies to individual properties in common ownership as opposed to the creation of policy. These decisions require an exercise of discretion in applying the requirements and standards of the SLDC, state and federal law.[12]

Section 4.4.3 of the SLDC requires that applicants seek a pre-application meeting with the County's Technical Advisory Committee (TAC) for the purpose of identifying studies, reports and assessments (SRAs) that the applicant must include with its Conditional Use Permit application.[13] An applicant must include the listed items before its application can be determined to be complete. Submission of all the required items does not entitle the applicant to the Conditional Use Permit. After receiving a complete application, the County must still determine

[9]SLDC, section 4.9.6.1.
[10]SLDC, section 4.9.6.5.
[11]"4.9.6.3. Application. An applicant may apply for a CUP by filing an application for discretionary development approval with the Administrator." SLDC, section 4.9.6.3. The ministerial-discretionary distinction is also described in the SLDC's description of "quasi-judicial proceedings" (which involve conditional use permits) and "ministerial development proceedings" (which involve uses permitted as of right). SLDC, sections 4.3.2 and 4.3.3.
[12]SLDC, Section 4.3.2.
[13]SLDC, section 4.4.3.

whether the items that are submitted – along with evidence submitted by proponents and opponents of the conditional use – satisfy the criteria in section 4.9.6.5 of the SLDC.[14] The County's Hearing Officer, Planning Commission and, potentially, the County Commissioners must consider the evidence, weigh the persuasiveness of the evidence and make decisions based on that evidence.

AES's "checking of the boxes" by submitting a "complete" application will not entitle it to the Conditional Use Permit. The quasi-judicial process must conduct a full review of the criteria in Section 4.9.6.5 of the SLDC.

B. The seven mandatory standards to receive a Conditional Use Permit

The discretionary review required for a CUP permit includes seven mandatory standards:

> 4.9.6.5 Approval Criteria. CUPs [Conditional Use Permits] may only be approved if it is determined that the use for which the permit is requested will not:
>
> 1. Be detrimental to the health, safety and general welfare of the area;
> 2. Tend to create congestion in roads;
> 3. Create a potential hazard for fire, panic, or other danger;
> 4. Tend to overcrowd land and cause undue concentration of population;
> 5. Interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements, conveniences or improvements;
> 6. Interfere with adequate light and air; and
> 7. Be inconsistent with the purposes of the property's zoning classification or in any other way inconsistent with the spirit and intent of the SLDC or SGMP.

The Rancho Viejo Solar Project fails standards 1, 3 and 7.

III. THE AES PROJECT "WILL BE DETRIMENTAL TO THE HEALTH, SAFETY AND GENERAL WELFARE OF THE AREA" AND "CREATE A POTENTIAL HAZARD FOR FIRE, PANIC, OR OTHER DANGER."

A. Hazards

1. Lithium-ion batteries, thermal runaway, and fires, explosions and toxic gases – as described by the Applicants

a. AES's draft guidance for first responders

The fires, explosions and releases of toxic gases that are associated with lithium-ion batteries result from a phenomenon known as "thermal runaway." Thermal runaway occurs when, for a number of potential causes, a lithium-ion battery cell generates extreme heat and

[14]See March 29, 2022 TAC letter as Appendix to the July 2024 AES Environmental Impact Report.

gases that are flammable and toxic. The phenomenon runs the risk of overheating adjacent cells and propagating the phenomenon throughout the facility. When exposed to oxygen, the flammable gases can ignite. And unless the container is vented, the flammable gases can build up and explode (i.e., deflagrate) in a manner similar to a natural gas explosion within a home or other contained area.

AES's draft guidance for first responders (submitted with their application) describes thermal runaway as follows:

> Thermal runaway potential exists during abnormal conditions as well as increased risk for short circuiting.
>
> Thermal runaway is one of the primary risks related to lithium-ion batteries. It is a phenomenon in which the lithium-ion cell enters an uncontrollable, self heating state. Thermal runaway can result in: Ejection of gas, shrapnel, and/or particulates (violent cell venting) and extremely high temperatures.
>
> Under abnormal conditions batteries may be subjective to the production of off gases to include, but not limited to Hydrogen, Hydrogen Fluoride, Hydrogen Chloride, Carbon Monoxide, Methane, Ethane & Ethylene gases which may result in smoke, fire, and/or explosion. Due to various gases present (listed above) appropriate PPE, including SCBA, protective clothing should be worn.[15]

AES's guidance states that its proposed fire suppression method, the deployment of Novec 1230, may temporarily interrupt a fire but that it will not fully suppress it:

> The Novec 1230 is an extinguishing agent, where discharge contains a colorless, nearly odorless, non-conductive, and fast-evaporating liquid that extinguishes the fire thanks to a cooling effect, reducing the flame's thermal power and interrupting the combustion reaction.
>
> The fire suppression system(s) at the BESS containers are designed to suppress small fires within the ancillary equipment and there is no expectation that a thermal runaway type fire within the battery banks will be suppressed. Thermal runaway produces explosive gasses prior to ignition, and it is anticipated that early warning will be provided by the gas detection system within each container.[16]

b. AES's Fire Risk Assessment submitted with AES's January 2023 application

A Fire Risk Assessment provided by AES in connection with AES's January 2023 Application describes the physical reactions that may occur during a thermal runaway. These include the potential physical destruction of the batteries and their containers, the propagation of

[15]AES EIR, Appendix G, First Responder Mitigation Guidelines, p. 10.
[16]Id., p. 9.

the runaway to adjacent batteries, the ejection of a "chaotic mixture of hot and glowing particles," the release of hazardous off-gases, and the potential for explosion and fire:

> The different stages and reactions contributing to the general thermal runaway process of a lithium ion-cell have been examined and are well documented within the energy storage industry. When a lithium-ion cell experiences thermal runaway, the noted degradation occurs resulting in elevated cell surface temperatures causing cascading impacts that have been demonstrated to propagate to the surrounding environment and adjacent cells. Observations from previous tests have shown these effects are very similar for all cell types (cylindrical hard case, prismatic hard case, pouch cell). Depending on the battery system design, adjacent cells may likewise be thermally damaged [and] enter thermal runaway.
>
> It is well documented that cell component breakdown due to thermal runaway results in the production of hot flammable gases due to the chemical reactions mentioned above. The flammable gas generation occurs during cell decomposition resulting in increased internal pressure, leading to cell expansion, including the application of compressive force to adjacent parts in the system. Depending on the magnitude of the expansive forces the cells have been known to rupture encapsulation.
>
> Upon rupture, the cell begins to vent and together with the produced gas and a chaotic mixture of hot and glowing particles are ejected from the cell. Expelled particles typically contain pieces of active material from the cell's anode and cathode. Temperature measurement of released gases for the Samsung SDI E4L NMC cells averages 150^{o} C. Analysis of the ejected gas showed high proportions of hydrogen, hydrocarbon, and carbon monoxide. Therefore, flammability and the risk of deflagration or explosion, based upon industry performance is given at a fuel concentration of approximately 9.21% at ambient temperatures.
>
> The mentioned effects usually have their impact on the battery and its environment as a function of time. The Samsung SDI E4L cells time to thermal runaway ranges from 24:26 min to 27:15 min. The heat release rate of a single cell thermally interacts with adjacent cells increasing the internal temperatures and challenges the integrity of the cell. This combination of effects creates the environment where subsequent cell failure will occur resulting in cascading degradation of the battery modules. Unmitigated, the entire module assembly will be damaged due to cell thermal runaway. The cascading degradations process will exponentially accelerate and usually within several minutes, the battery housing may lose integrity due to the amount of thermal energy. During degradation, the prismatic cells swell and bulge during pressurization. To be compliant with UL 1642, all lithium-ion cells include safety vents that are designed to release the internal pressure of the cell when a specified pressure is reached. Upon cell rupture, the gas accumulating inside the cell will be released and will react with atmospheric air (with fresh oxygen and moisture). The air exchange with the

> battery will react with the freshly plated lithium metal and electrolyte and may cause explosion and ignition.[17]

The Fire Risk Assessment also identified the following toxic gases that are released in a thermal runaway of the batteries examined:

> It is well documented that Lithium-ion battery fires generate intense heat and considerable amounts of gas and smoke. Although the emission of toxic gases can be a larger threat than the heat, the knowledge of such emissions is limited for large grid-connected energy storage systems. Therefore, the following discussion outlines the findings of research into peer-reviewed publications and government sources to identify the potential toxic gas constituents in an ESS fire.
>
> New York State Energy Research & Development Authority (NYSERDA) and Consolidated Edison, the New York City Fire Department (FDNY) and the New York City Department of Buildings (NY DOB), DNV-GL was commissioned to address code and training updates required to accommodate deployment of energy storage in New York City. The research by NYSERDA concluded "that all batteries tested emitted toxic fumes, the toxicity is similar to a plastics fire and therefore a precedent exists". Several different manufacturer battery cells were tested and the typical gases emitted included:
>
> -- Carbon monoxide (CO)
> -- Hydrochloride (HCI)
> -- Hydrogen Fluoride (HF)
> -- Hydrogen Cyanide (HCN)[18]

Hydrogen Fluoride and Hydrogen Cyanide are included in the U.S. Environmental Protection Agency's lists of Extremely Hazardous Substances for which the federal Emergency Planning and Community Right to Know Act (EPCRA) requires Local Emergency Planning Committees to develop emergency response plans.[19] (See below for a discussion of Santa Fe County's lack of such a plan.)

Experience with the thermal runaway events involving AES facilities (discussed below) indicates that fires resulting from thermal runaway continue for extended periods of time. Flames may be extinguished intermittently with chemical aerosols, fast-evaporating liquid solutions (i.e., clean agents) and other fire suppression methods, but the fire suppression methods don't generally stop the thermal runaway conditions within the battery cells. The release of the heat and gases stemming from the continuing thermal runaway causes reignition until the energy stored by the battery cells is finally dissipated.

[17] AES Clean Energy 40' CEN Battery Energy Storage System Project, Battery Energy Storage System (BESS) Level Fire Risk Assessment, Hiller Company, January 5, 2023, p. 13 (footnotes omitted) (emphasis added).
[18] Id., at p. 35 (footnotes omitted) (emphasis added).
[19] 40 CFR Part 355, Appendix A.

2. Fires and explosion at AES facilities

a. April 19, 2019 Surprise Arizona

In a Special Report, the National Fire Protection Association provided the following account of the April 2019 fire and explosion at the 2 MW battery energy storage system built and operated by an AES subsidiary for Arizona Public Service Company:

> Late in the evening on April 19, 2019, Bobby Ruiz, the fire chief in Peoria, Arizona, was at home preparing for the week ahead when he received the phone call every chief fears. He jumped in his car and raced to the Maricopa Medical Center in nearby Phoenix, arriving just as the medivac helicopters began unloading two of his firefighters: Hunter Clare, a captain, and Justin Lopez, a fire engineer.
>
> The situation was bleak. Both men had multiple broken bones, internal bleeding, organ lacerations, traumatic brain injuries, and thermal and chemical burns. "As they're working on them, a doctor looks over at our chaplain and tells him, 'I want you to get over there by his head and start praying over him—he needs it right now,'" said Ruiz, reliving the tense moments inside the emergency room. "I've been in the fire service 40-plus years, and I have never, ever heard a doctor tell the chaplain to go over there and start praying over him. It's a miracle they both survived."
>
> Hours earlier, Clare and Lopez, as members of the Peoria Fire-Medical Department's HAZMAT team, had been called to the McMicken Energy Storage facility, located in a remote corner of Surprise, Arizona, a neighboring suburb 20 minutes outside of Phoenix. No one on the team had heard of McMicken, and when they arrived it was unclear what they were looking at. Surrounded by a chain-link fence at the edge of the desert, a metal box the size and shape of a large shipping container was leaking milky white smoke. The structure, they soon discovered, housed a 2-megawatt energy storage system (ESS) owned by local utility Arizona Public Service; hundreds of the system's lithium-ion battery cells had experienced a catastrophic failure and were in a dangerous state known as thermal runaway.
>
> After hours of deliberation, Clare and Lopez finally opened the door of the battery container to ventilate it when a sudden explosion rocked the facility. Those outside of the blast zone described "a jet of flame that extended at least 75 feet outward and an estimated 20 feet vertically" from the door of the battery container, according to an extensive report on the incident published last year by the UL Firefighter Safety Research Institute. The force of the explosion blew Clare underneath the chain-link fence, and he came to rest 70 feet from the container door. Lopez was thrown violently into the fence, some 30 feet from the

> structure. Two other nearby firefighters were knocked unconscious, their breathing apparatus and helmets ripped away and strewn across the dusty ground.
>
> . . .
> Following the blast, Lopez and Clare endured lengthy hospital stays, multiple surgeries, and a grueling regimen of physical therapy. The two other injured firefighters, Matt Cottini and Jake Ciulla, suffered burns and headaches, among other lingering issues. All four have been back at work for about a year, according to Ruiz. "They're all doing fairly well—as well as could be expected," he said.[20]

A report prepared by Underwriters Laboratories described the following injuries:

-- Fire Captain suffered a traumatic brain injury, an eye injury, spine damage, broken ribs, a broken scapula, thermal and chemical burns, internal bleeding, two broken ankles, and a broken foot.

-- Fire Engineer suffered a traumatic brain injury, a collapsed lung, broken ribs, a broken leg, a separated shoulder, laceration of the liver, thermal and chemical burns, a missing tooth, and facial lacerations.

-- Firefighter 1 suffered an injured Achilles tendon, a fractured patella, a broken leg, nerve damage in his leg, spine damage, thermal burns, tooth damage, and facial lacerations.

-- Firefighter 2 suffered facial lacerations. Surprise Fire-Medical Department

Four other firefighters and one officer from the Surprise Police Department were transported to the hospital and observed overnight for exposure to Hydrogen Cyanide (HCN). These five individuals were released from the hospital the following morning with no noticeable lasting effects from HCN exposure.[21]

The incident became infamous and has been cited as the basis for increased scrutiny of the safety of utility-scale lithium-ion battery energy storage systems in subsequent years.[22]

b. April 18-May 1, 2022 fire in Chandler Arizona

A fire occurred on April 18, 2022 at an AES 10 MW lithium-ion battery storage facility in Chandler Arizona. The fire began on 18 April. The sprinkler system was deployed automatically and continued to spray water for several days to keep the temperature down and was turned off on April 29. On May 1, the fire department turned control of the site back over to AES so that it could begin its investigation. There were no reported injuries associated with the

[20]ESS Special Report: Learning from Surprise, Jesse Roman, NFPA Journal, July 26, 2021.
[21]Report: Four Firefighters Injured In Lithium-Ion Battery Energy Storage System Explosion – Arizona, UL Firefighter Safety Research Institute Columbia, MD 21045 July 28, 2020.
[22]In Wake of Battery Explosion, APS Assures ACC of Equipment Safety, California Energy Markets, Apr 26, 2019.

event, but the nearest freeway was closed, and the City of Chandler notified nearby businesses to evacuate.[23]

c. September 5-6, 2024 fire in Escondido (San Diego County) California

On September 5, 2024, a fire at a 30 MW battery facility built by an AES subsidiary in the industrial district of Escondido, California burned for two days, prompting an evacuation order for 500 businesses, school closures and shelter-in-place recommendations for residents.

When built in 2017 for San Diego Gas & Electric Company, the facility had received Utility Dive's award for Project of the Year as one of the largest lithium-ion battery facilities in the world.[24]

The local public radio station, KPBS, reported that, since 2021, there have been 45 fires at similar BESS facilities, including two recent fires at nearby non-AES facilities -- one at the Otay Mesa battery storage earlier this year and one in Valley Center last year. The report noted that the series of fires has prompted residents to oppose AES's plan to build a 320 MW battery facility, also in Escondido.[25]

B. Reports on the causes and impacts of the AES explosion and fires

1. Report on AES's April 2019 fire and explosion

An investigative report has been made publicly available only for the April 2019 explosion and fire. The report on the April 2019 fire and explosion provides a technical description of how a defect in a single battery cell resulted in a thermal runaway. The report also describes how the fire suppression system and other mitigation measures designed to prevent the runaway from propagating to other cells worked as designed but failed to prevent the fire and explosion:

> **EXECUTIVE SUMMARY**
> Davion M. Hill, Ph.D., Energy Storage Leader US, DNV GL, was retained by Arizona Public Service Company (APS) as an expert consultant, to provide technical advice and analysis regarding the investigation into a thermal event and subsequent explosion that occurred at the APS McMicken Battery Energy Storage facility. Dr. Hill was asked to prepare this report on behalf of APS, in order to summarize the findings and conclusions of the investigation. This report includes a review of all the reports completed to date by APS' retained experts, on the critical technical factors related to the battery energy storage system (BESS) failure. This report also includes Dr. Hill's expert opinion and analysis.

[23]AES investigating cause of "thermal runaway" at Arizona site, Energy Storage News, May 4, 2022. For a discussion of similar fires, see also, Tesla Grid Battery Fire Shows Young Industry's Failures and Successes, Canary Media, September 28, 2022.
[24]Project of the Year: SDG&E's Escondido energy storage project, Utility Dive, Dec. 4, 2017.
[25]Escondido lithium battery fire out, evacuation orders lifted as county mulls over moratorium, CNS News Service, Sept. 6, 2024, updated Sept. 10, 2024.

The BESS was commissioned and integrated by AES, on behalf of APS. The BESS was assembled with Lithium ion (Li-ion) batteries manufactured by LG Chem. On April 19, 2019, 25 months after the BESS was placed into service, a suspected fire was reported at the BESS. At 17:48 local time (PST), first responders arrived to investigate. Several hours later, at approximately 20:04, an explosion occurred from inside the BESS. The explosion injured several firefighters and essentially destroyed the BESS and its container.

The factual conclusions reached in this investigation are as follows:

-- The suspected fire was actually an extensive cascading thermal runaway event, initiated by an internal cell failure within one battery cell in the BESS: cell pair 7, module 2, rack 15 (battery 7-2).

-- It is believed to a reasonable degree of scientific certainty that this internal failure was caused by an internal cell defect, specifically abnormal Lithium metal deposition and dendritic growth within the cell.

-- The total flooding clean agent fire suppression system installed in the BESS operated early in the incident and in accordance with its design. However, clean agent fire suppression systems are designed to extinguish incipient fires in ordinary combustibles. Such systems are not capable of preventing or stopping cascading thermal runaway in a BESS.

-- As a result, thermal runaway cascaded and propagated from cell 7-2 through every cell and module in Rack 15, via heat transfer. This propagation was facilitated by the absence of adequate thermal barrier protections between battery cells, which may have stopped or slowed the propagation of thermal runaway.

-- The uncontrolled cascading of thermal runaway from cell-to-cell and then module-to-module in Rack 15 led to the production of a large quantity of flammable gases within the BESS. Analysis and modeling from experts in this investigation confirmed that these gases were sufficient to create a flammable atmosphere within the BESS container.

-- Approximately three hours after thermal runaway began, the BESS door was opened by firefighters, agitating the remaining flammable gases, and allowing the gases to make contact with a heat source or spark.

There were five *main contributing factors* that led to the explosion:

-- Contributing Factor #1: Internal failure in a battery cell initiated thermal runaway.

-- Contributing Factor #2: The fire suppression system was incapable of stopping thermal runaway.

-- Contributing Factor #3: Lack of thermal barriers between cells led to cascading thermal runaway.

-- Contributing Factor #4: Flammable off-gases concentrated without a means to ventilate.

-- Contributing Factor #5: Emergency response plan did not have an extinguishing, ventilation, and entry procedure.[26]

2. Lack of reports on AES's April 2022 and September 2024 fires

Internal reports prepared by AES and their consultants would be helpful to understand the causes of the April 2022 and September 2024 fires. And they would also be helpful to understand the present state of the risks of the company's battery energy storage projects. But none have been made public.

In a September 17, 2023 email, County resident Selma Eikelenboom-Schieveld asked Santa Fe County Fire Marshal Jaome Blay whether he had a copy of any investigative reports regarding AES's April 2022 fire – similar to the report that was published for the April 2019 explosion and fire. The next day Mr. Blay responded, saying he is not aware of any such report. He also declined her request to obtain a copy, citing "an effort to remain neutral":

> In an effort for our fire department to remain neutral, I am declining your request to contact them on your behalf.
>
> Please rest assure [*sic*] that our fire department is continually researching the application of fire safety codes and standards for the installation of these type of facilities.

Ms. Eikelenboom-Schieveld responded:

> I would think safety is not a prerogative of one of the parties involved. Safety involves us all.
>
> I wonder how you can research the application of codes and standards if you do not include what caused them to fail in the past.
>
> Knowledge that might be find [*sic*] in incidents reports like the one in the Chandler fire which you are not aware of.
>
> Can you blame me for being able to rest assured?[27]

[26]McMicken Battery Energy Storage System Event Technical Analysis and Recommendations, Arizona Public Service, Document No.: 10209302-HOU-R-01, July 18, 2020, at 1-2 (emphasis added).
[27]Email string September 17-18, 2023 between Selma Eikelenboom and Fire Marshal Jaome Blay (Exhibit 3) (emphasis added).

AES has also refused in its discovery responses to produce any reports relating to both the April 2022 fire in Chandler, Arizona and the more recent September 2024 fire in Escondido, California.

C. AES warns investors of "inherent risks" of AES lithium-ion battery energy storage systems

After the second of AES's BESS fires in April 2022, AES Corporation included for the first time a description of the fire and other risks associated with the company's lithium-ion batteries in its 2022 Annual Report filed with the U.S. Securities and Exchange Commission (SEC). After discussing the risks of AES Corporation's electric generation facilities, AES described the "inherent" risks of its battery storage operations:

> In addition, our battery storage operations also involve risks associated with lithium-ion batteries. On rare occasions, lithium-ion batteries can rapidly release the energy they contain by venting smoke and flames in a manner that can ignite nearby materials as well as other lithium-ion batteries. While more recent design developments for our storage projects seek to minimize the impact of such events, these events are inherent risks of our battery storage operations.
>
> The hazards described above, along with other safety hazards associated with our operations, can cause significant personal injury or loss of life, severe damage to and destruction of property, plant and equipment, contamination of, or damage to, the environment and suspension of operations. The occurrence of any one of these events may result in our being named as a defendant in lawsuits asserting claims for substantial damages, environmental cleanup costs, personal injury and fines and/or penalties.[28]

The same language was also used in AES's Annual Report for the succeeding year 2023.

D. Electric Power Research Institute

1. EPRI's 2021 report -- No "silver bullet" to eliminate the risks of battery failures and fires.

In 2021, the Electric Power Research Institute (EPRI), an independent nonprofit organization that conducts research and development relating to the generation, delivery and use of electricity for the benefit of the public,[29] published a report titled "Lessons Learned: Lithium

[28]Report 10-K (2022 Annual Report), AES Corporation filed with the U.S. Securities and Exchange Commission, March 1, 2023 pp. 58-59. The same language is also included in the company's 2023 Report 10-K filed on February 26, 2024. Report 10-K (2023 Annual Report), AES Corporation filed with the U.S. Securities and Exchange Commission, February 26, 2024, p. 55. (Exhibit 4.) (Emphasis added.)

[29]EPRI brings together its scientists and engineers as well as experts from academia and industry to help address challenges in electricity, including reliability, efficiency, affordability, health, safety and the environment. EPRI

(continued on next page)

Ion Battery Storage Fire Prevention and Mitigation – 2021." The report found that, over the four years preceding the report, large-scale lithium-ion battery storage systems were the subject of at least 30 failures and destructive fires:

> Over the past four years, at least 30 large-scale battery energy storage sites (BESS) globally experienced failures that resulted in destructive fires. In total, more than 200 MWh were involved in the fires. For context, roughly 12.5 GWh of globally installed cumulative battery energy storage capacity was operating in March 2021, implying that nearly 1–2% of deployed capacity had failed in this way. At least one incident resulted in life-threatening injuries to multiple first responders, creating significant backlash for this emerging asset class. Although many of the incidents did not involve harm to personnel, they showed that hazards can be severe. Safety incident reports for damaged stationary storage projects are not always immediately available, so this may be an incomplete picture.[30]

Starting in 2019, EPRI collaborated with 16 participating utilities in the "Battery Storage Fire Prevention and Mitigation—Phase 1" collaborative project. EPRI reported that, while conducting site visits, reviewing available public information and official reports, and participating in fire incident investigations, four themes emerged as likely root causes for the events:

> 1. Internal cell defect. Manufacturing quality control issues introduce unintended distortions, debris, or other contaminants in the cell assembly or chemistry that either induce or, by fatigue, develop into an internal short circuit.
>
> 2. Faulty battery management system (BMS). Inadequate protection settings or unreliable software or hardware performance result in exceedance of nominal operating thresholds (such as voltage, temperature, or duration at a certain state of charge).
>
> 3. Insufficient electrical isolation. Ground fault, short-circuit, or DC bus power quality that leads to electrical arcing within a module or string.
>
> 4. Environmental contamination. Exposure to humidity, dust, or otherwise corrosive atmosphere that breaks down existing electrical isolation or insulation.

EPRI concluded that proper design and maintenance can regularly prevent the persistence of failures due to Causes 2, 3, and 4 above, but "no currently available mitigation technology can prevent an internal cell defect from causing a thermal runaway event once that cell leaves the

members represent 90% of the electricity generated and delivered in the United States with international participation extending to nearly 40 countries. EPRI's principal offices and laboratories are located in Palo Alto, Calif.; Charlotte, N.C.; Knoxville, Tenn.; Dallas, Texas; Lenox, Mass.; and Washington, D.C.

[30]Lessons Learned: Lithium Ion Battery Storage Fire Prevention and Mitigation – 2021, Electric Power Research Institute, at 2.

factory. Regardless of the cause, these incidents demonstrate the possibility of fire, release of flammable gases, and explosion."[31]

EPRI reported that there is no "silver bullet" to eliminate the risks of battery failures and fires and that the issue of safety depends upon the reviewer's subjective willingness to accept the risks:

> Testing for energy storage performance or failure modes is a quantitative, objective process, but safety combines objective probabilities with subjective assessment of the acceptability of ever-present hazards. As one of the site hosts indicated, there is no "silver bullet" to address battery energy storage fire and explosion hazards, but rather many solutions are needed. Though the risk of a fault in an ESS may be low, certain issues can never be truly eliminated, and the tolerance to such risk is up to the storage asset's owner and operator. Interpreting objective test results and assigning a value to the severity of a failure incorporate the reviewers' perspectives. In addition, different experts may focus on various threats and treat them with unique attention or concern based on their familiarity and personal experience.[32]

2. EPRI's 2024 "root cause" report

A 2024 report by EPRI investigated actual thermal runaway incidents that have occurred at installed, operational systems. The report discounts the notion that recent improvements in battery technology and safety codes are sufficient to address the hazards of battery energy storage systems. The report examined the root causes of 26 of the 81 incidents in the EPRI database for which sufficient information was available to assign a root cause. It found that only six incidents were the result of faulty design and the others resulted from errors occurring during integration, assembly and construction; operational issues; and manufacturing defects.

The May 2024 EPRI report found that integration, assembly and construction was the most common cause (36%) of the thermal runaway incidents EPRI examined, followed by operational errors (29%), design (21%), and manufacturing defects (14%).[33]

3. EPRI's 2021 report on human health consequences -- toxic emissions of hydrogen fluoride and metals

EPRI issued a report in 2021 "to introduce concepts that can be used to develop a framework for evaluating potential human health risks associated with LIB [lithium-ion battery] failures."[34] The report includes a list of chemicals that researchers have found to have the potential to be released during a LIB failure.

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[31]Id. (Emphasis added.)
[32]Id., at 4 (emphasis added).
[33]Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database, Analysis of Failure Root Cause, EPRI, May 2024. https://www.epri.com/research/products/000000003002030360
[34]Approaches for Evaluating Potential Human Health Consequences of Utility-Scale Lithium-ion Battery Failures, Technical Update, Electric Power Research Institute, September 2021, p. v.

The report states that "carbon monoxide has emerged as the chemical that is likely to constitute the most significant release (by volume)" and "hydrogen fluoride has emerged as the chemical that has the potential for the most significant adverse impacts following LIB failure because of its well-known toxicity."[35] The report says that: "Even low cutaneous exposures to hydrogen fluoride can cause serious systemic toxicity.[36] As noted earlier, the EPA includes hydrogen fluoride on its list of "extremely hazardous substances" that requires emergency planning under the federal Emergency Planning and Community Right-to-Know Act.[37]

The report also cites a study from the University of Washington that found that the production of hydrogen fluoride from a LIB failure is proportional to the amount of electrical energy stored in the LIB. The study also states that "although the types of gases released during LIB failures are similar to those released from plastics fires, the high volume and energy density of ESS LIBs have the potential to increase the severity of risk when they fail.[38]

The EPRI report goes on to state that "because the chemical releases associated with LIB failure (*e.g.*, hydrogen fluoride and carbon monoxide) overlap with those associated with other types of fires and explosions (*e.g.*, oil and gas explosions, plastics), there is potential to travel large distances and cause injury.[39]

The EPRI report also states that human health can be affected post-fire from the residual deposition particulates, such as lithium, nickel, manganese, and cobalt. The report states that the potential for exposure to these residues could provide an ongoing source of chronic exposure to a workplace or residential neighborhood affected by a LIB fire.[40]

E. NFPA's 2023 update of NFPA 855 to address BESS fires: Annex G "Guide for Suppression and Safety of Lithium-Ion Battery Energy Storage Systems"

1. Annex G is the NFPA's response to lithium-ion battery energy storage system fires.

In response to the increasing incidence of lithium-ion battery energy storage system fires since the National Fire Protection Association issued the 2020 edition of NFPA 855 Standard for the Installation of Stationary Energy Storage Systems, the NFPA issued a 2023 edition on August 12, 2022 (with an effective date of September 1, 2022). The primary update was the addition of Annex G titled "Guide for Suppression and Safety of Lithium-Ion Battery (LIB) Energy Storage Systems (ESS)." The introduction states that the 2023 edition, including the 41-page Annex G, was developed expressly to address the number of fires related to battery energy storage systems that occurred since the issuance of the 2020 edition:

[35]Id. p. 3-7.
[36]Id.
[37]40 CFR Part 355, Appendix A.
[38]Approaches for Evaluating Potential Human Health Consequences of Utility-Scale Lithium-ion Battery Failures, p. 2-1.
[39]Id., p. 3-17.
[40]Id.

> In response to international incidents of ESS fires, requirements for fire detection and suppression, explosion control, exhaust ventilation, gas detection and thermal runaway have been added or revised. The requirements for fire and explosion testing (formally large-scale fire testing) have been clarified.
> . . .
> Information has been added in Annex B to provide guidance on the hazards associated with different battery types. Annex G has been added as a guide for suppression and safety of lithium-ion battery ESS.[41]

2. Annex G is a guide for permitting decisions and minimum safety requirements

Chapter G.1 states that Annex G is important for permitting authorities' consideration of lithium-ion battery (LIB) permits and the authorities' implementation of minimum safety requirements. Annex G's purpose "is to help stakeholders, designers, and authorities having jurisdiction (AHJs) understand and implement minimum safety requirements through a permitting and inspection process to ensure efficiency, transparency, and safety in their local communities."[42]

> G.1.1 Scope. This annex presents information for designers, users, and enforcers planning, approving or encountering installations of LIB-based ESS. This annex focuses on hazard identification and assessment, firefighting, fire protection, and fire and gas detection. It represents information on LIB properties and characteristics, guidance on implementing minimum safety requirements, maintenance and operation of fire protection systems, and other information that can be used to promote safety of LIB installations.[43]

Both the "information" and minimum safety recommendations in Annex G should be considered and evaluated by the County in its consideration of whether a particular Commercial Solar Energy Production Facility proposed for a CUP will be detrimental to the health, safety and general welfare of the area or create a potential hazard for fire, panic, or other danger.

3. Chapter G.2 describes the hazards of lithium-ion battery systems

Chapter G.2 identifies and describes the array of hazards that need to be addressed in the permitting of lithium-ion battery facilities during both normal and abnormal operating conditions:

> -- Fire and explosion hazards
> -- Chemical hazards, including toxic gas exposure, toxic liquid exposure, corrosive spills, and water-reactive material exposure
> -- Electrical hazards

[41]NFPA 855-23, Standard for the Installation of Stationary Energy Storage Systems, 2023 Edition, National Fire Protection Association, at 855-1 (emphasis added).
[42]NFPA 855-23, Annex G, Section G.1.2.1.
[43]NFPA 855-23, Annex G, G.1.1. (Emphasis added.)

-- Stranded or stored energy hazards
-- Physical hazards

All of these potential hazards should be considered and evaluated by the County in its consideration of whether a particular Commercial Solar Energy Production Facility proposed for a CUP will be detrimental to the health, safety and general welfare of the area or create a potential hazard for fire, panic, or other danger.

Annex G describes fire and explosion and chemical hazards as follows:

G.2.2 Fire and Explosion Hazards.
. . .

G.2.2.2 Under normal operating conditions, fire and explosion hazards can be due to heat sources such as live parts that can be in contact with combustible materials during service or maintenance, or to ignition of combustible concentrations or ignitable fluids and solids that can occur as part of the normal operation of ESS, such as hydrogen off-gassing from batteries with aqueous electrolytes that are open to the atmosphere.

G.2.2.3 Under abnormal operating conditions, fires can be the direct result of the following:

(1) Flammable concentrations can develop due to overheating and venting of flammable gases. A fire or explosion will occur if concentrations of vented gases such as hydrogen and hydrocarbons are sufficient to create combustible/flammable concentrations in the presence of hot surfaces, live electrical equipment, or other sources of ignition. All batteries, with the exception of hermetically sealed types such as sodium beta, have means to relieve internal pressure when overheated to prevent explosions of the battery cell from overpressurization.

(2) Short circuits and thermal runaway can cause overheating of electrical parts or ignitable plastic casings. In the case of thermal runaway, this can lead to a cascade failure of several modules or racks, and extensive fire damage.

(3) An oxidizer in an ESS will increase the intensity of a fire of other materials.

G.2.3 Chemical Hazards.
. . .
G.2.3.2 Under normal operating conditions, workers can be exposed to hazardous materials during maintenance, repair, and replacement of batteries, racks, or entire systems. OSHA and NIOSH have guidelines on exposures to hazardous materials,

including limits for workers that have the potential for exposure during normal operation and maintenance.

G.2.3.3 The following similar hazards are present during abnormal operation, but should be considered more likely as a result of upset or damage:

(1) *Corrosive spills*: A liquid with a pH ≤2 or ≥11.5 is considered corrosive and hazard level 3 and can cause serious or permanent eye injury for someone who comes in direct contact with it per Table B.1 in NFPA 704. With some systems that contain corrosive liquids, there can be the possibility of leaks or spills from the system under emergency/abnormal conditions.
(2) *Toxic liquid exposure*: There are different levels of toxicity from vapors generated under emergency conditions such as fires and hazardous toxic liquid leaks and spills. NFPA and OSHA provide extensive guidance on classifying the hazards associated with toxic liquids and vapors.

(3) *Water-reactive material exposure*: Water-reactive materials in ESS could be exposed under abnormal conditions, resulting in a violent reaction with the moisture in the air.

(4) *Toxic gas exposure*: Toxic gases can be released during abnormal operation or following damage to an ESS. OSHA and NFPA 704 contain guidelines for classification of these hazards.

4. Chapters G.3 and G.4 describe how to perform a Hazard Mitigation Analysis

Chapter 4 of the mandatory sections of NFPA 855 (part of the mandatory provisions of NFPA 855 that the Fire Department explicitly incorporated into its January 26 Plan Review) requires the performance of a Hazard Mitigation Analysis, but it does not prescribe how and when it should be performed.[44] Chapters G.3 and G.4 in Annex G provide that detail.

Annex G recognizes that there is not a single uniform set of standards that is sufficient to address the risks of lithium-ion batteries regardless of the type of system, its location and a community's willingness to accept the risks. The Annex requires a review that is conducted on a project-specific basis, with input from stakeholders to determine an acceptable level of risk and safety requirements to address that level of risk.

Annex G includes the recommendation that a Hazard Mitigation Analysis be conducted as early as possible in a facility's design process. Annex G's recommendations for the Hazard Mitigation Analysis are discussed in more detail in Sections III.E.4 and V.B. of this document.

[44]NFPA 855-23, Section 4.4.

5. Chapter G.6 describes fire protection systems and explosion risks.[45]

Chapter G.6 describes the complexity of the fire and explosion risks addressed with fire protection systems and the explosion risks they generate if the systems succeed in suppressing flames. As one example, the use of "clean agent systems" by AES Corporation and others needs to manage the trade-offs between extinguishing flames that burn the gases released during a thermal runaway and allowing the gases to accumulate and form an explosive situation. Section G.6.1.4 states that "clean-agent suppression systems" can extinguish a fire but will not stop thermal runaway or off-gassing if the cells are damaged, creating a potential explosive environment. Similar to a natural gas fire, if gas is allowed to accumulate, a more hazardous condition can develop. There might be times when venting is more critical than suppression. Section G.6.1.4 recommends the installation of a device that vents the suppressant and potentially restarts the flames to avoid the greater harm of an explosion.

6. Chapter G.7 -- Fire and flammable gas detection measures

Chapter G.7 stresses the importance of Fire and Flammable Gas Detection measures. Section G.7.3.6 notes that thermal runaway generally begins with the off-gassing of flammable gases and recommends the installation of off-gas monitors and detectors to detect and respond to thermal runaway. Section G.7.3.6 states that off-gas monitoring or off-gas particle detection provide the most amount of time to react to the condition.

7. Chapters G.9-G.11 -- Construction and Installation, Inspection and Maintenance, and First Responder Plans

Chapters G.9-G.11 provide recommendations on Construction and Installation plans, Inspection and Maintenance plans for installed systems, and First Responder plans. The Chapters also include sample formats for each type of plan.

The risks and recommended safety requirements described in Chapters G.6, G.7 and G.9-11 should be considered and evaluated by the County in its consideration of whether a particular Commercial Solar Energy Production Facility proposed for a CUP will be detrimental to the health, safety and general welfare of the area or create a potential hazard for fire, panic, or other danger. The County should require any application for a Commercial Solar Energy Production Facility to include these types of safety requirements as early in the project design process as possible, before a CUP application can be approved.

F. "I strongly believe we need to adopt more stringent requirements" (Santa Fe County Fire Marshal Jaome Blay)

On July 30, 2024, Santa Fe County's battery consultant, Nicholas Bartlett, informed Santa Fe County Fire Marshal Blay that the San Diego County (California) Supervisors announced recently they will develop siting regulations for battery storage projects, following battery

[45]Chapters G.5 and G.8 are "Reserved for future development." Chapter G.5 "Application of LIB-Based ESS and How Location Within a Building Impacts the Hazard Analysis" and Chapter G.8 "Flammable Gas, Deflagration Hazard Studies, and Use of NFPA 68 and NFPA 69 for Lithium-Ion Batteries" are "reserved" as placeholders. These chapters are still works in progress.

storage fires in September 2023 and May 2024 that required evacuations and shelter-in-place orders. San Diego County said "building and gaining the public's trust and acceptance" is necessary. They said the development of standards "will enable the County to gather more meaningful community input, provide better transparency for the public during the review process, and address specific safety and other environmental concerns such as fire risk, air quality, noise, and visual impacts."[46]

The next day, Fire Marshal Blay sent an email to Commissioner Hank Hughes, with copies to County Manager Shaffer, County Attorney Jeff Young, Fire Chief Black, Deputy Growth Management Director Lisaida Archuleta, and eight members of their staffs, citing the action in San Diego County and stating, "**I strongly believe we need to adopt more stringent requirements" for utility-scale battery storage projects**.[47] Santa Fe County officials have not acted to follow Fire Marshal Blay's call.

IV. AES'S PROJECT IS INCONSISTENT WITH THE SPIRIT AND INTENT OF THE SUSTAINABLE GROWTH MANAGEMENT PLAN.

AES's Application also fails the third of the most pertinent of the mandatory standards for the issuance of a Conditional Use Permit, i.e., that the proposed use "not be inconsistent with the spirt and intent of the [County's] Sustainable Growth Management Plan."

A. The County's Sustainable Growth Management Plan states that "[t]he current emergency response system is not sufficient to service our population today."

Since at least 2010, Chapter 9 of the County's Sustainable Growth Management Plan (SGMP) has identified as a "Key Issue" that "[t]he current emergency response system is not sufficient to service our population today. In the case of a large-scale emergency, where large numbers of County residents would have to be evacuated or hospitalized, the County and provider infrastructure and resources would be insufficient."[48] The SGMP also describes the involvement of the community in public safety planning as one of the "Keys to Sustainability."[49]

The County often cites Chapter 7 of the SGMP, "Renewable Energy and Energy Efficiency," in support of its efforts to promote the development of renewable energy projects. But Chapter 9, "Public Safety," is equally important. Chapter 9 presents goals, policies and strategies for addressing public safety issues. The primary goal is to establish and maintain an all-hazard emergency response plan:

9.6 GOALS, POLICIES AND STRATEGIES

[46]Agenda Item, Establishing Development Standards for Siting Battery Energy System Storage Projects in the Unincorporated County, San Diego County Board of Supervisors, July 17, 2024, p. 4.
[47]July 31, 2024 email, Fire Marshal Blay to Commissioner Hank Hughes, Greg Shaffer, Leandro R. Cordova, Elias Bernardino, Jacob Black, Jordan A. Yutzy, Jeffrey Carroll, Lisaida M. Archuleta, Dominic J. Sisneros, Wallace S. Starks, Roger L. Prucino, Michael A. Nunez and Jeff S. Young, attached as Exhibit 5 (emphasis added).
[48]2015 Santa Fe County Sustainable Growth Management Plan, Section 9.1.1.4 (p. 146).
[49]Id., at Section 9.1.2.7.

Goal 28: Establish and maintain an all-hazard emergency response plan for Santa Fe County.

Policy 28.1: Develop emergency response plans with a particular emphasis on a coordinated response to large scale epidemics and natural disasters.

Strategy 28.1.1: Work with local, state and federal agencies and other organizations to develop emergency plans.

Policy 28.2: Ensure adequate resources exist for implementation of emergency management services.

The discussion that follows in Sections B and C below shows that the County lacks both an all-hazard emergency response plan and the emergency response plan for hazardous chemical releases required by the federal Emergency Planning and Community Right to Know Act (EPCRA). The County should not be approving a Conditional Use Permit for a battery energy storage system project with known risks of fires, explosions and releases of toxic gases when it lacks the emergency planning required under the SGMP, the New Mexico All-Hazard Emergency Management Act and the federal EPCRA.

B. The County's failure to adopt and maintain an all-hazard emergency response plan required by the New Mexico All-Hazard Emergency Management Act

The October 24, 2023 report of the Santa Fe County Office of Emergency Management Task Force[50] stated that Section 5 of the New Mexico All-Hazard Emergency Management Act assigns responsibility to the County for maintaining an up-to-date emergency operations plan,[51] and it found that the County has lacked such a plan since 2008. In 2008, the City of Santa Fe withdrew from the joint emergency management plan that it developed with the County in 2007.[52]

The Task Force Report, which was adopted by the Board of County Commissioners on November 14, 2023, listed 45 recommendations, including ten that require "immediate attention."[53] One of the recommendations for immediate attention is the development of an emergency operations plan, and, significantly, it recommends that the plan be developed with input from the public:

> It is critical for the County and OEM to engage in a thorough planning process to create an updated EOP that follows federal planning doctrine. This will enable the

[50]The Board of County Commissioners adopted Resolution 2023-017 in February 2023 establishing an Office of Emergency Management Task Force. Section 2 of the Resolution directs the Task Force to "analyze and make non-binding recommendations to the Board concerning the structure, staffing, and responsibilities of the SFC OEM [Santa Fe County Office of Emergency Management], including, but not limited to, where it should be housed and to whom it should report."

[51]Section 12-10-5 of the All-Hazard Emergency Management Act provides that “the governing bodies of the political subdivisions of the state are responsible for the all hazard emergency management of their respective jurisdictions." NMSA 1978, 12-10-5. Santa Fe County, New Mexico Office of Emergency Management *Assessment and Recommendations Report*, October 24, 2003 ("Task Force Report") citing NMSA 12-10-5, at 14.

[52]Task Force Report, at 21.

[53]Id., at 6, 56.

County to better manage large-scale and complicated incidents. Forming a collaborative planning team is essential to achieving this. This team should include representatives from Couty [*sic*] departments, partnering government entities, community groups, private sector, faith-based organizations, as well as Access and Functional Needs (AFN) organizations. Inclusion of these stakeholders will ensure their buy-in and participation in the process.[54]

The Task Force Report describes the importance of emergency plans both to address "complex and large-scale emergencies" and "to socialize emergency functions throughout the entire County:"

> **3.6 Emergency Planning – Best Practice**
> Having up-to-date and comprehensive emergency plans is crucial for effectively handling complex and large-scale emergencies. These plans serve as the foundation for the emergency management program and should be continuously maintained and updated through a thorough planning process. This process should consider various factors such as potential threats, community input, stakeholder engagement, resilience, and organizational capabilities. By focusing on these factors, Santa Fe County can better prepare and develop effective strategies to manage disasters.
>
> Having emergency plans in place is critical. They offer clear strategies and courses of action for managing complex and large-scale emergencies. Furthermore, the planning process itself is essential for gaining a comprehensive understanding of participant roles, capabilities, limitations, and resources. When executed effectively, these plans can serve as the foundation for the emergency organization and help to socialize emergency functions throughout the entire County.[55]

C. The County's failure to adopt an emergency response plan for hazardous chemical releases under the federal Emergency Planning and Community Right-to-Know Act (EPCRA) and the New Mexico Hazardous Chemicals Information Act

Congress enacted the federal Emergency Planning and Community Right-to-Know Act (EPCRA) in 1986. EPCRA requires local emergency response plans to address the risks of hazardous chemical releases into the environment, public input to the response plans, and public access to information about hazardous chemicals present and released in their communities.

In terms of emergency planning, EPCRA requires states to establish emergency response commissions, requires each state to establish local emergency planning commissions (LEPCs), and requires the LEPCs to develop emergency response plans.[56] To implement the EPCRA, the New Mexico legislature in 1989 enacted the Hazardous Chemicals Information Act, which

[54]Id., at 51 (emphasis added).
[55]Id, at 21.
[56]42 USC Section 11001.

established the State Emergency Response Commission (SERC) for New Mexico.[57] The SERC subsequently established Santa Fe County as a local emergency planning district in which an LEPC was to be established to develop an emergency response plan.[58]

EPCRA requires the appointment of LEPC members from a wide variety of backgrounds, including community groups and the media. It requires public meetings to discuss the emergency plan, the opportunity for public comments on the plan, and public access to information about the plan.[59]

Section 11003(a) of EPCRA requires each LEPC to complete preparation of an emergency plan in accordance with the requirements of EPCRA not later than two years after October 17, 1986. Thereafter, it requires the LEPC to review the plan once a year, or more frequently as changed circumstances in the community or at any facility may require.[60]

Section 11003(c) lists the required elements of each plan:

> Each emergency plan shall include (but is not limited to) each of the following:
>
> (1) Identification of facilities subject to the requirements of this subchapter that are within the emergency planning district, identification of routes likely to be used for the transportation of substances on the list of extremely hazardous substances referred to in section 11002(a) of this title, and identification of additional facilities contributing or subjected to additional risk due to their proximity to facilities subject to the requirements of this subchapter, such as hospitals or natural gas facilities.
>
> (2) Methods and procedures to be followed by facility owners and operators and local emergency and medical personnel to respond to any release of such substances.
>
> (3) Designation of a community emergency coordinator and facility emergency coordinators, who shall make determinations necessary to implement the plan.
>
> (4) Procedures providing reliable, effective, and timely notification by the facility emergency coordinators and the community emergency coordinator to persons designated in the emergency plan, and to the public, that a release has occurred (consistent with the emergency notification requirements of section 11004 of this title).
>
> (5) Methods for determining the occurrence of a release, and the area or population likely to be affected by such release.

[57]NMSA 1978, Section 74-4E-4.
[58]https://www.nmdhsem.org/lepcs/
[59]42 USC 11001(c) (emphasis added).
[60]42 USC 11003(a).

(6) A description of emergency equipment and facilities in the community and at each facility in the community subject to the requirements of this subchapter, and an identification of the persons responsible for such equipment and facilities.

(7) Evacuation plans, including provisions for a precautionary evacuation and alternative traffic routes.

(8) Training programs, including schedules for training of local emergency response and medical personnel.

(9) Methods and schedules for exercising the emergency plan.[61]

Until August of this year, Santa Fe County had never established an LEPC, and it has still not developed an EPCRA emergency response plan.

I sent a letter to the Santa Fe County Board of Commissioners on February 18, 2024 informing them of the County's failure.[62] I did not receive a direct response, but the County has recently taken steps to start a process to develop an EPCRA plan. On August 2, 2024, City and County officials, owners of facilities using hazardous chemicals, and members of the public gathered to start the process of establishing a Santa Fe County LEPC and obtaining approvals of LEPC members from the SERC. LEPC bylaws were approved on October 10, 2024, but the next LEPC meetings are scheduled for January 9 and April 10, 2025.

The completion of the required EPCRA plan is still months or years in the future.

D. The AES project would be shoehorned in between two residential zoning districts in which its siting would be prohibited.

The 2022 Community Solar ordinance, adopted on July 12, 2022, included an amendment to the definition of Commercial Solar Energy Production Facility that enables battery storage to be eligible for a Conditional Use Permit in the Rural Fringe district in which it is proposed. On two adjacent sides of the site for the AES project, however, the project could not be permitted under any circumstances or conditions. Commercial Solar Energy Production Facilities (even without battery energy storage units) are prohibited uses in the Rural Residential district of Rancho San Marcos and the Residential Estate district in Eldorado.

Section 4.9.6 of the SLDC requires that a conditional use review consider potential impacts of a proposed use on adjacent land uses. Given that the project could not be permitted in Rancho San Marcos or Eldorado and given the fire risk associated with the proposed battery storage units, the grant of a Conditional Use Permit for the Rancho Viejo Solar Project with its attendant risks of fire, explosion and releases of toxic gases to the residents of San Marcos and Eldorado would violate the spirit and intent of the SGMP.

[61] 42 USC 11003(e).
[62] February 18, 2024 letter Schannauer to Santa Fe County Board of County Commissioners, attached as Exhibit 6.

E. Given their fire risk, utility-scale solar facilities that include battery storage should be sited like "Gas and Electric Power Generation Facilities" that the SLDC prohibits in Rural Fringe areas.

Because utility-scale solar farms with battery storage and utility-scale electric power generation facilities both pose fire risks, the SLDC's restrictions that apply to electric power generation facilities should also apply to solar farms with battery storage units.

A "Gas and Electric Power Generation Facility" is a prohibited use in the Rural Fringe zoning district where AES proposes to site the Rancho Viejo facility as well as in Rural Residential, Residential Fringe, Residential Estate, Residential Community, Traditional Community, Commercial Neighborhood, Mixed Use and Commercial General districts. A "Gas and Electric Power Generation Facility" is also not subject to being permitted as a conditional use in these zoning districts.

Gas and Electric Power Generation Facilities are permitted only in the following zoning districts and only as conditional uses: Agriculture/Ranching, Rural, Industrial General, Industrial Light, Public Institutional and Planned Development.

The AES battery storage units and electric generation facilities both pose fire risks, although for different reasons. The fire and other risks from battery storage units results from the overheating and thermal runaway of the batteries, while the fire risk from gas and electric power generation facilities stems from the natural gas and coal that are used as fuels.

F. The AES project conflicts with the County's official preference that solar projects be sited on brownfield, built environment, or degraded land.

The County adopted Resolution 2022-54 on July 12, 2022 at the same time as it adopted the 2022 Community Solar Ordinance. The Resolution spells out the criteria the County will use to determine whether to send Letters of Support to the Public Regulation Commission to help influence the PRC in its selection process for the limited number of Community Solar projects authorized by the Legislature in the Community Solar Act of 2021.

Under the Community Solar Ordinance, Community Solar projects are authorized in all zoning districts, but the Resolution specifies the County's preferences.[63] Two of the criteria include the following land use preferences:

> The Community Development Department, in its discretion and in consultation with appropriate County staff, or their designee, is hereby authorized by the Board of County Commissioners to issue letters of support for Community Solar

[63]The ordinance determined that Community Solar projects would be a permitted use in all zoning districts (without the need for a conditional use permit) and established standards "to accommodate the needs of community solar development and to only require the minimum standards to attempt to minimize the adverse effects on neighboring properties." The standards established restrictions on issues, such as fencing, access roads, reseeding of disturbed areas, the management of weeds and plant materials to reduce fire risks, setbacks and decommissioning.

projects that are determined to incorporate commitments or provisions beneficial to the local community and/or potential subscribers based upon adherence to some or all of the following criteria:

. . .

-- Not located on land with healthy, intact ecosystems, including wetlands, riparian areas, and other environmentally-sensitive areas/sites;

-- Sited on brownfield, built environment, degraded land, or rooftop;[64]

The County has not established any preferences for the siting of Commercial Solar Energy Production Facilities. However, the 96 MW AES project, which far exceeds the maximum allowable 5 MW size of Community Solar facilities, conflicts with the siting preferences established for those smaller facilities, a factor the County should consider in its discretionary review.

V. AES'S APPLICATION FAILS THE REQUIREMENTS OF THE SLDC, ORDINANCE 2023-09 AND NFPA 855

A. Technical Advisory Committee requirements

1. AES violated Section 4.4.2 of the SLDC by not seeking the pre-application Technical Advisory Committee (TAC) review of its August 2024 application.

Sections 4.4.3 and 4.4.4 of the SLDC require potential applicants for Conditional Use Permits to conduct a pre-application meeting with the County's Technical Advisory Committee (TAC) and a pre-application neighborhood meeting.

During a *pre-application TAC meeting*, the applicant is required to discuss the application in enough detail so that a reasonable assessment can be made of its compliance with the SLDC. The meeting is supposed to include a discussion of requirements of the SLDC that are applicable to the application, the procedure to be followed, notice to be provided, schedule for review and hearing, the studies, reports and assessments to be undertaken, and other relevant subjects. Technical requirements may also be discussed. After the meeting, County staff is required to provide the applicant with a written summary of the relevant issues to be covered by the applicant in its submittal materials.[65]

The *pre-application neighborhood meeting* is supposed to take place after the *pre-application TAC meeting* and prior to filing of the application. The applicant must provide notice to nearby property owners and applicable Community and Registered Organizations. The applicant must prepare plans that include: the boundary lines of the development; the approximate location of any significant features, such as roadways, utilities, wetlands, floodways, hillsides, trails and open space and existing buildings or structures; the proposed uses

[64]Santa Fe County Resolution 2022-54.
[65]SLDC, section 4.4.3.

for the property; the number of dwelling units and approximate square footage for nonresidential uses; and the proposed layout including open space, location of buildings, roadways, schools and other community facilities, if applicable. The applicant must include a written report on the meeting with the application. The report is supposed to include a summary of all concerns, issues and problems identified at the meeting, including how the applicant has addressed or intends to address the concerns and whether the applicant is unable to address them.[66]

AES conducted a pre-application neighborhood meeting for its August 30 Application on August 22, but it did not conduct the pre-application TAC meeting. Instead, AES submitted with its application the March 29, 2022 TAC letter prepared by the TAC based upon AES's November 4, 2021 pre-application TAC meeting for the January 2023 application.

AES's failure violates the filing requirement in Section 4.4.3 of the SLDC. The failure is significant because the TAC establishes the studies and analyses that are required to enable the County to determine whether an application satisfies the criteria in the SLDC for a Conditional Use Permit. Plus, as discussed in the section below, the County has increased the safety requirements for BESS applications since the March 29, 2022 TAC letter.

2. AES's August 2024 application violates Ordinance 2023-09. The March 2022 TAC letter AES submitted for its application does not incorporate the updated safety requirements in Ordinance 2023-09.

On August 29, 2023, the Commissioners updated the Santa Fe County Fire Code in Ordinance 2023-06 and adopted for the first time the National Fire Protection Association Standard 855 (NFPA 855) titled "Standard for the Installation of Stationary Energy Storage Systems." Section 1.2 of the 2020 edition of NFPA 855 stated that its purpose was to "provide the minimum requirements for mitigating the hazards associated with ESS."[67]

A few months later, on December 13, 2023, after I notified the County Commissioners that they had adopted the outdated 2020 edition of NFPA 855,[68] the Commissioners adopted the 2023 edition of NFPA 855 in Ordinance No. 2023-09. The 2023 edition, including Annex G, was issued for the specific purpose of addressing the number of fires related to battery energy storage systems that have occurred since the issuance of the 2020 edition.

The pre-application TAC meeting for the January 2023 Application for AES's Rancho Viejo Solar Project was conducted on November 4, 2021, and the TAC's letter of requirements to be covered in the applicant's submittal materials was issued on March 29, 2022.[69] The pre-application review, however, did not consider the fire risks of the project's battery storage units, and it did not include any reference to NFPA 855 -- not even the 2020 edition.

[66]SLDC, section 4.4.4.
[67]NFPA 855 (2020), Section 1.2.
[68]See November 1, 2024 letter from Schannauer to the Board of County Commissioners attached as Exhibit 7.
[69]March 29, 2022, Santa Fe County Technical Advisory Committee Letter for the Rancho Viejo Solar Project, attached as Exhibit 8.

The March 29, 2022 TAC letter noted that AES said that a battery storage facility would be included in the solar project, but, under "Fire Marshall Comments," the letter stated only that gates to the site must have an emergency unlocking/opening system and that the inside radii of turning areas must be 28 feet. It mentions nothing about fire risk associated with the battery storage facility.

Relevant Issues to be Addressed:
-- Submittal shall comply with Ordinance No. 2016-9, the Sustainable Land Development Code (SLDC) inclusive of criteria set forth in Chapter 7 (Sustainable Design Standards) and Section 4.9.6 (Conditional Use Permits);
-- Access via Highway 14 will require an NMDOT commercial access permit and a NMDOT Site Threshold Assessment;
-- The Gentie line and connection to the main power line are also a Conditional Use Permit;
-- SRA's required for this development are an Environmental Impact Report (EIR) and an Adequate Public Facilities & Services Assessment (APFA);
-- An Archaeological Survey shall be required.

Fire Marshal Comments
-- Gates must have an emergency unlocking/opening system (Knocks Box);
-- Inside Radii of turning areas shall be 28'.

Ordinance 2023-09, however, adopted the 2023 edition of NFPA 855, which included, as its primary change, the 41 pages of Annex G. As noted earlier, Annex G was intended to address the prevalence of battery energy storage system accidents that had occurred since the issuance of the 2020 edition of NFPA 855. Because AES failed to conduct a pre-application TAC meeting for its new August 30 Application, the new NFPA standards were not incorporated into a new TAC letter for the revised Rancho Viejo Solar Project.

3. The County has the authority to require adherence to the updated standards in the 2023 edition of NFPA 855.

County Staff stated in the October 22, 2024 virtual meeting with the public that the County does not have the authority to require the Applicant to seek a new TAC meeting and letter nor to increase the safety requirements for the project after the County issued the March 2022 TAC letter. That analysis is incorrect.

The County has the legal authority to establish heightened safety standards for battery energy system storage projects after an application has been filed. That authority exists under the County's general police powers to protect public health and safety – the same authority that supports the County's zoning regulations.

The test for whether any updated standards can be applied after a permit application has been filed is whether an applicant obtained a "vested right" by virtue of the filing of the application. And AES's January 2023 Application fails the test for two reasons.

First, AES withdrew the January 2023 application that was the subject of the March 2022 TAC letter, and the County Commissioners adopted NFPA 855 in Ordinance 2023-09 in December 2023 before the Applicants filed their new application in August 2024. Under Section 4.4.2 of the SLDC, AES should have sought a new TAC review.

Second, AES did not gain a "vested right" with the filing of the January 2023 application that could excuse its failure to seek a new TAC review. A two-prong test must be met for a "vested right" to exist. Under the first prong, there must have been an approval by the regulatory body. Under the second prong, there must have been a substantial change in the applicant's position in reliance upon the alleged approval of the regulatory body. See *Brazos Land, Inc. v. Board of County Commissioners of Rio Arriba County*, 1993-NMCA-013, 115 N.M. 168, 848 P.2d 1095; *Miller v. Board of County Commissioners of Santa Fe County*, 2008-NMCA-124, 144 N.M. 841, 192 P.3d 1218. AES fails the "vested rights" test, because it had not yet received the County's approval of its January 2023 Application, and there has not been a substantial change in AES's position based upon the filing of the January 2023 Application.

The County, therefore, has a sound legal and factual basis to have required AES to seek a new TAC review for AES's August 2024 application and to apply Ordinance 2023-09 and the 2023 edition of NFPA 855 to the new application.

4. The County should be required to enforce Ordinance 2023-09 equally for all applicants.

a. The County has required Linea Energy to comply with Annex G to NFPA 855 in Linea's soon-to-be filed CUP application for its battery energy storage project, but has not required the same for the Rancho Viejo Solar Project.

Unlike the County's treatment of the Applicants' August 30 application, the County explicitly included Annex G and the other updated requirements from the 2023 edition of NFPA 855 in the August 19, 2024 TAC letter issued to Linea Energy for a BESS project Linea is proposing in southern Santa Fe County. The Linea project was discussed at a TAC meeting held on August 1, 2024:

Relevant Issues to be Addressed:
-- Submittal shall comply with Ordinance No. 2016-9, the Sustainable Land Development Code (SLDC) inclusive of criteria set forth in Chapter 7 (Sustainable Design Standards) and Section 4.9.6 (Conditional Use Permits);
-- Access via Highway 14 will require an NMDOT commercial access permit and a NMDOT Site Threshold Assessment;
-- SRA's required for this development are an
  -- Environmental Impact Report (EIR) and an
  -- Adequate Public Facilities & Services Assessment (APFA);
  -- **Fiscal Impact Assessment (FIA)**
-- Applicant shall provide a Grading and drainage study

-- **Applicant shall provide a Hazardous mitigation analysis (HMA)**
-- An Archaeological Survey shall be required.

Fire Marshal Comments:
-- Roads and Access
-- Detailed road distribution site maps (with dimensions), especially around BESS, substations, inverters, and full perimeter of installation. Main arterial roads accessing BESS installations, inverters, and around the full perimeter of the solar farm shall require 20' roads capable of sustaining 75,000 pounds. Signage of roads for ease of locating patient/s.
-- Knox lock/s system, keyed to SFCFD at main entrance/s and may require at other secured fencing areas inside the installations
-- Water
-- 30,000 Gallon water storage tank with draft fire hydrant capable of 1000 gpm (See NFPA 22 and 24) located near each BESS/substation to protect exposures and other fires (not thermal runaway). Location will be determined once more detailed road sitemap is shared with us. Water level must be monitored mechanically or electronically.
-- Fire Codes
-- Santa Fe County Fire Code (Ordinance 2023-06)
-- 2021 IFC and IWUIC
-- **2023 NFPA 855**
-- Other standards as necessary for testing, equipment listing, safety and installation requirements
-- Other state and federal requirements
-- Plans and Reports
-- **Hazardous Mitigation Analysis (HMA) (see 2023 NFPA 855 Annex G section G.3) as comprehensive as possible to address known and unknown technologies the applicant might anticipate installing.**
-- **Emergency Operations Plan (See 2023 NFPA 855 Annex G Figure G.11.9) to include facility staff and first responder planning and training**
-- **Preliminary Decommissioning plan**
-- Other/Miscellaneous
-- Documents, reports, and evaluation information as needed.[70]

AES's August 30 application does not address the measures required by the 2023 edition of NFPA 855 that apply to the BESS project of Linea Energy.

[70] August 19, 2024 Santa Fe County Technical Advisory Committee letter for the Linea Energy Pentstemon and Globemallow Conditional Use Permit, attached as Exhibit 9. (Emphasis added.)

b. The County has required Linea Energy to perform a Fiscal Impact Assessment (FIA) for its proposed battery energy storage project but has not required a FIA for the Rancho Viejo Solar Project.

AES's August 30 application does not include the Fiscal Impact Assessment (FIA) required for the Linea Energy project.

Section 6.7.1 of the SLDC describes a FIA as a study of the fiscal implications of development in the County. It states that a development will be permitted only after a determination of the adequacy and financial provision for public facilities and services including but not limited to the costs the development will require of the County for functions such as law enforcement, fire and emergency response services.[71]

Both the Linea Energy project and the Rancho Viejo Solar Project will require the devotion of additional County resources for fire and emergency response services. But only the Linea Energy project is being required to perform the TIA. AES's August 30 application does not include this analysis.

B. AES's Environmental Impact Report and Hazard Mitigation Analysis

1. Background on SLDC and NFPA 855 requirements for evaluation and mitigation of hazards

This section provides background for the discussion in the following sections on the Applicants' non-compliance with the requirements of the SLDC and NFPA 855.

a. SLDC requirements for Environmental Impact Report

An Environmental Impact Report (EIR) is one of the "Studies, Reports and Assessments" (SRAs) under Chapter 6 of the SLDC that the Technical Advisory Committee required for the January 2023 Application. The applicants did not seek a TAC review for their August 30 Application, but they still included an EIR for their August 30 Application. The Hazard Mitigation Analysis attached to the EIR is required by NFPA 855.[72] It essentially supplements the EIR and addresses the potential impacts particular to battery energy storage systems.

Section 6.3.1 of the SLDC requires that an EIR "inform the County, the public and the applicant of the significant environmental effects and impacts of a project, identify possible ways to minimize the significant adverse effects or impacts, and describe reasonable alternatives to the project."[73] In addition to a discussion of areas of potential controversy identified in the pre-application TAC meeting,[74] the EIR is required to identify mitigation measures for each significant environmental effect identified in the EIR.

[71] SLDC, Section 6.7.1.
[72] NFPA 855 (2023), Section 4.4.2.
[73] SLDC, Section 6.3.1.
[74] SLDC, Sections, 6.3.3.2-6.3.3.3.

Perhaps most important here, Section 6.3.10.2 states that "[f]ormulation of mitigation measures shall be identified at the first discretionary approval and under no circumstances deferred until the ministerial development process."[75] The "first discretionary approval" is the Conditional Use Permit process here.

b. Ordinance 2023-09 adoption of NFPA 855 requirements for battery energy storage systems

NFPA 855, which was adopted by the County Commissioners in December 2023, states that its purpose is to provide the minimum requirements for mitigating the hazards associated with lithium metal or lithium-ion battery energy storage systems.[76] It requires applicants to conduct a Hazard Mitigation Analysis that addresses the particular types of failures and consequences experienced by battery energy storage systems:

-- Thermal runaway or mechanical failure condition
-- Failure of an energy storage management system or protection system
-- Failure of a ventilation (HVAC), exhaust ventilation, smoke detection, fire detection, fire suppression, or gas detection system
-- Other failures deemed necessary by the Authority Having Jurisdiction.[77]

c. Annex G as the 2023 update to NFPA 855

The NFPA 855 requirement for the preparation of a Hazard Mitigation Analysis predated the 2023 edition of the standard. Annex G was added to NFPA 855 in the 2023 edition of the standard to address the number of fires related to battery energy storage systems that occurred since the issuance of the 2020 edition of the standard. Annex G describes how the Hazard Mitigation Analysis should be performed.

Annex G requires applicants to identify stakeholders with an interest in the scope and applicability of the fire protection design early in the process. The purpose is to establish goals and objectives and evaluate whether the requirements of NFPA 855 are adequate to meet those goals and objectives. Annex G states that the criteria for acceptability of the level of fire and explosion protection should consider the perspective of the various stakeholders.[78]

Annex G states that each facility has its own special conditions that impact the nature of the installation, and it describes the project-specific issues that each Hazard Mitigation Analysis should address:

G.3.3.2 Project-Specific Inputs. . The project-specific inputs utilized in the HMA process include, but are not limited to, the following:
(1) Energy capacity and power
(2) Personnel/life presence levels as follows:

[75]SLDC, Section 6.3.10.2.
[76]NFPA 855 (2023), Section 1.2.
[77]NFPA 855 (2023), Section 4.4.2.
[78]NFPA 855 (2023), Annex G, Sections G.3.2.2, 3.4.1.

(a) Unattended/remote
(b) Manned but unoccupied
(c) Unoccupied but in populated area
(d) Occupied space
(e) Ambulatory space
(3) Energy types and volatility
(4) Plant layout and geographic (i.e., remote) location
(5) Equipment availability/redundancy
(6) Availability of water supply
(7) Capability of emergency responders
(8) Storage configuration (e.g., short term and long term)
(9) Historical loss information/lessons learned/fire reports
(10) Additional environmental considerations[79]

On April 28, 2024, I sent a letter to County Fire Marshal Jaome Blay and then-County Growth Management Director Penny Ellis-Green describing the importance and relevance of Annex G in the County's review of Conditional Use Permit applications for Commercial Solar Production Facilities such as the Rancho Viejo Solar Project.[80]

On April 29, Fire Marshal Blay responded, confirming that the County would apply and enforce Annex G in its totality in the County's review of an applicant's HMA and that the review would be done **before** a CUP is granted:

> The fire department shall enforce, amongst other enforceable codes and standards, the 2023 edition of NFPA 855, and shall, in collaboration with a BESS expert consultant, review and reference Annex G in its totality to ensure the CUP application meets the minimum requirements for mitigating the hazards associated with ESS and the storage of lithium metal or lithium-ion batteries.
>
> . . .
>
> The fire department is awaiting the hiring of a BESS expert consultant to review the HMA that will be submitted by the applicant **before** a CUP is granted.[81]

The letter closes with the following confirmation:

> **Annex G shall be considered in its entirety for all BESS installations within Santa Fe County**.[82]

And, as discussed below, compliance with Annex G was subsequently included as a specific requirement in the August 19, 2024 TAC letter for the BESS project being developed by

[79]NFPA 855 (2023), Annex G, Section G.3.3.2.
[80]April 28, 2024 letter, Schannauer to Fire Marshal Blay and Growth Management Department Director, Penny Ellis-Green (attached as Exhibit 10).
[81]April 29, 2024 letter, Blay to Schannauer, p. 1 (Emphasis in original) (attached as Exhibit 11).
[82]Id., at p. 3.

Linea Energy. AES, however, did not return to the Technical Advisory Committee in preparation for its August 30, 2024 application. AES continues to rely on the March 29, 2022 TAC letter it received for its January 2023 application, which preceded the County's adoption of NFPA 855 in Ordinance 2023-09.

2. Neither the Environmental Impact Report nor the Hazard Mitigation Analysis mentions AES's prior fires and explosion.

Section 6.3.1 of the SLDC requires that an EIR inform the County and the public of the potentially significant environmental impacts of a project, but neither the EIR nor the Draft Preliminary HMA Report submitted with the AES Application even mentions AES's history of fires and explosion. As noted above, an explosion and fire occurred at an AES facility on April 19, 2019 in Surprise Arizona. Fires occurred on April 18-May 1, 2022 in Chandler, Arizona and on September 25, 2024 in Escondido California. These AES facilities were much smaller than the 48 MW battery facilities proposed here -- 2 MW in Surprise, 10 MW in Chandler and 30 MW in Escondido.

What were the causes of the three accidents? Were they caused by design defects? By manufacturing or installation defects? By operational errors? What were the impacts to firefighters and adjacent landowners? What mitigation measures were used at the facilities? And how effective were they?

AES and the County Staff carefully avoid any mention or consideration of the prior thermal runaway incidents.

I submitted discovery requests to the Applicants seeking reports prepared by or for AES that investigate and report on the causes and impacts of the April 2019 and April 2022 fire and explosion incidents in Surprise and Chandler Arizona and the claims and damages paid as a result of the incidents. They refused to answer the requests, and, despite the requests' relevance, the Hearing Officer declined to consider my Motion to Compel answers, stating that discovery is not specifically provided for under the SLDC.

The County Staff even edited the following question I submitted for the November 6 virtual meeting on the County's review of the Hazard Mitigation Analysis to avoid discussing AES's history of thermal runaway incidents. I asked whether Fire Marshal Blay and the County's battery consultant reviewed and considered AES's history of accidents (and two additional issues) in a question I submitted for the County's November 6, 2023 virtual meeting with the public. This is the question I submitted:

Scope of the review by Atar and the Fire Marshal:
-- Was anything reviewed other than the documents and codes cited in the Atar letter?
-- Did Fire Marshal Blay or Atar review and consider any of the following?
- **AES's history of prior BESS accidents**?[83]

[83]Emphasis added.

- The Safety Data Sheets for the chemicals that will be stored and used at the site? If so, please identify the chemicals for which the Safety Data Sheets reviewed and considered and provide copies.
- The proximity of the natural gas transmission line that runs between the project site and the western edge of Eldorado?

The County, however, removed the question about "AES's history of prior BESS accidents." The County's presentation slide addressed only the questions about whether Fire Marshal Blay or Atar reviewed and considered the Safety Data Sheets for the chemicals that will be stored and used at the site and the proximity of the natural gas transmission line along the western edge of Eldorado. And in his answer to the question during the presentation, Fire Marshal Blay said the Safety Data Sheets and natural gas transmission line were not considered in Atar's and his reviews.[84]

3. AES's Hazard Mitigation Analysis addresses only the project's risks to facility occupants and facility equipment, not the criteria in Section 4.9.6.5 of the SLDC for a Conditional Use Permit.

The Hazard Mitigation Analysis attached as Appendix D of AES's EIR concludes that the risks of Rancho Viejo Solar Project are acceptable based on two and only two "acceptance criteria": (1) whether occupants of the facility could safely evacuate in the event of fires and products of combustion and (2) whether the facility will be equipped with a NFPA compliant deflagration (i.e., explosion) venting system to release the combustion gases and pressure resulting from a deflagration within the enclosure "so that structural and mechanical damage is minimized."

There is no discussion or analysis of the broader impacts of fire, explosion and the release of toxic gases on the residential land uses adjacent to the project, and there is no discussion or analysis of the central SLDC criteria at issue here: whether the proposed use will "be detrimental to the health, safety and general welfare of the area" or "create a potential hazard for fire, panic, or other danger."

Section 6.0 "Analysis Approval" of the HMA states that "the acceptance criteria applied in this analysis aligns to the HMA approval criteria listed in the 2023 edition of NFPA 855 and the 2021 edition of the IFC [International Fire Code]":

[84]Meeting on Hazard Mitigation Analysis and Emergency Response Planning for BESS, November 6, 2024, YouTube recording minutes 20:32 to 21:12. https://www.youtube.com/watch?v=fuQ46u6N89g

Table 9: Compliance with Analysis Acceptance Criteria

Acceptance Criteria	
1	Requirement: Fires and products of combustion will not prevent occupants from evacuating to a safe location
	Conformance: The CEN enclosure features a sufficient quantity of safety barriers to limit the rate of propagation of an escalating fire or thermal runaway event and provide adequate situational awareness to facility occupants to permit evacuation to a safe location.
2	Requirement: Deflagration hazards will be addressed by an explosion control or other system
	Conformance: This analysis has identified that a propagating cell failure event poses a deflagration hazard. The CEN enclosure will be equipped with a NFPA 68 compliant deflagration venting system to release the combustion gases and pressure resulting from a deflagration within the enclosure so that structural and mechanical damage is minimized.

See Draft Preliminary HMA Report, August 13, 2024, at p. 19, attached to Environmental Impact Report as Appendix D.

There is **no discussion and no analysis** of the criteria in Section 4.9.6.5 of the SLDC that must be satisfied to receive a Conditional Use Permit:

". . . that the use for which the permit is requested will not:
1. Be detrimental to the health, safety and general welfare of the area;
. . .
3. Create a potential hazard for fire, panic, or other danger;

There is **no discussion and no analysis** of the potential impacts of a thermal runaway, explosion, fire and release of toxic gases to anyone or anything outside the facility itself.

4. AES's Hazard Mitigation Analysis does not apply the 2023 updates to NFPA 855.

Annex G's purpose "is to help stakeholders, designers, and authorities having jurisdiction (AHJs) understand and implement minimum safety requirements through a permitting and inspection process to ensure efficiency, transparency, and safety in their local communities."[85] Annex G "describes the use and application of minimum safety requirements in NFPA 855."[86]

On December 13, 2023, the County Commissioners adopted the 2023 edition of NFPA 855 in whole in Ordinance 2023-09. It did not exclude or limit the incorporation of any part of NFPA 855. The primary update to the 2020 edition of NFPA 855 was the addition of Annex G, which, as noted earlier, was added in light of the accidents involving lithium-ion battery energy storage systems since 2020.

[85]NFPA 855-23, Annex G, Section G.1.2.1.
[86]NFPA 855-23, Annex G, Section G.1.1.2.

In addition, the most significant part of Annex G is an extensive step-by-step process for conducting a Hazard Mitigation Analysis to evaluate the hazards for each proposed lithium-ion battery system. The 2020 edition of NFPA 855 required the performance of the Analysis but did not prescribe a process for conducting it. Indeed, Chapter 4 of both the 2020 and 2023 editions of NFPA 855 requires that a developer perform a Hazard Mitigation Analysis, but they don't say how and what impacts should be addressed. Annex G provides those details.

AES's Hazard Mitigation Analysis applies Chapter 4 of NFPA 855 but not the requirements for Hazard Mitigation Analyses in Annex G.

The Hazard Mitigation Analysis claims it applies the 2023 edition of NFPA 855, but the only provisions from the 2023 edition that it applies are provisions that remained largely unchanged from the 2020 edition. It completely omits any reference to the 41-page Annex G, which was developed expressly to address the number of fires related to battery energy storage systems that occurred since the issuance of the 2020 edition.

5. Annex G provides for the adoption of a broader range of "acceptance criteria" that correlates with the criteria for the issuance of a Conditional Use Permit in Section 4.9.6.5 of the SLDC.

The "acceptance criteria" addressed in the AES Hazard Mitigation Analysis are stated as minimum, non-exclusive criteria. Section 4.4.3 states only that an Authority Having Jurisdiction, such as Santa Fe County, "shall be permitted" to approve the hazard mitigation analysis as documentation of the safety of the ESS installation. It does not grant a developer the right to receive a permit.

Annex G, added in the 2023 edition, expressly acknowledges that the acceptance criteria in Section 4.4.3 may not be sufficient for all installations. It establishes a "stakeholder process" to determine whether the acceptance criteria are sufficient for a particular project:

> G.3.2 Stakeholders.
> G.3.2.1 Stakeholders with an interest in the scope and applicability of the fire protection design should be identified early in the process.
> G.3.2.2 Stakeholders should establish goals and objectives and evaluate whether the requirements of NFPA 855 are adequate to meet those goals and objectives. The criteria for acceptability of the level of fire and explosion protection should consider the perspective of the various stakeholders.[87]

Section G.3.4 states that the stakeholders should establish goals and objectives and evaluate whether the requirements of NFPA 855 are adequate to meet those goals and objectives:

> G.3.4.1 Stakeholders should establish goals and objectives and evaluate whether the requirements of NFPA 855 are adequate to meet those goals and objectives. The criteria for acceptability of the level of fire and explosion protection should consider the perspective of the various stakeholders.

[87]NFPA 855 (2023), Section G.3.2.

G.3.4.2 The general arrangement and plant layout should be provided to clearly reflect the separation of hazards. If the layout is not acceptable, an additional fire and explosion risk evaluation should be developed to ensure objectives are met, and then return to the review process.[88]

Each hazard identified in the HMA should be reviewed and evaluated against the stakeholder-determined goals and NFPA 855:

G.3.4.3 Each hazard/area should be reviewed against the goals and objectives and NFPA 855. If the hazards control is not acceptable, then a fire risk evaluation should be developed to ensure objectives are met, and then return to the review process. NFPA 550 and NFPA 551 should be utilized for evaluation techniques. EPRI provides a good safety analysis base on bowtie review of failure analysis.[89]

The Applicants have still not started this first step of the Hazard Mitigation Analysis -- the creation of the stakeholder process to determine the design basis and acceptance criteria for the project. They have not tried to develop the fire and explosion design and protections that the stakeholders agree are appropriate for the level of risk they are willing to accept at a particular site. And they did not attempt to consider the perspective of stakeholders when they developed the narrow acceptance criteria -- employee evacuations and equipment protections -- discussed above.[90]

6. The AES HMA does not include the project-specific issues prescribed in Annex G.

Annex G states that there is no one-size-fits-all level of risk that is acceptable for every project and that there is also no one-size-fits-all set of standards that will provide adequate protection to the public for the risks. Section G.3.3.2 Project-Specific Inputs states that each facility has its own special conditions that impact the nature of the installation. The Hazard Mitigation Analysis should, accordingly, address each of the following project-specific factors:

(1) Energy capacity and power
(2) Personnel/life presence levels as follows:
    (a) Unattended/remote
    (b) Manned but unoccupied
    (c) Unoccupied but in populated area
    (d) Occupied space
    (e) Ambulatory space
(3) Energy types and volatility
(4) Plant layout and geographic (i.e., remote) location
(5) Equipment availability/redundancy
(6) Availability of water supply

[88]Id., Section G.3.4.1 and .2 (emphasis added).
[89]Id., Section G.3.4.3 (emphasis added).
[90]NFPA 855-23, Annex G, Section G.3.2.

(7) Capability of emergency responders
(8) Storage configuration (e.g., short term and long term)
(9) Historical loss information/lessons learned/fire reports
(10) Additional environmental considerations

The following are some of the most significant project-specific issues that were not addressed in AES's Hazard Mitigation Analysis.

a. AES's history of battery energy storage system accidents.

The Applicants' silence on AES's record of thermal runaways at its facilities in Arizona and California is matched by the silence on this issue in the Draft Preliminary Hazard Mitigation Analysis. This is one of the project-specific issues that Annex G states should have been addressed.

In the case of the Rancho Viejo Solar Project, this should have included a review of the causes and consequences of the 2019 explosion and 2022 and 2024 fires at AES Corporation's facilities in Arizona and California. It should also include consideration of the nature and dollar amount of the financial and other damages that resulted from the incidents and for which AES was liable.

b. Plant layout and geographic location.

The Hazard Mitigation Analysis did not address the plant layout and its geographic location. It should have considered the facility's proximity to residential neighborhoods and the Turquoise Trail Charter School. The impact of an accident near a residential area and school is greater than the impact if the facility is located in a more remote area. The Analysis should have also considered the potentially greater severity of any hazards that result from normally windy weather conditions and the flammability of the adjacent vegetation (i.e., dry grassland). The Analysis (and the EIR) also should have addressed the natural gas transmission line that runs along the western boundary of Eldorado and the risks posed in the event of a fire.

An issue whose omission is particularly hard to understand is the lack of any discussion of the "Environmentally Sensitive Area" inside the perimeter of the project site. It's hard to understand, because the "Environmentally Sensitive Area" is explicitly identified as environmentally sensitive in the Site Development Plan AES submitted with the August 30 application. The Site Development Plan shows an approximately 700 feet by 800 feet area identified as an "Environmentally Sensitive Area" located 100 feet from the 2.3 acres of the battery storage units.

Section 6.3.6 of the SLDC requires that an EIR's discussion "include relevant specifics of the area, including . . . environmentally sensitive lands."[91] EIRs are also required to identify mitigation measures for each significant environmental effect identified in the EIR, including any impacts on environmentally sensitive lands.[92]

[91]SLDC, Section 6.3.6 (emphasis added).
[92]SLDC, Section 6.3.10.1.

AES's EIR and Hazard Mitigation Analysis violate the SLDC requirements. The Environmentally Sensitive Area is not identified in the Environmental Impact Report submitted with the Application. The area and its proximity to the battery storage units are also not identified or discussed in the Hazard Mitigation Analysis.

c. Personnel.

The Hazard Mitigation Analysis does not address this issue. The Hazard Mitigation Analysis should address whether the facility will be manned or monitored remotely. The Analysis should consider the number, functions and qualifications of the personnel that will be present at the facility to operate and monitor its performance and respond to accidents. An unattended facility presents a higher risk of accidents and a potentially greater lapse of time before an accident is detected and an emergency response can be initiated. If the facility is manned, the Analysis should consider whether the in-person staff will be skilled or unskilled, what their job functions will be, whether the staff will include personnel skilled in responding to battery-related accidents, and what days and hours they will be present.

To the extent the project relies on remote monitoring, that capability should have been addressed. The Analysis indicates that the project will include a Remote Operations Control Center (ROCC), but the only reference to the ROCC is the following statement: "The strength of the gas detection and direct injection clean agent system barrier is conditional based on the quality and use of the emergency plan, and the quality of communication between the ROCC and on-site personnel."[93] But there is no discussion or evaluation of the quality of communication planned between the ROCC and on-site personnel. There is no description of the Remote Operations Control Center, including its location, when it is staffed and by whom, and the reliability of the communications link in the event of an emergency.

d. Availability of water supply.

The availability of water supply is also an important factor, especially as it relates to the emergency response to any fires and explosions. The availability of water as a means of fire suppression is, at a minimum, considered to be an important backup for "clean agent" fire suppression systems.

e. Capability and response times of emergency responders.

Similarly, the capability of the emergency responders who would be called on to address any fires and explosions is important. Will the responders be in close enough proximity, in large enough numbers, and with sufficient firefighting equipment and protections to address an emergency?

According to the Western Fire Chiefs Association and others, wildfires, especially in grasslands, can travel at up to 14 miles per hour.[94] At 14 miles per hour, a grass fire starting at

[93]Draft Preliminary Hazard Mitigation Analysis, p. 18.
[94]How Fast Do Wildfires Spread? Western Fire Chiefs Association, November 1, 2022 (attached as Exhibit 12).

the battery site could reach homes 1.5 miles away in less than seven minutes. At 7 miles per hour, a fire could reach those homes in less than 15 minutes. The area is also notorious for its wind speeds, which can accelerate the progress of such a fire.

The response times for local emergency responders are not fast enough to address the risks. Santa Fe County does not have a Hazardous Materials response team. It relies on a team from the City of Santa Fe, which, when available, has an estimated travel time of 24 minutes (16 miles) to the proposed site. If the City's team is not available, the County will seek help from Hazardous Materials response teams in Los Alamos, 49.3 miles from the site (estimated 55 minutes), and/or Albuquerque, 56.5 miles from the site (estimated 53 minutes).

The resources and response times for local fire responders, counting only the time to travel from their assigned stations, are also inadequate. Of the two closest fire stations, Station #60 at 39 Rancho Viejo Blvd. is located 5.7 miles/8 minutes with four personnel including one engine and a medic. Station #61 at 58 County Road 62 is located 10.9 miles/15 minutes.[95] These response times exclude the time required to assemble the manpower and resources and assume the personnel are not already dispatched to another fire.

f. Additional environmental considerations

The Draft Preliminary Hazard Mitigation Analysis also failed to discuss the following environmental considerations:

Air quality. There is no discussion of the toxic gases that will be emitted during a thermal runaway or any air monitoring that the Applicants propose to address the issue. Several of the compounds likely to be emitted, e.g., hydrogen fluoride and hydrogen cyanide, are listed by the EPA as Extremely Hazardous Substances.[96]

Safety Data Sheets for hazardous chemicals. There is no discussion of the hazardous chemicals that will be stored and used onsite.

Groundwater contamination. There is no discussion about the potential for groundwater contamination resulting from discharges from the proposed Novec 1230 fire suppression system. Novec 1230 is a PFAS compound that 3M, its primary manufacturer, is phasing out of production.

[95]Id.
[96]See 40 CFR Part 355, Appendix A.

7. The Hazard Mitigation Analysis must be completed and mitigation measures must be approved during the Conditional Use Permit process, not after the Permit is issued.

a. Section 6.3.10.2 of the SLDC requires the approval of mitigation measures no later than the Conditional Use process.

AES's "Draft Preliminary" Hazard Mitigation Analysis violates the SLDC's requirement that such analyses be completed and mitigation measures approved during the first discretionary review of a CUP Application. Section 6.3.10.2 of the SLDC requires that "[f]ormulation of mitigation measures shall be identified at the first discretionary approval and under no circumstances deferred until the ministerial development process."[97]

This means that the Hazard Mitigation Analysis must be conducted and submitted for review as part of the Conditional Use Permit process (i.e., the first discretionary approval for the project). It cannot be deferred until after the County has granted the Conditional Use Permit. And the review and approval of mitigation measures to address a project's hazards cannot be deferred beyond the Conditional Use Permit proceeding.

The risks to "the health, safety and general welfare of the area" and the "potential hazard for fire, panic, or other danger" are central issues in the County's review of the Conditional Use Permit that AES requests.

b. AES's HMA is only a preliminary draft that leaves the determination of critical mitigation measures to the final Hazard Mitigation Analysis and violates Section 6.3.10.2 of the SLDC.

The AES Hazard Mitigation Analysis describes itself as a "Draft Preliminary Hazard Mitigation Analysis." The EIR, to which the Analysis is attached as Appendix H, states that the final Hazard Mitigation Analysis (HMA) will be submitted after the Conditional Use Permit has been issued as part of the filing of an application for a Development Permit. Unlike the review for a Conditional Use Permit, the Development Permit review will be ministerial only, involving only the application of relevant fire and other codes to the project:

> -- A Preliminary Hazard Mitigation Analysis (HMA) has been prepared for the project (Appendix H). A Final HMA will be performed as part of the detailed engineering process. This HMA will include site and product specific fire risk assessment and a first responder plan (Appendix G). Local first responders will have access to these reports. Rancho Viejo will provide on-site and in-person training to the local responders prior to commercial operation of the system. There are no special materials required to respond to a fire event for the containerized BESS units. Only standard water application to the adjacent BESS containers is required, and this is only in the case where all internal fire suppression systems may fail. All information required by the first responders will be included in the first responder plan part of the HMA.

[97]SLDC, at Section 6.3.10.2. (Emphasis added.)

-- If a battery fire is initiated, the enclosures planned for this site will release fire suppressant in large concentrations directly into the initiating cell, removing heat and preventing thermal runaway throughout the enclosure. UL 9540 certification addresses safety and requires UL 9540a test results to be available for review. The UL 9540a tests of this system indicate adequate prevention of thermal runaway. The Rancho Viejo Energy Storage solution will achieve UL 9540 certification prior to site commercial operation.[98]

However, delaying the application of NFPA 855 (2023) and the approval of mitigation measures until after a permit decision has been reached would be a direct violation of the SLDC. The core issues in this case for issuing a Conditional Use Permit are whether the proposed project will be "detrimental to the health, safety and general welfare of the area" or "create a potential hazard for fire, panic, or other danger."[99] The complete 2023 edition of NFPA 855 needs to be applied in the course of the Conditional Use Permit review to determine whether the proposed project will satisfy those conditions. If the risks of fire, explosions and toxic gases are too great for the location proposed, the permit should not be issued -- period. Issuing the Conditional Use Permit with a requirement that NFPA 855 be complied with and mitigation measures be approved after a decision on the Conditional Use Permit has been made for that location would violate Section 6.3.10.2 of the SLDC.

The HMA submitted by AES is titled "Draft" and "Preliminary." And it indicates that it leaves unaddressed mitigation measures that are central to the issuance of the requested Conditional Use Permit. The HMA states that the issues will be addressed "in the final version of the HMA report" after the Conditional Use Permit has been approved.

As an example, the Draft Preliminary HMA states that "fire modeling" is being conducted to determine the likelihood of a fire spreading beyond the battery enclosures. It says the Final HMA report will be updated to include the results of the fire modeling:

Fire Spread Beyond Enclosure
A fire within the system has spread beyond the enclosure to adjacent ESS enclosures or other structures.
In this case, fire has likely compromised the entire or a large portion of the interior space of the enclosure and has now breached the container, posing immediate risk to adjacent equipment or facilities. This scenario may occur even if the fire does not compromise the enclosure fire partition. Defensive firefighting is likely required to mitigate this incident. A fire of this scale may burn for several hours or days. . . . **Fire modeling is being conducted to determine the likelihood of a fire spreading beyond that. The Final HMA report will be updated to include the results of the analysis.**[100]

[98]AES EIR, at ES-5. p. 3-38 (emphasis added).
[99]SLDC, Section 4.9.6.5.
[100]Draft Preliminary HMA Report, at p. D-2 (Emphasis added).

Similarly, a site-specific Emergency Response Plan **for facility operators** still needs to be developed:

> **Emergency Response Plan/First Responders.**
> ***System operator plan to handle any and all emergency events. A site-specific emergency response plan should be developed. Effectiveness based on level of the subject matter expert (SME) / first responder training, knowledge of the specific ESS undergoing failure, coordination with fire department, etc.***
> First responders refer to site personnel, corporate employees, local technicians, and SMEs who may be the first to detect or respond to failure or fault in the system and alert fire services. **The term first responders in this case does not refer to fire fighters or other fire service personnel, but to those who will be reporting the event or directing the fire service in regard to the risks posed by the system.** The guidance from these individuals, as well as the information contained in the emergency response plan, will serve as the initial human response to the incident and have the greatest chance of containing the incident, if it is containable, to a reduced state. Depending on time to detection, along with time to first response and fire service response, the incident may have progressed through multiple consequence pathways, as single cell failure can propagate to adjacent modules and beyond in a matter of minutes. **The ERP will be reviewed and the strength of this barrier will be expanded upon in the final HMA.**[101]

The Draft Preliminary HMA discusses the importance of measures that enable the battery system to shut itself down or disconnect itself. But, in Section 3.2.8 "Emergency Stop," it states that "Final details to include details of how e-stop will be accomplished will be provided in final HMA report."[102]

> **System Shutdown/Disconnect**
> *Ability of system to actively shut itself down or disconnect itself. This is the aggregate of the BMS ability as well as physical disconnects and the Balance of System controller's ability to shut down.*
> . . . **The strength of this barrier will be expanded upon in the final HMA.**[103]

Equally concerning, Section 4.2 of AES's Draft Preliminary HMA includes the following cryptic statement about "Bespoke Fire and Deflagration Testing":

> **4.2 BESPOKE FIRE AND DEFLAGRATION TESTING.** Bespoke Fire and Deflagration testing was conducted for this project. **Test results are being processed and updates will be provided in the final version of the HMA report. The results will be evaluated and compared to local ambient conditions**.[104]

[101]Id., p. D-6 (emphasis added).
[102]Id., p. 7.
[103]Id., p. C-7.
[104]Id. p. 9 (emphasis added).

AES does not describe in any detail the types of testing that are being customized and for what purpose(s). The comparison to "local ambient conditions" suggest, however, that the tests done to date are not based on site-specific conditions.

The following are examples of mitigation measures that are not finalized and whose effectiveness are still being evaluated.

Deflagration protection is supposed to mitigate the possible effects of explosions, but AES has not provided the results of its testing:

> **Deflagration Protection**
> *Activation of the enclosure's deflagration venting system.*
> Deflagration or explosion as a result of combustion, expansion, or detonation, poses severe risks to life and property near an ESS. UL 9540A testing indicates that the cell off gasses include hydrogen, carbon monoxide, methane and other flammable hydrocarbons. When mixed with oxygen from the air, a flammable mixture may be formed. The E5S enclosure has been provided with a deflagration vent design in accordance with the requirements of NFPA 68. **The system has been subject to both UL 9540A installation level testing and bespoke deflagration testing**. The system has been primarily designed to protect from an off-gassing event involving three cells.[105]

The UL 9540A installation level testing results are redacted, and, according to Section 4.2 of the Draft Preliminary HMA, the bespoke deflagration testing results are being evaluated and "will be provided in the final version of the HMA Report."

Further, the enclosure, fire separation and module thermal isolation barriers act to limit the propagation of an escalating thermal runaway event. Their effectiveness will be analyzed in the final HMA Report:

> **Thermal Isolation (Enclosure Insulation)**
> *Passive thermal propagation protection provided by insulation installed on the boundaries of the enclosure.*
> . . . **These will be analyzed and included in the final HMA report.**[106]
>
> **Thermal Isolation (Enclosure Fire Separation)**
> *Passive thermal propagation protection provided the enclosure's fire separation.*
> . . . **These will be analyzed and included in the final HMA report.**[107]
>
> **Thermal Isolation (Module/Rack Separation)**
> *Passive thermal propagation protection provided by physical separation between modules within a rack and physical separation between racks within the enclosure.*

[105]Id., p. D-4 (emphasis added).
[106]Id., p. D-5.
[107]Id. (Emphasis added.)

> . . . **The assessed strength of this barrier for the E5S enclosure is informed by both UL 9540A and bespoke fire testing. These will be analyzed and included in the final HMA report**.[108]

And, finally, the Draft Preliminary HMA Report states that UL 9540A testing was performed on July 6-7, 2023,[109] but there is no indication that UL 9540A certification has been accomplished. The Environmental Impact Report dated July 2024 states merely that "The Rancho Viejo Energy Storage solution will achieve UL 9540 certification prior to site commercial operation."

> If a battery fire is initiated, the enclosures planned for this site will release fire suppressant in large concentrations directly into the initiating cell, removing heat and preventing thermal runaway throughout the enclosure. UL 9540 certification addresses safety and requires UL 9540a test results to be available for review. The UL 9540a tests of this system indicate adequate prevention of thermal runaway. **The Rancho Viejo Energy Storage solution will achieve UL 9540 certification prior to site commercial operation**.[110]

c. UL 9540 certification does not replace the need for a properly performed Hazard Mitigation Analysis.

AES's Draft Preliminary Hazard Mitigation Analysis states that UL 9540A testing has been completed and that the applicants are waiting for UL 9540 certification. Santa Fe County's expert witness, Nick Bartlett of Atar Fire, whose primary task was to review the Hazard Mitigation Analysis, has stated that he has reviewed the UL 9540A test results and expects that the UL 9540 certification will be granted in the near future.

UL 9540 certification does not replace the requirement in NFPA 855 for a properly performed Hazard Mitigation Analysis. UL 9540 certification is directed only at the safety of an energy storage system that has been tested under certain controlled conditions. It does not address whether an installation, as built, will satisfy the broader criteria required to issue a Conditional Use Permit.[111]

NFPA 855 is the Standard for the *Installation* of Stationary Energy Storage Systems. NFPA 855 recognizes UL 9540 certification for specific types of systems, but it also contains standards for how and where the systems are installed, for inspection and maintenance and for first responder plans. NFPA 855, as adopted by Santa Fe County's Ordinance 2023-09, requires the performance of a Hazard Mitigation Analysis regardless of whether a proposed system has received UL 9540 certification.[112]

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[108]Id. (Emphasis added.)
[109]Id., p. 20.
[110]Environmental Impact Report (July 2024), p. ES-5 and p. 3-38. (Emphasis added.)
[111]Why Large-scale Fire Testing Is Needed for Battery Energy Storage Safety, Fluence, November 30, 2022 https://blog.fluenceenergy.com/battery-energy-storage-product-fire-safety-testing
[112]NFPA 855 (2023), Sections 4.4.1(6), 9.5.2.1.

Annex G warns of the limitations of industry tests, including UL 9540, that are used to evaluate the effectiveness of the energy storage systems, as designed and tested in a laboratory. Section G.3.6 states that the Hazard Mitigation Analysis should include a broader, "more holistic" review of the risks that considers the types of failures identified by EPRI and Clean Energy Associates reports below:

> Within these hazard categories, multiple threats exist, which would result in cells catching fire and, ultimately, that fire propagating, or posing the risk of propagating, throughout the whole system. Between these threats and such hazard events occurring, barriers exist that can stop the failure from occurring, minimize its severity, or contain its outcome such that it is unable to propagate. Should these barriers fail to do so, the event would then result in a propagating failure, leading to some consequence that could range from a fire involving some number of cells to a container or system wide, catastrophic conflagration. <u>While the failure mode and effects analysis (FMEA) called for in UL 1973 and UL 9540 look at the barriers in place to prevent these types of events within the ESS itself, an HMA or FRA looks holistically at the system and includes environmental and as-built components and considerations not included at the product level</u>.[113]

The May 2024 EPRI report on "root causes" (discussed in Section III.D.2 above) and a similar 2024 report by Clean Energy Associates prepared in February 2024 investigated actual thermal runaway incidents that have occurred at installed, operational systems. Both found that the root causes of the incidents often involved issues unrelated to the UL 9540 certification.

As discussed earlier, the 2024 EPRI report found that only six of the 26 incidents, for which it had sufficient data to study, were the result of faulty design. The others resulted from errors occurring during integration, assembly and construction; operational issues; and manufacturing defects.[114] The February 2024 Clean Energy Report identified defects occurring during the manufacture and integration/assembly of systems' components.[115]

8. The Environmental Impact Report does not identify or discuss any alternatives for the battery component of the project in violation of Section 6.3.11 of the SLDC.

Section 6.3.11 of the SLDC "Consideration and Discussion of Alternatives to the Proposed Project" requires an EIR to describe a range of reasonable alternatives to the project, or to the location, which would feasibly attain some of the basic objectives of the project but would avoid or substantially lessen the significant and adverse impacts or effects of the project. It also requires that the EIR evaluate the comparative merits of the alternatives, even if those alternatives would impede the attainment of the project objectives or would be more costly.[116] Section 6.3.11 also requires the EIR to briefly describe the rationale for selecting the alternatives

[113]NFPA 855-23, Annex G, Section G.3.6. (Emphasis added.)
[114]Insights from EPRI's Battery Energy Storage Systems (BESS) Failure Incident Database, Analysis of Failure Root Cause, EPRI, May 2024. https://www.epri.com/research/products/000000003002030360
[115]BESS Quality Risks, Clean Energy Associates, February 2024. https://info.cea3.com/hubfs/CEA%20BESS%20Quality%20Risks%20Report.pdf
[116]SLDC, Section 6.3.11.1.

to be discussed. It also requires the EIR to identify any alternatives that were considered but were rejected as infeasible and briefly explain the reasons underlying the determination.[117]

The EIR included no discussion of any battery alternatives:

> **2.3 Alternatives Considered but Eliminated from Further Analysis**
> Alternative locations for the solar array were explored within the larger parcel. Specifically, partially siting the Project in Sections 5 and 6 was examined but dismissed due to biological resources constraints along the southern branch of Bonanza Creek and the north-facing slopes. Siting the Project in Sections 5 and 6 was also dismissed based on public feedback related to concerns of potential visual resources effects to residential areas located to the south. Locating the Project closer to State Road 14 was also considered but this potential location was eliminated because it is part of the Turquoise Trail National Scenic Byway. Access road locations were modified to avoid documented cultural resources. Alternative locations for the Project BESS and gen-tie were not considered; however, the gen-tie route was largely dictated by topography and represents the shortest distance possible between the Project and the PNM line (resulting in the least surface disturbance). The gen-tie design was also altered to span a potential jurisdictional wetland (described below in Section 3.14.2).

The EIR did not provide any reasons why the consultant determined that alternative locations for the battery storage units would not be considered. And there is no discussion about why the EIR did not consider other reasonable alternatives, including a smaller number of batteries and the use of safer, longer duration batteries.

The most obvious alternative would be a solar facility as proposed by AES but without battery storage facilities. AES should have prepared an analysis of the technical and financial feasibility of such a project. This more limited project would mitigate the risks of fires, explosions and toxic gases that are central to the issues to be decided by the County for AES's requested Conditional Use Permit.

A second alternative would have substituted safer, longer-duration and more sustainable battery storage facilities for the lithium-ion battery facilities proposed by AES. Fire, explosion and toxic gas releases are documented risks of lithium-ion battery facilities. Much has also been reported about the environmental impacts (including impacts on workers' health) of the mining practices associated with the lithium, cobalt and other minerals used for lithium-ion batteries. Lithium-ion batteries also generally have four-hour durations, which are shorter than needed to replace the nighttime capacity that will be lost with the replacement of coal and natural gas generation.

Public Service Company of New Mexico (PNM) and other public utilities are seeking battery storage systems with longer durations than the four-hour durations of lithium-ion batteries. As examples, earlier this year, Xcel Energy (the parent company of Southwestern Public Service Company, which serves eastern and southeastern New Mexico) entered into

[117]SLDC, Section 6.3.11.3.

agreements for the deployment of 10 MW (1000 MWh) iron-air batteries in Minnesota and Colorado. Georgia Power Company also entered into an agreement for a 15 MW (1500 MWh) iron-air battery. Great River Energy, a wholesale generation and transmission cooperative in Minnesota serving 27 member distribution cooperatives in Minnesota and Wisconsin, is installing a 1.5 MW iron-air battery in central Minnesota.

Iron-air batteries have long duration times (up to 100 hours) and, unlike lithium-ion batteries, are not subject to thermal runaway. They use iron and other sustainable materials. Santa Fe County could be a leader in the deployment of these innovative battery storage technologies if AES were to pursue them.[118]

Flow batteries are another promising alternative. They also provide 10 to 12 hours of long duration storage without the risks of lithium-ion batteries. The Sacramento Municipal Utility District acquired their first batch of flow batteries in 2023 as part of a larger 2 GWh deal.[119]

AES's failure to include alternatives violates Section 6.3.11 of the SLDC.

9. The Application cannot be approved on the basis of redacted information withheld from the public.

AES has the burden to prove that the proposed land use will not be detrimental to the health, safety and general welfare of the area or create a potential hazard for fire, panic, or other danger. Key to their attempt to prove that they satisfy this burden is the Draft Preliminary HMA Report. But the Report, as filed, is heavily redacted in its text and its complete redaction of the UL 9540A fire test results that AES claims proves the safety of its project:

> 4.1 UL 9540A TESTING
> The CEN BESS system has been subject to testing utilizing the methods of UL 9540A at the cell, module, unit and installation levels. The UL 9540A test results are summarized below. Refer to the UL 9540A Cell, Module and Unit level test

[118]Further information about iron-air batteries and their deployments can be found at the following websites:
https://formenergy.com/technology/battery-technology/
https://www.pbs.org/wgbh/nova/article/iron-air-battery-renewable-grid/
https://www.utilitydive.com/news/minnesota-puc-xcel-form-energy-battery-sherco-solar/685460/
https://www.cbsnews.com/colorado/news/xcel-colorado-pueblo-power-plant-renewable-energy-storage-ldes/
https://www.mprnews.org/story/2023/02/10/rusty-batteries-could-hold-key-to-carbonfree-power-future
https://formenergy.com/wp-content/uploads/2023/04/24-7-Carbon-Free-Resource-Portfolio-4.24.23.pdf

[119]ESS delivers 3 MWh iron flow battery systems to Sacramento utility as part of larger 2 GWh deal, Utility Dive, September 12, 2023. https://www.utilitydive.com/news/ess-delivers-3-mwh-iron-flow-battery-systems-smud-Sacramento/693362/ . See also, "These batteries could harness the wind and sun to replace coal and gas", Washington Post, November 26, 2024:
https://www.washingtonpost.com/climate-solutions/interactive/2024/flow-batteries-renewable-energy-storage/
and "Flow batteries for grid-scale energy storage", MIT News, April 7, 2023: https://news.mit.edu/2023/flow-batteries-grid-scale-energy-storage-0407

reports for detailed information. Full UL 9540A test reports are provided for review in Appendix F.

• Cell Level Testing – Cell level testing indicates that **[REDACTED]** of gas may be released per cell when thermal runaway occurs. Testing indicates that the gas is primarily composed of **[REDACTED]** with a LFL of **[REDACTED]** at ambient temperature. Refer to the UL 9540A Cell Level Report for detailed gas composition data. The average cell surface temperature at thermal runaway was **[REDACTED]**. The cell vent gas fundamental burning velocity, Su, was determined to be **[REDACTED]** with a maximum pressure, Pmax, of **[REDACTED]**.

• Module Level Testing – Module level testing demonstrated that thermal runaway initiation of a single cell is capable of propagation throughout a majority of the cells within the module. The testing resulted in flaming combustion, flying debris, explosive discharge of gas and sparks or electrical arcs. A peak heat release rate (HRR) of **[REDACTED]** was achieved during testing.

Unit Level Testing – Unit level testing did not result in propagation of a thermal runaway event from the failure of a single cell. External flaming combustion was observed with a peak HRR of . Release of flammable gas with an associated explosion was not observed. The maximum enclosure wall surface temperature observed was **[REDACTED]**.

• Installation Level Testing – The installation level test is intended to collect information regarding the performance of the ESS's fire protection features. The installation level test included the operation of the direct injection clean agent cooling system. The installation level test did not result in propagation of a thermal runaway event from the failure of a single cell. No flaming or flying debris was observed outside of the enclosure. The maximum enclosure wall surface temperature observed was **[REDACTED]**.

Although not clear at this point, the redactions also appear to have been made to the documents filed with the County.

A similar issue arose with AES's January 2023 filing. The 2023 dispute involved two Fire Risk Assessments -- one prepared by an AES consultant and the other by AES. In both assessments, AES redacted large amounts of information about the project's risks of fires, explosions and releases of toxic gases that were central to the Conditional Use review there and of critical interest to the public.[120] The redactions related to the chance of accidents and their consequences, including fires, explosions and the composition of toxic gases expected to be released.

[120] *AES Clean Energy 40' CEN Battery Energy Storage System Project Battery Energy Storage System (BESS) Level Fire Risk Assessment*, Hiller Companies, January 5, 2023.

In that case, AES originally filed unredacted information with the County, and, after a resident filed an IPRA request for the unredacted information, the County and AES collaborated to allow AES to replace its original unredacted filing with the redacted filing. AES claimed that the redacted information constituted trade secrets and sued the County in District Court to prevent the IPRA disclosure. The County did not contest AES's claim, and the District Court entered a preliminary injunction preventing the disclosure. A citizens group, however, Coalition for Clean Energy, intervened in the case challenging the trade secret claim, and AES withdrew its claim agreeing to the County's release of the original unredacted copies.

Several lessons should have been learned from the 2023 controversy.

The first is that it is likely that AES's trade secret claim in the 2023 case (and likely the current case) are overbroad. Indeed, AES promptly agreed to the release of the redacted data when challenged in court. And, in the current case, AES has not even attempted to submit a justification for its claim of trade secret status.

The second lesson is that the required proof of the project's safety must be made available to the public -- even if the information qualifies as a trade secret. The public's interest in transparency is greater than whatever private interests exist in the value of the alleged trade secrets. The development and content of the Hazard Mitigation Analysis must be transparent given the potential impacts of the project on the adjacent residential communities.

In that regard, regardless of whether any information constitutes a trade secret, the County has the authority to require the disclosure of the information under Section 6.3.1 of the SLDC. Section 6.3.1 of the SLDC states that "[n]o EIR or SRA prepared pursuant to this Chapter that is available for public examination shall require the disclosure of a trade secret, except where the preservation of any trade secret involves a significant threat to health and safety."[121] The redacted information relates to the risks (i.e., fire, explosion, toxic gas) to which the public would be exposed if the Conditional Use Permit is granted. The County therefore has the authority to insist that the redacted information be disclosed to the public.

VI. DENIAL OF THE CONDITIONAL USE PERMIT WILL NOT IMPACT THE DECARBONIZATION GOALS OF NEW MEXICO AND SANTA FE COUNTY

The Application indicates that the developers intend to sell the project's output to PNM. And the County staff states that the project is consistent with the goal of the SGMP to encourage the development of local renewable energy resources in Santa Fe County to reduce the county's carbon footprint and to decrease the county's reliance on external energy providers.

But a crucial factor obscured by the Applicants and the County is the reality that the electricity from the Rancho Viejo Solar Project needs to be purchased by Public Service Company of New Mexico (PNM) to make the project viable. PNM (along with the Public Regulation Commission (PRC), following rules adopted by the New Mexico Legislature) will ultimately determine the utility-scale resources that will be built in PNM's service territory.

[121]SLDC, Section 6.3.1. (Emphasis added.)

The criteria PNM uses to select resources include PNM's particular needs, which include the locations of resources developers propose to PNM. The location/siting of those resources, including solar and battery resources, is therefore a central concern for PNM in every resource decision it makes.

The siting of any generation resource must align with the needs of the utility that a developer will rely upon to purchase its energy and make the project viable. In that regard, utilities evaluate where resources are needed to serve customer demand and where their transmission networks have sufficient transmission capacity to accommodate the newly acquired energy. Resource selections also need to be cost-effective, because their costs are passed through to their customers. So the utility considers the costs they will incur to upgrade their transmission networks to accommodate their resource selections.

PNM also needs to comply with the New Mexico Legislature's requirements for decarbonization. The New Mexico Renewable Energy Act requires PNM and other electric utilities to supply one hundred percent of all retail sales of electricity in New Mexico with zero carbon resources by 2045,[122] and PNM has stated that it intends to achieve that goal by 2040. The 2019 New Mexico Energy Transition Act (ETA) establishes a preference for projects in the Central Consolidated School District in San Juan County to replace the capacity lost with the retirement of the San Juan Generating Station and the impending retirement of the Four Corners Power Plant and to assist with the economic impacts of the retirement.[123]

Electric utilities are required to develop Integrated Resource Plans every three years that analyze resource options and develop a Most Cost-Effective Portfolio to achieve these goals over the next 20 years. PNM's 2023 plan, updated in October 2024, indicates that PNM's needs for generation resources have been and will continue to be dominated by its goal to replace its fossil-fuel generating resources by 2040. This trend started with the phased retirement of its 783 MW interests in 2017 and 2022 in the four coal-fired units at the San Juan Generating Station near Farmington. The Plan indicated that the trend will continue with its stated intent to not renew its contract to purchase power from the 155 MW Valencia natural gas generating plant in 2028, to retire the 140 MW Reeves natural gas generating plant in Albuquerque in 2030, and to retire its 200 MW interest in the coal-fired Four Corners Power Plant in 2031.[124]

At the same time, PNM is experiencing substantially increasing demand in the Albuquerque area for large industrial customers such as the Meta (Facebook) data center near Los Lunas.

The preliminary draft of PNM's most recent competitive Request for Proposals for its resource needs in the years 2029-2032 also acknowledges the brownfield opportunities to locate new generating stations at sites where PNM has existing and previously retired fossil-fuel plants.[125]

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[122]NMSA 1978, 62-16-4(A).
[123]NMSA 1978, 62-18-3(F).
[124]2023 Integrated Resource Plan, Supplemental Analysis, PNM, October 10, 2024; 20-Year Transmission Planning Study, PNM, April 24, 2024.
[125]Draft Request for Proposals, Case No. 23-00409-UT, October 22, 2024, p. 22 of 30.

Those factors and the transmission capacity that is freed up with retirements of existing plants have led to PNM's pursuit of renewable energy projects (i.e., solar and battery storage projects) in northwest New Mexico and the Albuquerque area. PNM has had access to plenty of resource options that do serve PNM's needs. Since 2020, PNM has approved projects ranging from Bernalillo, Valencia and Sandoval counties, west to Cibola county and to San Juan, McKinley and Rio Arriba counties in the northwest.

In this context, PNM has rejected the Rancho Viejo Solar Project on a number of occasions. Although the exact number of times AES has submitted proposals to PNM is unclear, it is clear that the Rancho Viejo Solar Project has been rejected by PNM at least twice. PNM issues public explanations only for the projects it selects, not for the projects it rejects. Based on PNM's selections, however, and the number of times the Rancho Viejo project has been rejected, the location proposed for the project does not appear to align with PNM's existing physical network and its resource and transmission plans. Santa Fe County is also not experiencing the industrial load growth occurring near Albuquerque, and the 115 kv transmission line into which the proposed project would connect is smaller than the 345 kv lines PNM has available in other locations. The necessary upgrades would be expensive.

Just recently on November 22, PNM made a resource procurement filing with the PRC that confirmed the general trend spelled out in its 2023 IRP. PNM requested approval of two 150 MW energy storage agreements for four-hour lithium-ion batteries to be located in Bernalillo County and PNM's construction of a 100 MW solar and 30 MW lithium-ion battery facility to be located in the Central Consolidated School District in San Juan County. The agreements are for storage to be available in 2028. And, instead of allowing PNM's power purchase agreement with the Valencia natural gas generating plant in Belen to expire in 2028, PNM now seeks the PRC's approval to extend the agreement to 2039. Furthermore, the combined solar-BESS facility planned for San Juan County is also expected to come online in 2028 – the year in which the Applicants here said they plan to sell their product to PNM.[126]

Santa Fe County's decision-makers should consider these realities in their discretionary review as they weigh the alleged benefits of the Rancho Viejo Solar Project against the hazards the project poses for neighboring residents. **Denial of the Conditional Use Permit at issue here will not impact the decarbonization goals of New Mexico and Santa Fe County.**

VII. CONCLUSION

No one doubts that renewable energy and storage technologies are important to address the existential problem of climate change. But as these technologies are deployed, it is also important to site them in a thoughtful way. A 680-acre project is large. It translates into a project that encompasses one square mile.

It makes no sense to site a known fire risk in a dry, windy area susceptible to grass fires in the midst of two heavily-populated residential communities. The County should take the

[126]Application for Approval of Purchased Power Agreements, Energy Storage Agreements, and Certificates for Public Convenience and Necessity for System Resources in 2028, Docket No. 24-00271-UT, November 22, 2024.

opportunity to prevent a problem that is clearly foreseeable. As the EPRI report discussed in Section III.D concluded and as the SLDC's criteria state, the question is how tolerant the County should be of the risk that its decision will create for these communities.

The County should deny AES's request to include a 48 MW lithium-ion battery storage complex in the Rancho Viejo Solar Energy Project for which it has requested a Conditional Use Permit. The battery storage complex would "create a potential hazard for fire, panic, or other danger" and "be detrimental to the health, safety and general welfare of the area." It is inconsistent with the spirit and intent of the Sustainable Growth Management Plan. And the Application violates numerous sections of the SLDC, County Ordinance 2023-09 and NFPA 855. These factors disqualify the proposed use from receiving Conditional Use approval under the standards of section 4.9.6.5 of the SLDC.

Respectfully submitted,
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Exhibits

1 Schannauer Qualifications
2 October 16, 2024 Order on Motion to Intervene
3 September 17-18, 2023 email string between Eikelenboom and Fire Marshal Blay
4 AES Corporation Annual Reports for 2022 and 2023
5 July 31, 2024 email from Fire Marshal Blay to Commissioner Hank Hughes, County Manager Shaffer and other County officials
6 February 18, 2024 letter from Schannauer to Board of County Commissioners
7 November 1, 2023 letter from Schannauer to Board of County Commissioners
8 March 29, 2022 TAC letter for the Rancho Viejo Solar Project
9 August 19, 2024 TAC letter for the Linea Energy solar project
10 April 28, 2024 letter from Schannauer to Fire Marshal Blay and Growth Management Department Director Ellis-Green on Annex G
11 April 29, 2024 letter from Fire Marshal Blay to Schannauer on Annex G
12 How Fast Do Wildfires Spread? Western Fire Chiefs Association, November 1, 2022

SELF AFFIRMATION

I, Ashley C. Schannauer, upon penalty of perjury under the laws of the State of New Mexico, affirm and state that the foregoing Testimony and Exhibits are true and correct based on my personal knowledge and belief.

DATED November 27, 2024.

/s/ Ashley C. Schannauer
ASHLEY C. SCHANNAUER

CERTIFICATE OF SERVICE

I hereby certify that I have served a copy of the foregoing Testimony and Exhibits to the following by email on this date:

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