Rancho Viejo Solar + Storage Project

Board of County Commissioners

August 11th, 2025, presented by AES

115 MWdc / 96 MWac / 192 MWh
Solar + Battery Energy Storage System (BESS)

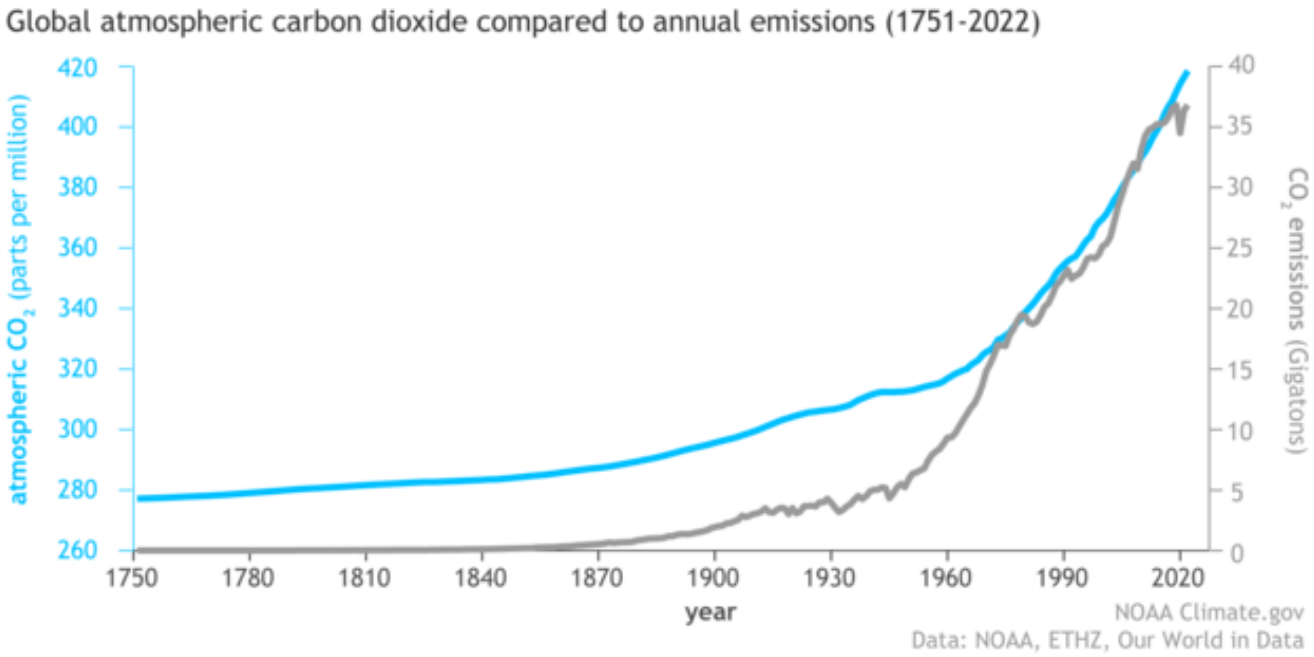
2 miles east of Hwy 14
Santa Fe County, New Mexico

Accelerating Santa Fe's clean energy transition with locally-sourced, dispatchable solar power!

Presentation Agenda

- Why we are here today
- The AES Corporation / AES Clean Energy
- Project Location
- Project Overview
  - Updates for Revised CUP Application
  - Solar Photovoltaic Modules
  - Battery Storage Design and Safety + UL 9540A Video
- Project Diligence
  - Visual Simulations, Noise Study, Water, Environmental Studies
- Estimated Project Timeline
- Economic & Environmental Benefits
- Conditional Use Permit Approval Criteria & Response to Hearing Officer Recommendation

Why we are here today



Beetle-killed forest near Serpentine Lake, Pecos Wilderness

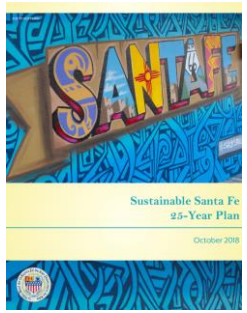
Why we are here today

- UN Paris Agreement 2015
- NM Energy Transition Act of 2019 (SB489)
  - 50% renewables by 2030
  - 100% carbon-free by 2045
- Santa Fe City & County Climate Goals
  - Sustainable Santa Fe 25 Year Plan
  - County Resolutions No 2017-68 & 2023-074
  - SGMP Chapter 7 – Renewable Energy
- PNM Request for Proposals
  - 2029-2032 Resources

The Daily Times

Gov. Michelle Lujan Grisham signs the Energy Transition Act into law Friday at the State Capitol. The act will require electric utilities to produce a larger share of electricity from renewable sources, eventually getting to 100 percent renewable energy by 2045. Luis Sánchez Saturno/The New Mexican

Santa Fe New Mexican



THE BOARD OF COUNTY COMMISSIONERS
OF SANTA FE COUNTY

RESOLUTION NO. 2023 - 074

A RESOLUTION ADOPTING THE COUNTYWIDE CLIMATE ACTION PLAN PHASE I AND SUPPORTING ITS IMPLEMENTATION

WHEREAS, the County seeks to increase its funding capacity, participation and support in collaborative opportunities that conserve resources, promote renewable energy, stimulate social equity and engagement, and increase sustainable practices in New Mexico.

PUBLIC SERVICE COMPANY OF NEW MEXICO

2029-2032 GENERATION RESOURCES RFP

Why we are here today

In Texas, Batteries are Keeping the Lights On

DW IN FOCUS Israel-Hamas war Ukraine US Democratic Party Latest videos Latest audio

BUSINESS

New energy storage facilities in high demand

Klaus Deuse
02/18/2021

Wind and solar farms do not generate enough electricity at all times and in all weather conditions. Germany's energy transition hinges on the storage of power from renewables — and batteries come to the rescue.

SUPPORT

Storage appears to be the most realistic path, a new analysis finds.

by **Kari Lydersen**
August 22, 2024

The AES Corporation

32,100 MW
In operation (gross)

$12.3 billion
Total 2024 revenues

4,900 MW
Generation capacity under construction

$47.4 billion
Total assets owned & managed

4 Continents

12 Countries

6 Utility companies

17 million
Number of people served by energy we generate annually in countries where we operate

9,100+ people
Our global workforce

Recognition for our commitment to sustainability

Great Place To Work.

2024 WORLD'S MOST ETHICAL COMPANIES® ETHISPHERE 11 Time Honoree

FTSE4Good

FAST COMPANY

AES' US Businesses overview

1,400+ People

600+ Projects

29 States and territories

12.8 GW
Operating energy resources

53 GW
Clean energy projects in development

5.4 GW
solar

2.4 GW
wind

1.7 GW
battery energy storage

3.3 GW
Energy infrastructure

Recognitions for AES

Newsweek
America's Greatest Workplaces for Veterans, 2024 & 2025

Forbes
Forbes' America's Most Trusted Companies, 2025

FORTUNE
Fortune's World's Most Admired Companies, 2024

FAST COMPANY
Fast Company's 100 Best Workplaces for Innovators, 2020, 2022, & 2024

THE WALL STREET JOURNAL.
Wall Street Journal's Best Managed Companies, 2020, 2021, 2022, & 2024

ETHISPHERE
GOOD. SMART. BUSINESS. PROFIT.
Ethisphere World's Most Ethical Companies, 12-years running

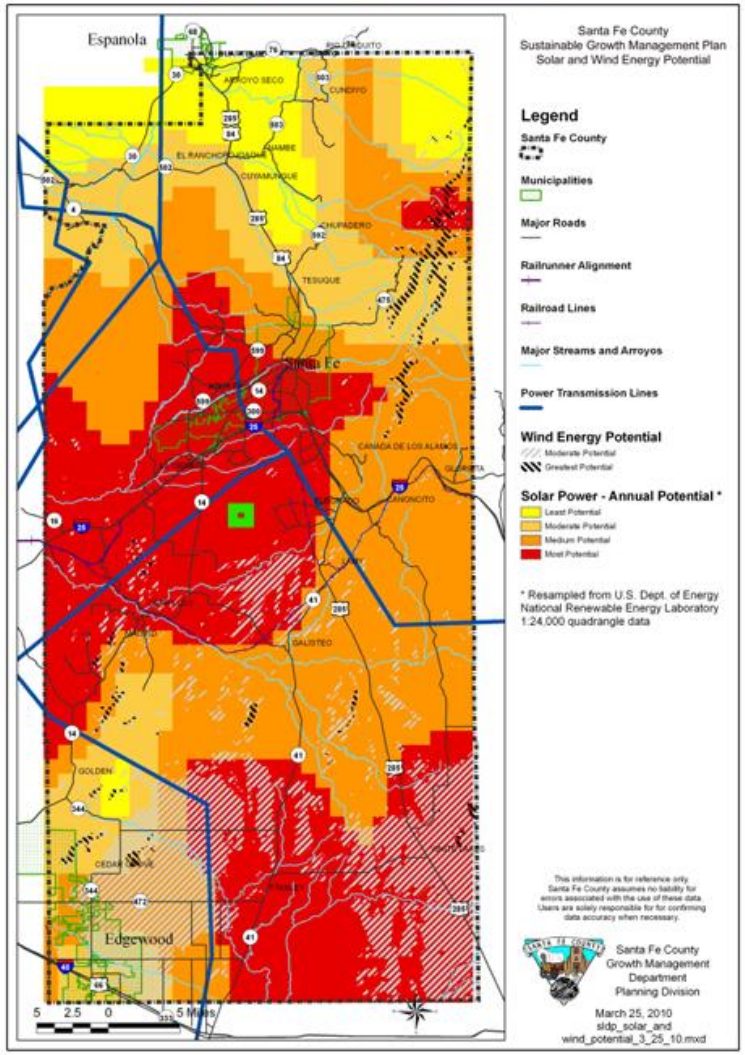
CIO 100 AWARDS
CIO Award for IT Leadership & Innovation, 2024, 2025

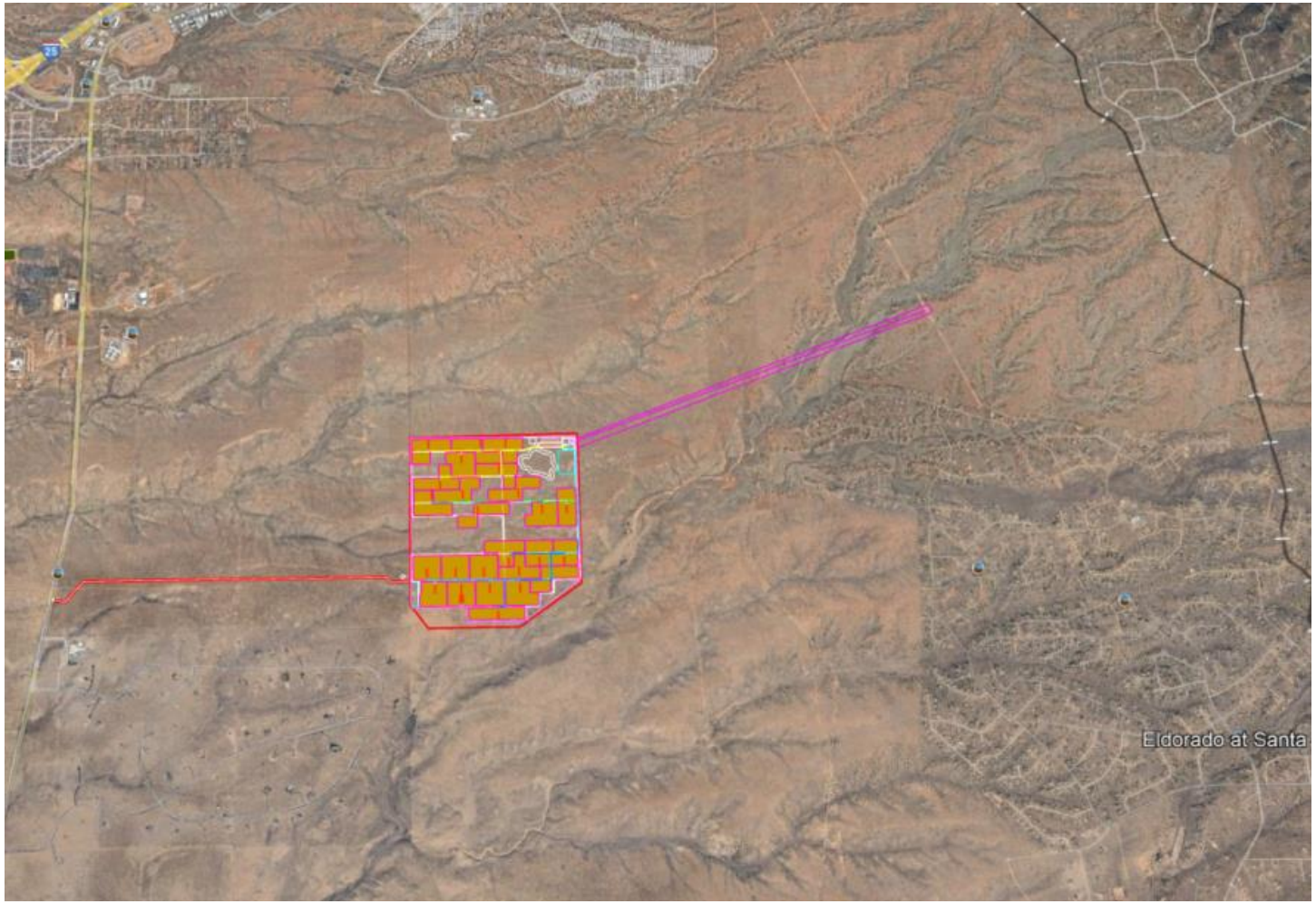
Bloomberg NEW ENERGY FINANCE

We are proud to be recognized by BloombergNEF as a top provider of clean energy to corporations for the third year in a row, reflecting our commitment to co-creating innovative energy solutions with our partners.

Project Location – Highest Solar Resource

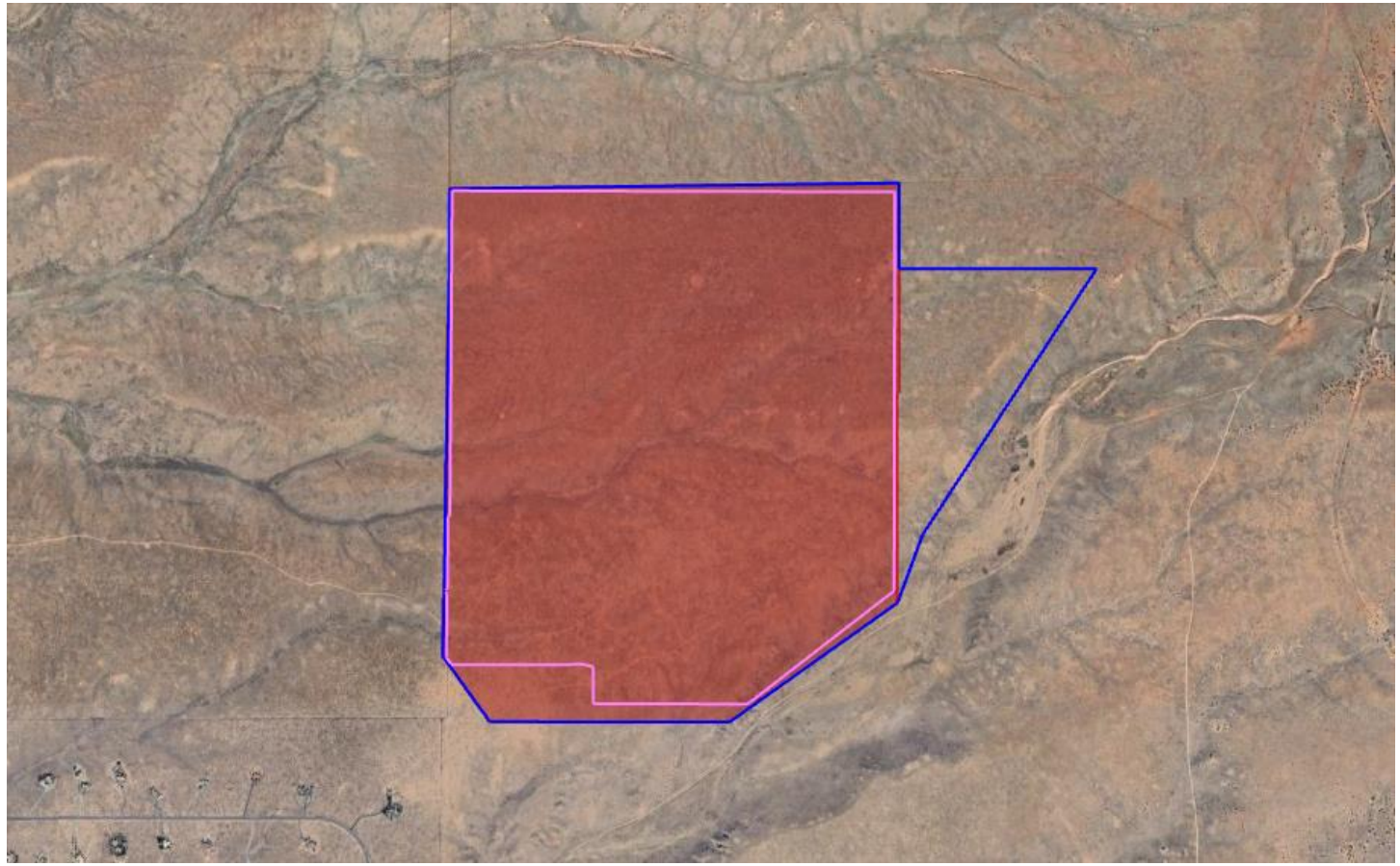
Map 7-1 A: Renewable Energy Potential-Solar and Wind





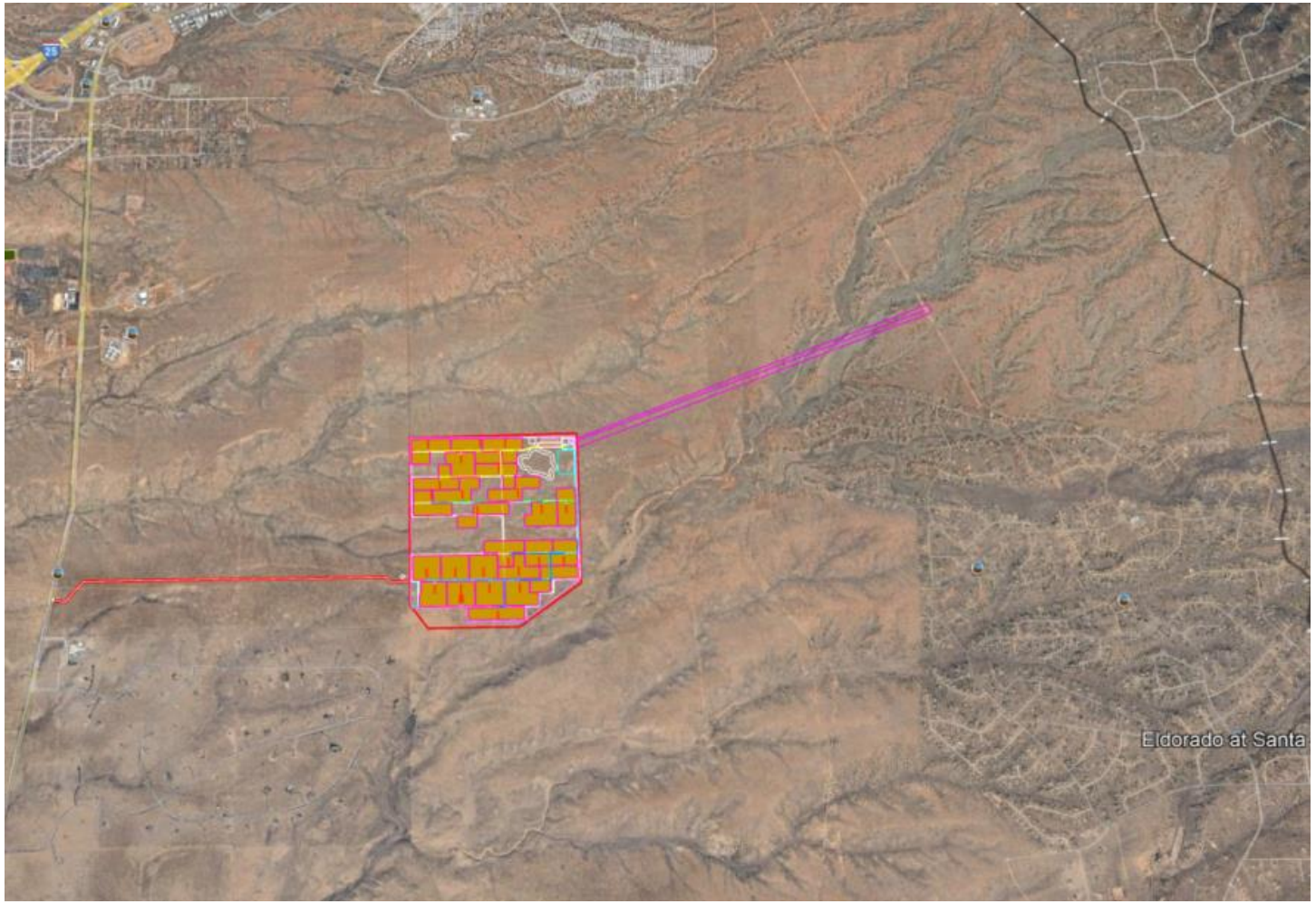
Property in Relation to Project Boundary

- 828-acre property (blue boundary), as specified in the approved survey plat included with the CUP application
- 731-acre project boundary (red polygon)
- 680-acre fenced project area (pink boundary)
- 340 acres will remain natural opens space in conformance with SLDC open space requirements



Project Location - Summary

- 3 miles south from Santa Fe
- 2 miles east of Hwy 14
- ~1.5 miles west of Eldorado neighborhood
- 1/3 mile from nearest residence in San Marcos
- BESS sited 1.5 miles from both San Marcos and Eldorado neighborhoods
- 680 fenced acres for project
- Located on private property, within a larger 8,225-acre tract



Perpetual Conservation of Buffer Lands

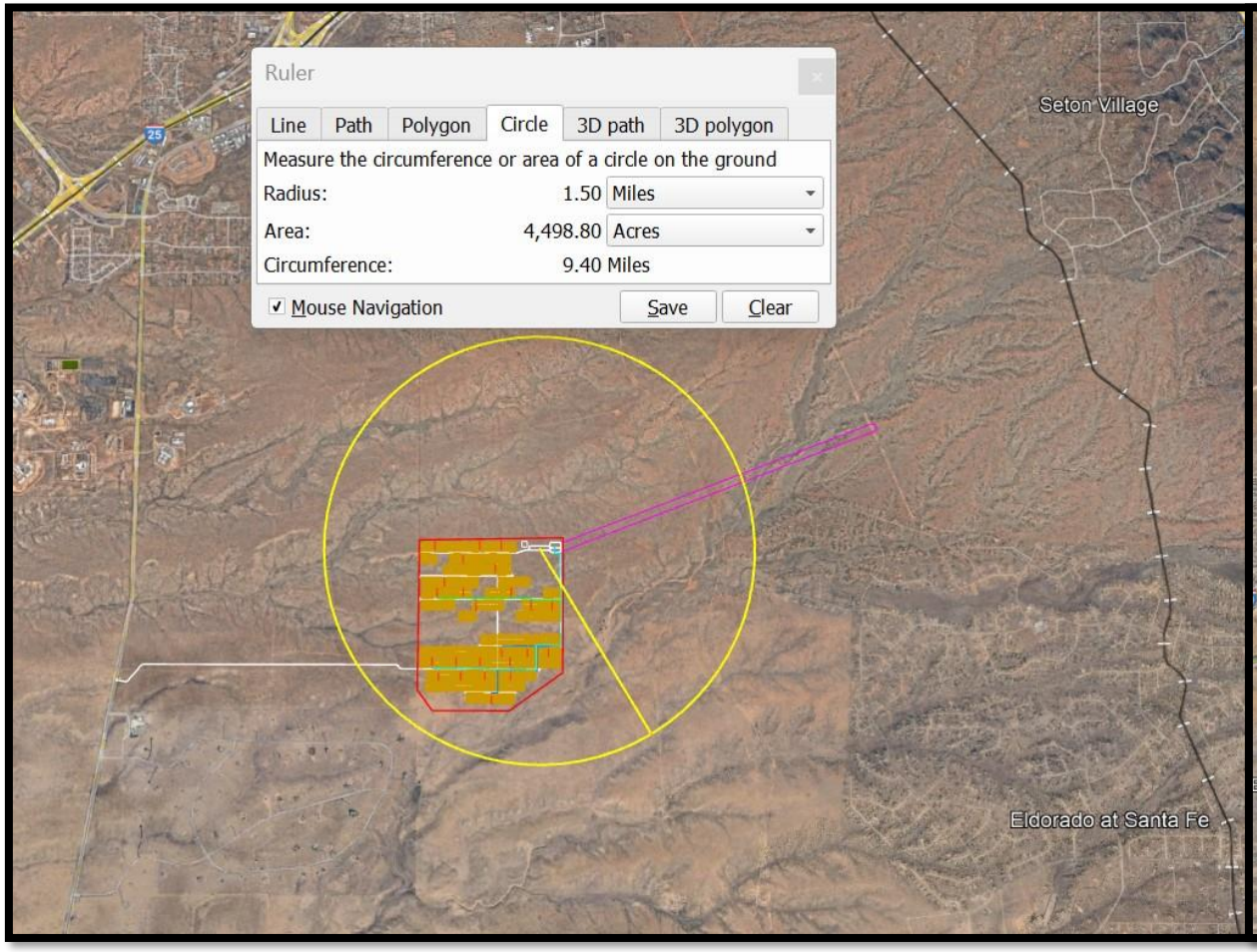
Landowner working with County on a Transfer of Development Rights on surrounding parcels

- 828-acre project property (blue boundary)
- Proposed **5,706-acre** TDR Sending area (yellow)

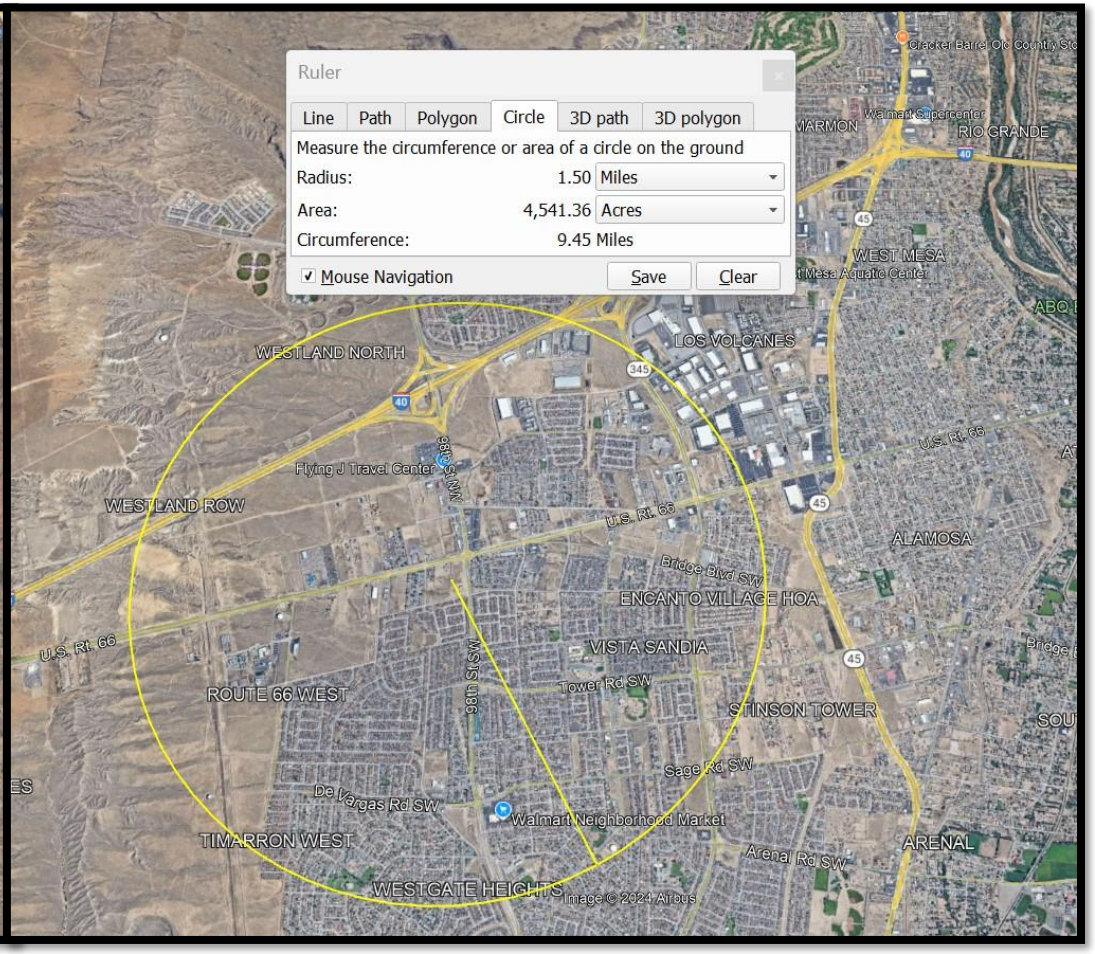
Project Location - Perspective

View from SW corner of nearest planned solar array 1/3 mile to the nearest residence in San Marcos

Project Location – 1.5 mile BESS Setback

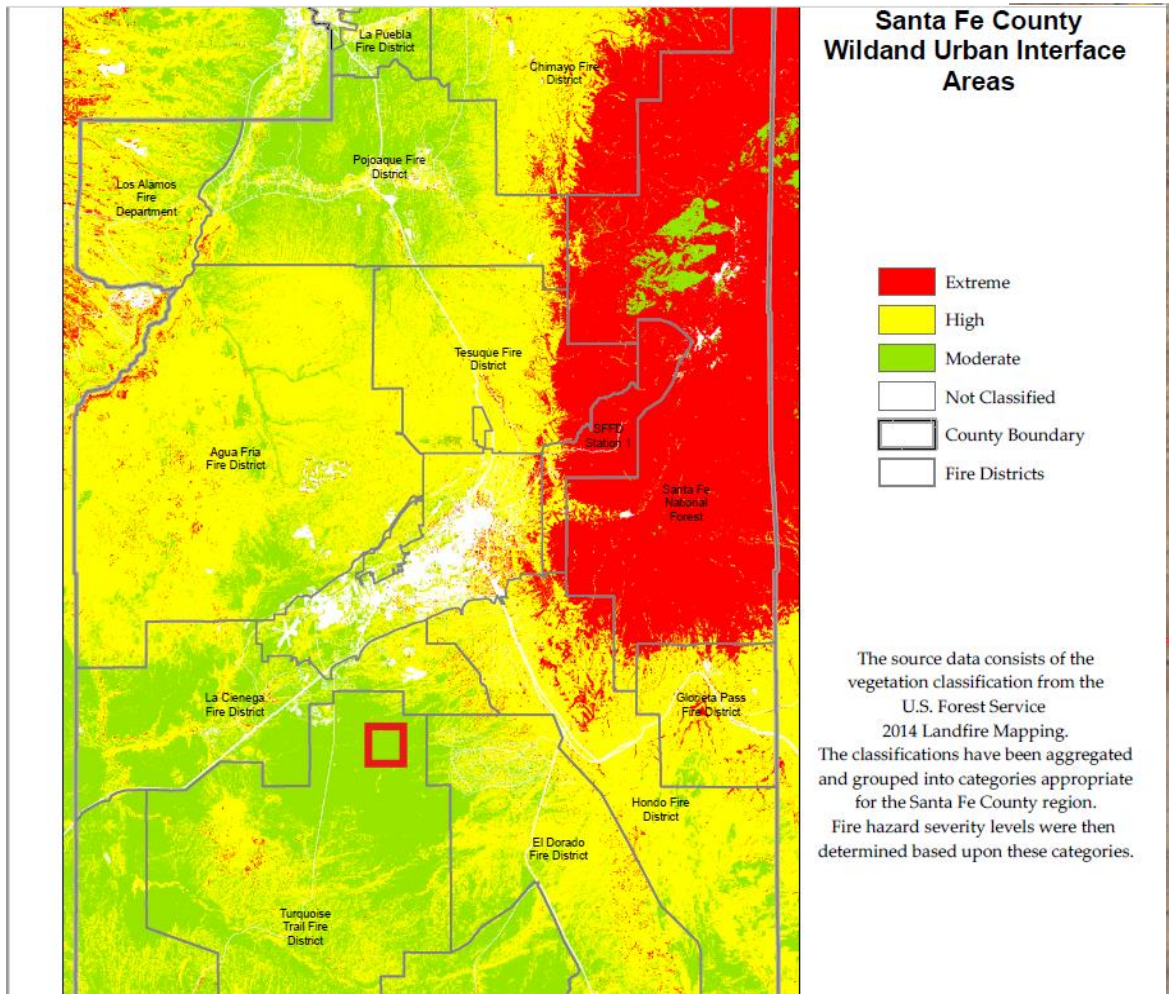


1.5 mile radius of Rancho Viejo 48 MW / 192 MWh BESS facility



1.5 mile radius from approved Sun Lasso 150 MW / 600MWh BESS project in ABQ

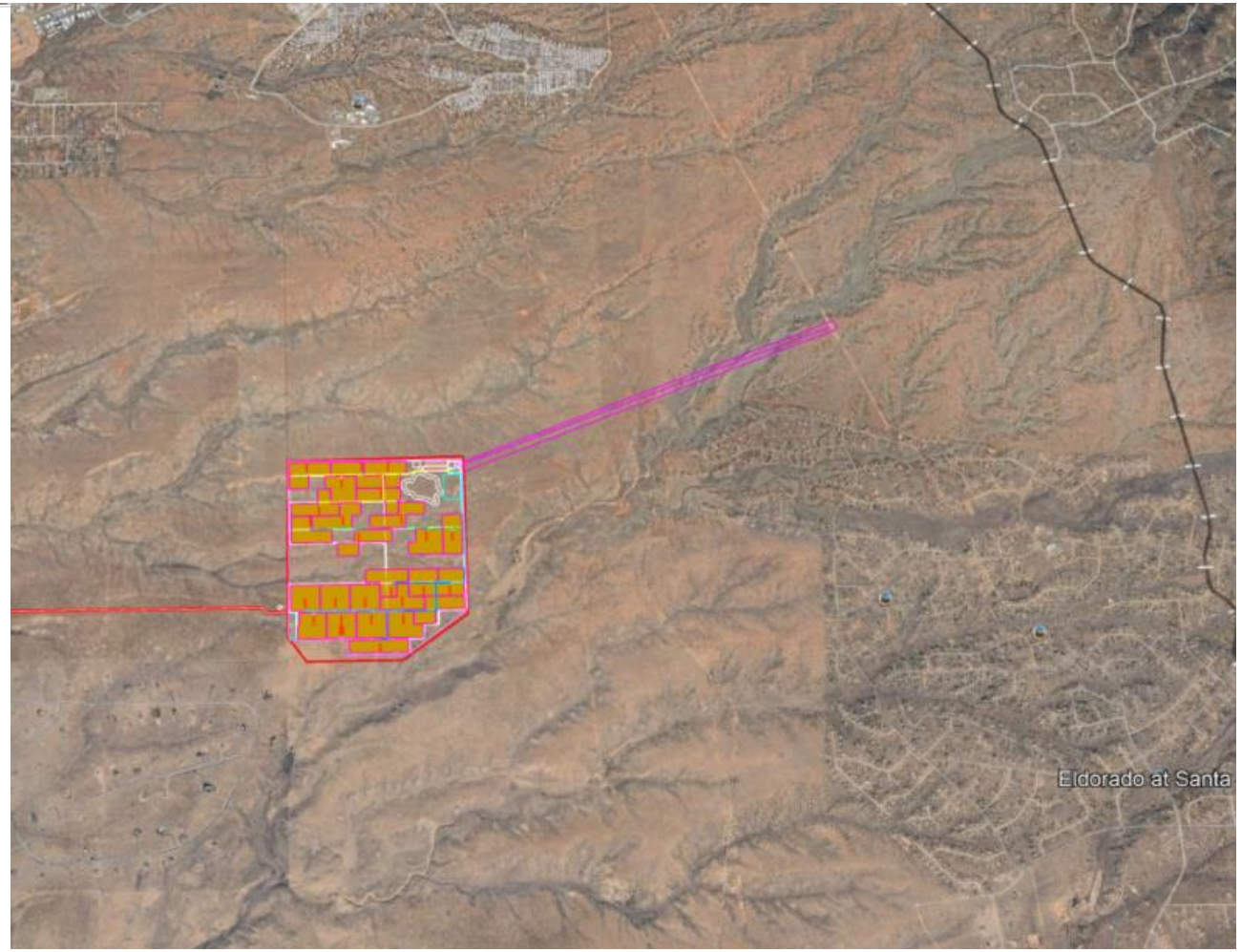
Project Location – Lowest County Wildfire Risk



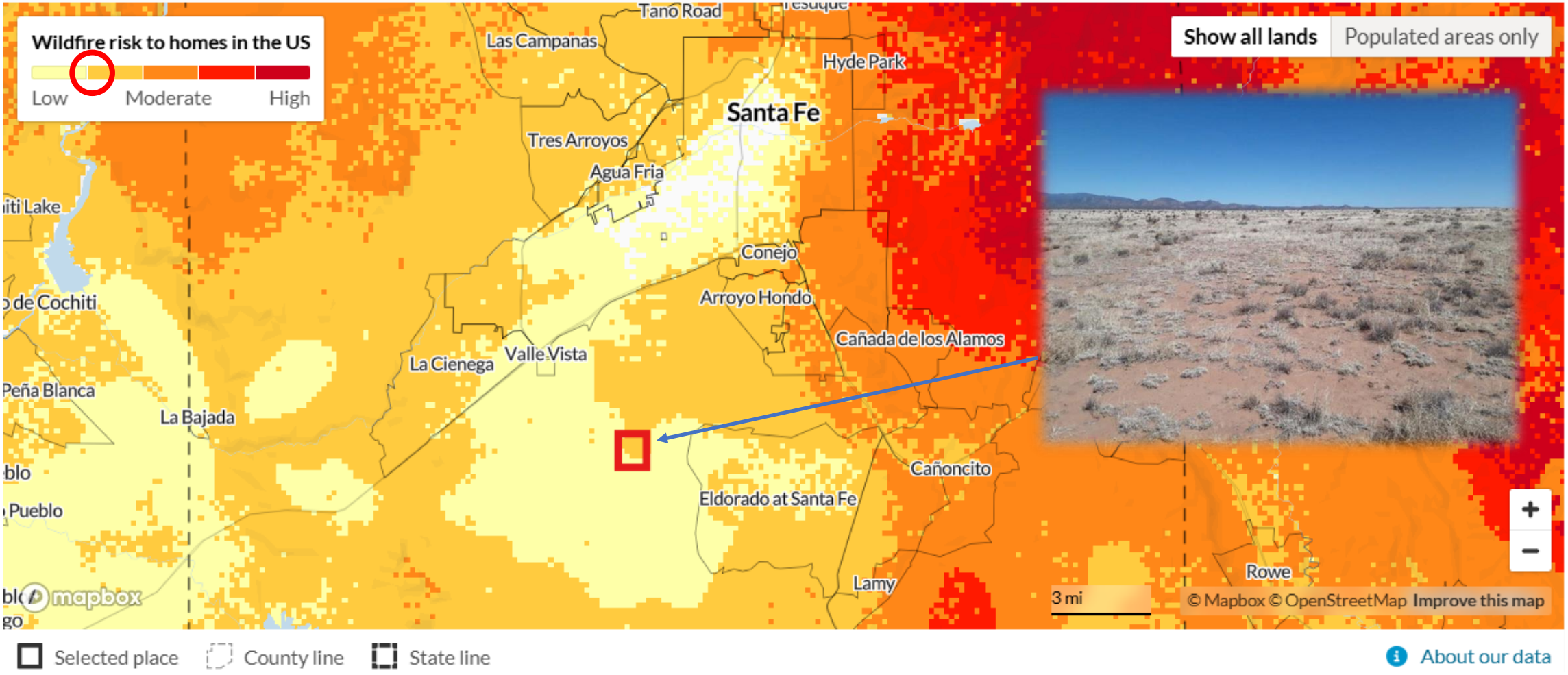
Santa Fe County Wildand Urban Interface Areas

- Extreme
- High
- Moderate
- Not Classified
- County Boundary
- Fire Districts

The source data consists of the vegetation classification from the U.S. Forest Service 2014 Landfire Mapping. The classifications have been aggregated and grouped into categories appropriate for the Santa Fe County region. Fire hazard severity levels were then determined based upon these categories.



Project Location – Low-Moderate Wildfire Risk



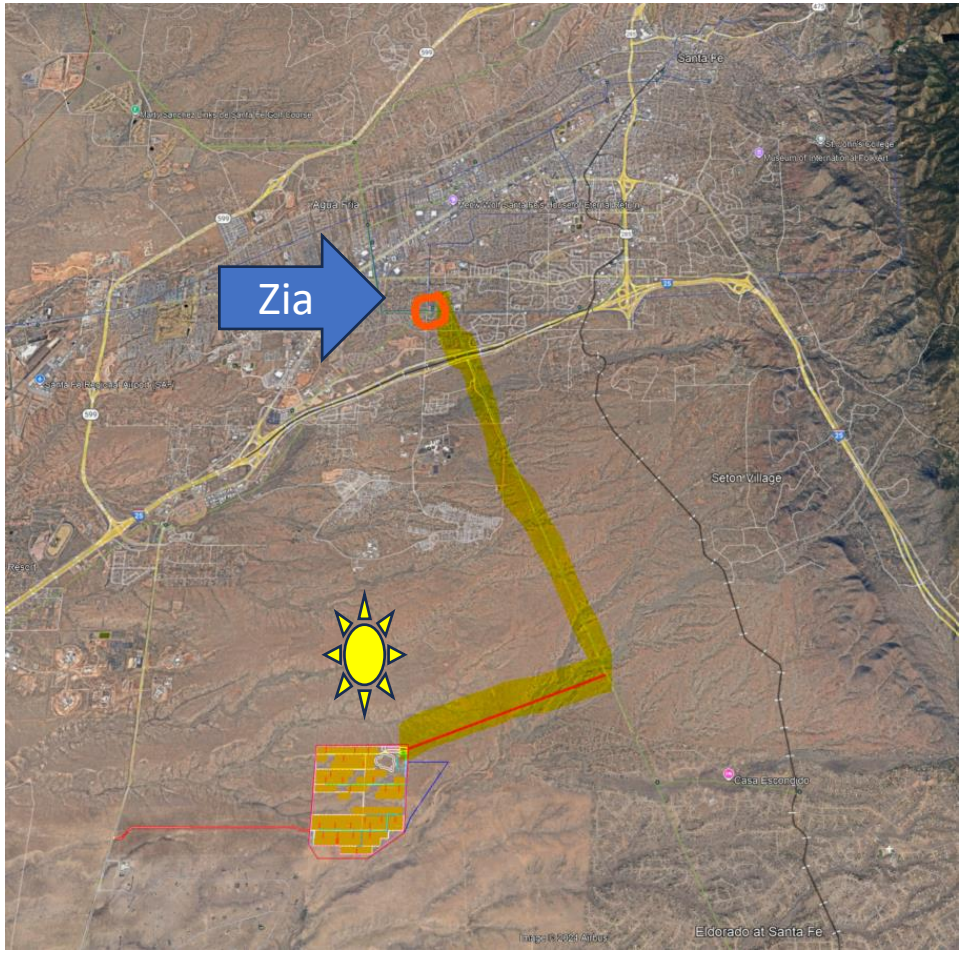
Project location approximated. Source: https://wildfirerisk.org/

Wildfire Risk Reduced with Defensible Space

Representative BESS yard for illustrative purposes of defensible space. Not Rancho Viejo visualization

Concrete pads, graveled BESS yard, and perimeter road give distance to vegetative fuel

Project Location - Where does the power go?



The following types of resources are of specific interest to PNM under this RFP:

- Stand-alone short-duration and long-duration energy storage and hybrid renewable-storage projects that maximize benefits to PNM ratepayers by capitalizing upon the
- Resources located near PNM's load center or load-side resources that avoid transmission curtailment risks and/or the need for significant transmission upgrades;

18) Transmission Deliverability: To the extent applicable to the Proposal offered, provide proof that the quoted capacity can be delivered via the electric transmission system to PNM's load (including documentation demonstrating that either (i) firm transmission service is available or (ii) a viable plan for firm transmission service to enable the delivery of energy to PNM's load is in place) with a copy of any associated agreements included in the Proposal. Proposals must account for delivery to PNM's system at one of the following locations:

- Albuquerque and Rio Rancho Load Center;
- South of the Albuquerque Load Center (Los Lunas/Belen);
- San Juan;
- Four Corners;
- West Mesa;
- Clines Corners;
- Zia; or
- Norton.

Excerpt: DRAFT PNM 2029-2032 Resource RFP

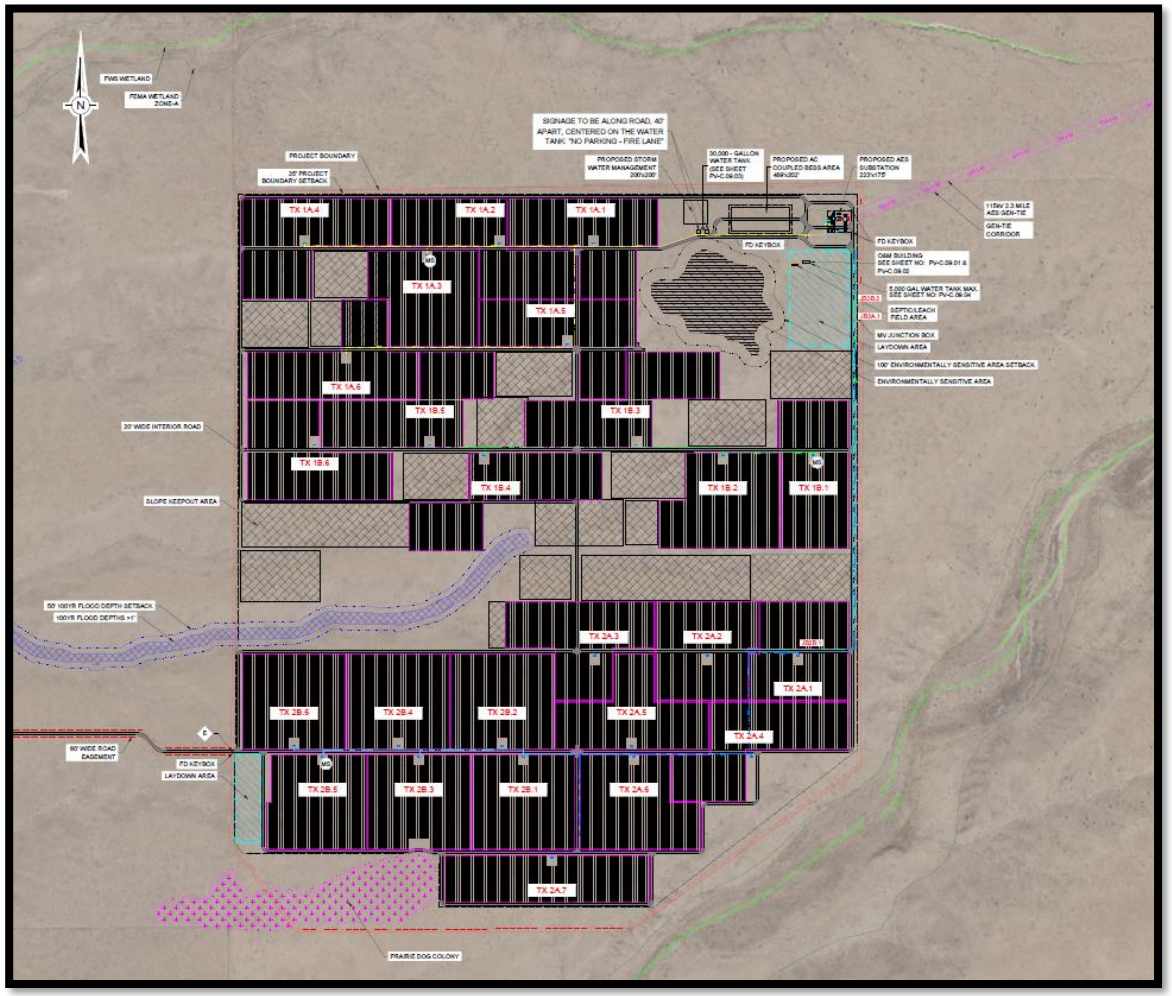
SEARCHLIGHT NEW MEXICO
INDEPENDENT INVESTIGATIVE JOURNALISM

HOME TOPICS SERIES SUBMIT TIPS ABOUT NEWSLETTER

"When we have a contract, it's completely exclusive and the vendor cannot sell energy to anyone else," said Raymond Sandoval, a spokesman for PNM, the state's largest electricity provider. "PNM charges and discharges the battery at its sole discretion, and operates the facility to the sole benefit of PNM customers." While acknowledging that "there really isn't a way to know where the power is going to go," Sandoval said PNM wants to "use it first here in New Mexico." If there's excess energy in the system, that could be sold out of state and the profits used to reduce rates for PNM customers, he added. If PNM and AES reach an agreement on the project, he assumes the generated energy mostly would be sent to Santa Fe and Albuquerque.

https://searchlightnm.org/burning-question-whats-the-right-place-for-a-solar-farm/

Project Overview



Technical Specifications

- 115 MW DC solar photovoltaic source
- 96 MW AC output
- 48 MW / 192 MWh battery storage (4 hours)
- Feed into PNM transmission grid
- ~271 GWh of clean energy, aprox. equivalent of annual residential load of Santa Fe
- Fully power Santa Fe at times of max output
- 100% renewable energy goal by 2045

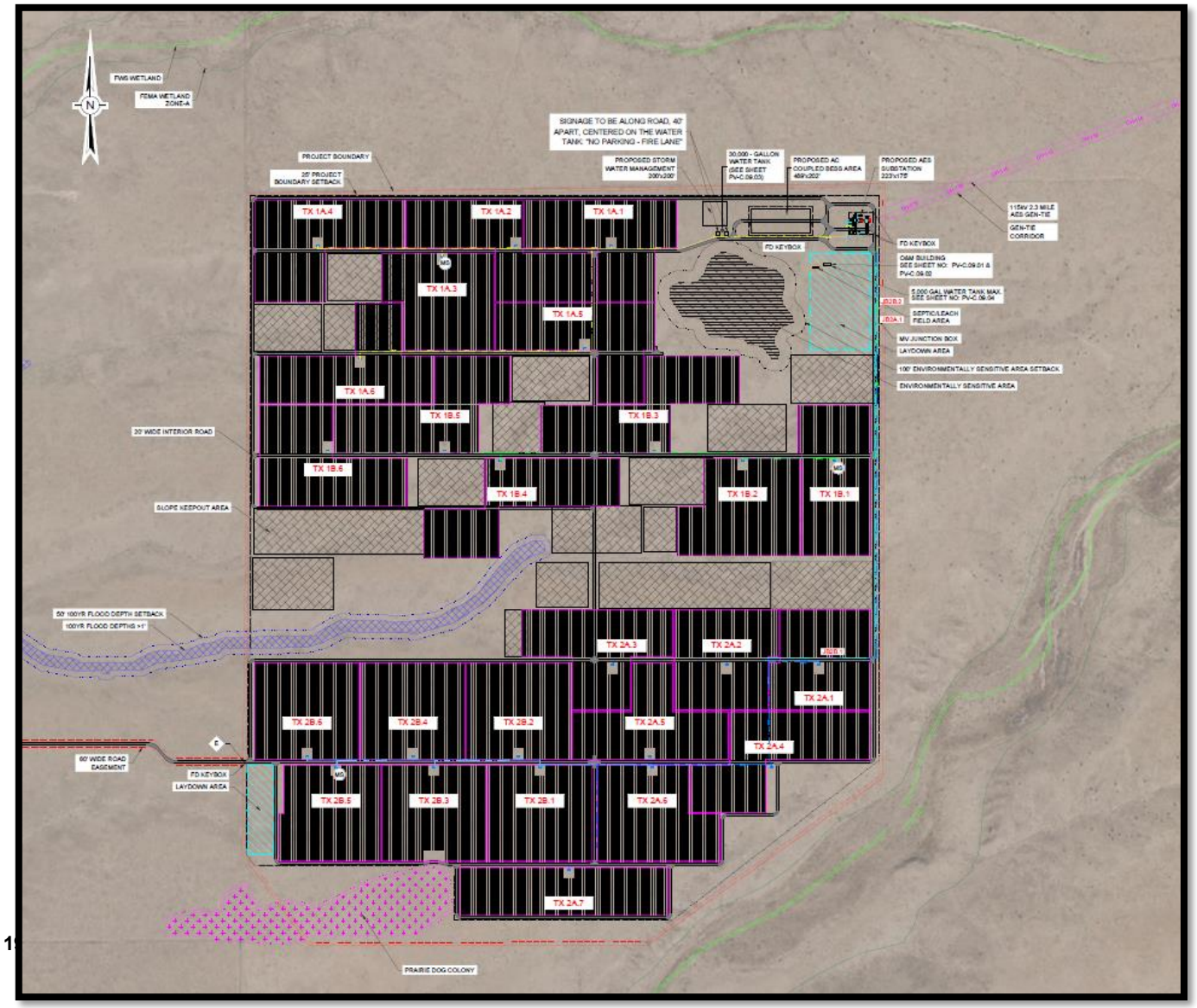
Temporary Use

- 35-year asset life
- Decommissioning and Restoration

Construction and Operation

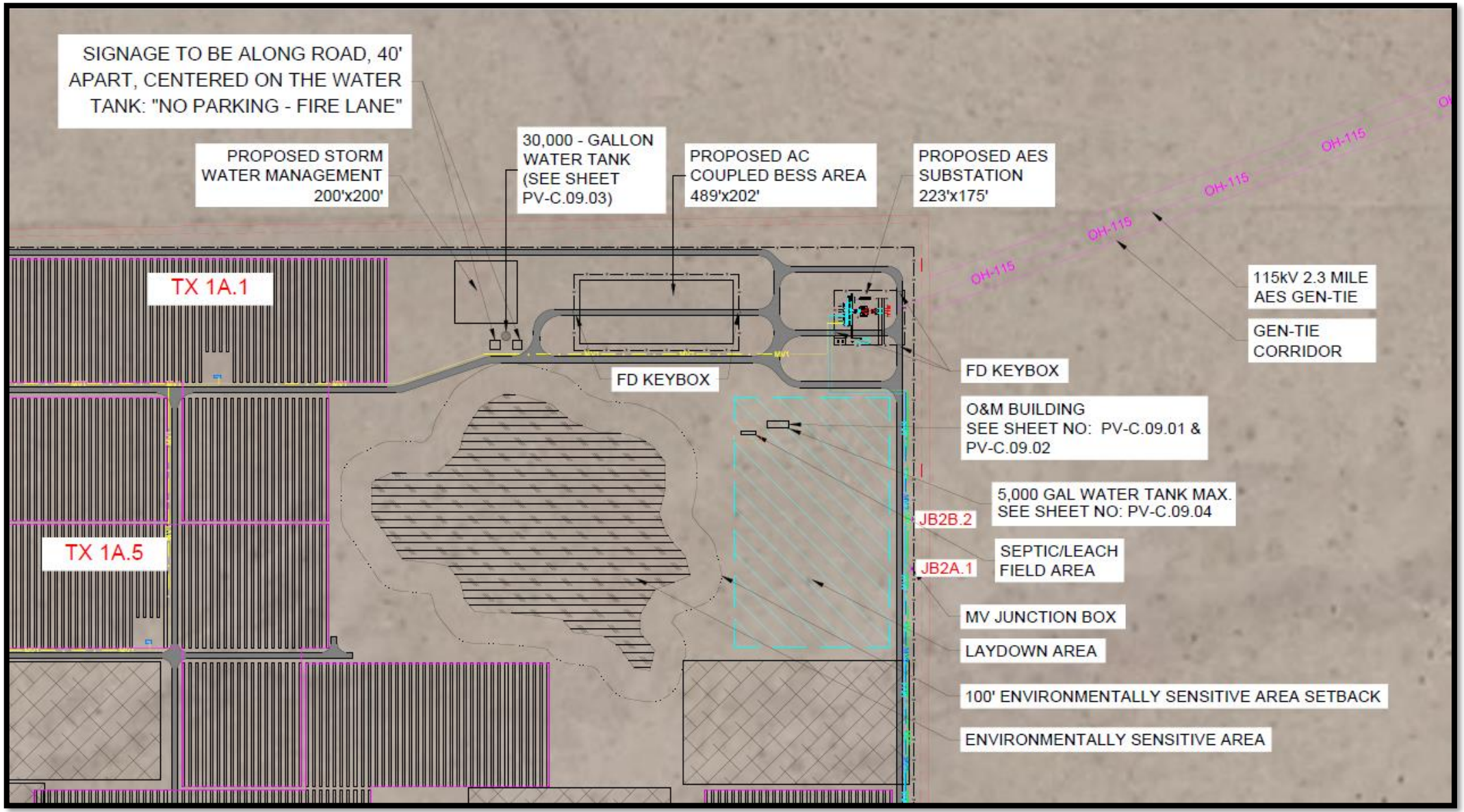
- Year-long construction process
- Remote & on-site operation with limited site traffic
- Low impact - minimal noise, water, lighting

Project Overview – Site Plan Updates



- **Removed array north of San Marcos**
- **Max panel height reduced to 8’**
  - Previously specified 12’
- **Perimeter access road**
  - Consultation with SFCFD
- **Water storage tank** – 30,000 gallon
  - 2021 IFC Chapter 5, Fire Service Features, Section 507, Water Supply
- **O&M building** – 1400 sq ft
  - IFC Chapter 12, Energy Systems, Section 1207.1.6.1, Fire mitigation personnel.
- **Monopole gen-tie**
  - Reduces poles from 33 to 23

Project Overview – Site Plan Updates



Project Overview - Solar Photovoltaic Modules

Structure Dimensions

- ~8’ max height at full 52° tilt in early morning/late evening
- 5’ 4” clearance at central rack and at flat tilt, or stow mode.
- 14’ 6” aisles between modules / 22’ post to post
- Currently specified with New Mexico-built trackers

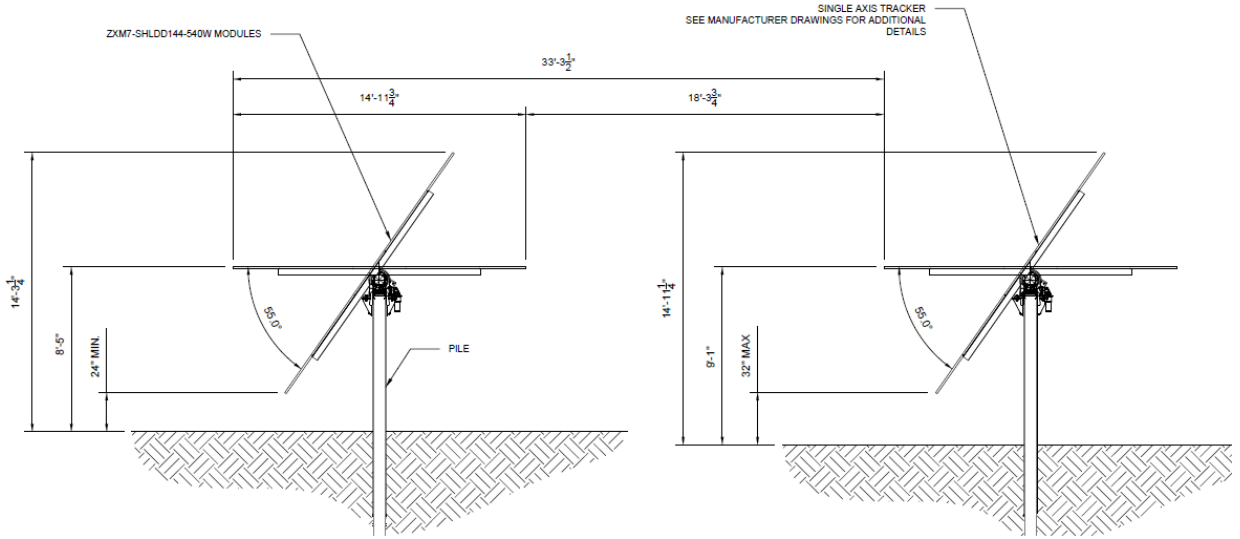


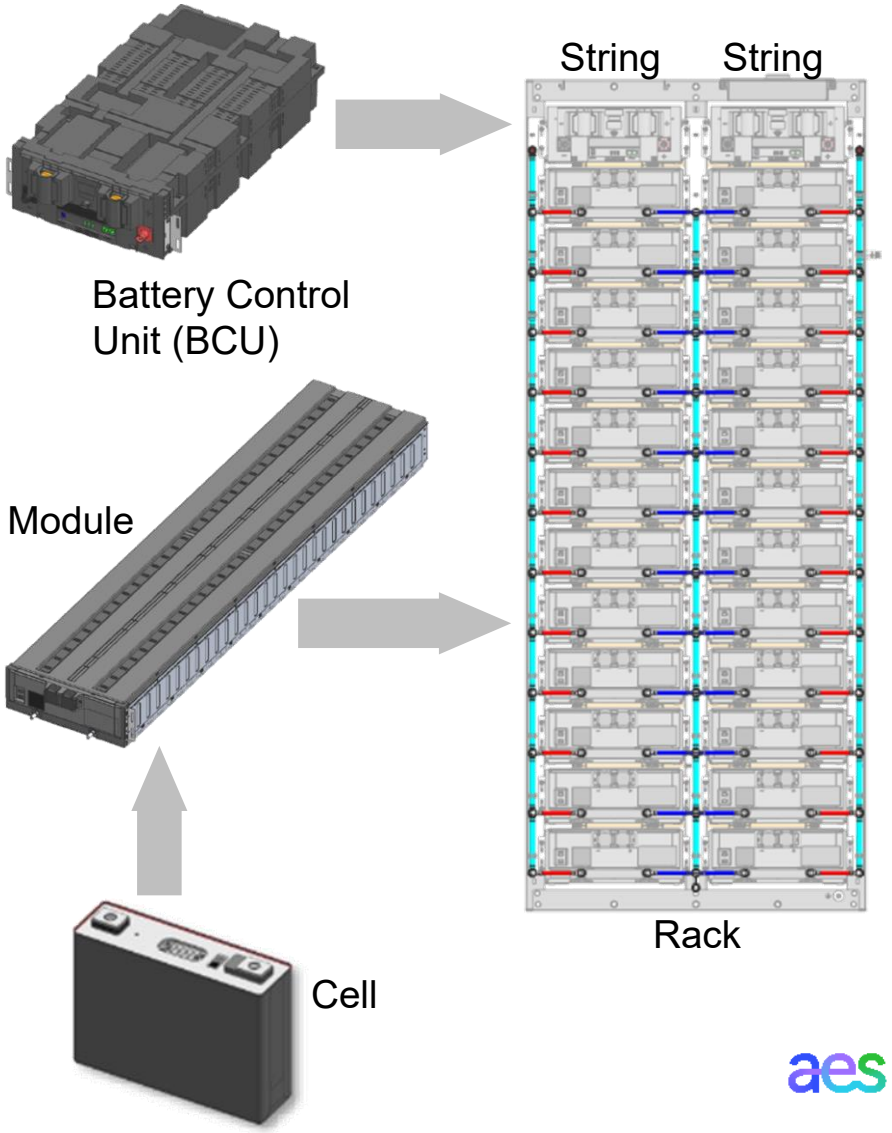
Image representative of tilt and function, clearances are not related to Rancho Viejo specifications

Project Overview - Battery Storage System

Table 4: E5S BESS System Specification Summary	
ESS System Manufacturer:	AES
ESS Model #:	AES Spec CEN-E5S
ESS Electrical Ratings:	8,068 kWh
ESS Max Voltage:	1494 Vdc
ESS Enclosure Dimensions:	40'-0" (L) x 8'-0" (W) x 9'-6" (H)
ESS Layout / Construction:	Non-Occupiable, Non-Walk-in, Non-Combustible 252 Modules per enclosure

Bank / System / "Installation Level"

Representative image from earlier containerized BESS solution



Project Overview - Battery Storage System

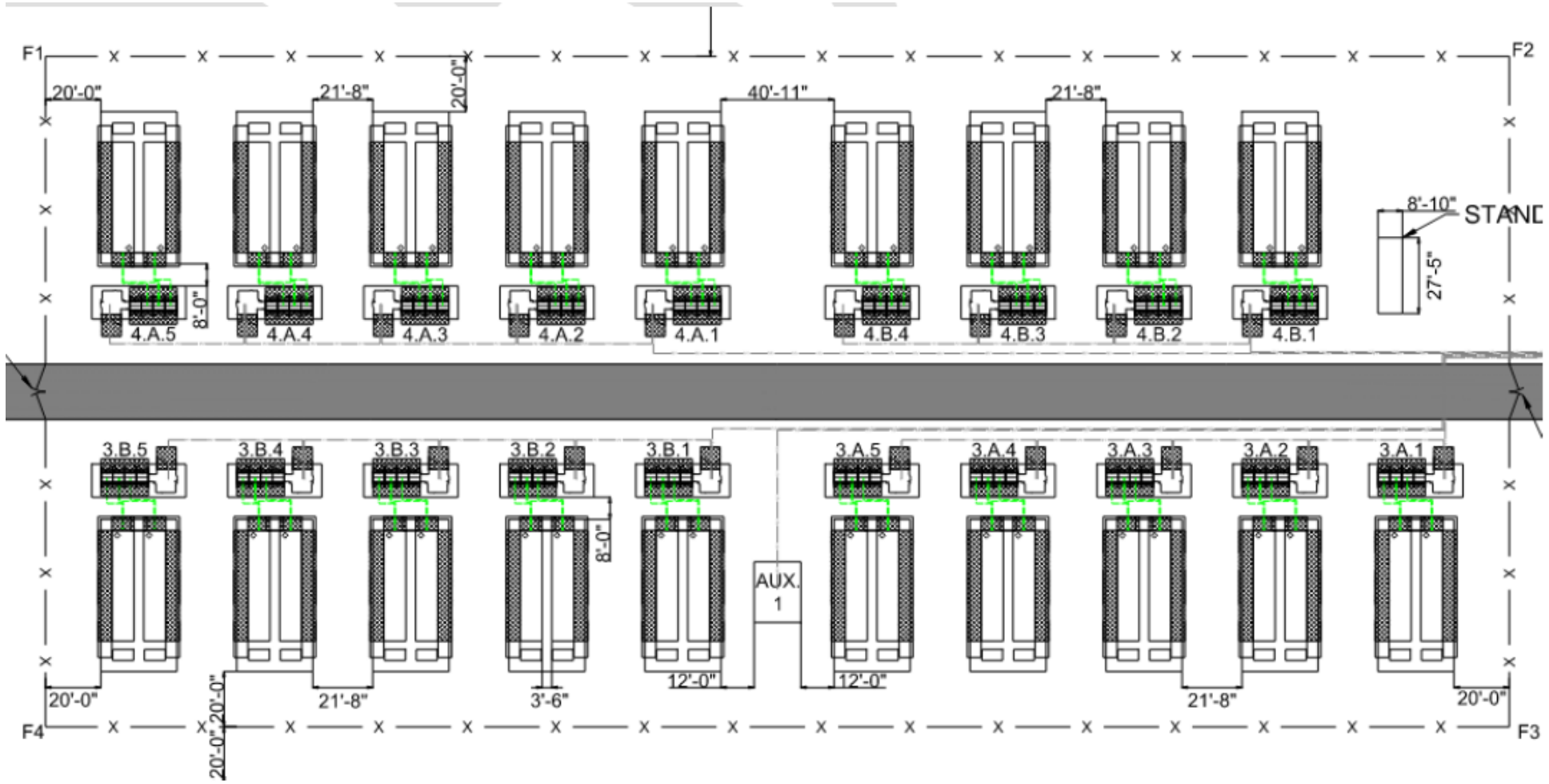
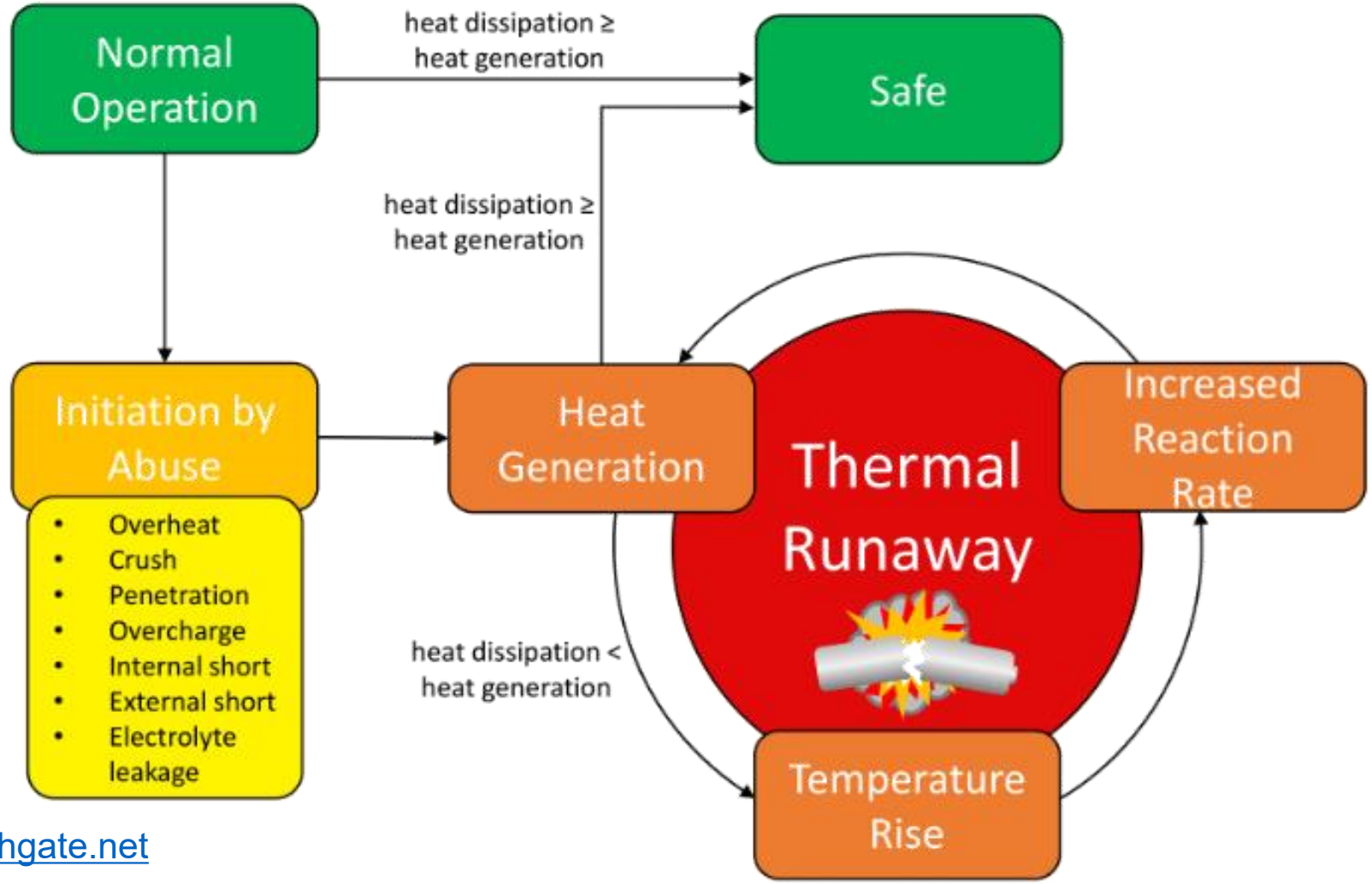


Figure 1 - Rancho Viejo BESS Site Plan

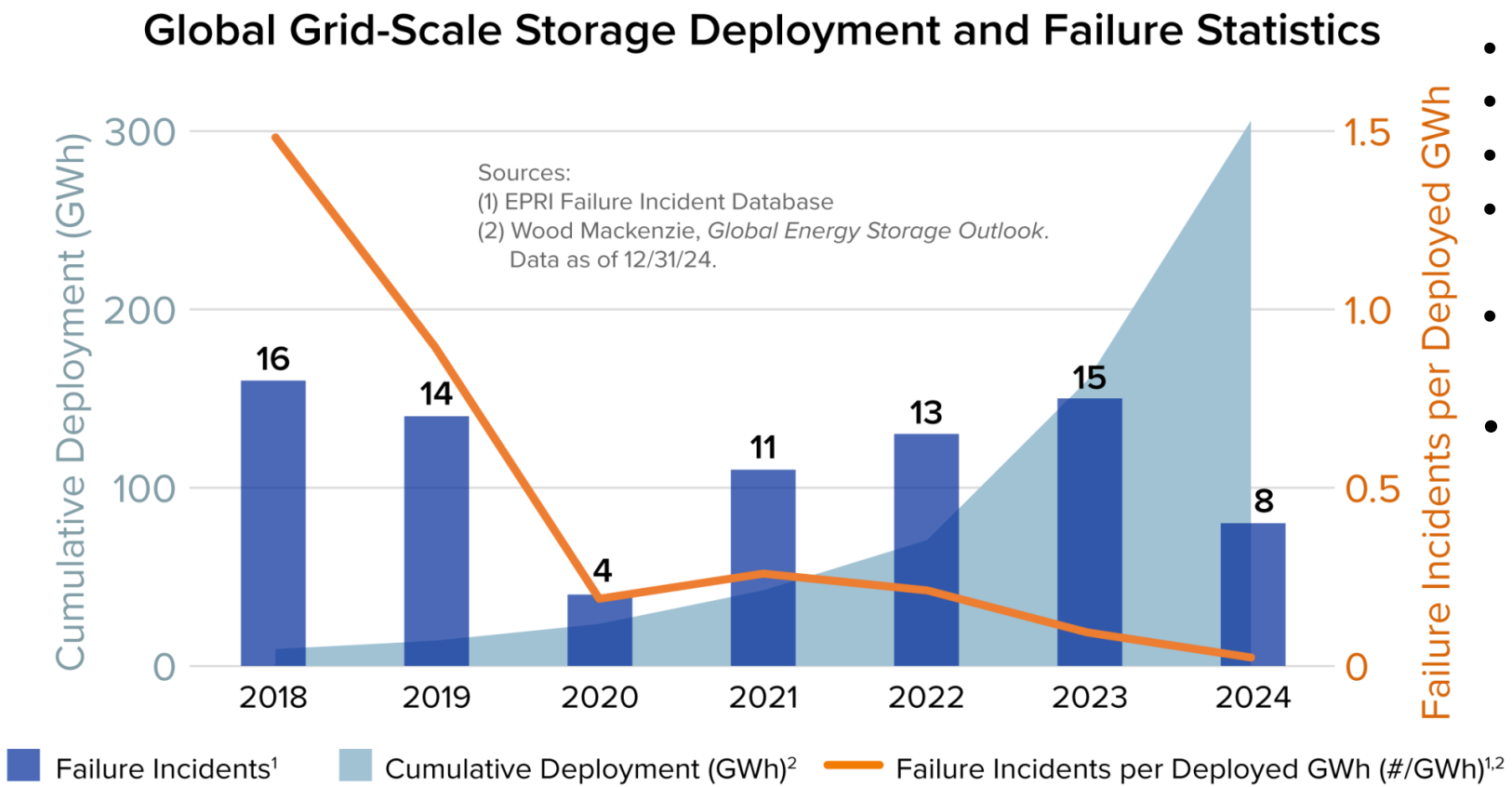
Energy Storage Hazards

What is Lithium Ion Thermal Runaway?



Source: researchgate.net

BESS Failure Rate Decreasing



- 90% of global battery capacity is Li-Ion
- 2023 Global Installed BESS: **+50 GW**
- 2023 U.S. new BESS capacity: **16 GW**
- 2024 U.S BESS doubled to **30 GW**

- **+400 MW BESS operating in NM**

- AES is a **global leader in BESS**
  - Safety is AES' #1 priority
  - Pioneer of technology for BESS
  - Operating BESS for >15 years
  - 2 GW of BESS in operation

Source: [BESS Failure Incident Database - EPRI Storage Wiki]

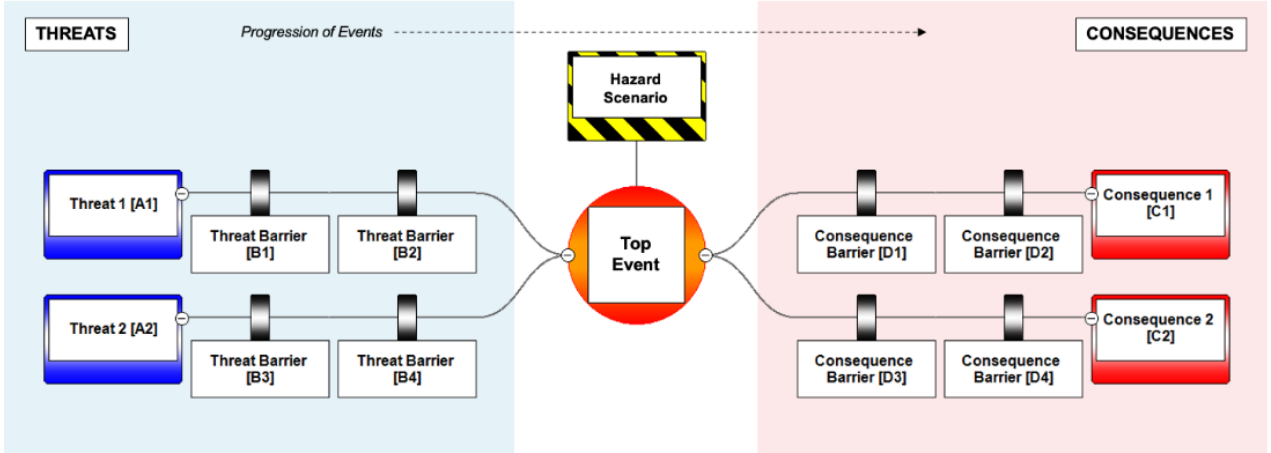
BESS Technology Evolution

	Early BESS Technology	Advanced AES Spec BESS
Enclosure Type	Walk-in Style	Non-walk-in, Containerized
BMS Protection	Yes	Yes
Internal Energy Sources	Batteries + Power Electronics	Batteries Only
Thermal Management	Air Cooling	Liquid Cooling
Gas Detection & Explosion Prevention	No	Yes
Smoke & Heat Detection	Yes	Yes
Fire Suppression	Disperse Clean Agent / Sprinkler	Targeted Clean Agent
NFPA 855 Compliant	No	Yes
UL 9540 Certified	No	Yes

No battery fires in over 6 years of AES Spec BESS operations.

Equipment Safety Approaches

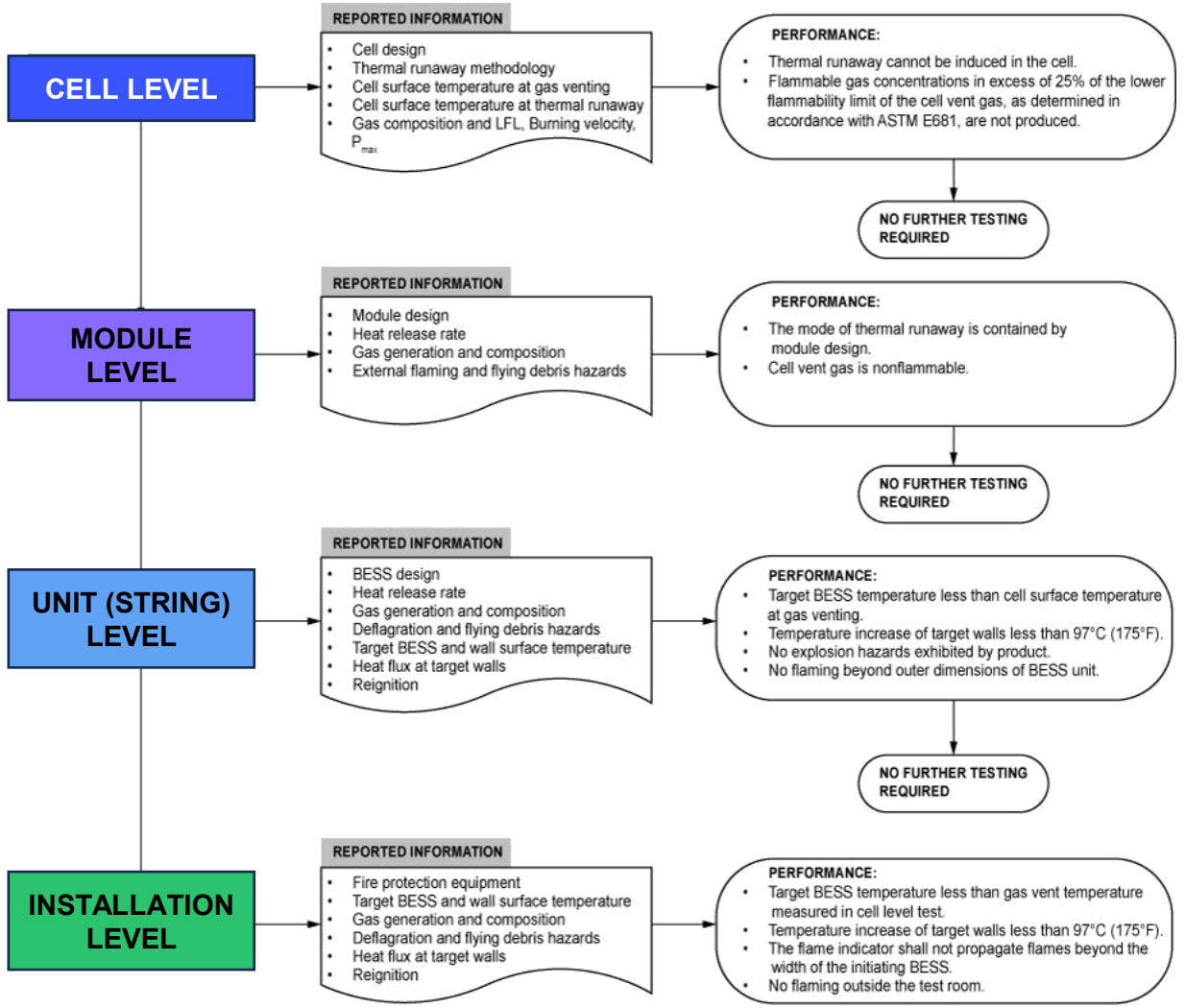
- Hazard Mitigation Analysis (HMA)
- Battery Management Systems
- Emergency Shutdown
- Flammable Gas Detection
- Fire Detection and Alarm
- Direct Injection Fire Suppressant
- Exhaust Ventilation
- Deflagration Venting
- First Responder Training
- Emergency Response Plans



Standardized Testing (UL 9540A)

Measurement of Hazard Characteristics and Severity

No Success or Certification Criteria Specified



Source: UL.com

ESS Safety Features

Passive Safety

Cell/Module Level

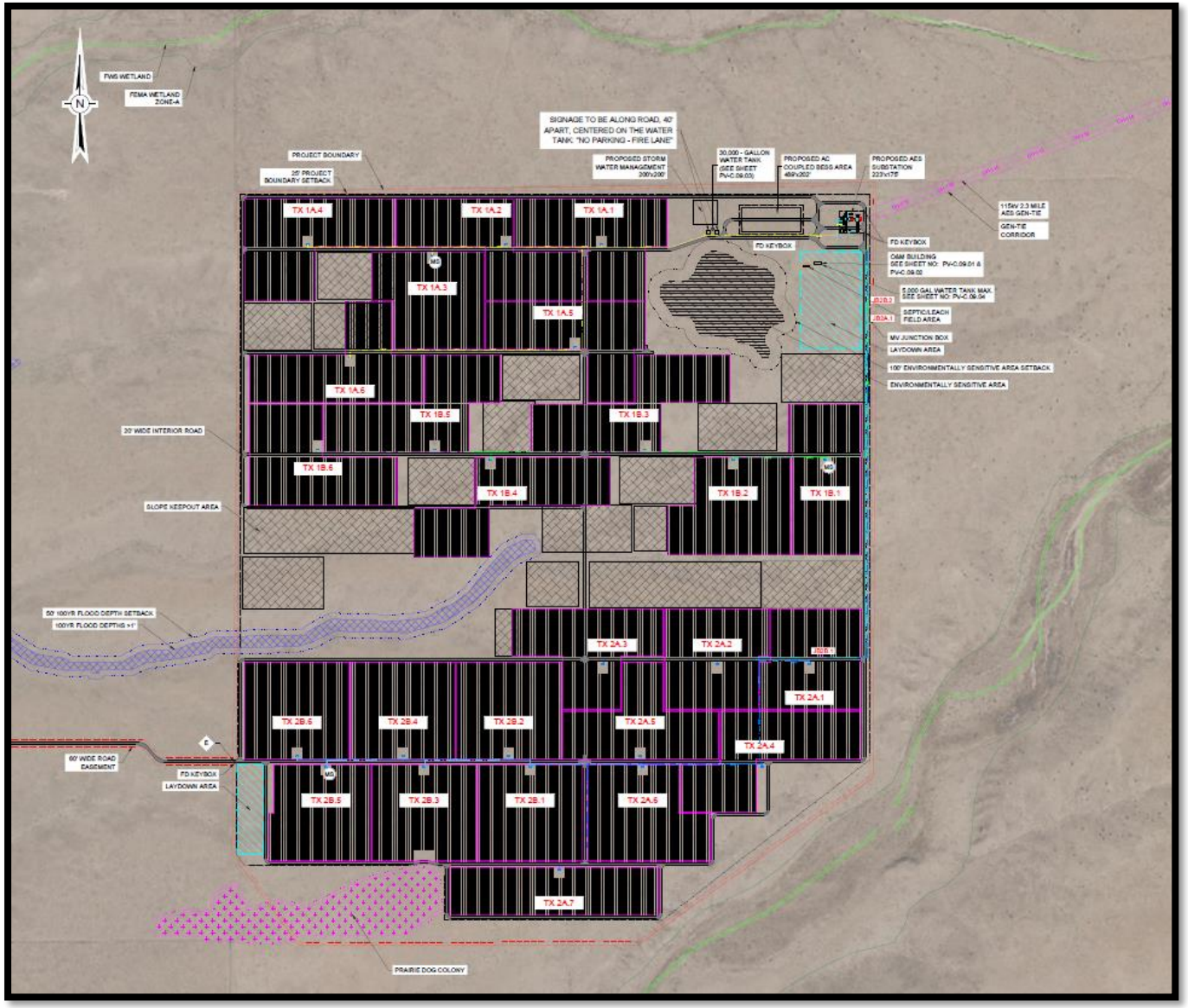
- UL 1642 and UL 1973
- Factory QA/QC
- Battery Management Systems (BMS)

Enclosure Level

- Insulation/Isolation
- Field QA/QC
- Environmental protection
- NFPA 68 Deflagration Vents

System Level

- Setbacks
- Defensible distance
- Fencing
- Monitoring



ESS Safety Features

Active Safety

Module/String Level

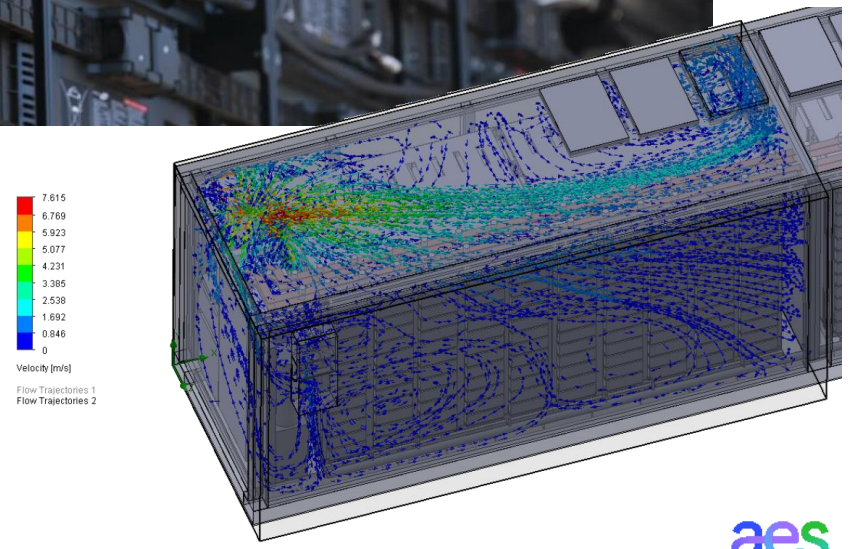
- BMS threshold disconnects
- Direct injection of clean agent fire suppressant

Enclosure Level

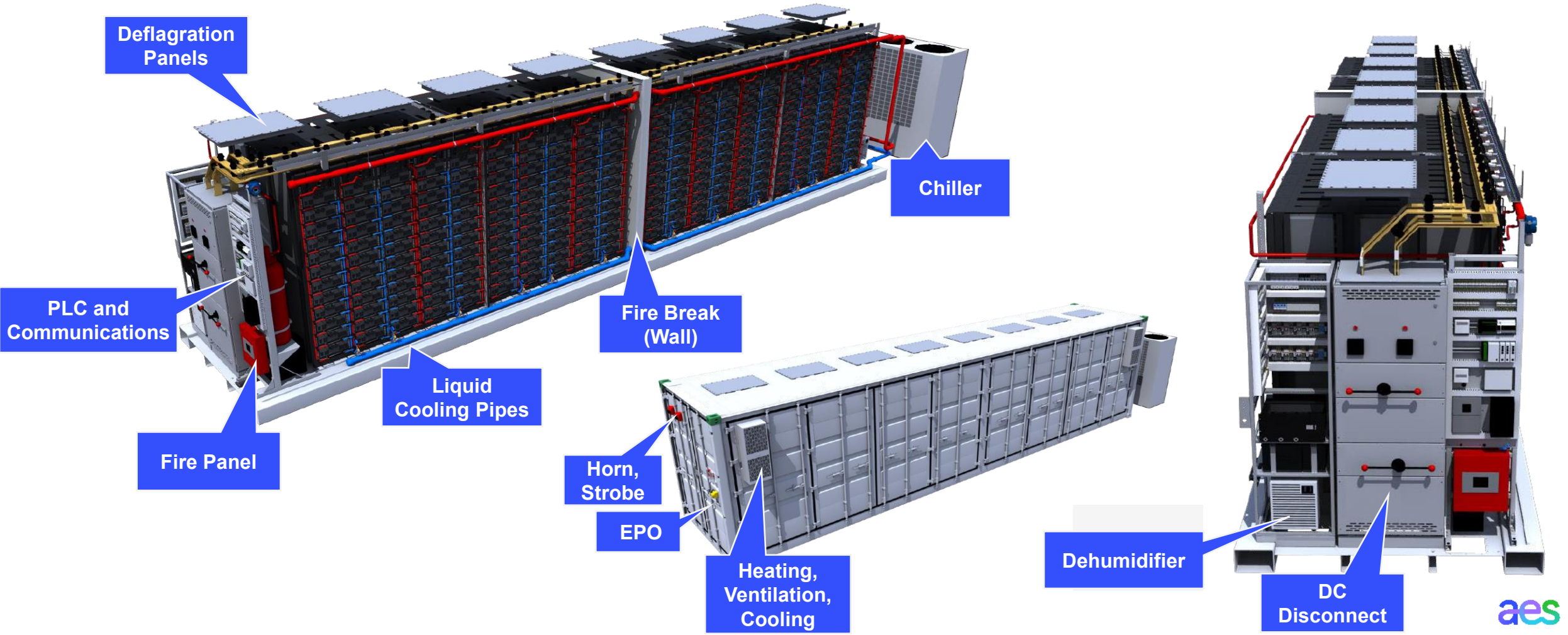
- Chillers/HVAC thermal management
- NFPA 69 Combustible Concentration Reduction
- Sensor-integrated controls
- Horn/Strobe Alarms

System Level

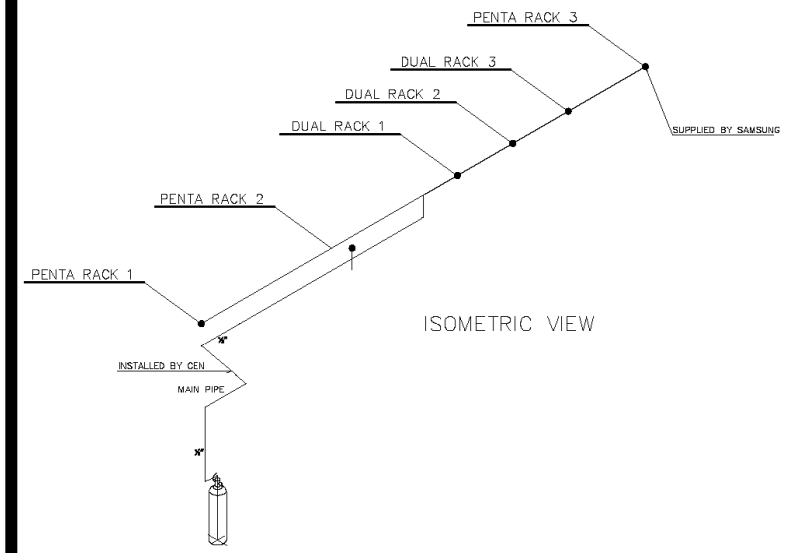
- Alarm-limited plant control
- 24x7 remote monitoring

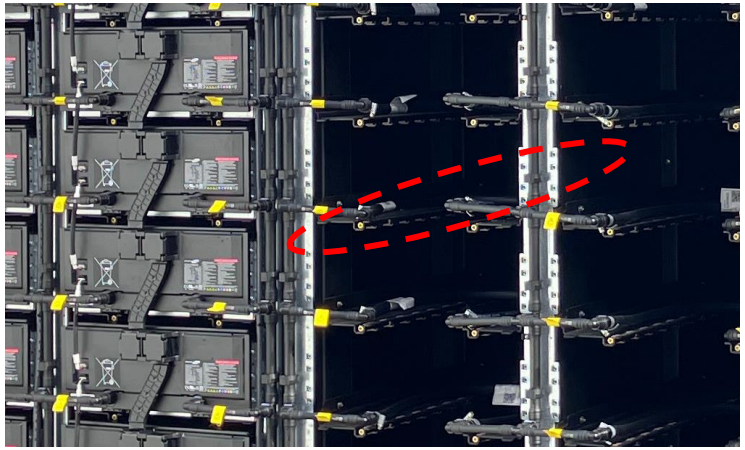


BESS Hazard Mitigation Features



Direct Injection Thermal Runaway Propagation Protection: UL9540A BESS Fire Safety Test



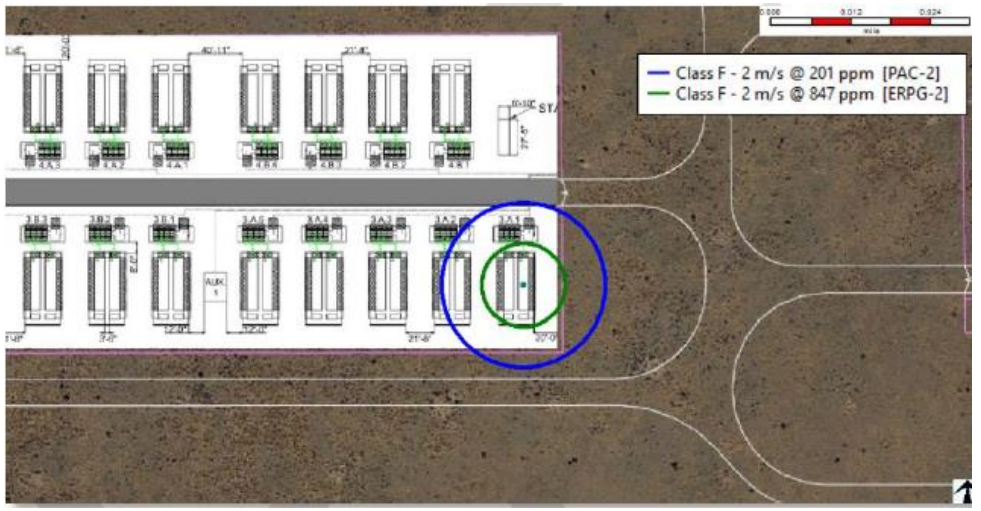


In the improbable event that all prevention mechanisms are defeated leading to venting...

Cell venting does not occur under standard operations.

Under extreme cell failure, combustible gases above toxic limits (PAC-2*) may travel to 87 feet.

Gases remain above typical breathing height, but are applied at ground level conservatively.



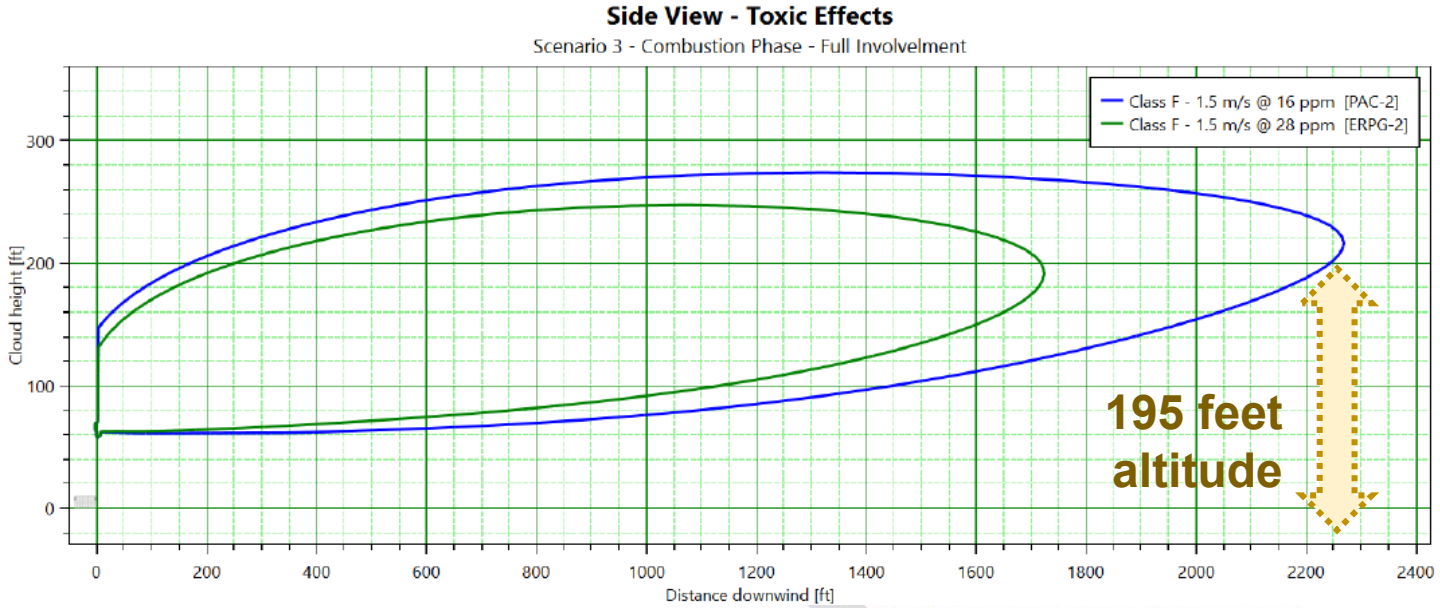
*Protective Action Criteria Database - DOE PacTeel, "generally accounts for exposure to unprotected persons, including sensitive individuals, to accidental releases of chemicals into the air"

In the improbable event that all prevention mechanisms are defeated leading to fire...

Battery fires do not occur under standard operations.

Under extreme failure after redundant fire protections are defeated, the modeled plume exceeding toxic limits (PAC-2*) may travel to 0.43 mile (<1/3 the distance to nearest residence) .

Gases remain well above typical breathing height, but are applied at ground level conservatively.



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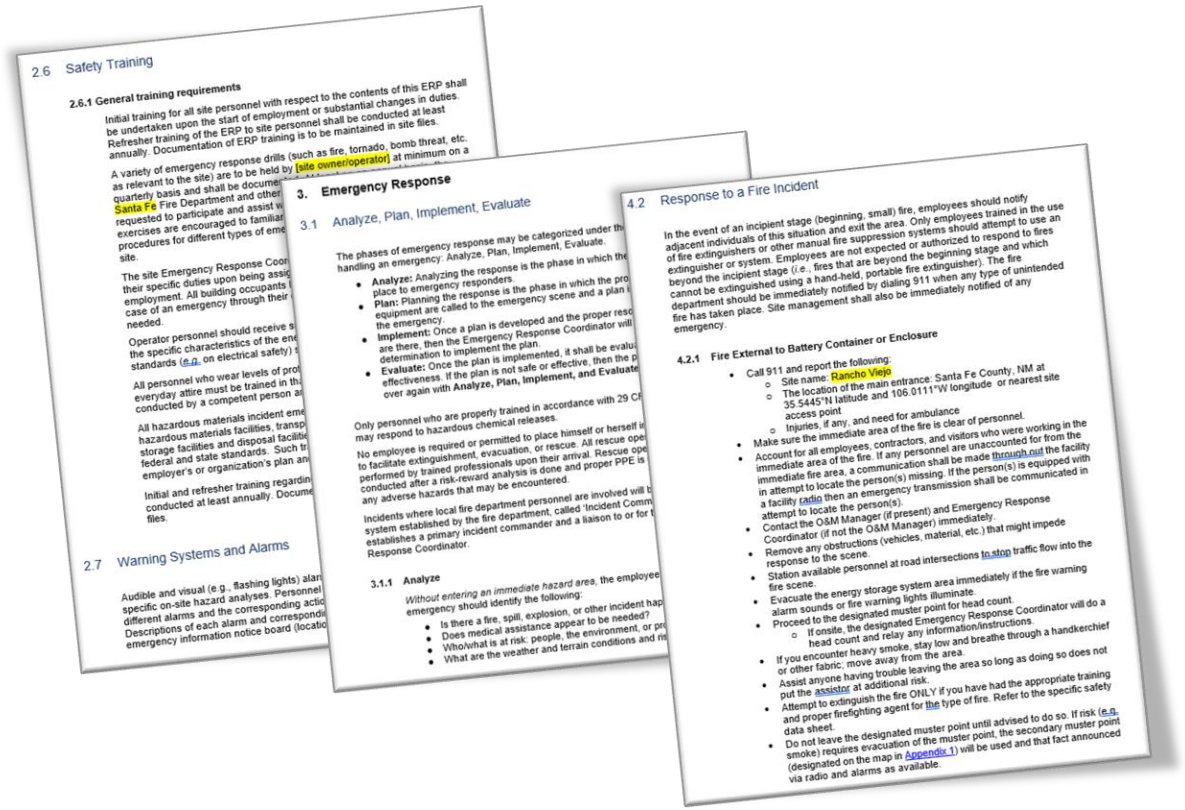
Emergency Response Plans

ERP Includes

- Emergency Response Management
- Emergency Response
- Fire Incidents
- Chemical Release
- Medical Emergency
- Security Incidents
- Environmental Hazards
- Cybersecurity



2.6 Safety Training

2.6.1 General training requirements

Initial training for all site personnel with respect to the contents of this ERP shall be undertaken upon the start of employment or substantial changes in duties. Refresher training of the ERP to site personnel shall be conducted at least annually. Documentation of ERP training is to be maintained in site files.

A variety of emergency response drills (such as fire, tornado, bomb threat, etc. as relevant to the site) are to be held by [site owner/operator] at minimum on a quarterly basis and shall be documented. Santa Fe Fire Department and other requested to participate and assist with exercises are encouraged to familiarize procedures for different types of emergency site.

The site Emergency Response Coordinator their specific duties upon being assigned employment. All building occupants in case of an emergency through their needed.

Operator personnel should receive s the specific characteristics of the emergency standards (e.g., on electrical safety)

All personnel who wear levels of protection everyday attire must be trained in the conducted by a competent person a

All hazardous materials incident emergency hazardous materials facilities, transportation storage facilities and disposal facilities federal and state standards. Such tr employer's or organization's plan and

Initial and refresher training regarding conducted at least annually. Documentation files.

2.7 Warning Systems and Alarms

Audible and visual (e.g., flashing lights) alarm specific on-site hazard analyses. Personnel different alarms and the corresponding actions Descriptions of each alarm and corresponding emergency information notice board (location

3. Emergency Response

3.1 Analyze, Plan, Implement, Evaluate

The phases of emergency response may be categorized under the handling an emergency: Analyze, Plan, Implement, Evaluate.

- **Analyze:** Analyzing the response is the phase in which the place to emergency responders
- **Plan:** Planning the response is the phase in which the equipment are called to the emergency scene and a plan the emergency.
- **Implement:** Once a plan is developed and the proper resp are there, then the Emergency Response Coordinator will determination to implement the plan.
- **Evaluate:** Once the plan is implemented, it shall be evalu effectiveness. If the plan is not safe or effective, then the p over again with **Analyze, Plan, Implement, and Evaluate**

Only personnel who are properly trained in accordance with 29 CF may respond to hazardous chemical releases.

No employee is required or permitted to place himself or herself in to facilitate extinguishment, evacuation, or rescue. All rescue oper performed by trained professionals upon their arrival. Rescue oper conducted after a risk-reward analysis is done and proper PPE is any adverse hazards that may be encountered.

Incidents where local fire department personnel are involved will b system established by the fire department, called 'Incident Comm establishes a primary incident commander and a liaison to or for t Response Coordinator.

3.1.1 Analyze

Without entering an immediate hazard area, the employee emergency should identify the following:

- Is there a fire, spill, explosion, or other incident hap
- Does medical assistance appear to be needed?
- Who/what is at risk: people, the environment, or pr
- What are the weather and terrain conditions and ris

4.2 Response to a Fire Incident

In the event of an incipient stage (beginning, small) fire, employees should notify adjacent individuals of this situation and exit the area. Only employees trained in the use of fire extinguishers or other manual fire suppression systems should attempt to use an extinguisher or system. Employees are not expected or authorized to respond to fires beyond the incipient stage (*i.e.*, fires that are beyond the beginning stage and which cannot be extinguished using a hand-held, portable fire extinguisher). The fire department should be immediately notified by dialing 911 when any type of unintended fire has taken place. Site management shall also be immediately notified of any emergency.

4.2.1 Fire External to Battery Container or Enclosure

- Call 911 and report the following:
  - Site name: Rancho Viejo
  - The location of the main entrance: Santa Fe County, NM at 35.5445°N latitude and 106.0111°W longitude or nearest site access point
  - Injuries, if any, and need for ambulance
- Make sure the immediate area of the fire is clear of personnel.
- Account for all employees, contractors, and visitors who were working in the immediate area of the fire. If any personnel are unaccounted for from the immediate fire area, a communication shall be made through out the facility in attempt to locate the person(s) missing. If the person(s) is equipped with a facility radio then an emergency transmission shall be communicated in attempt to locate the person(s).
- Contact the O&M Manager (if present) and Emergency Response Coordinator (if not the O&M Manager) immediately.
- Remove any obstructions (vehicles, material, etc.) that might impede response to the scene.
- Station available personnel at road intersections to stop traffic flow into the fire scene.
- Evacuate the energy storage system area immediately if the fire warning alarm sounds or fire warning lights illuminate.
- Proceed to the designated muster point for head count.
  - If onsite, the designated Emergency Response Coordinator will do a head count and relay any information/instructions.
- If you encounter heavy smoke, stay low and breathe through a handkerchief or other fabric; move away from the area.
- Assist anyone having trouble leaving the area so long as doing so does not put the assistor at additional risk.
- Attempt to extinguish the fire ONLY if you have had the appropriate training and proper firefighting agent for the type of fire. Refer to the specific safety data sheet.
- Do not leave the designated muster point until advised to do so. If risk (e.g. smoke) requires evacuation of the muster point, the secondary muster point (designated on the map in Appendix 1) will be used and that fact announced via radio and alarms as available.

Early and frequent coordination with local first responders is central to AES operations.

Project Diligence

Site Studies Performed

- **ALTA and topographical survey**
- **Aquatic Resources Inventory Report** – gen-tie to span crossing of jurisdictional feature
- **Biological Survey Report** – no federal/state T&E species, prairie dog/burrowing owl avoided
- **Phase I Environmental Site Assessment** - no REC, CREC, & HREC
- **Hydrologic and Hydraulic Study** - minimal flood hazard for solar project development
- **Cultural Resources Pedestrian Survey** – sensitive resources avoided
- **Site Thresholds Analysis** – additional traffic impact studies are not warranted
- **Visual Impact Assessment** – would not unduly impair visual resources
- **Appraisal Solar Impact Study** – no anticipated impacts to values; Matched Pair Analysis done to Uniform Standards of Appraisal Practice by Appraisal Institute

Project Diligence

Site Studies Performed

- **Environmental Impact Report** – no significant resource issues
- **Noise Technical Report** – Operational noise would not be perceived by a human observer
- **Geotechnical Investigation Report** – Completed to inform project design
- **Decommissioning Plan** – Prepared in accordance with the 2021 IFC; Section 1207.2.3 of the Santa Fe Fire Code; and the applicable sections of the Santa Fe County SLDC
- **Preliminary Hazard Mitigation Analysis** – Prepared in accordance with NFPA 855, Standard for the Installation of Energy Storage Systems and IFC
- **First Responder Mitigation Guidelines** – Developed to provide BESS response guidance, emergency planning and training to first responders and AES BESS personnel and contractors
- **Pre-Incident Plan** – Identifies fire protection, fire alarm and safety systems, special conditions and hazards, and response and staging information
- **Plume Study** - Modeled failure scenarios and resulting plumes, none of which result in toxicity to unprotected persons > 0.4 miles


AES RANCHO VIEJO 96 MWAC/115.2 MWDC SOLAR
& 48 MWAC BATTERY ENERGY STORAGE SYSTEM (BESS)
PRE-INCIDENT PLAN (4152 NM 14, Santa Fe, NM 87508)
35.5415, -106.0106

Santa Fe County FD
Review Date:
By:

FACILITY: Rancho Viejo BESS | BUILT: In Progress #Units 38 CENs | DATE: July 2024
24 Hr Emergency Contact: SLC ROCC - 855-679-3553 | Contents: Lithium-Ion Battery ES Array

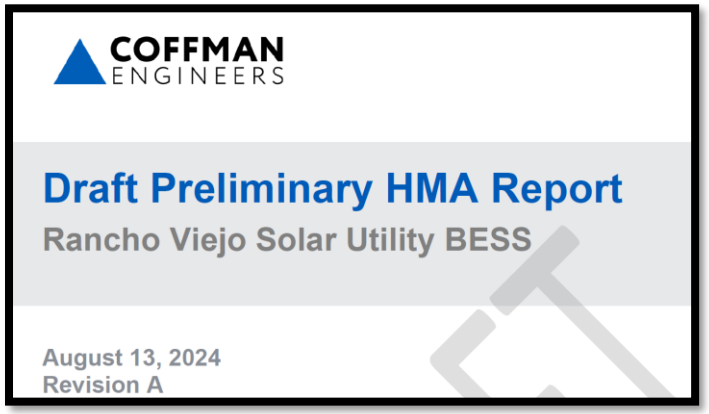
FIRE PROTECTION, FIRE ALARM & SAFETY SYSTEMS
- Battery Management System
- Novec Suppression
- Monitored 24/7 SLC ROCC
- FM Detection
- Gas Detection (H2 & CO)
- Fire Alarm Panel
- E / F Stops
- Manual Pull Station
- Exterior Horn/Strobe
- Explosion Venting

CONSTRUCTION INFORMATION
Type: Metal | Height: 9.5ft | Length: 40ft | Width: 8ft
Occupant Load: Unmanned
Onsite Water Supply
1. 29K Gallon Tank
Fire Flow: N/A
Enclosure Design: "AES Spec" CEN Unit, Samsung SDI-ESS Modules
Exposures: •North – •South – •East – •West –

SPECIAL CONDITIONS AND HAZARDS
- STOP: (Maintain 150 ft) Emergency Responders DO NOT MAKE ENTRY into the AREA or ENCLOSURE without Prior BESS & PIP Training & BESS ESCORT
- ***LITHIUM-Ion BATTERIES & HIGH VOLTAGE***
- EMERGENCY Battery Cutoff (FOR AES USE ONLY) is located at the BESS Enclosure.
- CAUTION: Overhead High Voltage Lines.
- CAUTION: Sample BESS Area LEL Before Entry; Battery Off Gases can provide an explosive atmosphere.
- CAUTION: After power shutoff (Stranded Energy still Exists)
- CAUTION: Bulging & Heating of the Batteries, White Smoke & Hissing are signs of impending Failure.
- CAUTION: DO NOT come in contact with batteries/frames.
- Utilize SCBAs, Thermal Imaging/Gas Detection for initial entry & throughout the entire operation.
- Rescue Ops, utilize WATER Fog Pattern @ a 10 degree angle @ a 5-ft min distance, DO NOT use Class D Fire Extinguisher.
- Ensure PPE is Thermal, High Voltage & HazMat Rated.
- Enclosure is ONE Fire Area; Lithium-Ion Battery Arrays in Open Racks throughout Each Enclosure.
- "Stranded Energy" Do not perform SALVAGE Operations.

RESPONSE & STAGING INFORMATION
- FIRST ALARM: Stage at Main Entry and await AES / REPI
- NOTE: Water Tinder Needed for additional water: Exposure Protection, and Defensive Posture Only.
- UNLESS Rescue is needed!
- NOTE: If horn / strobe of a Container is alarming, wait 6 hrs before approaching with AES Personnel escort, then evaluate. If heat or gas are elevated, wait another 4 hrs.

24/7 Emergency Notification: SLC ROCC | Phone: 855-679-3553


COFFMAN ENGINEERS

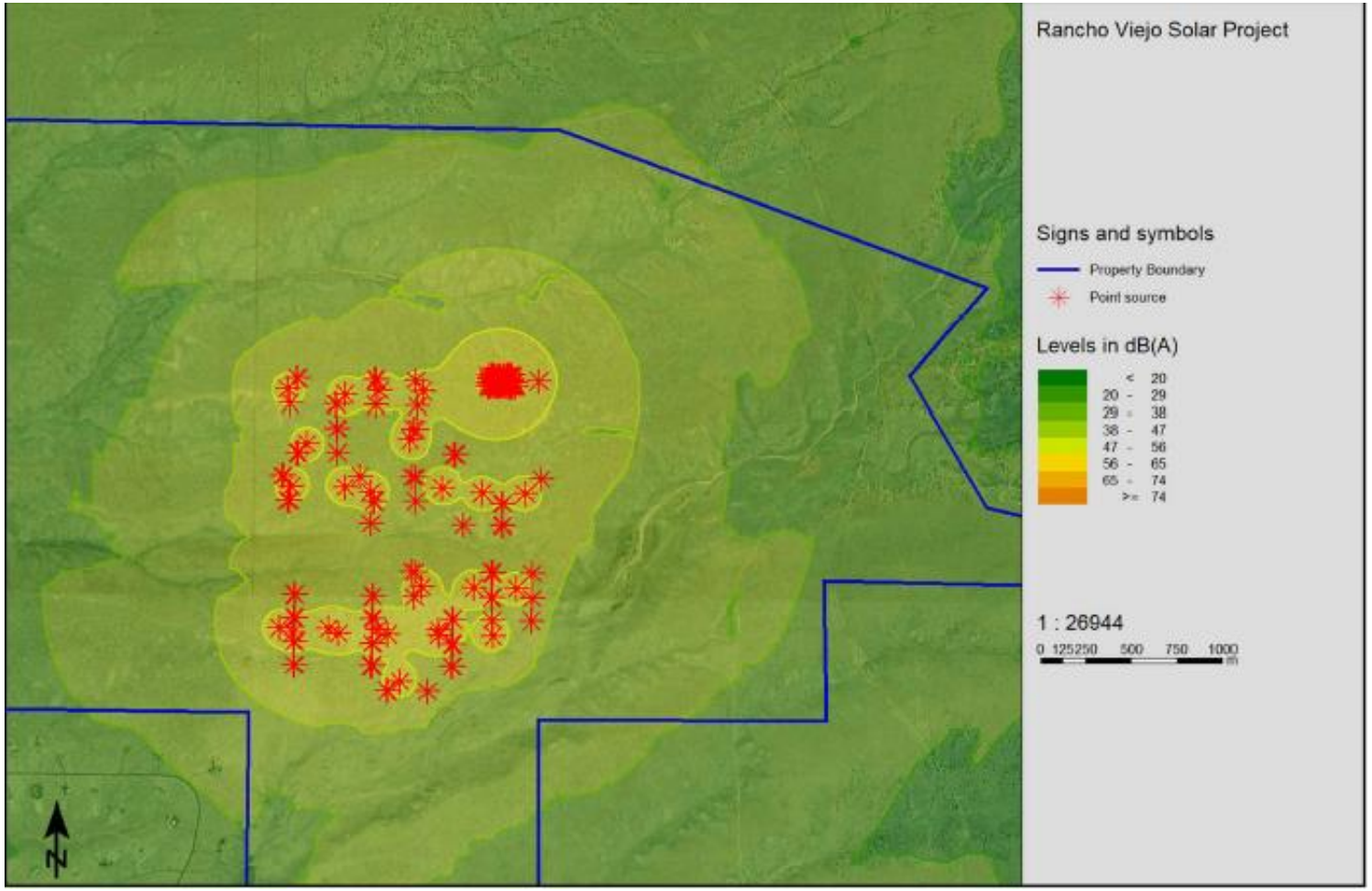
Draft Preliminary HMA Report

Rancho Viejo Solar Utility BESS

August 13, 2024
Revision A

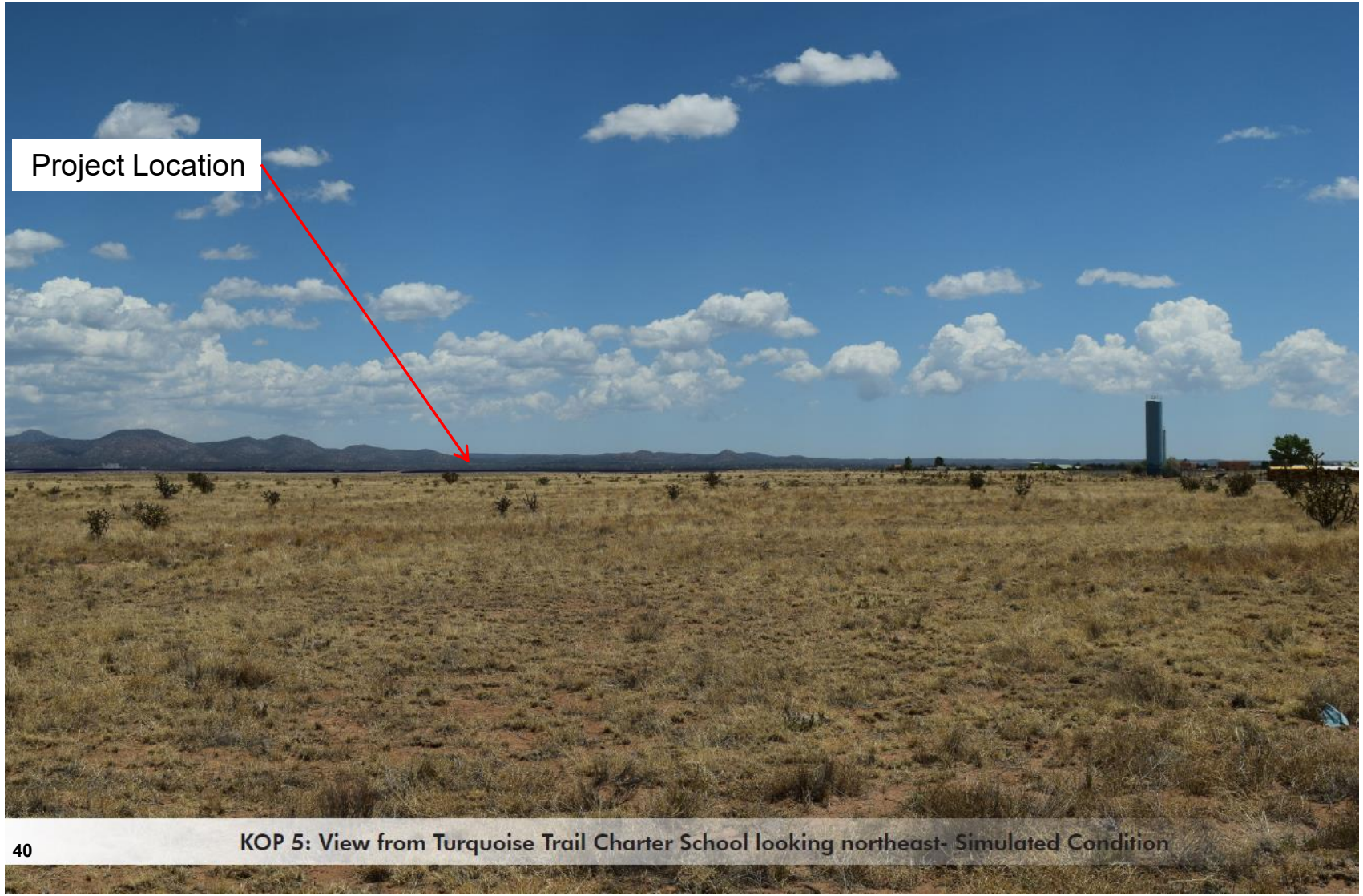
aes

Noise Technical Study



- Detailed operation-related noise modeling completed using SoundPlan
- Noise level at the closest property boundary of 40.6 dBA during daytime hours and 38.4 dBA during nighttime hours
- Calculated noise levels emitted would be below Ordinance No. 2016-9 Chapter 7 – Sustainable Design Standards
  - Daytime: 55 dBA, or 5 dBA above ambient ; whichever is less. (note: ambient daytime noise is 38.4 dBA).
  - Nighttime: 45 dBA, or 5 dBA above ambient; whichever is less (note: ambient nighttime noise is 34.0 dBA)

Visual Simulation – View from Hwy 14



KOP 5: View from Turquoise Trail Charter School looking northeast- Simulated Condition

Photo capture location

Visual Simulation – View from Camerada Loop (Monopole)

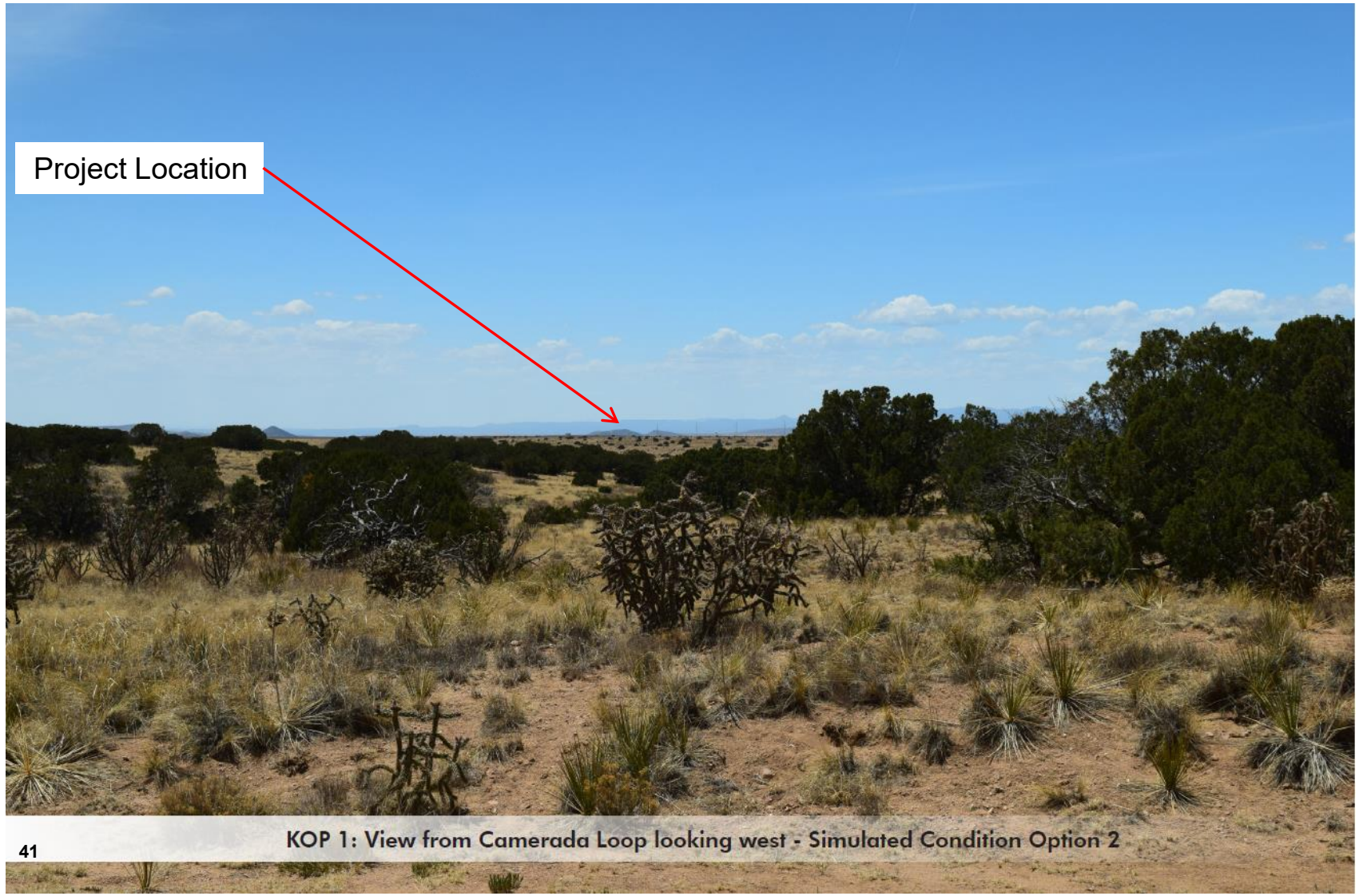


Photo capture location

Monopole structures up to 70 feet in height with structure spans ranging from 250 feet to 450 feet.

Visual Simulation – View from Nearest Resident

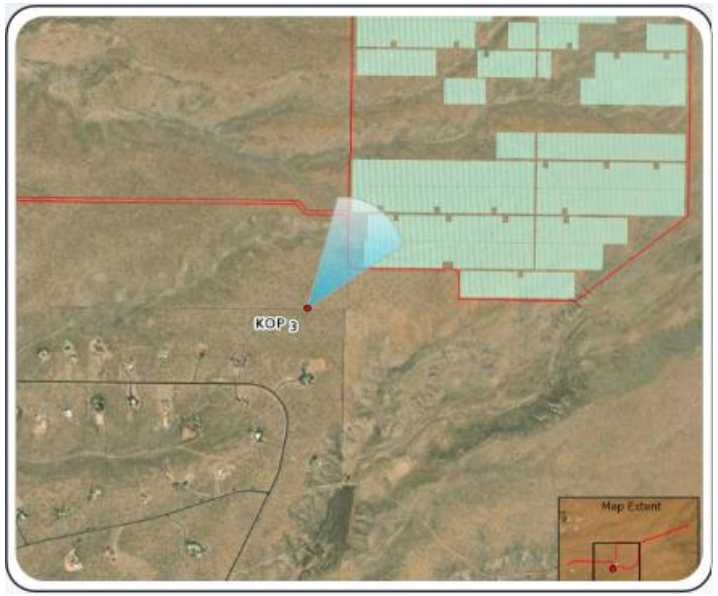


Photo capture location

Taken at nearest property boundary. Residence is still 1000ft further away.

FK 5-1-12 Clean Agent Fire Suppression

- Non-PBT (persistent, bio-accumulative, toxic) clean agent!
  - ➢ EPA SNAP approved fire suppressant
- Housed in canister within BESS enclosure

- BESS enclosures have an ingress protection (IP) rating of IP55, no leaking at low pressure.
- Applied inside the BESS enclosure **directly** at affected battery cell, vaporized upon contact
  - ➢ Not a flooded application
- Water not to be applied to affected container – no medium for groundwater contamination

Table 2.5: Halogenated gaseous agents used in total flooding applications – environmental factors

Generic Name	Ozone Depletion Potential (1)	Global Warming Potential, 100 yr. (2)	Atmospheric Life Time, yr. (2)
Halon 1301	10	7,140	65
HCFC-22 (component in HCFC Blend A)	0.055	1,760	11.9
HCFC-124 (component in HCFC Blend A)	0.022	527	5.9
HCFC-123 (component in HCFC Blend A)	0.02	79	1.3
HFC-23	0	12,400	222
HFC-125	0	3,170	28.2
HFC-227ea	0	3,350	38.9
HFC-236fa	0	8,060	242
FK-5-1-12	0	< 1	7 days
HFC-134a (component in HFC Blend B)	0	1,300	13.4
HFC-125 (component in HFC Blend B)	0	3,170	28.2

Note 1: Source: Montreal Protocol Handbook (2012)
Note 2: Source: IPCC 5th WGI Assessment Report http://www.climatechange2013.org/

Water Use - Construction and Operation

Construction Water (Temporary)

- 100 (*likely*) to 150 (*conservative*) acre-feet over a 12-month construction period
- Approximately 50 percent of construction water used will be reclaimed water

Operation Water Use

- 2-to-3 acre-feet per year for panel washing, and will be primarily reclaimed water
- O&M building potable water use will be 3,000 gallons per month

Time of Year	Trucked Class A Reclaimed Water	Daily Truck Trips[1]	Piped Hydrant Water
Water use of 150 acre-feet (134,000 gpd) over 12-month construction period			
April thru September	24,000 gpd	6	110,000 gpd
October thru March	80,000 gpd	20	54,000 gpd
Total Water Use by Source	18,980,000 gallons 58 acre-feet	--	29,930,000 gallons 92 acre-feet
Water use of 100 acre-feet (90,000 gpd) over 12-month construction period			
April thru September	24,000	6	66,000
October thru March	80,000	20	10,000
Total Water Use by Source	18,980,000 gallons 58 acre-feet	--	13,870,000 gallons 42 acre-feet

[1]Water trucks are assumed to be 4,000 gallons.

Estimated Project Timeline

2021
- TAC meeting
- Interconnection studies commence

2022
- Initial site studies commence
- 10% design complete

2023
- Initial CUP application submitted
- Site studies continue
- 30% design complete

2024
- Interconnection Agmt issued
- Site studies conclude
- Revised CUP application submitted
- Hearing Officer Meeting

2025
- PNM RFP submission
- Planning Commission Hearing
- Target permit CUP approval
- Target PPA /ESA contracting

2026-2028
- 100% design complete
- Contract EPC
- Initiate Construction in 2027
- Conclude construction/ interconnection in 2028

2028 – 2063
- Operate for 35 years
- Repower or decommission project
- Restore land

Benefits: Economic

Market-competitive supply of clean energy at a long-term fixed cost to PNM ratepayers

~200 construction jobs (direct)

~Contributions to local services (accommodation, restaurants, professional services)

>$200 million capital investment

~$28 million in labor and wages

~$5 million in wages/material within Santa Fe county

~>$18M in NM mfg output

~>$10 million in property taxes

~$4 million in est. GRT tax

~$3M to County

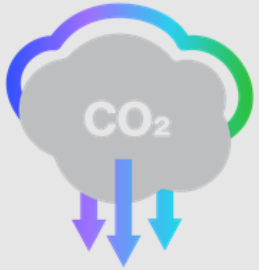
Benefits: Environmental

Low impact development that diversifies and strengthens grid resiliency in Santa Fe county

Serve **~1.1%** of all of New Mexico's load in support of its goal to procure 100% renewable energy by 2045

Renewable power for equivalent of **34,582*** homes' annual electricity use

*based on EPA Greenhouse Gas Equivalencies Calculator



Avoid emissions equivalent of **~36,493** gasoline powered cars annually

CUP Approval Criteria

SLDC, Section 4.9.6.5, Approval Criteria. CUPs 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;
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.

Response to Hearing Officer's Recommendations

Project is too big and close to communities

- Sized to generate clean energy equivalent to approximately the entire Santa Fe residential load/year
- BESS 1.5 miles from nearest residence
- Solar 1/3 mile from nearest residence, only 20 homes within 1 mile, most >1.5 miles

Concerns with BESS safety and previous incidents

- Prior incidents were earlier generation deployments lacking evolved safety features updated to NFPA 855 (2023) and UL9540 (2023) standards and associated fire safety codes

Ability for County to manage a potential BESS incident without a proper hazmat team

- Santa Fe County Fire Dept and Atar Fire independent consultant *"concluded that a sufficient level of information has been provided to validate the issuance of a Conditional Use Permit, as it pertains to fire and life safety code"* - **Conditional Use Permit Plan Review dated 10/11/24**

The proposed system is older, less safe type of technology

- Proposed BESS is latest generation technology designed and tested to NFPA 855 and UL9540

Response to Hearing Officer's Recommendations

Impact of PFAS from fire suppressant on groundwater

- Facility is primarily constructed and operated with solid-state materials; negligible liquids
- Not all PFAs are the same: FK 5-1-12 is non-PBT, contained, benign, and quickly evaporating in rare deployment
- Water is **not** used in a rare case of a thermal event -> no medium for groundwater contamination

Potential for wildfire

- Redundant fire safety design features diminish likelihood of a thermal event; laboratory tested
- Fire-rated enclosures, concrete pads, graveled perimeter, defensible space void of vegetation

Impact to property values and ability to obtain insurance

- Performed property appraisals conclude no likely impact to property value. No known evidence of home insurance affected by proximity of Solar and/or BESS projects to residence

Outdated/inaccurate info cited in recommendation

- *First Responder Mitigation Guidelines* cited had been updated on 10/10/2024 already, cited language had been removed to mention use of direct-injection clean agent fire suppression system

What we can do today

UNITED NATIONS

Thank you!

The sun sets on the horizon, but Rancho Viejo Solar will keep the lights on for Santa Fe into the night

Questions?

Contact us:

Email: RanchoViejoSolar@aes.com

Web: www.aes.com

Appendices

CUP Approval Criteria

SLDC, Section 4.9.6.5, Approval Criteria. CUPs 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;

- The project is designed and will be implemented to not adversely impact the health, safety and welfare of the surrounding area.
- The project will be developed to comply with all applicable requirements contained in the SLDC and all state and federal laws, and all codes and standards as adopted in Santa Fe County, including IFC, 2021 Edition and NFPA 855, Standard for the Installation of Stationary Energy Storage Systems, 2023 Edition.

2. tend to create congestion in roads;

- Traffic added to NM14 primarily to support temporary construction. Operational traffic will be minimal.
- A Site Threshold Analysis (STA) was submitted to NMDOT District 5 in support of the NMDOT Access Permit. NMDOT accepted the STA and requested application for a NMDOT Access Permit.
- NMDOT Environmental Design Division provided environmental clearance of the application. NMDOT Drainage Design Bureau provided acceptance of the application.
- NMDOT Access Permit was approved.

CUP Approval Criteria (continued)

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

3. create a potential hazard for fire, panic, or other danger;

- The project will comply with the most current applicable codes adopted by the State of New Mexico, Santa Fe County, and other entities.
- The project will include 20-foot-wide roads, 28-foot turning radii, and a 30,000-gallon on-site water tank.
- The BESS containers will be equipped with internal fire suppression systems.
- All information required by the first responders will be included in the first responder plan part of the final approved Hazard Mitigation Analysis (HMA).
- The Applicant will provide on-site and in-person training to the local responders prior to commercial operation of the system.

4. tend to overcrowd land and cause undue concentration of population;

- The project is a static, non-obtrusive, use of land that will not overcrowd the land nor cause undue concentration of population. The project includes 340 acres of designated natural open space which exceeds the requirements of the SLDC; and will be coupled with a TDR of 5,700ac of adjacent land

CUP Approval Criteria (continued)

SLDC, Section 4.9.6.5, Approval Criteria. CUPs may only be approved if it is determined that the use for which the permit is requested will not:

5. interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements, conveniences or improvements;

- The project is in a remote area of Santa Fe County and will not interfere with adequate provisions for schools, parks, water, sewerage, transportation or other public requirements.

6. interfere with adequate light and air;

- Minimal lighting is included for security and will meet SLDC requirements and be shielded and downlit.
- The “Monopole” or “H-frame” structures allows for air and wind to flow through with minimal obstruction.

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.

- A commercial solar energy production facility within the Rural Fringe (RUR-F) Zoning District is an allowed use with the approval of a CUP.
- Chapter 7 of the SGMP explicitly supports the development and distribution of renewable energies at a regional scale.

Response to Hearing Officer's Recommendations

Project is too big and close to communities

- The project is appropriately sized to produce the amount of carbon-free energy approximately equivalent to the entire residential energy demand of Santa Fe annually.
- The BESS is located 1.5 miles from the nearest residence, an exceptional setback compared to recently approved projects elsewhere in the state, including one in Albuquerque sited just 500 feet from densely populated neighborhoods.

Concerns with BESS safety and previous incidents

- Safety is AES' number one value and priority. AES has taken a leadership role in collaborating with industry and fire protection professionals to evaluate past incidents; revise testing, design and operational protocols; and strengthen fire safety standards to which deployed BESS must comply to prevent further incidents in the future. As a result of these industry-wide efforts, the failure rate of BESS has fallen precipitously while the deployed capacity has grown exponentially.
- The specified BESS equipment for Rancho Viejo was tested vigorously to the UL 9540a procedure by an independent, nationally recognized laboratory, and concluded that *"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."*

Response to Hearing Officer's Recommendations (continued)

Ability for County to manage a potential BESS incident without a proper hazmat team

- AES has worked closely with the SFCFD in its review of the project, and we are committed to providing comprehensive first responder training prior to commissioning and during operations of the Rancho Viejo facility.
- Both SFCFD and the third-party, independent fire professional consultant (ATAR Fire) hired by the County have reviewed the AES permit application and agreed that the project meets appropriate criteria for issuing a CUP.
- All fire hazards have been mitigated by a combination of layered passive and then active technologies incorporated into the BESS design and then rigorously tested. If a truly unavoidable event occurs (e.g., a plane crash into BESS containers), the large-scale fire testing of this system indicates that a fire will consume hazardous materials, leaving a plume of smoke and a pile of ash.
- Plume studies indicate that smoke will rise well above altitudes that could pose health hazards - recent examples, such as the SDG&E Escondido BESS fire, exhibit no hazardous exposure to neighbors. Ash can be disposed of by trained hazmat under the direction of AES as owner and operator. As no liquid is involved in the suppression of the fire, AES and independent reviewers both expect no water table exposure.

Response to Hearing Officer's Recommendations (continued)

The proposed system is older, less safe type of technology

- This is not true and appears to be an unsupported conclusion borrowed from a statement made by a presenting member of the project opposition.
- The BESS system proposed by AES for Rancho Viejo incorporates the latest generation of battery energy storage system technology that fully complies with NFPA 855 and all other applicable fire codes and standards, including UL 9540a testing, which demonstrated successful prevention of thermal runaway from a single cell failure.

Impact of PFAS from fire suppressant on groundwater

- Water is not employed to extinguish a BESS fire in the highly unlikely case that a thermal event or fire occurs. The industry standard guidance is for first responders to maintain a defensive perimeter (150ft away), apply water to adjacent areas to further bolster containment, and allow for the affected container to burn itself out in a matter of hours.
- In combination with the IP55 ingress protection rating of the battery enclosure, which prevents egress of leaking fluids at low pressure, there is no means for FK-5-1-12 (the fire suppression clean agent) to enter groundwater.
- FK-5-1-12 is non PBT (persistent, bio accumulative, toxic) clean agent fire suppressant

Response to Hearing Officer's Recommendations (continued)

Potential for wildfire

- The UL9540a is a *"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."* Based on this result, and in combination with additional design measures such as adequate spacing between containers placed on concrete pads, along with an additional 30' of defensible space of crushed gravel without vegetative fuel, and a perimeter fire break, the facility has been designed to not only protect *itself* from an approaching wildfire, but also not be the cause of one.
- According to the most recent Santa Fe County Wildland Urban Interface fire risk map, the project is located in the lowest area of wildfire risk in the region. In fact, 30% of the ground within the project location is barren.

Response to Hearing Officer's Recommendations (continued)

Impact to property values and ability to obtain insurance

- AES commissioned an appraisal report using standards and practices established by the Appraisal Institute in conformance to the Uniform Standards of Appraisal Practice and invited the independent review of that report by a Santa Fe-based appraiser, in which both parties concluded that the proposed Rancho Viejo project would not have a negative impact on market values of properties in the vicinity.
- There is also no evidence or precedent for home insurance coverage being denied due to proximity to a solar or BESS facility.

Outdated/inaccurate info cited in recommendation

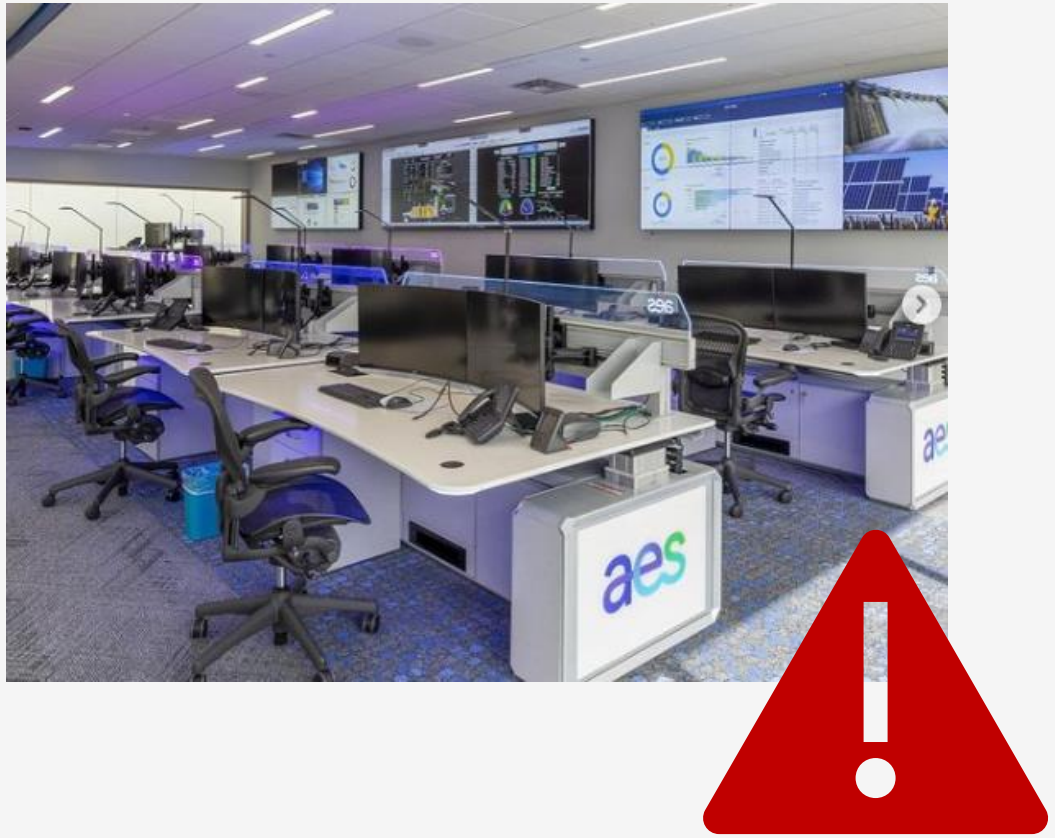
- Inaccurate information from an outdated sample draft of a First Responder Mitigation Guidelines document was referenced in the hearing officer's analysis when an updated version of the document was supplied to the County on October 10th.
- The updated document contains factual information about the demonstrated effectiveness of the direct injection fire suppression system at diminishing the likelihood of a thermal runaway event.

Supporting Material

ESS Safety Features

BMS Safety Features

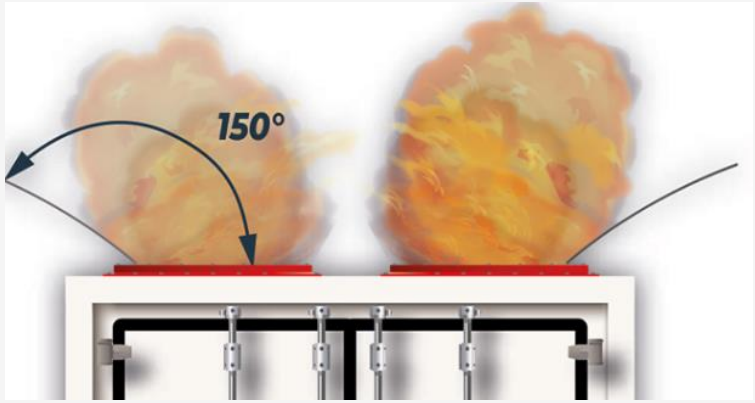
- Battery Management System provides observation and enforcement
- Voltage, current, and temperature state and limits
- Communication of real-time status
- Warning of functional anomalies
- Disconnect of strings when limits violated



ESS Safety Features

Passive Safety Explosion Mitigation

- Six deflagration vent panels available to provide passive relief in the unlikely event of release, buildup, then ignition of flammable gases
- Demonstrated and validated at full scale in dedicated test, June 2024

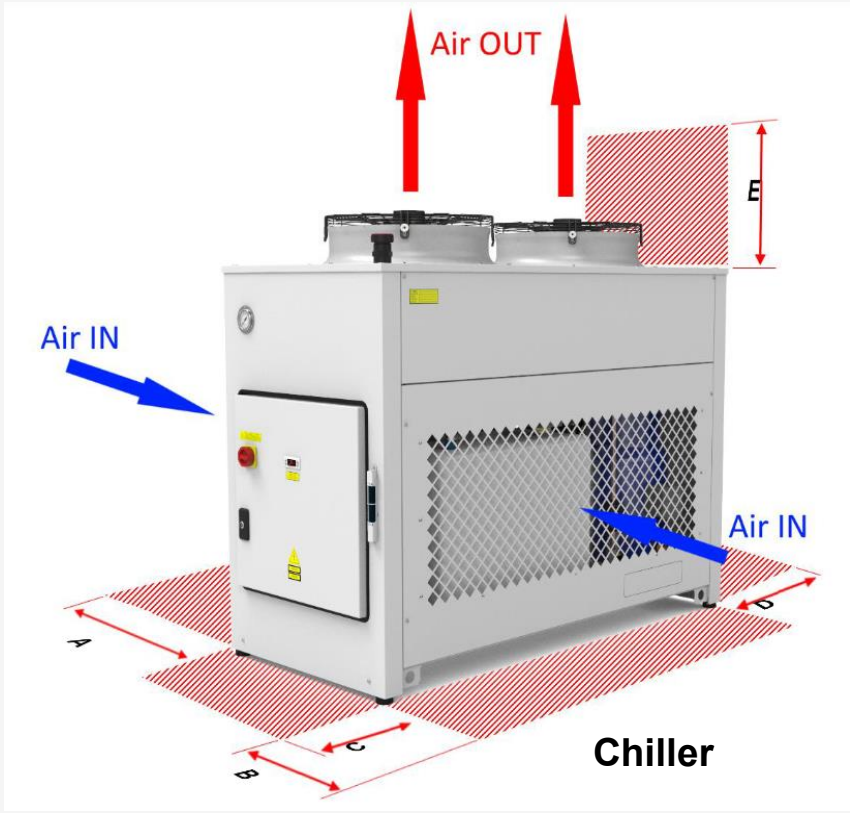


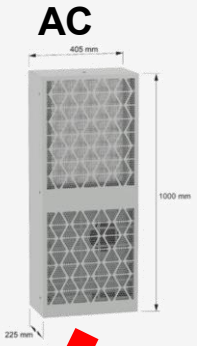
Source: Vigilex

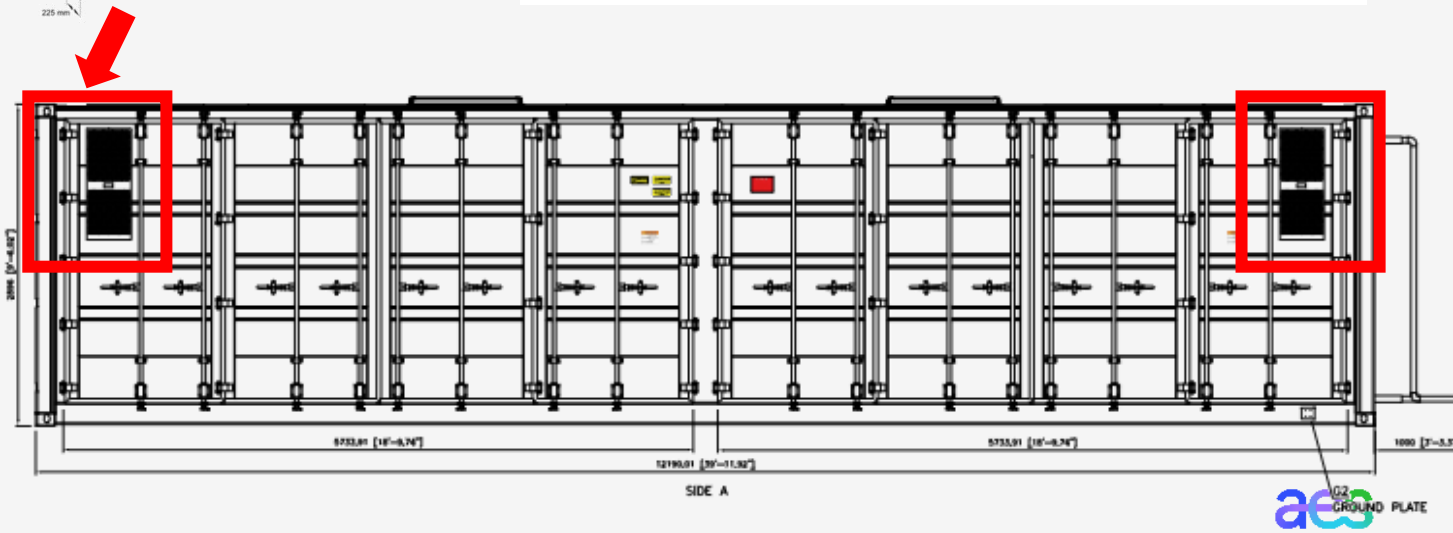
Figure 10: Deflagration panels post-test 2

Active Safety Thermal Management

- Active thermal management with central chiller and AC
- Liquid cooled design maintains desired temperature of each battery module
- Supplemental air conditioning maintains climate for support equipment
- Thick mineral wool insulation reduces energy usage
- Dehumidifiers isolate hardware from harsh ambient environment







Active Safety Control Logic

Detection (redundant)

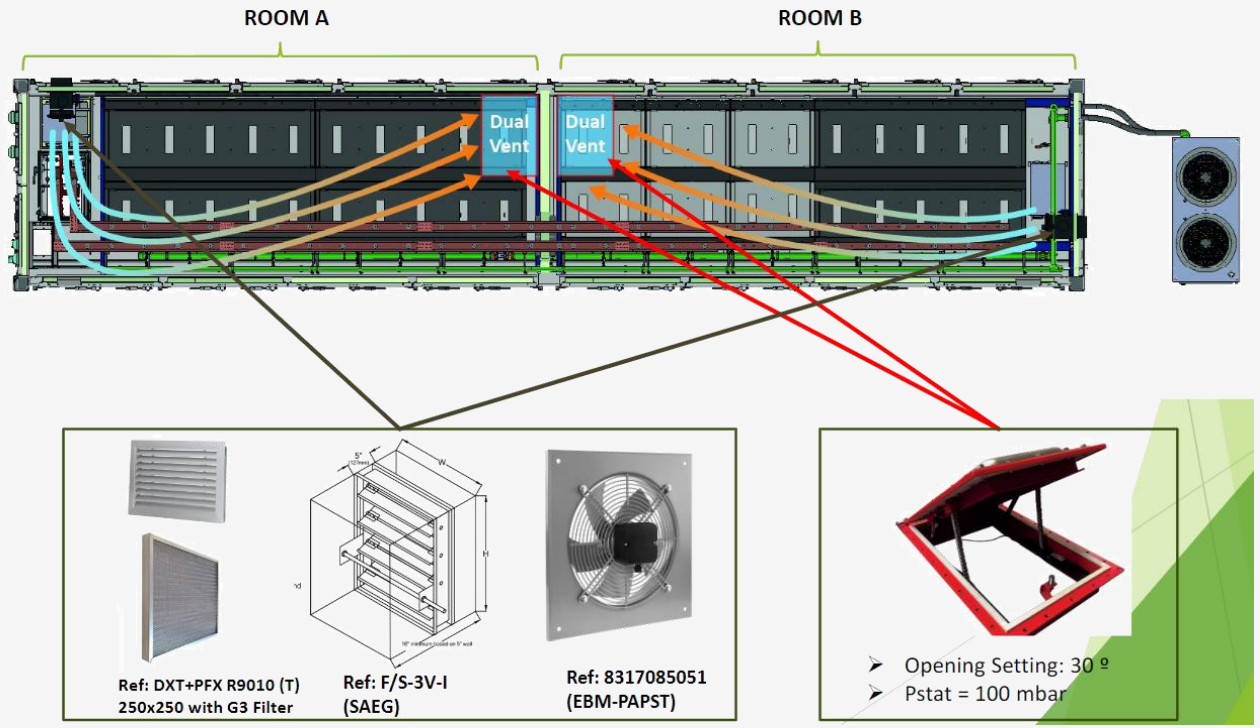
- Smoke (distributed)
- Temperature (cell, module, string, ambient)
- Gas (both sides)

Signal Output

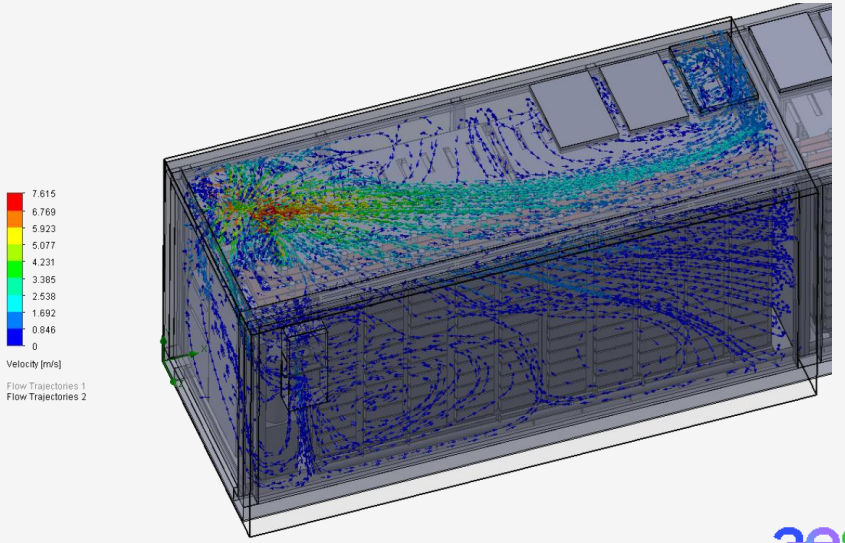
- Suppressant Actuator
- DC Switch
- Alarms
- Fire Panel - Operations
- Battery Backup (UPS)

Active Safety
Explosion Prevention

- Battery Cell Off-Gas Detection
- "Active" exhaust ventilation
- Computational Fluid Dynamics (CFD) analysis demonstrates correct engineering design



Flammable Gas Detector



CFD: Vented Gas Dispersion

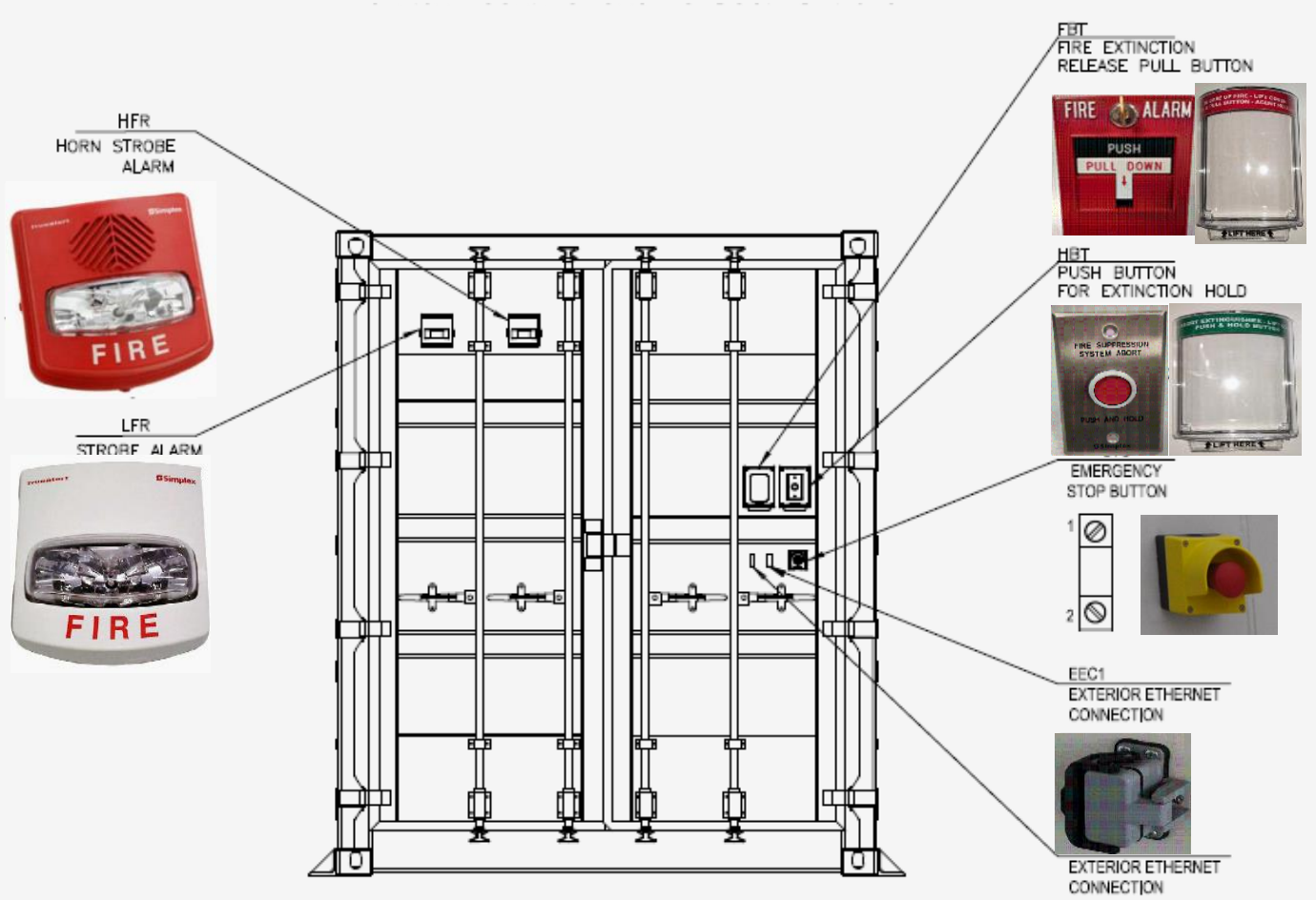
Active Safety Communication

Alarms

- Audible Horn and Strobe
- Strobe

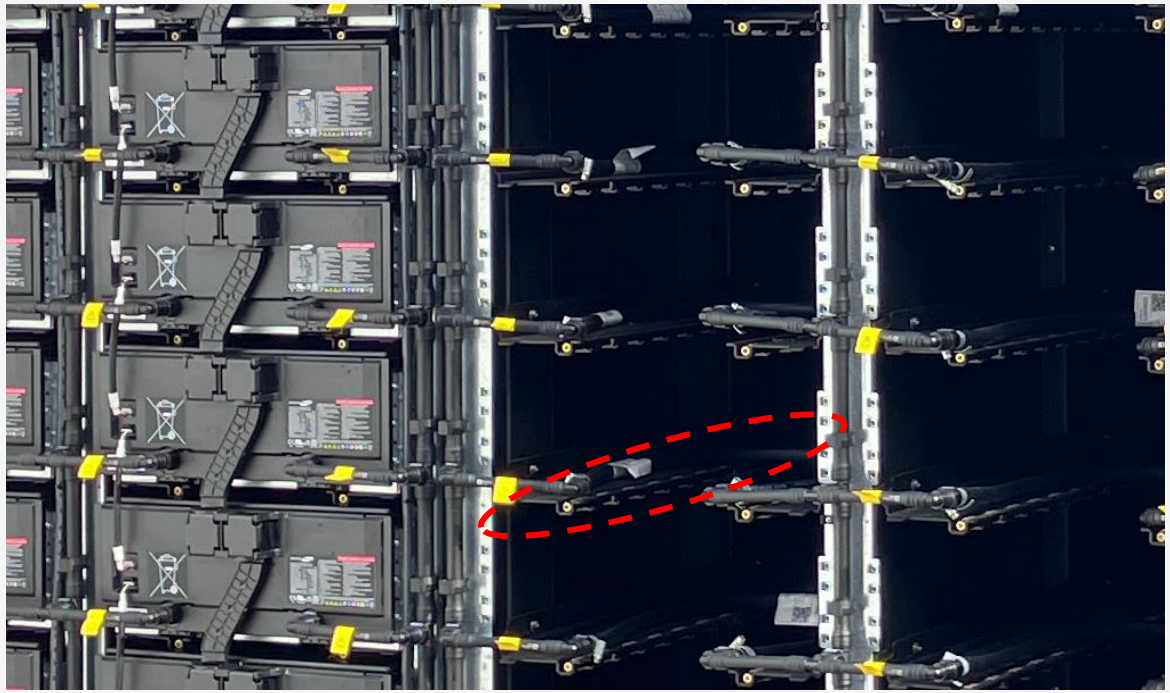
Emergency HMI

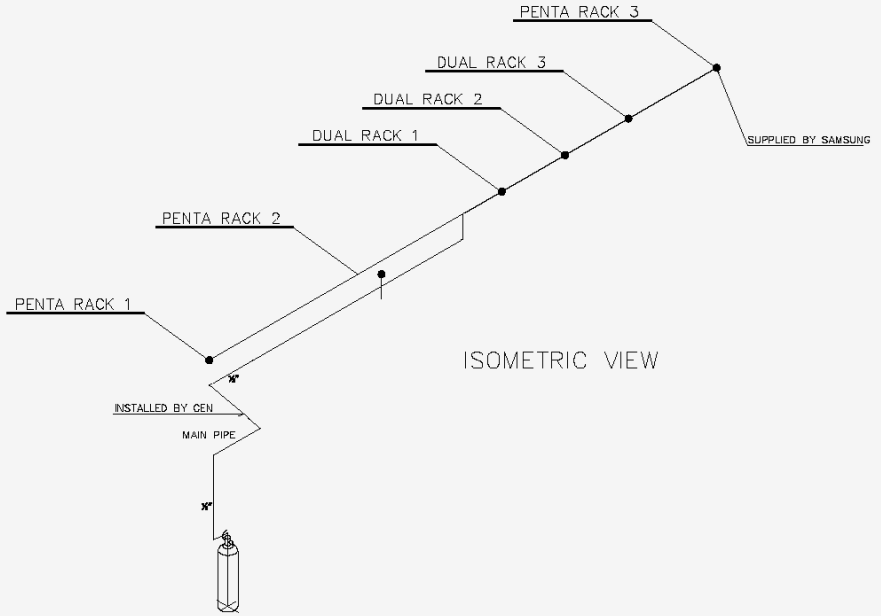
- Fire Alarm Pull
- Fire Extinguish Hold Button
- Emergency Stop Button



Active Safety
Fire Suppression

- Direct injection fire suppression

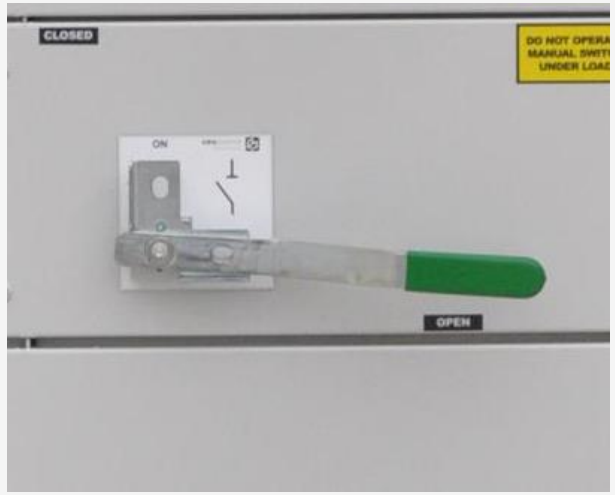




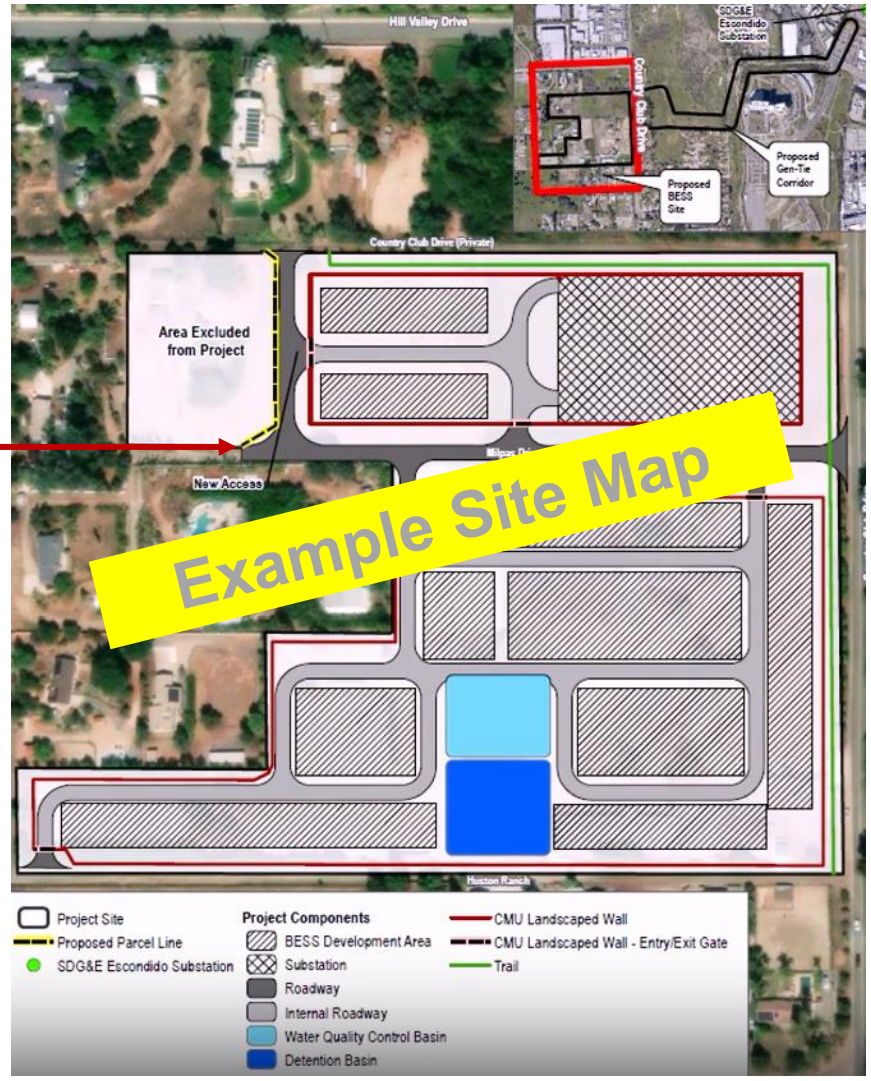
Maintenance Provisions

DC Disconnect Switch
- Fused
- Non-load operating
- Able to Lockout/Tagout

Clear Hazard Labels
- Arc Flash
- Shock
- E-stop



Site Navigation / Wayfinding



Key points during an emergency:

- Primary Designated Muster Point
- Fire Panel: Located at the Entrance
- Safe approach distance: **150 ft**
- Phases of Emergency Response: