



**ADVANCED AERIAL
INSPECTIONS**

CASCADE SOLAR FARM

Aerial PV Inspection Report

April 1, 2020

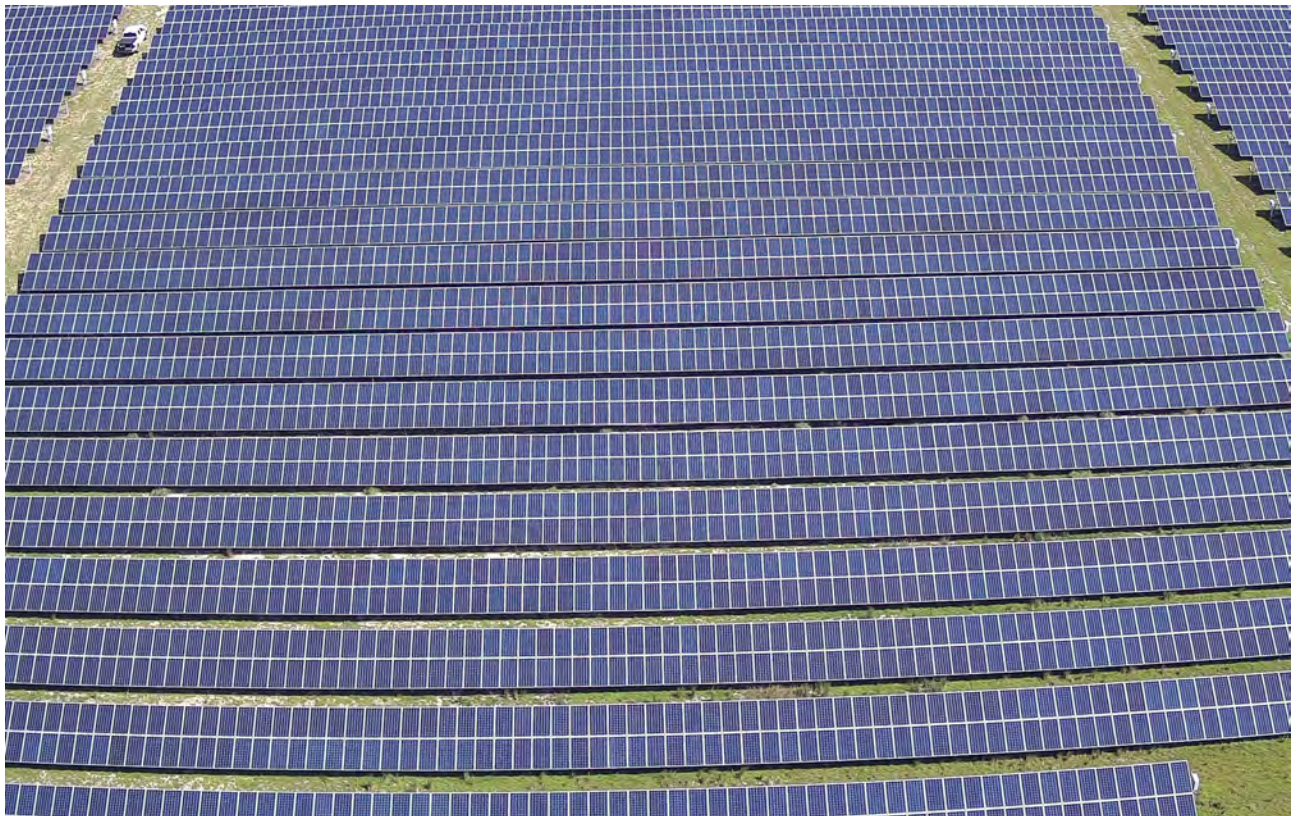


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Site Summary

Site Name	Cascade Solar Farm
Location	35.6640815733333
Location	I-78.51978302 N/A
Inspected On	Mon, April 1, 2020
Time of Day	1:00 PM
Inspection Purpose	Preventative Inspection

Results have been quality checked and reviewed for accuracy. Raptor Maps software analysis checks for all of the following anomalies: Cell, Cell Multi, Combiner, Cracking, Delamination, Diode, Diode Multi, Hot Spot, Hot Spot Multi, Inverter, Junction Box, Module, Missing Modules, Shadowing, String, Tracker, Reverse Polarity, Vegetation, and Suspected PID. The appendix located at the end of the report includes further descriptions of the found anomalies. All RGB (color) and IR (thermal) imagery has been cross-checked to tag the source of the anomaly.

Site Overview

■ Company

NAME

Cascade Solar Farm

PHONE

+1 617 833 9567

CONTACT

John Smith

EMAIL

j.smith@cascadesolar.com

■ Site

POWER5.39 MW_{dc}**INVERTERS**

SMA

MODULE NAME

Cascade Solar

MOUNT

RBI fixed tilt

CS6X-315P 315W

MODULE TECH

N/A

SITE LAYOUT

Single site

MODULE LAYOUT

19 modules per string

■ Data Capture

UAS

DJI M200

IMAGING SYSTEM

DJI Zenmuse XT2 13mm 640x512

DATA COLLECTED BY

AAI

■ Weather

HUMIDITY

32%

TEMPERATURE

7.68° C

CLOUD COVER

Clear

WIND SPEED

14.98 km/h

Findings

Anomaly	Anomalies ^{*(1)}	Modules ^{*(2)}	Est. Affected DC ^{*(3)}	Est. Affected DC ^{*(4)}	Est. Annual Impact (kWh) ^{*(5)}	Est. Annual Impact (\$) ^{*(6)}
Cell	4	4	0.42 kW	<0.01%	839.92 kWh	\$209.98
Cell Multi Medium	4	4	0.42 kW	<0.01%	839.92 kWh	\$209.98
Cell Medium	1	1	0.16 kW	<0.01%	315.00 kWh	\$52.49
Cell Multi	1	1	0.16 kW	<0.01%	315.00 kWh	\$52.49
String	16	304	95.76 kW	1.78%	191520.00 kWh	\$47880.00
Diode	21	21	2.20 kW	<0.01%	4409.56 kWh	\$1102.39
Totals	47	335	99.12 kW	1.83%	198,239.40 kWh	\$49507.33

^{*(1)} Anomalies: The number of instances of a specific anomaly.

^{*(2)} Modules: The number of modules affected by a specific anomaly.

^{*(3)} Est. Affected DC (kW): The estimated affected power is determined by multiplying the number of modules affected, the peak power of the solar module at STC, and a power factor ranging from 0 to 1 specific to the anomaly.

^{*(4)} Est. Affected DC (%): The estimated affected power of the anomaly is divided by the total site's power and represented as a percent.

^{*(5)} Est. Annual Impact (kWh): The estimated annual impact in kilowatt-hours is the estimated affected power multiplied by the site's peak sunlight hours. The peak sunlight hours can be changed by selecting the "\$ PPA Values" button in the left navigation menu.

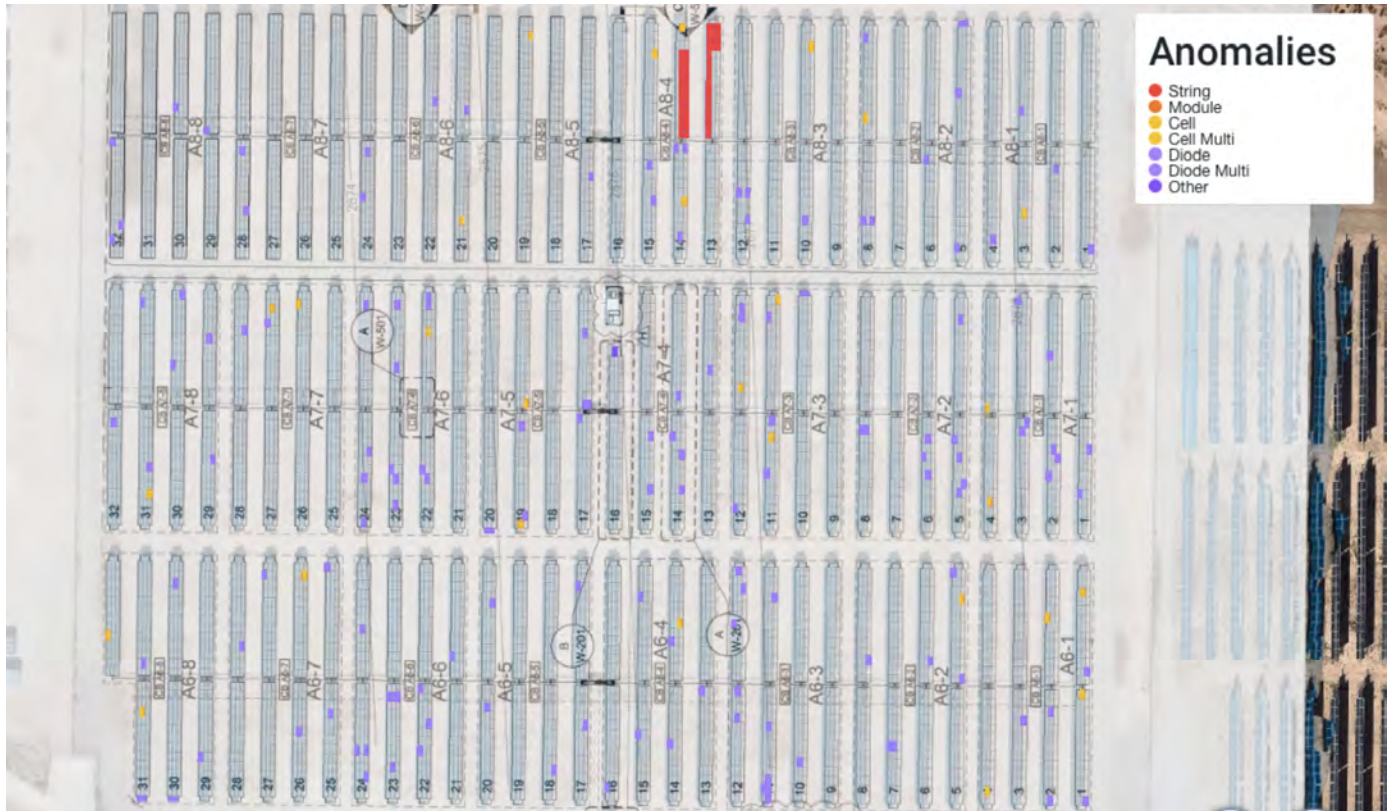
^{*(6)} Est. Annual Impact (\$): The estimated annual impact in money is the estimated annual impact in kilowatt-hours multiplied by the money per kilowatt-hour i.e. power purchase agreement (PPA) rate. The PPA rate can be changed by selecting the "\$ PPA Values" button in the left navigation menu.

For more information on each class of anomaly please continue to the appendix to learn more.

Anomaly Map

Site Overview

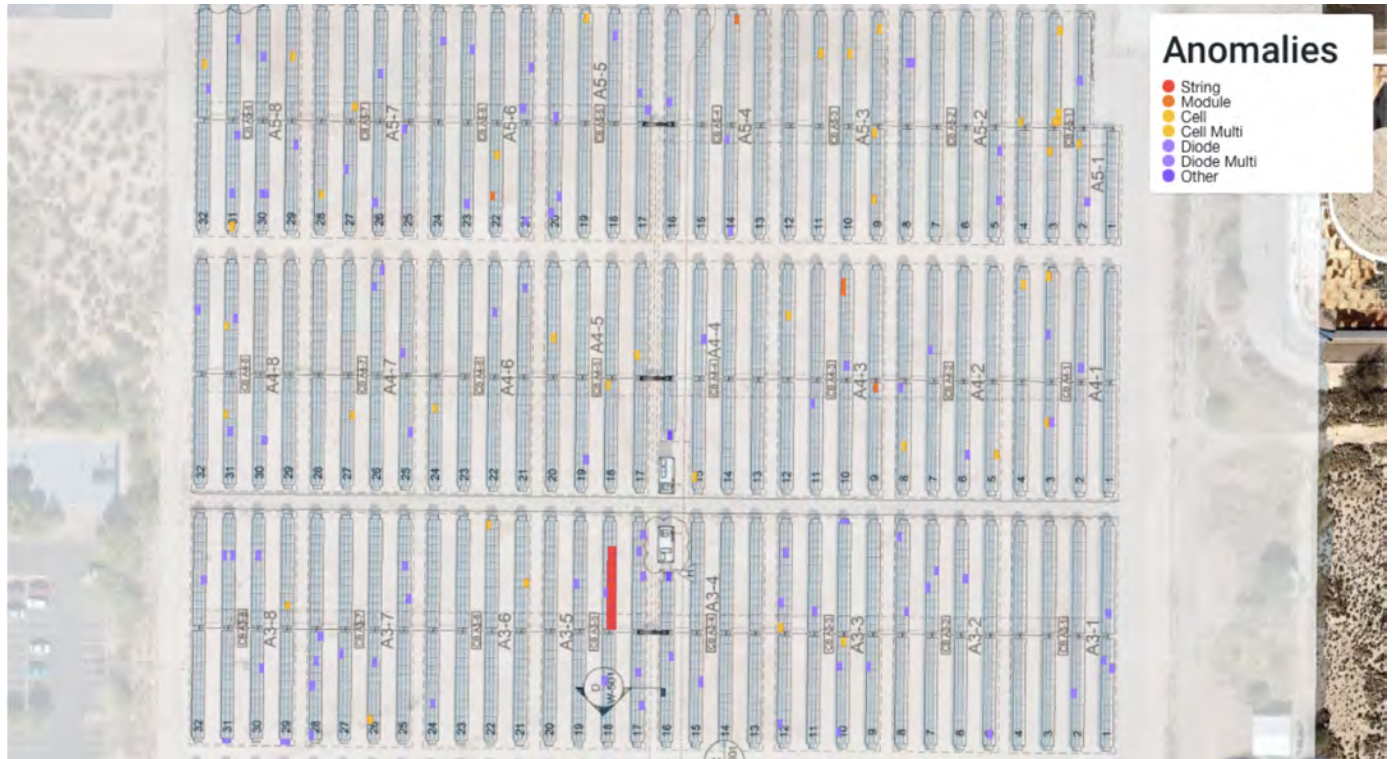
Scan Date: 4/1/2020



Anomaly Map

Site Overview

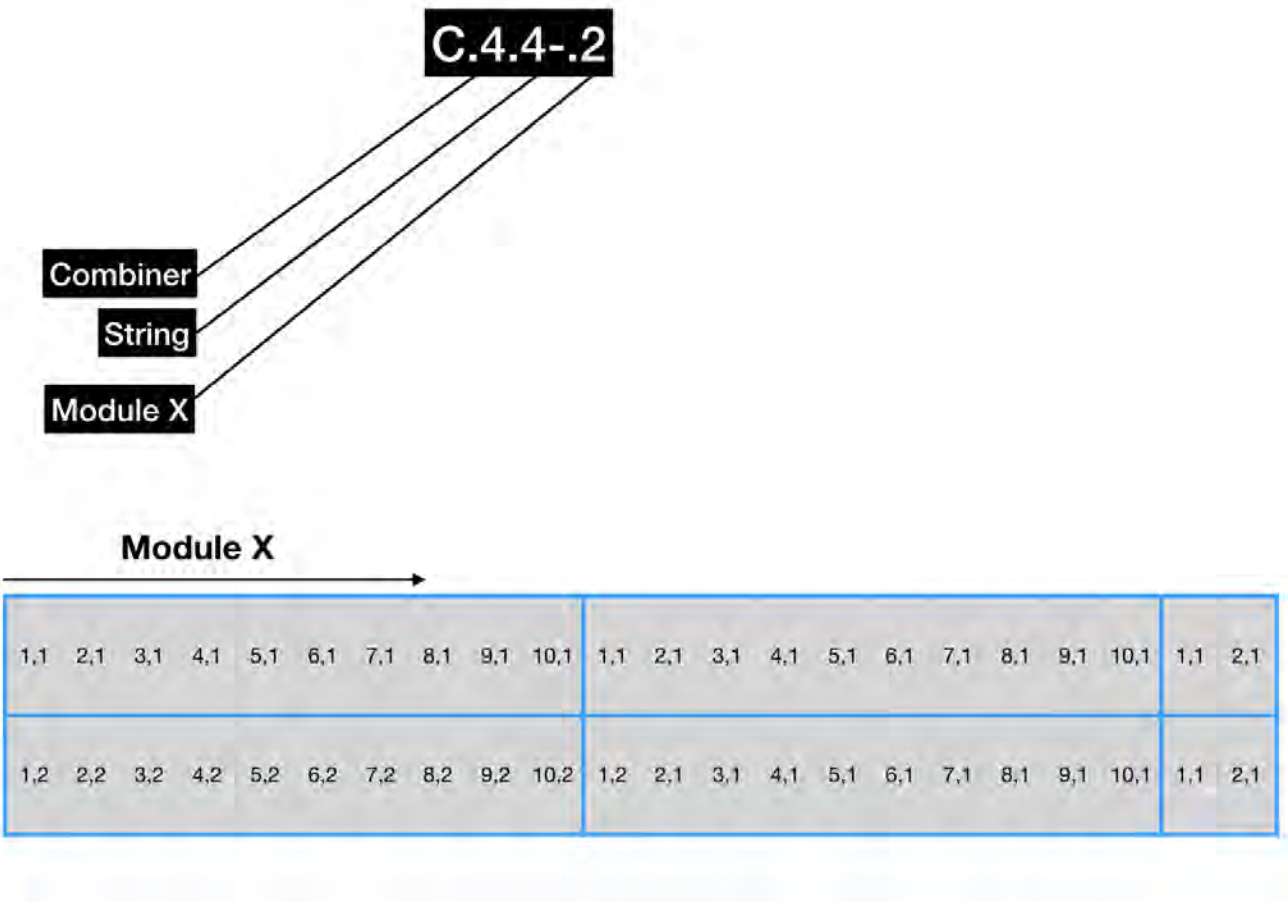
Scan Date: 4/1/2020



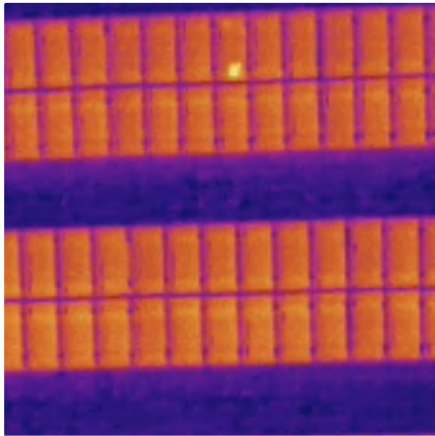
Anomaly Location

	Filename	Tag Name	Priority
	DJI_0033_R.JPG	Diode	None
	DJI_0251_R.JPG	Cell	None
	DJI_0199_R.JPG	Cell Multi Medium	None
	DJI_0116.jpg	Cracking	None
	DJI_0303_R.JPG	String	None
	DJI_0037_R.JPG	Diode	None

Localizing Anomalies

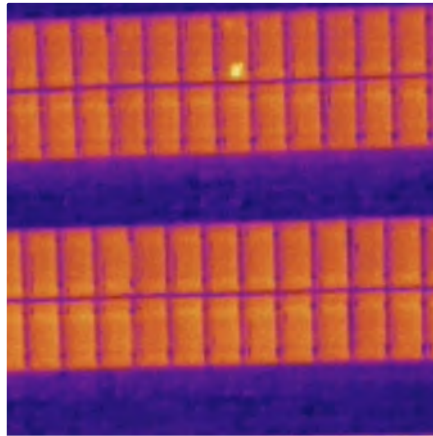


Example of Anomalies



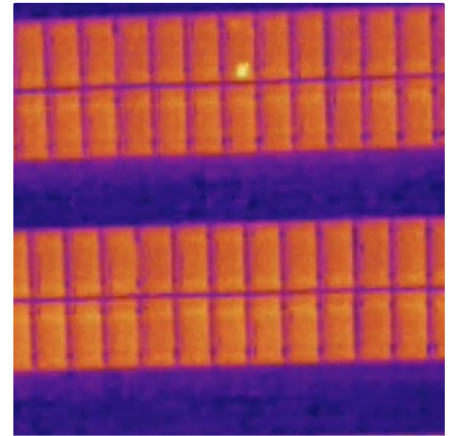
Cell

Hot spot occurring with square geometry in single cell



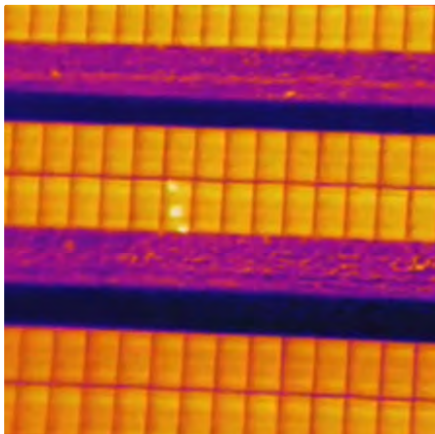
Cell High

Cell anomaly, where the temperature of an anomalous area is 20°C higher than adjacent areas



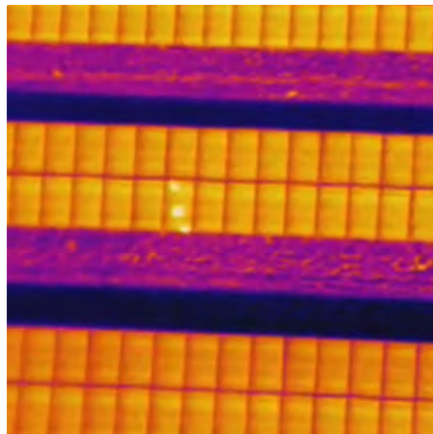
Cell Medium

Cell anomaly, where the temperature of an anomalous area is 10-20°C higher than adjacent areas



Cell Multi

Hot spots occurring with square geometry in multiple cells



Cell Multi Medium

Cell multi anomaly, where the temperature of an anomalous area is 10-20°C higher than adjacent areas



Missing

Module is present on as-built but missing from PV system