Luhdorff & Scalmanini
Consulting Engineers

TECHNICAL MEMORANDUM

DATE: October 30, 2026 Project No. 23-1-099

TO: Lisa Hunter, Corning Subbasin GSA

FROM: Eddy Teasdale, PG, CHG; William Anderson, GIT

SUBJECT: Results of Capay Farms Towed Transient Electromagnetic (tTEM) Survey

1. INTRODUCTION

Geophysical Imaging Partners, Inc. (GIP) conducted a towed Transient Electromagnetic (tTEM) survey at Capay Farms property near Hamilton City, California, to improve the understanding and characterization of subsurface sediments and hydrogeological conditions. This investigation supports the Corning Subbasin GSA's ongoing managed aquifer recharge (MAR) program by providing high-resolution information on subsurface stratigraphy, including the distribution, thickness, and continuity of relatively coarse-grained sediments that may provide favorable pathways for groundwater recharge.

The project was supported through Proposition 68 funding. This funding allowed the GSA to collect detailed subsurface information that would otherwise be difficult and costly to obtain using conventional drilling alone. The resulting tTEM dataset will be used to help identify and evaluate potential MAR opportunities, guide future field investigations and recharge project design, and support the ongoing update and refinement of the Corning Subbasin groundwater flow model.

Specifically, the geophysical data will provide additional information on the spatial distribution and continuity of hydrostratigraphic units that can be incorporated into the model framework to improve representation of aquifer geometry and subsurface heterogeneity. The information can also be used to refine the assignment and distribution of hydraulic properties, evaluate potential vertical and lateral recharge pathways, and improve the model's ability to simulate the movement and storage of recharged water. Incorporating these data into the updated groundwater model will strengthen the GSA's ability to evaluate potential MAR projects, estimate recharge benefits, assess changes in groundwater elevations and storage, and support future groundwater-management decisions within the Corning Subbasin.

A map showing the location and extent of the tTEM survey area is included in GIP's data report, provided as **Appendix 1**.

2. FIELD OPERATIONS

Field activities were conducted between March 3 and March 26, 2026. The tTEM equipment was transported to the Capay Farms site by cargo van, assembled in the field, and tested prior to beginning data collection to confirm that the system was operating properly.

During the survey, the transmitter and receiver units were mounted on lightweight sleds and towed behind an all-terrain vehicle (ATV). The sleds and support frames were constructed of nonmetallic materials to minimize interference with the geophysical measurements, while the systems electronics and power supply were mounted on the rear of the ATV. This configuration allowed the survey team to efficiently collect closely spaced measurements across the property.

Individual tTEM measurements, commonly referred to as "soundings," were collected continuously along the survey lines and provide information on subsurface electrical resistivity to depths generally exceeding 70 meters (approximately 230 feet). The actual depth of investigation varies across the site depending on subsurface geology, electrical properties, and the signal-to-noise ratio of the measurements. The tTEM method works by transmitting a controlled electrical current through a loop mounted on the sled, which generates a magnetic field that penetrates the subsurface. When the current is rapidly switched off, secondary electrical currents, or "eddy currents," are induced within the ground and migrate progressively deeper with time. A receiver coil positioned behind the transmitter measures the resulting decay of the magnetic field. These measurements are then processed to estimate the electrical resistivity of subsurface materials, which can be used to distinguish variations in sediment texture and hydrogeologic conditions.

In general, coarser-grained sediments such as sands and gravels tend to exhibit different resistivity characteristics than finer-grained materials such as silts and clays. Mapping these contrasts provides valuable information on the distribution and continuity of subsurface units that may influence groundwater movement and recharge.

Additional information regarding the tTEM system specifications is provided in **Appendix 2** and **Appendix 3**.

3. DATA COLLECTION

tTEM data were collected primarily along existing orchard rows, which provided efficient access across the property and allowed for relatively dense, regularly spaced survey coverage. The close spacing between survey lines provided a detailed three-dimensional dataset for characterizing subsurface conditions across the site.

Key aspects of the data collection approach included:

- Survey layout: Data were collected along closely spaced orchard rows to maximize spatial coverage and improve resolution of subsurface features.
- Real-time navigation: Survey lines were monitored using the tTEM navigation system, allowing the field crew to track progress in real time and maintain consistent spacing between adjacent lines.
- Quality control: The operator continuously monitored the system performance and measurement parameters during data collection to confirm that the equipment was functioning properly and that recorded values remained within expected ranges.
- Field conditions: Overall, the site conditions were favorable for acquiring tTEM data and allowed for efficient collection of a dense geophysical data set.

- Electromagnetic interference: As expected, measurements collected near potential sources of electromagnetic noise sources, such as power lines, fences, buried or surface metal objects, were affected by interference. Data exhibiting excessive noise or other quality concerns were identified and removed during subsequent processing and quality control review.

The resulting datasets provided broad and detailed coverage of the survey area and formed the basis for the development of the three-dimensional subsurface resistivity model.

3.1 Data Processing and Inversion

The tTEM data were processed and inverted using Aarhus Workbench (https://www.aarhus geosoftware.dk/aarhus-workbench), a software platform specifically developed for processing, quality control, and inversion of transient electromagnetic data.

Data processing generally involved the following steps:

- Quality control and noise removal: Measurements affected by excessive electromagnetic interference or other data-quality issues were identified and removed.
- Data averaging: The remaining measurements were averaged to improve the signal-to-noise ratio and produce a more stable dataset for interpretation.
- Geophysical inversion: An inversion algorithm was applied to the processed voltage-decay data to estimate the distribution of electrical resistivity with depth. The inversion process iteratively adjusts the subsurface resistivity model until the modeled response provides an acceptable match to the measured tTEM data.
- Model visualization: The resulting resistivity models were compiled into depth slices and vertical cross sections to illustrate spatial variations in subsurface electrical properties across the survey area.

The final inverted dataset provides a three-dimensional representation of subsurface electrical resistivity that can be interpreted in conjunction with available lithologic, geologic, and hydrogeologic information to help characterize the distribution and continuity of subsurface materials.

3.2 Quality Control

Quality control (QC) procedures were implemented throughout both the field data acquisition and subsequent data processing and inversion to help ensure the reliability and consistency of the tTEM data set.

During field data acquisition, QC activities included:

- Equipment inspection: System components, cables, sleds, and connections were frequently assessed to ensure that all equipment remained secure and fully operational.
- Real-time system monitoring: The operator continuously monitored key system parameters, including TEM signal strength, battery voltage, transmitter current, instrument temperature, and GPS reception.
- Signal quality review: Signal-to-noise ratios (SNR) were observed across the surveyed area. Overall, the survey area produced a generally good SNR condition suitable for interpretation.

Following field collection, additional QC was performed on the processed and inverted dataset. This review included evaluation of the number of measurements available at each location, the latest usable time gate, observed noise levels, inversion fit between measured and modeled responses, and other indicators of data quality and model reliability.

Together, these QC procedures were used to identify and remove unreliable measurements and to confirm that the final resistivity models were suitable for hydrogeologic interpretation.

4. RESULTS

As previously described, the tTEM survey measures variations in the electrical resistivity of subsurface material. Following processing and inversion, the measured electromagnetic responses were converted into a three-dimensional resistivity model representing estimated subsurface electrical resistivity at different depths across the study area. These resistivity variations can then be interpreted in the context of known geologic and hydrogeologic conditions to evaluate the distribution, thickness, and continuity of subsurface sedimentary units.

The tTEM results are presented in Appendix 1 as:

Plan-view mean resistivity maps showing the lateral distribution of resistivity within selected depth intervals; and

Vertical resistivity sections illustrating changes in resistivity with depth along selected survey transects.

Together, these products provide a three-dimensional perspective of subsurface conditions and allow both lateral and vertical changes in sediment characteristics to be evaluated across the Capay Farms property.

4.1 Relationship Between Resistivity and Lithology

Electrical resistivity is influenced by several physical properties of the subsurface, including grain size, clay content, porosity, water saturation, and groundwater chemistry. In unconsolidated alluvial deposits, these characteristics commonly produce recognizable relationships between measured resistivity and sediment type.

As generally illustrated in **Figure 1**:

Lower resistivity values are commonly associated with finer-grained, clay-rich sediments that typically have relatively low hydraulic conductivity.

Intermediate resistivity values may represent mixtures of sand, silt, and clay or transitional sedimentary units.

Higher resistivity values are commonly associated with cleaner, coarser-grained materials such as sand and gravel, which generally have greater hydraulic conductivity and may provide more favorable pathways for groundwater recharge and movement.

These relationships are particularly useful for MAR investigations because laterally extensive zones of relatively high resistivity may indicate coarse-grained deposits with greater potential to transmit recharge water from the land surface into the underlying aquifer system. Conversely, lower-resistivity zones may indicate finer-grained deposits that could restrict vertical infiltration or separate more permeable aquifer units.

4.2 Factors Impacting Resistivity Interpretation

The relationship between resistivity and lithology is not unique, and resistivity values should not be interpreted as a direct measurement of grain size or hydraulic conductivity. Similar resistivity values can result from different combinations of lithology, saturation, and groundwater chemistry.

For example:

- Increasing clay content generally decreases formation resistivity because clay minerals have relatively high electrical conductivity.
- Increasing groundwater salinity or total dissolved solids can also reduce formation resistivity, even within relatively coarse-grained sediments.
- Lower water saturation generally increases resistivity because less electrically conductive pore water is present.
- Changes in mineralogy, porosity, and pore-water chemistry can further influence the measured response.

Accordingly, interpretation of tTEM results is most reliable when the geophysical data are evaluated together with independent hydrogeologic information. Where available, lithologic logs, geophysical borehole logs, water-quality data, groundwater elevations, and regional geologic information can be used to establish site-specific relationships between resistivity and subsurface materials. These relationships can then be applied across the broader tTEM survey area to improve interpretation of the three-dimensional hydrogeologic framework.

For this project, the tTEM results provide an important additional line of evidence for identifying the distribution and continuity of coarse- and fine-grained sediments beneath the Capay Farms property. When integrated with available borehole and groundwater information, the results can help identify potential preferential recharge pathways, evaluate the presence of lower-permeability layers that may impede vertical recharge, and improve understanding of hydraulic connectivity between shallow and deeper portions of the aquifer system.

4.3 Resistivity Visualization

For this study, the resistivity color scale was adjusted to emphasize spatial and vertical variations observed within the survey area and to improve visualization of potentially significant hydrogeologic features. The same color scale is used consistently throughout the maps and cross sections presented in this report to facilitate comparison between different depths and locations.

The color scale used for presentation of the tTEM results is shown in Figure 2. Areas beyond the reliable depth of investigation (DOI) are identified separately and should not be interpreted with the same level of confidence as portions of the resistivity model located within the DOI.

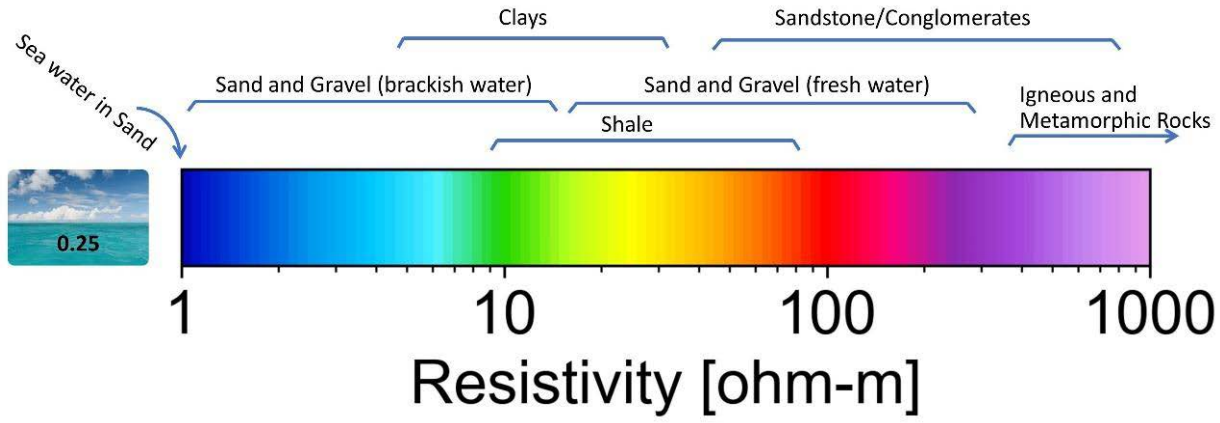


Figure 1: General Correlation between electrical resistivity, geologic materials, and groundwater quality

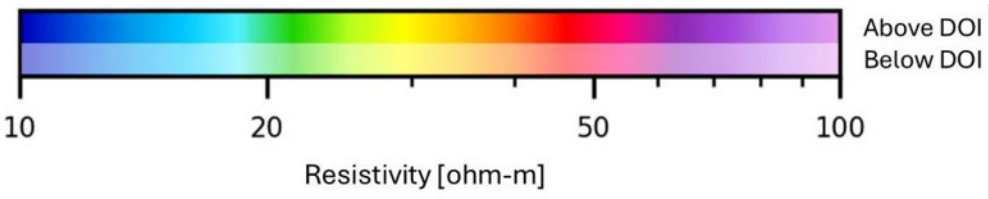


Figure 2: Resistivity color scale used for presentation of the tTEM results. DOI refers to the estimated depth of investigation

5. CONCLUSIONS

The tTEM survey successfully provided a high-resolution, three-dimensional characterization of subsurface electrical resistivity across the Capay Farms property. The quality and density of the dataset allowed for detailed evaluation of the lateral and vertical variability of subsurface materials, including the apparent distribution, continuity, thickness, and heterogeneity of relatively coarse- and fine-grained sedimentary units.

When evaluated in conjunction with available geologic, lithologic, groundwater, and water-quality information, the tTEM results provide an important line of evidence for refining the hydrogeologic conceptual model of the site. In particular, the survey helps identify areas that may contain relatively coarse-grained sediments capable of providing favorable pathways for infiltration and groundwater recharge, as well as lower-resistivity, finer-grained intervals that may limit or redirect vertical recharge.

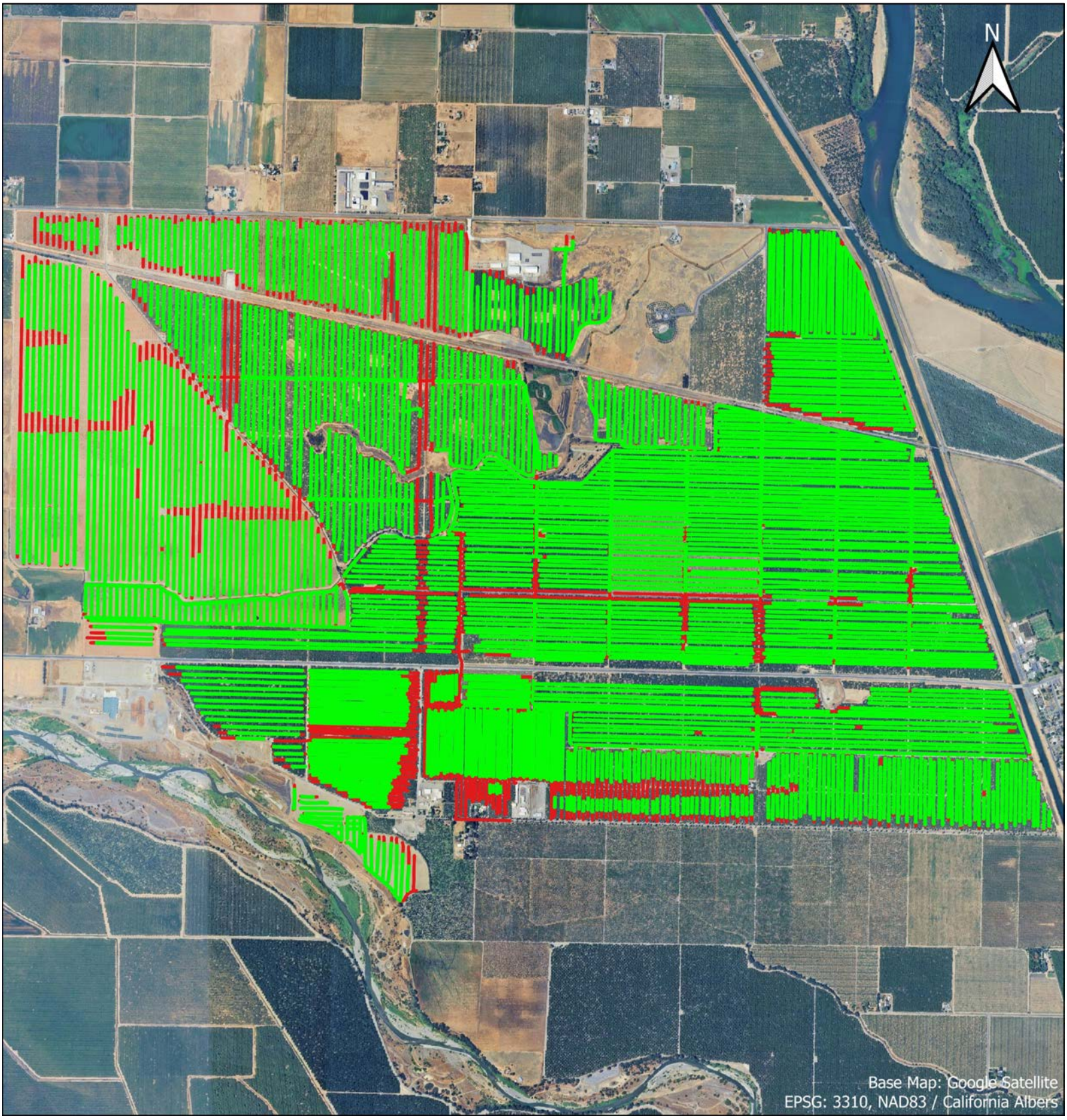
These findings provide valuable information for the Corning Subbasin GSA's ongoing evaluation of managed aquifer recharge (MAR) opportunities at the Capay Farms property. The results can be used to help prioritize areas for additional field investigation, inform the siting and design of future recharge

facilities, and evaluate the potential hydraulic connection between recharge areas and underlying aquifer units.

The tTEM dataset will also support updates to the Corning Subbasin groundwater flow model by improving the representation of subsurface hydrostratigraphy and spatial heterogeneity. Incorporating this information into the model can help refine model layering and hydraulic-property distributions and improve simulations of recharge, groundwater movement, changes in groundwater elevations, and groundwater storage. Collectively, the results provide a stronger technical foundation for evaluating future MAR projects and supporting long-term groundwater sustainability within the Corning Subbasin.

Attachment(s):
Appendix 1: Survey Results, Maps and Cross Sections
Appendix 2: TEM Theory
Appendix 3: tTEM Instrumentation, Processing & Inversion Settings

Appendix 1 – Survey Results Maps and Cross Sections



Capay Farm Site

Data Coverage

Data used for inversion: Green dots/squares
Rejected data: Red dots/squares

0 500 1,000 m
0 1,000 2,000 ft

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Data Residual

0 500 1,000 m

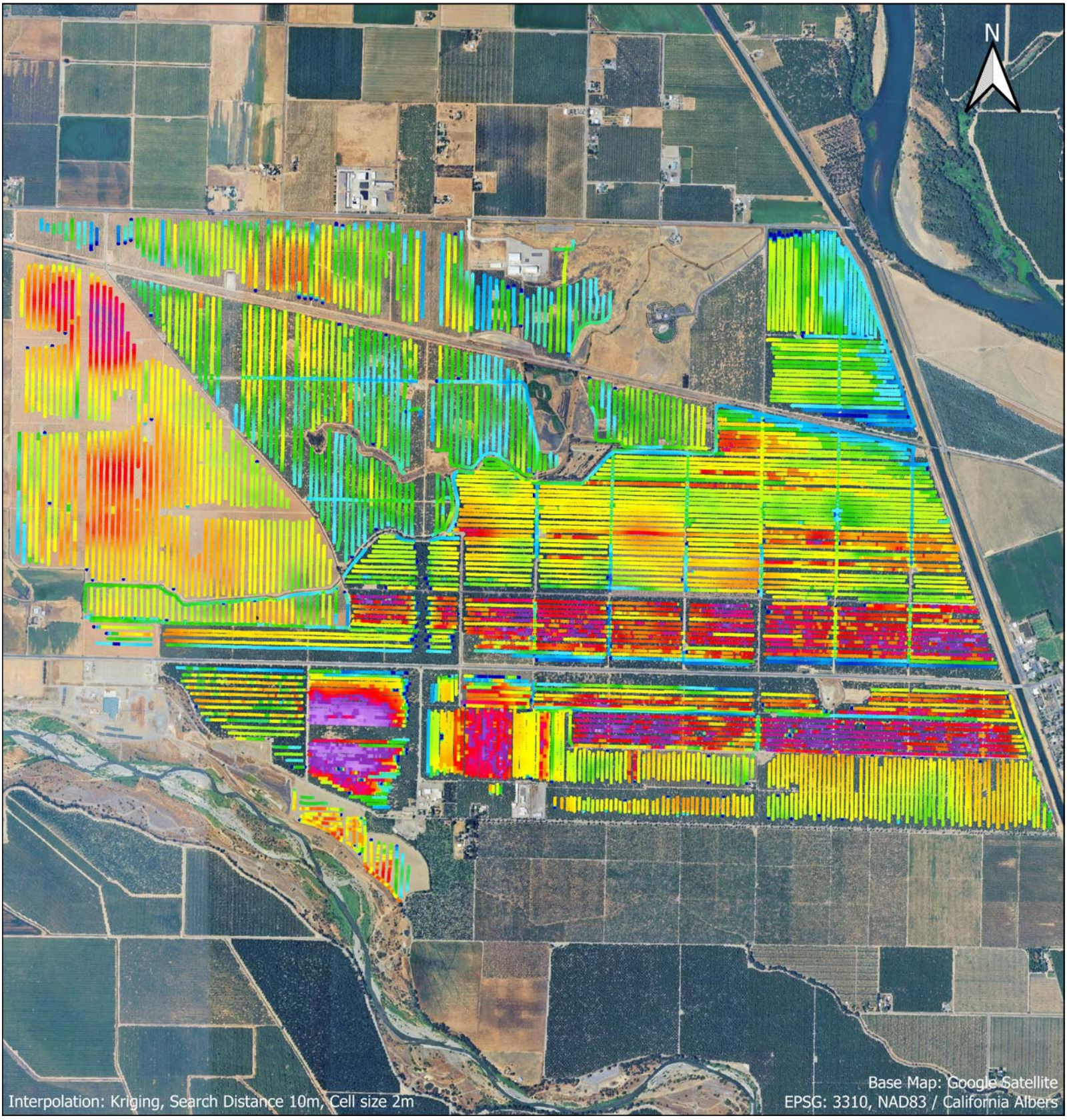
0 1,000 2,000 ft

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5

Residual
[-]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

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Capay Farm Site

Depth of Investigation

0 500 1,000 m

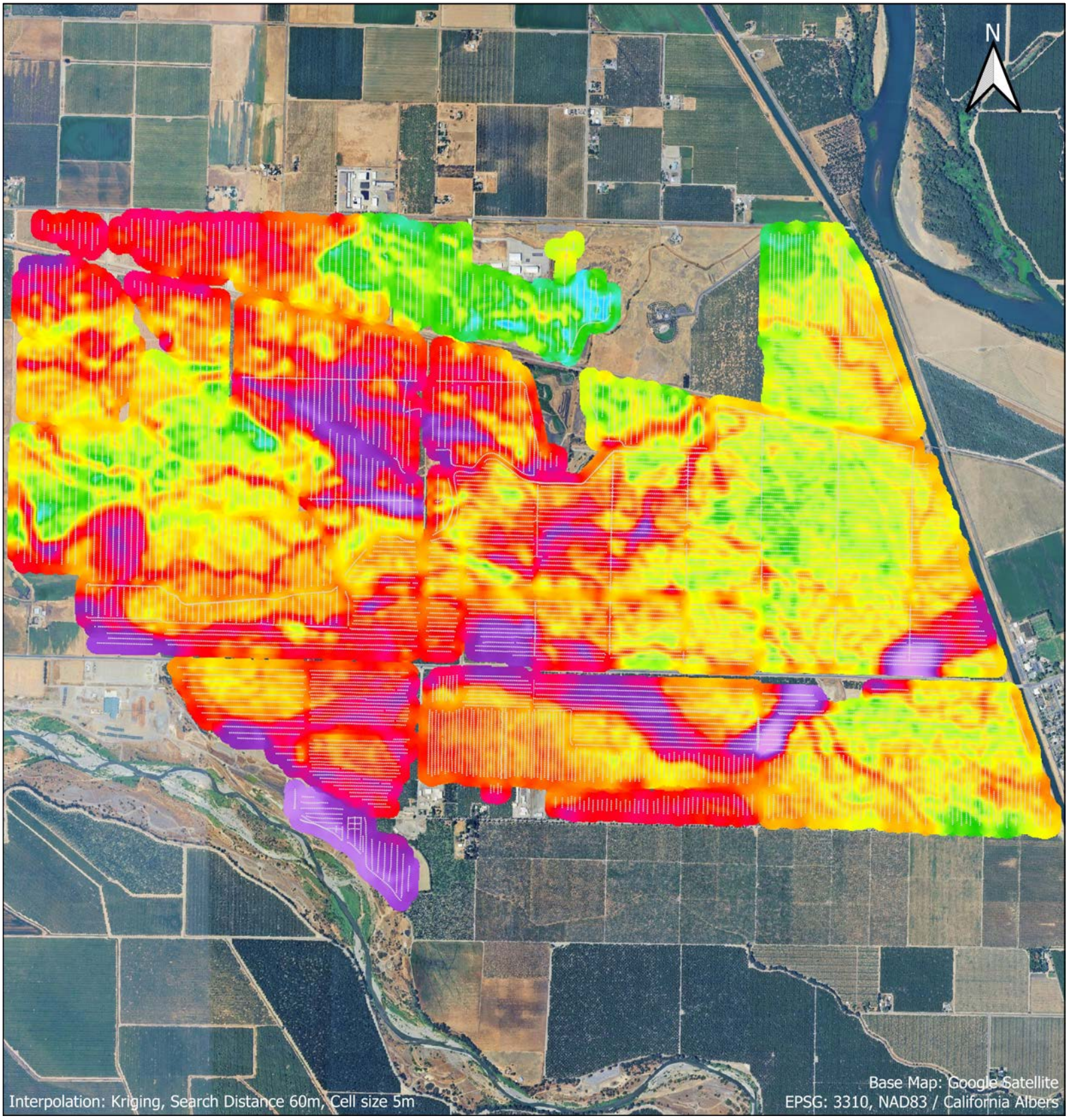
0 1,000 2,000 ft

Depth [m]

40.0 60.0 80.0 100.0 120.0

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

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Capay Farm Site

Mean Resistivity Map
Depth Interval 0-2 meters (0-7 feet)

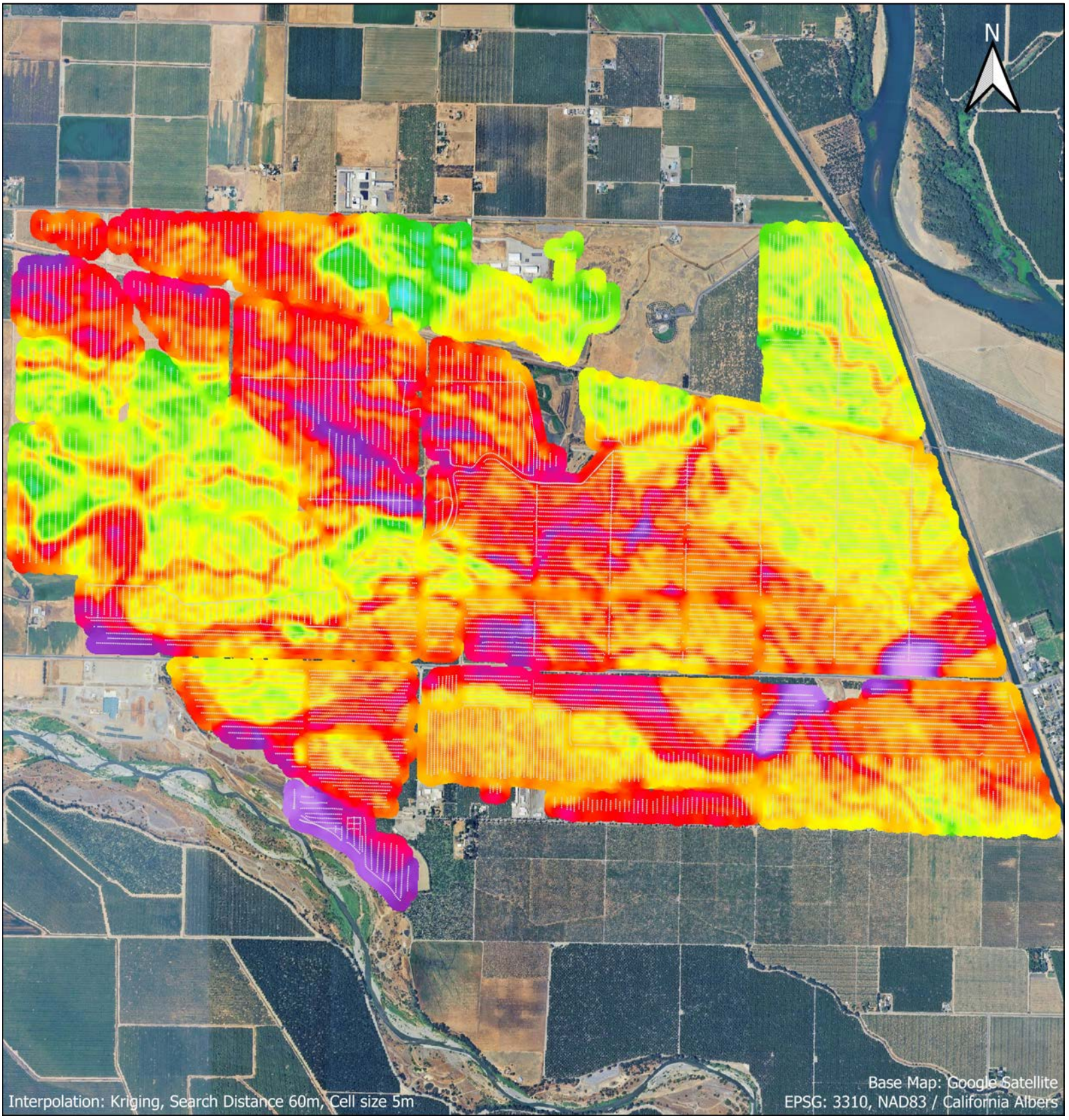
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 2-4 meters (7-13 feet)

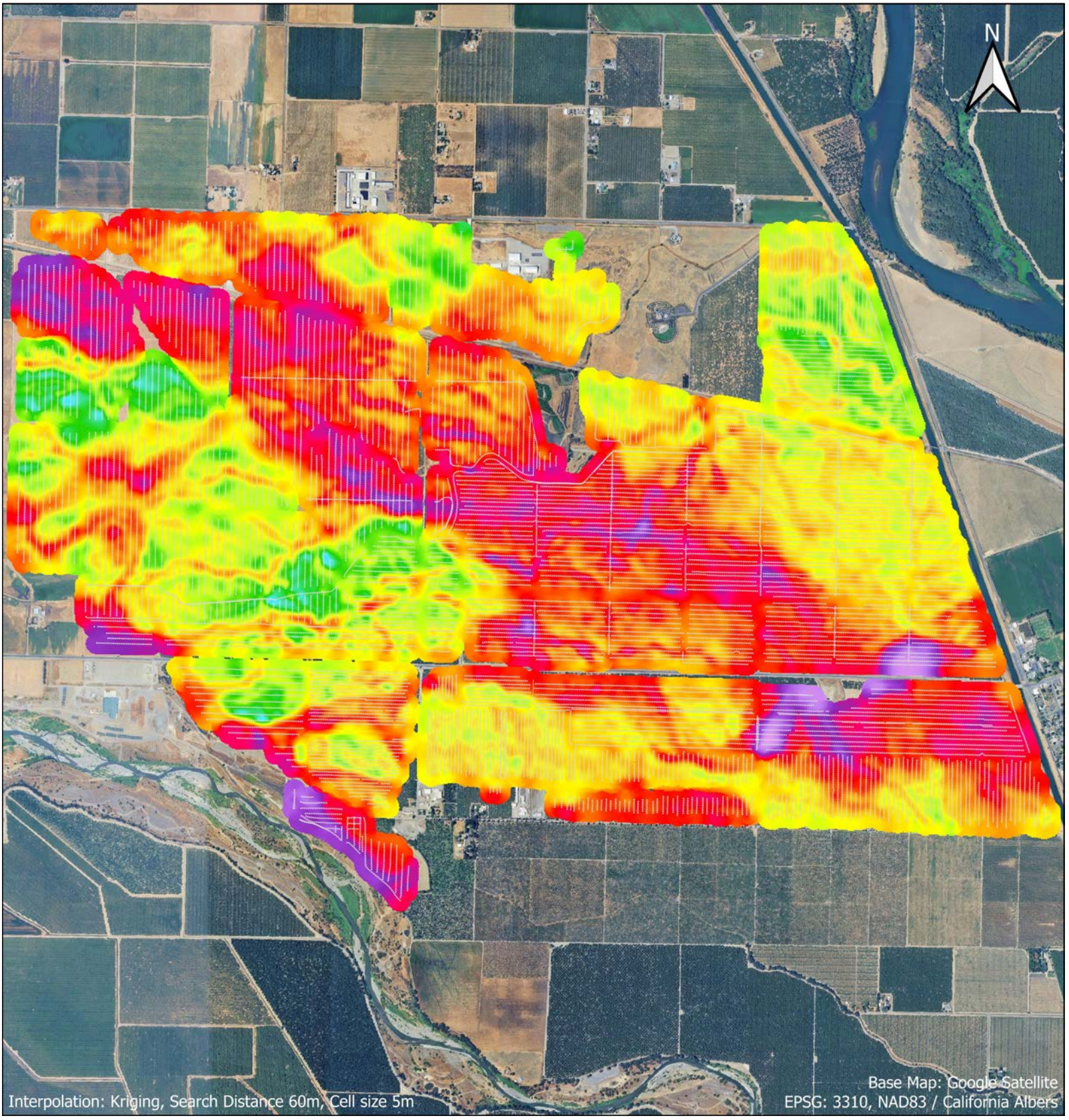
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100
Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

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Capay Farm Site

Mean Resistivity Map
Depth Interval 4-6 meters (13-20 feet)

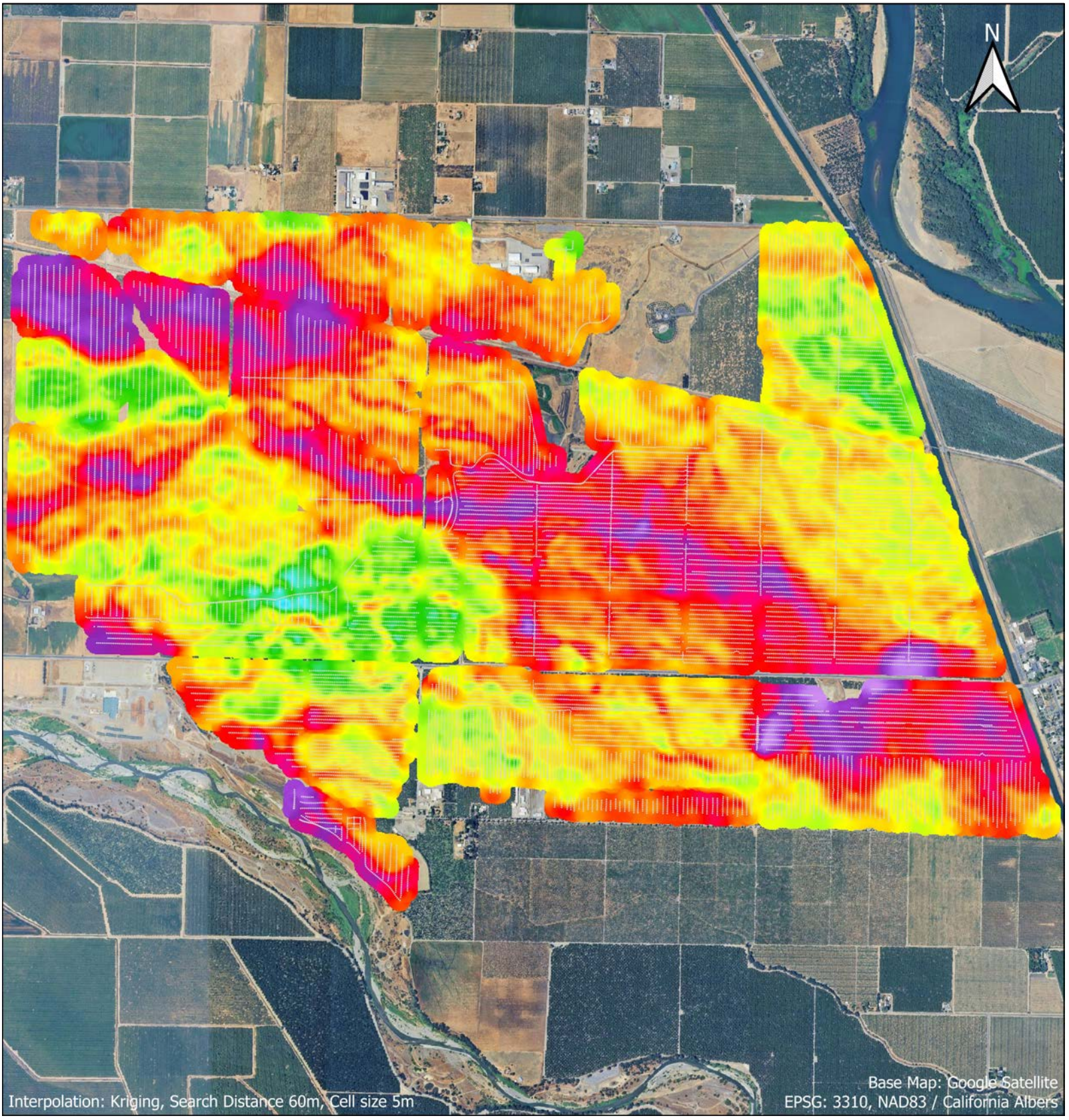
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100
Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 6-8 meters (20-26 feet)

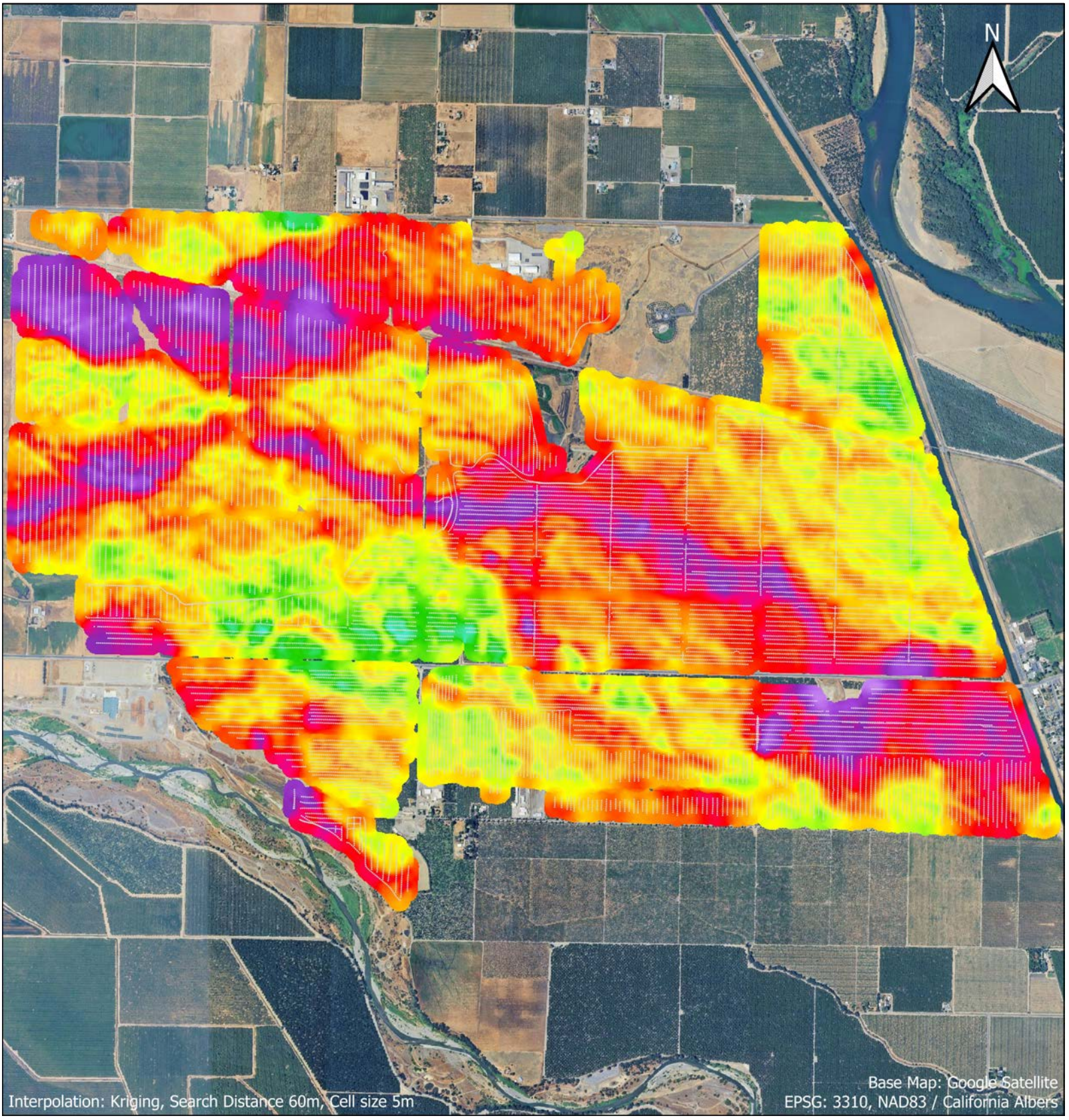
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 8-10 meters (26-33 feet)

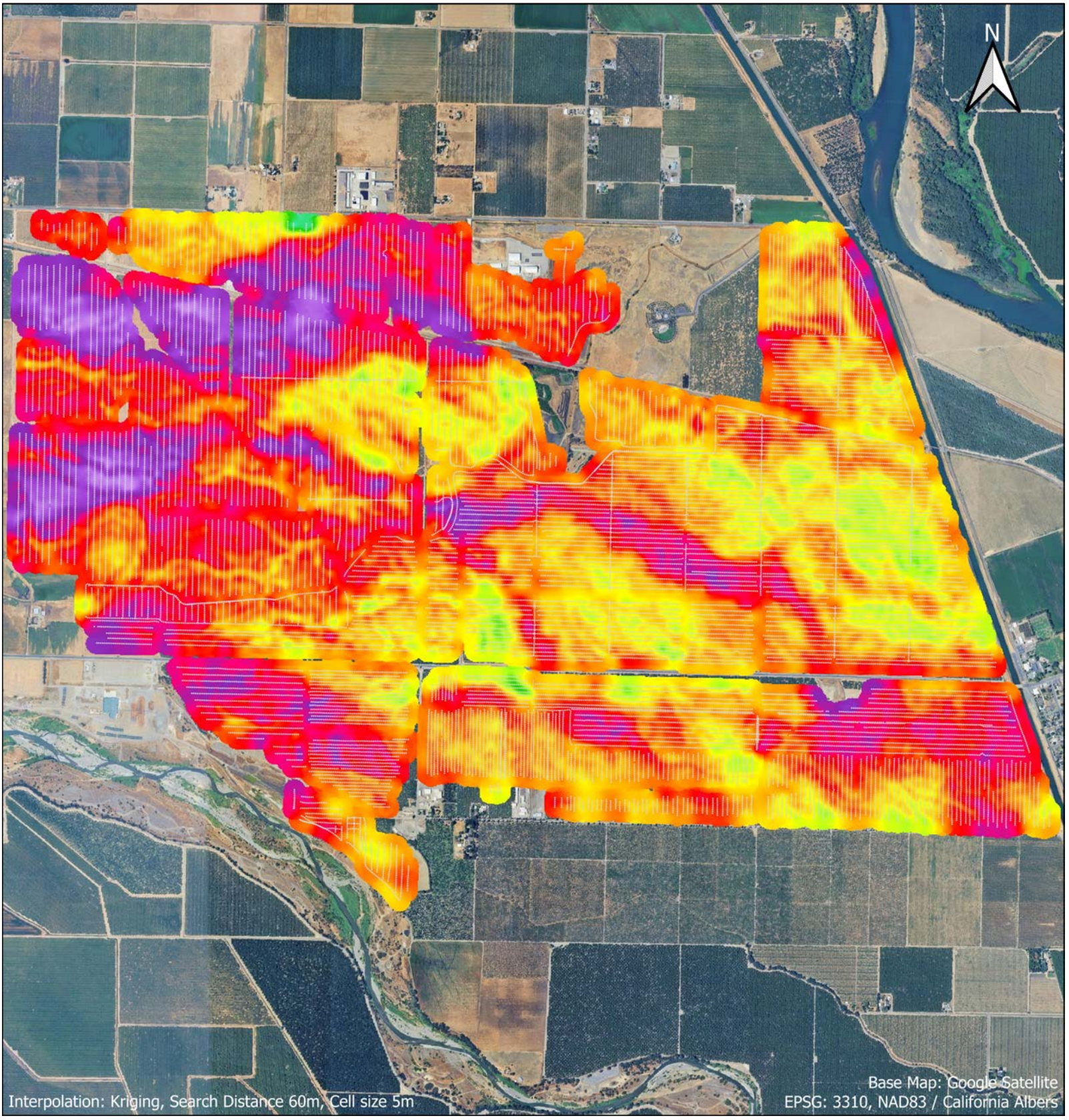
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100
Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
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Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 10-15 meters (33-49 feet)

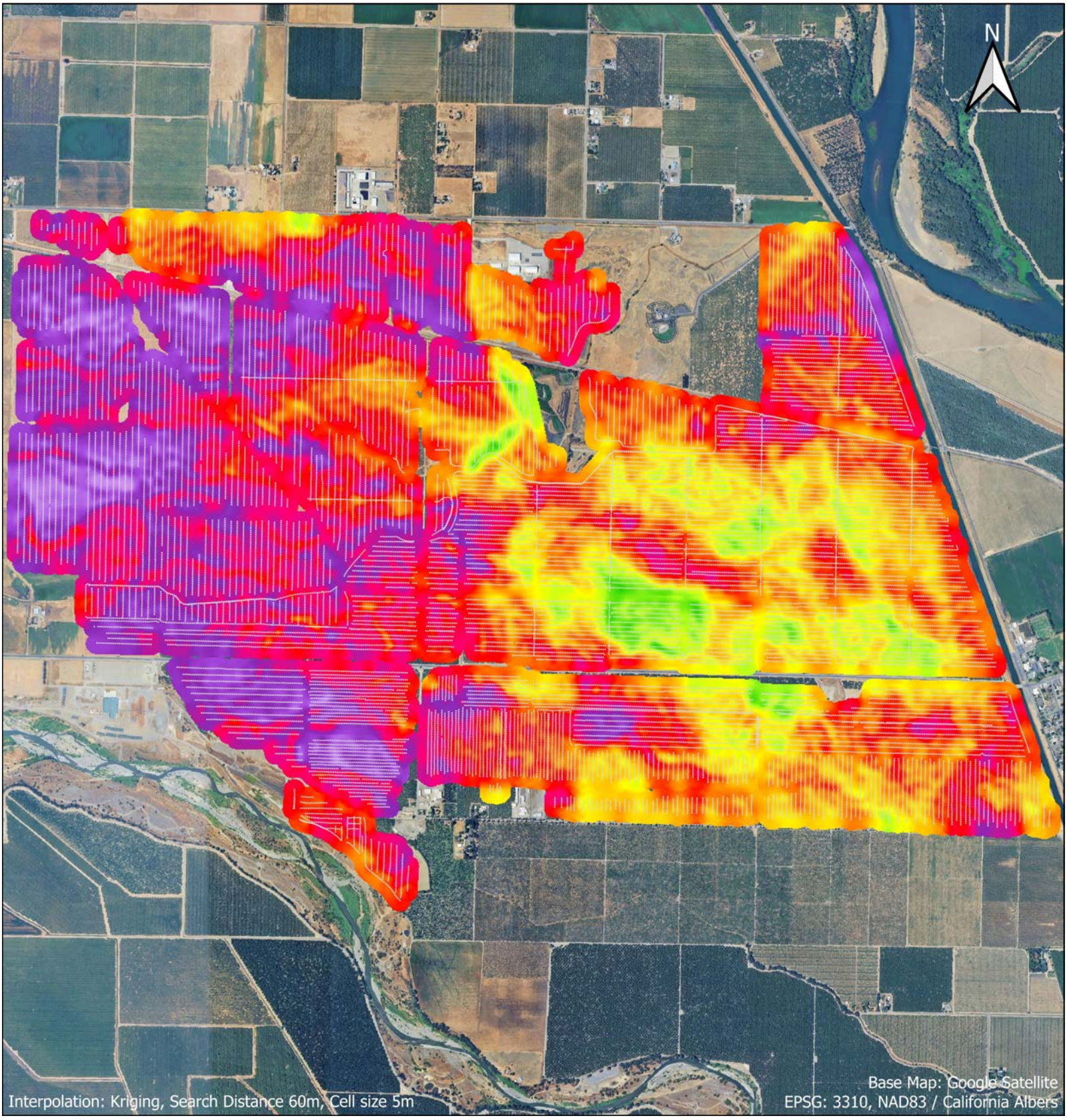
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100
Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 15-20 meters (49-66 feet)

Data Points: Gray dots

0 500 1,000 m

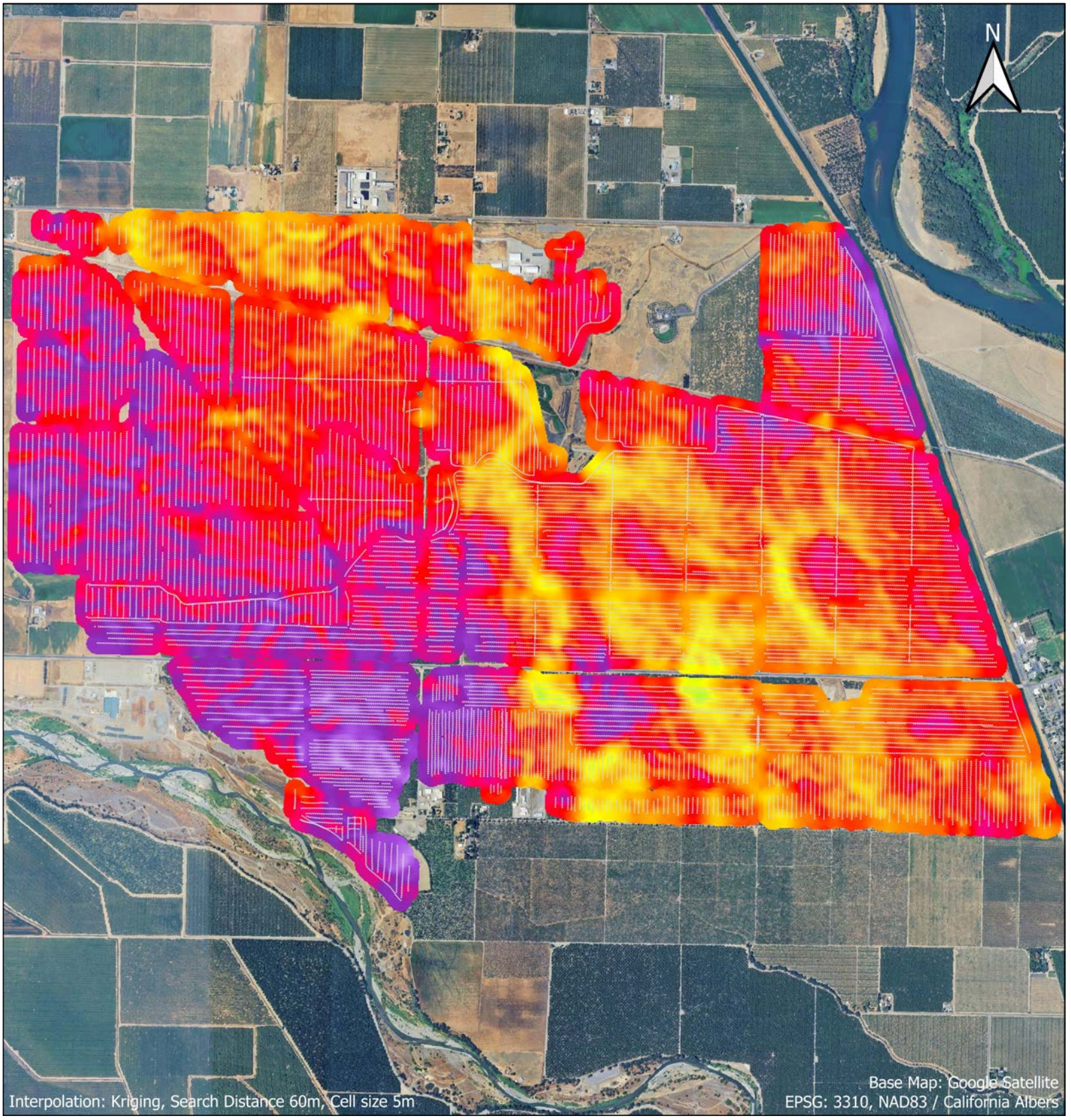
0 1,000 2,000 ft

3 10 30 100

Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 20-30 meters (66-98 feet)

Data Points: Gray dots

0 500 1,000 m

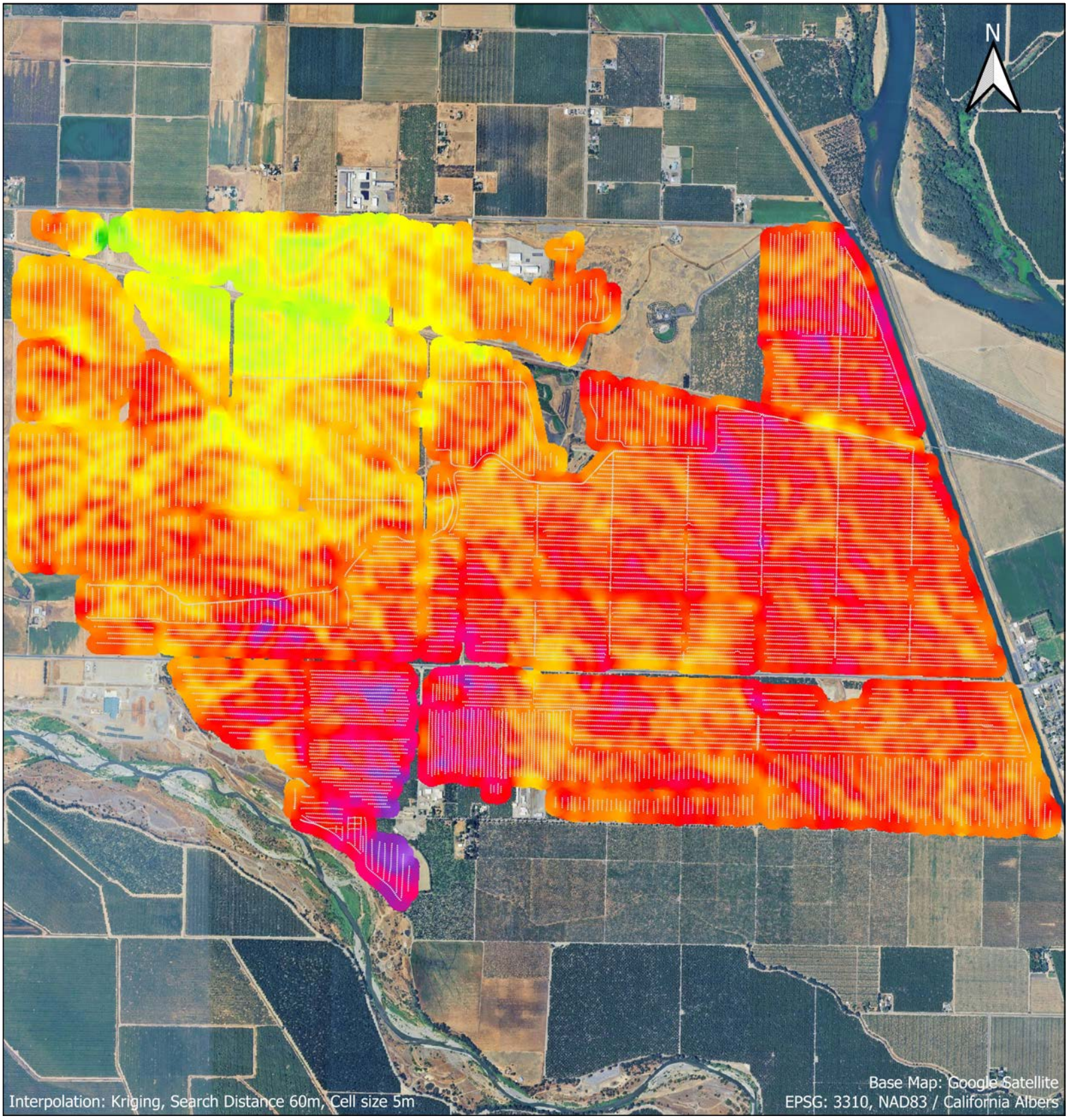
0 1,000 2,000 ft

3 10 30 100

Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 30-40 meters (98-131 feet)

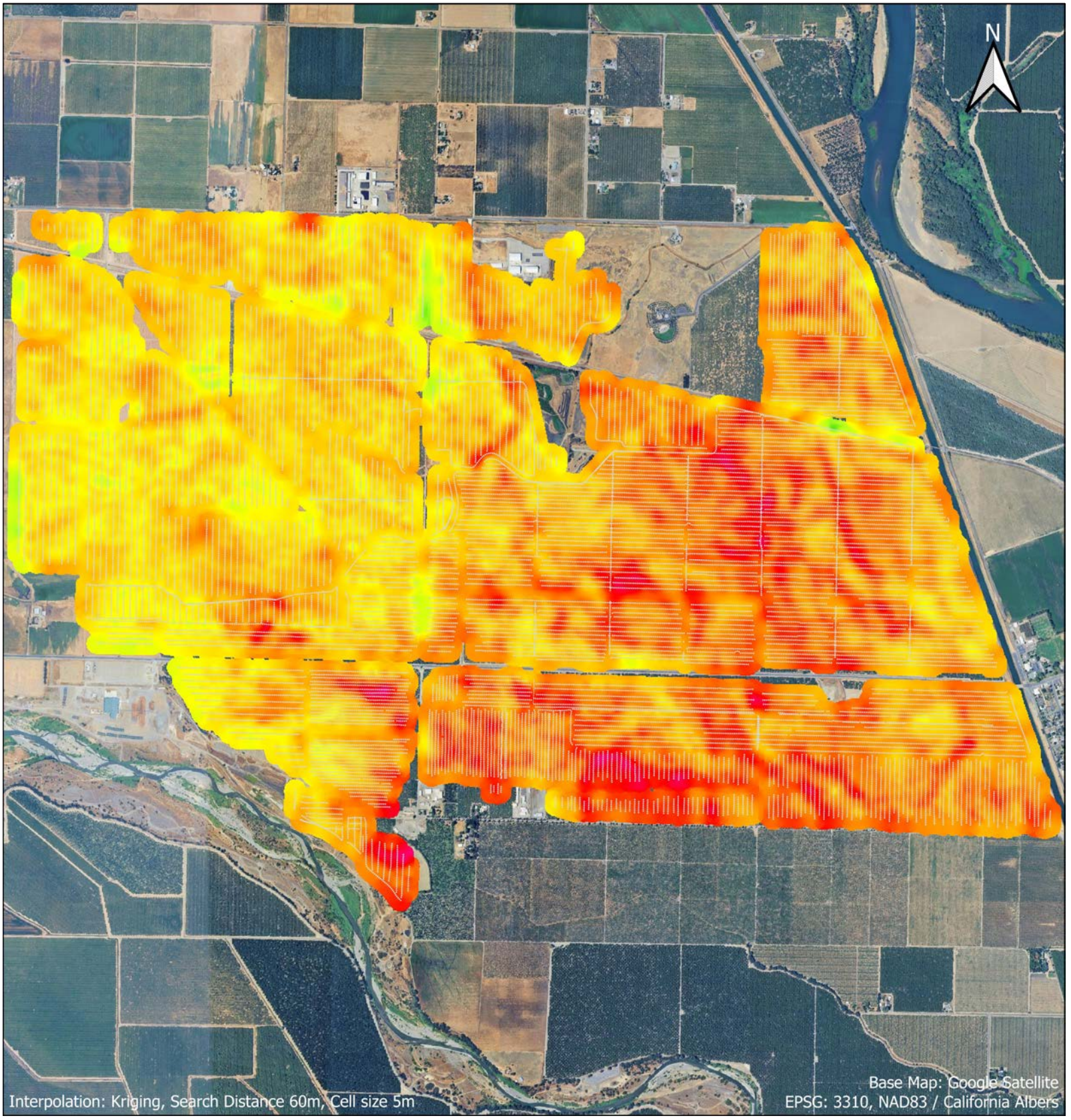
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

Project: 24003
Date surveyed: 3/4-26/2026
Date map created : 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 40-50 meters (131-164 feet)

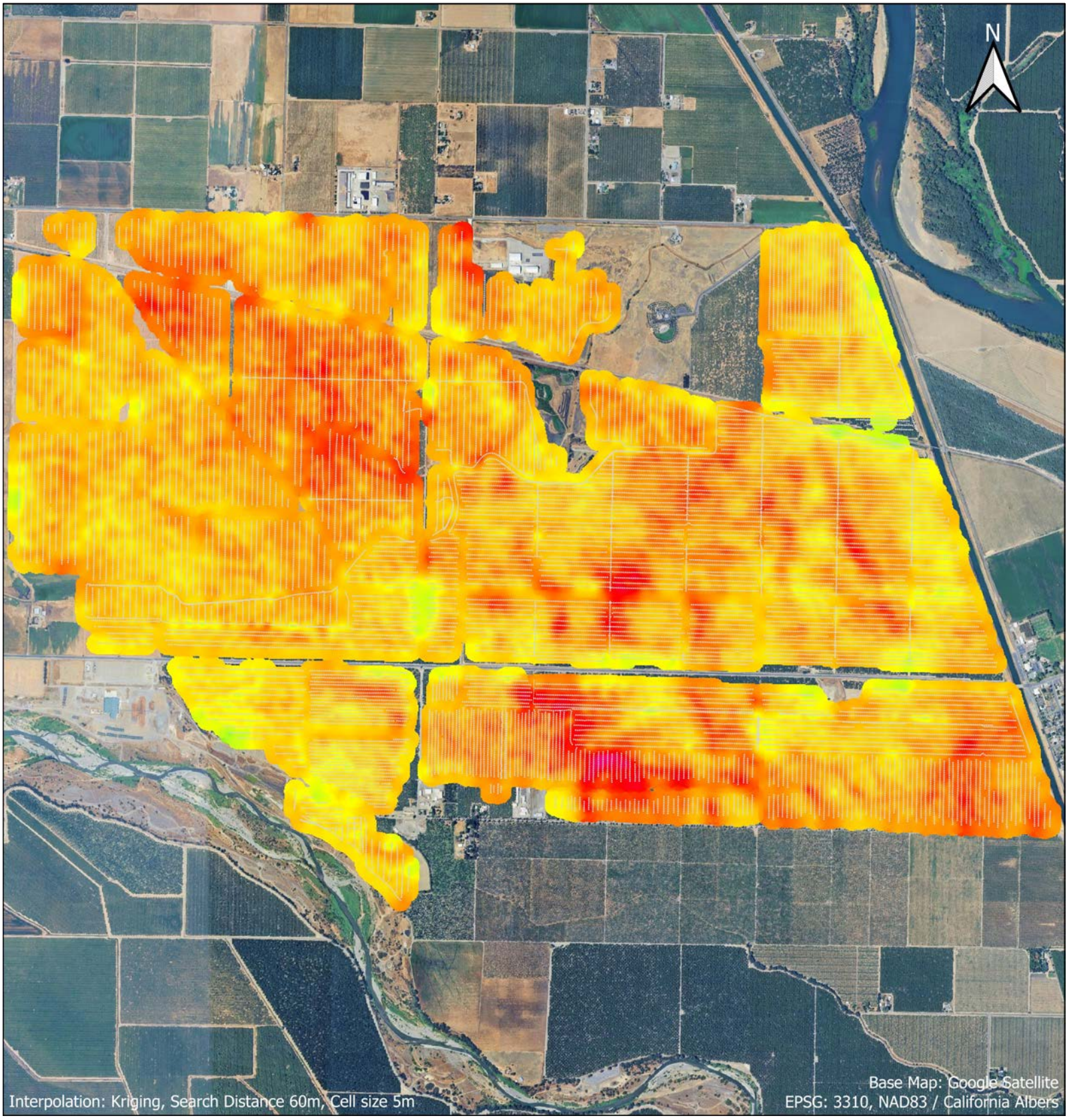
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

Project: 24003
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Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 50-60 meters (164-197 feet)

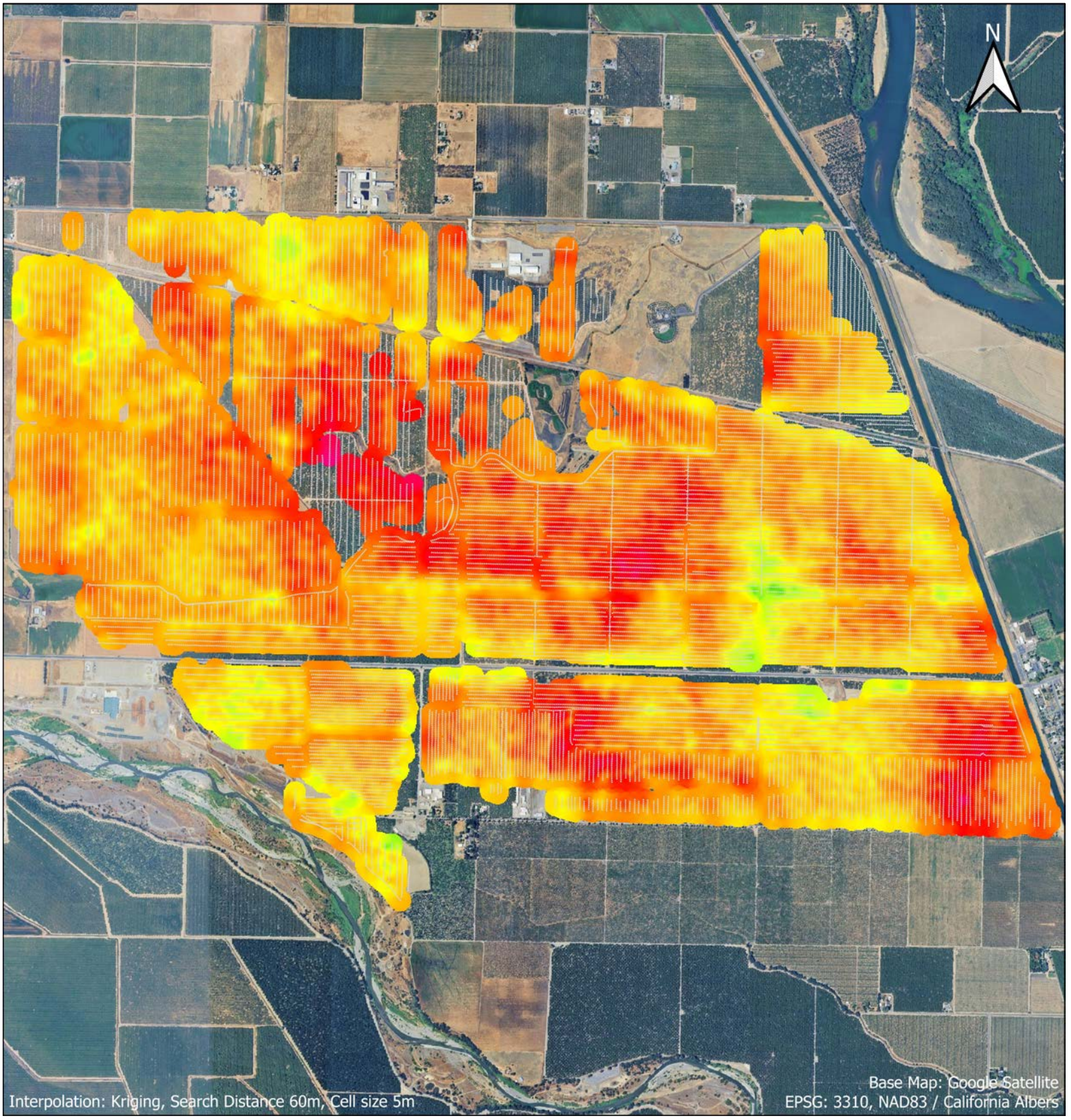
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

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GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 60-80 meters (197-262 feet)

Data Points: Gray dots

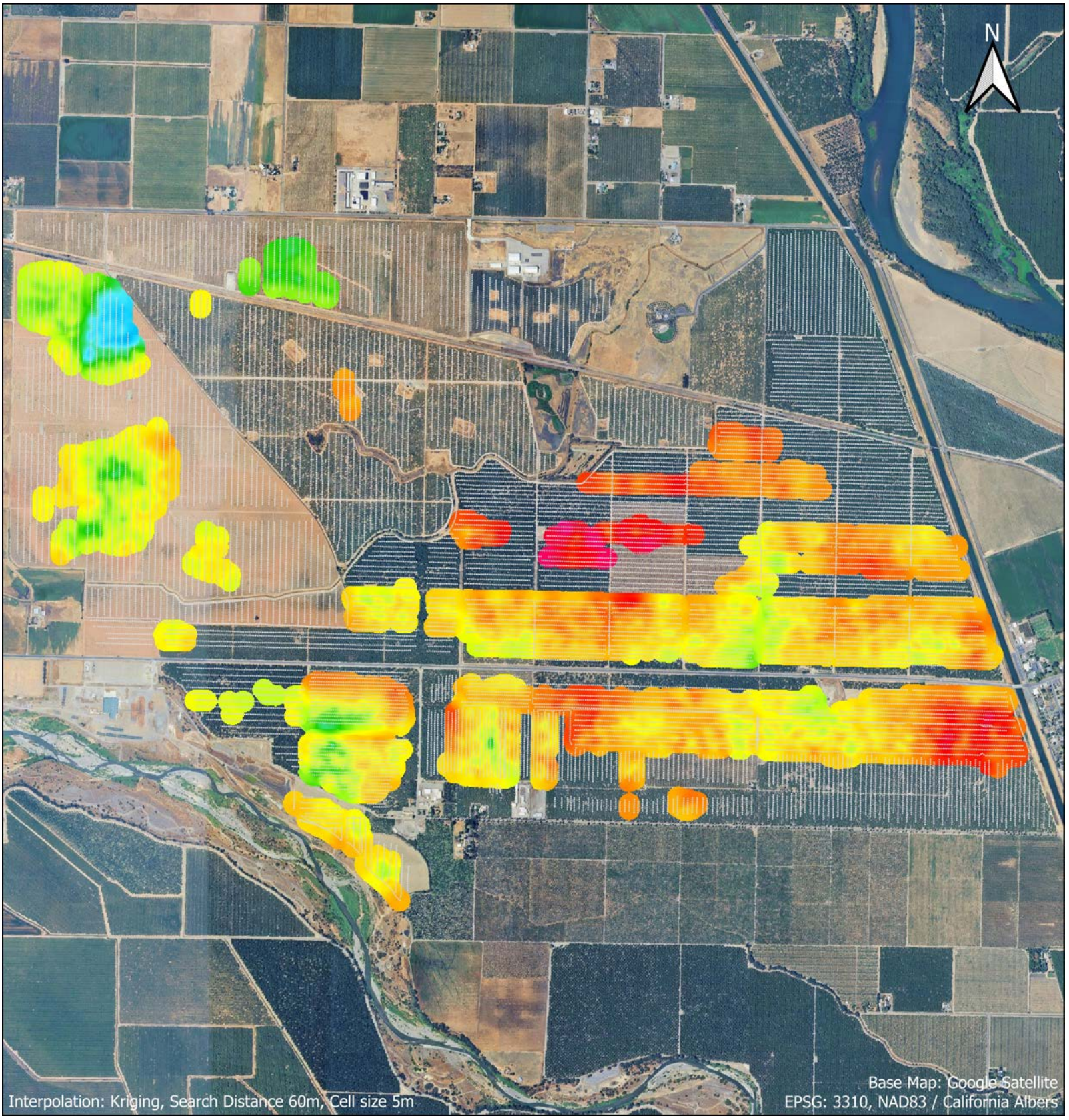
0 500 1,000 m

0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

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GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 80-100 meters (262-328 feet)

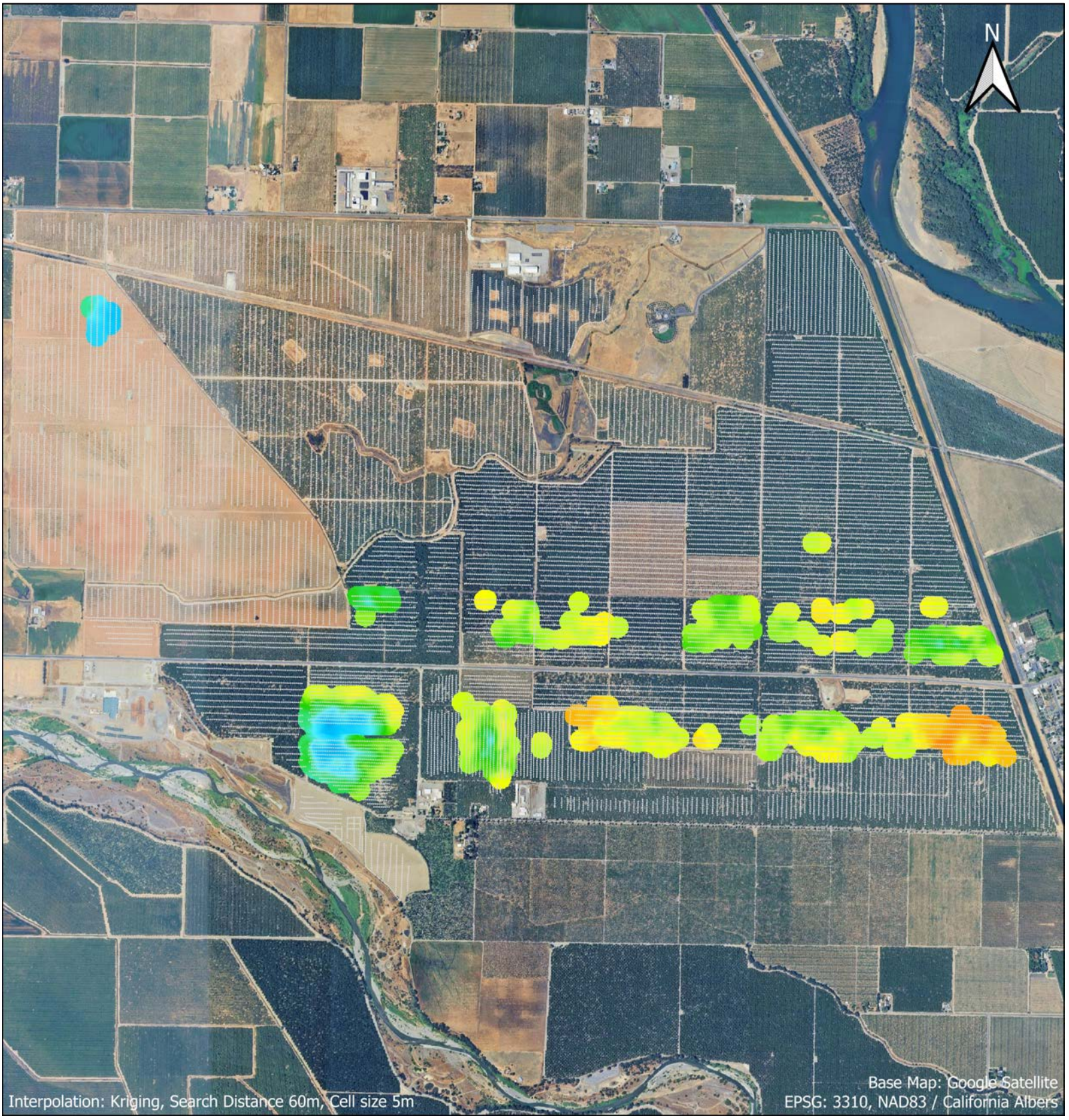
Data Points: Gray dots

0 500 1,000 m
0 1,000 2,000 ft

3 10 30 100 Resistivity [ohm-m]

Project: 24003
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Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS



Capay Farm Site

Mean Resistivity Map
Depth Interval 100-120 meters (328-394 feet)

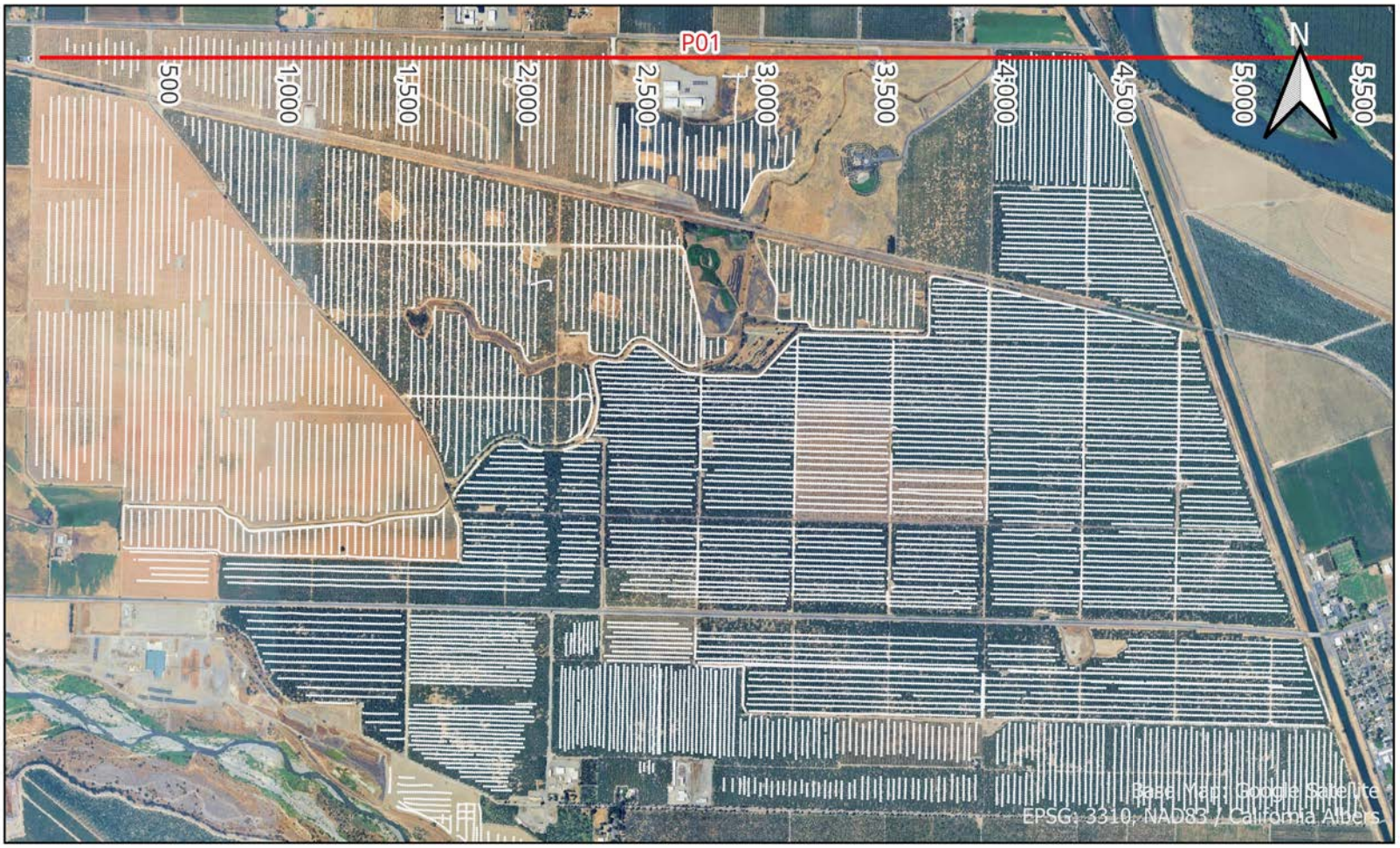
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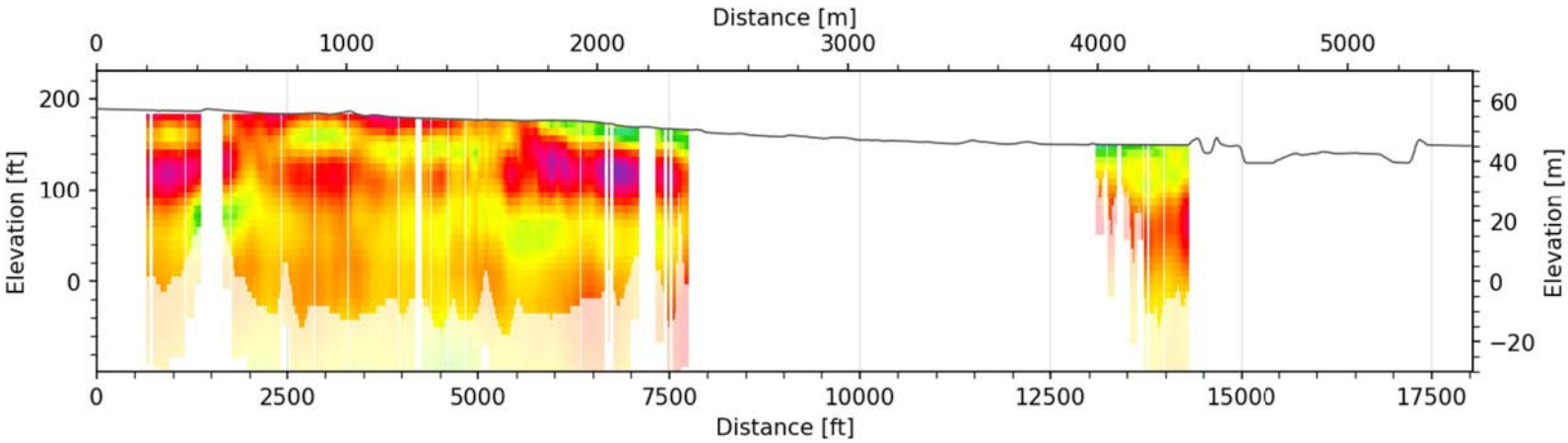
0 500 1,000 m
0 1,000 2,000 ft

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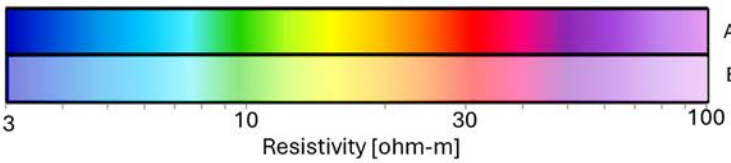




Vertical Section P01 W-E

0 200 400 m

0 1,000 2,000 ft

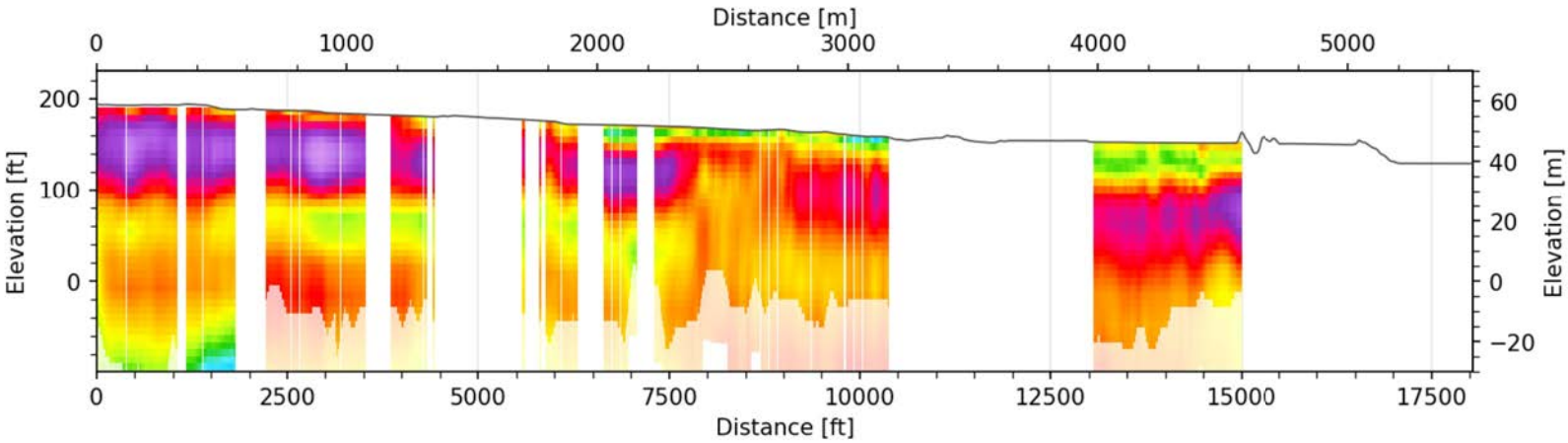


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
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Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

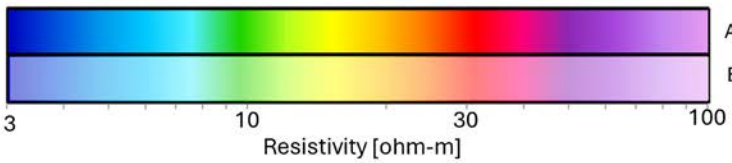




Vertical Section P02 W-E

0 200 400 m

0 1,000 2,000 ft

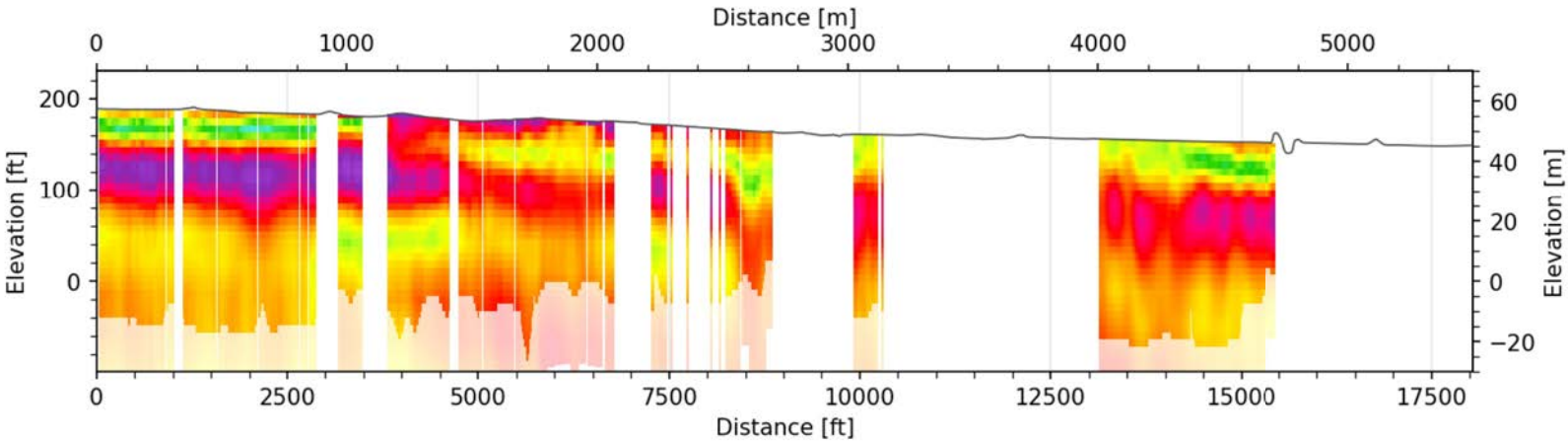


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
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GEOPHYSICAL IMAGING PARTNERS





Vertical Section P03 W-E

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

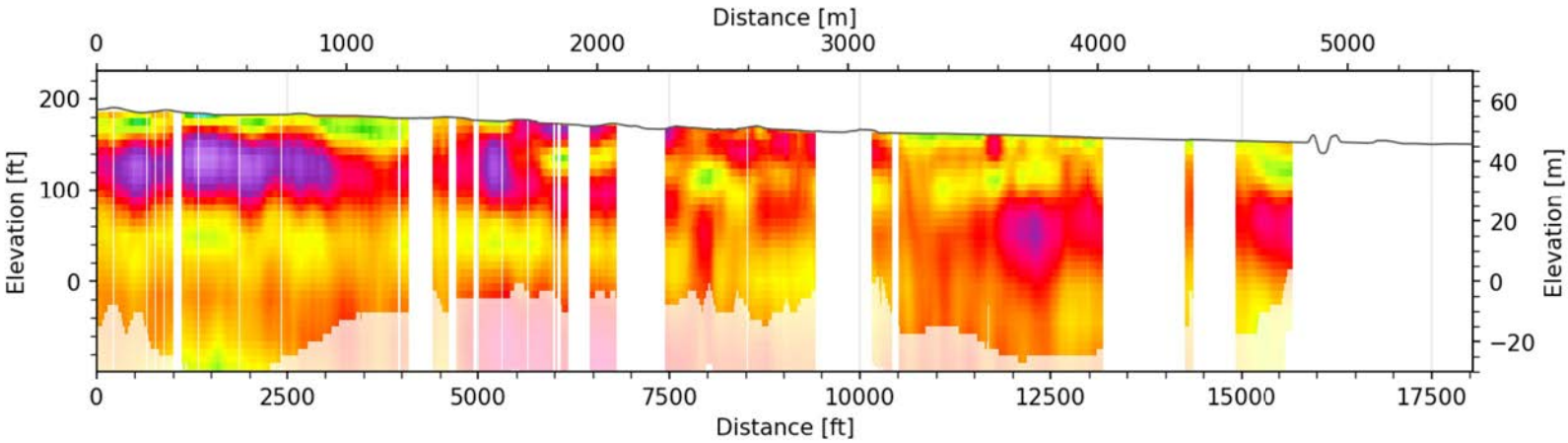
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P04 W-E

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

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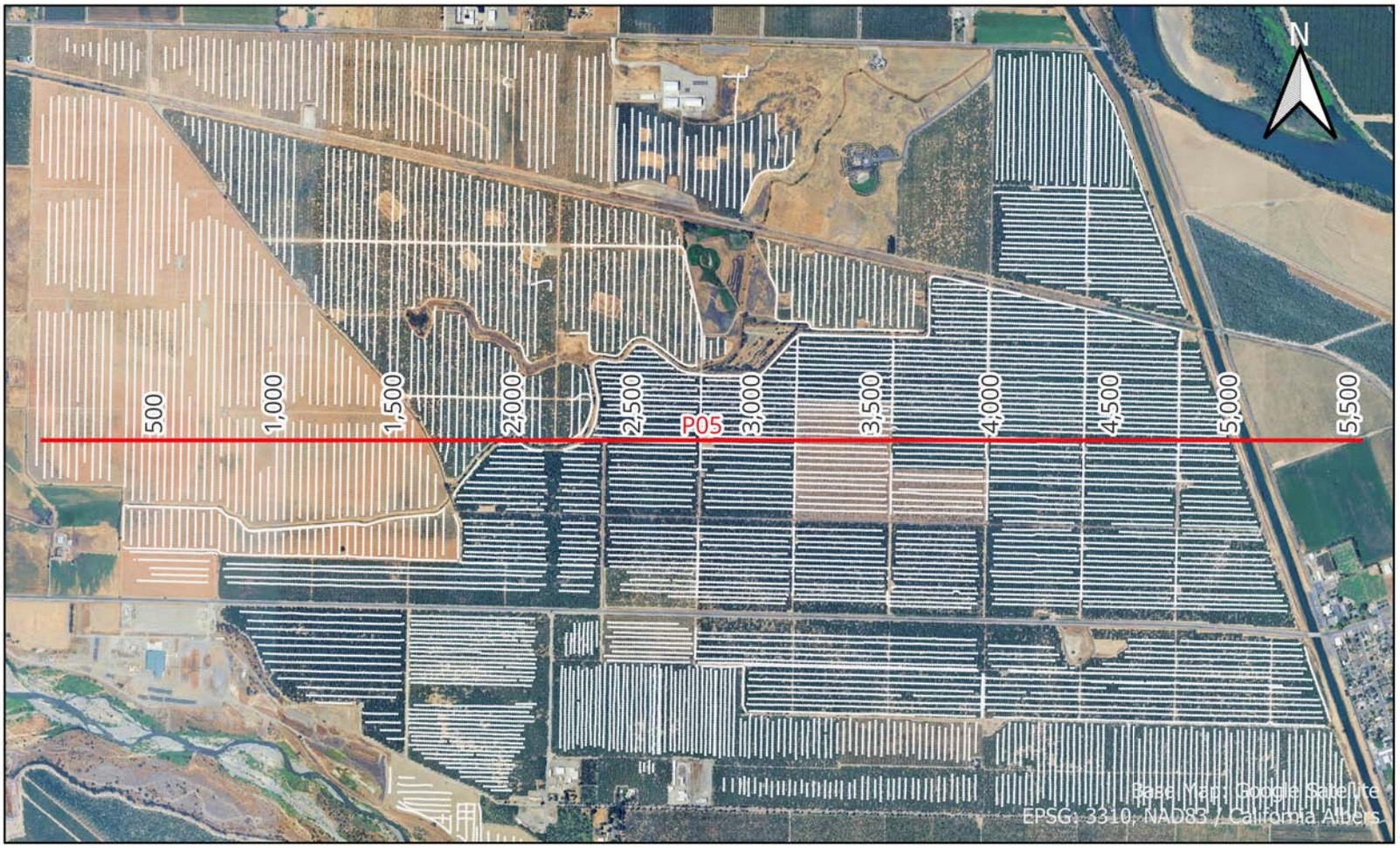
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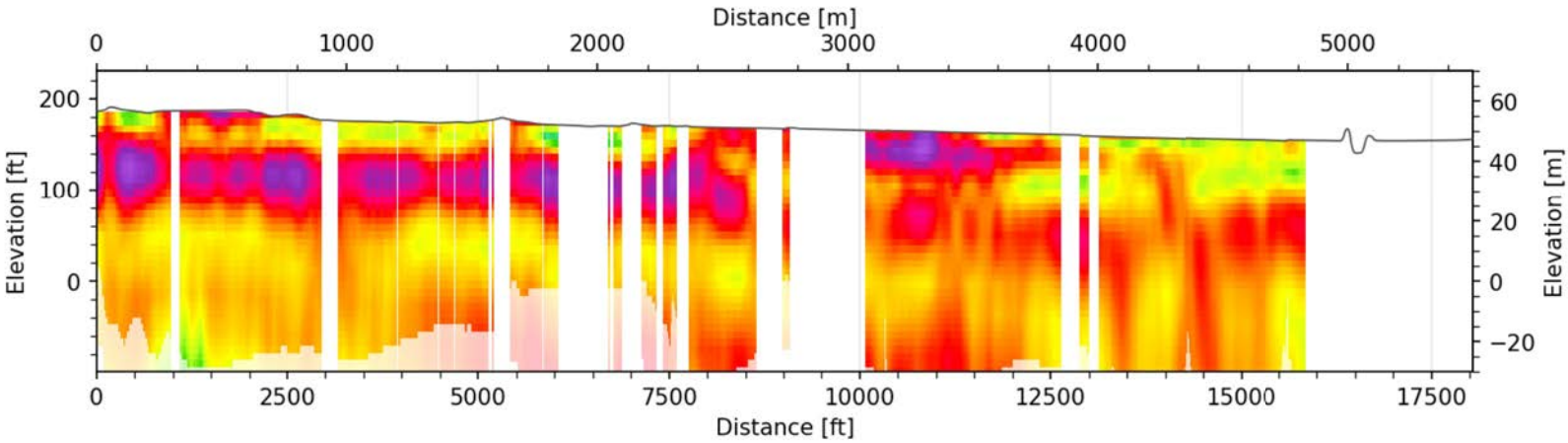
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P05 W-E

0 200 400 m

0 1,000 2,000 ft

*

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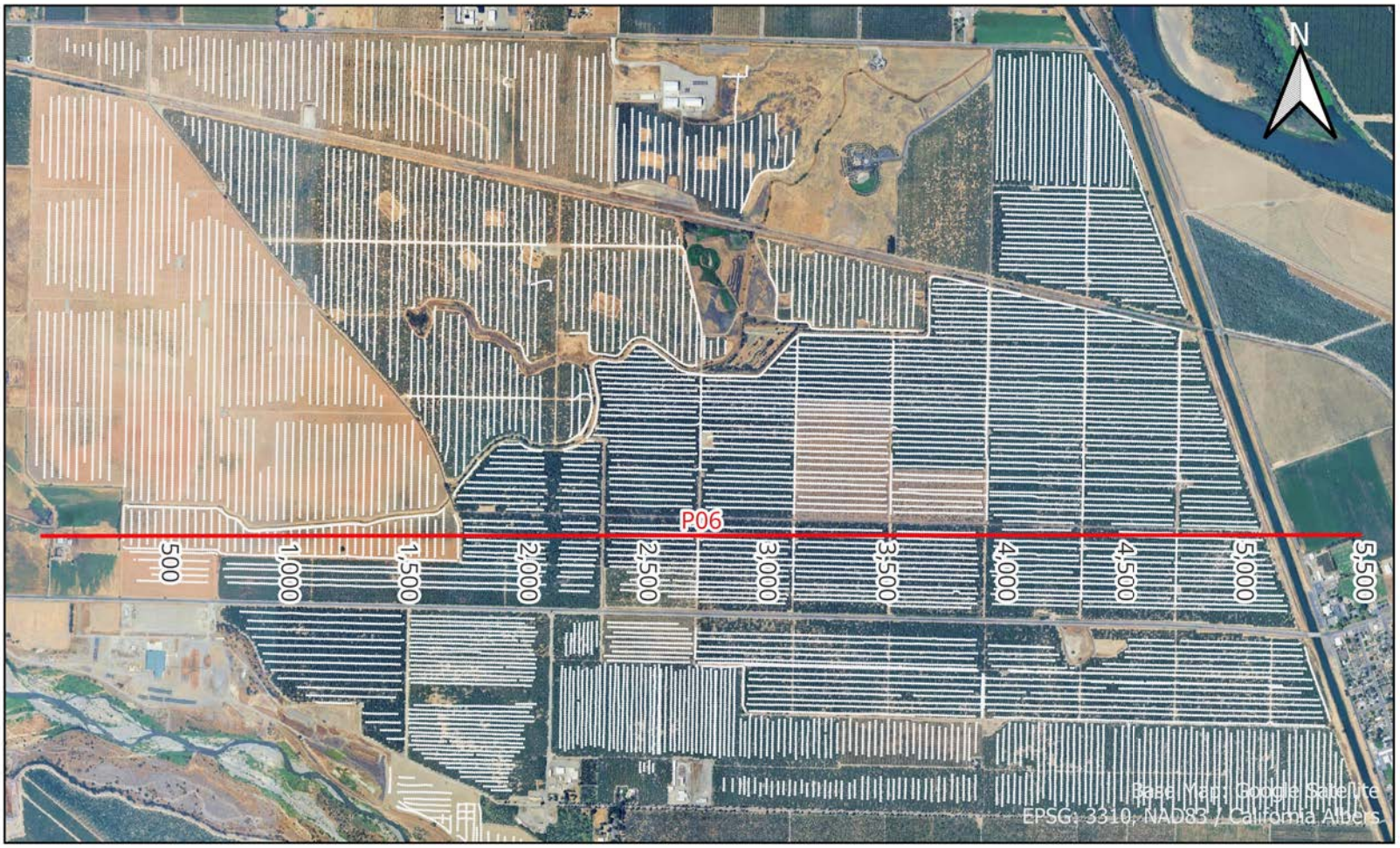
3 10 30 100

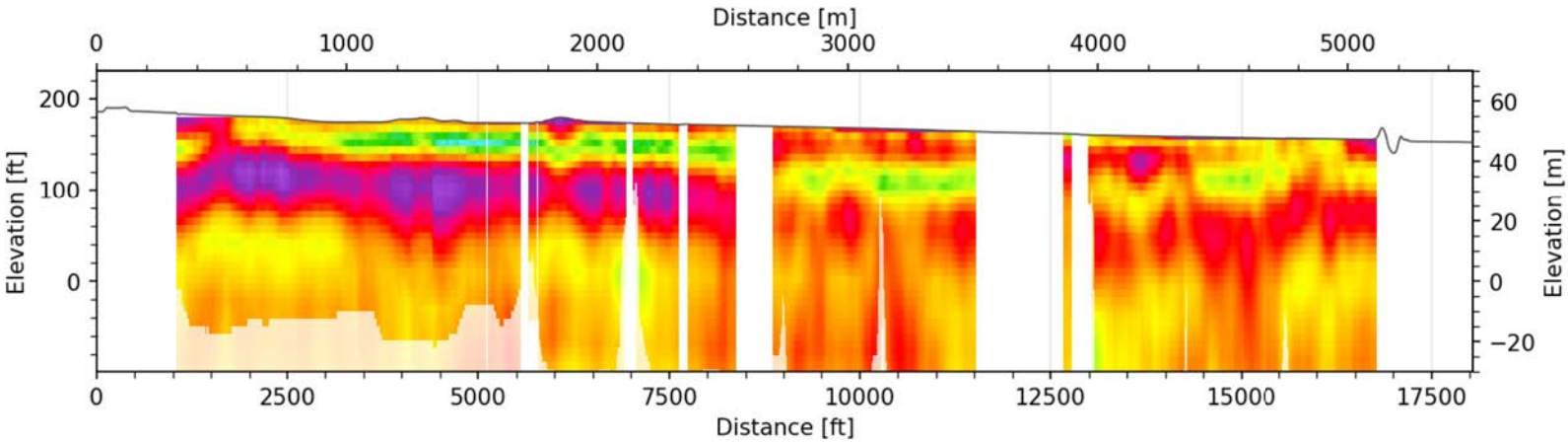
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
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Date map created: 10/19/2026
Created by: MH
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GEOPHYSICAL IMAGING PARTNERS





Vertical Section P06 W-E

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

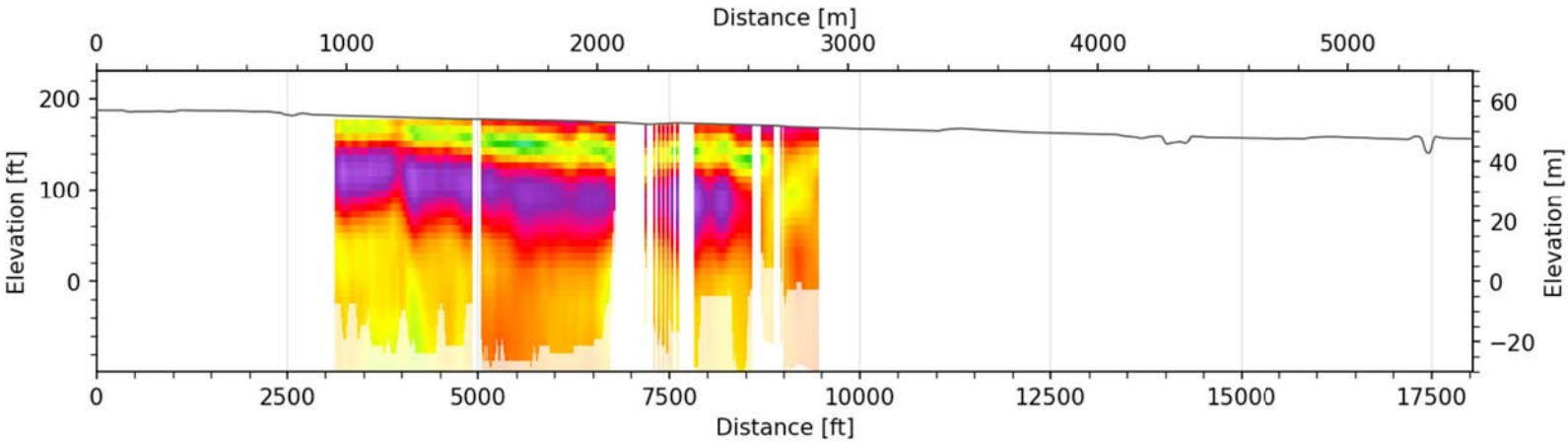
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
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Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

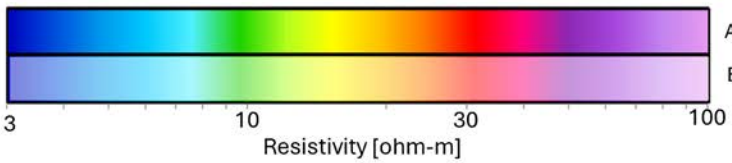




Vertical Section P07 W-E

0 200 400 m

0 1,000 2,000 ft

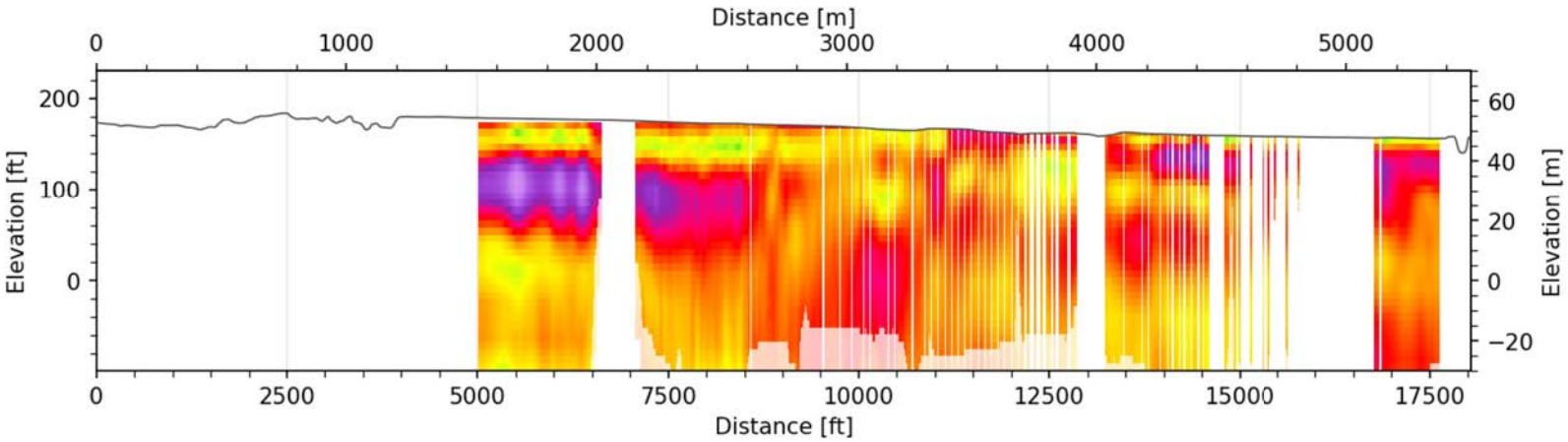


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

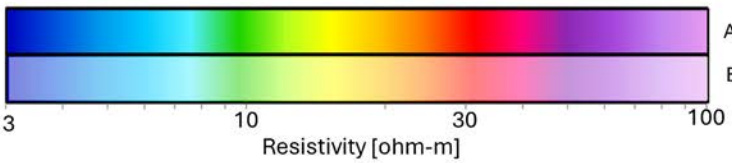




Vertical Section P08 W-E

0 200 400 m

0 1,000 2,000 ft

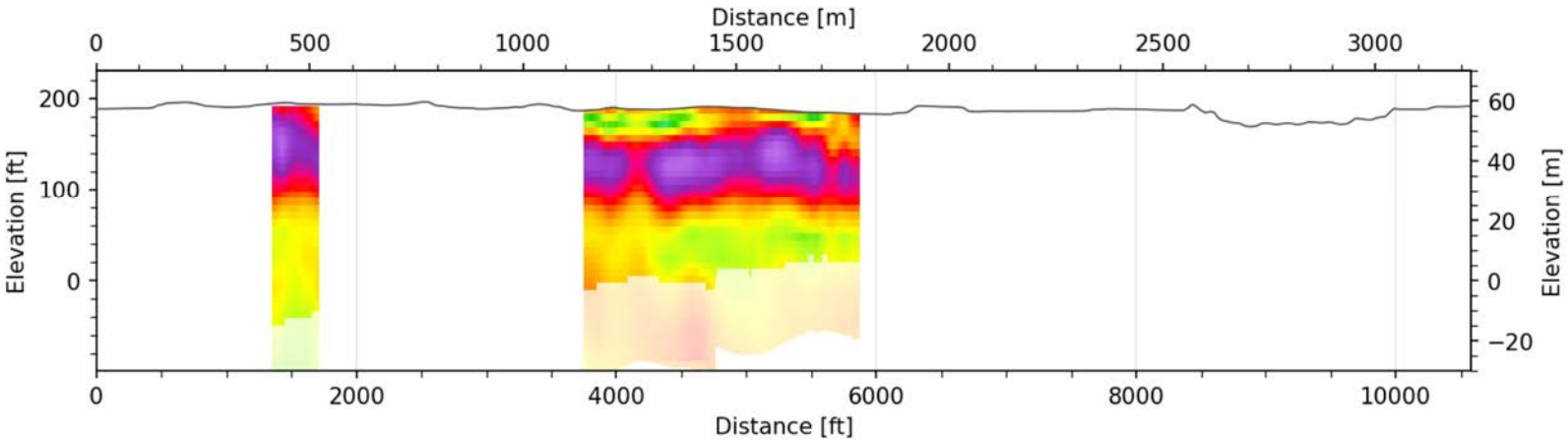


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P09 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

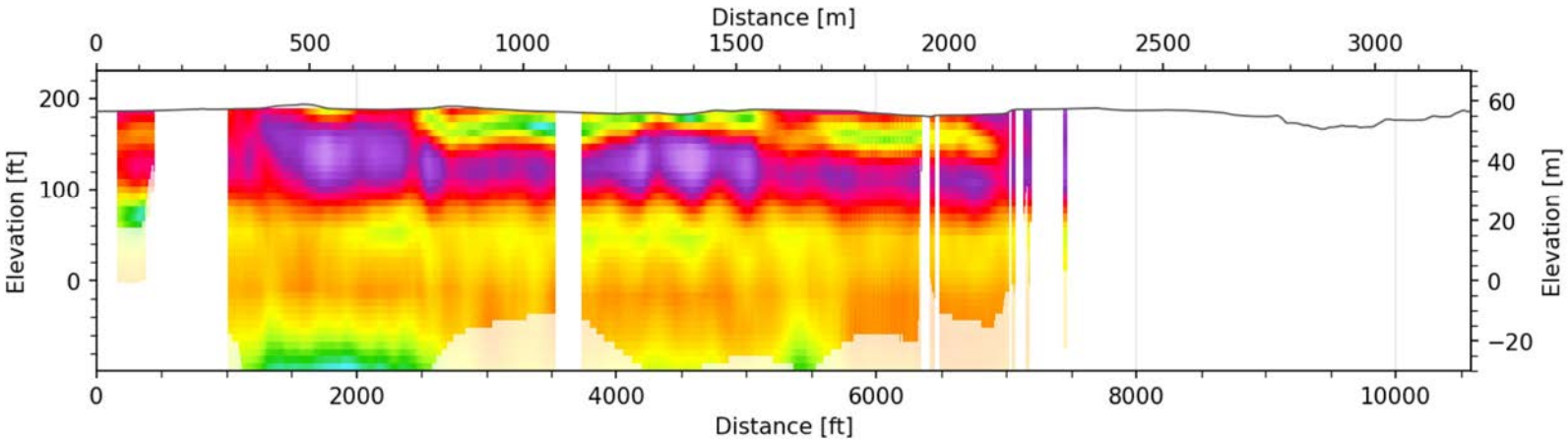
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P10 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

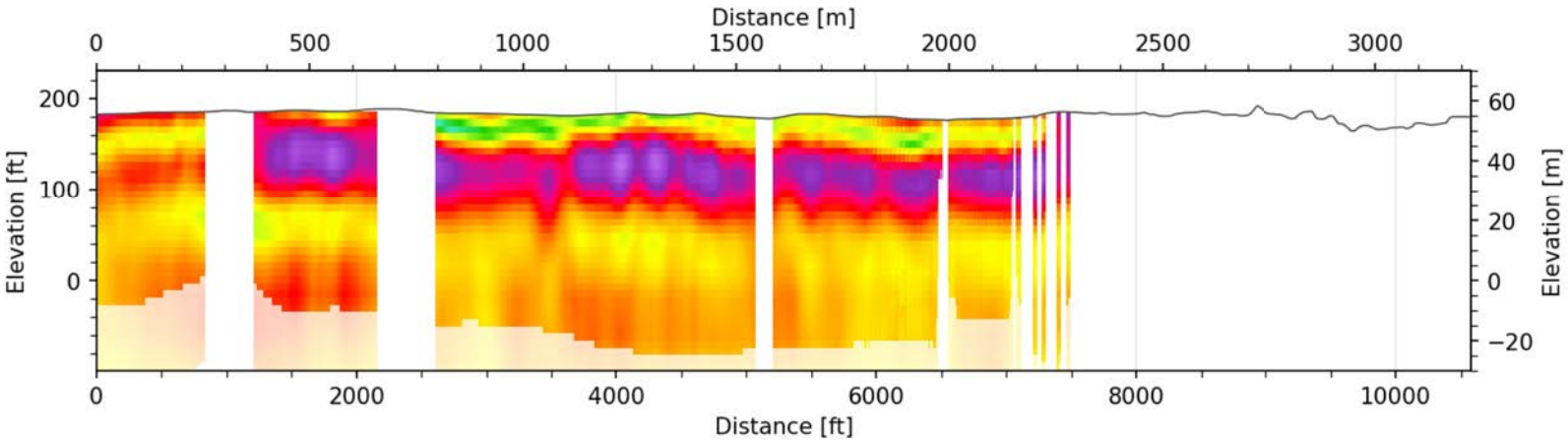
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P11 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

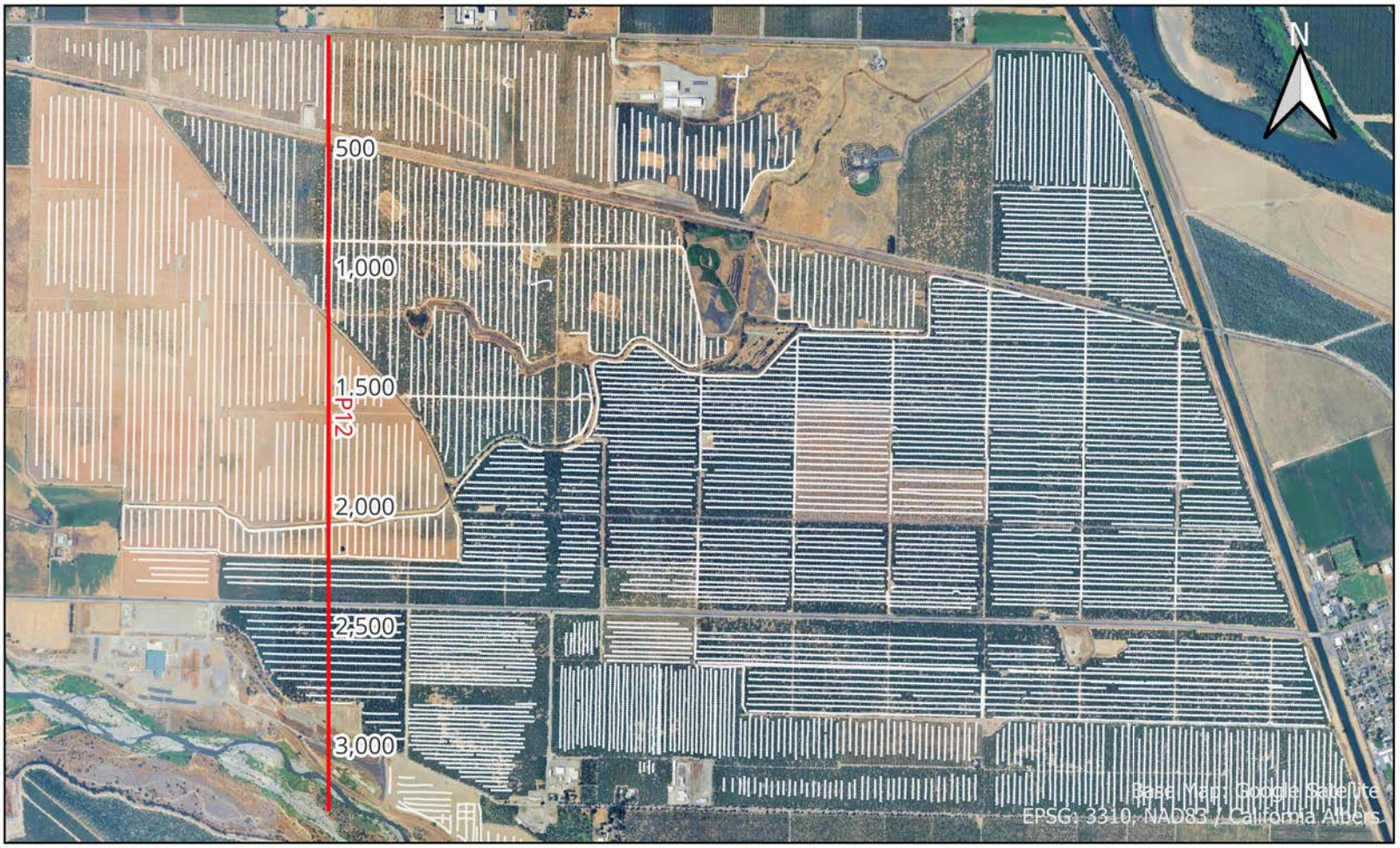
3 10 30 100

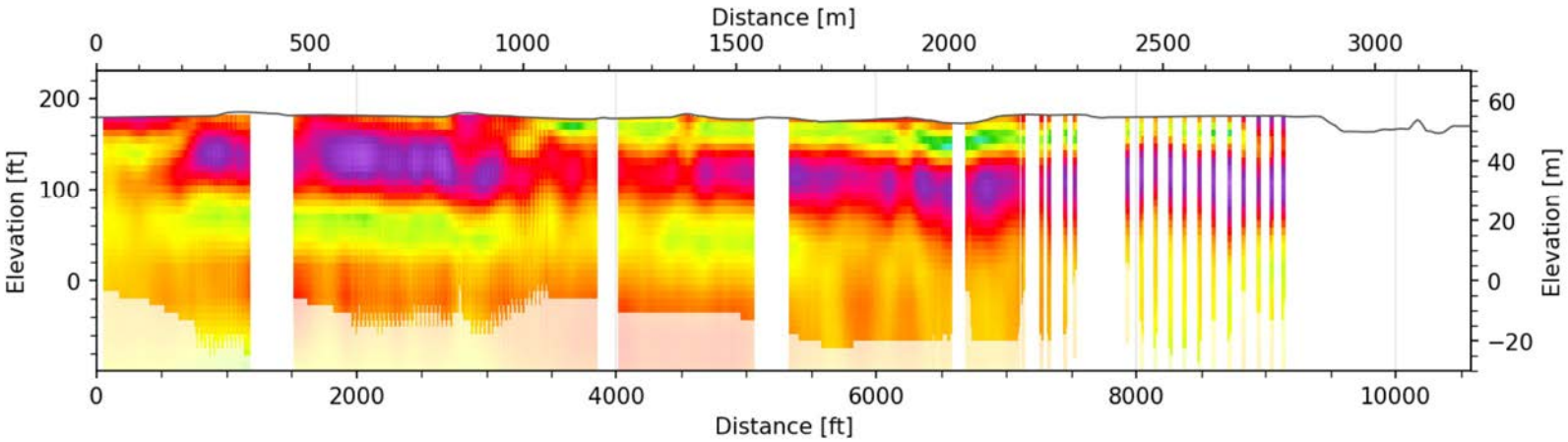
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P12 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

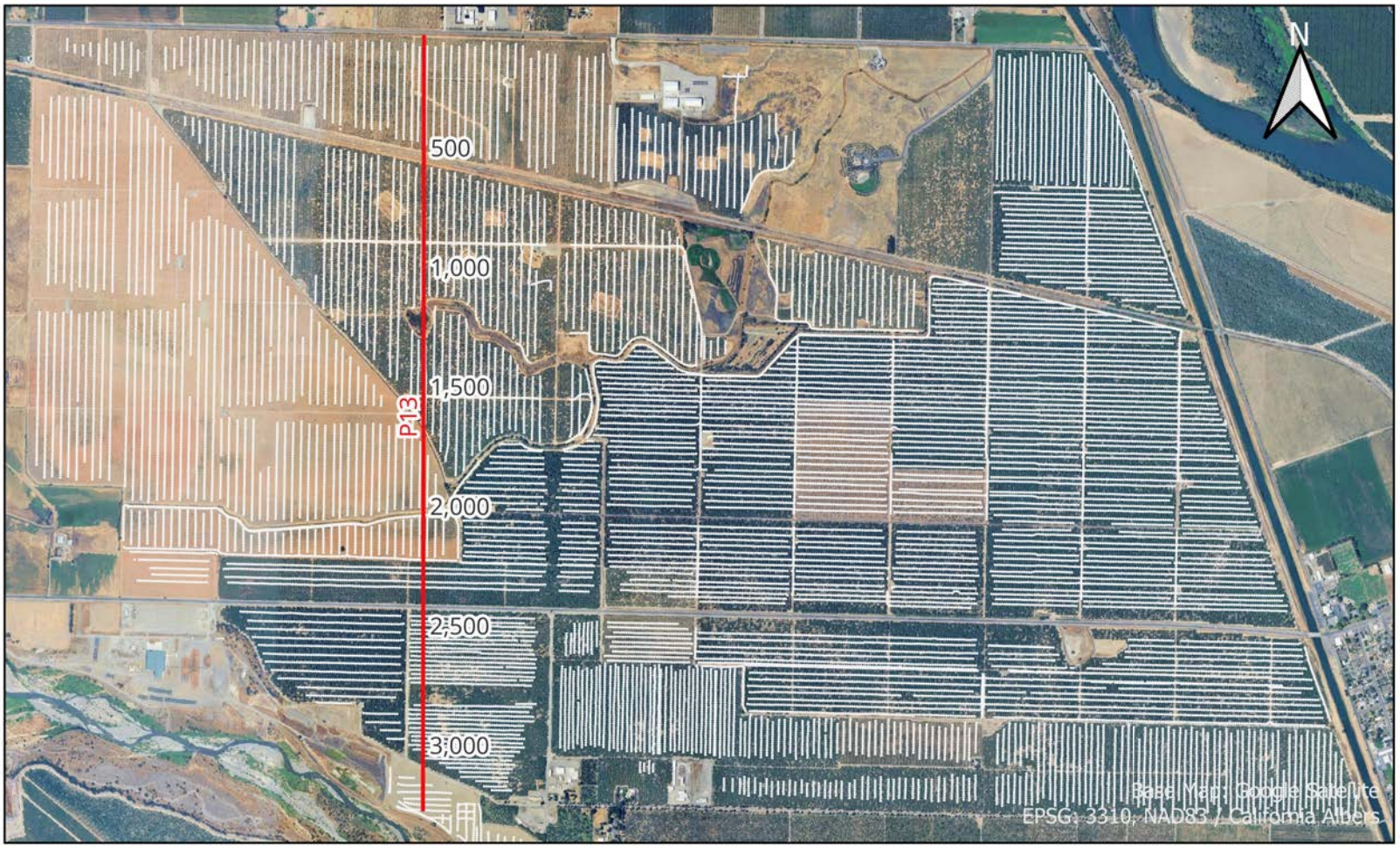
3 10 30 100

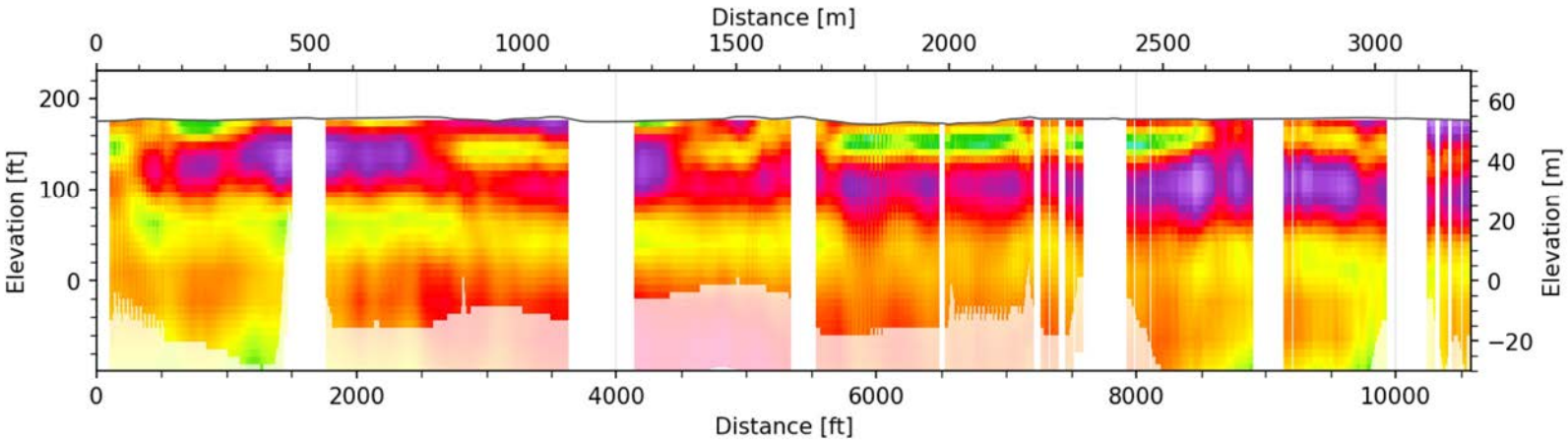
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P13 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

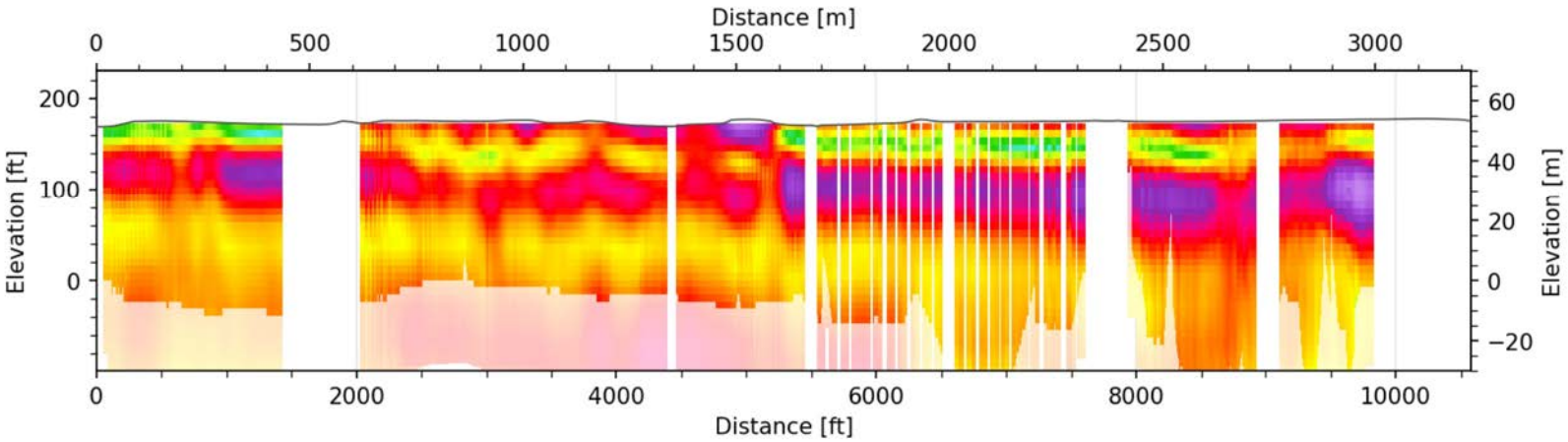
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

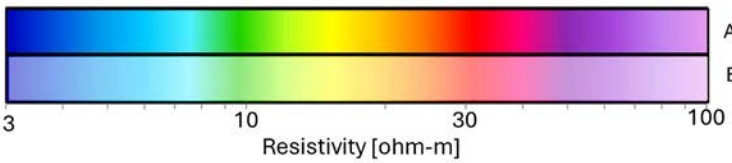




Vertical Section P14 N-S

0 200 400 m

0 1,000 2,000 ft

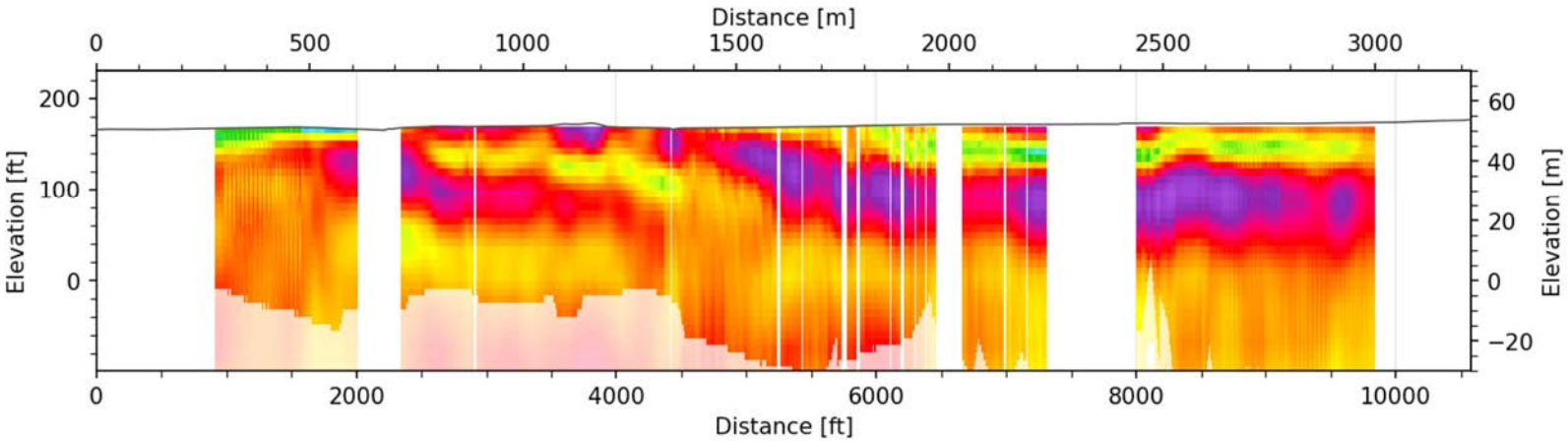


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS





Vertical Section P15 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

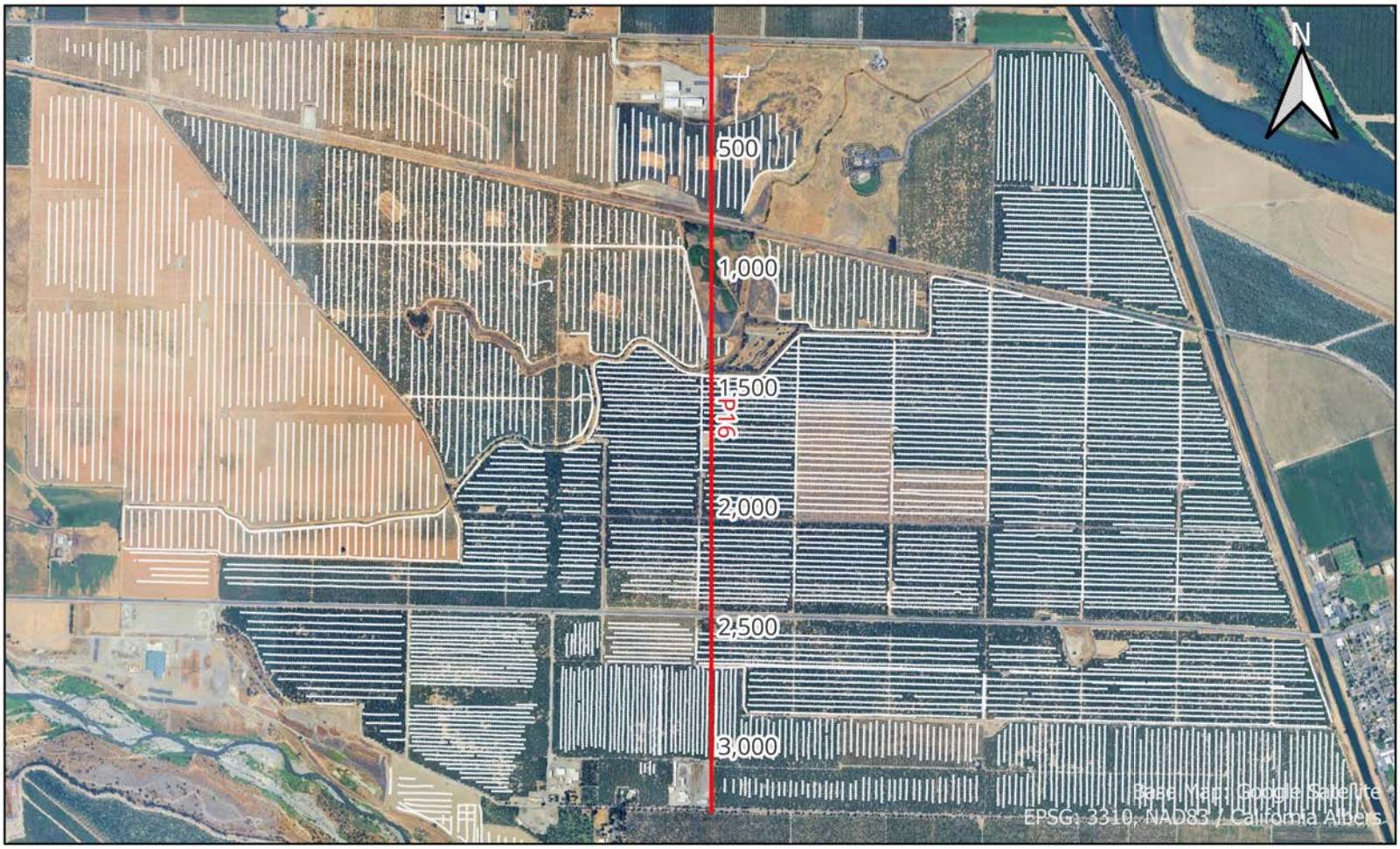
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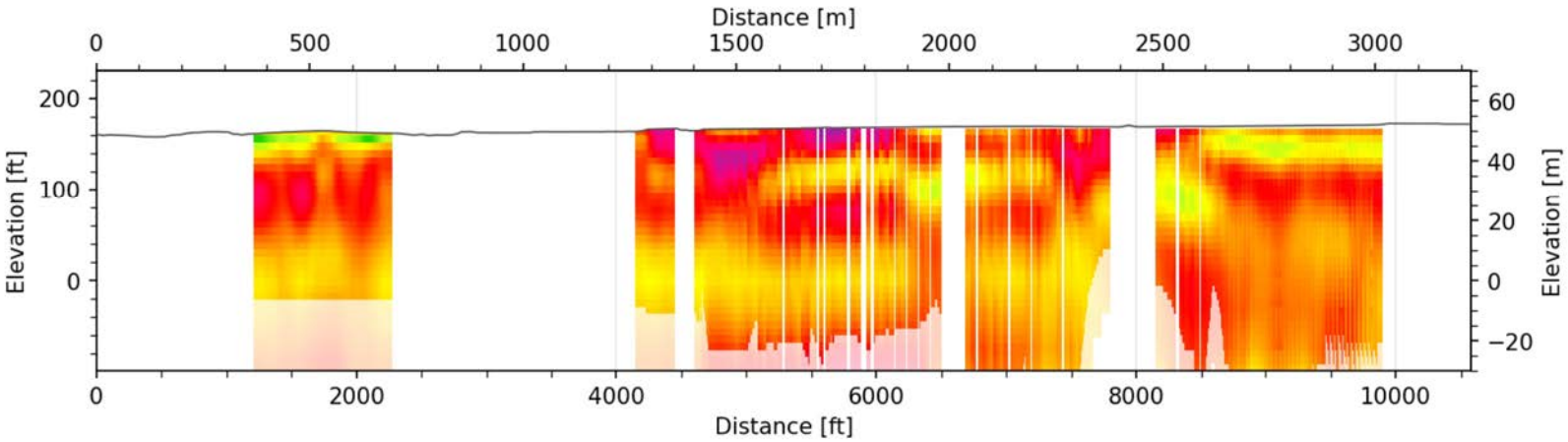
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

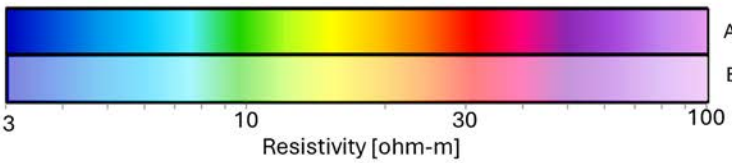




Vertical Section P16 N-S

0 200 400 m

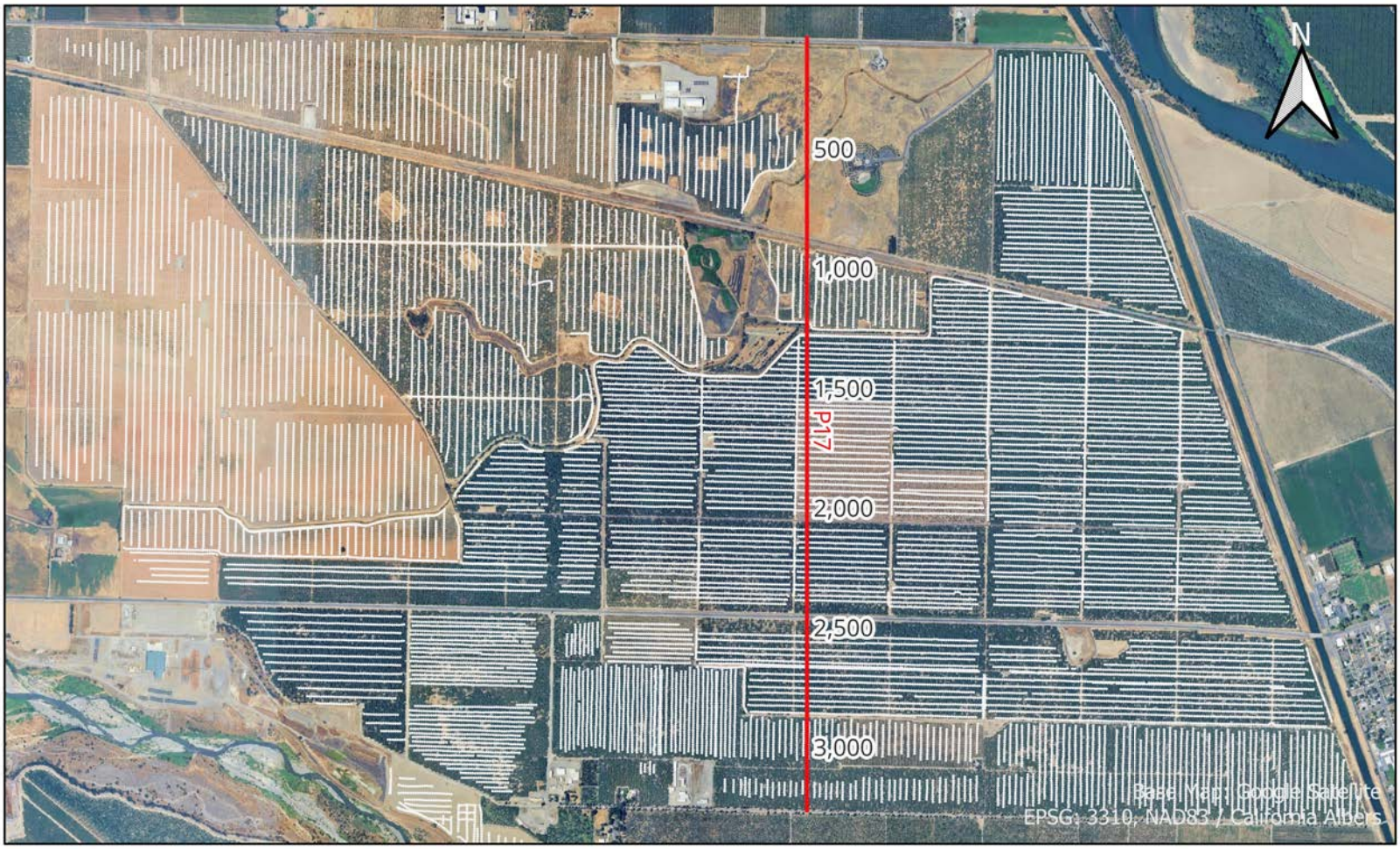
0 1,000 2,000 ft

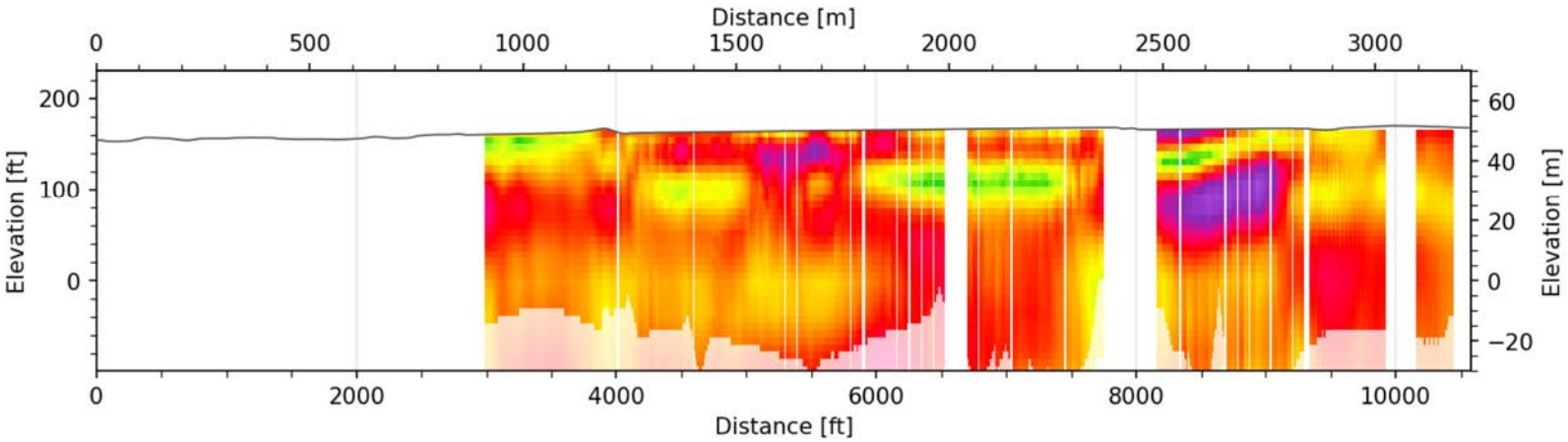


*) Depth of investigation

Project: 24003
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GEOPHYSICAL IMAGING PARTNERS

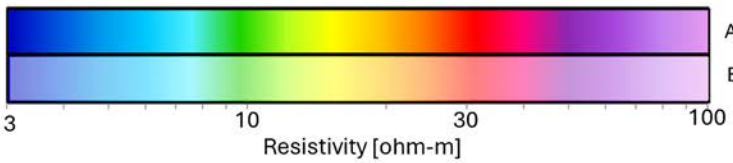




Vertical Section P17 N-S

0 200 400 m

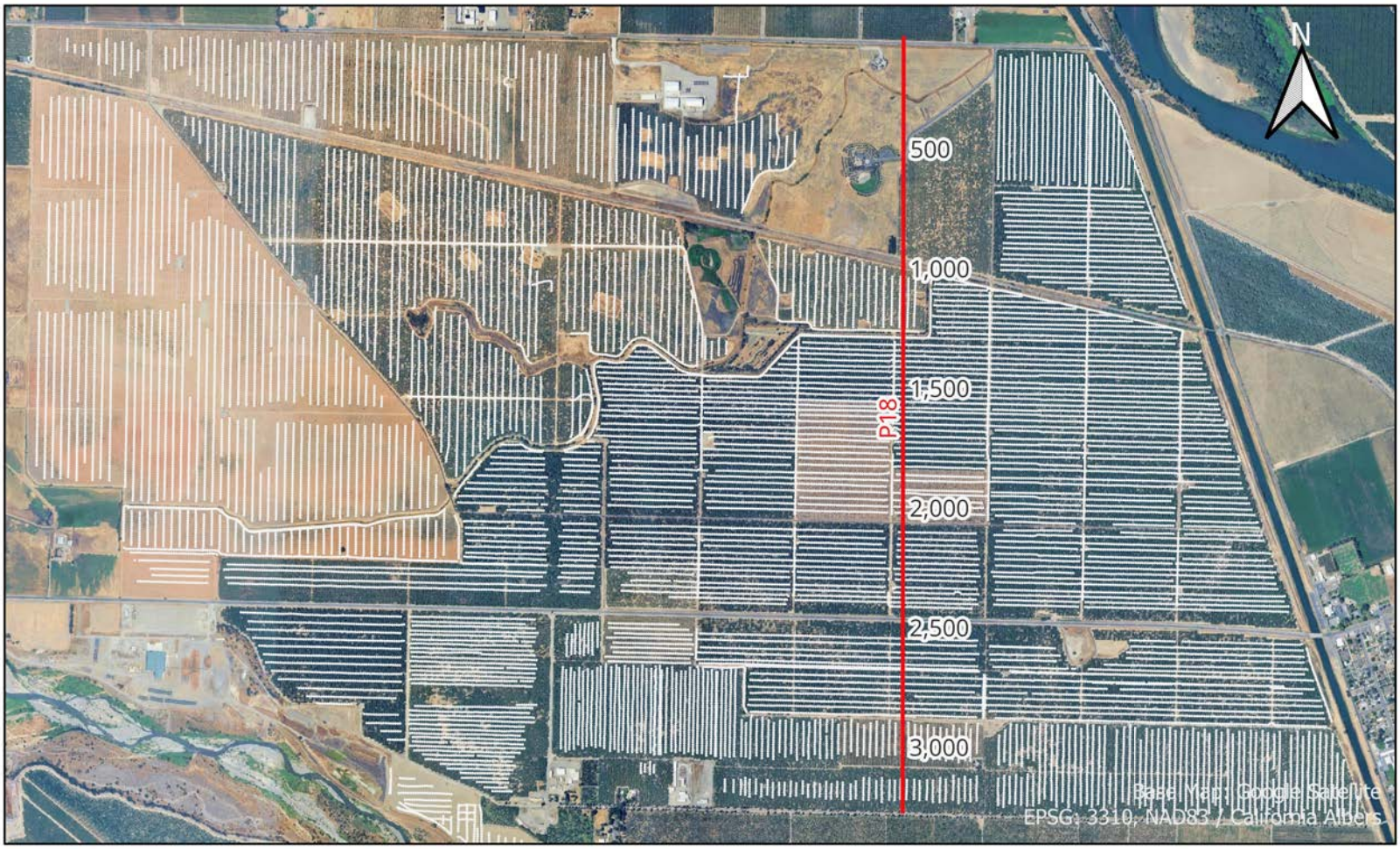
0 1,000 2,000 ft

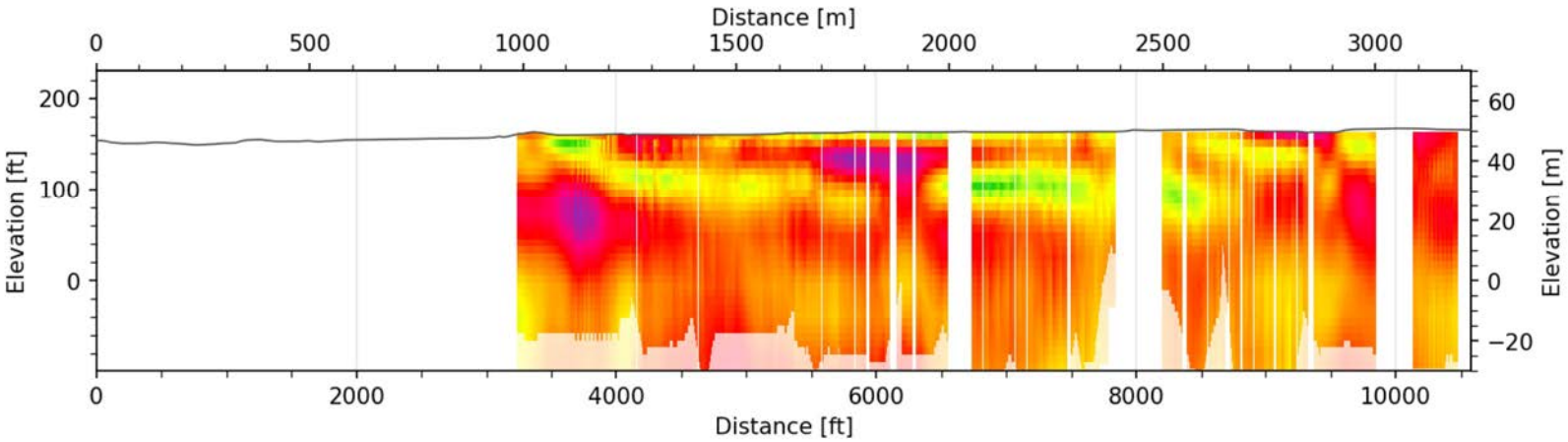


*) Depth of investigation

Project: 24003
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GEOPHYSICAL IMAGING PARTNERS





Vertical Section P18 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

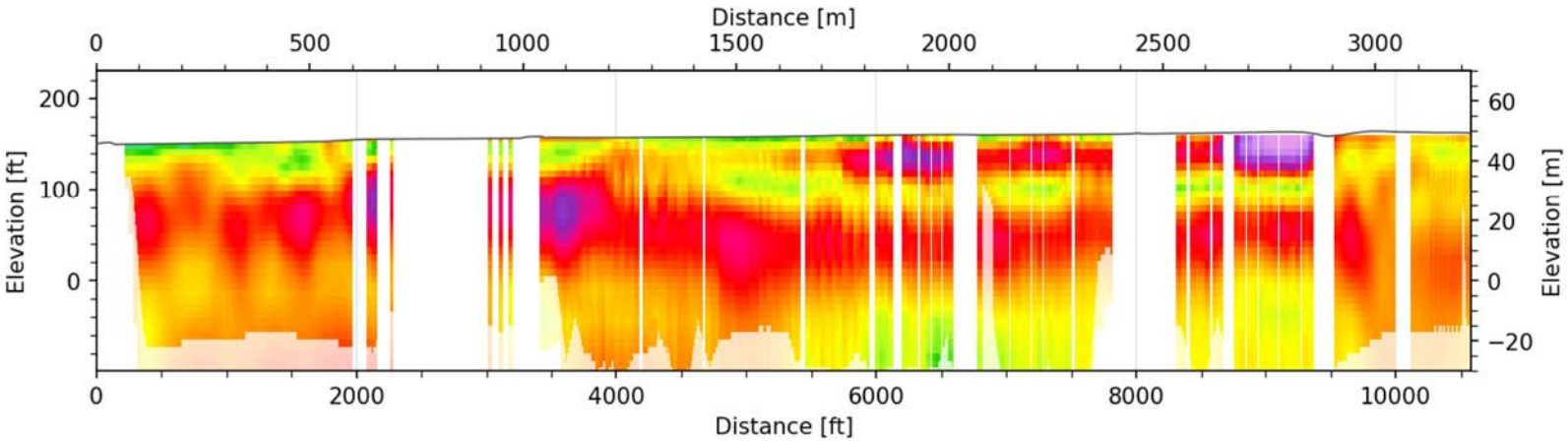
Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

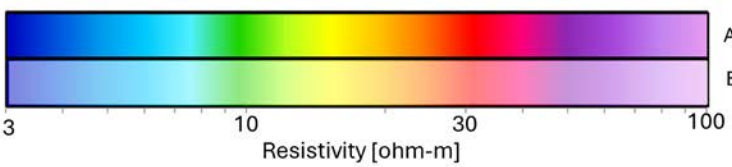




Vertical Section P19 N-S

0 200 400 m

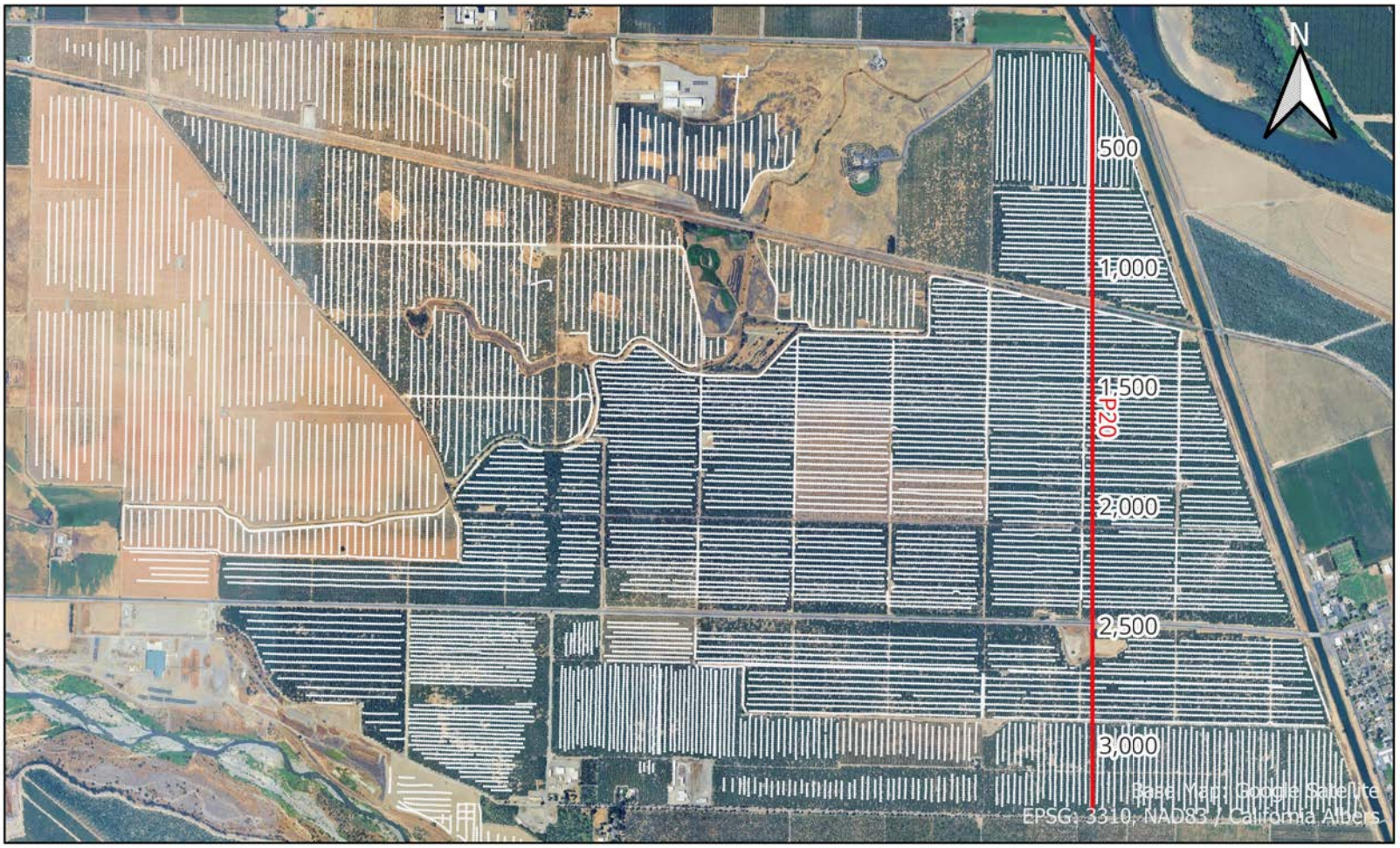
0 1,000 2,000 ft

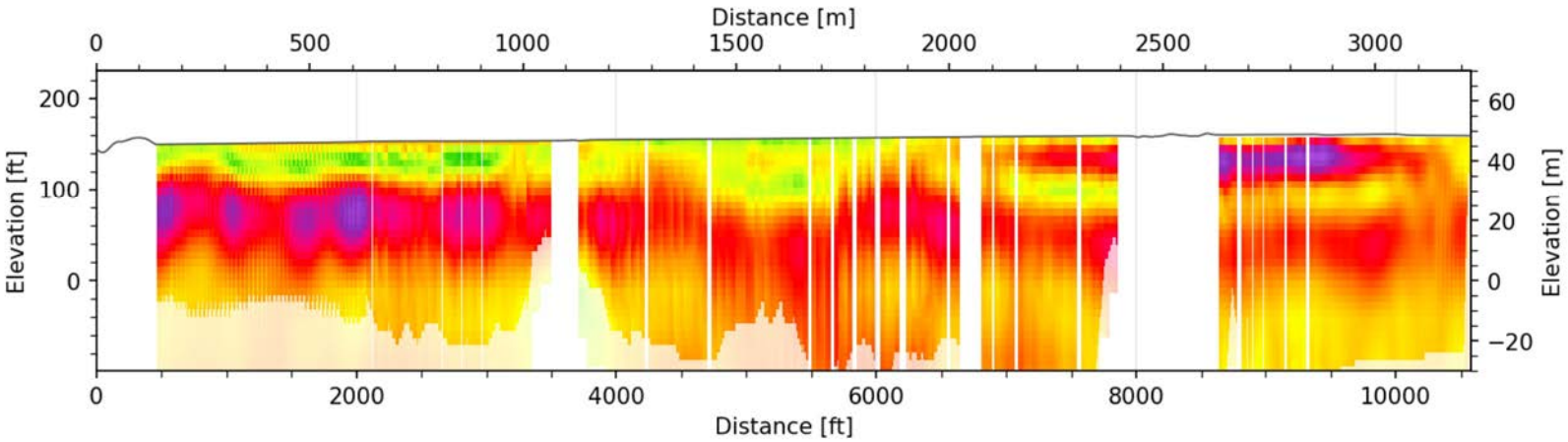


*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
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Created by: MH
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GEOPHYSICAL IMAGING PARTNERS





Vertical Section P20 N-S

0 200 400 m

0 1,000 2,000 ft

*

Above DOI

Below DOI

3 10 30 100

Resistivity [ohm-m]

*) Depth of investigation

Project: 24003
Date surveyed: 3/4-26/2026
Date map created: 10/19/2026
Created by: MH
Checked by: AAB

GEOPHYSICAL IMAGING PARTNERS

Appendix 2 – TEM Theory

For decades electromagnetic (EM) methods have been used worldwide for cost effective mapping of the subsurface materials for different applications. More recently, the accuracy of the instruments and their ability to obtain information about aquifers and hydrogeological properties has improved significantly. As a result, the TEM method is now one of the most efficient geophysical technologies for groundwater investigations.

Principles of TEM

The physical principle of the TEM is based on the electromagnetic induction phenomenon. The ground is first energized by a primary magnetic field generated by a direct current injected in a transmitter (Tx) loop. When the current stabilizes, the transmitter is turned off abruptly. During this rapid decay of the current an electromotive force results in short-duration eddy currents whose strength is largest in conductive parts of the ground. The EM induction phenomenon generates what is called the secondary magnetic field, the decay of which is measured just after the end of the turn-off using an induction receiver coil located in the center of the Tx loop (central loop configuration like ground-based stationary TEM) or outside the Tx loop (off-set configuration like tTEM). The actual measurement, referred to as TEM "sounding" or dB/dt curve, is the time derivative of the magnetic flux passing through the receiver coil. An example of a measured sounding curve is shown in Figure A1- 1.

The TEM response is measured and interpreted as a function of time. Just after the current in the Tx loop is turned off, the eddy currents in the ground will be close to the surface, and the measured signal primarily reflects the resistivity of the top layers. At later times the current will run deeper in the ground, and the measured signal contains information about the resistivity of the deeper layers. This is why the method is referred to as time-domain EM or TEM. Measuring a TEM sounding will therefore provide information about the resistivity as a function of depth.

The transmitter magnetic moment (Tx loop area x current x number of wire turns) and the signal-to-noise ratio (SNR) determine the depth of investigation (DOI). A stronger magnetic moment enables deeper penetration of the magnetic fields and thus greater DOI. The SNR depends on the ground electrical resistivity and ambient noise. The higher the SNR, the greater the DOI.

More information about the principles of the TEM method can be found in Ward and Hohmann (1988).

Noise in TEM data

TEM data are comprised of different types of noise components. Noise can cause bias signals and affect the depth of investigation and if not properly identified and removed, can result in incorrect geological and hydrological interpretations. The different sources of noise include: (1) Galvanic coupling caused by the electromagnetic signal induced in a metal object, such as grounded overhead powerlines, metal pipes, metal fences etc., (2) Capacitive coupling caused by the induced EM signal in an insulated installation such as a power cable, (3) Coherent noise from electrical powerlines, (4) Atmospheric noise, and (5) Instrument internal noise.

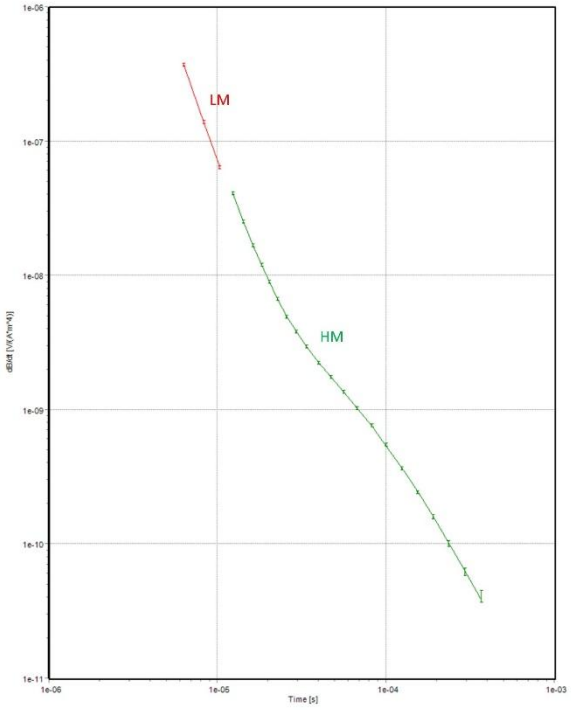


Figure A1- 1 An example of a dB/dt curve (sounding data) measured with the tTEM system.

References

Ward SH, Hohmann GW (1988) Electromagnetic theory for geophysical applications. In: Nabighian MN (ed) Electromagnetic methods in applied geophysics, vol 1. SEG, Tulsa, pp 131–311.

Appendix 3 – tTEM Instrumentation, Processing & Inversion Settings

This appendix describes the tTEM instrument setup, processing and inversion settings.

Instrument Setup

The tTEM instrument measures data continuously while being towed on the ground. The system is designed to provide very high near-surface resolutions using very early time gates. The tTEM data collection was performed using an offset loop configuration (Figure A2- 1), employing a 2.9 m x 2.9 m (9.5 ft x 9.5 ft) single-turn square-shaped transmitter loop and a 0.5 m x 0.5 m (1.6 ft x 1.6 ft) multi-turn receiver coil placed 7.5 m (25 ft) behind the transmitter loop. The transmitter loop was positioned 4 m (13 ft) away from the ATV. The entire system layout extended to 14.4 m (47 ft).

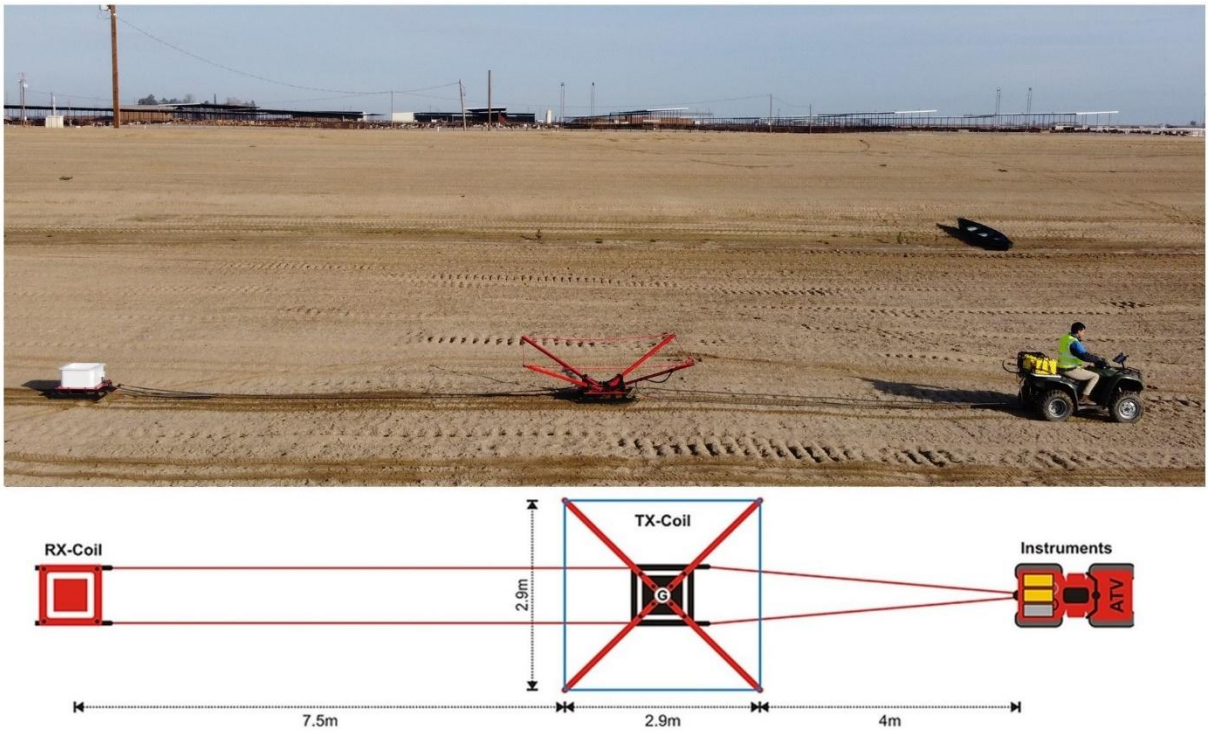


Figure A2- 1 The tTEM system configuration.

Instrument ID

The ID information of the instruments used in this survey can be found in Table A2- 1.

Unit	ID1	ID2
tTEM instrument		V100A240014
RC20 Receiver coil	RCS20-0012	V112A240012
tTEM Receiver Platform		20220850
tTEM Tx Coil	331	V106A240007

Table A2- 1a ID information for the instruments used in this survey.

Device positions and geometry

The positions and geometry of the main tTEM system components with respect to the transmitter frame are listed in Table A2- 2 in (x,y,z) coordinates. X and y define the horizontal plane. Z is perpendicular to (x, y). X is positive in the survey direction, y is positive to the right of the survey direction, and z is positive downwards.

Unit	X (m)	Y (m)	Z(m)
GP_Tx (GPS)	7.85	0.00	-0.90
RxZ (Z-receiver coil)	-9.28	0.00	-0.30
Tx-Coil, center	0.00	0.00	-0.97
Tx-Coil corner 1	-1.45	-1.45	-0.97
Tx-Coil corner 2	1.45	-1.45	-0.97
Tx-Coil corner 3	1.45	1.45	-0.97
Tx-Coil corner 4	-1.45	1.45	-0.97

Table A2- 2 Positions and geometry of the tTEM transmitter, receiver, and GPS units

Measurement cycle

The key parameters defining the transmitter setup are listed in Table A2- 3.

Parameter	LM	HM
Moment ID	2	1
No. of turns	1	1
Transmitter effective area (m2)	9 m2	9 m2
Tx Current	~ 3 A	~ 30 A
Tx Peak moment	~ 27 Am2	~ 270 Am2
Repetition frequency	2016 Hz	564 Hz
Raw Data Stack size	336	248
Period Time	496E-6	1773E-6 s
Raw Moment cycle time	0.17 s	0.50 s
Tx on-time	200 µs	450 µs
Duty cycle	40%	25%
Turn-off time	2.6 µs at 3 Amp	4.2 µs at 30 Amp
Number of gates	10	21
Gate time interval (gate center time)	4 µs – 30 µs	12 µs – 910 µs
Front-gate	2 µs	4 µs

Table A2- 3 Basic settings of the instrumentation.

Receiver coil

The receiver coil can be described by the following parameters. The parameters are used in the inversion scheme.

Parameter	Value
Low pass filter frequency	679 kHz
Low pass filter order	1
Effective area	20m^2

Table A2- 4 Receiver coil parameters.

Processing and inversion settings

The processing and inversion are based on the Aarhus Workbench software, version 6.9.0.0.

A 30-layer model has been applied. Table A2- 5 lists the fixed layer thicknesses, depth to bottom of layer and the initial resistivity assigned to the model layers. For this survey, an initial resistivity value of 40 ohm-m was assigned to all layers during the inversion.

Layer	Thickness [Meter]	Depth [Meter]	Start value [Ohm-m]
1	1	1	40
2	1.1	2.1	40
3	1.2	3.3	40
4	1.3	4.6	40
5	1.4	6	40
6	1.5	7.5	40
7	1.7	9.1	40
8	1.8	11	40
9	2	12.9	40
10	2.1	15.1	40
11	2.3	17.4	40
12	2.5	19.9	40
13	2.8	22.7	40
14	3	25.7	40
15	3.3	28.9	40
16	3.5	32.5	40
17	3.9	36.3	40
18	4.2	40.5	40
19	4.6	45.1	40
20	5	50.1	40
21	5.4	55.5	40
22	5.9	61.4	40
23	6.4	67.8	40
24	7	74.8	40
25	7.6	82.4	40
26	8.3	90.6	40
27	9	99.6	40
28	9.8	109.4	40
29	10.6	120	40
30	--		40

Table A2- 5 Depth discretization and starting resistivity values for the inversion.