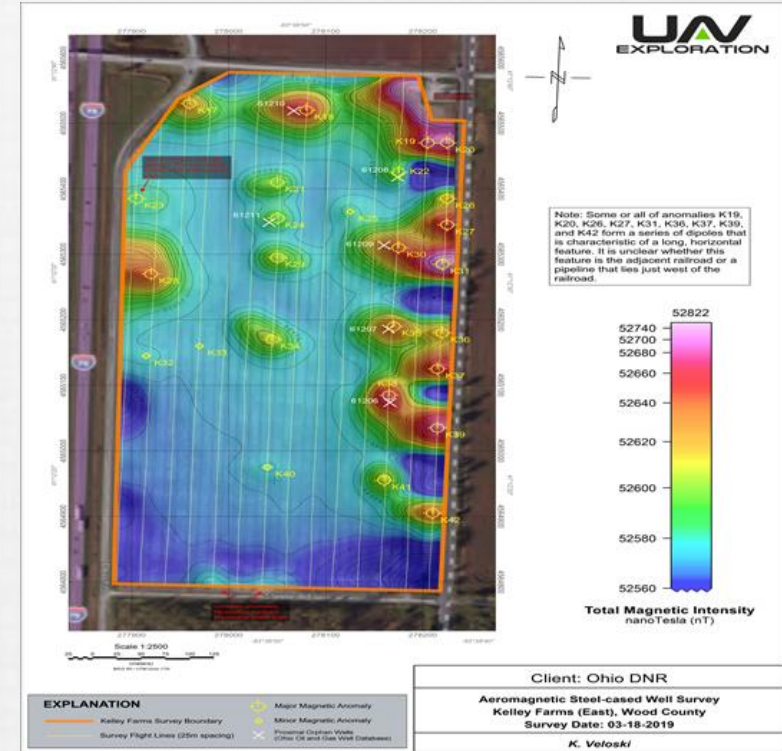




Ohio Department of Natural Resources  
 Division of Oil and Gas Resources Management  
 Orphan Well Program Survey Section



# OHIO'S DRONE BASED APPROACH TO ORPHAN WELL LOCATION



GEOMETRICS

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ODNR



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# Welcome & Overview

- UAS Workflow, Challenges, “cost”
- UAS and Ground survey examples
- Discussion



# UAS site Overview



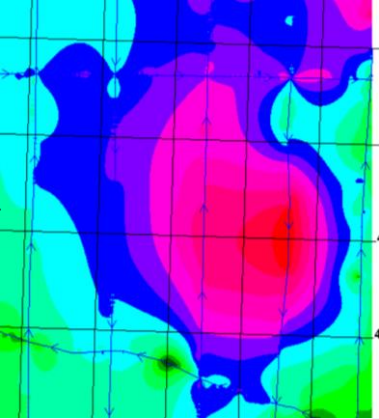
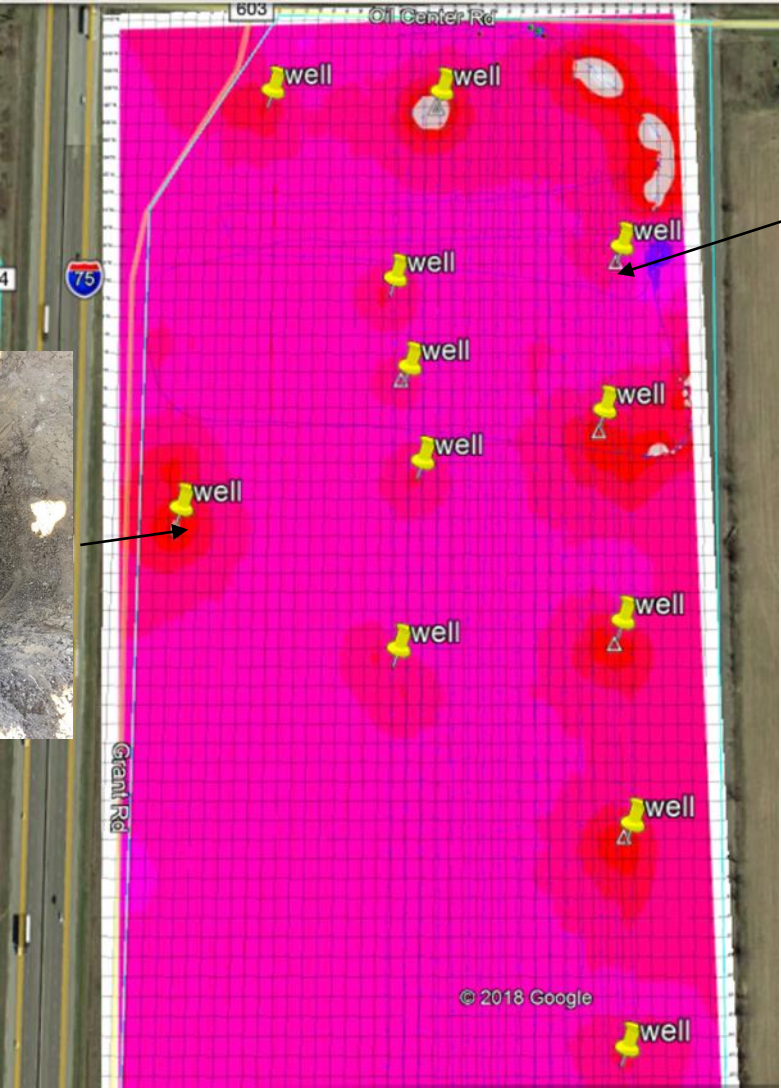
# Ohio's Workflow for a non-emergency UAS survey

- Project needs – To find Buried well Casings, Casings in inaccessible areas?
- Create a map of the extents of the project area – KMZ, Lat long
- Mission planning – terrain, site hazards, Air Space restrictions, flight plans
- Mission date scheduled – Predicted weather, space weather
- Mission Day – Visibility, Wind, Rain, Air Space restrictions, space weather, local magnetic anomalies.
- Data quickly checked in field for major problems – data downloaded while batteries being changed.
- Data processing and base map creation – used to get target Latitude Longitude
- Survey Crews schedule a day to expose targets.
- Exposed casings are assessed by technical team.



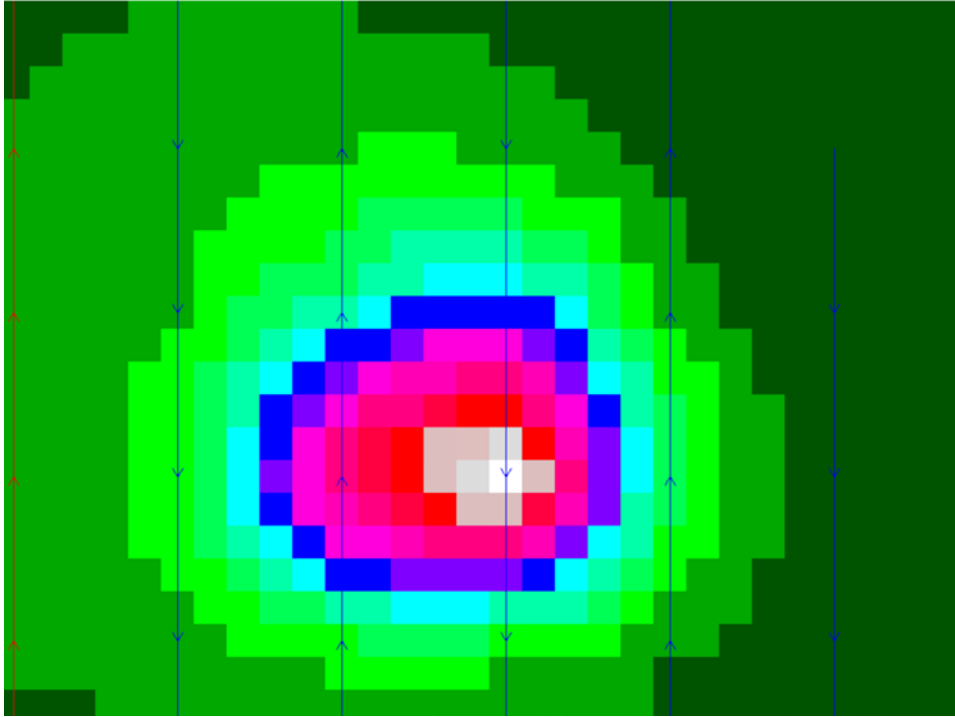
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# UAS Collected Map



- Different processing software's have different levels of display quality and capabilities.
- Benefit of covering lots of area in a short amount of time.

## Ground Unit Collected Map



- Covers less area
- We utilize to ground truth targets and to provide base station (diurnal correction)
- Less Liability compared to UAS

# Thoughts on Cost

- Magnetometer for UAS ~ mid 30k and up
- Ground Magnetometer/base ~ 7-20k
- UAS capable of carrying sensor ~7-10k+
- Staff – minimum Pilot in command, visual observer and someone capable of processing mag data.
- Software – Supplied with sensor – 20k+ per year for third party.
- Training – companies are now offering training specifically tailored to this type of survey.



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# Magnetic survey conclusion

- Questions?





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