UNEXPLODED ORDNANCE (UXO) ASSESSMENT AND CLEAN-UP PROCESS

Former Waikoloa Maneuver Area, Waimea, Hawaii

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Presenter Name

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Environet, Inc.

Agenda

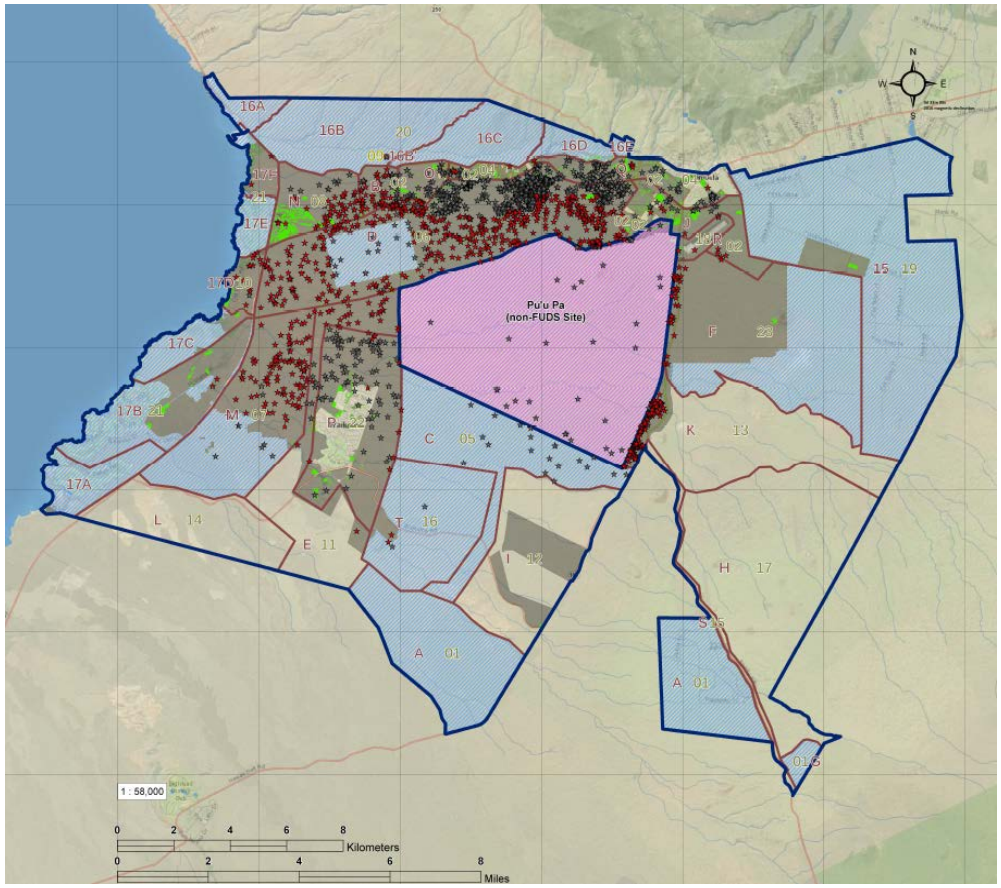
- Live Fire and UXO Training
- UXO Detection and Removal Process
- Guidance for Property Owners and Developers
- Comments, Question, and Answers

Live Fire Training

- Why troops train
- Train with live and inert ordnance
- Training ordnance can have live explosives
- 10% DUD rate

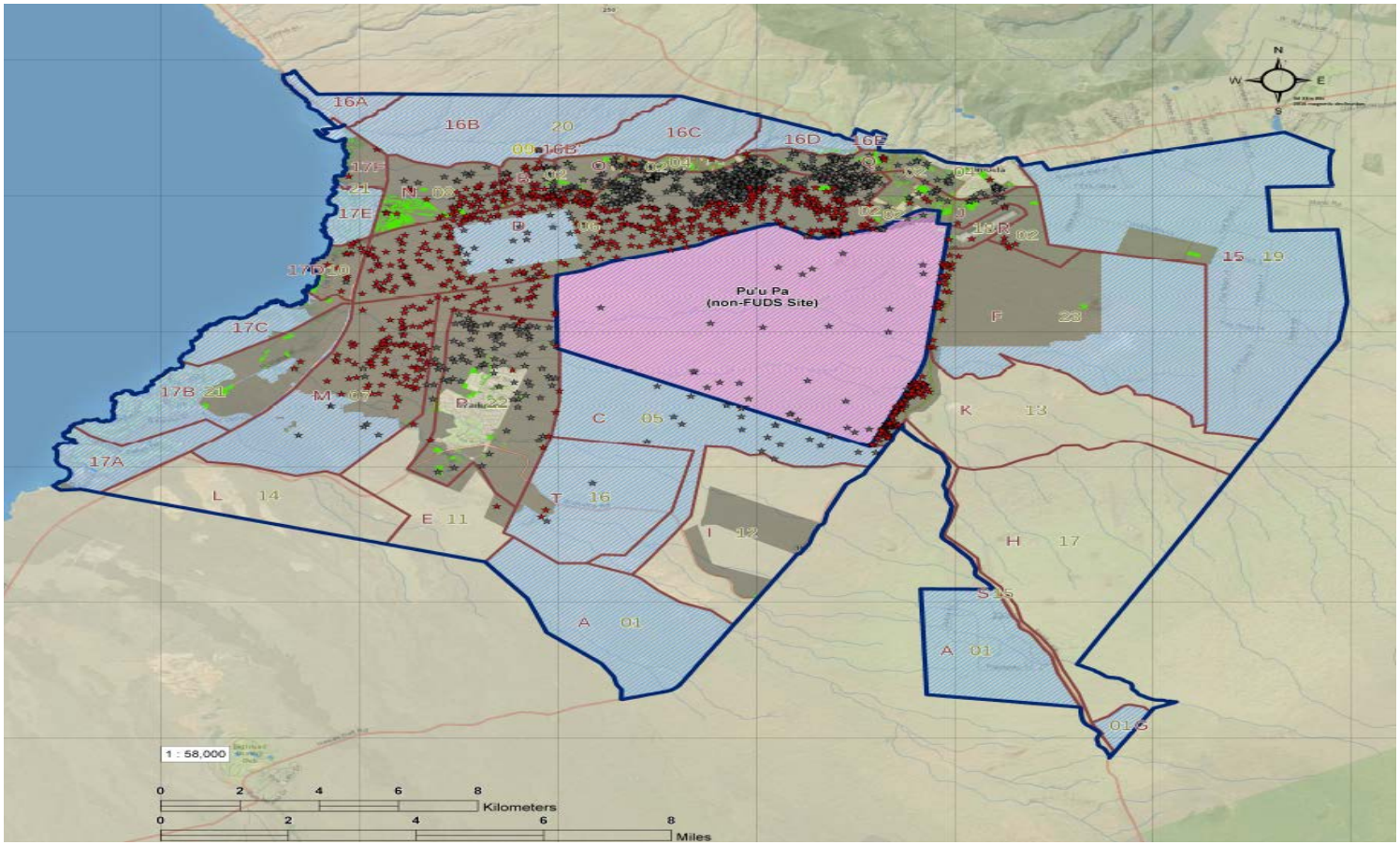
Where Troops Train

- Target versus Maneuver Area
- WMA – opportunity



Where Troops Train – WMA

- 2,675 live items to date



UXO Training

- UXO Professionals and Technicians
- Department of Defense Explosive Safety Board (DDESB) prescribed curriculum in excess of 200 hours (5 weeks) of contract time curriculum – in residence (spelled out by DDESB Technical Publication 18)
- Worker Requirements: diplomas, OSHA certifications, time on-the-job experience etc.
- Companies must be able to produce the documents

UXO Training

- Who to trust and how do you know who to hire
  - Companies should be able to provide documented experience
  - Companies should be able to demonstrate clear understanding of UXO requirement
  - Companies should be willing to provide certification paperwork with resumes demonstrating they have properly qualified personnel

- Resources
  - State of Hawaii Department of Health
    US Army Corps of Engineers
  - National Association of Ordnance Contractors (www.naoc.org)

UXO Detection & Removal Process

- Detection History
  - Began with a guy and a shovel looking for holes and something on the ground
  - Different technologies emerged
  - Are any 100% – no
- Removal Process
  - Began with a guy, a stick of dynamite, and a blasting cap
  - Different technologies emerged

Detection Equipment

- Handheld – real time detection
- Non-handheld – digital data collection
- Advanced Geophysical Classification

Handheld Detection Device

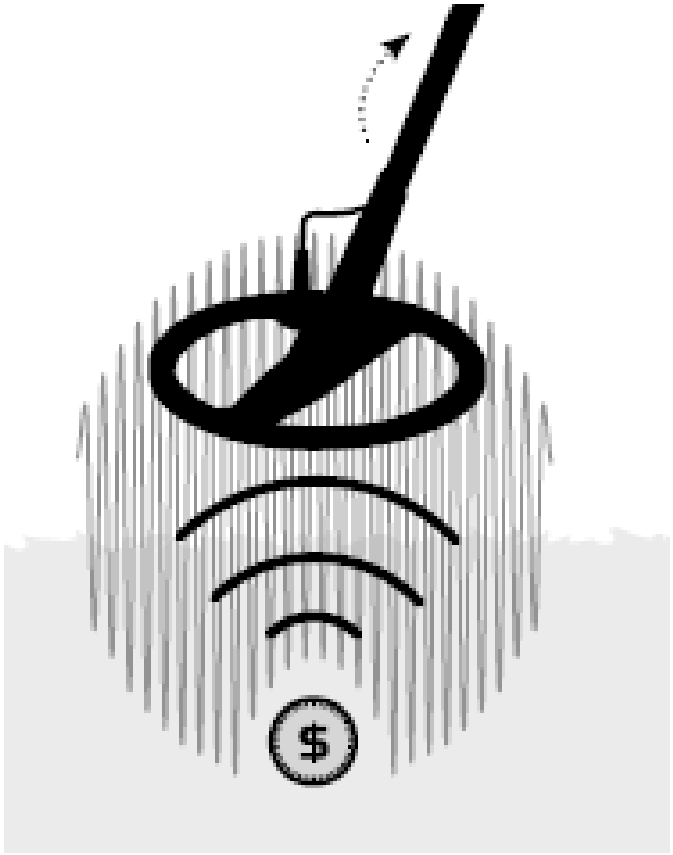
Purpose:

For the detection of
metal, in the performance of surface
and subsurface clearance

Technology

Technology:

Metal detector creates an electro-magnetic (EM) field, which penetrates the ground. Because the metal or MEC is conductive it causes a change in this field. Changes in the field create an audible alarm.



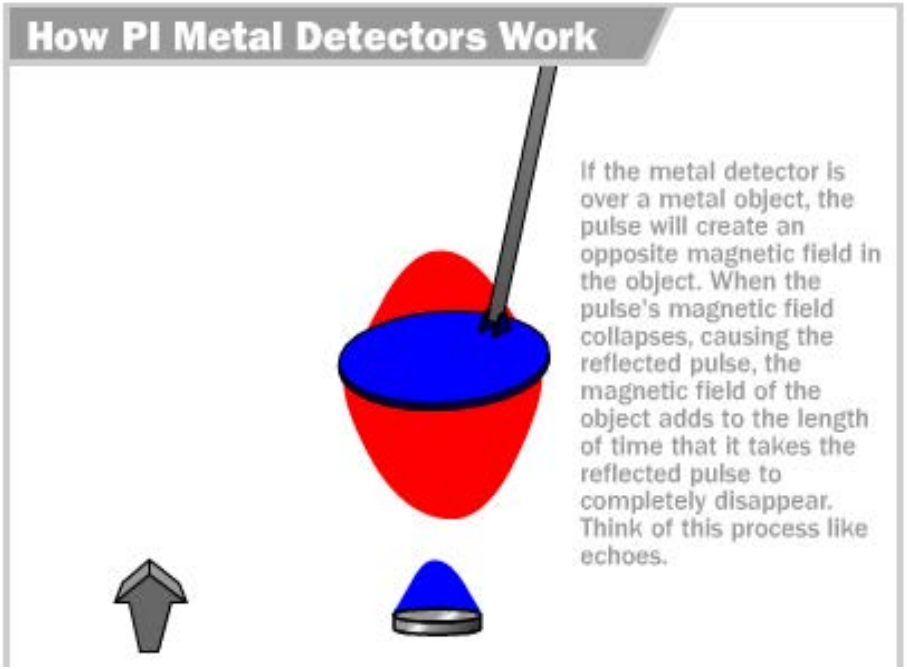
Handheld Detection at Work

Detection in Action – Lalamilo

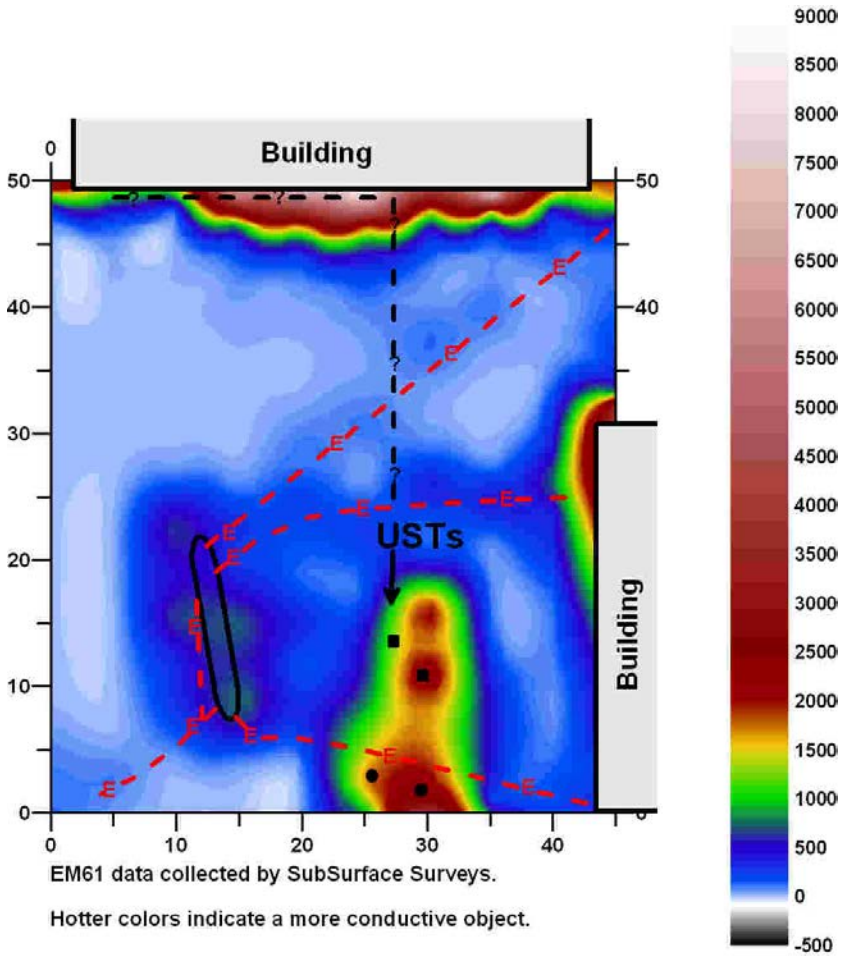
Digital Data Collection

Purpose:

To collect signatures of subsurface anomalies for identifying potential ordnance.



Pulse Induction Detector – EM61



EM61 data collected by SubSurface Surveys.

Hotter colors indicate a more conductive object.

Advanced Geophysical Classification

- Approaching fielding
- Potential for discrimination in the upper 90% range
- Metal Mapper
- TEMTADS
- MPV

Detection Limitations

- Geology
- Instrument capabilities
- Outside influences (fencing, power lines, etc.)

UXO Removal

- Types of removal operations
  - Real time excavation (coupled with detection) sometimes with heavy equipment
  - Digital Data Collection and selective excavation
  - Sifting
- Alternatives to removal
  - Construction Support
  - UXO Avoidance
- Department of Health

UXO Removal Considerations

- Considerations
  - Goal of removal operation
  - Type and Cost of removal operation
  - Proximity of homes
  - Protective measures required

UXO Removal Considerations

- Goals
  - Unrestricted use – certified clear
  - Use with limited impact – letter of remediation
  - Restricted use – no action

UXO Removal Considerations

- Type and Cost
  - Sifting – most expensive, over $20K+ per acre
  - Digital detection and removal – $15K+ per acre
  - Analog detection and removal – $6K+ per acre

UXO Removal Considerations

- Proximity of Homes
  - Is there room for sifting equipment?
  - Is there room for excavation equipment?
  - Do you require barricades?

UXO Removal Considerations

- Protective measures required
  - Do you need barricades?
  - Do you require trenching?
  - Do you require evacuation?

SANDBAG BARRICADE – MK II

Hand Grenade Detonation

155MM Projectile

Barrage Rocket

Sandbag Mitigation

155MM Disposal

Detonation Lalamilo

Double Mitigation

Anekona Estates

Standards

- 85% detection level with a 90% confidence level and higher can be achieved utilizing proven geophysical verification
  - Geophysical Prove Out
  - Instrument Verification Strip
- MIL-STD-1916 DOD Preferred Methods
- NAVFAC Standards
- USACE Requirements
- Interstate Technology & Regulatory Council

Guidance for Property Owners

- Know what you want to do with your property
- Seek responsible parties to protect yourself and your community
- Remember, if you did not put down please do not pick it up. UXO will call you.
- 2.23” or car part – which one is it?

Guidance for Property Owners

- Detection Levels
- Observe 3 Rs
- People die from these, kids, hikers, etc.
- People have died in the WMA
- These are live items that can kill you and your neighbor
- 3,000’ frag range
- 26,000’ per second

Questions