

# Preliminary Results of the Geophysical Survey at Tseyaz bunk'ut (Lejac Residential School)

Respectfully Presented by:

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# Acknowledgments...

- Former students/Survivors, families
- Community
- All involved workers and helpers
- Leadership

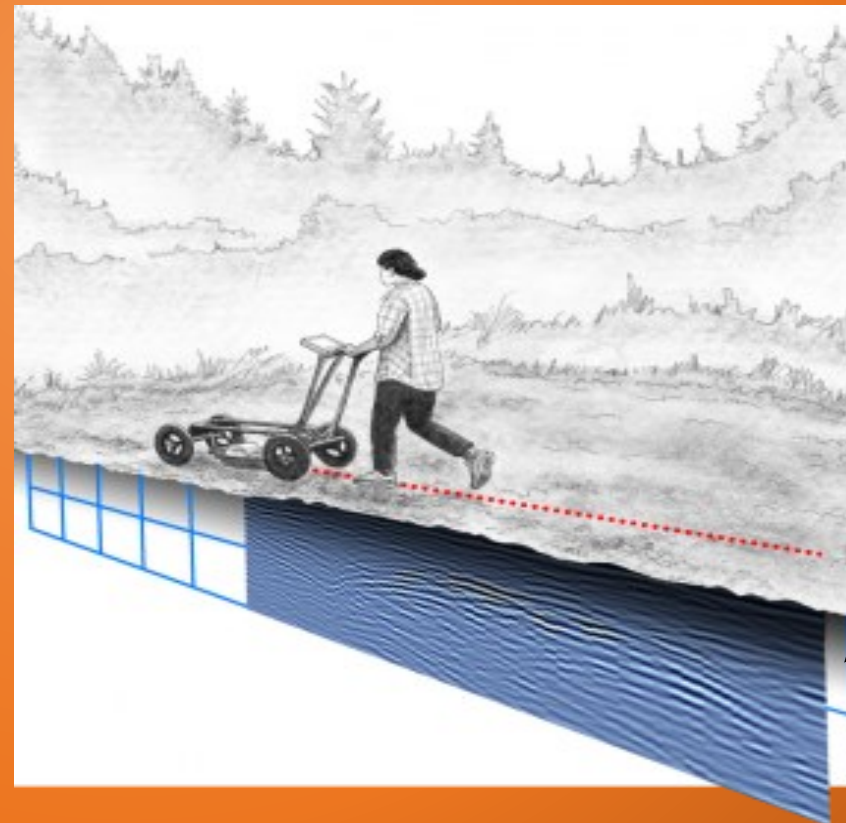
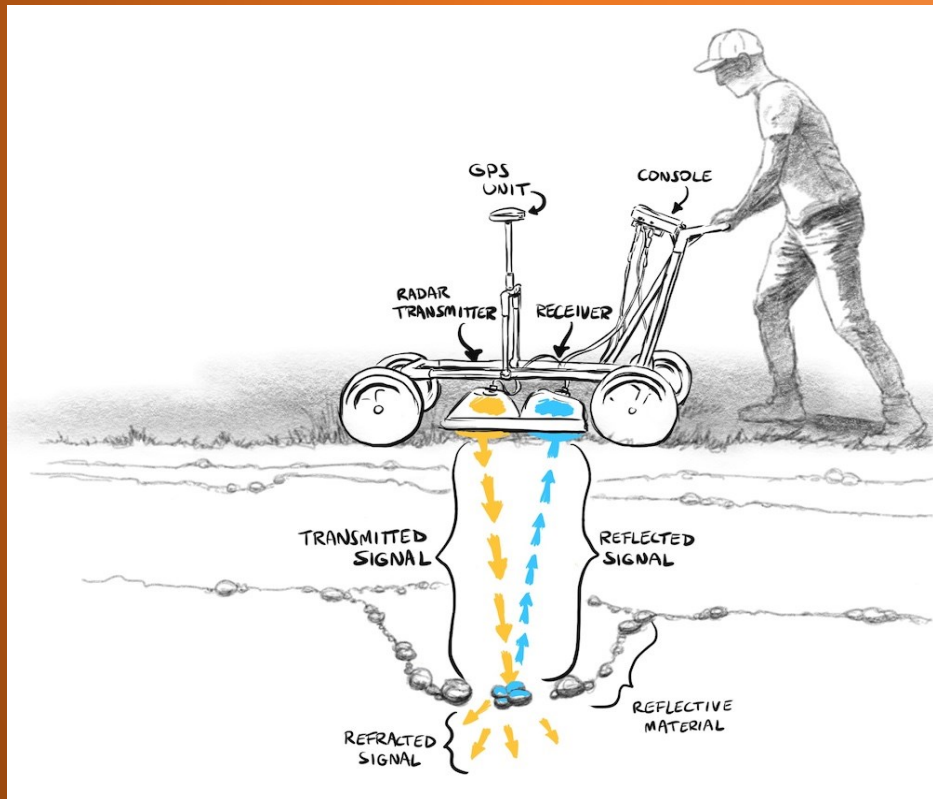


# A community-Led, Community-Driven Process...

- Complex work involving:
  - Archival research
  - Survival accounts
  - Community knowledge
- Ground investigations uses:
  - Ground-Penetrating Radar (GPR)
  - Magnetometry
  - High accuracy GPS/GNSS positioning
  - Aerial mapping and elevation modelling
  - Geographic Information Systems (GIS)

# What is GPR?

- GPR uses radio waves to image the subsurface
- Can detect variations in soil and stratigraphy



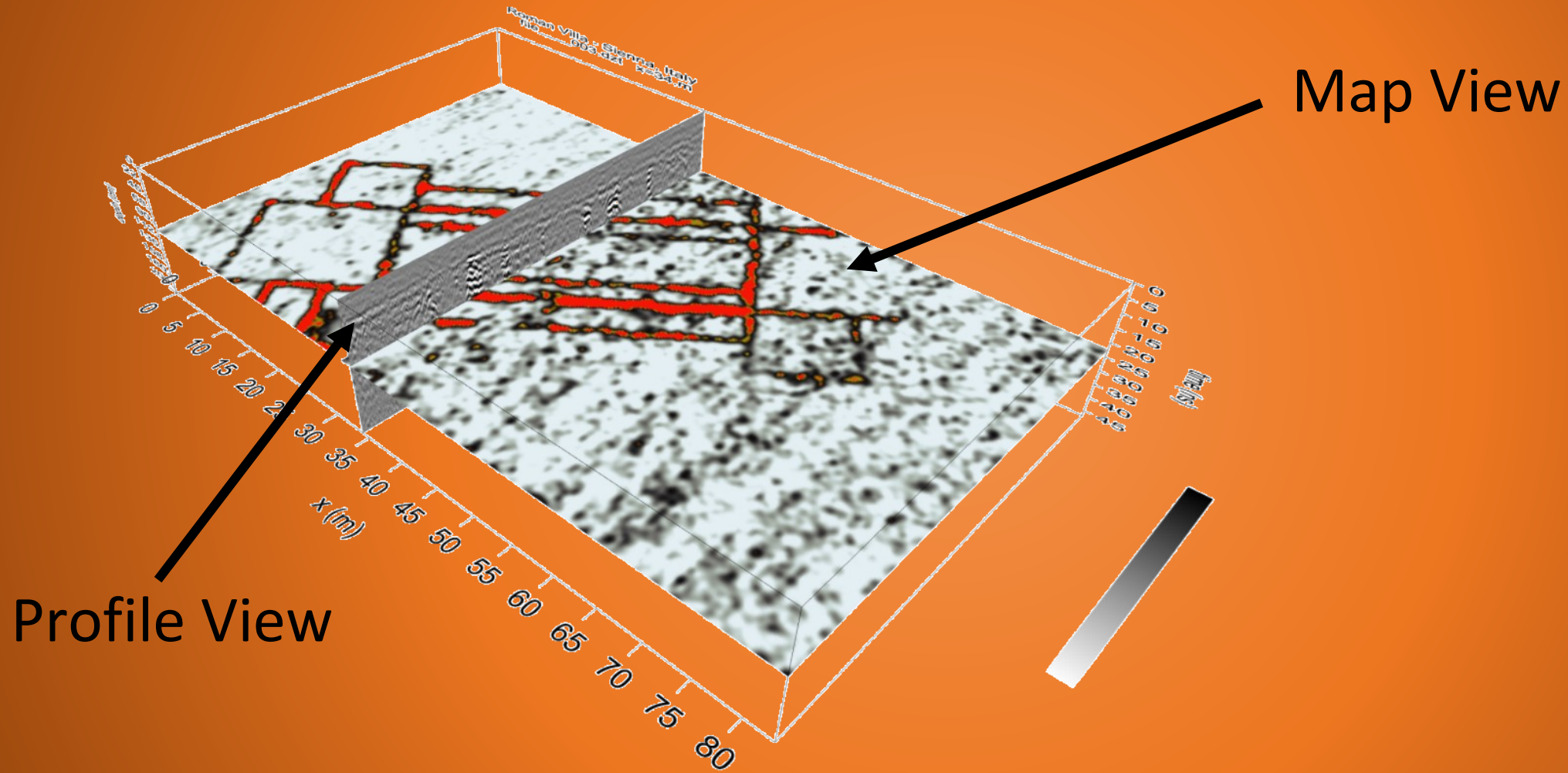
GPR profile

# What is GPR?

- Parallel profiles to create a complete dataset
- Map (Top) view: Depth slices



# Map View vs. Profile View



# Other Methods and Limitations

- GPR Limitations
  - Limited depth in certain soils
  - Provides little information about soil composition
- Additional method used: Magnetometry
  - Detects changes in magnetic field caused by magnetic objects
    - E.g., Steel, burned/fired features
    - Fast compared to GPR (both data collection and data processing)



# Multi-Method Approach

Using every available datasets to help understanding the subsurface

Archival data, survivor accounts



Interpretation





# Data Interpretation

- Indirect evidence only, context is important



- Objective list of criteria (next)



- Profile and Top (Map) view interpretation



- Several features in the ground, e.g.: roots, logs, rocks, utilities, building foundations, manholes, debris, animal tunnels, tree falls, excavations, etc.

# Criteria – Four Basic Tests

Top (Map) View:










1. Shape
2. Size

Profile View:



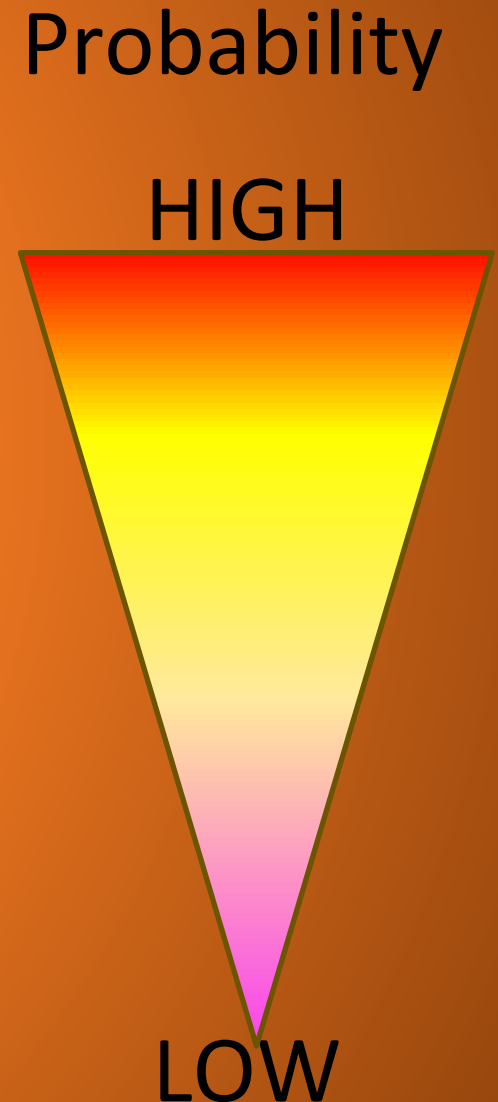
3. Breaks/Gaps in soil layers  
(possible grave shaft)
4. Reflections within gap area

# Interpretation Categories

Symbol	Description	Detail
	<b>Likely Grave</b>	Subsurface disturbances identified displaying all characteristics typical of grave-type anomalies. These signatures display clear geometry, and typically associated with surficial evidence. Characteristics and attributes observed rule out potential geological origins.
	<b>Potential Grave</b>	Subsurface disturbances identified displaying some of the characteristics attributed to grave-type anomalies. Their geometry typically resembles a grave-type feature and context-based evidence may suggest a grave as their origin.
	<b>Unknown Source</b>	Subsurface disturbances of unknown origins. These features may display a cluster of reflections or singular source that may be associated with anthropogenic sources; however, geological (e.g., rock, boulders), or biological origins (e.g., tree roots, animal burrows) cannot be ruled out.
	<b>Utility/Trench</b>	Linear type reflection on any of the collected datasets displaying typical characteristics of a utility, for example logical termination point, depth and*or curvature.
	<b>Potential Structure</b>	Surficial or subsurface disturbances showing geophysical signatures or geometries indicating man-made structures such as roads, walls, or building foundations.
	<b>Magnetic Signature</b>	High amplitude magnetic anomaly on magnetic datasets. Typically attributed to shallow subsurface high magnetic content materials, such as steel (tools, horseshoes, vehicle parts, debris, construction material, etc.). Their presence typically indicated former human activities.
	<b>Surficial</b>	Typically, strong GPR reflection occurring at or near the surface, usually masking potential reflections beneath. Typical examples are puddles (or saturated top soil) and manholes.

# Probability Chart

- 'Likely' graves feature
  - Geophysical and surficial evidence, grave marker
- 'Potential' grave feature
  - Only geophysical evidence
- 'Unknown' origin
  - Displays very minimal characteristics of typical grave features in geophysical data



# Survey Area

- Total survey area:  $\sim 142,500 \text{ m}^2$  ( $\sim 27$  football fields) with each method
- GPR survey line spacing: 9 cm
- GPR Survey (pink) Grid total: 139
- $\sim 1,908.67 \text{ km}$  of GPR profile collected.
- Survey Days: 35 in 2024, 5 in 2023:

# Summary

- Potential grave type features noted
- Former cemetery is identified, graves likely still present
- Countless features noted of unknown origin, likely natural causes displaying very few characteristics of potential grave type features
- Several utilities, building remnants, debris
- GPS positioning of every noted feature is available
- Results overlaid on historical aerial maps, plans

**Thank You!  
Nahchailhya**

