

Summary Report for the GPR Survey of the Johnson County Poor Farm Cemetery and Asylum Sites

**4 Ground-Penetrating Radar Grids
(1 and 2 August, 2013; Grid 3 May, 2009; and Grid 4
next to asylum, August 2013)**

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2014

The former Johnson County Poor Farm and Asylum is located on the south side of Melrose Avenue just east of the intersection with Slothtower Avenue in Johnson County on the far west side of Iowa City. The poor farm and asylum operated at this location from 1855 into the 1980s. The current ground-penetrating radar study was conducted in support of the nomination of the Johnson County Poor Farm and Asylum Historic District to the National Register of Historic Places. The nomination is sponsored by Johnson County under the direction of the Johnson County Historic Preservation Commission and funded by a grant from the Certified Local Government program as administered by the State Historical Society of Iowa.

This summary report concerns two investigations: one conducted in May of 2009, by Dr. Glenn Storey of the University of Iowa with Matt Hill and Dave Campbell (USGS Ret). N.B. The 2009 grid was called Grid 1 in documentation, but is here referred to as 2009 Grid 1 (Figure 1).

In August of 2013, the second investigation was conducted with Leah Rogers of Tallgrass Historians L.C., Iowa City, and University of Iowa freshman under the direction of Dr. Glenn Storey of the University of Iowa Department of Anthropology. The 2013 study resulted in the completion of three additional GPR grids (referred to herein as 2013 Grids 1-3) and five GPR transects (2013 GPR Transects 1-5) at selected locations on the suspected Johnson County Poor Farm cemetery site (13JH1149), near the extant asylum building, and east of the extant dairy barn on the poor farm site (13JH1148) (see Figure 1).

The main purpose was to determine if the GPR could identify graves on the site traditionally thought to be the cemetery for the poor farm and asylum inhabitants in the 19th and early 20th centuries.

Radar data is shown from RADAN software analysis (the proprietary software from the radar unit manufacturer, GSSI); alternative analysis was carried out in the Conyers-Lucius software processes and will be so marked.

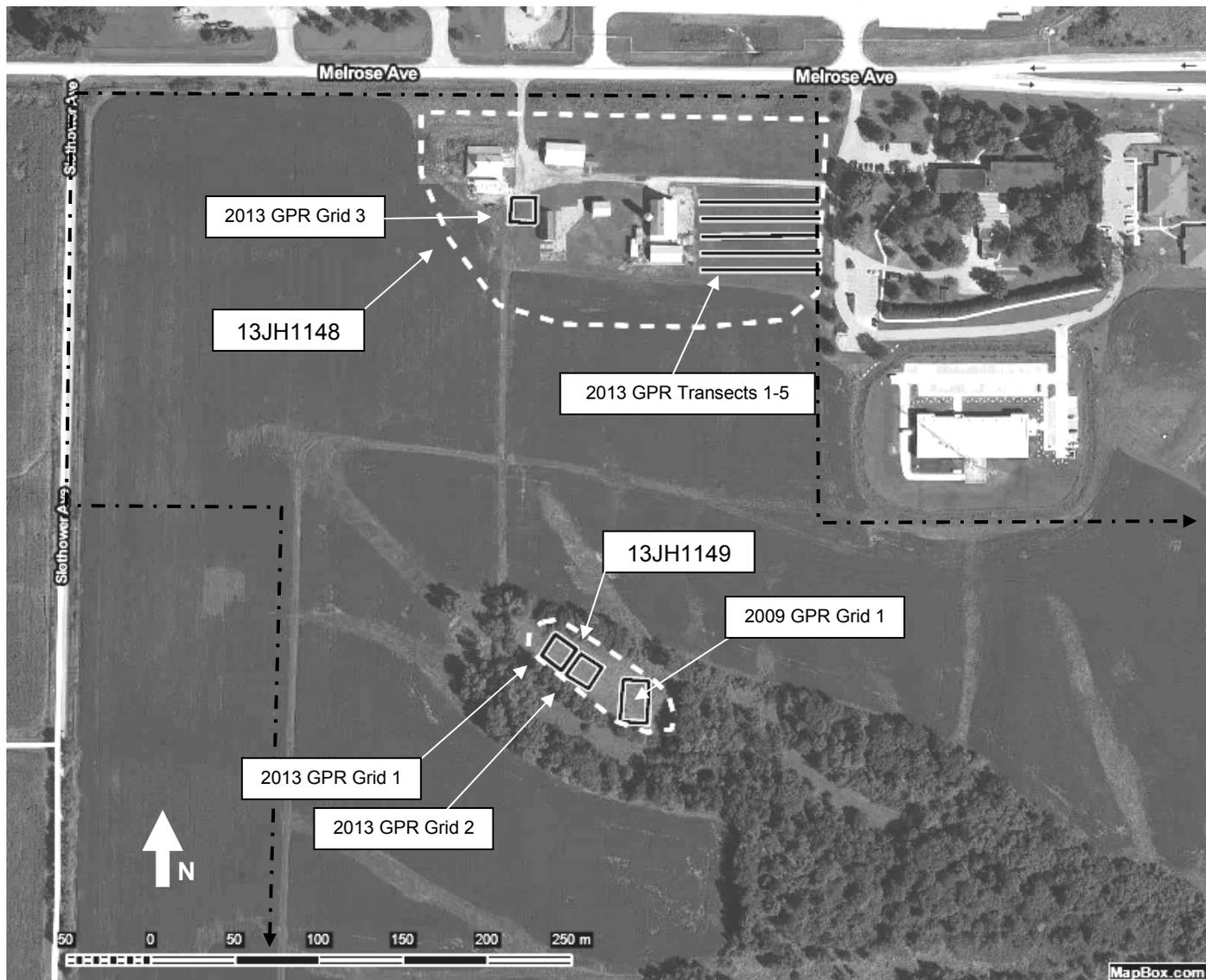
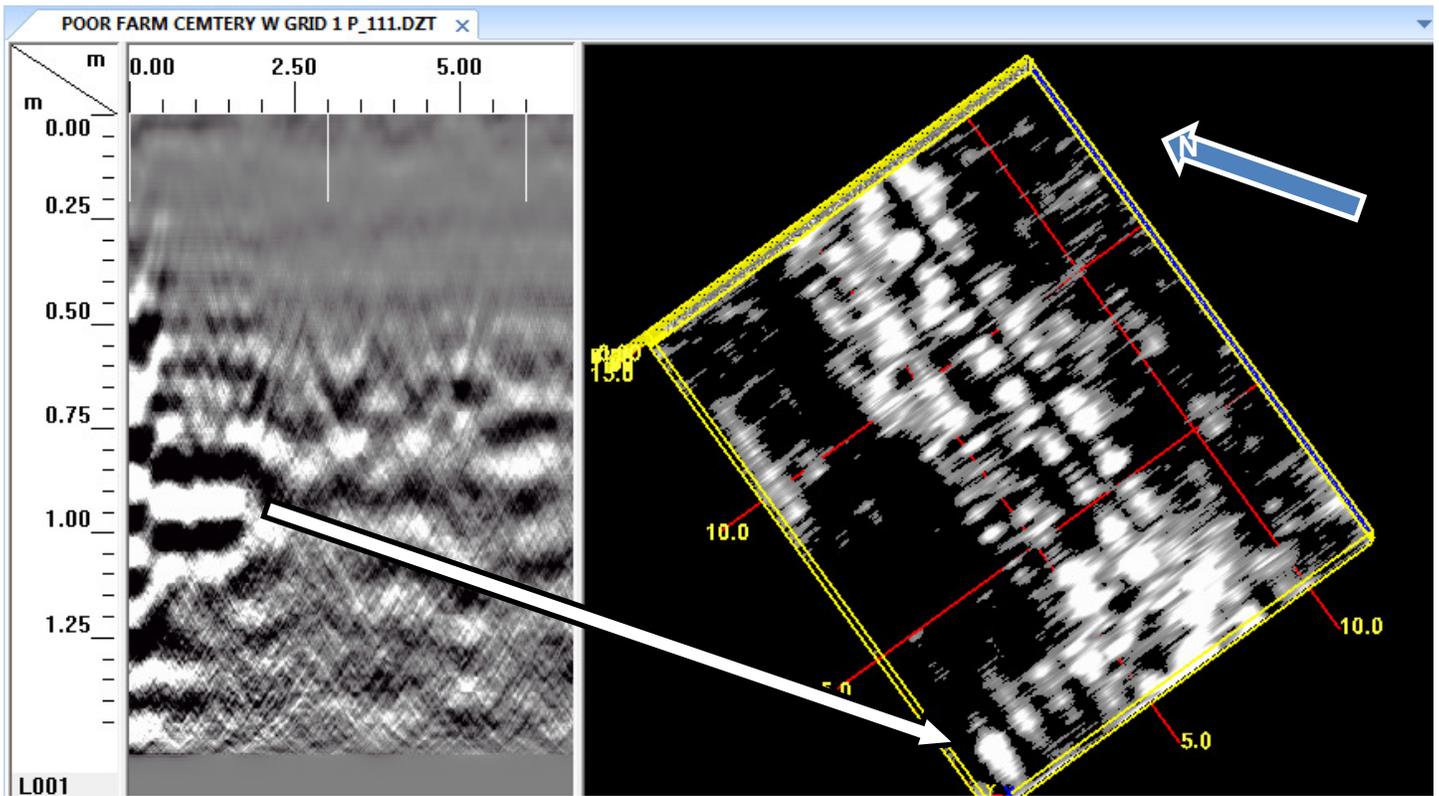
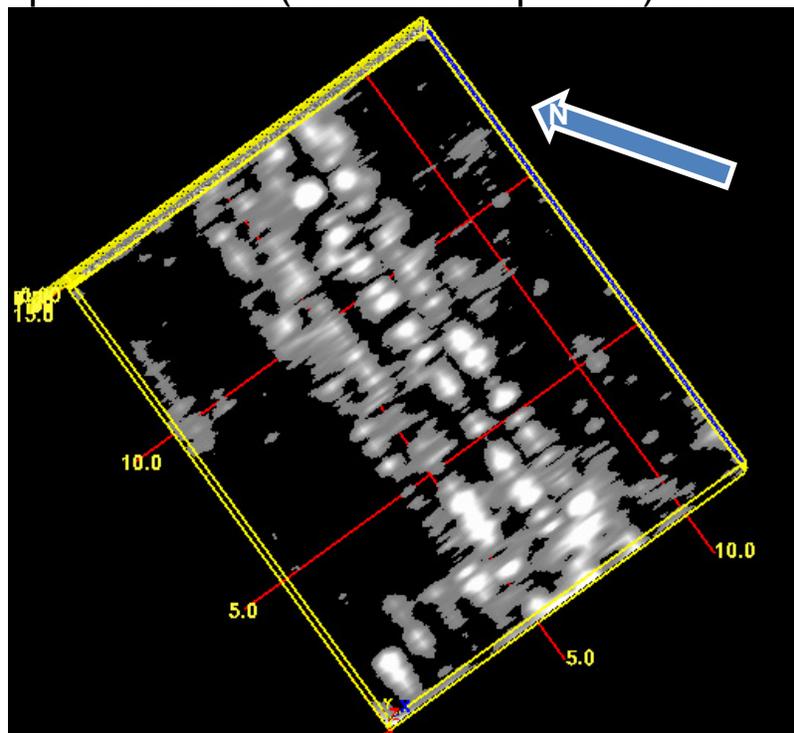


Figure 1. Aerial map showing location of Sites 13JH1148 and 13JH1149 (white dashed outlines) and of the 2009-2013 GPR grids and transects (black lines) conducted at the Johnson County Poor Farm and Asylum Historic District (black dashed outline).
 Source for base map: 2013 aerial photograph obtained from ExpertGPS mapping software, 2014

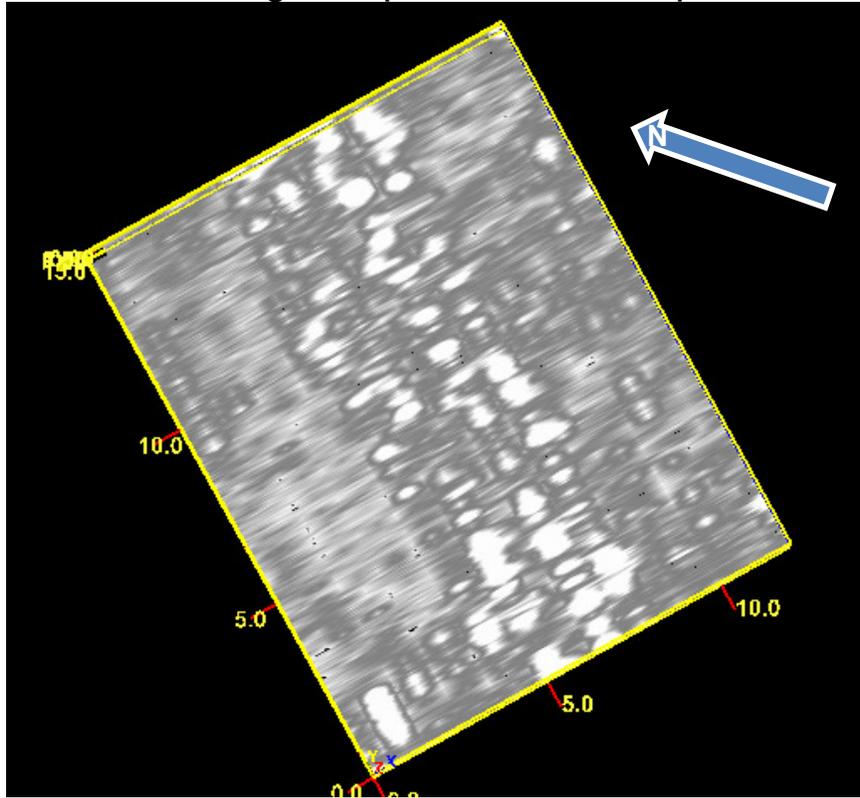
RADAN 2013 Grid 1 (West of the modern Cross) Depth = 1.26 m
Distinct lines of graves; arrow links 2D feature with corresponding 3D trace
(N arrow in all views)



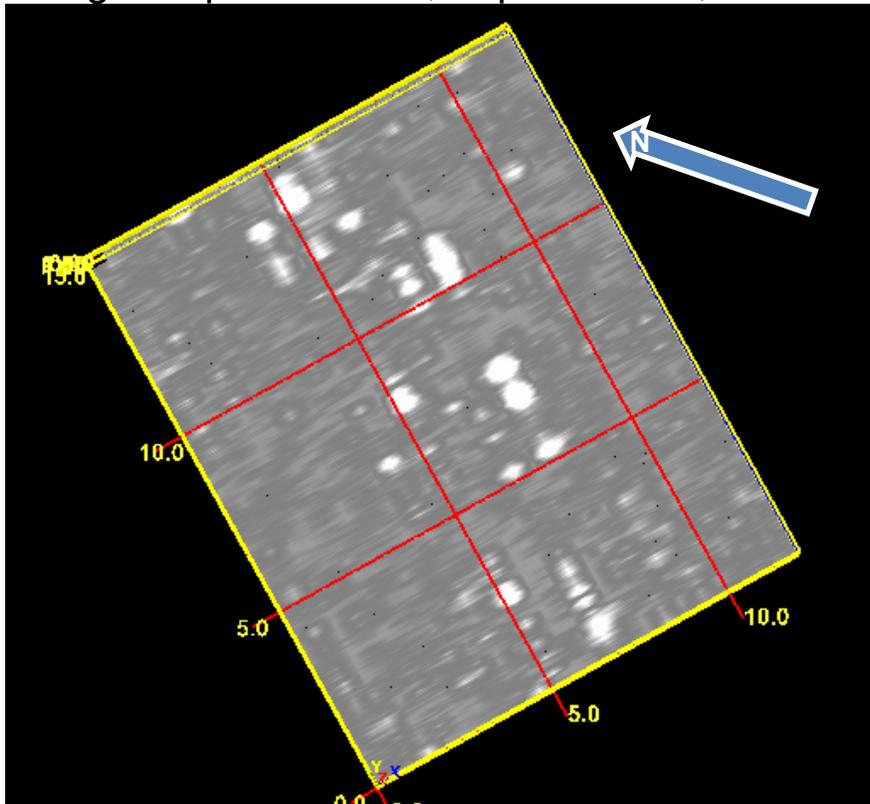
2013 Grid 1 Depth = 1.26 m (reduced amplitude) oval/blobs are graves



2013 Grid 1 high amplitude view; depth 1.15 m

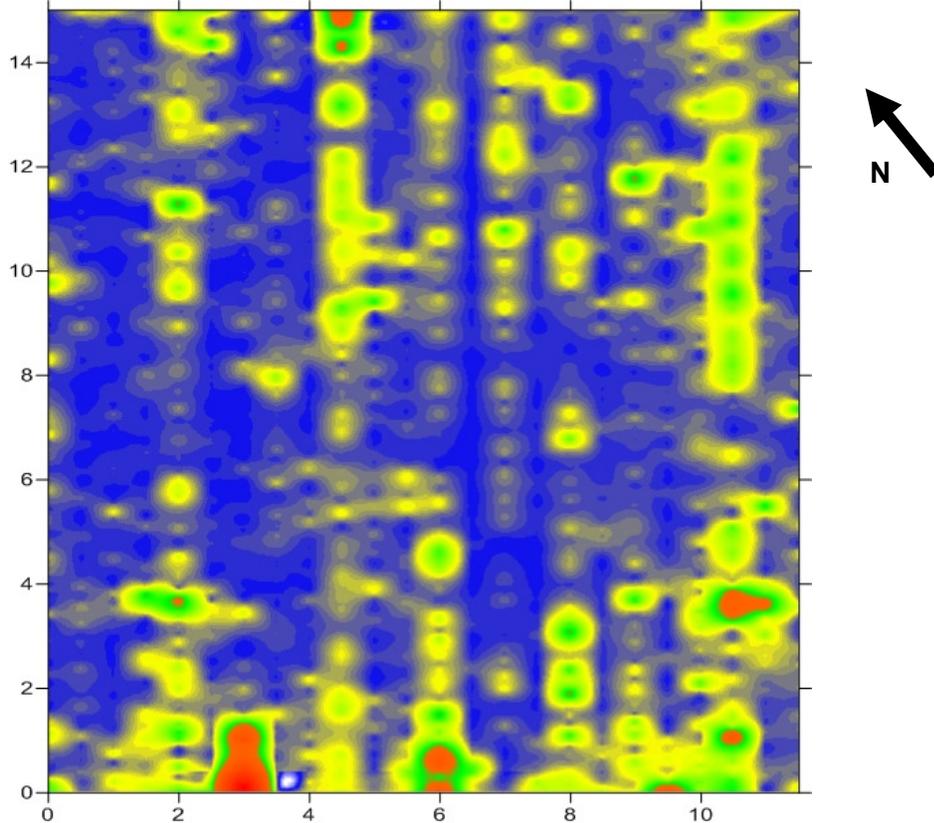


2013 Grid 1 high amplitude view; depth 1.64 m, bottom of the data

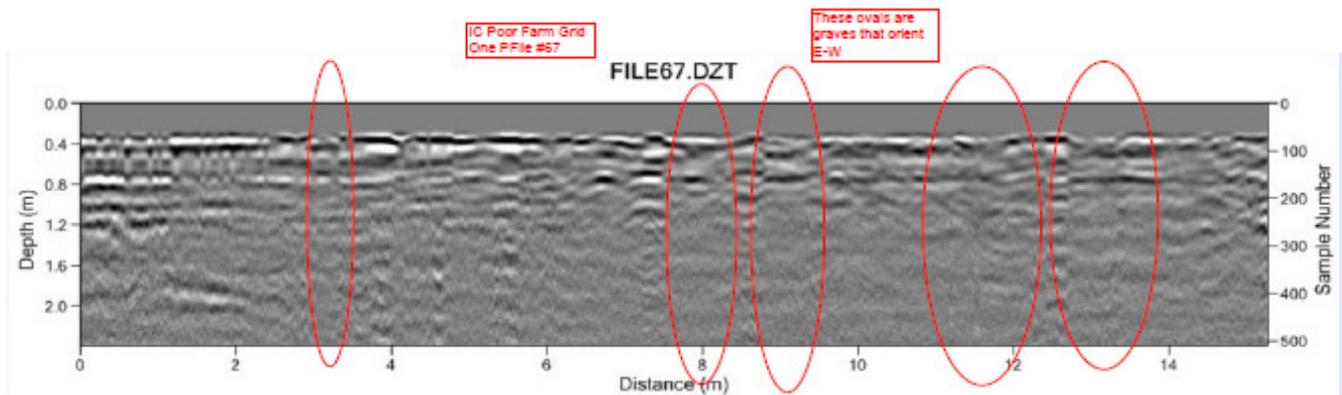


2013 Grid 1: Conyers-Lucius Method

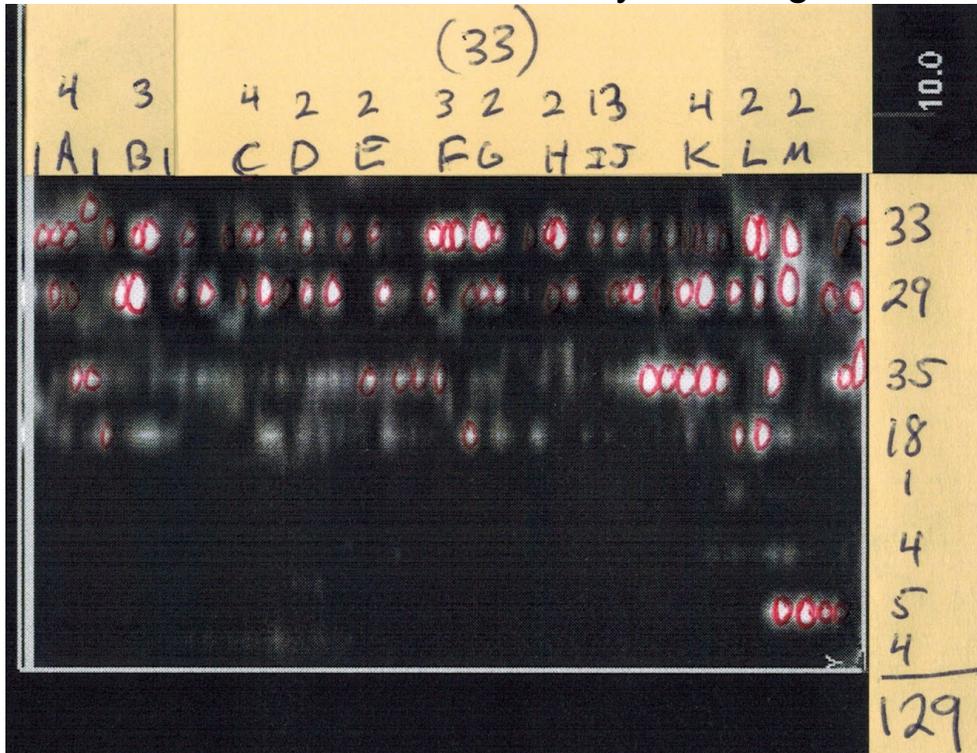
10 nanosecond horizontal slice at maximum depth of 29 nanoseconds.
Note the very high amplitude features in orange representing possible metal caskets.



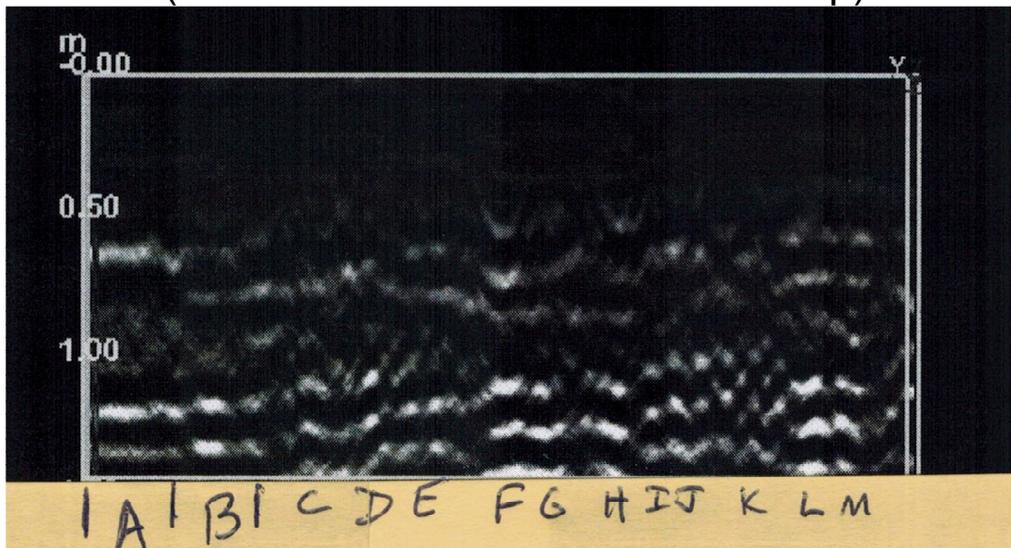
GPR Viewer: 2013 Grid 1, grave signals shown in 2D profile.



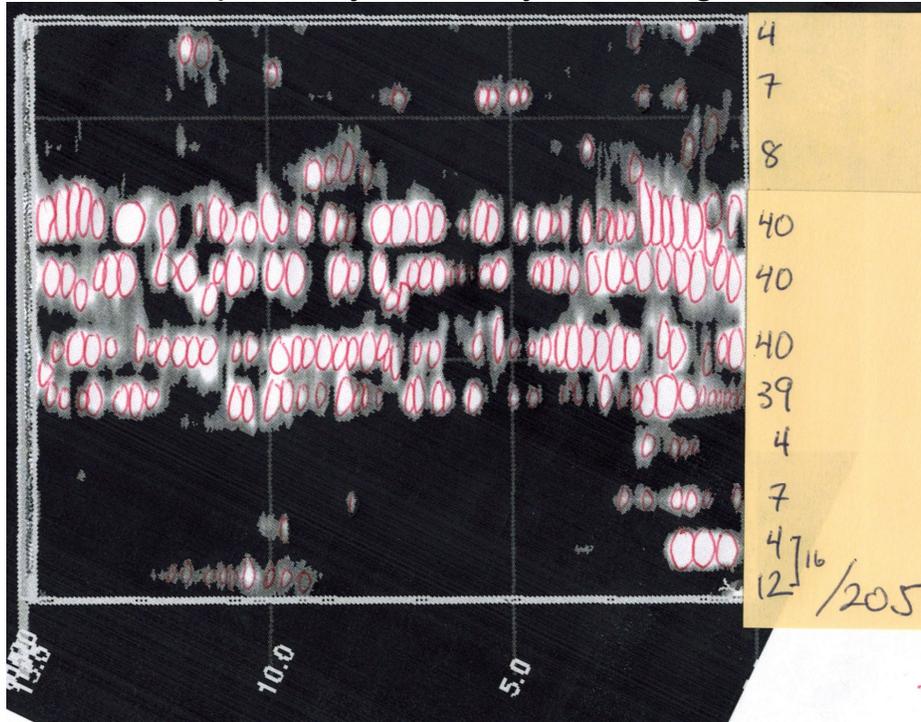
2013 Grid 1 reduced amplitude; 40 cm slice at 1.31 m depth; oblong features in 8 rows for as many as 129 graves.



2013 Grid 1 reduced amplitude 2-D profile along 7.80 m line from datum (letters match features in above map)



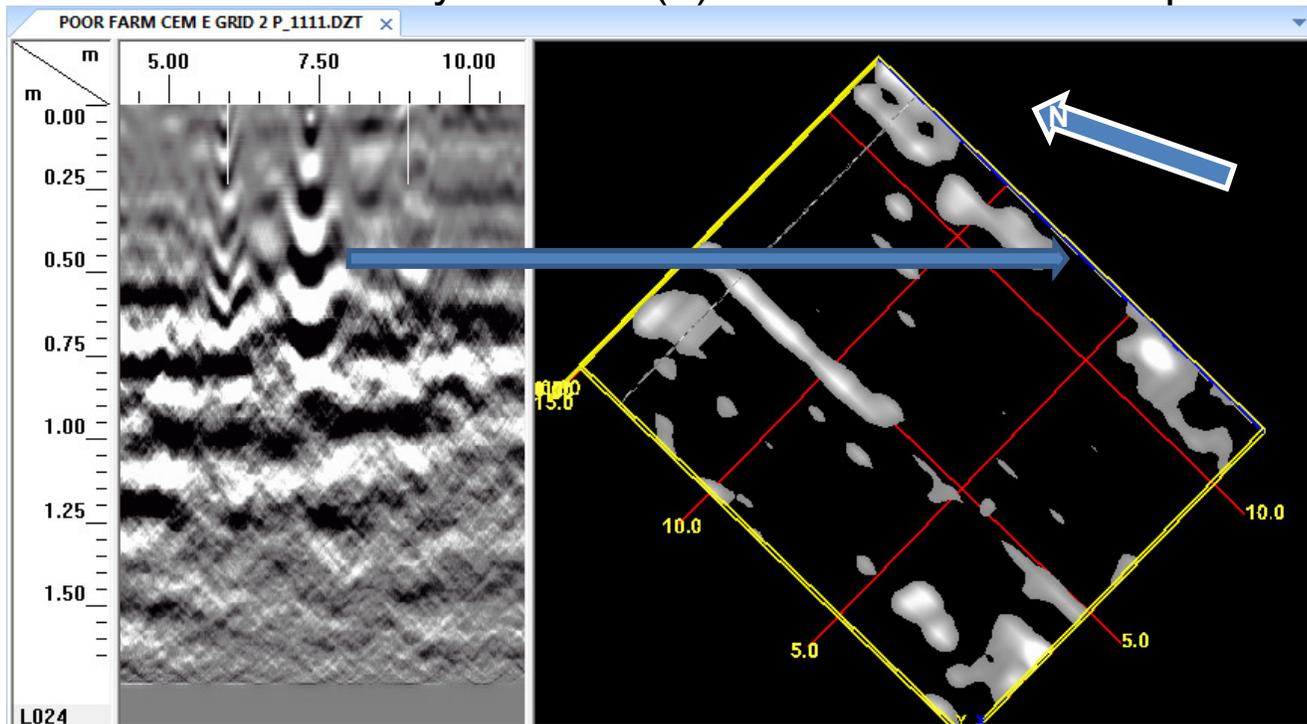
2013 Grid 1 high amplitude, 40 cm slice at 1.31 m; oblong features in 10 rows; possibly as many as 205 graves.



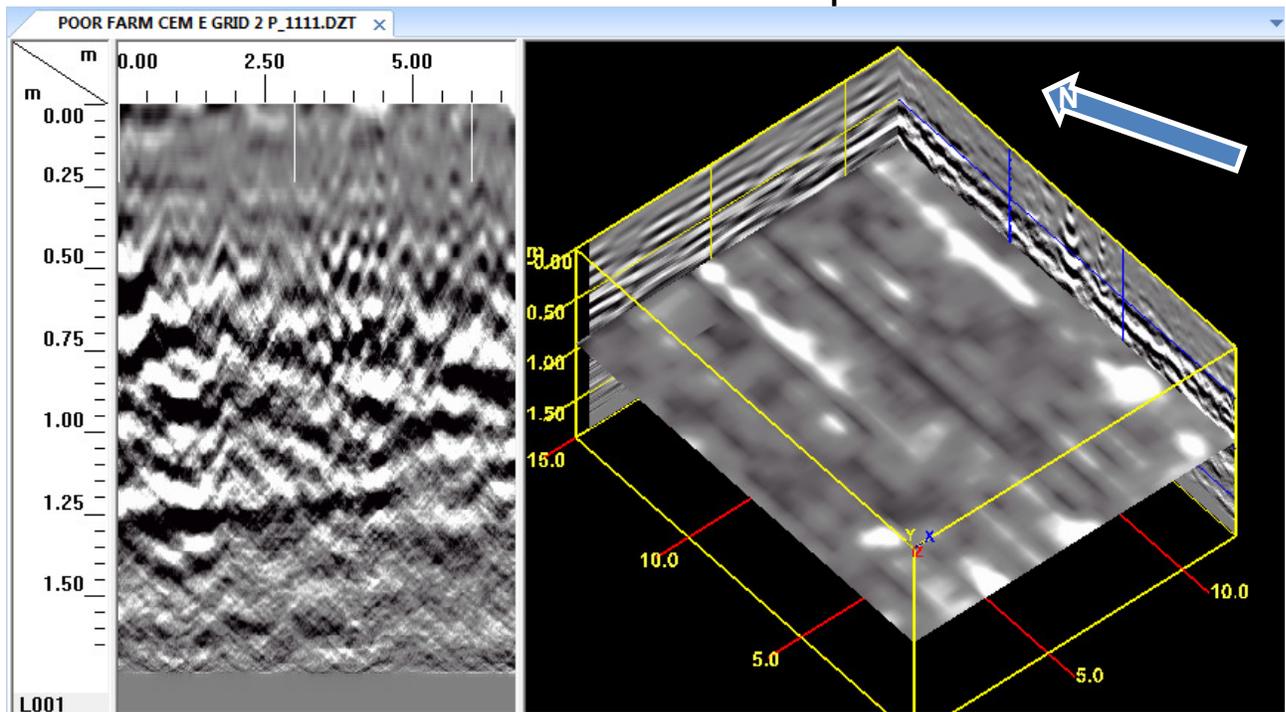
Interpretation of 2013 Grid 1

- 2013 Grid 1, west of the modern cross shows a definite pattern of interments in about 8-10 rows running N-S.
- Orientation of the interments appears to be mostly E-W.
- Likely between 120-210 graves lying in 8-10 rows.
- Appears to be part of the main interment space for the facility.

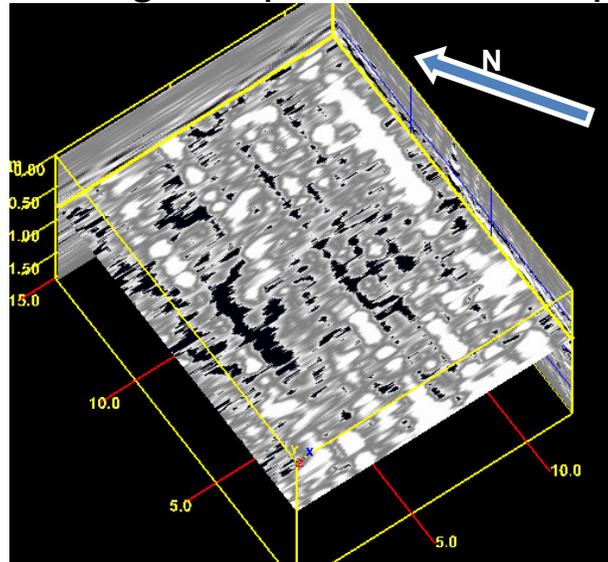
2013 Grid 2 (East of modern Cross), Depth 1.12 m - eight concentrations of possible burial pits including long linear pit plus metal accessory or coffin (?) at arrow in below map.



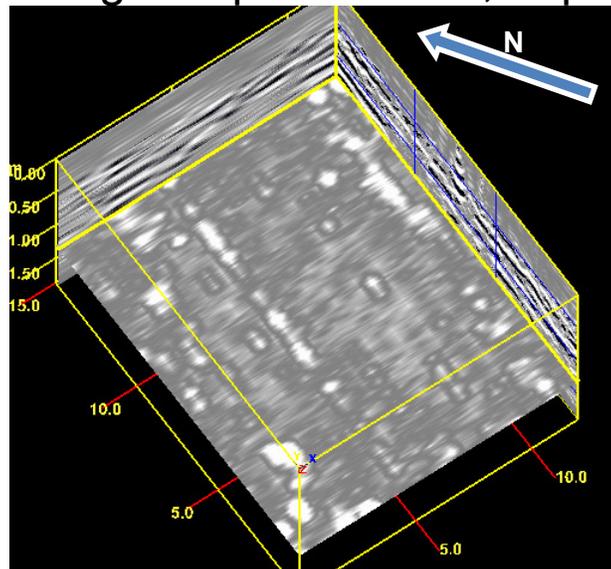
2013 Grid 2 Depth .94 m showing two distinct lines of grave trenches and several pits.



2013 Grid 2 High amplitude view; depth .75 m.



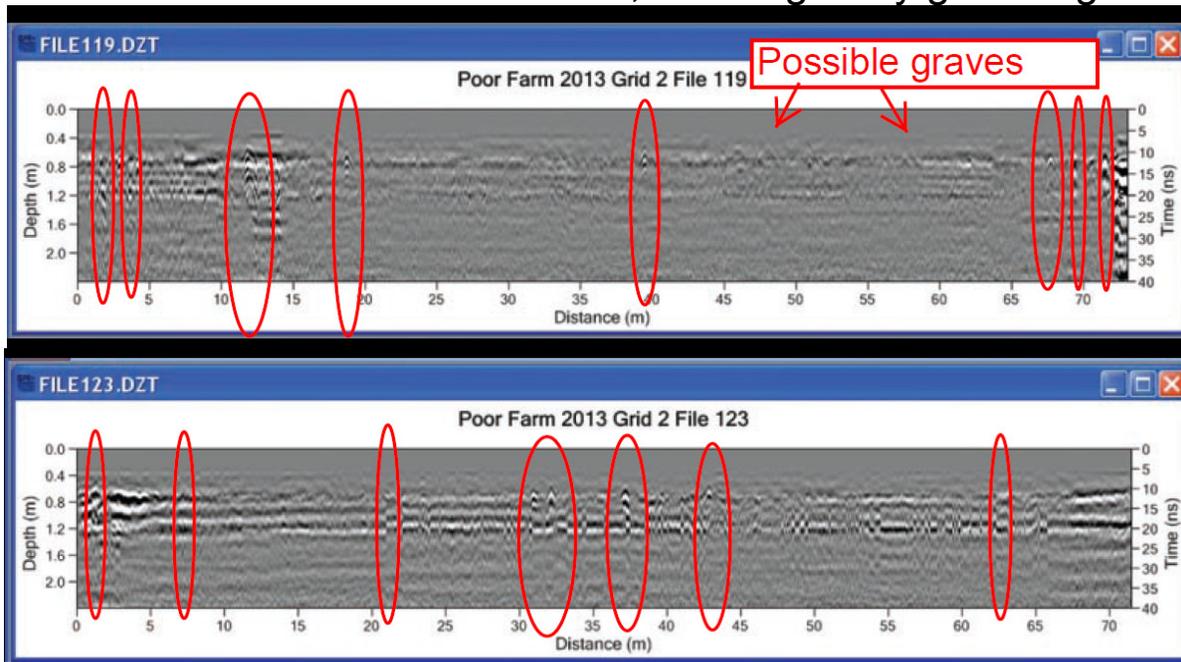
2013 Grid 2 High amplitude view; depth = 1.31 m.



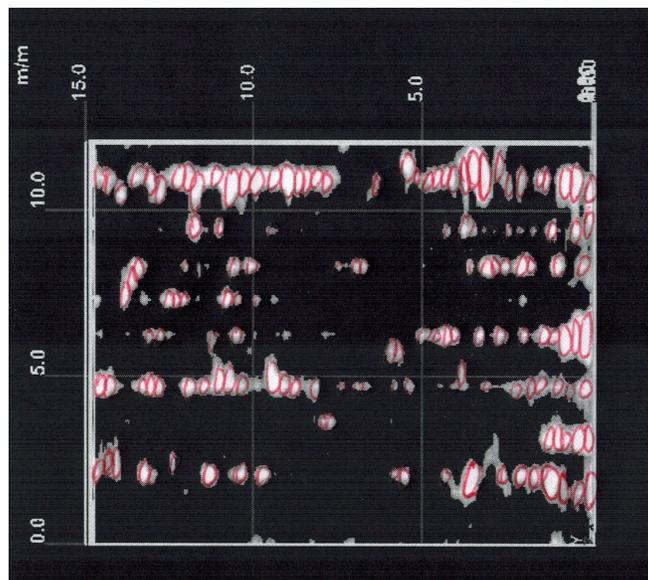
2013 Grid 2 Conyers-Lucius method,
10 nanosecond slice at 9 nanoseconds depth.



2013 Grid 2 GPR-Viewer 2D Profiles, showing likely grave signatures.



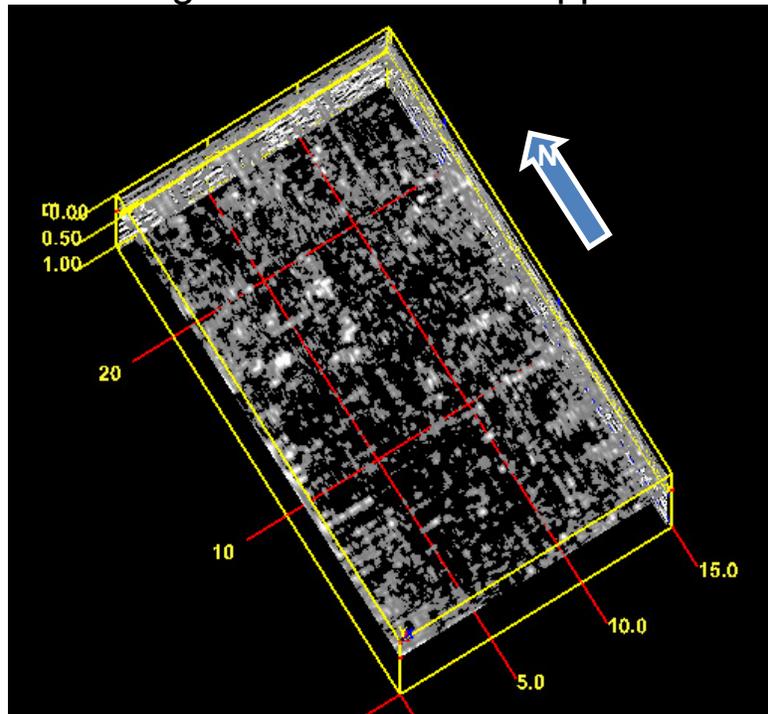
2013 Grid 2, .82 m depth, reduced amplitude, .4 m horizontal slice with rows of burials as 2013 Grid 1.



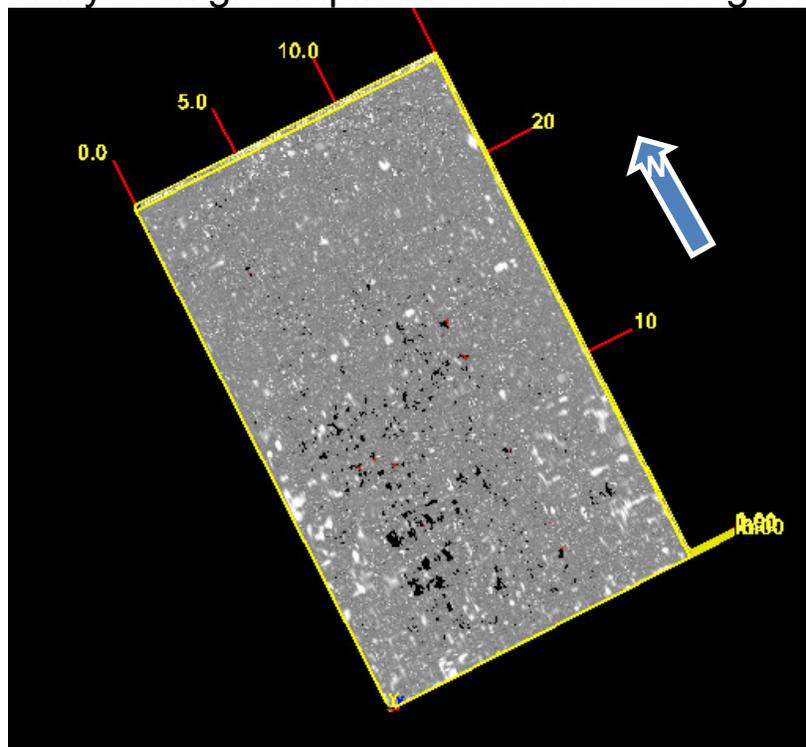
Interpretation of 2013 Grid 2

- 2013 Grid 2 is east of the modern cross.
- The high amplitude view suggests some falling of targets in rows somewhat similar to 2013 Grid 1.
- Reduced amplitude view shows upwards of 130 graves in 8-10 rows.
- The very bright N-S trenches in 2013 Grid 2 resolve into similar deposit to 2013 Grid 1.
- Probable mirror deposit on east side of cross.

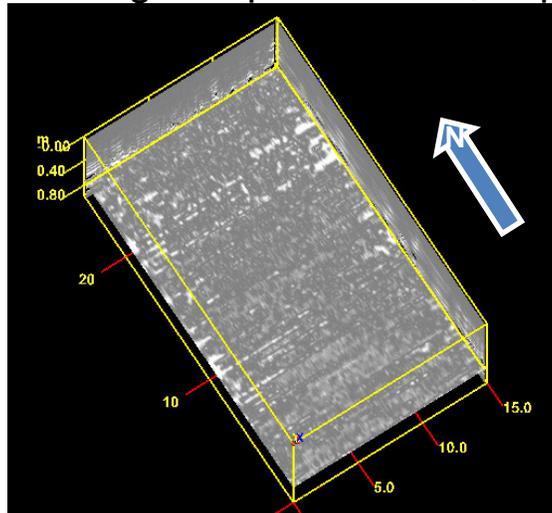
2009 Grid 1 east of 2013 Grid 2 and the modern cross;
no grave-like features appear.



2009 Grid 1, showing extreme homogeneity and
virtually no high-amplitude features = no graves.



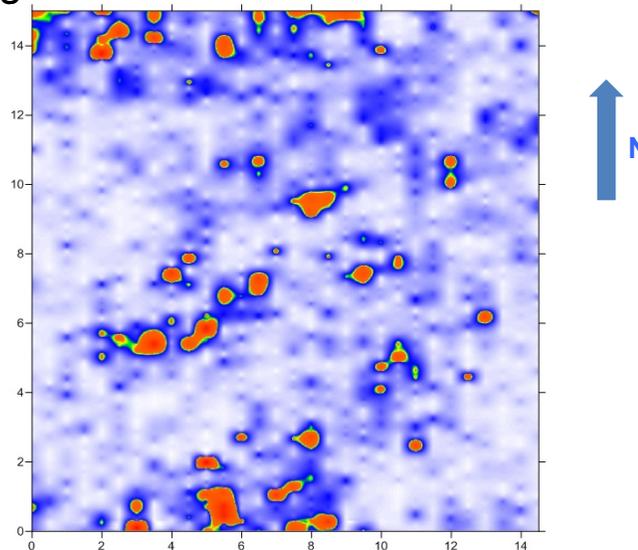
2009 Grid 1 High amplitude view; depth.73 m.



2009 Grid 1 Conyers-Lucius Method.

10 nanosecond slice. Maximum depth 19 nanoseconds.

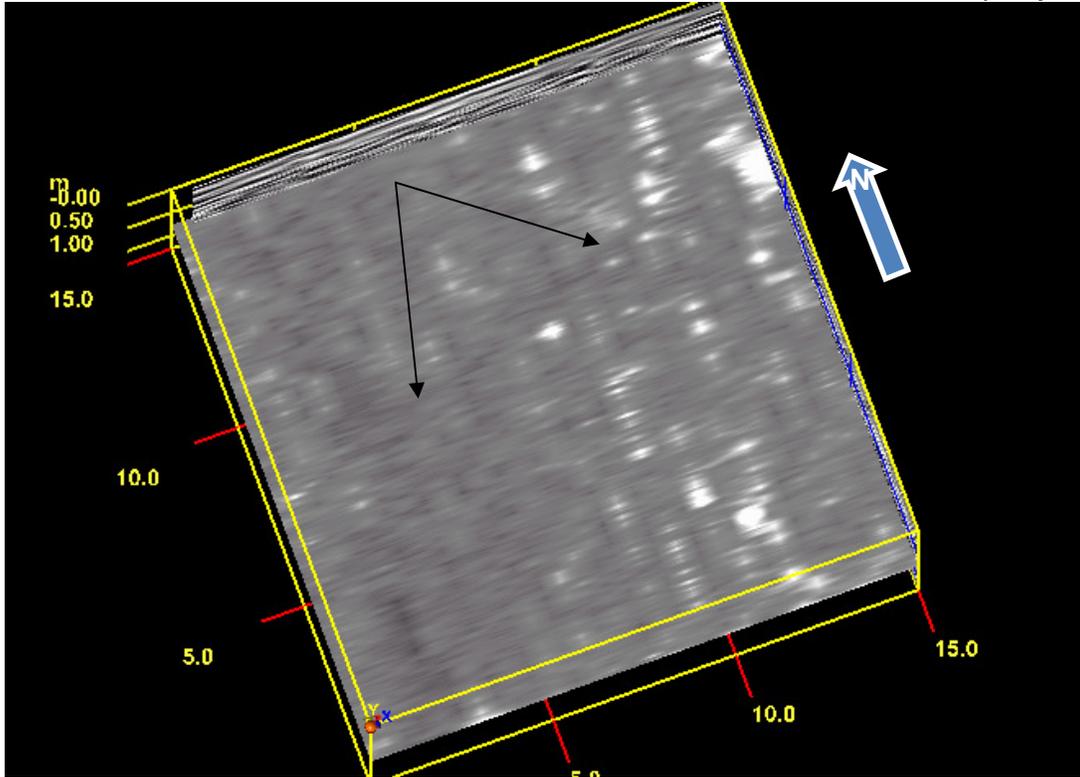
High amplitude hot spots lack regular configuration and lack uniformity of range of target sizes in 2013 Grid 1 and 2013 Grid 2.



Interpretation of 2009 Grid 1

- 2009 Grid 1 is east of Grid 2 (without overlap).
- 2-D profiles show lots of small targets, but when aggregated for 3-D viewing, we see virtually no high-amplitude oblong features that would suggest graves.
- The RADAN output is uniformly low-amplitude; the GPR viewer shows some high amplitude targets, but it does so only by using a very thick slice (10 nanoseconds is about 90 cm). The high amplitude signals lack the coherence seen in the rows of 2013 Grids 1 and 2.

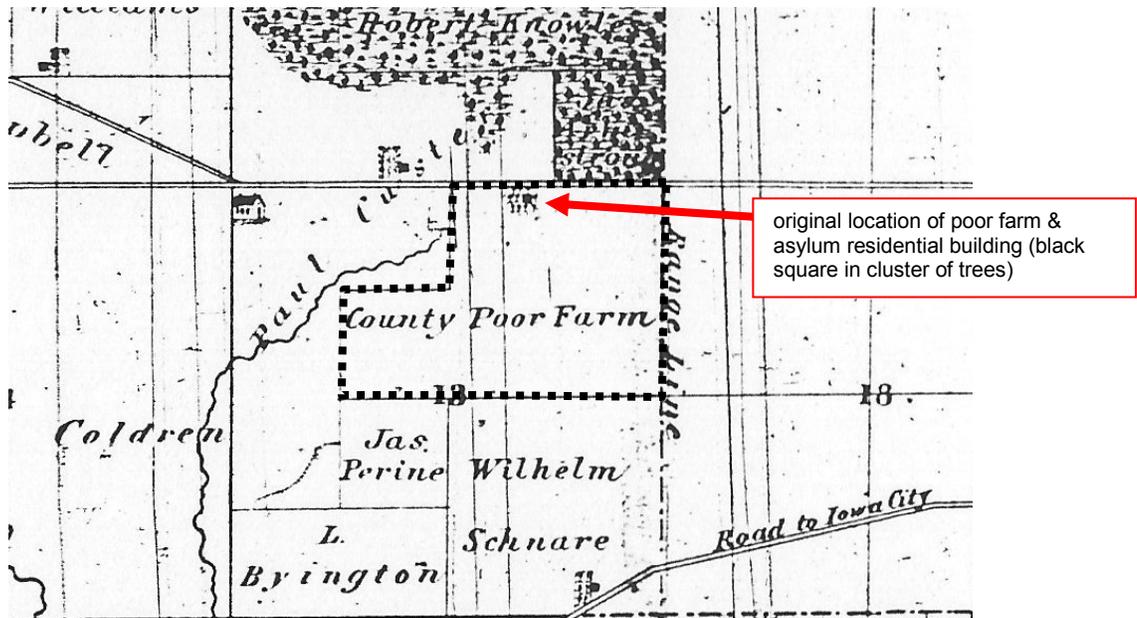
2013 Grid 3 West of standing Asylum building;
arrows indicate faint line of foundation of the main structure (depth .78 m).



Interpretation of 2013 Grid 3

- 2013 Grid 3 just to the west of the standing asylum building was sited so as to catch the main structure, which according to the late 1930s map of the Poor Farm property crossed the extant building in a T-form. At that time, the asylum building was being used for agricultural purposes.
- The orientation of the asylum is askew from straight N-S.
- The faint line marked by the arrows could well be the South foundation line of the main structure.
- The orientation of the faint line may be too askew from east-west.

Further historic research found that the extant asylum building had been moved in 1888 to its current location where it was used for agricultural purposes, including later use as a hog house. The other asylum and pauper buildings were also moved at the same time and likely formed the “T” formation shown on the late 1930s map of the poor farm. The suspected original location of the asylum and pauper buildings is shown as the circled area on the 1870 map in relation to the 2013 aerial photograph below:



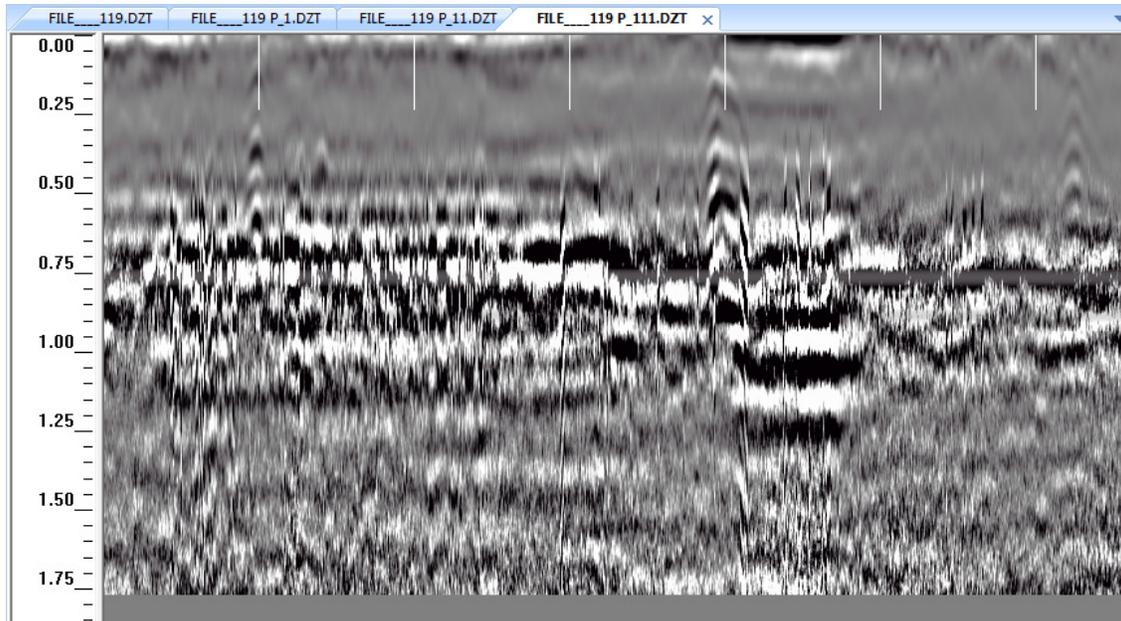
Source: 1870 *Combination Atlas Map of Johnson County, Iowa*.
Thompson and Everts, Geneva, Illinois.



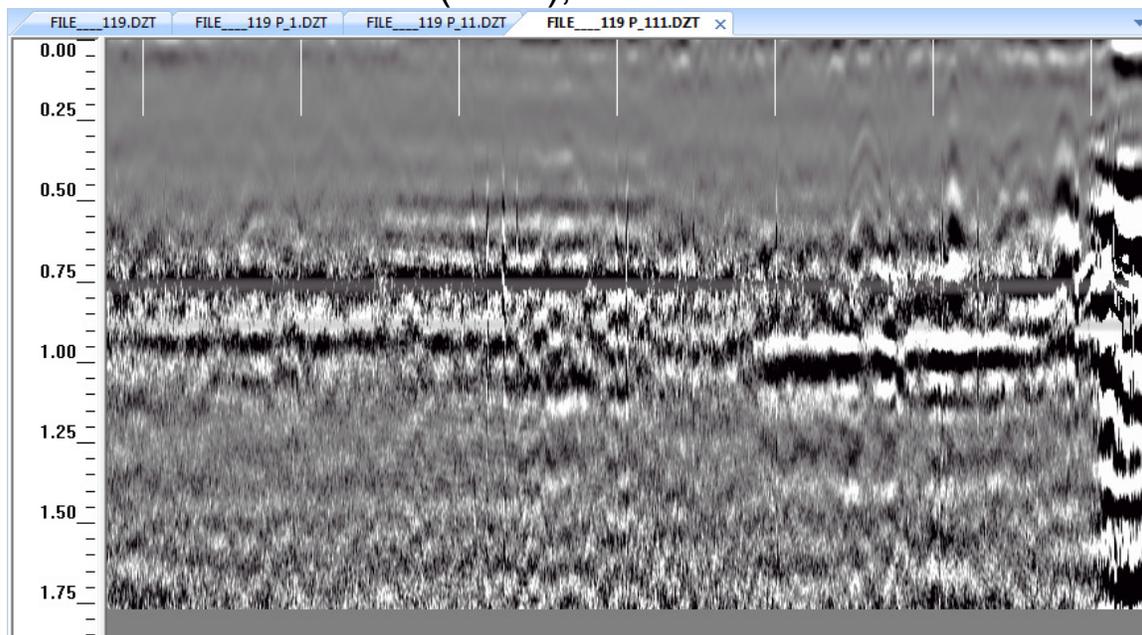
2013 natural color aerial photograph showing the red-outlined area where it is suspected that the original asylum and pauper buildings were sited prior to 1888. This area conforms to the location shown in 1870 (above map) where the residential building was depicted on the County Poor Farm.

Source for aerial: ExpertGPS mapping software, 2014.

2013 E Transect 1, 20 m east of start.



2013 E Transect 1 at end (75 m), next to Chatham Oaks Driveway.



Interpretation of five E-W transects conducted in 2013.

- The 5 east-west transects, running about 75 m east of the dairy barn were merely exploratory.
- Four of the five transects showed a very uniform soil profile.
- Transect 1 showed a very bright high amplitude features in the first 18 meters of the profile, and the last 5 meters of the profile. The nature of these objects is not known.

Resolution of Initial Discrepancies in 2013 GPR Study

- The data for the August 2013 project initially were not promising.
- Considerable RADAN analysis was required to boost the gains to make the high amplitude oblong targets bright enough to suggest the regular rows of graves.
- Initial analysis via GPR Viewer and the Conyers-Lucius method were less clear, largely because standard procedures with that method utilize very thin slices; when the slices were increased markedly, the 2013 Grid 1 results were comparable to those with RADAN.
- The high amplitude signals for the 2013 Grids 1 and 2, in their regularity (lacking in 2009 Grid 1), suggest the sought-after graves.

Results

- Structural remains of the rest of the main building are highly disturbed and do not appear clearly; only a very faint trace remains. As noted above, historic research has indicated a more likely location in the northeast corner of the farmstead property (south of Melrose Avenue and north of the dairy barn) where a residential building was depicted on the county poor farm property in 1870. It is known that the original asylum and pauper buildings were moved in 1888 to their current location after a new county home building was constructed (non-extant) where Chatham Oaks now stands. It is recommended that future GPR studies conduct grid surveys in the grassy strip of land in the northeast corner of the farmstead (north of the dairy barn).
- The 2013 cemetery grids were very successful in showing perhaps 350 graves or more; these results are some of the clearest seen for Iowa historical cemeteries, because the main burial trenches appear to have been maintained just east and west of the current standing cross marker.
- We appear to have the main deposition location for the cemetery and its numbers are consistent with the history of a facility in operation for over 100 years. Historic research suggests that the cemetery site was primarily used for burials in the late 19th and early 20th centuries.

Acknowledgments

- Thanks to Johnson County for permission and the Johnson County Historic Preservation Commission and local volunteers for assistance with the data recording.
- Thanks to Leah Rogers of Tallgrass Historians L.C. for setting up the project.
- Thanks to the University of Iowa Honors Program for the students participation.
- Thanks to 21 U of I Freshman for participating in the class and field activities.
- Finally, thanks to Robin Lillie of the Burials Program of the Office of the State Archaeologist for her insights.