

# **Ground Penetrating Radar Survey Report:**

## **Deerfield Beach Cemetery Plot Deerfield Beach, Florida**



*Deerfield Beach plot looking NE towards  
what is thought to be entrance to cemetery.*

**Data Acquired September 29, 2004**

**Report compiled October 17, 2004**

**Survey and Report Submitted by Mnemotrix Systems, Inc.**

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## **Introduction**

On September 29, 2004, Mnemotrix Systems, Inc. was asked to assist Bob Carr and the Archaeological and Historical Conservancy with a GPR Survey on a project which would confirm the actuality of the verbal claims that a Deerfield land plot was once a cemetery, and that remains of burials still exist unmarked on the spot to this day.



**Figure 1: View of Deerfield Cemetery Plot looking northwest.**

Towards the end of our field day, a 59 year old lifetime resident of the area named Alphanso Dean came to see what we were doing, and added his recollections to our verbal record of the

history of the site. He has an older sister who remembers more and might have some photos or leads to photos as well. He remembers from 1951 or 1952 being a child and going to funerals at this cemetery. His father, Malachai Dean, who has passed on now, was a preacher who worked at the church which still stands down the block, west on SE 4th street from the cemetery. There is also a funeral home in that area. He suspects that the funeral home, or the church, would have records of who was buried in this plot, or perhaps names of family members who might have photos.

While in the field he affirmed to us that the area was without a doubt a cemetery with many people buried on the whole plot, which used to be filled with palmetto trees which have since been cleared off. He did not remember headstones ("Who can afford a

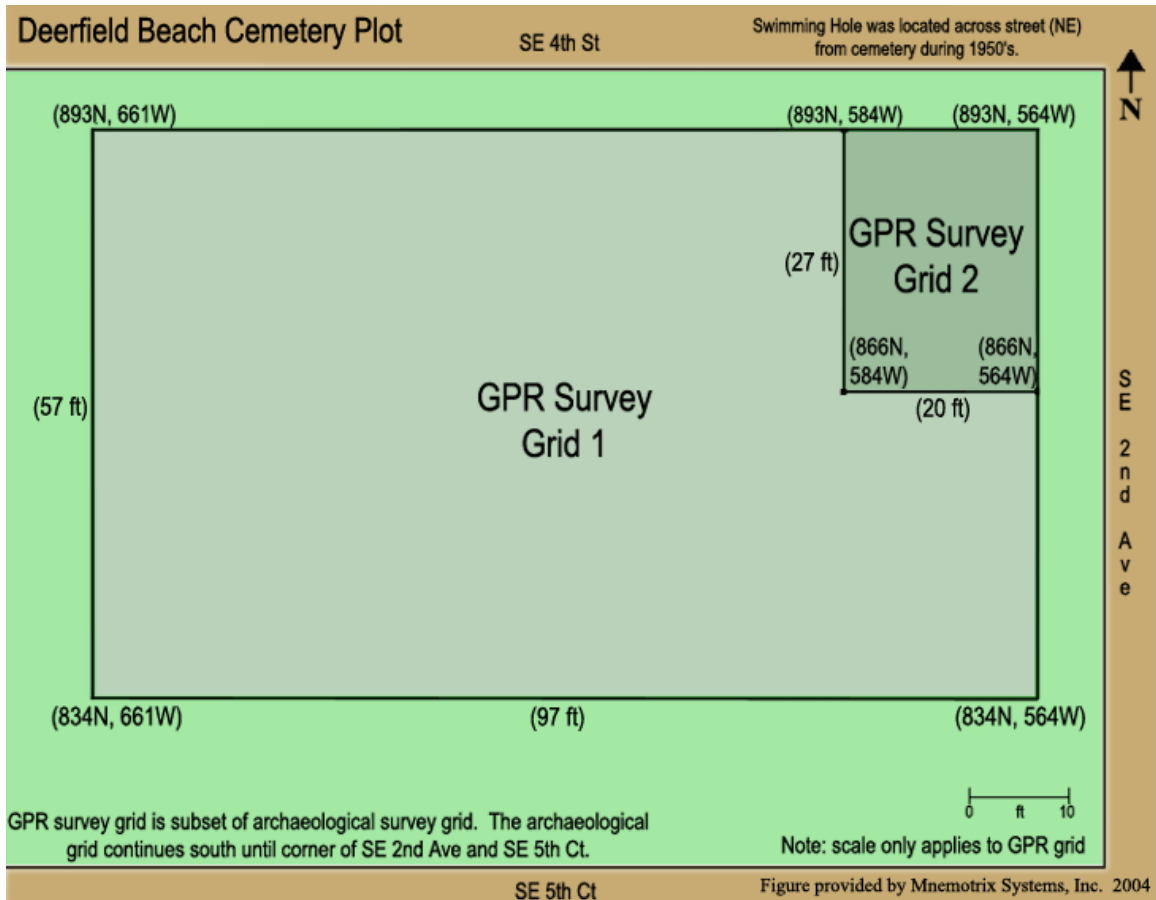
headstone?"), just people in wooden boxes. "Ashes to ashes, dust to dust". He told us that around the late 1950's or early 1960's people came through and cleared the plot, covered everything over with sand, and stopped using it outwardly as a cemetery. However, the coffins were not removed. He warned us about the land itself, as it is only sand, and thus is not stable enough for heavy building. Mr. Dean also told us that going to the plot at night is not advised as a person could easily fall into a deep sinkhole filled only with sand, bodies, and bones of burials. Finally, Mr. Dean noted that as a child he remembered a swimming hole across the street in a NE direction from the site of the cemetery on which we completed our GPR survey.

We include this information as it helps to orient those involved in this project to the history of the plot and larger region it is a part of. Past use of the site is important to give us a better understanding of what to expect, and how to explain what we see in the GPR data.

### **Actions Taken**

Because we were dealing with potentially a very mixed matrix of the near sub-surface, we wanted as high resolution as possible. We used a 400 MHz GSSI (Geophysical Survey Systems, Inc.) antenna with a shallow profile, which gives a viewing window of about three to nine feet, to set the parameters of the survey. We used this profile to acquire the data of GPR Grid 1 (97 ft E/W x 57 ft N/S), and then marked out a subset grid, GPR Grid 2, which was (20 ft E/W x 27 ft N/S). Grid 2 used a 400 MHz Deep profile with a viewing window of five to fifteen feet.

GPR Survey Grid 1 consisted of 96 GPR transects in an alternating N/S direction moving west, every foot. Data acquisition went steadily throughout the day, which became sunny and hot. GPR Survey Grid 2 consisted of eleven GPR transects in an alternating N/S direction moving west, every two feet. Both grids can be seen more clearly in Figure 2 below.



**Figure 2: Map of the Deerfield Beach Cemetery plot and the spatial relation between the archaeological and geophysical (Ground Penetrating Radar) surveys of the site.**

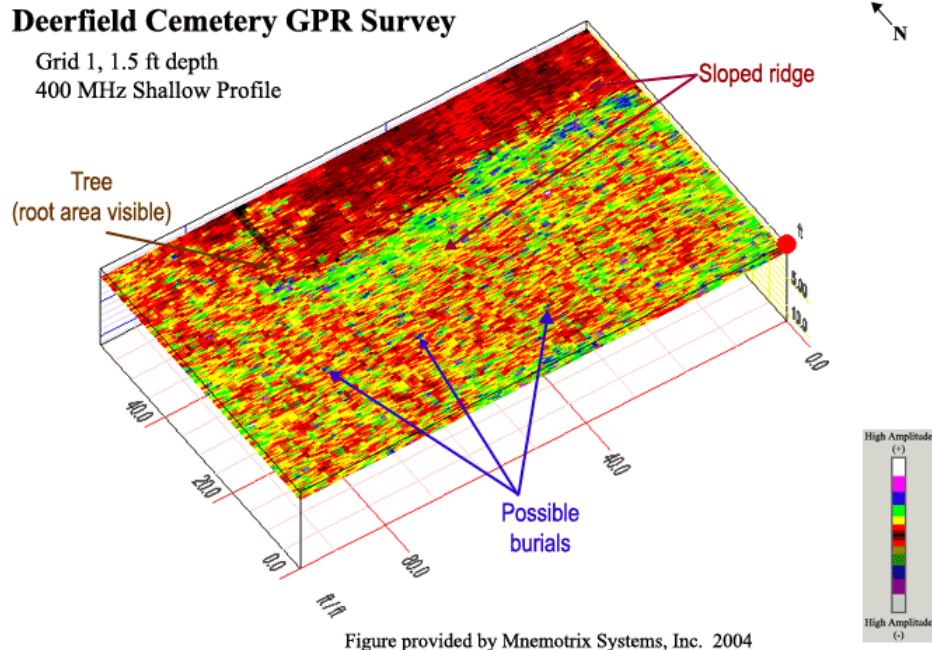
The GPR grids discussed in this report are subset to the archaeological grid of archaeologist Bob Carr and his team. As can be seen in Figure 2, the larger archaeological grid continues south along the block between SE 4<sup>th</sup> St. and SE 5<sup>th</sup> Ct. in Deerfield Beach, Florida.

## **Results and Analysis**

Once field acquisition concluded, basic post-processing was applied to the GPR data. Files were appended together to create a 3D dataset, which can be viewed as a 3D cube. The smaller grid with a deeper viewing window was also superimposed on the larger grid to compare results which could be extrapolated to the entire area surveyed, and to confirm conclusions.

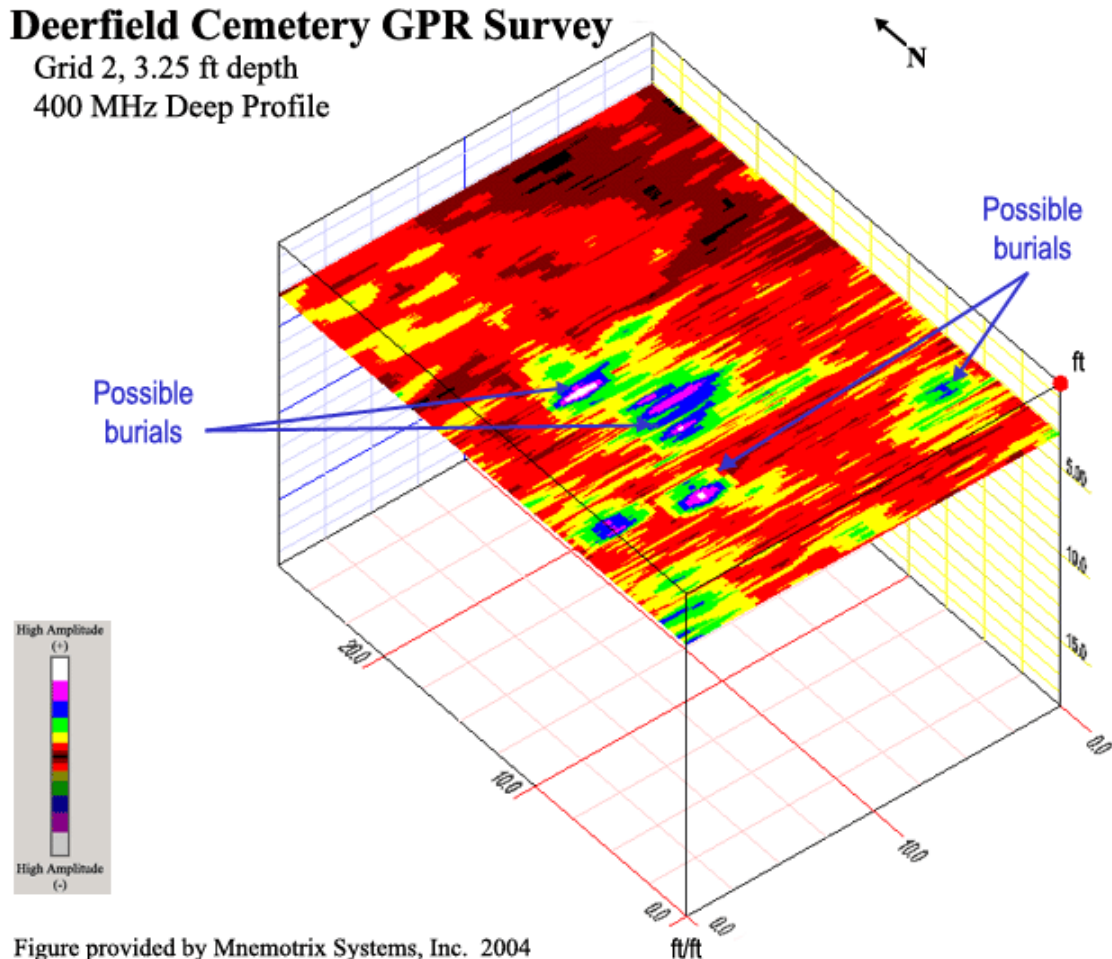
The gradual slope of the plot to the south due to the earlier mentioned bulldozing of the site can be seen easily while in the field. This feature was also evident in the GPR data and is labeled as such in the following figures. Anomalies can be seen near the ridge especially on the NE side, indicating there may well be burial remains beneath the surface there. Two trees were present in the NW section of the grid. The roots of these trees were also seen in the GPR data and are labeled in Figure 3 below. In addition, a concrete slab was found in the southwest corner of the grid and was partially excavated at the site. This feature, marked out in the Anomaly Map provided in Figure 5, can be clearly recognized in the GPR 3D grid, and is not dissimilar to other such patterns seen elsewhere on the site, so this may not be the only one present.

Scattered throughout the entire gridded area were small reflections that were most clearly seen in the first 1 – 2 feet of the sub-surface. The archaeologists involved did not expect burial remains to extend further than about three feet below the surface. Indeed, these reflections that are scattered throughout the area tended to disappear by about 3 – 4 feet depth in the GPR data.



**Figure 3: 3D view of GPR Grid 1 results showing typical possible burial reflections, the sloped ridge, and trees in the NW section.**

Figure 4 below shows a view of GPR Survey Grid 2. This looks a bit like a magnified version of the results from Grid 1, mostly because it gives us a coarser and deeper view of the sub-surface. The white, light purple, blue anomalies seen here seem are very similar to those of Grid 1, and match up in location when the two grids are compared. Through analysis these anomalies seem to resemble what could be graves as the white shows void space, which would accompany an old burial. It is only through ground truth excavation that we will be sure of their identity. This study also showed two deeper horizontal reflections, at ten and twelve feet, which correlate approximately to where the bedrock and water table would exist.

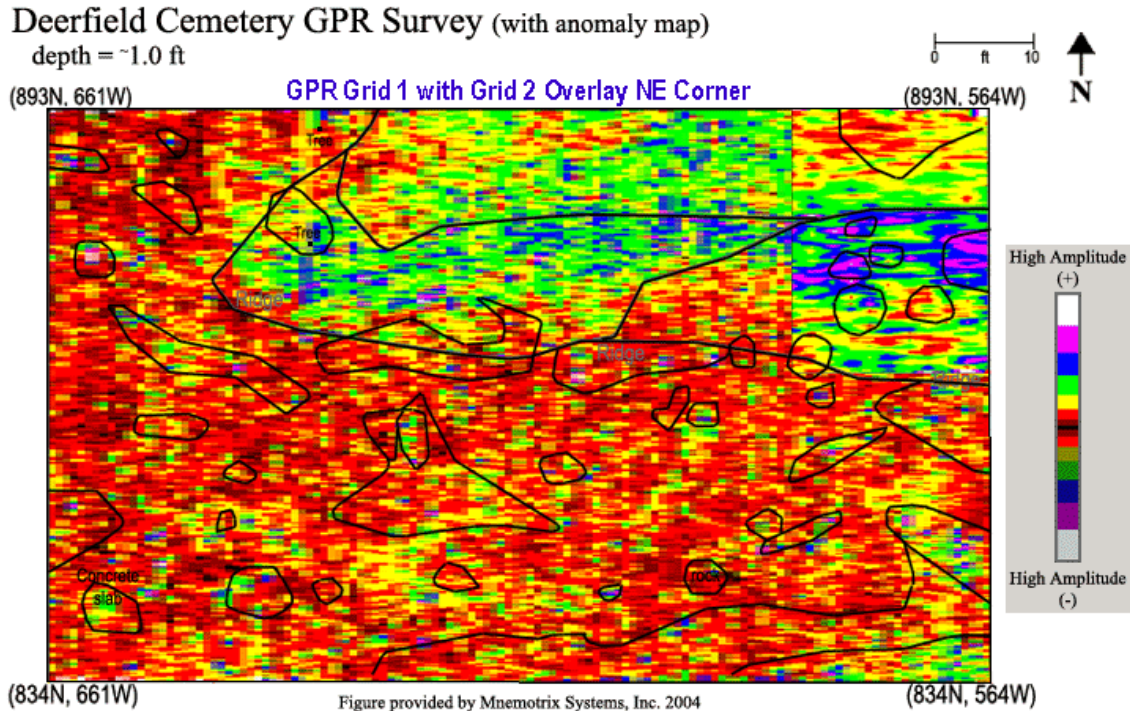


**Figure 4: 3D view of GPR Grid 2 results showing possible burial reflections near and in ridge area.**

To aid in understanding, an animation of the GPR data with the two grids overlaid on top of each other is able to be seen at:

[http://www.mnemotrix.com/geo/deerfield/deer\\_anm.gif](http://www.mnemotrix.com/geo/deerfield/deer_anm.gif).

This animation shows depth slices of the data from the surface to about 2.5 feet depth. An anomaly map has also been included where anomaly groupings can be viewed and understood. This map is part of Figures 5 and 6. If you are unable to connect to the Internet at this time, an excerpt from that animation is seen in Figure 5 below.

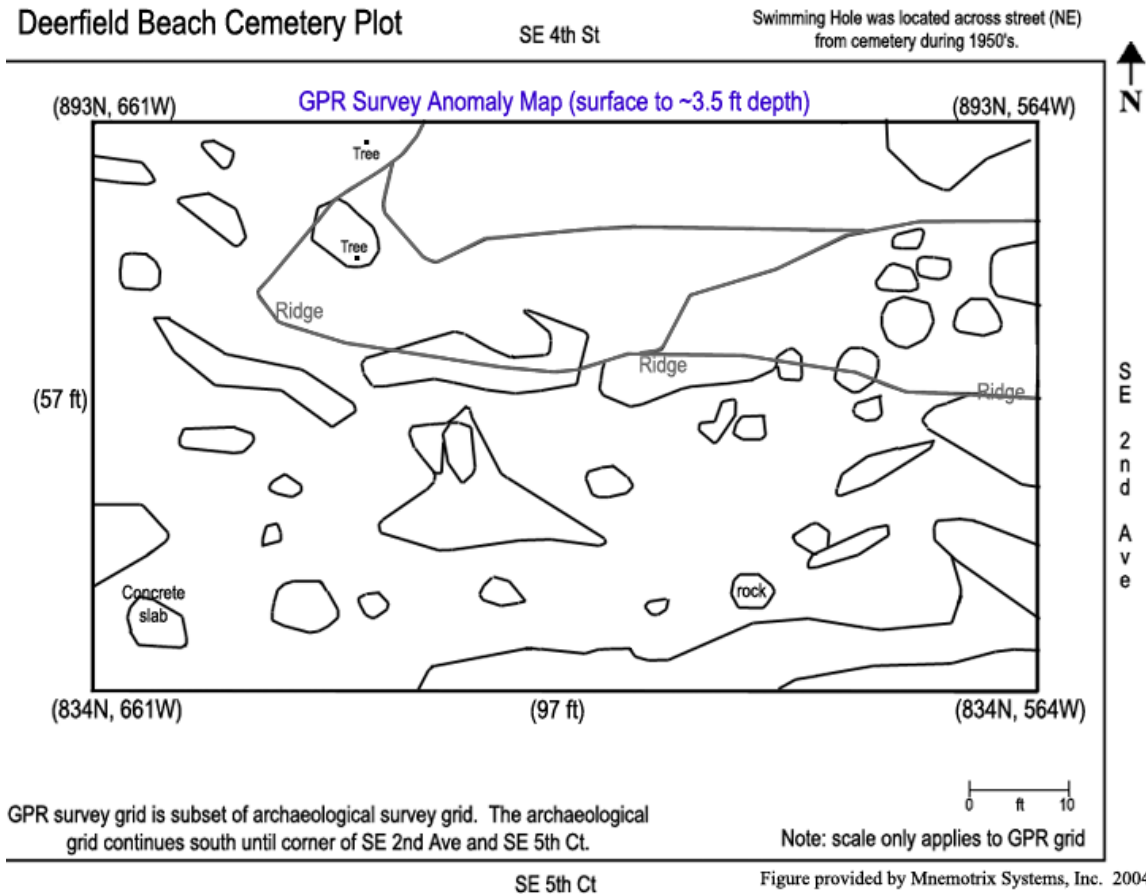


**Figure 5: The anomaly map included in this figure is the result of tracing anomalies through depth. Grid 1 is overlaid by Grid 2 in the northeast corner.**

In studying the GPR scans through depth, an anomaly map was created which groups certain anomalies. Smaller round anomalies are seen to be scattered throughout the survey and are discussed in previous figures. The sloped ridge is also present and has been traced.

Based on historic data, we are told that the entrance to the cemetery was in the northeast corner. Upon first entering the cemetery, the burials were said to have been facing the parking lot. Based on the anomaly map, it seems that the burials may have “framed” this entrance and swept around to the northeast corner. There are several groups that are elongated, possibly a burial that is more intact than the more round anomalies scattered throughout the area.





**Figure 6: Anomaly map to be used in the field by archaeological team.**

Figure 6 is the anomaly map that has been overlaid in the earlier figure. This map is meant to be used by the archaeological excavation team in ground-truthing the plot. It is clear that there are many points of interest to start excavation. If a recommendation would be as to where to start excavation in the large plot to gain better understanding in a time efficient manner, the Mnemotrix team would recommend beginning excavation in the middle of the eastern edge of the GPR grid. In so doing, both teams would understand the ridge, and the identity of the round anomalies that are evident here.