MEETING MINUTES OF THE
Gilpin County Historic Preservation Advisory Commission (HAC)

January 20, 2015

The Gilpin County Historic Preservation Advisory Commission convened in the Gilpin County Library, 15131 Hwy 119, Black Hawk, Colorado.

Public Attending: 1

Call to Order: Meeting called to order at 6:58 p.m.

Quorum Call:
Present: Chair Bret Johnson, Secretary Barbara Thielemann & Rick Newman
Absent: Chair pro-tem Linda Jones (excused), Herman Gaines (excused) & Mike Keeler (resigned due to work conflict)
Staff Present: Historic Advisory Liaison Ray Rears

Election of Officers:
Newman moved to appoint Johnson as Chair, seconded by Thielemann and the appointment was accepted. Johnson moved to appoint Newman as Chair pro-tem, seconded by Thielemann and the appointment was accepted. Newman moved to appoint Thielemann as Secretary, seconded by Johnson and the appointment was accepted.

Agenda Review: Newman requested to add Freemont Graves to the agenda and all agreed.

Minutes: Thielemann moved to approve the October 21, 2014 minutes as corrected seconded by Newman and the motion was unanimously approved.

Old Business:

Nevadaville Historical Survey – Certified Local Government Grant:

Rears provided a brief overview the progress of the report that the consultants are working on the report and their second draft deliverable of all the site forms are due soon. Rears indicated that after they are reviewed, he will forward them on the commission.

Thorn Lake School – State Historical Fund Grant

Rears informed the commission that the project is now complete and only wrapping up grant administration is left, including final payments. Rears mentioned that the Commissioners maybe looking at completing this project from County funds, but nothing has been determined. Johnson commented that if anything is done, the roof is the priority. Rears said that he or Johnson will email a link to the report, so the HAC will have a copy.

Fremont Grave

Newman requested an update on the report that U.S. Forest Service South Zone Archaeologist Paul Alford was going to receive. Rears informed the commission that he had not received an update from last it was mentioned in September and that he would request an update.

New Business:

Winks Panorama – National Register of Historic Places

Rears provided a letter of History Colorado that the Winks Panorama National Register of Historic Places boundary change was approved on October 15, 2014. Rears referenced that this site was on the tour two-years ago and the commission was supportive of this boundary increase to include related structure into the district boundary.

Vacancy / Reappointment Update

Rears informed the commission that there is currently one open position and the deadline for applications is February 6, 2015. Both Thielemann and Gaines were reappointed for a new term ending in 2017 by the Board of County Commissioners.

Colorado Preservation Conference – CAMP

Thielemann confirmed that she will be attending the CAMP portion of the conference February 4-6, 2015. CAMP was paid for by the OAHP. Johnson confirmed he will also be attending.

Bald Mountain Cemetery -

Rears reported that since the last meeting Jones and he have selected the six stones in need of repair. A quote was received from Norman Memorials in the amount of $3,145. That leaves $550 which Jones and Rears discussed could be used for a plaque for cemetery itself. Jones is now unable to write the description for Bald Mountain Cemetery, so Rears will prepare it. The plan is to use the full $3,695.10 on these two projects by the end of the year.

HAC Tour 2015 –

It was discussed if or when the tour should occur this year. July 11, 2015 was held up as a tentative date for the tour. Johnson mentioned that he may have found the original location of the Thorn Lake School and that should be a stop on the tour.

Linda Jones Status -

Thielemann provided an overview to the recent medical needs and status of Linda Jones. Thielemann will send a get well card from the entire commission.

Public Comment:

Newman requested to address the commission as a member of the public and moved seats in doing so. Newman stated that we are losing heritage in the County and that we need to think about preserving the stories of old timers and not just the buildings. Newman wants to introduce the human element to our efforts. Ken Reed and Newman have done some a few recording, but there needs to be more done. Discussion ensured and it was suggested Newman work with the library to see if there is something out there to assist his effort, such as the StoryCorps heard on National Public Radio. It was also mentioned that Gilpin History also has some oral history recording done too. Rears indicated he would send out copies of minutes of when this was discussed previously.

Adjournment: There being no further business to come before HAC, Jones moved to adjourn, all in favor at 8:03 p.m. The next meeting will probably be on April 21, 2015.

Respectfully submitted,

Bret Johnson
Chair

ORIGINAL

Thursday, September 04, 2014

Locating the Freemont Men with Ground-penetrating Radar in Gilpin/Boulder County

Produced for:
The Freemont Men Research Group

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Introduction:

The purpose of this project was to locate graves in various cemeteries throughout Gilpin/Boulder County. Two grids of GPR data was collected on August 20th, 2014. The reflection data in all surveys were collected using the GSSI SIR-3000 system with a 400 MHz dipole antenna. Each grid was laid out with tape measures and grid corners were identified with metal pins and nails with multiple colored flagging tapes. This data was placed into space using the survey wheel encoder device attached to the radar antennas. The corners of the grids were also measured to permanent landmarks, such as corners of headstones, footstones and water pipes.

GPR: Use and Background

Ground-penetrating radar data is an active method which transmits electromagnetic pulses from the surface antennas into the ground, measuring the time elapsed between when the pulses are sent and received back at the surface (Conyers 2013). Radar travel times are measured in nanoseconds, which are a billionth of a second. Measuring the travel time of the energy pulses, along with their calculated velocity, allows us to accurately measure distance, or depth in the ground. As the antenna is moved along the ground surface, individual reflections are recorded about every 2 to 10 centimeters along transects (Neal 2004, Conyers 2013). Forms of individual reflected waves, also known as waveforms, received within the ground are digitized into a trace (Conyers 2013). A trace is a series of waves reflected back to the surface location (Conyers 2013). When traces are stacked sequentially they produce a two-dimensional vertical profile. Combining these two-dimensional reflection profiles, each of which contain thousands of reflection traces, can be used to produce two and three-dimensional images. The amplitudes of the reflected waves directly relate to changes in physical and chemical properties of different materials in the ground (Conyers 2013). Each time a radar pulse traverses a material with a different composition or water saturation, the velocity changes and a portion of the radar energy is reflected back to the surface and is recorded. The remaining energy will continue to pass into the ground to be further reflected, until it dissipates with depth (Conyers 2013). The greater the contrast in physical, electrical, and magnetic properties between two materials at an interface, the stronger is the reflected signal, and therefore the greater the amplitude of reflected waves. The success of GPR surveys in archaeology depends upon the soil and sediment mineralogy, clay content, ground moisture, depth of burial, surface topography, and vegetation (Conyers 2013). The presence of mineralogical clays or salts in soil can attenuate radar energy quickly, which affects how deep the energy can potentially resolve features of interest (Conyers 2013).

Processing Procedure:

GPR reflection profiles viewed during or directly after being acquired in the field, especially in residential areas, are obscured by "noise". The reflection profiles can also contain extraneous reflections such as air waves, multiple reflections, and point source reflection hyperbolas which can make interpretation more challenging and must be processed into useable maps. These raw field reflection profiles are also usually not collected with accurate depth and must thus be placed into the reflection records after returning from the field (Conyers 2013). In almost every case, "raw" reflection data must be "cleaned up" and adjusted in some way prior to interpretation (Conyers 2013).

These data sets required the use of background removal, migration, range gaining and velocity analysis. Using the software GPR Viewer Plus, two-dimensional reflection profiles are created. The background removal removes extraneous horizontal reflections in profiles usually caused by high frequency noise such as cell phone usage, radios, televisions, etc, can exert radar energy and interfere with the GPR collection. Range gaining allows for an increase in visibility of subtle or low-amplitude reflections and makes for easier interpretation. The migration method removes and compresses point source hyperbolas to their sources. The migration method also assists in changing and finding the RDP value to adjust depths for velocity.

All three data sets involved the generation of amplitude slice-maps which are two-dimensional tools for viewing differences in reflected amplitudes across a given surface at various depths. These reflected radar amplitudes are of interest as they reflect the degree of physical and chemical differences in the buried materials (Conyers 2012). Strong, or high amplitude reflections often indicate dense buried materials, such as solid rock foundations or other historic features, such as coffins and caskets.

In the amplitude map method, wave strengths (as measured by amplitude values) are recorded as digital values and analyzed at each location in a grid where there is a reflection recorded (Conyers 2012). The amplitudes of all traces are then compared to the amplitudes of nearby traces along that profile and between adjacent transects. A map is then produced which shows amplitudes in map views as well as depth. The database can be "sliced" horizontally and displayed to show the variation in reflection amplitudes at a sequence of depths in the ground (Conyers 2012). Using a computer program known as *Surfer 9*, grid files were created and the data was interpolated using the minimum curvature method. From the original .dtz files (raw data), a series of image files were created from cross-references the amplitude slice maps that were produced.

The slicing of the data began with the reversal of the odd numbered profiles to compensate for the data collection technique and to insure that all collected profiles line up in the same direction. Since every other line is collected in the opposite direction, reversal is necessary prior to mapping the data. The next step requires the creation of .xyz files. This step creates a Cartesian coordinate grid into which the data are eventually incorporated (Conyers 2012). The final step is generating the amplitude slice maps. These amplitude slice maps are created in a program called *GPR Process* and are saved in ASCI text format (Conyers 2012). This is a three column text file containing X, Y, and amplitude value information. The Z coordinate for every point in a single file is the same, because each file represents a discrete depth unit (Conyers 2012). One text file is created for each grid at every depth that is slices. After slicing, the data are imported into *Surfer 9* where the areas between the regular grids of known values are statistically interpolated. Interpolation involves a number of techniques used to estimate an unknown value in a continuous dataset using the known values of nearby points (Conyers 2012). The primary assumption in continuous data sets is that points close together will be more similar than those farther apart. Following spatial interpolation, the data were rendered into horizontal slice maps depicting reflection intensity as a continuum of rainbow colors (ROYGBIV). The ROYGBIV scale begins with violet and white for low reflection amplitude and progress through the visual spectrum to red for very high intensities (Conyers 2012). In this case, white was used substituted for violet; therefore white represents the lowest reflection, or no reflection at all. The intensities depicted on these maps are relative to the data in each grid, the colors do not indicate specific intensities, but rather a relative span from low to high.

Background:

A typical casket below ground surface shows a hyperbolic reflection, much like the one seen in the figure below. The ability to see these reflections and for the radar waves to be able to detect a difference between the material of the casket and its surrounding material is dependent upon a multitude of factors. The older the casket, especially a wooden one, the more it begins to homogenize with the surrounding soil and sediments. This, therefore, decrease the definition of each casket detected by the radar waves. Among factors effecting data collection is ground moisture. Dry sand is loose and is therefore surrounded by millions of air pockets. Air is free of objects that can slow the speed and shorten the depth of radar waves. Therefore, radar waves can travel extremely quickly and deeply in areas of dry sand. The opposite scenario features clay. Clay is a fine-grained soil. Most geological clay deposits are composed of phyllosilicate minerals containing variable amounts of water trapped in the mineral structure. Water occupies space and in combination with clay it becomes almost impermeable to radar waves.

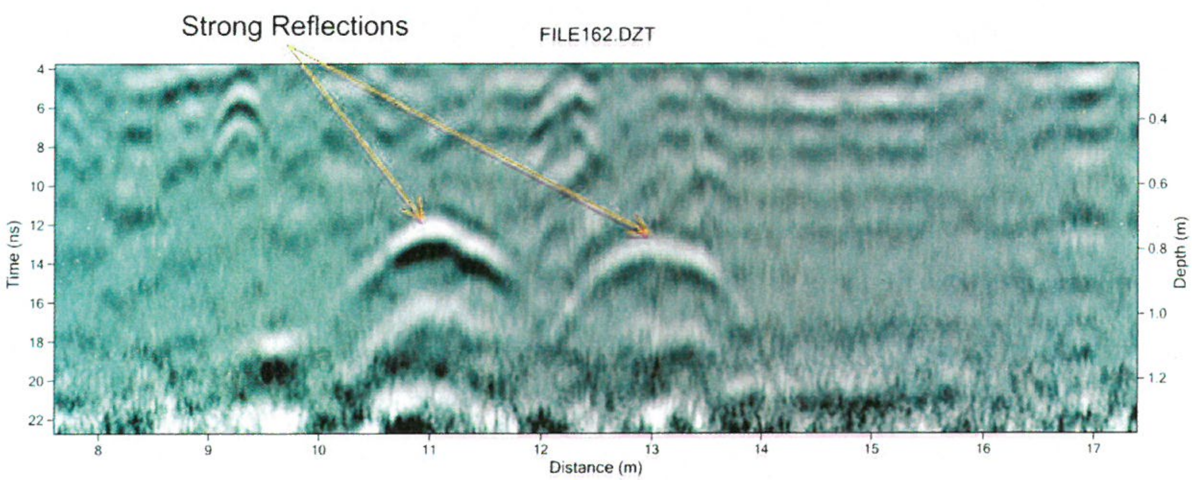

Figure 1: Average casket reflections

Results:

Due to the large amount of water deposit within the soil, the radar was unable to greatly detect smaller difference between soil layers. Since it is unknown whether these men were buried in a casket (wood or otherwise), coffin, wrapped in a blanket, or simply placed into the ground, the radar was unable to verify their location. All profiles showed to be like the one featured below in figure 2. The dense areas of black and white lines show an increase in water saturation and therefore a decrease in clarity and definition of soil layers and possible features within these soil layers.

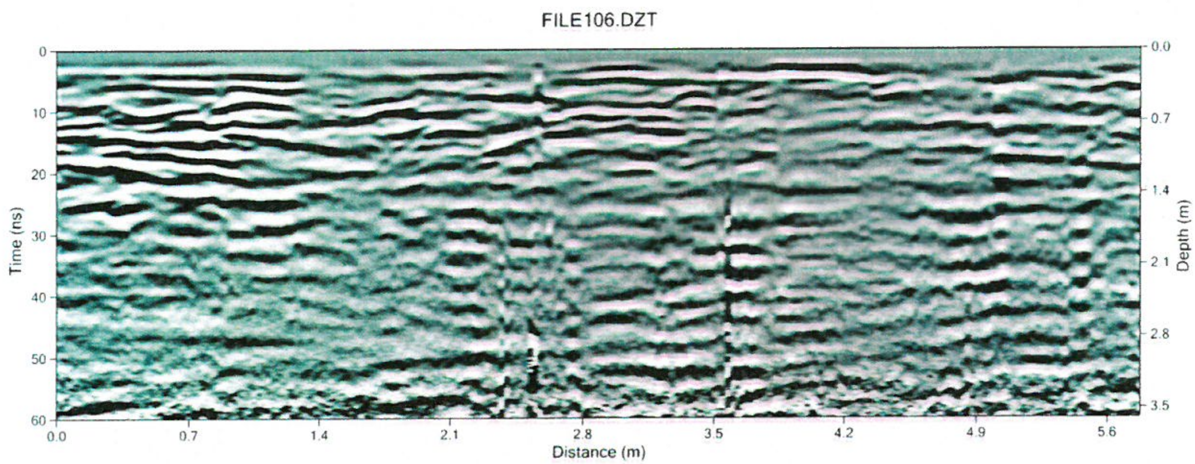

Figure 2: Data collected within Grid 1