Appendix D

White Paper Regarding Noisy Area

Assessment, Data Processing and Remedy for "Noisy Area" Grids Within MRS-16, Former Ft Ord

During the DGM of MRS 16 we noticed a stretch of noisy data that runs East West parallel to Parker Flats Rd.. It is constrained to the northern portion of the site just north of the ridge that runs East West. This affects several grids. We have not surveyed the northernmost grids. However, a large portion of that area has trees. There are no visible power lines or anything that looks like it could cause interference.

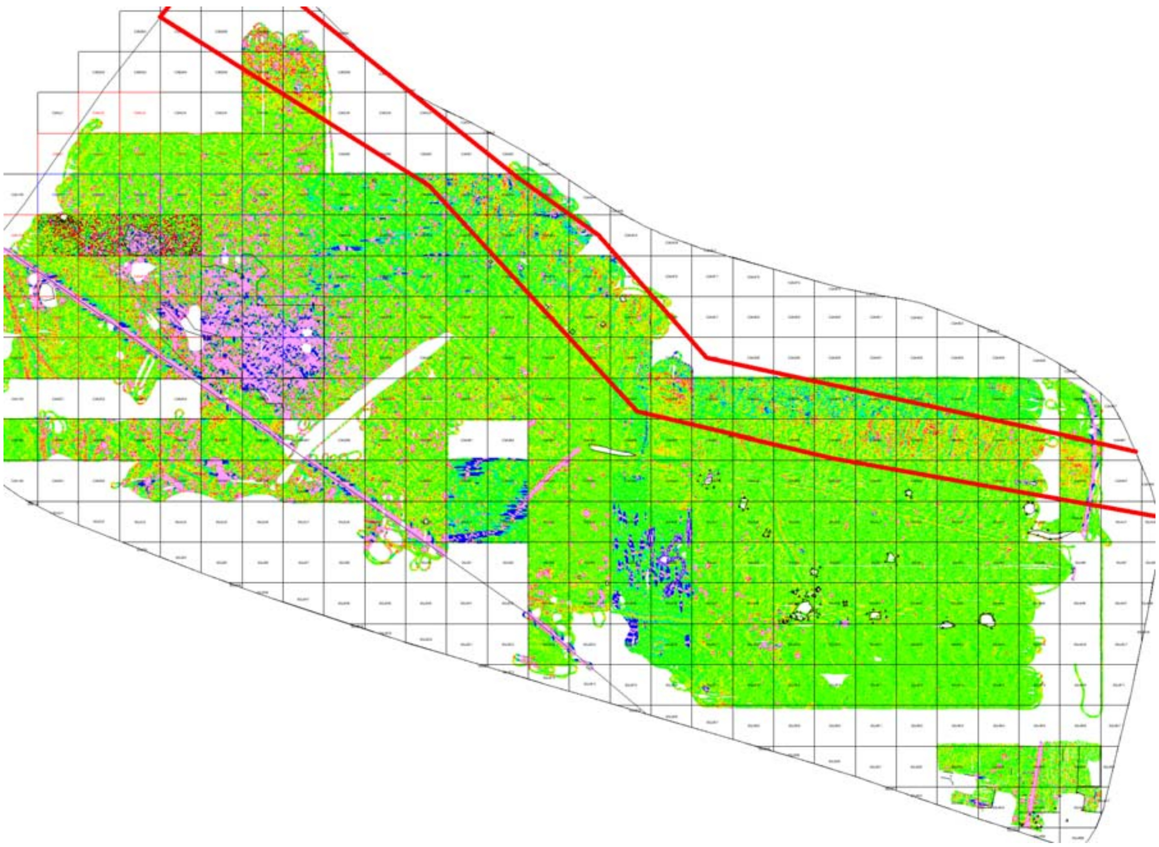

Figure 1. Outline of noisy area present in the data we've obtained to date.

- □ At first we believed it to be an equipment issue. Therefore we decided to resurvey one of the noisy areas. The resulting data showed the same pattern in the data. Because of this and because it is localized, it was determined that outside factors are causing the higher readings.

- □ We also tested a single unit in gridblock C3A3A6. We noticed the high background when we were reacquiring targets in grid C3A3C6 and had a hard time nulling the EM61 because the background was changing so rapidly. We only reacquired the first 9 targets and they were all false positives. At this point we decided to survey a few lines to demonstrate the background issue. The results of the survey were the same and showed EM61 readings increasing as you go north on C6.

- We ran a static test inside the noisy area. We set an EM61 within the noisy area and let it run for a couple of hours in the morning and a couple of hours in the afternoon. The purpose was to determine if there is any outside interference. There was no spiking (or unusual readings) evident in the data, however the drift was high for channels' one and two.

- Because the background is higher in these areas, we tried leveling the data using different parameters within Geosoft's UX-Drift correction. Basically, we accounted for the higher readings by including a larger percentage of high readings for the average background. This helped dramatically. However, there are still signals that are probably false targets. We've tested this on gridblock C3A3A6. The first 9 in C6 (done previously and mentioned above) that were false positives and our changing the leveling eliminated 6 of these. With this and careful target picking we believe we can eliminate most of the bad targets.

Below is a profile showing the differences in background we are referring to.

Looking at the raw and leveled data for gridblock C3A3A6 (which contains grids C3A3A6, C3A3B6, and C3A3C6) you can see the changes in EM61 readings. The profile in figure 2 is from a towed array survey traversing grids C3A3A6, C3A3B6, and C3A3C6. C6 is in the 'noisy area' and each of the peaks in the data below is within C6 (it was traversed back and forth several times). There is both an increase in long wavelength readings and short wavelength readings (of which we are interested). There is a sharp drop in C6 at the last 4 peaks (marked with M) and that is due to a mound in the grid. During reacquisition Chuck noticed that the background jumped from 20mV to 0mV on channel 1 on top of the mound. This is evidenced in the data below. Note that this general pattern exists in all grids that cross over into the 'noisy area'. This "Effect" affects about 20 to 30 grids.

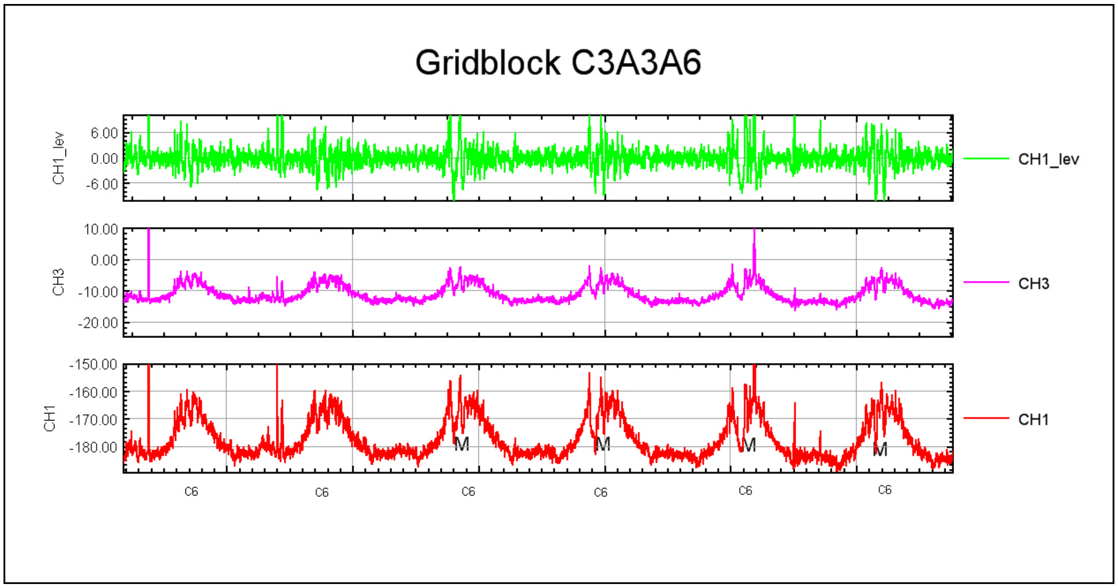

Figure 2. Profile going North-South in Gridblock C3A3A6. The higher readings occur inside grid C3A3C6. C6 = inside noisy area in grid C3A3C6. M = Mound.

Processing and Testing

Shaw conducted a comparison in processing routines for Grid C3A3C6 (noisy grid). Channel 3 was the least affected channel on the EM 61 Mk2 data (Figure 2). Therefore, we processed the channel 3 data with the improved fore-mentioned leveling routine and processed the channel 3 data very similar to the Parsons approach. We chose to do this because our "normal" processing routines for the MRS 16 data generated too many false positives. It was thought that using channel 3 data (least affected by the noise and background phenomena) would generate less false positives. Shaw also reprocessed the same grid using Sum 4 data and the improved leveling routine. As it turns out both methods generated approximately the same number of "false positives". The Channel 3 processed data actually exhibited more false positives because we had to lower the threshold value to gain maximum detection.

It should be noted that there is a low false positive percentage across MRS-16 outside of the noisy area (approximately 8 percent).

Field Testing

Shaw conducted reacquisition of the anomalies from both processing methods in Grid C3A3C6. Most of these anomalies were false positives (Sum 4) as they did not register an EM 61 reacquisition value above background. In general 27 anomalies were generated. 16 of them had reacquisition values well below 14 mV (Sum 4 values of 0 to 8 mV). These were all excavated to a depth of 2 feet and nothing was found. Therefore, these anomalies were obviously caused by external noise. Ten anomalies were reacquired very close to the 14 mV threshold value. These anomalies were excavated and most of the anomalies were characterized by rusty soil or soil that had some small mV response. However, only one anomaly exhibited a small metal object (small piece of fence). One anomaly was reacquired at a 60 mV value and some range related debris (frag) was excavated. No other anomalies existed. It should be noted that the original value of all anomalies within this grid ranged from 15 to 401 mV. Therefore due to this testing process it is assumed the anomalies are generated by external noise of some kind.

Remedy Derived from Test Data

Since processing will not totally solve the problem (data is improved with different leveling scheme in the "noisy area"), Shaw suggests that the problem can be minimized by a reacquisition approach. Any anomaly with a reacquisition value significantly less than 14 mV will not be excavated. As referenced above, anomalies from 0 to 8 mV yielded no source. Therefore, any anomaly that is reacquired at 8 mV or less will not be excavated. Ten percent of the anomalies that are reacquired from 8 to 11 mV will be excavated. Although none of the anomalies in this range during the field testing yielded sources, they will be considered QC excavations. For a conservative approach, all anomalies above 11 mV will be excavated. This approach would cut down on the time and money spent with anomalies caused by external noise. It would also be somewhat consistent with the processing and other logistics used over the remainder of the site and would be a conservative safe approach to the situation.