



*File  
B00015*  
**C&S Companies**  
499 Col. Eileen Collins Blvd.  
Syracuse, NY 13212  
p: (315) 455-2000  
f: (315) 455-9667  
www.cscos.com

February 28, 2008

Gregg A. Townsend, P.E.  
Regional Hazardous Waste Remediation Engineer  
New York State Department of Environmental Conservation  
615 Erie Blvd. West  
Syracuse, New York 13204-2400



**Re: Maider Road Brownfield Site  
NYSDEC Site No. B-00015-7  
Geophysical Investigation**

Dear Mr. Townsend:

On behalf of the Town of Clay, NY, attached is the Geophysical Investigation Report for the East Study Area at the Maider Road Brownfield Site (NYSDEC Site No. B-00015-7). The geophysical investigation followed the procedures outlined in our August 24, 2007 geophysical investigation work plan. As you requested in your September 12, 2007 letter, additional investigation and sampling in the East Study Area will be proposed by C&S following a meeting with the Department in which the results of the geophysical survey can be discussed.

***Site Reconnaissance***

Prior to the mobilization of the geophysical investigator, representatives of the Department and C&S walked the East Study Area with the geophysical investigator to determine a practical way to establish lines to be followed with the geophysical investigation equipment. Subsequent to that, C&S personnel cleared and marked paths along lines nominally spaced at twenty foot intervals. To facilitate the clearing, C&S hired a utilities clearing company for one day of work with an eight-foot wide brush hog to provide access corridors through the center of the property.

***Geophysical Investigation Report***

The geophysical investigation was conducted by Geomatrix of Amherst, New York. The attached report from Geomatrix includes terrain conductivity and inphase response mapping generated from the EM-31 data and indicates the locations of magnetic anomalies and general interpretation of data.

Gregg A. Townsend, P.E.  
February 28, 2008  
Page 2

Page 4 of the Geophysical Investigation Report discusses the seven locations where apparent magnetic anomalies were identified. We believe that each of these locations could be accessed with a rubber wheeled backhoe or with a track mounted drill rig. Given the uneven terrain, heavy vegetation, and potentially inundated surface conditions (particularly for locations A and B), it may be preferable to plan follow-up investigations for frozen winter conditions or to await drier conditions following the spring run-off.

Please contact me if there are any questions or comments and to arrange a meeting to discuss further activities.

C&S ENGINEERS, INC.

Sincerely,

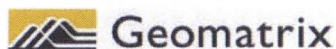


Thomas A. Barba  
Manager, Remediation & Compliance

TAB/rw

Copies:      Jim Rowley, Supervisor, Town of Clay  
                 Doug Wickman, Town Engineer  
                 Robert Germain, Esq., Town Attorney  
                 Naomi Bray, Town Council Member  
                 Rory Woodmansee, C&S  
                 Carl Ciupylo, NYSDEC  
                 Mary Jane Peachey, NYSDEC  
                 Mark VanValkenburg, NYSDOH

F:\Project\195 - TOWN OF CLAY\195705001 Maider Road Brownfield\SI and RAR\GeoPhysicalInvReport.doc



January 18, 2008

Wayne Randall  
C&S ENGINEERS, INC  
499 Col. Eileen Collins Blvd.  
Syracuse, NY 13212

Transmitted via email to: wayner@CSCOS.COM

Dear Mr. Randall:

Subject: Geophysical Survey Results at Maider Road Brownfield Site, Town of Clay, NY

## **1.0 INTRODUCTION**

This letter report presents the results of the geophysical investigation performed for C&S ENGINEERS, INC (C&S) in support of their environmental investigation of a brownfield property located on Maider Rd in the Town of Clay, NY (the Site).

The geophysical investigation was designed to geophysically characterize the subsurface and focus a follow-up intrusive investigation. The information provided herein is intended to assist C&S with their assessment of potential environmental concerns at the Site. The specific objective of the investigation was to provide a general geophysical characterization of the site. Geomatrix Consultants, Inc. (Geomatrix) performed data acquisition between November 27 and December 15, 2007. Geomatrix used frequency domain geophysical techniques to characterize the property.

The survey area is approximately 57 acres in size and is heavily vegetated with wetlands, woods and brush. Snow was present during data acquisition however most of the foliage had already fallen.

## **METHODOLOGY**

The following sections present the geophysical methodology utilized for this investigation.

### **2.1 Reference Grid**

The EM31 survey utilized a differential GPS system and the line spacing was approximately 20 ft. A reference grid was installed by C&S personnel to facilitate data acquisition and the



subsequent reoccupation of measurement locations during their potential follow-up intrusive activities. Multicolored pin flags and ribbon tape were placed at a nominal 20 ft spacing.

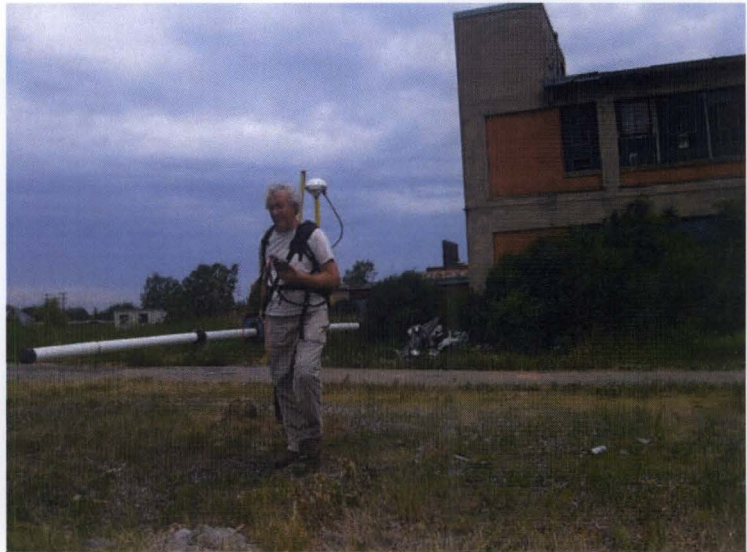
## 2.2 Electromagnetic EM31 Survey Methodology

A Geonics EM31 Terrain Conductivity meter was used to measure and record the quadrature component (ground conductivity) and the inphase component of the EM field along the survey lines. The quadrature component of the EM field is a measurement of the apparent ground conductivity. The inphase component of the EM field is sensitive to metallic objects. Comparison of the quadrature component of the EM field data (expressed in units of milliSiemens per meter (mS/m)) and the inphase

component data (expressed in units of parts per thousand (ppt)) results in increased anomaly definition.

The character of the EM response, low or high, is partially dependent on the orientation of the buried target relative to the orientation of the EM31 device during data acquisition, and the survey direction. A buried metal pipe, for example, will exhibit a high valued response when the trend of the pipe is parallel to the survey direction. Alternatively, when a survey line crosses a buried metal pipe whose trend is perpendicular to the survey direction, it is characterized by a low response. Similarly, other complex buried metal anomalies are indicated by a coupling of a high and low response.

All readings were taken with the instrument oriented parallel to the direction of travel, in the vertical dipole mode and with the instrument at waist height. The depth of penetration with the instrument in this configuration is approximately 12 to 15 feet below ground surface. Data were collected and stored in a solid state memory data logger during the survey. The data logger was interfaced to a portable computer and the data were transferred to a floppy disk for subsequent processing and interpretation. A survey base station was established on-site and was revisited throughout the survey to check for instrument drift and malfunction. No significant drift or malfunction was observed.



EM31 with GPS in use (photo not from this site)

The terrain conductivity and inphase data were initially edited and then plotted as profile lines for interpretation. Contour maps of the data were then constructed and utilized for final interpretation. The geophysical data are presented in final form as a series of color contour maps. The color maps allow for an illustration of detected anomalies that are associated with conductive materials such as buried metals, wastes, fill, utilities, and changes in soil texture and/or moisture content.

### **3.0 EM31 Results**

EM31 conductivity and inphase data for the site is shown in Figures 1 and 2. Figures 1a and 2a show the same data with the actual measurement points superimposed. Surface features that were observed during the data acquisition are noted on the figures.

Conductivity values at the site were observed to range from below 0 mS/m to over 20 mS/m. This variation in conductivity may be related to any one or combination of the following conditions:

- A change in soil/fill type. For example, the presence of conductive fill material will often be expressed as short wavelength (high frequency) anomalies. Also, an increase in relative clay content may increase the measured conductivity and variations in fill type will cause associated anomalies;
- A change in soil moisture. Moisture content would be expected to increase in areas of low topographic elevation as more saturated sediments lie within the depth of investigation of the EM instrument;
- A change in pore fluid specific conductance. For example, the presence of salt-impacted water within the pore space of the shallow soil will increase the measured conductivity primarily due to the presence of chloride ions; or
- Interference from surface metallic anthropogenic features such as powerlines, fences, pipes, reinforced concrete and other metallic structures.

The inphase data set shown in Figures 2 and 2a exhibits significantly less variation than the conductivity data. The inphase data has been presented to amplify potential significant anomalies and as a result, some "noise" is evident on the figures. Anomalies that are interpreted to be most significant are labeled (A through G on the figures) and discussed below. Most anomalies are observed on both the conductivity and inphase data sets however some are unique to one or the other.



The conductive anomaly (not labeled - large red/pink area on Figure 1) that runs parallel to Maider and Bennett Rds is possibly related to road salt impacted groundwater. The size of this anomaly appears to grow larger near the road intersections where one would expect more salting to occur. All other labeled anomalies are likely related to buried metals. Conductive anomalies that are large in aerial extent but small in relative amplitude are likely related to natural variations in soil type.

**Anomaly A** is a buried metal anomaly located north of observed surface metals ("SM" on the figures) and a discarded automotive tire. This area of the site had significant surface water and at the time of the survey was frozen.

**Anomaly B** is a buried metal anomaly located in the southern portion of the survey area immediately west of the rail line.

**Anomaly C** is a linear anomaly best observed on the inphase data set. An inphase high response is typical of data acquisition with the EM coils parallel to the trend of the linear feature. A downed electrical wire was observed north of this anomaly and it is possible the two are related.

**Anomaly D** is a linear anomaly located south of the concrete plant. This anomaly may be related to a buried utility.

**Anomalies E, F and G** are buried metal anomalies located in the vicinity of an old building foundation. While some surface metals were observed in this area, significant snow cover may have prevented us from noticing a surface metallic feature. These anomalies may be related to relic structures associated with the former building or other buried (or surface) metals.

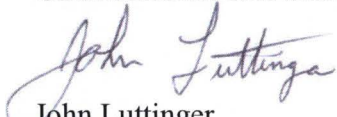
Wayne Randall  
C&S ENGINEERS, INC  
January 18, 2008  
Page 5

#### 4.0 LIMITATIONS

The geophysical methods used during this survey are established, indirect techniques for non-destructive subsurface reconnaissance exploration. As these instruments utilize indirect methods, they are subject to inherent limitations and ambiguities. Metallic surface features (electrical wires, scrap metal, etc.) preclude reliable non-invasive data/results beneath, and in the immediate vicinity of, the surface features. Targets such as buried drums, buried tanks, conduits, etc. are detectable only if they produce recognizable anomalies or patterns against the background geophysical data collected. As with any remote sensing technique, the anomalies identified during a geophysical survey should be further investigated by other techniques such as historical aerial photography, test pit excavation and/or test boring, if warranted.

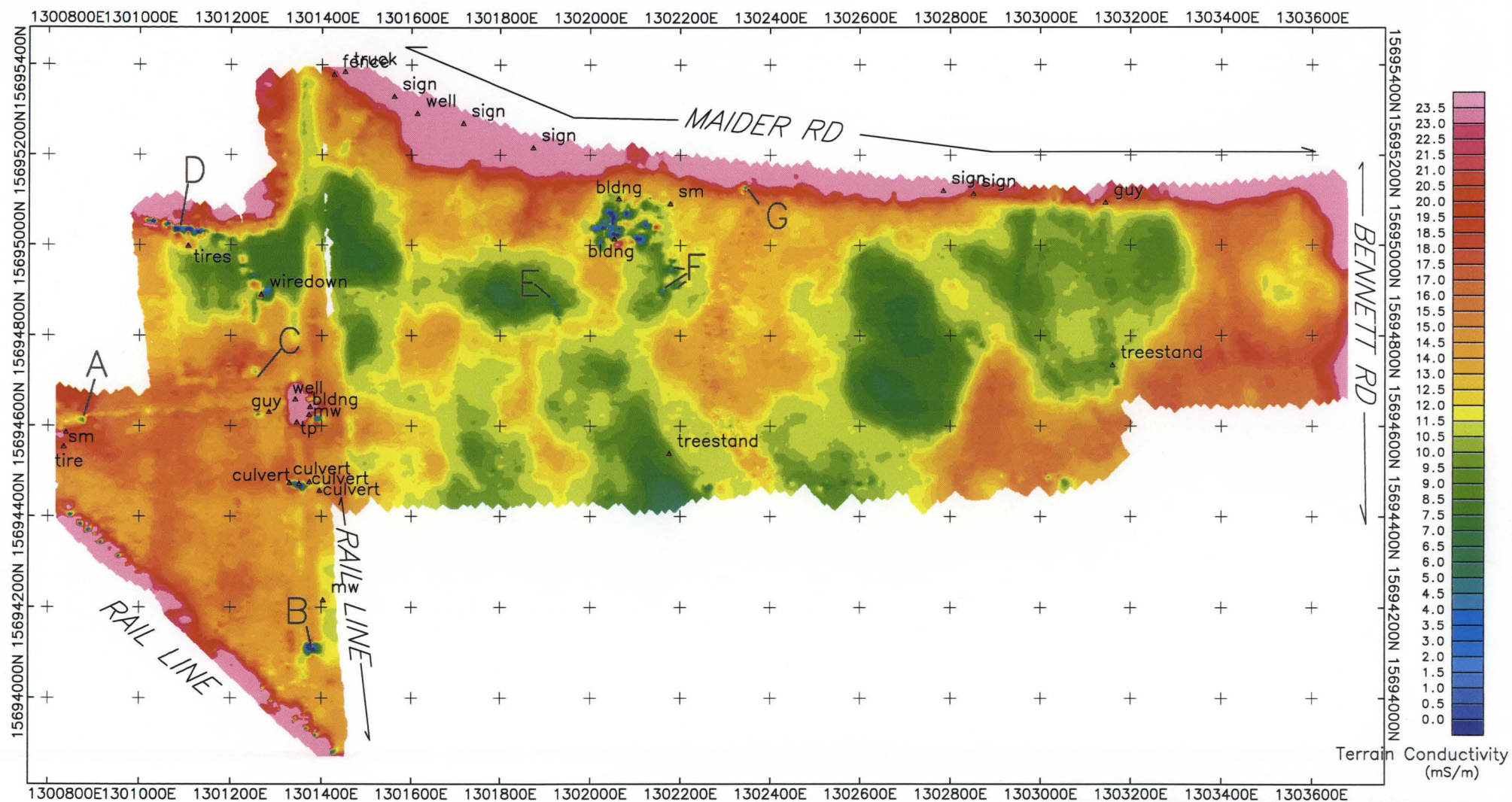
Please do not hesitate to contact us if you have any questions or require additional information.

Sincerely yours,  
GEOMATRIX CONSULTANTS, INC.



John Luttinger  
Senior Geophysicist





A Geophysical anomaly discussed in report



100 0 100 200 300 400 500  
(feet)

Figure 1

Geophysical Survey Results  
Color Contours of EM31 Data  
Terrain Conductivity (mS/m)

Maider Road Brownfield Site  
Town of Clay, NY  
C&S Engineers

Geomatrix (716) 565-0624







Geomatrix (716) 565-0624



