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CLIENT DRIVEN SOLUTIONS

APPENDIX B
Delta Geophysics Geophysical
Investigation Report

GEOPHYSICAL INVESTIGATION REPORT

SITE LOCATION

Suffolk County Fire Academy
Yaphank, New York 11980

PREPARED FOR:

P.W. Grosser Consulting, Inc.

630 Johnson Avenue, Suite 7
Bohemia, New York 11716

PREPARED BY:

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Delta Geophysics Inc.
738 Front Street
Catasauqua, PA18032

January 30, 2018

Delta Geophysics, Inc. (Delta) is pleased to provide the results of the geophysical survey conducted at the Suffolk County Fire Academy Yaphank, New York 11980.

1.0 INTRODUCTION

From January 17-30, 2018 Delta Geophysics personnel performed a limited geophysical investigation at the Suffolk County Fire Academy Yaphank, New York 11980. The area of interest included specific areas of the campus, outlined on the attached site map (D013018) in grey. During the time of the survey, subsurface conditions were unknown; surface conditions consisted of grass, concrete, asphalt, and gravel.

2.0 SCOPE OF WORK

The objective of this survey was to investigate the subsurface for anomalies consistent with underground storage tanks (USTs) and/or former excavations. A secondary objective was to locate and mark all underground utilities within the survey areas.

3.0 METHODOLOGY

Selection of survey equipment is dependent upon site conditions and project objectives. For this project the technician utilized the following equipment to survey the area of concern:

- Geophysical Survey Systems Inc. SIR-3000 cart-mounted Ground Penetrating Radar (GPR) unit with a 400 Mhz antenna.
- Radiodetection RD7000 precision utility locator.
- Fisher M-Scope TW-6 pipe and cable locator.

Ground penetrating radar (commonly called GPR) is a geophysical method that has been developed over the past thirty years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high frequency pulsed electromagnetic waves (generally 10 MHz to 1,000 MHz) to acquire subsurface information. Energy is propagated downward into the ground and is reflected back to the surface from boundaries at which there are electrical property contrasts. GPR is a method that is commonly used for environmental, engineering, archeological, and other shallow investigations.

The GSSI SIR-3000 GPR can accept a wide variety of antennas which provide various depths of penetration and levels of resolution. The 400 MHz antenna can achieve depths of penetration up to about 20 feet, but this depth may be greatly reduced due to site-specific conditions. Signal penetration decreases with increased soil conductivity. Conductive materials attenuate or absorb the GPR signal. As depth increases the return signal becomes weaker. Penetration is the greatest in unsaturated sands and fine gravels. Clayey, highly saline or saturated soils, areas covered by steel reinforced concrete, foundry slag, of other highly conductive materials significantly reduces GPR depth of penetration.

The 400MHz antenna was configured to transmit to a depth of approximately 10 feet below the subsurface (bgs).

The RD7000 precision utility locator uses radio emission to trace the location of metal bearing utilities. This radio emission can be active or passive. Active tracing requires the attachment of a

radio transmitter to the utility, passive tracing uses radio emissions that are present on the utility. Underground electrical utilities typically emit radio signals that this device can detect. RD7000 depth of penetration is between 15-17ft bgs.

The TW-6 is designed to find pipes, cables and other metallic objects such as underground storage tanks. One surveyor can carry both the transmitter and receiver together, making it ideally suited for exploration type searches of ferrous metal masses. Metal detectors of this type operate by generating a magnetic field at the transmitter which causes metallic objects in the subsurface to generate a secondary magnetic field. The induced secondary field is detected by the receiver, which generates an audible tone equal to the strength of the secondary field. Tw-6 depth of penetration was limited to 7-8ft bgs

4.0 SURVEY FINDINGS

All accessible areas within the designated survey areas were examined during this survey. The areas were surveyed with the TW-6 and GPR for potential anomalous features, and then surveyed with the RD7000 and GPR for potential subsurface utilities.

No anomalies of note were detected within the survey areas.

Utility Survey

The following utilities were detected during the survey: electric, gas, product lines, sanitary sewer, storm sewer, telecommunications, water, unknown utilities, and vent lines.

A site map (D013018) is included with all located subsurface features.

5.0 SURVEY LIMITATIONS

GPR transmit depth was configured to 10 feet below the subsurface. Radar reflections were noted at depths greater than 5 feet but were inconsistent within the survey areas, average depth of return signal was 5ft overall. No additional anomalies were detected at greater depths. The limiting factor was due to conductive soils. The TW-6 was not able to be utilized within close proximity to metallic fences, storage containers, trailers, buildings, reinforced concrete, and metallic surface structures on site. Storage containers, pallets, surface structures, fences, and parked cars limited accessibility throughout the survey areas. Heavy snow during the final day of the survey restricted the utility survey in the area adjacent to Building #1 and the two large field areas within the training area. Therefore, it is extremely likely that numerous subsurface utilities within and potentially connecting to surrounding survey areas are not located. This snow covering also reduced the effectiveness in mapping the subsurface utilities which were previously located due to a loss of visual confirmation.

6.0 WARRANTIES AND DISCLAIMER

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity to any anomalies indicated in this report. In addition, the absence of detected signatures does not preclude the possibility that targets may exist. To the extent the client desires more definitive conclusions than are warranted by the currently available facts; it is specifically Delta's intent that the conclusions stated herein will be intended as guidance.

This report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein

are based on the facts currently available within the limit or scope of work, budget and schedule. Delta represents that the services were performed in a manner consistent with currently accepted professional practices employed by geophysical/geological consultants under similar circumstances. No other representations to Client, express or implied, and no warranty or guarantee is included or intended in this agreement, or in any report, document, or otherwise.

This report was prepared pursuant to the contract Delta has with the Client. That contractual relationship included an exchange of information about the property that was unique and between Delta and its client and serves as the basis upon which this report was prepared. Because of the importance of the understandings between Delta and its client, reliance or any use of this report by anyone other than the Client, for whom it was prepared, is prohibited and therefore not foreseeable to Delta.

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LEGEND

- UTILITY VALVE COVER
- MANHOLE COVER
- UTILITY POLE
- LIGHT POLE
- STORM SEWER INLET
- FIRE HYDRANT
- TREE/SHRUB
- ELECTRIC
- GAS
- TELECOMMUNICATION
- STORM SEWER
- SANITARY SEWER
- WATER
- UNKNOWN UTILITY
- FENCE
- VENT LINE
- PRODUCT LINE
- RAILROAD TRACKS

NOTES:

This site plan was produced from data positioned by differential GPS measurments collected in the field. Due to the errors normally present in DGPS data, this document is not intended or represented to be of survey precision. Caution should be used in all field measurments based on this site plan.

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity of any anomalies indicated in this document The absence of detected signatures does not preclude the possibility that targets exist. The geophysical data and results presented in this site plan are based upon the application of scientific principles and professional judgements to certain facts with resultant subjective interpretations. Professional judgements expressed herein are based on the facts currently available within the limits of the existing data, scope of work, budget, and schedule.

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DATE	DESCRIPTION	REV.
	REVISIONS	

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Phone: (610) 231-73012

GEOPHYSICAL INVESTIGATION
SUFFOLK COUNTY FIRE ACADEMY YAPHANK, NEW YORK 11980

FOR

P.W. GROSSER CONSULTING, INC.

DRAWN BY DZM
CHECKED BY
DATE 01-30-18
SCALE 1" = 50'
DRAWING NO. 013018
SHEET NO. 1 OF 1
PROJECT NO.