



SubSurface Surveys

An Applied Geophysical Company

2075 Corte Del Nogal, Suite W

Carlsbad, California 92011

Office: 760-476-0492

Fax: 760-476-0493

GeoTek

Attn: Anna Scott

1548 N Maple St

Corona, California 92880

October 15th, 2021

Subject: Geophysical Survey
12080 Bellegrave Ave
Jurupa Valley, California

Project Number: 21-460

This report is to present the results of our geophysical survey carried over portions of property located at 12080 Bellegrave Avenue in Jurupa Valley, California (Figure 1), on October 11th, 2021. Purpose of the survey was to locate and identify, insofar as possible, a specific gas line that enters the property from the north and trends south.

A combination of electromagnetic induction (EM), magnetometry, and ground penetrating radar (GPR) were applied to the search. A utility locator with line tracing capabilities was also brought to the field and used where risers exist onto which a signal could be impressed and traced.

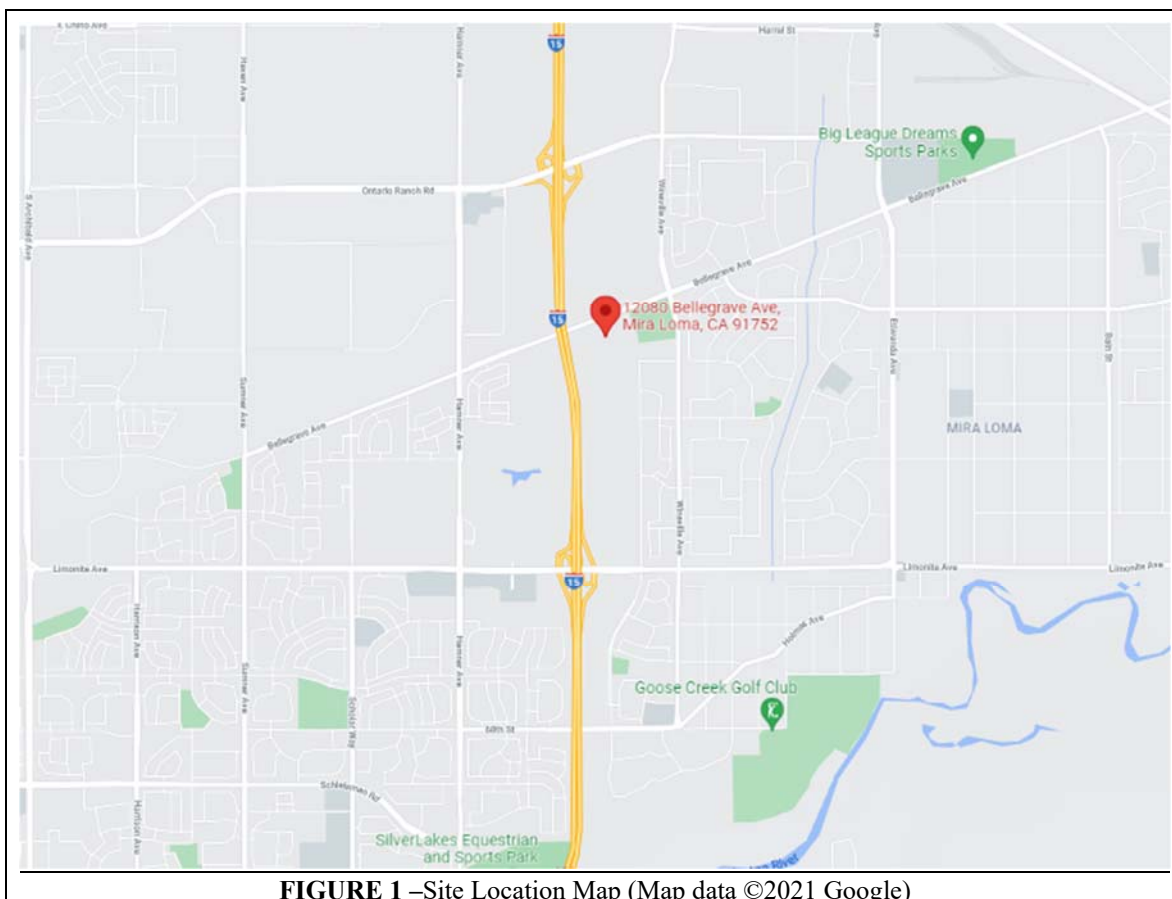


FIGURE 1 –Site Location Map (Map data ©2021 Google)

Survey Design – The gas line in question was located in the northeastern corner of the property and trends south toward the corn fields.

The line tracer, M-Scope and GPR were systematically traversed in many directions. Additional traverses were taken, access permitting, for detailing and confirmation where anomalous conditions were found. Multiple GPR profiles were also collected in more specific areas for confirmation where other instruments detected anomalies. The line tracer was also used to trace out the specific gas line in attempts to locate its location and orientation.

Hard copy of the EM data was not acquired, that is, discrete readings on the nodes of a grid were not recorded that could be put into a contoured map format. Rather, the instruments' meters were read continuously, and in real-time, during each traverse. This free-traversing method allowed for immediate detection of anomalous objects and facilitated the opportunity to investigate them further, without first having to download data in the office. The lack of hard copy for EM data sets does not degrade the quality of the survey in any way. Hard copy merely provides a basis for report documentation of these geophysical fields, if such documentation is needed.

A Fischer TW-6 M-Scope was used for the EM sampling. A Sensors & Software Noggin Ground Penetrating Radar unit with a 500 MHz antennas produced the radar images. A Metrotech 9890 and RIDGID SR-60 SeekTech utility locator rounded out the tools applied.

Brief Description of the Geophysical Methods Applied - The line locator is used to passively detect energized high voltage electric lines and electrical conduit (50-60 Hz), VLF signals (14-22 kHz), as well as to actively trace other utilities. Where risers are present, the utility locator transmitter can be connected directly to the object, and a signal (9.8-82 kHz) is sent traveling along the conductor, pipe, conduit, etc. In the absence of a riser, the transmitter can be used to impress an input signal on the utility by induction. In either case, the receiver unit is tuned to the input signal, and is used to actively trace the signal along the pipe's surface projection.

The GPR instrument beams energy into the ground from its transducer/antenna, in the form of electromagnetic waves. A portion of this energy is reflected back to the antenna at a boundary in the subsurface across which there is an electrical contrast. The instrument produces a continuous record of the reflected energy as the antenna is traversed across the ground surface. The greater the electrical contrast, the higher the amplitude of the returned energy. The radar wave travels at a velocity unique to the material properties of the ground being investigated, and when these velocities are known, the two-way travel times can be converted to depth. The depth of penetration and image resolution produced are a function of ground electrical conductivity and dielectric constant.

The M-Scope device energizes the ground by producing an alternating primary magnetic field with AC current in a transmitting coil. If conducting materials are within the area of influence of the primary field, AC eddy currents are induced to flow in the conductors. A receiving coil senses the secondary magnetic field produced by these eddy currents, and outputs the response to a meter in the form of ground conductivity values for the M-Scope. The strength of the secondary field is a function of the conductivity of the object, say a pipe, tank or cluster of drums, its size, and its depth and position relative to the instrument's two coils. Conductive objects, to a depth of approximately 7 feet for the M-Scope are sensed. The devices are also somewhat focused; that is, they are more sensitive to conductors below the instrument than they are to conductors off to the side.

Interpretation and Conclusions - The interpretation took place in real time as the survey progressed, and accordingly, the findings of our investigation were documented with a Google™ earth map (Figure 2).

The suspect gas line originated from a gas riser located in the northeastern corner of the property. After impressing a signal onto its tracer wire, the signal was found trending south approximately 2000 feet toward a compound structure that services the corn field ending at a second riser. The gas line was not detected going in any other direction beyond this point. It should be noted that a water line was detected within the same trench. This line does continue south towards the southern portions of the subject property. Please refer to the Site Interpretation Map (Figure 2) for a better representation of our findings.

Limitations and Further Recommendations - It should be understood that limitations inherent in geophysical instruments and/or surveying techniques exist at all sites, and nearly all sites exhibit conditions under which instruments might not perform optimally. Consequently, the detection of buried objects in all circumstances **cannot be guaranteed**. Such limitations are numerous and include, but are not limited to, rebar-reinforced ground cover, abrupt changes in ground cover type, above-ground obstacles preventing full traverses or traverses in one direction only, above-ground conductive objects interfering with instrument signal, nearby powerlines or EM transmitters, highly conductive background soil conditions, limiting GPR penetration, non-metallic targets, shallower or larger objects shielding deeper or smaller targets, tracing signal jumping from one line to another, and inaccessible risers, cleanouts, valve boxes, and manholes. If one or more geophysical instrument is rendered ineffective and cannot be utilized, the quality of the survey can be somewhat degraded.

For the above reasons, and in the interest of maximum safety, we encourage our clients to take advantage of Underground Service Alert (USA), Dig Alert, or other similar services, when possible. Furthermore, we recommend hand-auguring and the use of a drilling method known as air knifing and vacuum extraction, when feasible or if applicable to this project. These methods may significantly limit damage to underground pipes, conduits, and utilities that might not have been detectable during the course of this survey. Please bear in mind, that geophysical surveying is only one of several levels of protection that is available to our clients.

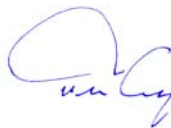
SubSurface Surveys may include maps in some reports. While they are an accurate general representation of the site and our findings, they are not of engineering quality (i.e., measured and mapped by a licensed land surveyor).

SubSurface Surveys and Associates makes no guarantee either expressed or implied regarding the accuracy of the findings and interpretations present. And, in no event will SubSurface Surveys and Associates be liable for any direct, indirect, special, incidental, or consequential damages resulting from interpretations and opinions presented herewith.

All data acquired in these surveys are in confidential file in this office, and are available for review by your staff, or by us at your request, at any time. We appreciate the opportunity to participate in this project. Please call, if there are questions.



Bret Herman
Staff Geophysicist



Travis Crosby, GP# 1044
California State Geophysics Registration GP1044
Senior Geophysicist, SubSurface Surveys



SITE:
12080 Bellegrave Ave
Jurupa Valley, California

TITLE:
Site Interpretation Map

DATE:
October 11th, 2021

PREPARED FOR:
GeoTek

SSS PROJECT NO:
21-460

LEGEND:



gas line



water line



gas riser



FIGURE 2