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| **Environmental Enlightenment #66** By Ami Adini - Reissued December 10, 2014   |  | | --- | | This is a SHORT, LIGHT and SIMPLE newsletter. Its purpose is to rekindle in the initiated terminology they have once learned, and enlighten the uninitiated on terms they may have heard but never known the meaning of. | | **Finding Buried Objects**  Real estate transactions happen in times to hinge on the potential presence of buried objects such as historical underground storage tanks, chemical storage drums, pipelines and others. In another line of activity, safety of construction projects depends on exact knowledge of buried objects in the planned excavation areas. Hitting an unknown, high pressure gas line can and has caused loss of lives.   |  |  | | --- | --- | | http://amiadini.com/NewsletterArchive/141210-NL66/ee-66-1.gif | We need tools to assist us in the exploration of buried objects, and such tools should be capable of doing the work without disturbing the surface.  The field of *geophysics*comes to our need.  *Geophysics*is a compounded word: *geo*plus *physics.*  *Geo*is *earth*in Greek, from *Gaia*, the mythological goddess personifying earth*. GAIA*was Mother Earth, an ancient primeval goddess who emerged at the creation of the universe, second only to *Khaos*(Air). She was depicted as a buxom, matronly woman, shown half risen from the earth, unable to completely separate herself from her element. |   *Physics*derives from Latin *physica*: natural science, from Greek *physika*: of nature.  *Physics*is the science that deals with matter and energy and their interactions. Physics includes such fields of mechanics, optics, heat, electricity, magnetism, atomic structure, and others. It is the study of how objects (from the very tiny to the very big) behave.  *Geophysics*is the study of the physical properties of the earth and the composition and movement of its component layers of rock.  Geophysics is applied to mining exploration to detect zones that could be characterized by physical properties such as magnetism, gravity or conductivity. It studies the physics of the Earth, using the physical principles underlying such phenomena as seismic waves, heat flow, gravity, and magnetism to investigate planetary properties. It is the study of the physical properties of rocks and minerals.  Assessment of contamination in the subsurface is done by advancing test holes to the desired depths and collecting samples of soil and/or groundwater. Drilling involves the inherent hazard of colliding with unknown buried objects such as gas lines, power lines, petroleum pipelines, fiber-optic arteries, water mains, underground storage tanks and connected gasoline lines. Such encounters involve great risks of explosions and attendant losses in life and property.  It is crucially important to identify buried utilities in areas of intended excavations. Tools are needed that will identify underground targets without actually intruding on the subsurface world.  Also, in the exploration for environmental liabilities in real estate transactions, it is not uncommon to find records of historic existence of underground tanks with no information on their ultimate fate: Have they been removed? Are they still there? Where?  We need a tool that, with minimal interference with the current conditions of the property will help us find buried objects.  The science of Geophysics has long used non-destructive methods to identify subsurface characteristics of underlying rocks, formations, minerals and groundwater. These tools are used today extensively to assist in our environmental needs for the exploration of subsurface features and buried objects.  In this and forthcoming articles we shall look at the features and uses of these tools.  In assembling the articles we relied on information gleaned from several sources on the World Wide Web. A major source has been a U.S. EPA publication. All information copied, to the best of our knowledge, has not been copyrighted. For lack of space, a general credit and gratitude is hereby expressed to all other sources without identifying any. They are easy to locate through key words in a good search engine. We are biased to Google and a hearty appreciation to the creators of this engine is hereby expressed.  Surface geophysical methods are generally non-intrusive and can be employed quickly to collect subsurface data.  http://amiadini.com/NewsletterArchive/141210-NL66/ee-66-3.gif  http://amiadini.com/NewsletterArchive/141210-NL66/ee-66-4.gif  http://amiadini.com/NewsletterArchive/141210-NL66/ee-66-5.gif  http://amiadini.com/NewsletterArchive/141210-NL66/ee-66-6.gif  Data collected with geophysical tools are often difficult to interpret because a given data set may not indicate specific subsurface conditions. Instead, data provided by these tools indicate anomalies which can often be caused by numerous features. As a result, geophysical methods are most effectively used in combination with other site information (*e.g.*, data from different geophysical methods, sampling and analytical tools, geological and historic records, anecdotal information). A combination of these sources is often necessary to resolve ambiguities in geophysical plots (*i.e.*, the graphical representation of data produced by a specific method).  The most appropriate geophysical methods for UST site investigations are:   * ground penetrating radar (GPR); * electromagnetic methods; * electrical resistivity; * metal detection; * seismic methods; and * magnetometry.   All geophysical methods have limitations that will affect their applicability at specific sites.  In the next articles we shall deal with each of these methods. | | You can find past issues of our "Environmental Enlightenment" at [amiadini.com](http://www.amiadini.com/)Wealth of information about environmental site assessments in the real estate transactions and issues concerning assessment and cleanup of contamination in the subsurface soil and groundwater. |  |  | | --- | | Call me if you have any questions. There are **no obligations.**  Ami Adini Environmental Services, Inc. Environmental Consultants & General Engineering Contractors California Lic. #1009513 A B HAZ ASB **818-824-8102**; [**mail@amiadini.com**](mailto:mail@amiadini.com) [www.amiadini.com](http://amiadini.com/)  Ami Adini is a veteran environmental practitioner with over 40 years of experience. He carries a Bachelor of Science degree (B.Sc.) in Mechanical Engineering including academic credits in Nuclear and Chemical Engineering and postgraduate education in these fields. His career includes design and construction of nuclear plant facilities, chemical processing plants and hazardous wastewater treatment systems. He is a former California Registered Environmental Assessor Levels I & II in the 1988-2012 registry that certified environmental professionals in the assessment and remediation of environmentally impacted land, and a Registered Environmental Professional (REP) since 1989 with the National Registry of Environmental Professionals (NREP). He is a California Business & Professions Code Qualifying Responsible Managing Officer (RMO) in the General Engineering Contractor classification with Hazardous Substance Removal and Asbestos certifications, and president of AMI ADINI ENVIRONMENTAL SERVICES, INC. (AAES), a general engineering contractor and consulting firm specializing in environmental site assessments, rehabilitation of contaminated sites and removal of environmental risks from real-estate transactions. (Contact Ami for a complete resume.) **AAES provides practical solutions to environmental concerns using the highest standards of ethics and integrity while providing its clients with maximum return on their investments.** | |