

news

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MTBE CLEANUP COSTS MAY TOP \$3 BILLION

Methyl tertiary-butyl ether (MTBE) is a fuel oxygenate that was first blended into gasoline in 1979 to replace lead and increase octane. Within the last 15 years, it has come to the attention of many that MTBE contamination is a serious environmental problem and is very expensive to remediate.

As reported in the June 16, 2005 issue of the NCPMA *Oil Argus*, ENSR International estimates that the cleanup costs for MTBE contamination will be between \$1 billion and \$3 billion. Others have suggested that the cost could be between \$29 billion and \$140 billion.

Why does it cost so much to remediate MTBE? First, MTBE has a high solubility compared to other compounds found in gasoline. When a release of gasoline occurs, as the product moves through the soil, a portion is retained on the soil, usually on organics found in the soil. If the volume is sufficient or if there is little separation between the leaking tank and the groundwater, the release will impact groundwater. MTBE has a low affinity to bind to organic matter

within the soil. Due to the high solubility of MTBE, once it reaches groundwater, it can dissolve into the water quickly. If the rate of dissolution is higher than the rate of biodegradation, the MTBE will migrate in the direction of groundwater flow. If the rate of groundwater flow is high, MTBE plumes may reach several hundred feet in length. If there are nearby pumping wells, the MTBE may be pulled deeper into the aquifer.

Thus, the physical properties of MTBE make it a difficult compound to assess. Once an assessment is complete and it is determined that the MTBE must be remediated, recovering and treating MTBE is often difficult due to the size of the plume and the difficulty in removing the compound from groundwater.

In June 2005, a bill was introduced to ban MTBE in North Carolina. Several other states have already banned its use. While there are some new technologies that show promise in remediating MTBE, they are still in the testing stage and are not inexpensive. For now, the most cost-effective solution is to make sure your tank is not leaking.

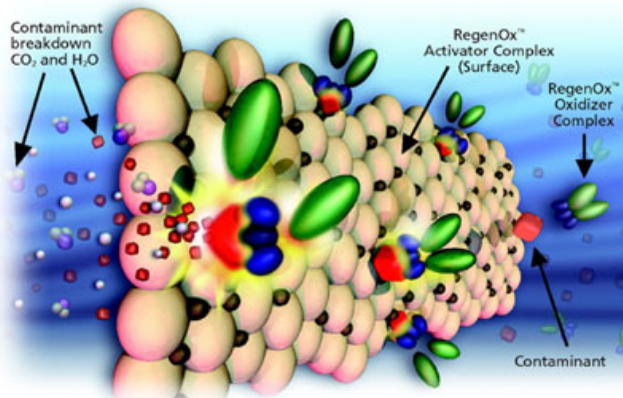


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CHEMICAL OXIDATION

Figure 1. RegenOx™ Surface-Mediated Oxidation



Chemical oxidation is a remedial technology that uses oxidants to destroy contaminants in soil and groundwater. The chemicals (oxidants) used can convert the contaminants into harmless compounds such as water and carbon dioxide. Many types of contaminants can be treated and include fuels, solvents, and pesticides.

In order to treat the contaminants, the oxidants are often injected into the soil or groundwater using a Geoprobe. In other cases, the oxidants can be injected into wells. The process can be a one time injection with or without follow-up, or circulation

through injection wells. The success of treatment depends a lot upon the level of assessment conducted prior to remediation. In order to successfully remediate a site, you must have a thorough understanding of the contaminants and site hydrogeology.

Before using chemical oxidation, there are some points to consider. First, the oxidation process can cause an exothermic reaction that generates enough heat to boil water. Second, liberated gases may need to be recovered and treated. Finally, oxidants are corrosive and can burn skin and damage certain materials.

Regenesis is a specialized manufacturer of various remedial compounds. Their RegenOx compound is an alkaline oxidant that produces effective remediation without a violent exothermic reaction. The adjacent drawing shows how the compound works to destroy contaminants.

TerraQuest can evaluate your site and determine if an innovative technology such as chemical oxidation is acceptable. Please contact us for further information.

GEOPROBE VISITS TERRAQUEST

Geoprobe recently stopped at TerraQuest to show us the new 6620DT unit along with many new equipment innovations. Geoprobe is the world leader in subsurface exploration equipment and they are constantly working to improve their products.

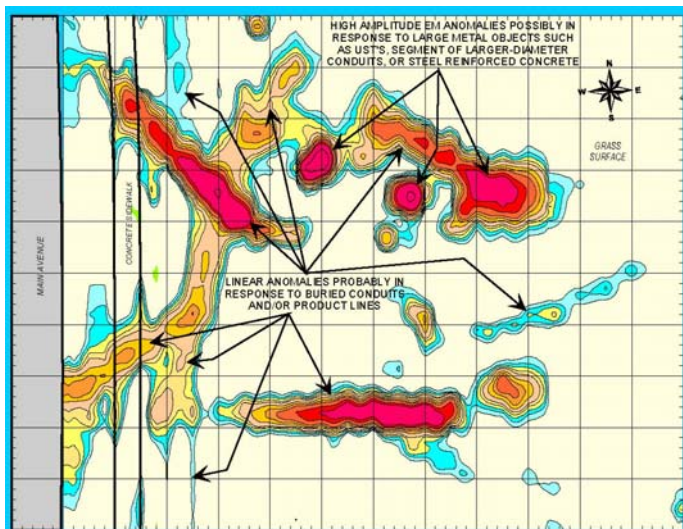
Some of the new products included light-weight rods, rod holders, and redesigned soil liner cutters. All of the innovations are geared toward increasing productivity while making the job easier. Geoprobe units and equipment are shipped all over the world.

TerraQuest has operated a 6610DT Geoprobe for two years. We have used many types of drilling equipment and the 6610DT unit is by far the best. Not only is it more versatile (see article page 4), but we provide the drilling expertise. Jonathan Grubbs and Nick Perry are NC licensed drillers. Jonathan is also a NC licensed geologist. Nick has approximately 5 years of environmental experience that includes well installation, soil

sampling, remediation system maintenance, and report preparation. Having experienced personnel conducting the drilling has increased our efficiency by allowing us to have better quality control over the drilling process and make rapid field changes.



GEOPHYSICAL INVESTIGATIONS



Geophysical investigations are routinely conducted by the NC Department of Transportation to identify underground utilities or tanks. In most cases, geophysical scans are made at old or abandoned stations to determine if forgotten tanks remain at the site.

Geophysical scans can be as simple

as using metal detection equipment or as sophisticated as using ground penetrating radar (GPR). GPR can locate non-metallic anomalies such as fiberglass product lines and identify areas that have been disturbed, possibly indicating a former tank.

Proper identification of current and former utilities and tanks is critical in the assessment process. Aside from the obvious safety risks associated with drilling into an underground utility, product line, or tank, identification of unknown tanks and areas of concern are critical to the success of any remediation effort. Until the sources of contamination are identified, they cannot be

remediated. TerraQuest recently completed a geophysical investigation of a former bulk plant. Since the site had been cleared, the only records that remained of where tanks were formerly located were an aerial photo and a sketch map. While the aerial photo showed the position of above-ground tanks, the location of the underground tanks was uncertain based on the sketch map. The geophysical scan identified several areas that had been disturbed or had remaining underground lines. With the aid of this information, TerraQuest was better able to select soil and groundwater sampling locations instead of randomly installing points looking for the contaminants.

The cost for a full geophysical scan is approximately \$3,000. Due to the depth-to-water at this site, the cost of one monitoring well and one soil boring was approximately \$1,600. There is no doubt that the geophysical scan proved to be cost-efficient.

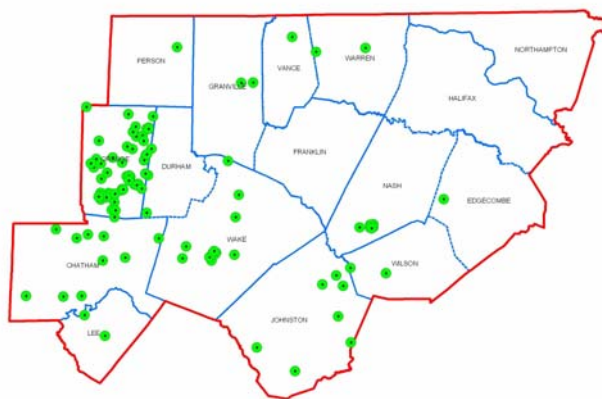
NC WELLS CONTAMINATED WITH ARSENIC

Recently, it has been reported in the news that NC has a growing problem with arsenic contamination in water supply wells. Consumption of water containing arsenic has been proven to increase the risk of certain types of cancer.

Many of the areas affected are located in the Carolina Slate Belt (CSB). The CSB is a geological belt of rocks crossing the central portion of the state. Some of the rocks contain high concentrations of metals such as arsenic and lead. A lot of the occurrences are near former gold mines. The adjacent map shows that Chatham and Orange Counties have a high occurrence of wells with arsenic problems. Some of the other scattered problem areas are probably associated with localized rock types or surficial sediments that contain arsenic.

The current drinking water standard set by the EPA for arsenic is 50 micrograms per liter (ug/l). The standard will be lowered to 10 ug/l in January 2006. North Carolina has set a health based standard of 0.02 ug/l. Thus, any detection of arsenic is too much and wells should be treated.

For some, the best alternative is to connect to the municipal water system. However, for many, a water system is not available and water treatment options should be consid-



ered. There are treatment options available which can be placed at the well head or under the sink. Some can be installed for less than \$500. For more information about whether you are in a high risk area or to have your water tested, please contact us.

TerraQuest Environmental Consultants, P.C. is a full service environmental consulting company providing assessment and remediation services to various industries. Our highly trained staff is OSHA certified and able to provide clients with high quality, cost competitive services. If you have any questions regarding our services, please contact us.

Specializing In:

- Phase I/Phase II audits
- Soil and Groundwater assessment and remediation
- Drilling and Geoprobeing
- UST removal and in-place abandonment
- Permitting
- Pilot testing
- Expert witness testimony
- Brownfields



WHERE CAN TERRAQUEST AND GEOPROBE GO?

Wherever they are needed. Geoprobos are used all over the world in various climates. They have been used in Alaska where temperatures reach -30°F and on barges in Louisiana to collect soil samples.

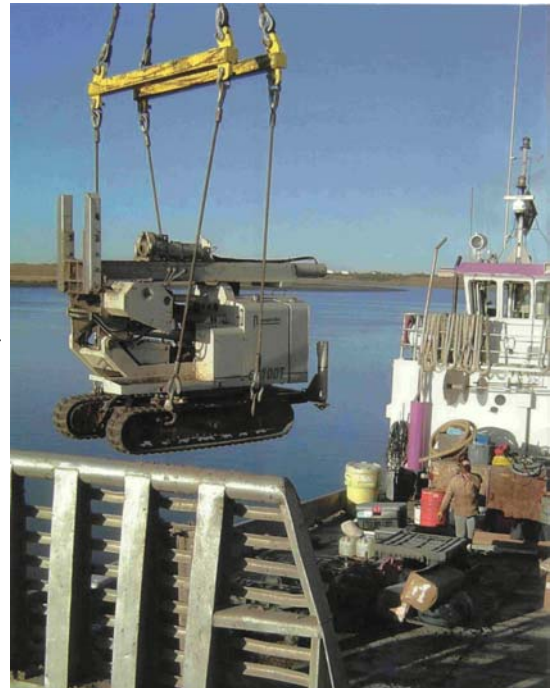
Not only are they versatile in a range of conditions, but they can get into places that conventional drilling rigs cannot. Many of the projects that we conduct require us to be very close to structures such as a residence, canopy, or in a narrow alley. We have even taken the Geoprobe inside a building and drilled through the floor. The small size of the unit allows us to get to these areas without any special clearing. The tracks have also allowed us to maneuver in steep terrain adjacent to a railroad where a conventional drill rig would have been stuck.

No matter where your site is, TerraQuest has a solution for

you. TerraQuest has NC licensed drillers, geologists, and a water pollution control operator. In addition, Michael Brown is also a licensed geologist in Virginia and Tennessee. Work can be conducted in South Carolina via reciprocity. Contact us about work in other states.

In addition to serving our regional clients, TerraQuest has begun serving several national environmental companies. We have assisted a Texas based company with geological consulting and drilled at a pumping station in Virginia. TerraQuest also recently conducted drilling for companies out of New

York, Massachusetts, and Missouri. Our experienced personnel have made our clients' jobs easier.



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