

NYC Department of Environmental Protection
 Bureau of Water & Sewer Operations, Environmental Health & Safety

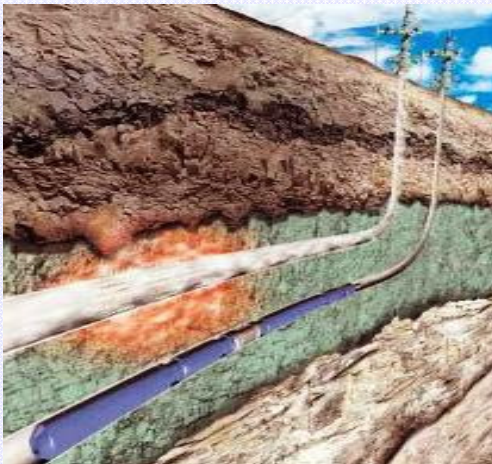
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Current Trends in Renewable Energy Development: What Does a Shift Away from Oil Dependency Mean for Our New York City Drinking Water System?

Hundreds of feet below Earth's surface, beyond our New York City (NYC) underground subway lines and water tunnels, lies a forthcoming source of clean and renewable energy called geothermal energy. Geothermal energy is continuously created beneath Earth's surface from extreme heat contained in liquid rock (magma), and depending on how it is utilized, can act as a heat source or a heat sink.

If water is present near this heat source, the geothermal energy creates hot water or steam, which can then simultaneously be piped to Earth's surface and be used to turn a steam turbine, thus generating electricity. Geothermal energy can also be obtained by piping water underground to extract heat

from hot dry rocks. Additionally, geothermal heat pumps can be used to cool buildings in the warmer months, particularly in an area like NYC where the core temperature, at the depth that wells are being drilled, is constant around 50 to 60 Degrees F. During the warmer months the heat pumps would force the warmer air found inside buildings back underground where the temperature is relatively cooler, rather than directing the air outside.



Continued on page 3

Steps to Ladder Safety

Since a significant number of worker injuries involve falls, it seems fitting to take a few moments to review important safety practices for the use of portable ladders. The **OSHA Standard** for portable ladders contains specific requirements designed to ensure worker safety on loads, angles, rungs, slipping and other requirements.

Loads: Self-supporting portable ladders (*which fold-out*) and non-self-supporting portable ladders (*which must be able to lean*) should support at least four times the maximum intended load. This excludes the extra-heavy-duty metal or plastic ladders that can sustain 3.3 times the maximum load. Additionally, all ladders come with a load rating posted on the side.

Angle: Non-self-supporting ladders, which must lean against a wall or other support, are to be positioned at such an angle that the horizontal distance from the top support to the foot of the ladder is about 1/4 the working length of the ladder.

Rungs: Ladder rungs, cleats, or steps must be parallel, level, and uniformly spaced when the ladder is in position for use. Rungs must be spaced between 10 and 14 inches apart. For extension trestle ladders, the spacing must be 8-18 inches for the base, and 6-12 inches on the extension section.



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Dear BWSO Readers:

In this issue of *The Conduit*, we present two articles featuring EHS challenges and approaches in other countries. One article (p. 4) about Jacqueline Hincapié's visit to a Canadian asbestos mine demonstrates that protective measures and regulations can vary widely depending on where one lives! The article on Bangladesh (p. 3) is an interesting case study on how inadequate regulations and short sighted environmental assessments helped to create a tragic public health outcome, even though intentions were good. Both articles reinforce that the United States has among the most protective regulations for both human health and the environment in the World. If you have article ideas for future issues, please contact us.

Sincerely,
 Persis D. Luke, EHS Director

**WIN A SUBWAY GIFT CARD!
 TAKE QUIZ ON PAGE 4**



BUREAU OF WATER & SEWER OPERATIONS
 ENVIRONMENTAL HEALTH & SAFETY DIVISION

Steps to Ladder Safety Continued from page 1

Slipping: Ladders are to be kept free of oil, grease, wet paint, and other slipping hazards. Wood ladders **must** not be coated with any opaque covering. Of course, this does not include the identification or warning labels on the side rail.

Other Requirements: Fold-out or step-ladders must have a metal spreader or locking device to hold the front and back sections of the ladder in an open position when in use. When two or more ladders are used to reach a work area, they must be offset with a landing or platform between the ladders. The area around the top and bottom of ladder must be kept clear. Ladders must not be tied or fastened together to provide longer sections, unless they are specifically designed for such use. Never use a ladder for any purpose other than the one for which it was designed.

All commercial ladders should have a load rating which is at least 3.3 (heavy duty plastic or metal) or 4 times (self-

supporting) the intended load for the ladder. The intended load includes the worker and his or her tools! Under no circumstances should more than one person be on a ladder. The load rating labels and other important safety information are contained in the affixed labels on the side of the ladder. It is a good practice to check to see if they are there, and familiarize yourself with them and any ladder that you use! **Any questions?** Please use the references below or contact your **EHS** specialist.

For additional information see:
29 CFR 1926 Subpart X, Ladders.
OSHA Standard.1926.1053
Ladders 1926.1053(a)



Can Your Cell Phone Harm You?

In recent times, there has been on-going debate about health and safety consequences resulting from the use of cell phones. We are pleased to inform you that all studies to-date have shown no correlation between cancer and cell phone usage in humans. Yet, we must keep in mind that the widespread use of cell phones is relatively recent. With 3 billion users worldwide, we should expect a lot more data on such effects in the near future.

Cell phones emit non-ionizing radiation waves of energy that are too weak to break chemical bonds or to set off the DNA damage known to cause cancer in humans. So far, there is no known biological mechanism to explain how non-ionizing radiation might affect our long term health. Non-ionizing radiation basically creates heat.

The specific absorption rate (SAR) of a cell phone is a measure of the quantity of radio frequency energy that is absorbed by the body. For a phone to pass Federal Communications Commission (FCC) certification, the phone's maximum SAR must be no more than 1.6 watts per kilogram (W/kg).

The table below lists a few FCC approved cell phones with the highest and lowest SAR's.

HIGHEST RADIATION PHONES		LOWEST RADIATION PHONES	
Model	SAR (W/kg)	Model	SAR (W/kg)
Motorola V195s	1.6	Motorola Razr V3x	0.14
Motorola W385	1.54	Samsung SGH-G800	0.23
BlackBerry Curve 8330	1.54	Samsung Soul	0.24
T-Mobile Shadow (HTC)	1.53	Nokia 7390	0.26

To check the SAR of your cell phone, visit: <http://www.fcc.gov/cgb/sar/>
& <http://reviews.cnet.com/cell-phone-radiation-levels/>

In publishing this list, we are not implying that cell phone use is or isn't harmful to your health, but it is important to note that cell phones can affect internal pacemakers. In short, the jury is still out, research is on-going, and results are continually being monitored. If you would like to take precautionary steps, it is

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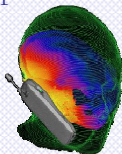
for achieving a high level of EH&S compliance and for their **OUTSTANDING PERFORMANCE***

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OEHSC EHS AUDITS

*Based on a comparison of their two most recent audits resulting in a 50% or more reduction of their total findings.

recommended to choose a cell phone with the lowest possible SAR.



What's So Important About Occupational Injury and Illness Recordkeeping?

Part 3 in a 3 Part Series on Injury Recordkeeping and Investigation

The EH&S Division collects and analyzes the Bureau's occupational injury and illness statistics.

The Bad News: Our average annual incidence rate of **7.87** recordable cases (per every 100 employees) is higher than the national average of **6.3**.

The Good News: BWSO EH&S has vastly improved injury and illness statistics from our 2007 rate of **14.7**. Although we are getting better at reducing injuries, there is always room for improvement. We must all remember that one injury is one too many!

A wide variety of injuries can occur on the job. Within BWSO, the majority of reported incidents include:

- Slips, trips, and falls (23% of all injuries);
- Back injuries and other sprains/strains (24% of all injuries); and
- Being struck or injured by equipment (28% of all injuries).

So, how can we prevent injuries?

The obvious answers are...

- Equip every work site with appropriate safety equipment, well-designed and properly maintained;
- Use equipment that is appropriate for the job task; and
- Wear your PPE to reduce your chances of being injured.

However, these precautions alone are not enough! Simply having the right equipment and PPE isn't going to prevent injuries.



Injury prevention is a **STATE OF MIND** and depends upon job-knowledge, awareness of one's surroundings, using equipment properly, recognizing or anticipating potential hazards, and adopting a safe-work consciousness. Targeted training, based on specific equipment and written work procedures, can also reduce chances for equipment-related injuries.

It's not difficult to take extra precautions to protect yourself. Simple rules to keep in mind that can help prevent occupational injuries include:

- Don't take chances or shortcuts;
- Know how to use hazardous materials and equipment;
- Take responsibility for your own safety;
- Be observant -- Identify potential hazards; and
- When in doubt, **ASK!**

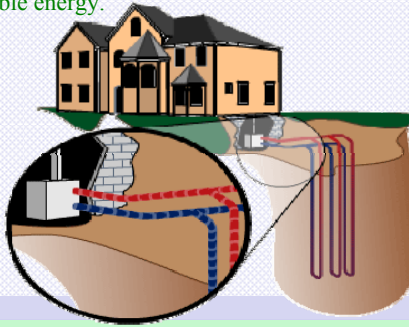
Current Trends in Renewable Energy Development: What Does a Shift Away from Oil Dependency Mean for the New York City Drinking Water System? Continued from Page 1

Sounds simple? Unfortunately the production of electricity from geothermal sources is not as easy as it sounds. According to the U.S. Environmental Protection Agency (EPA), while geothermal energy exists everywhere in the U.S., mining is complex if the energy is not located in close proximity to ground level. In addition to the great distance that must be covered in order to reach the heat source, NYC faces another significant obstacle - ensuring that our valuable water supply distribution system is preserved and protected from the deep drilling associated with geothermal wells.

Under current law, NYC and the DEP in particular, is responsible for protecting the NYC drinking water system, yet standard operating procedures for dealing with these new environmental compliance concerns regarding geothermal well drilling are still in development. Over the past two years, Edward Coleman, Director of BWSO Distribution Operations and Acting Director of BWSO Field Operations, has become aware of an increasing number of proposed geothermal well projects in NYC. "Under the current city and state regulatory structure, there are two mechanisms for us (DEP) to review proposed geothermal well installation projects - 1) If a proposed well is more than 500 feet in depth, then a permit must be obtained from the New York State Department of Environmental Conservation (DEC); and 2) If a proposed well is

to be installed on a NYC street or sidewalk, then a permit from the NYC Department of Transportation (DOT) must be obtained." Under both permitting processes, the DEP is informed of the proposed projects and provides feedback on the proposals. As development increases, a more formalized process is needed to ensure the water supply system is protected.

NYC has proposed an amendment to the current rule that would ban drilling within 200 feet of city water tunnels, conduits, and shafts and would impose drilling protocols and restrictions on areas just outside of the 200 feet "no drill zone." Once a law such as this proposed amendment is in place, the DEP will have the authority it needs to ensure that one of NYC's most valuable resources is no longer threatened. This will ensure the people of NYC are provided clean water, while expanding the potential to also have a source of clean, renewable energy.



Jumble



- _ _ _ _ _ OTMFCOR
- _ _ _ _ _ LACIDEM
- _ _ _ _ _ EUOSTRP
- _ _ _ _ _ GHTIL
- _ _ _ _ _ RWKO
- _ _ _ _ VOSINI

Hint: Protects employee from safety hazards in the office environment.

UPCOMING TRAINING
 1. Office Right-to-Know
 2. Traffic Work zone Safety
 3. Confined Space
 Questions? Contact Nelson Leon x5544 or e-mail at nleon@dep.nyc.gov

Bangladesh – A Nation’s Fight to Provide Clean Drinking Water

Millions of people in Bangladesh are victims of what the World Health Organization has declared the "largest mass poisoning of a population in history."

Bangladesh, a small country located in the southeastern region of Asia, is currently dealing with an unintended and unfolding crisis stemming from failed safe-water programs and practices. So far, water-related diseases are responsible for 24% of all deaths in the country. The water problem is so severe that scientists have said that it is "far more catastrophic than any other natural calamity throughout the world in recent times."

This water disaster began with a large number of people unknowingly consuming unsafe levels of arsenic contained in the country's drinking water supply.

What is arsenic?

Arsenic is a naturally-occurring, ubiquitous mineral found in sand, bedrock, and gravel. "It is a speedy killer in high doses, but a sluggish and fickle assailant in low ones." The poison is undetectable in its early stages, and usually requires 2 to 10 years or more to work its damage. It affects different people in different ways, and it may never affect some. Over-exposure causes skin lesions, cancer, and even death.

Where did the arsenic come from?

Bangladesh's surface water was used as the traditional source of drinking water and usually consumed untreated. However, due to numerous outbreaks of water-borne infectious diseases resulting from bacteria associated with poor sanitation, the water was deemed unusable. In an attempt to solve the nation's drinking water problem,



Bangladeshi's were urged to install hand pumped tube wells, which tapped into the plentiful supply of subterranean aquifers. Regrettably, no one ever tested the arsenic contaminated groundwater that was pumped through the tube wells. The water exposed 25-40 million people to high levels (up to 16 times the national limit) of arsenic.

The exact onset of arsenic contaminated groundwater exposure is suspected to have started sometime during the 1960's and 1970's, but it was not until the late 1980's that arsenic in the drinking water and arsenic skin lesions were first documented in the region. Although the reason arsenic is leaching from the sediments into the groundwater is not fully understood, numerous international, governmental and private collaborative efforts have been implemented to provide clean water for the people in the region. Hundreds of well-head arsenic removal units have been installed. Each of the removal units serves approximately 200-300 households, and contains activated alumina to remove the arsenic. There are also other approaches in arsenic removal that are currently being used in Bangladesh. For example, the Bangladeshi Government has implemented BioSand Water Filter technology, an effective and inexpensive system that can remove 98% of the arsenic present in the groundwater.

It is the hope of the Bangladesh Government that their nation will someday not have to worry about whether the water they are consuming is unsafe to drink.

For more information: <http://www.sos-arsenic.net/>

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Behind the Scenes of Canada's Black Lake Asbestos Mine:

A BWSO Occupational Health & Safety Specialist's Perspective

Jacqueline Hincapié is an ambitious and hardworking Occupational Health and Safety Specialist at the Bureau of Water and Sewer Operations. Recently, she toured the Black Lake Asbestos Mine located in the Thetford region of Quebec, Canada, an area east of Montreal, which tourist guides refer to as the "Region of Asbestos."

"During my visit, I closely observed the production of asbestos in the Black Lake Mine in order to better understand health and safety issues workers face in the mining industry," Ms. Hincapié reported back to her professors at Hunter College, where she is currently pursuing an M.S. in Environmental and Occupational Health Sciences.

The Black Lake Mine is approximately 1,200 feet deep and, when operating at full capacity, can produce 170,000 tons of asbestos annually. For those of you who are not familiar with asbestos, it is a fibrous rock-forming mineral occurring naturally in the environment, which can be characterized by its fibrous structure. There are three primary forms of asbestos - Chrysotile, Amosite, and Crocidolite. In Canada, Chrysotile is the only type of asbestos mined, and it is exported to approximately 60 countries for use in asbestos-cement construction products, sewer pipes, corrugated roofing, and building shingles.

Today, the Black Lake Mine is the only active asbestos mine in Canada; the last mine in an area once home to seven asbestos mines. "While on a bus tour along the surface of the Black Lake Mine, I witnessed how workers loosened asbestos deposits from surrounding rock by carefully drilling and blasting it with explosives," Ms. Hincapié reports. "Afterwards, the rocky debris was transported out of the mine and into the separation operation, where the material was crushed, screened and sent through various filters," she continued.

Once the asbestos is extracted from the rock, the remains become tailings (mine waste). The waste is piled around the cities of the Thetford region, which form large black mountains. EHS Directors from the mine claimed that the mountains "contain approximately .5% asbestos and pose no threat to the environment or to the health of local residents because a natural crust forms and prevents wind from picking anything up."

"Back in the packing operation, hundred of bags are filled with asbestos daily," Hincapié states. According to the Black Lake Mine EH&S Directors, "there is no need to wear a mask" during this phase because regular air monitoring results show asbestos fiber levels to be below Canadian regulatory standards. The Canadian exposure limits are not as stringent as those in the U.S., however, employees are required to wear adequate hearing protective equipment! "The Directors believe there is a greater risk of hearing damage than cancer or asbestosis," Hincapié says.

Hincapié left the Black Lake Mine and Thetford Region of Quebec with a newfound understanding of the asbestos mining industry and the way in which other countries address potential health and safety issues associated with asbestos mining. Looking back on her time at the Black Lake Mine, Hincapié was struck by "the difference in safety standards instituted by the Canadian government, in comparison to the United States." It also points to the indisputable fact that risk assessment is not an exact science and allowable practices differ between nations. She is thankful for the valuable experience and knowledge that she gained during her trip, and is looking forward to using this information throughout her career.

For more information about asbestos in the U.S. and applicable regulations visit:
<http://www.epa.gov/asbestos/>



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BE SURE TO INCLUDE YOUR FULL NAME AND WORK ADDRESS. FAX: (718) 595-5541 OR EMAIL: BWSOEHS_suggestions@dep.nyc.gov

- Which of the following statements is TRUE?
 - DEP policy prevents painting over surfaces containing lead-based paint.
 - Lung damage caused by asbestos is reversible.
 - DEP policy is to apply the NIOSH mercury vapor Threshold Limit Value (TLV) of 0.015 mg/m³ as both a ceiling limit that requires immediate action and as an 8 hour Time Weighted Average (TWA).
 - Asbestos is only a hazard when it is friable.
- Patients with high levels of lead in their bodies can suffer from _____.
 - Memory Loss
 - Mesothelioma
 - Skin Lesions
 - Deuteranopia (Color Blindness)
- Mercury is a problematic legacy contaminant, primarily because:
 - It may cause a blue discoloration of the skin on contact.
 - It has high tensile strength.
 - It can easily vaporize and become an airborne contaminant.
 - It may be carcinogenic in humans.
- _____ are mercury-containing items that can be found at DEP locations.
 - Caulkings and mastics
 - Brass fittings in well pumps
 - Fluorescent light bulbs
 - Cable coverings

Answers for August 2008 Newsletter Quiz: 1) C 2) D 3) A 4) C