The Conduit

Volume 3 Issue 1
February 2009

EHS NEWS FOR BWSO

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

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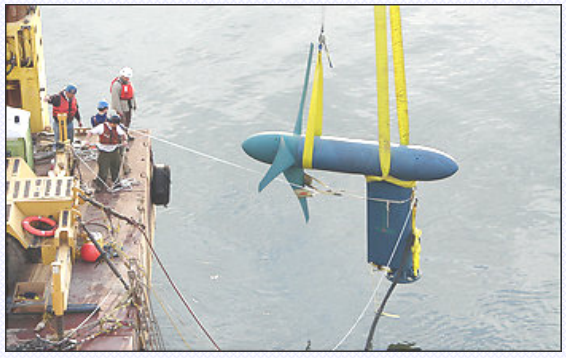
Turning Water Into Power!

A Supervisor from Queens South Sewer Maintenance sent us a question through the BWSO Employee Suggestion Program and we thought it deserved your full attention!

He Asked:
What is DEP Doing to Use Water as a Renewable Source of Power?
(For the complete question, please see page 2.)



In this 2006 photo, a Verdant Power turbine is lowered into the river off Roosevelt Island. (Associated Press)

Congratulations! Your suggestion has made front page news! Thank you for the great question. However, we had no idea what the answer was so we asked around and found out that DEP does have a Sustainability Initiative which is in line with Mayor Bloomberg's PlaNYC 2030. We interviewed Anthony J. Fiore, Director of Planning and Sustainability, Office of Strategic Projects (NYCDEP). Here is what we found out....

- **Hydroelectric:** DEP currently has 5 established hydroelectric turbines. Two are located inside conduits in the East Delaware and Neversink tunnel outlets. These turbines deliver energy back to the regional grid.

Important Note: The lease between the Water Board and the City excludes funds generated from use of the system for purposes not directly related to the supply and distribution of water to the consumer or the collection, treatment or disposal of sewage to be counted as revenue. As a result, revenues/savings go directly into the NYC general fund.

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Wintertime Indoor Air Quality

Low humidity, insufficient fresh air, static shock... These are all environmental conditions that frequently occur in indoor spaces during the cold winter months. Although there are many theories as to how these conditions affect overall air quality and public health, many of them are based on myth, rather than fact. Let's take a moment to debunk some of the common misconceptions about indoor air quality.

One of the Most Common Misconceptions: Cold Weather Causes Wintertime Illnesses

Although many believe that frigid temperatures and damp weather lead to common winter illnesses, the truth is that cold and flu germs cause illnesses, not drafts and cold temperatures. Keeping indoors during the winter months increases the chance of contact with germs (person-to-person/person-to-surface), while low humidity creates conditions in our sinuses that allow infections to take hold. To eliminate contact with cold and flu germs, make sure you wash your hands regularly with soap and water, especially during the winter.

"Fresh air and a properly functioning heating, ventilation, and air conditioning (HVAC) system will clean the air."

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In this issue:

Interested in
WATER PLANT OPERATOR
Continuing Education Credits?
See Page 2

YOU ASKED, WE ANSWERED!

BWSO Environmental Health and Safety (EHS) has received many thought-provoking questions through the BWSO Employee Suggestion Program, so we decided to dedicate this issue to answering some of your great questions!

Environmental Health & Safety
Bureau of Water & Sewer Operations

WIN A STARBUCKS GIFT CARD!
TAKE QUIZ ON PAGE 4

BUREAU OF WATER & SEWER OPERATIONS
ENVIRONMENTAL HEALTH & SAFETY DIVISION

Employee Disturbed About Dust

We have a lot of construction going on at our facility and it is really dusty. I am concerned about the amount of dust I breathe in everyday. Is the dust bad for me? – BWSO Employee

Depending on the circumstances, the answer to your question can be either yes or no. Construction dust may pose health risks. In order to address your concerns, we must answer the following:

1. Can we control the dust using engineering controls?
2. Does the dust contain any harmful substances?
3. Is the dust extensive or present in harmful concentrations?
4. Is the particle size deemed hazardous to my health?

In situations where the makeup of disturbed materials are unknown, an EH&S professional may conduct a risk assessment. A risk assessment normally involves sampling the substrates and/or air and having the samples analyzed. In order to determine harmful effects of dust, it is important to know the particle size. Dust generated from trucks riding over dirt poses minimal risk because the vast majority of particles are over 10 microns in size – too big to travel into the lung. However, if the environment is extremely dusty, it might exceed regulatory levels for nuisance dusts, something that can be determined by an EHS specialist. In situations where hazardous materials are suspected (e.g. silica, asbestos), lab results of air samples are compared to particulate concentrations deemed hazardous by scientific bodies and regulatory agencies (e.g. NIOSH, ACGIH or OSHA).

Construction workers who are involved in extensive concrete cutting are at the greatest risk for dust-induced respiratory disorders. If you work in areas subject to construction dust, you should be aware, especially if you have a pre-existing respiratory condition. Prolonged exposure to elevated concentrations of nuisance dust can aggravate existing respiratory conditions such as asthma, bronchitis, chronic obstructive pulmonary disorder (COPD), and even cause silicosis (lung damage).

The key to preventing exposure to dust is to keep the dust from being dispersed and airborne. Use water to dampen the dust at all times, reduce vehicle speed, and reduce traffic on site. For extremely dusty work operations, erect adequate containment. If dust is an inevitable problem during work activities, wearing a dust mask is recommended. If you choose to wear a dust mask, you must sign Attachment D of the Respiratory Protection Policy.

Finally, regardless of concentration, any type of dust may aggravate a person's sensitivity and allergies.

Sincerely,
Fred Chyke-Okpuzor, Manager, Health & Safety

Employee Concerned About Reusing Plastic Water Bottles

Not only do I work to supply clean water, but I also drink a great deal of NYC water during the day. I usually refill my used Poland Spring water bottles. Is this safe to do? Also, for how long can a bottle be reused? – BWSO Employee

Plastics, by nature, are extremely sanitary materials, and plastic bottles are no more likely to harbor bacteria than other kinds of packaging or drinking containers. Bacteria, particularly the ones found in saliva, thrive in warm, moist environments where they rapidly multiply. Once bacteria have been introduced, virtually any drinking container (coffee mugs, drinking glasses, serving pitchers, etc.) can become a suitable environment for bacterial growth and cause the common cold, flu or diarrhea.

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He Asked: What is DEP Doing to Use Water as a Renewable Source of Power?

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Has the Department ever considered having a plan of using our own flows from upstate reservoirs, large trunk sewers, etc...to generate power back to the grid, cutting our energy bills? What about tidal flow energy? What about methane gases from treatment plants?
– Queens S. Sewer Maintenance Supervisor

There are three additional hydroelectric turbines upstate. Ashokan and Kensico are operated by the New York Power Authority (NYPA), and a third operates in Sullivan County. Anthony Fiore reports that DEP is "in the early stages of exploring the feasibility of developing hydroelectric generation at some of our upstate dams." The dams under consideration are Pepacton, Cannonsville, Neversink, and Schoharie. DEP has submitted a preliminary permit application to the Federal Energy Regulatory Committee (FERC).

Also under study is the Croton Reservoir, but this would have to be measured in relation to water demands of new in-City projects (e.g. Croton Filtration Plant).

- **What About Tidal Power Projects?** Although tidal energy is outside DEP's jurisdiction, there are public-private partnerships that are exploring the viability in NYC. Verdant Power is piloting a tidal power project in the East River. Turbines power two buildings on Roosevelt Island and are unique because they capitalize on tidal energy in both directions! The initial turbine installation in 2006 failed because the material used in the blades was not adequate enough to handle the tidal forces. The turbines were re-installed using new aluminum alloy turbine rotors. Since 2006, the project has been feeding electricity to a local Gristede's supermarket. When fully completed the project will generate enough power for up to 10,000 New York homes (Source: Washington Post, September 20, 2008).

- **Methane Gas:** Also referred to as Anaerobic Digester Gas or "ADG", methane gas has been used by DEP's Waste Water Treatment Plants (WWTPs) for beneficial use ever since their inception in the early 1900s. In the 1970s and 1980s, this practice fell out of favor because electricity became so cheap. With growing awareness of the implications of unrestricted greenhouse gas emissions with respect to climate change, DEP is upgrading plants to prevent uncontrolled venting of ADG and putting it to beneficial use – powering boilers, selling it back to the natural gas grid, and fueling electric generation and cogeneration equipment (engines, fuel cells and microturbines). Three plants already have co-generation capacity and four WWTPs have fuel cells installed (operated by NYPA) which can produce 1.6 megawatts of electricity and offset as much as 1,233 tons of CO_2 per year!

We have enjoyed researching this topic and hope that you have learned as much as we did. It's important to remember that DEP's primary mission is to supply water and waste waster treatment services to millions of people, but the Department is poised to study and help develop energy efficiency projects that are feasible, and in the best interest of all involved stakeholders. Based on what we have learned here, it stands to say that DEP is moving in the right direction to create renewable energy opportunities and to uphold our inherent charge of environmental sustainability.

Sincerely,
Persis D. Luke, Director, Environmental Health & Safety

UPCOMING TRAINING: February – April 2009

1. Respiratory Protection	3. Chainsaw Safety
2. *Water Plant Operator CEU Course;* Watershed Protection	4. Traffic Work Zone Safety
	5. Excavation Competent Person

Questions? Contact Nelson Leon x5544 or E-mail at nleon@dep.nyc.gov

Working in Extreme Cold

"Wearing warm clothing with insulating layers is the best way to reduce the effect of cold stress on your body."

- EHS Specialist, BWSO

Individuals who spend much of their work shifts in very cold environments may be affected by cold stress. This condition can lead to injuries such as frostbite and trench foot, as well as systemic illnesses such as hypothermia. Frostbite occurs when exposed skin freezes from cold temperature or direct contact to very cold objects, while trench foot results from prolonged immersion in freezing water or dampness. Hypothermia is a potentially fatal medical condition that occurs when core body temperature drops to 95 °F or lower.

How Does the Body React to Cold Stress?

When exposed to extreme cold, the body uses two adaptive mechanisms to regulate its internal temperature: one is constriction of blood vessels, which shifts blood from the skin and extremities to the chest, abdomen, and major organs to conserve body heat; the second is persistent shivering to increase metabolic heat.

What are the Signs of Frostbite, Trench Foot, and Hypothermia?

Skin tissues that are affected by trench foot and frostbite usually turn red first, then purple, and eventually white. Patients usually experience tingling, stinging, and aching sensations, followed by numbness on the exposed skin or extremities.

There are three stages of hypothermia: mild, moderate, and severe. Normal core body temperature is 98.6 °F. When core body temperature drops below 95 °F, we are at serious risk. Patients with mild hypothermia exhibit cold and pale skin, shivering and slurred speech, and may become disoriented. Those with moderate hypothermia have a considerable drop in heart rate, respiratory rate, and blood pressure. Patients with severe hypothermia often lose consciousness as well. Their breathing rate is very low, and their pulse is difficult to find. If appropriate first aid treatment is not administered in a timely fashion, death may result.

What Preventive Measures Should Be Taken?

DEP employees should wear multiple layers of warm, loose fitting clothing to prevent cold stress. Clothing might include an outer layer that breaks the wind, a middle wool layer that serves as insulating material, and an inner synthetic or cotton layer to allow ventilation. Synthetic is best because it wicks sweat away from the body. Moisture inside clothing can exacerbate cold stress. Wearing a hat or hood is critical, since 40% of body heat can be lost through an uncovered head. In addition, employees should wear insulated gloves, footwear, and thick socks. OSHA guidance documents indicate that the "danger zone" does not occur for most healthy adults in proper clothing, until the temperature drops to about 15° below (factoring in 10 mph wind). However, since we are all different, it is important to know the signs and symptoms of cold stress, and when to take a break to warm up.

First Aid Treatment

If an individual shows signs of moderate or severe hypothermia, call 911 immediately. Until the ambulance arrives, move him or her into a warm and dry location. If the person is wearing wet clothes, replace them with dry clothes; wrap the patient with warm blankets and have him or her drink hot and sweet non-caffeinated beverages.

For additional information about cold stress and hypothermia, refer to NYC DEP EHS Guidance "Exposure to Extreme Heat and Cold", dated 3/15/07.

Wintertime Indoor Air Quality

The Science Behind Static *Shock*

Have you ever walked across the office carpet and reached for the doorknob and...ZAP— you experience a static shock. Does it seem that this occurs more often during the winter months? Static shocks, which primarily occur in the winter due to low humidity, are a result of the exchange of normal electrical charges between people and building materials. These charges get absorbed by the more humid air during the non-winter months, depleting the shocks.

Indoor Air Pollutants

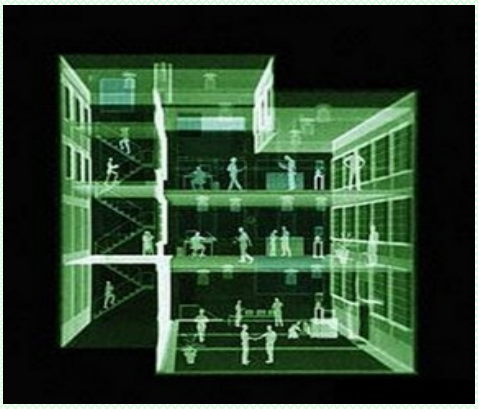
Anyone who has entered into a newly renovated building knows that a roomful of new carpet or freshly painted walls can smell to headache-inducing heights. The odors are a component of building materials (like paints and flooring materials) called Volatile Organic Compounds or VOCs. Naturally, in the wintertime, windows are opened less and fresh air is kept outside, thus lowering air quality indoors. Fresh air and a properly functioning heating, ventilation, and air conditioning (HVAC) system will clean the air by providing enough air exchanges to minimize indoor air pollutants. The amount of VOCs released from certain materials diminishes over time.

How Does the Government Regulate Indoor Air Quality?

Thus far, OSHA indoor air quality standards do not exist. OSHA has not remained completely silent on this issue, and recommends the following American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) guidelines:

- Humidity 30 – 60%
- Carbon Dioxide < 1050 ppm
- Temperature 67 – 76 °F (73 – 79 °F in summer)
- Air exchange of 15 cubic feet per minute (cfm) per person

For additional information see: http://www.epa.gov/iaq/, http://www.cdc/gov/niosh/topics/indoorenv/Building Ventilation.html



Concerned about Reusing Plastic Water Bottles

Continued from Page 2

While plastic water and soft drink bottles are sold with the intention of single use, they can be safely reused from as little as a few days and up to a maximum of a week under sanitary conditions. The key is to use an undamaged bottle that has been properly washed with hot soapy water, thoroughly rinsed and dried between uses and of course, filled with fresh clean water. Since plastics start to breakdown and become less sturdy after repeated washings, it may be best to use water bottles that are meant for multiple uses.

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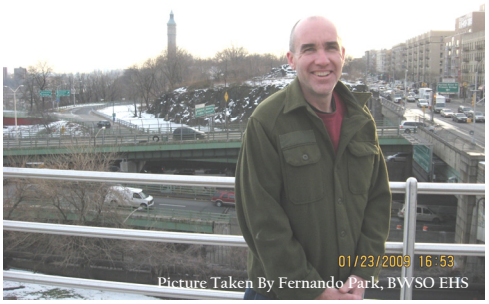

James Donahue is a Stationary Engineer, Electric at 179th Street Pump Station in Manhattan, New York. He began his career with the NYC DEP in 1983 as a Sewage Treatment Plant worker, Oiler, and was later promoted to Stationary Engineer, Electric in 2001. Over the 25 years, James has worked in various NYC DEP locations such as Newtown Creek, Hunt's Point, North River, and 179th Street Pump Station. James is a supervisor who is serious about ensuring safety for his colleagues, and maintenance of 179th Street Pump Station. EHS Specialists claim that James is great because he is "meticulously organized and serious about EHS duties."

Q: Where are you from?
A: I grew up in the Bronx.
Q: Where did you attend school?
A: I attended Aviation High School in Long Island City, and graduated from New York City Technical College.
Q: Do you have any hobbies and/or interests? What do you like to do in your spare time?
A: I have an interest in automobiles. If I had the spare time, I would enjoy researching and working on vintage cars.
Q: So, prior to working for DEP, where did you work?
A: I worked at Chase Manhattan Bank as an Assistant Mechanical Supervisor for two years. That's where I met my wife!
Q: What did you do as an Assistant Mechanical Supervisor?
A: I was responsible for the heating, air conditioning, and boilers for the Chase Manhattan branches in the New York City area as well as upstate.
Q: What are your responsibilities as a Stationary Engineer, Electric?
A: As a Stationary Engineer, Electric, I operate the plant - a boosting station for this area of Manhattan. I also operate and exercise generators to ensure reliability - even if the electricity goes down! This way the facility can continue to provide water to the people. Also, I perform corrective and preventive maintenance to the pumps, breakers, and generator sets.
Q: What types of EHS duties have you participated in?
A: I prepare for audits, tool box talks, and safety inspections. I update the Material Safety Data Sheets, Compliance Tracking System, and navigate policies. I also participate in the Lock-out Tag-out and Confined Space Programs, and the Aboveground Storage Tank Petroleum Bulk Storage monthly inspections. Also...monthly fire inspections, emergency light test, Facility Inventory Forms, monthly reports, and procurement.
Q: What do you enjoy most about your current job?
A: Providing clean, safe water to this end of Manhattan.
Q: What are your qualifications?
A: I have a sewage treatment operator's license, fresh water distribution license, and a refrigeration operator's license.
Q: What was the most memorable and/or challenging experience you have encountered at work?
A: It was before my shift, and I was walking to 179th Street Pump Station and saw that there was a flood outside of the facility; a water main broke. Since I couldn't access the plant, I ended up assisting Distribution Engineer, Lomesh Patel (an extremely knowledgeable DEP employee) in manually shutting down valves with the assistance of Port Authority plumbers.
Q: Who do you admire the most and why?
A: I would have to say Mark Sass. He is humble, and a great go-to-guy. He is helpful and willing to share his knowledge. I would also have to mention Nelson Leon. Nelson is another great go-to-guy. He is behind the scenes but is important and very helpful. Lastly, I admire all my DEP brothers and sisters, past and present!
Q: What is your greatest achievement?
A: My greatest achievement is having the support of my wife, Lisa, and my children Katelyn and Liam. I also can't overlook the support and guidance of my parents. Lastly, the support I receive from my co-workers.
Q: Any words of wisdom, advice or motto to share?
A: Learn all you can, try to follow every step, and share your knowledge. We're all working together to get the job done.

TAKE THIS QUIZ: SUBMIT CORRECT ANSWERS FOR A CHANCE TO WIN FREE GIFT CARDS WITH $10 VALUES!

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

1. A COMMON condition resulting from hypothermia can be:
   a) Shivering – although elderly adults may have not have this symptom
   b) Nausea
   c) Thirst
   d) Earache

2. Hydroelectricity is a renewable energy source that relies on the power of _____ to generate electricity.
   a) Steam b) Wind
   c) Natural Gas d) Water

3. Static Shock can be attributed to:
   a) Low humidity b) Asbestos
   c) AM/FM radio signals d) Fluorescent colored clothing

4. OSHA recommends the ___ guidelines for indoor air quality.
   a) American Society of Civil Engineers (ASCE).
   b) American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
   c) American National Standard Institute (ANSI).
   d) Refrigeration Service Engineers Society (RSES).

Answers for December 2008 Newsletter Quiz: 1) B 2) D 3) D 4) C