ENVIRONMENTAL NEWS

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

Newsletter of the N.H. Department of Environmental Services September-October 2015

COMMISSIONER'S COLUMN

Little Falls Cooperative Resident: "We've been waiting for this for years"

In August, NHDES participated in the groundbreaking of a water line extension project in Rochester, New Hampshire. Ordinarily, a water line extension project is not especially noteworthy. This project, though, extended Rochester municipal water service to the residents of the Little Falls Cooperative, resolving a five-year ordeal for the residents who had been using bottled water because their drinking water was contaminated with MtBE. For NHDES, the project was significant because it was the first infrastructure improvement project funded by MtBE Lawsuit Settlement Funds to proceed to the construction phase.

The Little Falls Cooperative is a resident-owned manufactured housing community. This 30-unit community was purchased by the homeowners in 1997. When residents purchase manufactured housing developments, they sometimes face significant challenges with the infrastructure associated with the original construction of the community. In the case of Little Falls, its development over time included installation of four water supply wells and multiple water distribution systems. These systems caused the overall water system to be exempt from regulation under the Safe Drinking Water Act, depriving

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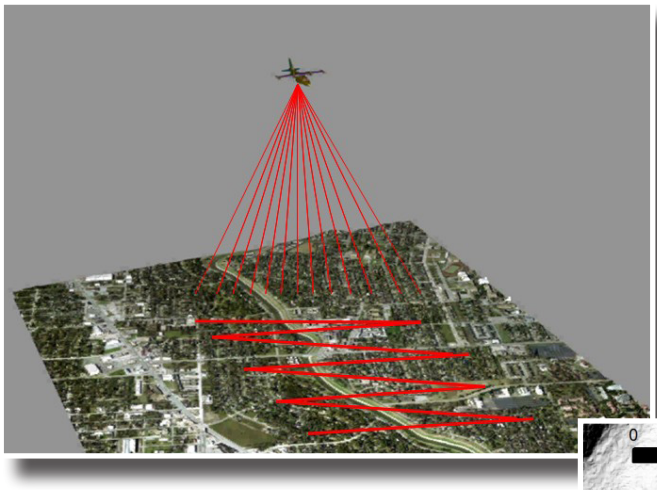
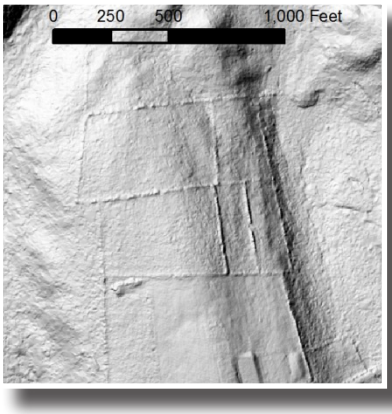
The Emerging LiDAR Landscape

Imagine a technology that can accurately measure ground surface elevations from an airplane flying a thousand feet above the treetops. That technology is LiDAR (short for "Light Detections and Ranging"). Planes will be in the air over New Hampshire this fall to map large swaths of the state, beginning as soon as leaves start to drop in the North Country. The LiDAR method uses red-light laser pulses (between 5,000 and 50,000 pulses per second) to "scan" the land surface and record the travel time of each laser pulse that is reflected back to a detector on the aircraft. A single pulse can generate multiple "returns" as it reflects off of any surface in its path (such as the forest canopy) before hitting the ground below. The collected data, known as the LiDAR "point cloud," are then processed to extract the last returns, which represent the "bare earth." The first and intermediate returns can be used to derive vegetation characteristics (such as forest canopy height and density) and/or to extract features within the built environment such as building footprints.



Airborne LiDAR data acquisition (image courtesy of Dodson & Associates)



The resulting "bare earth" digital elevation model (DEM) accurately defines areas that will be inundated during floods of different magnitudes and represents the new standard for delineation of flood hazard zones by the Federal Emergency Management Agency (FEMA). On the New Hampshire Seacoast, LiDAR data have been essential for accurately mapping areas that would be affected by different predictions of sea level rise, providing a reliable basis for long-term planning in coastal communities. Pathways of contaminants and eroded sediments carried in stormwater runoff from hillsides and parking lots to lakes, streams and other water bodies can be accurately traced using LiDAR.

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the community of the important associated protections afforded under the Act.

In 2010, the Little Falls Cooperative became aware that two of its four water supply wells were contaminated with MtBE. Since that time, affected homeowners have been using bottled water for consumption. The bottled water addresses much of the exposure risk, but does not eliminate impacts from non-potable water uses, such as inhalation of MtBE during showering.

Correcting the Cooperative's MtBE-contaminated water system was problematic in several ways. First, the water supply wells were installed in locations that require water lines to cross an electric utility easement without clear permission from the utility to do so. Second, due to possible interconnection of water supply sources and a lack of as-built plans of the overall system, it was very difficult to determine which homes were served by each of the four wells. Third, no wellhead protection area had been established, and at least two facilities that are potential sources of the MtBE contamination are located in relatively close proximity to the drinking water wells. Finally, the existing pump houses and distribution piping needed upgrades and repairs.

MtBE poses a risk to New Hampshire drinking water wells. New Hampshire's aquifers are primarily shallow bedrock aquifers protected by thin layers of saturated soils, and rural areas are relatively densely developed compared to, for example, western states. New Hampshire's aquifers are extensively used for drinking water and aquifer protection is vital to ensure protection of this important resource. Although New Hampshire has very successful well head and drinking water protection programs, poorly biodegradable and mobile contaminants like MtBE pose significant risks to our drinking water. Unfortunately, the original water supply for Little Falls Cooperative was one of many that have been impacted by gasoline releases and MtBE contamination.

In 2000, the state of New Hampshire sued manufacturers and suppliers of MtBE in connection with MtBE impacts to the state's groundwater resources. In 2013, all but one of the litigants settled with the State of New Hampshire. Settlement funds were used to establish the MtBE Remediation Bureau at NHDES and are being used to address the MtBE contamination problem. The Little Falls Cooperative project is the first of many drinking water infrastructure projects that the Bureau expects to undertake as it works to address MtBE contamination in our state.

The permanent solution to Little Falls Cooperative's MtBE contamination is to connect the homes to Rochester's drinking water system. Construction of the new system, which includes installation of a central metering pit, a four inch diameter water main, and new distribution lines, is expected to be completed this fall.

NHDES is pleased to have assisted this community by helping to provide safe, clean drinking water. NHDES has provided additional services to similar resident-owned communities over the years to upgrade low-income homeowner substandard fuel oil storage tanks via the SAFETANK program and to clean up petroleum spills via the Fuel Oil Discharge Cleanup fund. We are proud of our track record over the years of providing assistance via these programs to resolve many serious environmental problems, and to improve New Hampshire's aging infrastructure. ■

ENVIRONMENTAL NEWS

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Mendums Pond Dam Repairs Set to Begin

NHDES is planning to repair Mendums Pond Dam, in Nottingham,which will preserve the pond that lies mainly in Barrington. The existing dam is approximately 31 feet high and is constructed of an earthen embankment placed between upstream and downstream dry stone masonry walls. The dam is 440 feet long and averages approximately 36 feet thick. Originally constructed in 1840 and acquired by the State in 1955, it is one of the highest laid-stone and earth gravity dams in New Hampshire. The dam is classified as a "High Hazard" dam because its failure would flood houses in Nottingham and Lee and overtop roadways downstream, including Route 4.

During inspections of the dam, NHDES found some problems with the dam that could, if left unaddressed, threaten the structural integrity of the dam. It is now necessary to draw down the pond (i.e., temporarily lowering its water level) to enable repairs to be completed and to make sure that the dam at Mendums Pond can operate safely and reliably for years to come.

NHDES will be drawing down the level of Mendums Pond for the repair starting September 9, 2015. It is anticipated that the water level will reach the 20-foot drawdown stage within 30 to 45 days, weather dependent. NHDES estimates that

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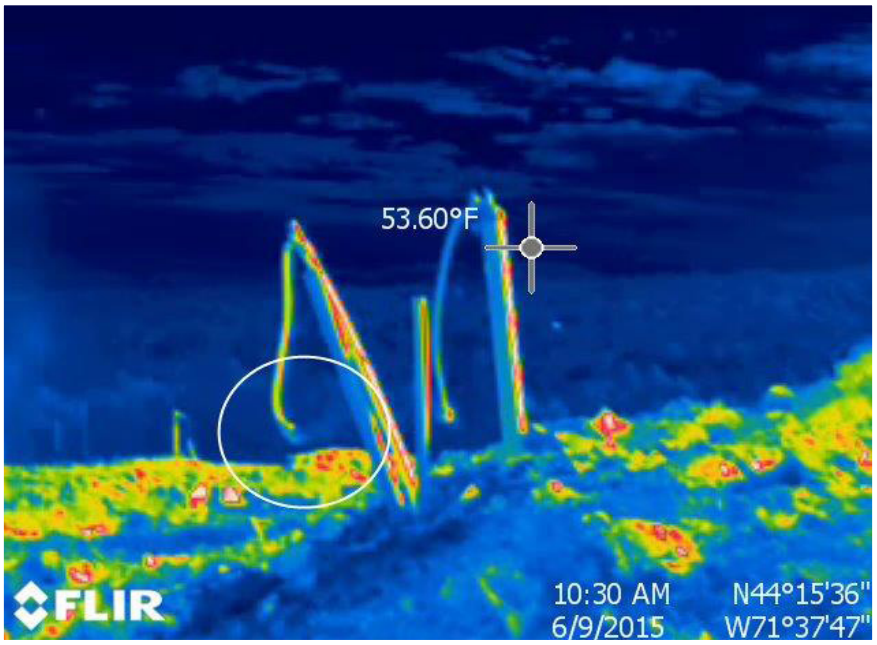
IR Camera Helps "See" Gas Leaks

The NHDES Air Resources Division's (ARD) Compliance Bureau recently received a grant from EPA to purchase a new infrared camera, a FLIR GF 320, is a special type of thermal imaging camera that detects a very narrow range of the infrared (IR) spectrum using special lens coatings and an IR detector cooled with liquid nitrogen. This narrow range of infrared energy is absorbed by gaseous volatile organic compounds (VOCs). The FLIR allows the user to "see" the emission of an otherwise invisible VOC plume using infrared light, just as we can normally see a steam plume in visible light. VOCs are a primary contributor to the formation of ground-level ozone and specific VOCs have health-related concerns.

The FLIR is designed for the detection of large, high-concentration leaks of VOCs from piping, valves or other equipment at refineries, tank farms, and oil and gas drilling rigs. It allows safety personnel to identify VOC leaks that might result in a fire or explosion. New Hampshire has very few of these types of facilities, but we do have emitters of potentially substantial amounts of VOCs. ARD is collaborating with other states and EPA to find other valuable uses for this VOC detection technology.

ARD has already used the FLIR at several landfills to detect leaks of landfill gas (LFG, which is approximately 50% methane) due to poor gas collection or poor cover maintenance. The FLIR has been used in conjunction with another type of gas detector, a Flame Ionization Detector, which measures the concentration of the gas it is sampling. The combination of these two detectors gives a quantifiable and visually-strong indicator of a LFG leak.

The FLIR has also been used to confirm the destruction efficiency of VOCs from LFG flares. The very hot temperature of these flares makes it difficult to measure by normal means. ARD also plans to use the FLIR to monitor above ground storage tanks and VOC air pollution control equipment at permitted sources. ■



As seen by the IR camera during a combined air/waste inspection of a landfill, this is a plume of landfill gas escaping from an unsecured gas collection well, which was otherwise invisible to the naked eye

Volunteers Raise Baby Oysters to Help Great Bay

During its 2015 season, the Oyster Conservationist Program – a volunteer-based restoration effort run by The Nature Conservancy together with the University of New Hampshire – expanded to 71 sites in New Hampshire, the most active sites in its ten-year history. This is on top of its geographic expansion into southern Maine in 2014, with current participation in 14 towns in the Seacoast areas of the Piscataqua region of New Hampshire and Maine.

The program recruits and trains local volunteers how to raise oysters on their private docks that are later used to help restore oyster reefs in Great Bay. Its value was recently recognized by the Gulf of Maine Council, a US-Canadian partnership dedicated to protecting environmental quality in the Gulf of Maine, which awarded the Oyster Conservationist Program with a Visionary Award last June for its innovation, creativity and commitment to marine protection.

Third-year Oyster Conservationist Liz Bratter (left) receives her cage of baby oysters, called spat, from The Nature Conservancy's Oyster Conservationist Volunteer Program Coordinator, Jessie Batchelder. Liz will clean and check the cage weekly for predators until the oysters are big enough to be moved to a restoration site in Great Bay in September. Photo by Megan Latour/The Nature Conservancy.

"I think that the best part of the program is how it enables homeowners to take a more active role in protecting the water body that is in their backyards," said Jessie Batchelder, The Nature Conservancy's Oyster Conservationist Volunteer Program Coordinator.

The oyster conservationists each receive a cage full of shells with the baby oysters, called spat, in mid-July, and host the spat until they are big enough to be moved in September. Some of the shells in the cages are clean—without spat—and help researchers learn valuable information about where in the Bay wild baby oysters are coming in to use the shells all on their own. Another volunteer element of the project is that the shells have been collected and recycled from area restaurants, an initiative begun and coordinated by the New Hampshire Coastal Conservation Association. Oysters prefer to grow on shells, and stay in the same place throughout their lives.

Oyster conservationists help keep the baby oysters alive by monitoring their cages weekly to clean off any fouling and to remove predators, such as green crabs. They also measure the growth of the oysters biweekly. This year's New Hampshire crop of oysters will be used as part of a 2.5-acre restoration project in the southwest part of Great Bay near Greenland.

Oysters help bring the Bay, which is currently overdominated by mudflat habitat, to a more natural and healthy state. Oysters are especially important to the water quality of Great Bay because they clean and filter as many as 20 gallons of water a day. Clearer water favors eelgrass growth, which is in itself a rockstar habitat provider and has also been in severe decline in the Bay. Another role oysters play in the environment is to they provide habitat for marine life, such as fish and shrimp.

"You'll see the fish in there, you'll see the eelgrass in there coming. It's breathing pockets of life," said The Nature Conservancy Director of Marine Science & Conservation Ray Konisky, about oyster reefs.

Once widespread and dense in Great Bay Estuary, adult oyster populations plummeted with 90% losses by the year 2000 following disease outbreak in the 1990s. Disease has continued to reduce the life span of adult oysters, going from 10-20 years pre-disease to a current mere 3-5 years. And more bad news: during their short life spans, oysters are under constant threat of being killed from sediment movement and harvest, according to Ray Grizzle, University of New Hampshire Research Professor of Zoology and operator of a local commercial oyster farm, who has been working with oysters since 2000.

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The Great Bay Estuary currently has about 125 acres of natural oyster reef, 50 acres of oyster farms, and 20 acres of restored reef compared to 500 or more acres of reef historically. Additionally, today's oyster beds are 10-20 percent less dense than what they were even in the 1990s.

Researchers have discovered during the last five years of restoration work that the restoration sites need to be located close to native oyster reefs to have the highest probability of attracting spat, said Grizzle.

Grizzle sees lots of value in the Oyster Conservationist Program, including that it contributes to restoration efforts, gets people involved, and provides information to researchers.

"It's more than a feel good program; it's providing data and educating people," he said.

The Oyster Conservationist program is funded, in part, by the NHDES Coastal Program with a grant from NOAA's Office for Coastal Management under the Coastal Zone Management Act. ■

Team Approach Improves Complaint Response

Have you ever wondered who shows up when you file a complaint about a spill or improper waste disposal with NHDES? Most likely, it is staff of the Spill Response and Complaint Investigation Section (SRCIS) within the NHDES Oil Remediation and Compliance Bureau. Among their many duties, SRCIS staff respond to all reported spills, and frequently investigate complaints about improper handling/disposal of petroleum, hazardous waste and solid waste. The high volume of complaint assignments and emergency response incident management duties carried by each member of SRCIS focused attention on the need to manage complaints more efficiently, from receipt through resolution. To develop a new approach, staff from NHDES Water, Air Resources and Waste Management Divisions assembled to examine the existing process and identify opportunities to increase efficiency.

Early on, the team categorized complaints into four broad categories: improper solid waste disposal, threats to the environment, hazards to human health and potential violations of air or water programs. Available data showed most complaints involve improper solid waste disposal. NHDES' solid waste program has no dedicated funds or federal funds, and so has very limited funding to investigate solid waste complaints and no funding to remove solid waste that has been illegally dumped. The need for efficient response and resolution of solid waste complaints is thus particularly acute.

The plan developed by the team calls for informing responsible parties more completely at the first site visit of applicable requirements and potential penalties for the violation(s), to eliminate the need for multiple return trips. Team members also developed standardized complaint triage and follow-up procedures that include involving local officials more often and earlier in the process; revising the Report of Initial Complaint Investigation form to more clearly identify petroleum, hazardous waste and solid waste violations, and list the corrective actions needed; and enhancing data collection.

Although it is too soon to tell how much efficiency has been gained, the effort has been declared a success. Staff from across NHDES worked together to solve a multi-media problem, and all team members gained a better understanding of the importance of the work SRCIS does and the large number of complaints handled by this small group of talented, resourceful and dedicated individuals. ■

LiDAR *continued from page 1*

Potential uses of LiDAR data extend well beyond water resources to support other aspects of economic development and public safety, representing a broad range of stakeholder interests. The ability of LiDAR to see through the trees even creates an unprecedented opportunity to identify and document historical resources, by enabling the state's legacy of stone walls and cellar holes to be mapped in detail.

The current project, funded by a Capital Budget appropriation and matching contributions from the US Geological Survey, the Natural Resources Conservation Service, and FEMA, will cover a little more than half of the state. This will add significantly to areas in the Merrimack Valley, Seacoast regions and the White Mountain National Forest where LiDAR data have previously been acquired. ■

USEPA issues Administrative Order to clean up Pease Drinking Water Wells

On July 9, 2015, EPA issued an Administrative Order under the Safe Drinking Water Act to the US Air Force for the former Pease Air Force Base in Portsmouth, NH. The Order requires the Air Force to address contamination of the drinking water supply under the facility known as the Pease International Tradeport. A portion of the drinking water supply is contaminated with perfluorinated compounds (PFCs) above EPA's provisional health advisory.

The administrative order was prompted by the recent decision by EPA to classify PFCs as contaminants of emerging concern. This is a group of man-made chemicals that have been used for decades in the manufacture of numerous household and industrial products. EPA has established a drinking water provisional health advisory level (PHA) for two PFC compounds: Perfluorooctane Sulfonate (PFOS) with a PHA of 0.2 micrograms per liter; and Perfluorooctanoic Acid (PFOA) with a PHA of 0.4 micrograms per liter. PFCs can be present in a type of fire-fighting foam known as Aqueous Film Forming Foam (AFFF). Due to the potential for widespread releases of AFFF at the former Pease AFB, EPA and NHDES requested that the Air Force sample the three Tradeport water supply wells (the Haven, Smith and Harrison wells) for PFCs. The samples were collected on April 16, 2014 and the Air Force notified NHDES on May 12 that the Haven Well showed levels of PFOS approximately 12 times higher than the PHA. PFOA and PFOS were also detected in the Smith and Harrison wells, but at levels below the PHA. The two City wells (Collins and Portsmouth #1) were sampled by NHDES on May 16, 2014 and subsequently by the Air Force, and only trace levels of PFCs below the PHA were detected.

In response, the City of Portsmouth shut down the Haven well on May 12, 2014. The loss of the highly productive Haven Well requires the Tradeport water system to be supplemented from other City water sources, placing additional strains on the City water system. There is concern that higher levels of PFC contamination could be drawn into the Smith and Harrison or the City's wells, requiring further shutdowns.

A work group consisting of EPA, the City of Portsmouth, the Air Force and NHDES was quickly formed and conferenced weekly to fast-track investigation priorities. A robust sampling program was established for the Tradeport and City supply wells, along with the establishment of monitoring wells in the aquifer close to each supply well. To date, the monitoring wells have not shown increasing levels of PFC contamination immediately near the Smith, Harrison or City wells, which remain online. A comprehensive and frequent monitoring program has been established for each supply well and its monitoring wells to examine water quality trends going forward. A residential well sampling program of homes surrounding the Tradeport was also conducted. This program identified one residential well with PFOS levels above the PHA; a water treatment system has been installed at this home.

Existing monitoring wells from across the Pease aquifer were sampled for PFCs to provide a preliminary evaluation of the extent of contamination, which showed that PFOS contamination above the PHA was widespread, especially in the central portion of the aquifer where the Haven well is located; PFCs were found in all hydrogeological units, including deep bedrock. High levels of contamination were also present at the Air Force's former fire training area located in the northern portion of the Tradeport.

Because PFCs are known to accumulate in the body during periods of exposure, the New Hampshire Department of Health and Human Services (DHHS) offered PFC blood testing for any person who may have consumed Pease water prior to the Haven well shutdown in May, 2014. Over 500 people have signed up for testing. DHHS is conducting a series of public meetings to discuss the findings.

While exposure to water from the Haven well has been eliminated, EPA, NHDES and the Pease community were concerned that, with the Haven well shut-down, significant changes in groundwater flow in the aquifer will occur, allowing higher levels of PFOS contamination near the Haven well to migrate south toward the remaining supply wells. In consultation with NHDES, EPA exercised its authority under the Safe Drinking Water Act and issued the Air Force the administrative order mentioned above. The order requires the Air Force to restore the Pease aquifer; design, install and operate a PFC groundwater treatment system for the Haven Well; design a contingency PFC groundwater treatment system for the Harrison and Smith wells; implement remedial measures at the Air Force's former fire training area; and investigate other potential PFC sites at Pease. The order requires the Air Force to conduct these actions in a timely manner, with the ultimate goal of allowing full utilization of this important groundwater resource. NHDES, EPA and the City will continue to work closely together with the Air Force, to ensure that these actions are implemented promptly and effectively. ■

New Web Application Helps Private Well Owners Navigate Water Treatment Decisions

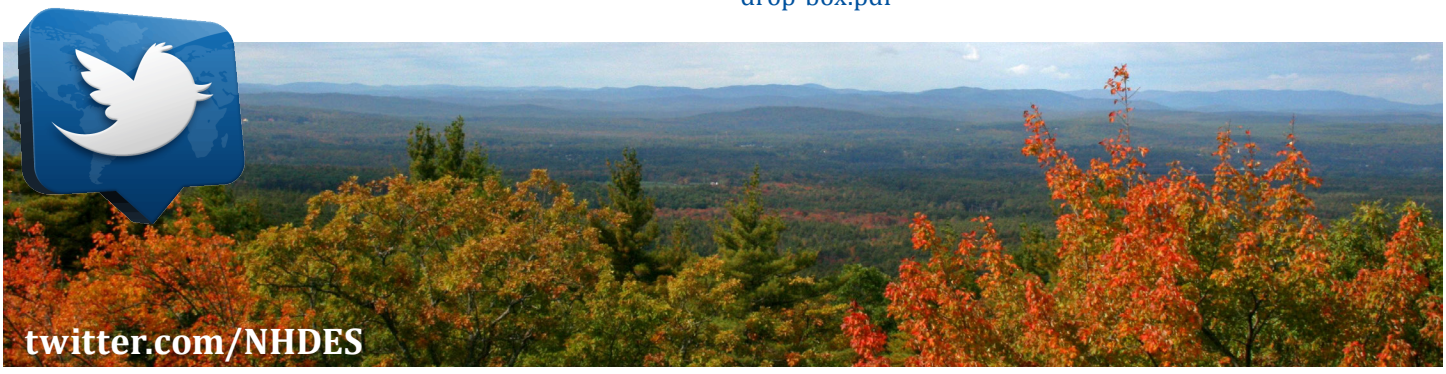
Private well owners have a new tool to help them make better-informed decisions about water treatment systems. NHDES' "Be Well Informed" web application enables well owners to enter test results for common well water contaminants from a lab report. After clicking "submit," users find out whether their water meets drinking water standards (or guidelines), the health implications of drinking untreated water, and treatment options. While other web-based tools provide treatment information for one contaminant at a time, "Be Well Informed" evaluates test results for multiple contaminants simultaneously, providing water treatment recommendations tailored to the user's overall water quality results. The application is a big step forward in terms of enhancing NHDES's capacity to assist private well users to select the right treatment technology to avoid exposure to arsenic and other common groundwater contaminants. "Be Well Informed" was built around the testing parameters that NHDES recommends all well users have tested – 14 in the "Standard Analysis" package and three radiological parameters (users do not have to enter all 17 parameters). The web application will provide results based on whatever information the user enters. Users are urged to consult with water treatment professionals after reviewing their results.

The web application addresses a key stumbling block encountered by private well users in their efforts to ensure that their drinking water is safe. In May 2014, Dartmouth College's Toxic Metals Superfund Research Program conducted a statewide survey of private well owners for NHDES, and found that nearly 1 in 4 private well owners who tested their well water did not initially understand their lab reports while approximately 1 in 3 did not understand what actions to take based on their lab results.

Contact Pierce Rigrod (pierce.rigrod@des.nh.gov, 271-0688) at NHDES if you have questions or comments about the Be Well Informed web application, or visit www.des.nh.gov, and search "Be Well Informed." Funding to complete the statewide private well survey and the Be Well Informed web application was provided by a grant from the U.S Centers for Disease Control and Prevention (CDC). ■

James Houle, UNH Stormwater Center explains innovative stormwater practice plans to (L to R) Commissioner Burack, NH Representative William Baber, and Dover City Councilor Deborah Thibodaux during a Dover Berry Brook project site tour hosted by NHDES and the city of Dover.

A National Drug Take Back Day will occur on September 26, 2015 from 10 AM-2 PM. A list of participating locations can be found at http://www.deadiversion.usdoj.gov/drug_disposal/takeback/index.html. A list of permanent drug collection drop boxes in local police stations can be found at http://doj.nh.gov/criminal/documents/prescription-drug-drop-box.pdf



Mendums *continued from page 3*

the flow released from Mendums Pond during this period will temporarily increase the level of the downstream impoundment, Nottingham Lake, by approximately 1 foot over normal conditions.

In the interim, NHDES has been focused on improving access for construction vehicles to be able to properly negotiate and stage the construction, and to bring power to the site for construction activities. As soon as the drawdown begins, NHDES engineers will be observing monitoring wells installed in the dam to gather additional information about the dam. After the drawdown is finished and the pond is lowered to its temporary construction level, NHDES engineers will be inspecting the upstream face of the dam to look for opportunities to repair the upstream face to reduce leakage and seepage through the dam.

NHDES is also currently developing plans and specifications for the repair work. Current plans call for a repair that will include a downstream soil buttress and cutoff wall. The cutoff wall will be used to cut off the leakage currently exiting the dam, while a new downstream soil filter will drain any seepage still passing through the dam or its foundation. The remainder of the soil buttress will act to stabilize the downstream face of the dam and prevent future erosion and rotation of the downstream face. Current plans and estimates indicate that approximately 6,000 cubic yards of earthen materials and approximately 400 cubic yards of concrete will be used in the project. At the same time, NHDES will make improvements to the operational elements of the dam, including the existing outlet channel and gates near the center of the structure. By making these improvements, NHDES is planning to have more reliable operational capabilities in the future.

NH Fish & Game (NHFG) was consulted regarding removal and relocation of fish during the drawdown, as well as limiting recreational fishing activities. NHFG determined that, while some fish may move downstream during the drawdown, the approximately 100-acre, 30-foot-deep pond that will remain during the drawdown would be sufficient to sustain the fishery during the construction. In regard to restricting fishing, NHFG determined that the limited public access already restricts fishing opportunities in the pond, so that the fish remaining in the drawndown pond during construction should not be vulnerable to overfishing.

Additional information can be obtained about the project at the NHDES website – www.nh.des.gov. Search the A to Z list for the "Mendums Pond Repair Project." ■

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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