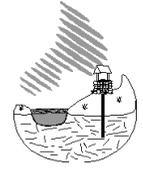




SUPPLY LINES WITH THE SOURCE



Newsletter of the NHDES Drinking Water & Groundwater Bureau
on the web at www.des.nh.gov

Summer 2018

For the Love of Water

Excerpted from SELTviews, Spring 2018 newsletter

Dave Olson believes that decisions based on love always work out. His love for his land and the creatures who dwell there are at the core of his decision to conserve his 72-acre property – the Bel Ami Farm – for ongoing public benefit.

Tucked away in a quiet corner of Madbury, this property is nestled along the banks of the Bellamy River and Reservoir and is home to wildlife, a blueberry plantation, a small 12-acre Christmas tree farm, and diverse forests.

Dave, and the City of Portsmouth, know the value of this land. The Bellamy is the city's primary water supply. Conserving land that surrounds, or includes, wetlands, rivers, streams and larger bodies of water protects these resources from the pressures of development and helps municipal water systems provide higher quality water at the tap.

Dave, a former professor of wildlife biology and forest management at UNH, opened access to his land in 1974. It is accessed thousands of times annually for low-impact uses like kayaking, fishing and hiking.

This February, Southeast Land Trust of New Hampshire (SELT), the City and Dave agreed on a partnership to permanently conserve this land through the sale of

a conservation easement. To support the effort, SELT helped the City apply for – and receive – a grant from the newly established New Hampshire Drinking Water and Groundwater Trust Fund. These funds made conserving this property possible.

According to Al Pratt, Water Resource Manager for the City of Portsmouth, "Portsmouth City Council support in appropriating the remainder of the funds for this purchase is very much appreciated and is in line with

the City of Portsmouth's long-term commitment to sustainability."

He continues, "The conservation easement on Mr. Olson's property is an important step toward the continued long-term protection of the Bellamy Reservoir and the quality of the drink-

ing water supply for Portsmouth and the Seacoast area. We hope that this project will be the keystone parcel for further land protection efforts in the Bellamy watershed."

Through this conservation easement, Dave is enshrining his passion for this special place and ensuring that people – whether by kayaking the reservoir, hiking its shoreline, or turning on the tap – will experience the beauty and wildness of the Bellamy. 💧



*The Bel Ami Farm
Photo by Jerry Monkman/EcoPhotography*

Forests Save Money for Water Systems

Yet another study, this one by the American Water Works Association (AWWA) and U.S. Forest Service, adds to the body of research showing that increased development in water supply watersheds increases treatment costs. The study used models to examine the effect of changes in land cover (forest changing to residential, commercial or industrial use) on water quality (turbidity and total organic carbon (TOC)) and chemical treatment costs. The study also relied on water quality and treatment cost information from 37 treatment plants in forested areas across the country. The researchers found that increasing development by one percent of the watershed area increases turbidity by three percent and increases cost by 0.5 percent. This study did not find a relationship between development and TOC, although some previous studies have. The recent AWWA-Forest Service study was published in October 2017 in a special “Water Economics and Policy” issue of the journal *Water* and is available at https://www.fs.fed.us/rm/pubs_journals/2017/rmrs_2017_warziniack_t001.pdf.



A number of previous studies linked loss of forests to deterioration in water quality, and increased source water turbidity with higher treatment costs. As noted in the most recent study, “First, other land uses tend to add more pollutants to water than undisturbed forests, and second, forests can remove pollutants from the water flowing through them.”

A handful of studies also link forest cover directly with treatment cost. The most widely cited is a 2002 report, based on a survey of 27 water systems, by AWWA and the Trust for Public Land (TPL). That study found that a loss of forest cover in one percent of the watershed meant a two percent increase in treatment cost. A later study of 40 treatment plants by TPL found that both turbidity and TOC decreased with forest cover.

Recognizing these connections, more and more water systems in New Hampshire are pursuing opportunities to permanently protect forests in their watersheds and wellhead protection areas now that state funding is once again available to help through the New Hampshire Drinking Water and Groundwater Trust Fund (see *For the Love of Water*, pg 1). ♦

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Be Well Informed: Moving Out of State

Since the fall of 2015, 4,000 private well users in New Hampshire have entered their well water test results into NHDES’ *Be Well Informed* (BWI). BWI is an interactive, web-based tool that helps private well users determine appropriate water treatment options based on whether contaminants found in their water meet the standards (e.g., Maximum Contaminant Levels) required of public water systems. Last year, EPA took an interest in sharing New Hampshire’s BWI with other states. To date, 14 states are working with EPA or have expressed an interest in creating a version of BWI for private well users, tailored to the groundwater quality issues within their state. ♦

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29 Hazen Drive
PO Box 95
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03302-0095

Commissioner	Robert R. Scott
Asst. Commissioner	Clark Freise
Bureau Administrator	Sarah Pillsbury
Editors	Paul Susca Pierce Rigrod
Design Editor	Lara Hooper

To subscribe, contact Pierce Rigrod
at (603) 271-0688 or
pierce.rigrod@des.nh.gov
www.des.nh.gov
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Dealing With Low Yielding Wells

The amount of water a well can produce (well yield) can decrease over time. Factors contributing to this are drought conditions, over pumping, competing water users and sediment build-up. Water conservation is the best answer to dealing with a low yielding well, but sometimes that is not enough. Attempting to increase well yield is referred to as well development. When dug or point wells run dry, they can be replaced with deeper wells. For gravel wells, development may help but replacement is usually best.

(Dealing, continued on pg 6)

DWGB Calendar of Events & Deadlines: July 2018 – December 2018

- | | |
|------------|---|
| July 19 | Water Works Operator certification exam. Completed applications due at least 1 month prior, contact Wade Pelham at wade.pelham@des.nh.gov or (603) 271-2410 |
| July 27 | 2019 Leak Detection Survey Grant applications due, contact Kelsey Vaughn at kelsey.vaughn@des.nh.gov or (603) 271-0659, or see http://des.nh.gov/organization/divisions/water/dwgb/water_conservation/leak-detection.htm |
| August 2 | DWSRF public hearing, contact Johnna McKenna at johnna.mckenna@des.nh.gov or (603) 271-7017 |
| August 6 | Final applications due for water supply land conservation grants under the Trust Fund and NHDES-NHDOT (I-93) programs, contact Holly Green at holly.green@des.nh.gov or (603) 271-3114 |
| August 15 | Drinking Water and Groundwater Trust Fund Advisory Commission Meeting, 9 AM at NHDES; contact Erin Holmes at erin.holmes@des.nh.gov or (603) 271-8321, or Johnna McKenna at johnna.mckenna@des.nh.gov or (603) 271-7017 |
| October 10 | Disinfection Byproducts and Chlorine Residual report for Quarter 3 – 2018 due, contact Debra McDonnell at debra.mcdonnell@des.nh.gov or (603) 271-6703. |
| October 16 | SRF Joint workshop, contact Johnna McKenna at johnna.mckenna@des.nh.gov or (603) 271-7017 |
| October 18 | Water Works Operator certification exam. Completed applications due at least 1 month prior, contact Wade Pelham at wade.pelham@des.nh.gov or (603) 271-2410 |
| October 30 | The Lost Art of Communication Asset Management Workshop, contact Luis Adorno at luis.adorno@des.nh.gov or (603) 271-2472 |
| November 1 | Local Source Water Protection grant applications due, contact Andrew Madison at andrew.madison@des.nh.gov or (603) 271-2950, or see https://www.des.nh.gov/organization/divisions/water/dwgb/dwspp/lswp_grants.htm |
| December 1 | Asset Management Program Grant applications due, contact Luis Adorno at luis.adorno@des.nh.gov or (603) 271-2472, or see https://www.des.nh.gov/organization/divisions/water/dwgb/asset-management/index.htm |
| Anytime | Cyanobacteria Monitoring and Training grant applications accepted, contact Tyler Davidson at tyler.davidson@des.nh.gov or (603) 271-3906, or see https://www.des.nh.gov/organization/divisions/water/dwgb/cyano-response-training.htm |
| Anytime | Record Drawing grant applications accepted, contact Johnna McKenna at johnna.mckenna@des.nh.gov or (603) 271-7017, or see https://www.des.nh.gov/organization/divisions/water/dwgb/documents/record-drawing-grant-app.doc |
| Anytime | Tank Inspection grant applications accepted, contact Luis Adorno at luis.adorno@des.nh.gov or (603) 271-2472, or see https://www.des.nh.gov/organization/divisions/water/dwgb/asset-management/index.htm |

To see event calendars for additional opportunities, please visit:

Granite State Rural Water Association at www.granitestatewater.org

New Hampshire Water Works Association at www.nhwwa.org

New England Water Works Association at <http://newwa.org>

Best of 2018: Awards for Source Protection and Sustainability

Seabrook's Water Department, Rockingham Planning Commission and Plymouth Village Water and Sewer District (PVWSD) were recognized for their outstanding work to protect and preserve vital local drinking water resources at NHDES' annual Source Water Protection Conference on May 17, 2018.

In September of 2017, Seabrook worked with Rockingham Planning Commission and NHDES to reclassify its wellhead protection area (WHPA) to "GAA," the most protective groundwater classification in New Hampshire. GAA reclassification, among other things, limits certain high-risk land uses within the reclassified area and puts into practice a "best management practice" (BMP) inspection program to limit contaminant releases that could potentially contaminate source water.

PVWSD's efforts to conserve water and energy have yielded significant results. By upgrading its water meters, replacing water mains, and installing solar panels and variable frequency drives at its pump station, it has improved the system's energy and water efficiency, including reducing its water balance from 22% to 10%.

As Sarah Pillsbury, Administrator of the DWGB, noted, "Folks getting these awards today are going way beyond

what they are required to do, and over time, the results will be measured out in terms of better protection of public health and more efficient use of available resources." Congratulations to this year's award winners! 💧



Seabrook L-R: Curtis Slayton, Sarah Pillsbury (NHDES) and Julie LaBranche



Plymouth L-R: Sarah Pillsbury (NHDES), John Crowley, Jason Randall, Gary Hancock and Fred Yeaton

New Rules for Licensing Child Care Programs

New Hampshire's child care licensing rules (He-C 4002) were readopted last year, effective November 6, 2017 through 2027. The previous rules (2008-2016) defined a program that cares for more than 24 children and that has its own independent water supply as a non-transient, non-community water system subject to regulation by NHDES. The 2017-2027 rules revised the description to include programs that serve an average of at least 25 individuals – counting both children and staff – to be consistent with the Safe Drinking Water Act.

In addition to casting a slightly wider net with respect to child care programs regulated as public water systems (PWS), the 2017-2027 rules incorporate significant changes to the water testing requirements for programs on a private well that do not qualify as a PWS, as follows:

- No later than March 31, 2018, test the water for bacteria, and then test for bacteria every 3 months thereafter.
- No later than December 31, 2018, test the water for arsenic, nitrate and nitrite, and annually thereafter.
- No later than December 31, 2018, test the water for stagnant lead, stagnant copper, fluoride and uranium, if not tested within the previous three years, and then every three years thereafter.

More information on the major changes made to the Child Care Program Licensing Rules can be found at <https://www.dhhs.nh.gov/oos/cclu/rules.htm>. 💧

New Drinking Water and Groundwater Trust Fund Administrator

We want to welcome Erin Holmes, P.E., as the new Drinking Water and Groundwater Trust Fund Administrator. Erin's background is in chemistry and environmental engineering. She has over 15 years of experience in site investigation and remediation of contaminated sites. Although her career has not been focused on drinking water, she has always had a passion to provide clean, reliable drinking water. As a graduate student at the University of New Hampshire (UNH), she was a founding member and President of the UNH Chapter of Engineers-Without-Borders (EWB-UNH).

In 2003, she travelled to the village of Santisuk, Thailand with a team to implement two projects to protect source water and install a treatment system, and to address wastewater treatment needs. "Being able to bring clean water to the people of Santisuk had a profound effect on me. I am excited to have the opportunity to reignite the passion towards drinking water I had 15 years ago." 💧



Erin Holmes

New Faces at DWGB

DWGB's Engineering and Sanitary Survey Section is pleased to announce that Kaitlin Murphy is our new Sanitary Surveyor of Small Public Water Systems for the north country. Kaitlin will use her environmental conservation and GIS education, and four years of experience with the Drinking Water and Groundwater Bureau in data management and system inspections, to keep drinking water safe.

Abby Fopiano joined DWGB at the end of March to become the Water Well Program manager, replacing Rick Schofield, who retired last year. Abby is a Licensed Profes-

sional Geologist with extensive experience as a consultant permitting large groundwater withdrawals, developing public water supply wells, conducting contaminated site assessments and implementing remedial action measures. She also has invaluable expertise associated with her recent position managing a private well and pump company and analytical laboratory. This experience focused on small public water operations, compliance, design and installation of drinking water treatment and water well pump

systems.

Andrew Madison joined DWGB in April, assuming the Source Water Coordinator position within the Planning, Protection and Assistance section. Before coming to NHDES, Andrew spent four years with Granite State Rural Water Association (GSRWA) working directly with water suppliers to create and implement source water protection plans. Andrew also worked closely with NHDES staff on the New Hampshire Drinking Water Festival and managing source water protection grant projects awarded to GSRWA. He will be managing the Local Source Water Protection Grant Program and providing training and technical assistance to operators, planners and public officials.

Tyler Davidson is the new Source Protection Specialist and is involved with the Bureau's cyanobacteria and best management prac-

tices (BMP) for groundwater protection programs. Tyler also assists with several other source protection initiatives within the Bureau. He has professional experience in environmental consulting and an educational background in natural resources management and biology.

Welcome Kaitlin, Abby, Andrew and Tyler! 💧



Andrew Madison, Abby Fopiano, Kaitlin Murphy and Tyler Davidson

Recently Approved DWGB Rules



The Joint Legislative Committee on Administrative Rules (JLCAR) recently approved the following rules managed by DWGB. If you have questions on a specific recently approved rule, please contact the staff person listed below. If you are interested in receiving emails when proposed DWGB rules are in the rulemaking process, please email Debra Sonderegger at debra.sonderegger@des.nh.gov.

<u>Rule</u>	<u>Date Approved</u>	<u>DWGB Rule Contact</u>
<ul style="list-style-type: none"> Large Groundwater Withdrawals (Env-Wq 403) 	March 21, 2018	Stephen Roy, 271-3918 or stephen.roy@des.nh.gov
<ul style="list-style-type: none"> Groundwater Monitoring and Treatment (Env-Dw 717) 	June 1, 2018	Harrison "Chip" Mackey, 271-0655 or harrison.mackey@des.nh.gov
<ul style="list-style-type: none"> Disinfection Residuals, Byproducts, and Byproducts Precursors (Env-Dw 715) 	June 1, 2018	For last two rules: Richard Skarinka, 271-2948 or richard.skarinka@des.nh.gov
<ul style="list-style-type: none"> Filtration, Disinfection, and Waste Recycling (Env-Dw 716) 	June 1, 2018	

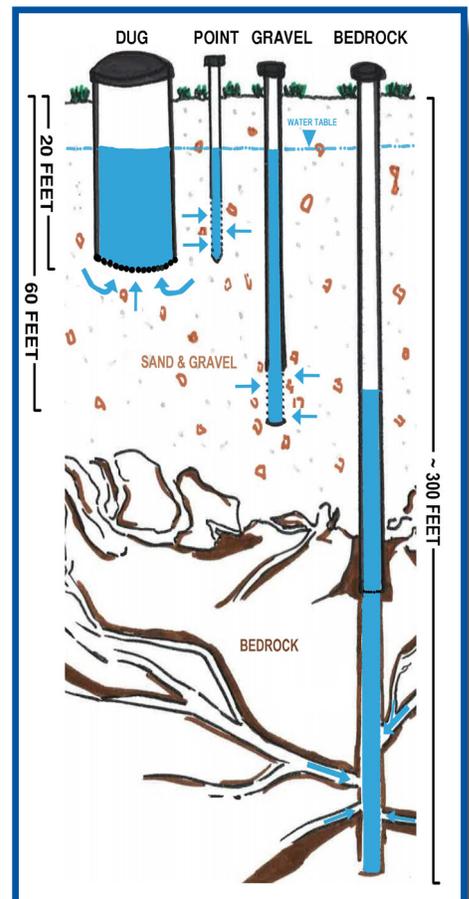
(Dealing, continued from pg 3)

Common bedrock well development methods include surging and hydro-fracturing. During surging, cylindrical block(s) are sent down the well and repeatedly hoisted up and down (like a plunger) to vigorously move water in and out of existing fractures. In hydro-fracturing, water and air are injected at high pressures (2,500 PSI or higher) to increase the number of and interconnections between fractures. After either method, rock fragments and sediment are washed out of the well.

Chemicals can be added in conjunction with these methods to dissolve minerals and loosen sediment but they are not commonly used in residential wells. Certain well developments on public water supply wells must be pre-approved by NHDES. Water quality testing after any development activity is recommended for private wells and may be required for public water wells. See https://www.des.nh.gov/organization/divisions/water/dwgb/well_testing/documents/well-testing.pdf for private well testing recommendations.

All work on wells must be done by a [licensed water well contractor](#) who follows the Water Well Board rules. NHDES is in the process of fining an unlicensed contractor \$4,000 for using dry ice (frozen CO₂) to develop a well. Using dry ice is prohibited. It can trigger chemical reactions that alter water chemistry and can cause an explosion lifting the steel casing out of the ground, permanently damaging the well. Licensed water well contractors can be found at https://www2.des.state.nh.us/OneStop/Water_Well_Contractors_Query.aspx.

Declining well yields does not mean you've hit rock bottom. Work with a licensed water well contractor to identify the best remedy. For more information, visit the Water Well Board website at <https://www.des.nh.gov/organization/divisions/water/dwgb/wwb/index.htm>. 💧



Drawing by Abby Fopiano

Operator Profiles:

Dylan McDermott

Please tell us about your system. The Town of Hanover has a grade 2 treatment and grade 2 distribution system with a 2.5 million-gallon-per-day (MGD) PALL Micro Filtration membrane treatment facility. We have three reservoirs with 367 million gallons of usable water. The micro filtration membrane system consists of four filter skids (compact and self-contained treatment units): three with 40 pressurized filtration modules, one with 20. Each larger skid is capable of filtering 800 gallons per minute (GPM), the smaller skid can filter 200 GPM. Our raw water has a turbidity of around 1.5 NTU and is treated with sodium permanganate to help oxidize iron and manganese and address taste/odor issues. We also add polyaluminum chloride for coagulation. Flocculation takes place in the 800' of 12" pipe from our raw water pump station to our treatment plant. Once the water reaches the plant it is filtered, it then goes into our 120,000-gallon clear well where sodium hypochlorite is added for disinfection. Post clear well we add sodium bicarbonate for alkalinity, polyortho phosphate for corrosion control and fluoride. Finished water gravity-flows into our one million-gallon storage tank then out into distribution. Our distribution system consists of approximately 35 miles of pipe ranging in size from 2"-20", four storage tanks, one pump station, 315 fire hydrants, 2,000 services, and serves 8,000 customers daily. Four employees maintain the distribution system and the treatment plant, which produces about 0.85 MGD. The plant runs 24 hours a day and is equipped with a full SCADA system, which allows the plant to be monitored "off shift" from anywhere. Finished water quality typically enters distribution around 0.030 NTU, 2.5mg/L TOC, 7.15 pH, 1.10 mg/L free Cl₂, 0.03 mg/L manganese, and a hardness of 23-24 mg/L.

What was your first ever job? My first full time job was stocking shelves at a grocery store. When I graduated high school I was offered a job stocking shelves in Claremont. I lived in Concord, so I drove an hour each way for over a year. Two hours a day is a long time to think about what life had in store for me and I knew it wasn't stocking shelves.

How long have you been in the profession? I had a friend who I played softball with who worked at a pipe supply company in Concord. They needed someone to load trucks in the yard. So, in 1998, when I was 24 years old, I started a new job. Over time, I learned what different pipe was used for and what fittings would go with each job. After 1 ½ years, I took over as their service technician, doing everything from 12" insertion valves, fusing 30" PE pipe, to testing back flows and testing large diameter meters.

My first municipal job was with the City of Concord in 2011. I worked in the distribution department for four years before I moved my family to the Upper Valley for a job with the Town of Hanover as the Senior Water Technician. This was my first job on the water treatment side of the industry but having a great team to work with made it an easy transition. It's close to 20 years in this profession and I've really enjoyed it.

What is your favorite part of being a water works operator? One of my favorite parts of being involved in this industry is the people. I know that's what everyone says but it is true. They all have the same job to do. They are all very proud of the jobs they do and proud of the system they have. They all like to talk about how they like to do things and it's not a competition. There are no trade

secrets, no one trying to outdo anyone and that is what makes this industry special.

What have you learned that you wish you had known when you first started in the industry? Chemistry! I wish I had known what I was going to be doing in 20 years when I was back in high school. So much of being a water treatment plant operator involves chemistry that a background would have been very helpful for me.

What advice do you have for new operators? The best advice I can give to a new operator is to have a passion for what you are doing. That could go for anything in life but especially for a water works operator. This profession means working some long cold nights dealing with mud and ice-cold water, but I really enjoy the career I have chosen as a water works operator. 💧



Dylan McDermott,
grade 2 treatment & distribution, certified backflow tester

Sludge Eating “Bugs,” Sewer Cameras and Glacier Samples, Oh My!

Fourth Graders learned about all things water during the Drinking Water Festival and Science Fair on May 9. The festival was held in Plymouth and hosted 240 children, who rotated through dozens of interactive activities. They took samples of water treatment “bugs,” observed them under a microscope and were riveted watching live video footage from a sewer camera as it cruised down a pipe. Students had a rare opportunity to learn about ancient history and modern science with a 5,000-year-old glacier ice core sample. Students also dived into water conservation, the water cycle and wildlife, to name a few other topics.

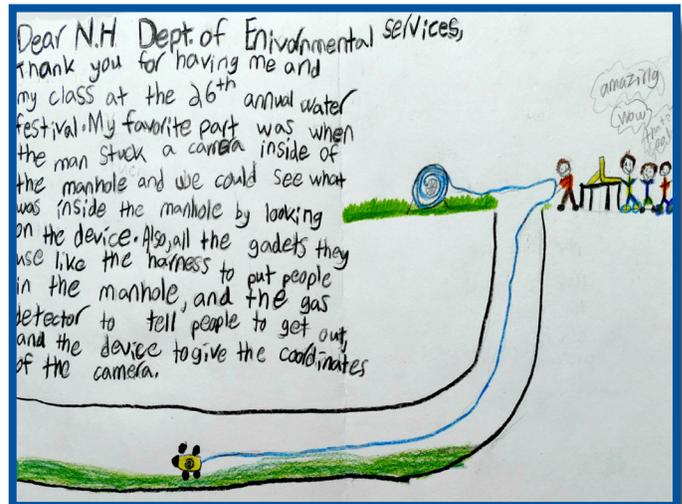
Meteorologist Hayley LaPoint presented awards to Water Science Fair and Poetry Contest state finalists at the Flying Monkey Theater. Poetry finalists read their compositions to everyone from the stage – proud moments in these young students’ academic careers!

What did students think of their day?

- “I would go again if I had the chance. My favorite exhibit [sic] was when we were using sponges to show how water runs off certain areas [sic]. Thank you!”

- “It was one of my favorite field trips!”
- “I never knew that when you do stuff like wash your car or water your garden all the water and soap goes to a storm drane [sic].”

This event was made possible and amazing by our hosts: Plymouth Village Water and Sewer, Plymouth Park and Recreation, the Plymouth Regional Senior Center, volunteers from across the state and generous donations. If you would like to learn more, please contact Lara Hooper at lara.hooper@nhdes.gov. ♦



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