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Got Water?

Joe Meek from DEQ’s Sourcewater Protection Program sent this photo of a flowing well in Gallatin County owned by Montana Fish, Wildlife and Parks. The high run-off in 2011 moved the bank of the Madison River, leaving the well about 8 feet from shore. While the well still flows with 8 PSI of closed-in pressure, it will soon be abandoned by a licensed driller. Water in this well is not under the direct influence of surface water, but obviously the wellhead and casing are!

MEHA Announces Award Winners at Fall Conference

The Montana Environmental Health Association recognized four people for their outstanding service to the field of Environmental Health at the Fall conference in Billings. Beth Norberg of Lewis and Clark County received the Donald Pizzini Outstanding Achievement award. Corrine Rose of Pondera/Teton County received the William G. Walter Outstanding Sanitarian award. Laura Brusky of Cascade County was given a Certificate of Recognition, and Jason Seyler, an Environmental Scientist for DEQ, received the Distinguished Service award.

Congratulations to each of these folks for jobs well done!
From the Editor

I write this on the last day of what was a tumultuous year at the Environmental Health Department in Ravalli County. Our most senior sanitarian, Morgan Farrell, retired after 15 years of service to our county; our next most senior sanitarian, Dan Hooten, spent a good part of the year recovering from surgery, and our newest sanitarian, Anthony York, was laid off due to county budget cuts.

Our resulting smaller staff is now dealing with a wider array of issues — condominium conversions, open-burning complaints, dumpsites on county land, newly approved wastewater treatment systems, ... It’s enough to make your head spin!

This issue of our newsletter is chock full of good stuff and I hope you enjoy it. As always, I appreciate those individuals who took the time to submit articles and photos.

Thank you! Rod Daniel, R.S.

MEHA President’s Message

The MEHA board has been hard at work, meeting monthly via phone conference.

The conference planning committee will begin meetings in January with Montana Public Health Association (MPHA) to plan our second joint conference. Tentative plans are to hold the conference Oct. 1-3, in Butte, at The Copper King Hotel and Conference Center. It is hard to believe it is time to start planning already!

The planning committee will listen carefully to the ideas generated from the post-conference survey and evaluation and will try to bring you an interesting conference while fulfilling your Continuing Education needs.

Meetings will also begin this month with MEHA, MPHA and AMPHO (Association of Montana Public Health Officials). As voted by the membership, these three associations will explore a partnership to strengthen our ability to respond to legislation which impacts public and environmental health. I will attend these meetings along with Legislative/Resolution Committee Co-chairs Christine Hughes and Marylou Gilman.

2012 looks to be an exciting year for MEHA! I wish for you a wonderful and restful holiday season as we recharge for the year ahead!

Karen Solberg, MEHA President
Meet the new MEHA Board

From Left to Right in picture above: Christine Hughes, Past President; Joshua Juarez, Treasurer; Erik Leigh, Director; Karen Solberg, President; Ruth Piccone, President- elect; Clark Snyder, Secretary; Frank Prescar, Director.

Below: (left) Mary Lou Gilman, Director; (right) Steve Kilbreath, Director.

Missing: Laurel Riek, 1st Vice President
Food Safety

NEHA has recently started utilizing the Industry-Foodborne Illness Investigation Training (I-FIIT). The program is a one-day, face-to-face workshop designed to bring together food service representatives and their appropriate local and state regulatory officials in an effort to create stronger working relationships prior to the occurrence of a foodborne illness incident. The goal is to have a framework for a collaborative effort in place if and when such an incident occurs.

Additionally, the workshop will provide a better understanding and clarification of the investigation process by identifying roles and responsibilities, discussing early detection strategies, and establishing and implementing control measures based on model practices. By providing this training, I-FIIT aims to assist industry and regulatory officials in producing a more rapid, efficient and effective response to foodborne illness incidents. For more information check it out on the NEHA website.

Swimming Pool

NEHA wants all members to be aware that currently there are two modules of the Model Aquatic Health Code open for public comment. Comment periods end on December 29, 2001, so get your comments in soon. You can view the proposed code and make comments at: http://www.cdc.gov/healthywtr/swimming/pools/mahc/

NEHA is continuing work with professionals and associations on the possibility of a multi-agency swimming pool award that will recognize an outstanding swimming pool program in the country.

Consulting Programs

The Center for Priority Based Budgeting (CPBB) is moving forward at breakneck speed. The Center has recently contracted with Green River, WY, and is in negotiations with two more towns in Wyoming. The center is also nearly ready to announce its first contract in Montana.

NEHA and CPBB have been helping communities across America as they struggle to develop meaningful and fiscally prudent budgets. Revenues are down and demand for services from citizens is up. Many citizens believe governments have the money to provide the services they want and even that waste is available to cut. Policy makers often believe fiscal policy should center on spreading the pain (with equal cuts across the board) with no appreciation for unintended consequence.

The creative, organic, and diagnostic process developed by the CPBB progresses from a diagnosis to a prescription that ultimately enables communities to link funding decisions to their avowed priorities. The process brings together government finance officers, policy makers, and community citizens to make decisions that better align the community's resources with what the community and its leaders value the most. Accomplish this and you've attained Fiscal Health and Wellness.

If your community could use some help prioritizing its limited budget, I encourage you to let your policy makers know about the Center. You can find more information about the Center on the NEHA website.
The NEHA Board of Directors has been discussing a possible realignment of regions so that the numbers of NEHA members are more equally distributed through the different regions. Though this is proving a difficult task, some changes have been made. The Past Presidents affiliate was added to Region 3 during the fall board meeting and then removed during our winter meeting. During the recent winter board meeting, Region 3 gained the Jamaican and Saudi Arabia affiliates. These two regions are the only two that are not in the United States and the board felt that they should be represented by the headquarter region, which is in Denver. This may only be a temporary change due to the new International Partnership Status that these two affiliates may choose.

NEHA Section Chairs are now known as Technical Matter Advisors

With our recent change in the name and roles of Section Chairs to Technical Advisors, our President, Mel Knight, has been busy filling the roles for his remaining time in office. This change has been a tedious exercise but is coming to a conclusion before Christmas. Stay tuned to the website to see who will represent the different fields of Environmental Health.

Don’t miss the upcoming NEHA Annual Educational Conference and Exhibition (AEC) in sunny Southern California. This year the AEC will be held at the Marriott Marquis and Marina June 28-30, 2012, in San Diego, Calif. Make your reservations now to spend time with NEHA on the beaches of the Pacific Coast.

Our Keynote speaker for the AEC will be Google’s own Tom Frey who has an incredible knack for imaging what the future will look like and driving his company in that direction. Many of us have seen the budget cutbacks and reduced workforces in our industry and look for ways to replace those budgets and increase our staffing to previous levels. Instead, we should be looking at the trends that are driving our workforce and prepare for the most likely future. Tom Frey’s presentation is geared toward getting us to think about these new realities.

The UL Event this year is a great opportunity to get familiar with the unique culture of San Diego and to experience one of the great US Navy ships of WWII by touring the USS Midway and Museum. It’s like going to sea without leaving the port! Attendees will be served dinner in the huge hanger bay and will be able to tour the flight deck where attendees will get to explore more than 60 exhibits with a collection of 27 restored aircraft. Special tours will be available to take small groups on a full tour of the ship including the mess hall, sleeping quarters and throughout the ship. The gift shop will also be available for fabulous souvenirs. This is a great opportunity to experience history first-hand and to see why San Diego is still considered a “Navy Town”. For more information on the USS Midway and Museum visit: http://www.balboapark.org/conservancy

Future AECs include:

2013 Washington DC. This AEC will be pushed very close to the 4th of July for anyone who might want to take a family vacation to the nation’s capital on the 4th.

2014 NEHA will host the World, with the International Federation of Environmental Health (IFEH) meeting in the States. Negotiations are nearing an end and a location may be decided by New Years.

Roy Kroeger is a Registered Environmental Health Specialist and supervisor for the Cheyenne/Laramie County, Wyo., Health Department. He currently serves as Regional Vice President for Region 3 of the National Environmental Health Association.
Finley Point, MT Case Study - Quanics Level II Treatment & Drip Irrigation

By: Philip Kedrowski, PE, LEED-AP
Redleaf Consulting, PLLC

Finley Point on Flathead Lake is one of the most beautiful and prestigious places to build a home in Montana. Located in Lake County just outside Polson on the Flathead Indian Reservation, Finley Point is also home to a very sensitive ecosystem. Because of this, the Lake County Health Department is always searching for better technologies to treat and disperse wastewater near the lake.

Donald Saisbury, R.S. recently issued a permit for the installation of a Quanics Aerocell Advanced Treatment System (ATS) and Drip Irrigation dispersal system for the five-bedroom Busha Family residence located on Finley Point. Quanics Aerocell ATS’s are designated as Level II wastewater treatment systems by the Montana Dept. of Environmental Quality (MTDEQ) and are also NSF/ANSI certified. The NSF Wastewater Technology Test Center is currently the only third party wastewater treatment test center in the U.S. During NSF/ANSI certification testing, the Quanics Aerocell delivered extremely low results for three critical effluent treatment measurements: Biochemical Oxygen Demand (CBOD₅), Total Suspended Solids (TSS), and Total Nitrogen (TN), (See table).

<table>
<thead>
<tr>
<th></th>
<th>CBOD₅</th>
<th>TSS</th>
<th>TN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 mg/l - mean</td>
<td>2 mg/l - mean</td>
<td>9 mg/l - mean</td>
</tr>
</tbody>
</table>

These low levels of TSS and CBOD allow effluent to be dispersed through a pressurized drip irrigation system. Although drip irrigation dispersion is relatively new in Montana applications, it is very commonly used throughout the United States with advanced treatment systems.

Saisbury stated that Level II treatment with drip irrigation is a good solution for Finley Point and other sensitive ecosystems. The Busha treatment system consists of a 1,500g septic tank, a 1,000g treatment dose tank, a 500g drip irrigation dose tank, and a Quanics ATS-8 (8 ft long module).

The system is sized to treat wastewater from a five-bedroom, 400 gpd residential structure and is designed to continue treatment of the wastewater even during periods of low use, using a 20/80/100% recirculation device. Under normal conditions, this device will return 80% of the effluent to the head works of the treatment train for the optimal 5:1 treatment dose ratio. However, when no new effluent enters the system, the device will return 100% of the effluent to the head works of the treatment train. This helps maintain microbial populations within the media that perform the treatment and enables uninterrupted treatment of wastewater during periods of low use. This technology makes Quanics systems a great option for resort and vacation properties.

The system was installed by licensed site installer David Graham and the general contractor for the project is Traditional Homes, Inc. An engineer from Redleaf Consulting, PLLC was on site to oversee the installation. Redleaf Consulting is an engineering design company and the Certified Dealer for Quanics in Montana, Idaho, and Wyoming. Hans Lund, owner of Traditional Homes, Inc. reported the project installation went smoothly and that he was happy to see the engineer and dealer on site to answer questions.

The initial system startup will be scheduled following the completion of the structure. Philip Kedrowski, PE of Redleaf Consulting, PLLC plans to be on site to facilitate the start up. If you would like more information regarding the Quanics Advanced Treatment Systems, contact Philip @ 406.995.2996.
By Rod Daniel, R.S.

Ravalli County Environmental Health recently permitted the state’s first Advanced Enviro-Septic (AES) Wastewater Treatment System. Developed by Presby Environmental, Inc. of Whitefield, N.H., the AES system purports to provide advanced treatment of effluent inside the absorption system, passively, without the use of pressure distribution. If pumping to the drain filed is required, effluent will be sent to a distribution box and dispersed via gravity to the special AES absorption pipe.

The AES system has been approved in more than a dozen states and in Canada and has received NSF Standard 40 certification. The AES system is designed to purify wastewater that has received primary treatment in a septic tank and to disperse the treated wastewater into the underlying soils. Basically, the system consists of 10-inch diameter, corrugated plastic, perforated pipe, surrounded by a green plastic fiber mat, which, in turn, is surrounded by black geotextile fabric. A white bio-accelerator fabric lies below the pipe, sandwiched between the pipe and the green plastic fiber. The AES pipes are surrounded by at least 6 inches of ASTM C-33 treatment sand.

Effluent is retained for awhile in the pipe, where it is aerobically treated on multiple surface media, before being dispersed in the receiving soil. The continual cycling of effluent (i.e., the rising and falling of liquid inside the pipe) enhances bacterial activity. The AES system is vented to ensure a steady flow of oxygen throughout the system. It also has a number of amenities designed to prevent clogging of the fabric.

Extensive testing of the AES system has revealed impressive numbers for reduction of Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD) beneath the drain field. It is these numbers – TSS less than 30 mg/L and BOD less than 25 mg/L – that prompted Montana DEQ to grant a 50 percent reduction in drain field size for the AES system.

The system Ravalli County permitted needed such a reduction in order to fit the drain field on a site with limited space; in fact, that is the reason the consultant opted to use the Presby AES system. But since DEQ-4 Design Standards for Subsurface Wastewater Treatment Systems does not currently allow such systems, the Department had to grant deviations from the following rules:

DEQ-4 8.3.2.3 “Gravity-fed and gravity-dosed absorption trenches must be separated by at least 5 feet between trench walls.” Deviation: Presby laterals may be placed two feet on center.

DEQ-4 13.2.3 “The absorption size in square footage per Chapter 8 may be reduced in size by 25 percent when using infiltration or leaching chambers.” Deviation: Gravelless systems with NSF Standard 40 approval may be reduced in size by 50 percent when soil percolation rates are less than 60 minutes per inch.

DEQ is in the process of updating DEQ-4 and final changes on the document should be complete in spring 2012. Those changes include allowing a 50 percent reduction in drain filed area when a system has NSF 40 approval and allowing other gravelless systems to be installed in accordance with DEQ-approved manufacturer’s recommendations. So when the changes to DEQ-4 have been adopted, the Presby AES system will no longer require deviations from DEQ-4.

According to Steve Kilbreath, DEQ Subdivision Review section supervisor, BOD and TSS reduction is what dictates drainfield reductions. It was, according to Kilbreath, these reductions in BOD and TSS that allowed intermittent sand filter, recirculating sand filter, and recirculating trickling filter systems the reductions they receive in DEQ-4. Furthermore, he said, recognizing NSF 40 as a standard that justifies a 50% reduction in drainfield sizing is an industry standard practice.

The attributes of the Presby AES system include greater versatility on sites with limited space, steep slope, mature landscaping and pavement. Because it is vented and because it can be configured in a multitude of shapes, it can be installed on sites where conventional drain fields would not work.

For more information on the Presby AES Wastewater Treatment system go to http://presbyeco.com
Erionite: An Emerging North American Hazard

by David Weissman, M.D., and Max Kiefer, MS, CIH

Erionite is a naturally occurring mineral that belongs to a group of silicate minerals called zeolites. It is usually found in volcanic ash that has been altered by weathering and ground water. Like naturally occurring asbestos, deposits are present in many Western states (see map).

Erionite can occur in a fibrous form. Disturbance of this material can generate airborne fibers with physical properties and health effects similar to asbestos. For example, it has long been known that residents of some Turkish villages where erionite-containing rock was used to construct homes have a remarkably high risk for development of malignant mesothelioma.

Until recently, erionite was not generally considered to be a potential hazard in North America, in part because relatively little risk for exposure was seen. However, evidence has slowly accumulated linking exposure to erionite with serious adverse health effects in North America, and suggesting that some workers may have a greater potential for exposure than previously recognized.

The first North American with erionite-related lung disease was recognized in Utah and reported in 1981. He was a road construction worker who lived in an area rich in zeolite deposits. He had extensive parenchymal and pleural fibrosis and had a lung biopsy revealing the presence of both fibrous and nonfibrous particles which had compositions determined by energy-dispersive X-ray analysis to be consistent with erionite.

In 2008, a mesothelioma cluster was described in the vicinity of a small village in a zeolite-rich region of central Mexico. The same year, two additional cases were reported from a neighboring Mexican state. One of them underwent lung biopsy and examination of tissue showed a high burden of erionite.

In 2009, a mesothelioma case associated with pulmonary interstitial fibrosis, pleural plaque formation and substantial lung burden of erionite was documented in a man who had lived in Mexico and the United States.

In 2011, the results of a study conducted in southwestern North Dakota were reported. The study was motivated by the realization that, since the 1980s, gravel pits had been excavated in areas containing erionite deposits and the gravel used to surface local roads and other areas. Ambient and activity-based sampling was performed and demonstrated the potential for airborne fiber exposures. Individuals with potentially high exposures were identified and underwent careful clinical evaluation. Two with histories of road maintenance work (one had also worked in a local gravel pit) were found with mild bilateral localized pleural changes with calcification and minimal unilateral and bilateral lower lobe interstitial changes that could only be seen by CT scan. Other than erionite, neither reported potentially causative exposures.

There are no regulatory or consensus standards or occupational exposure limits (OEL) for airborne erionite fibers. Development of a quantitative OEL awaits development of a standardized, validated exposure assessment method and quantitative evaluation of risks associated with given exposures. Still, The National Toxicology Program has designated erionite to be a known human carcinogen and a study by the U.S. Geological Survey found that erionite fibers from the Cappadocian region of Turkey, North Dakota, and Oregon were chemically and morphologically similar.

Little is known about exposures currently experienced by US workers. However, erionite-related disease has most often been reported in road construction and maintenance workers with potential occupational exposures to erionite-containing gravel used in road surfacing. Also, one case had worked in an erionite-containing gravel pit (but had also been a road (Continued on page 9)
Erionite fibers only pose a hazard if they are disturbed and become airborne, and control recommendations should focus on reducing the potential for exposure to airborne erionite fibers. Activity-based breathing zone air sampling has confirmed that when gravels containing erionite are disturbed, erionite fibers can become airborne. Intensity of these exposures may vary due to a number of factors, including the weather conditions (damp vs. dry, windy vs. calm), the intensity with which erionite-containing materials are disturbed and the concentration of erionite in the gravels being disturbed. However, bulk gravel erionite concentrations alone are not a reliable predictor of air concentrations, as disturbance of gravels containing erionite in "trace" amounts (<0.2%) can sometimes result in relatively high airborne fiber concentrations.

These data support the need to implement precautions to protect workers by limiting the generation and inhalation of dust known or thought to be contaminated with erionite. A reasonable approach based on current information would be to take precautions such as those described in existing guidance for working with asbestos (Occupational Safety and Health Administration [OSHA] 29 CFR 1910.1001). Existing recommendations for working in areas with naturally occurring asbestos may be particularly relevant to reducing outdoor occupational erionite exposures.

Risk reduction recommendations to limit erionite exposures of workers who engage in activities that disturb erionite-containing gravel/soil or crush rocks that contain erionite can include:
- Training workers about the potential hazards of erionite and control methods for reducing the potential for exposure
- Knowing where erionite containing material is present and will be encountered prior to beginning any work
- Avoiding the use of erionite containing aggregate whenever possible
- Using wet methods to reduce dust generation for road and other work such as in quarries where erionite is present

- Limiting the number of workers who will be engaged in work with erionite
- Establishing decontamination protocols including change of clothing, showering before leaving the worksite, and appropriate cleaning/disposal of personal protective equipment
- Ensuring work clothing is not washed at home to prevent erionite fibers from being brought home on work clothes and boots
- Prohibiting dry sweeping, the use of leaf blowers, or the use of compressed air for cleaning
- Protecting employees with personal protective equipment, including respiratory protection.
- Prohibiting eating, drinking, or smoking in dusty work areas where erionite fibers may be airborne. Workers should move away from the work area for breaks and wash their hands and face before eating, drinking, or smoking.
- Establishing protocols for vehicle use on erionite containing roads (drive slowly, vents closed, windows up)
- Wet washing equipment and vehicle exteriors, and wet cleaning/High Efficiency Particulate Air (HEPA) filter vacuuming of vehicle interiors.
- Following Environmental Protection Agency (EPA) procedures for proper dispose of waste and debris that contains erionite.
- Limiting bystander exposure by preventing visitors and coworkers from standing in work areas where erionite fibers may become airborne.

Although much remains to be learned about erionite in the US, airborne occupational erionite fiber exposures should be considered at least as hazardous as asbestos fiber exposures and similar preventive measures used. We look forward to working with our scientific colleagues to stay informed about further occupational health data relating to erionite as more studies become available, and we invite you to consider what scientific and technical questions you would have about this emerging occupational health issue.

Dr. Weissman is Director of the NIOSH Division of Respiratory Disease Studies.
Mr. Kiefer is Director of the NIOSH Western States Office.
High nitrate levels in the ground water of a Missoula neighborhood posed a problem for businesses and developers. Peak Health & Wellness Center was unable to expand, Watson Children’s Shelter was undersized and turning away children in crisis, and Mostad Construction was unable to develop land they owned in the area.

Addressing this problem, these businesses contracted with Territorial Landworks, Inc. (TLI) to develop a solution for the groundwater issue. The Territorial team considered a number of options, from wastewater lagoons to advanced treatment systems. In the end, they decided upon a Sequencing Batch Reactor (SBR) system.

An SBR is a variation of the activated sludge biological treatment process. Activated sludge is made up of aerobic bacterial flocs. Aerobic floc has a metabolic rate approximately ten times higher than anaerobic sludge, and that rate can be further increased by exposing the bacteria to an abundance of oxygen. Compared to a septic tank, which takes several days to reduce organic material, an SBR tank can reduce the same amount of organic material in approximately four to six hours. This allows for a much higher degree of process efficiency and the ability to produce effluent with concentrations of nitrate less than 10 ppm. As a result of their high level of treatment and ability to automate the process through advances in computer controls, SBR systems have become increasingly popular over the past few decades.

TLI contracted with Northwest Water Systems (NWS) to develop an SBR system using square concrete tanks. Previous SBR designs researched during the preliminary stages of the project utilized fiberglass tanks. During the design process we found that using concrete, with the proper additives, would allow a faster more economical construction schedule as well as a more efficient use of available space.

The Peak SBR system is made up of the following components:

- Distribution Tank: Collects influent.
- Four 6000 gallon SBR tanks: Fluctuates between aerobic and anaerobic stages to perform biological treatment.
- Filter Feed Tank: Uses polymer to settle out suspended particulate.
- Sand Filter: Removes remaining suspended particulate.
- UV disinfections: Removes 99.9% of bacterial contaminants within the effluent.
- Dose Tank: Treated effluent is discharged to common drainfield.

We’ve been operating the SBR system for 14 months now and have achieved levels of treatment as low as 2 ppm nitrate. Discharging effluent of this quality will slowly help the existing groundwater plume as over time, the clean effluent will work to dilute the contaminated groundwater.

Through the cooperation of TLI, NWS, Montana DEQ, and the Missoula County Health Department, the Peak Wastewater System has proved to be a success. Where originally it was thought that any future development was impossible, Peak Health & Wellness Center, Watson Children’s Shelter, and Mostad Construction have been able to undertake their projects and over time the SBR system will help to improve the existing groundwater issues in the area.