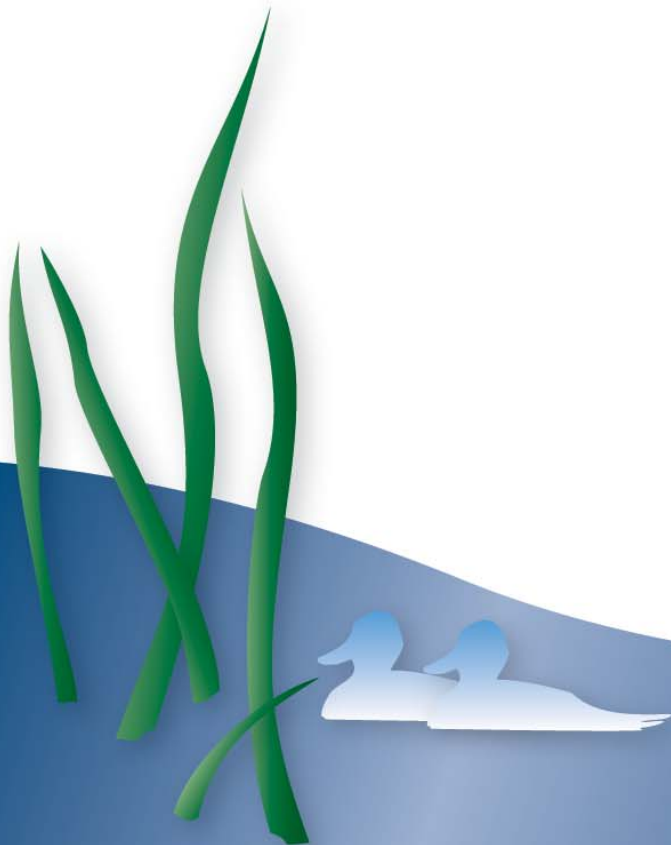


Volume 20, Number 1

# HAZMATTERS





## A MESSAGE FROM THE PRESIDENT, CELESTE SUTTER, CHMM

Dear Fellow Chapter Members,

Since I am relatively new to KCHMM, I feel I should begin this message with an introduction. I have worked at Hanover College for 20+ years, first as a Lab and Safety Coordinator for the Science Division and for the last 15 years, as the campus Environmental Health and Safety Officer. Working for a small, private educational institution in this field has proven to be extremely challenging—in any given week I might have to clean up a hazardous materials spill, conduct employee safety training, and investigate a possible infestation of bedbugs. (This sounds like a topic for a future HazMatters—“Wearing Many Hats, Without Losing Your Head: The Challenges of an EH&S Professional”). I enjoy my work and I am invested in promoting awareness of environmental health and safety issues. I am also deeply committed to learning more about this ever-changing discipline.

As you know, the field of Environmental Health and Safety is not static. New regulations, updates to current regulations, new technologies, and modifications to work practices all keep EH&S professionals “on their toes”. The management of hazardous materials traverses multiple disciplines—it intersects with aspects of public health, transportation, emergency response, homeland security and environmental stewardship. It is a critical part of manufacturing, general industry, education, health services, occupational health, waste management, and numerous others. We bring to the table varied backgrounds and expertise to which KCHMM tremendously benefits. In sharing information about our particular fields, we acquire new knowledge and understanding of EH & S subjects. We can then put this knowledge into practice in our own fields, as well as in our everyday lives.

I think it is important to revisit the mission statement of our Chapter. The purpose of the KCHMM Chapter is:

- to collectively represent and to safeguard the common interests of the members of the hazardous materials management profession;
- to cultivate, promote and sustain the profession of hazardous materials management;
- to elevate and maintain the professional character and education of hazardous materials managers;



### ISSUE HIGHLIGHTS:

- Page 3: Earth Day at the Zoo
- Page 4: Kentucky Legislative Update
- Page 4: KCHMM at the Science Fair
- Page 5: Accepting Nominees for the Rachel Davis Award
- Page 6: May Meeting Invitation
- Page 7: Feature Article by Ralph McCord
- Page 14: Adult CPR/AED Course Offered

### EARTH DAY AT THE ZOO - WE WANT YOU!

Submitted by **Corinne Greenberg, CHMM**

The Louisville Zoo will hold its annual Earth Day celebration on Saturday, April 23, 2011. From 10:00 AM – 2:00 PM they will have an Earth Day extravaganza to conclude their month-long “Party for the Planet.” KCHMM will sponsor a children’s craft booth at this Earth Day celebration, making environmentally-friendly bird feeders out of pinecones and peanut butter! (Yum!) Accordingly, we are now accepting volunteers willing to donate two hours of their time on what will hopefully be a sunny Saturday in late April. Please consider your interest in volunteering your time & talent in this very meaningful way. If you would like to volunteer and have not already done so, please email [corinne.greenberg@iconserv.com](mailto:corinne.greenberg@iconserv.com) at your earliest opportunity. Thank you for your consideration. Happy (Early) Earth Day to All! Members already signed up include Baker, Bascom, Benson, Coombs, Crooks, Price, and Tucker. Thank you!

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*A Message From the President, continued from page 2:*

- to contribute toward the protection of human health and of the environment; and,
- to facilitate the exchange of ideas to improve administration of hazardous materials management programs.

The Board of Directors is making a concerted effort to promote and advance the mission of the Chapter. I would like to take this opportunity to encourage you to consider your involvement with KCHMM. The success of this organization requires quality leaders, good communication, invested members and effective recruitment. KCHMM has recently persevered through the work of a relatively few dedicated individuals—I would like to change this trend. I understand fully the challenges of squeezing more commitments into an overloaded schedule; your contributions may be small, but collectively they have a significant impact. At a minimum, please keep your contact information and dues current. Please attend the technical programs and consider a greater contribution of your time and talents to our organization. I offer the following suggestions: 1) volunteer for one of the committees, 2) run for an office, 3) submit a newsletter article, 4) suggest or present a technical program, 5) propose ideas for the website, 6) volunteer for a community outreach project, 7) conduct a training program, 8) bring a colleague or friend to a meeting/technical program, 9) donate door prizes, or 10) simply promote the organization and the credential to your colleagues.

If you were previously active and are now lurking on the mailing list, if you just haven’t gotten around to renewing your membership, or if you’ve considered membership but haven’t officially joined, please mark your calendars now and plan to join KCHMM at the next meeting and technical session on May 11<sup>th</sup>, 2011. Bring a colleague, socialize and network with other EH&S professionals and enjoy the program. I will send details about the topic and our new venue soon, via email.

I look forward to seeing everyone in May!

**Celeste Sutter, CHMM**  
KCHMM President

## NEW CHAPTER MEMBER

Please welcome new KCHMM Member **Danny Carroll!**

## KENTUCKY LEGISLATIVE UPDATE

Submitted by **Lauran Sturm, Stites & Harbison**

DAQ has proposed an amendment to 401 KAR 51:052, Review of New Sources in or Impacting upon Nonattainment Areas. The amended regulation allows for the use of emission offset credits for new permit applications received after source shutdowns and curtailments in production or operating hours. The current regulation only allows for emissions offset credits if a permit application is received before a source shutdown or curtailment. In addition, the amendment clarifies the ratios of actual emissions reductions to emissions increases for purposes of offset requirements. A public hearing for the proposed amendment will be held April 26, 2011, at 10 a.m. in conference room 201B at DAQ offices, 200 Fair Oaks Lane, Frankfort.

DWM is also proposing amendments to the UST regulations. The new provisions would require secondary containment for all new and replaced tanks, piping, and spill buckets and would prohibit delivery to tanks that are out of compliance with the requirements for spill prevention, release detection, or overflow or corrosion protection or to tanks whose leaking components have not been repaired or replaced. The proposed amendment would also establish screening levels for permanent closure and investigation assessments, in place of final cleanup standards that apply throughout the corrective action process. DWM plans to file the amended regulations with the LRC in mid-April.

On March 16, Governor Beshear signed into law Senate Bill 70, which amends KRS 224.1-530 to require use of the Region 3 Regional Screening Levels, rather than the previously used Region 9 Preliminary Remediation Goals, as screening levels. The bill also requires the Cabinet to use the Risk-Based Concentration Table User's Guide.

## ENVIRONMENTAL STEWARDSHIP IN ACTION - KCHMM AT THE SCIENCE FAIR

Submitted by **Corinne Greenberg, CHMM**

This year KCHMM adopted the Louisville Regional Science Fair as the beneficiary of its main stewardship focus. The Louisville Regional Science Fair, recently held March 12, 2011, provides an opportunity for high school and junior high students from 11 counties in the Commonwealth to showcase their scientific accomplishments with the hopes of moving on to statewide and national competition. This regional fair is only possible through the support of hundreds of local volunteers supporting these students in their work. Accordingly, KCHMM is proud to share that not only did eight of our members volunteer their time and talent as judges, but the Chapter also sponsored a \$300 special award in the field of environmental management. And, not only did we gain the inherent satisfaction associated with philanthropy, but we also earned recognition as an "Environmental Advocate" in the KY EXCEL program. Win-win-win!

*Continued on Page 13...*

## NOW ACCEPTING NOMINEES FOR THE RACHEL DAVIS AWARD

Submitted by **Corinne Greenberg, CHMM**

It is not too early to nominate a fellow certified Chapter member to receive the 2011 Rachel Davis Award. This award was established years ago to keep alive the memory of past KCHMM President, environmental colleague, and friend Rachel Davis by honoring her legacy. This award will be presented at the 2011 social meeting (date & venue yet to be determined). The official nomination form will soon be posted on the Chapter website but, if you are already ready to recognize someone, you can now submit your Award nomination(s) according to the following protocols:

Candidates shall be nominated by a fellow KCHMM member (no self-nominations). Nominees must be **certified** Chapter members in good standing as of March 1, 2011. Nominees shall have publicly demonstrated commitment to the Chapter and its mission. Preferred candidates will show civic involvement/leadership in environmental, safety, and humanitarian causes.

Nomination should consist of:

- o Date of nomination
- o Person submitting the nomination
- o Person being nominated
- o Briefly describe how you believe this candidate has demonstrated commitment to the Chapter and its mission (no more than 250 words)

Briefly describe how you believe this candidate has demonstrated civic involvement and leadership in environmental, safety and humanitarian causes (no more than 500 words). Please **submit your nomination to last year's honoree Corinne Greenberg** at [corinne.greenberg@iconserv.com](mailto:corinne.greenberg@iconserv.com) or fax to her attention at 502-634-4227. The review committee made up of the last three winners (Greenberg, Goodman & Hildreth) will evaluate all nominations received and will select this year's winner. The 2011 honoree will be announced at the annual social meeting (tbd). The recipient will receive an award of one year of waived membership dues, recognition at the annual social meeting, and a free meal that evening.

Past years' winners are Corinne Greenberg, Al Goodman, Cheri Hildreth, Karen Blake, Jennifer Triplett, Evelyn Crooks, Jim Plum, and Brent Fryrear. Let the legacy continue!

## ACCEPTING SUBMISSIONS FOR THE NEWSLETTER

The Newsletter Committee happily accepts any items of interest to our general membership for inclusion in *HazMatters*. If you have industry information, training classes, chapter functions, technical articles, or other information for our members, please submit these items to **Bryant Lewis, CHMM**, *HazMatters* Editor, at [lewisbe@cdm.com](mailto:lewisbe@cdm.com). Thank you!

**NEXT KCHMM MEETING: WED MAY 11, 2011, RAMADA DOWNTOWN NORTH**

**KCHMM Meeting Invitation: May 11, 2011, Ramada Downtown North**

Located on Zorn Avenue: I-71, Exit 2  
1041 Zorn Avenue, Louisville, Kentucky 40207  
Phone: 502-897-5101

Please RSVP before 5:00 PM on Friday, May 6, to [sammonsvl@cdm.com](mailto:sammonsvl@cdm.com).

Our technical presentation will be on the topic of:

**"HOW NOT TO STEP IN IT FROM A LEGAL PERSPECTIVE WHEN CONDUCTING INTERNAL AUDITS"**

**KIM K. BURKE / Partner-Attorney-CHMM Taft Stettinius & Hollister LLP, Cincinnati, OH**  
(This technical session will earn you 1 CMP toward renewal of your CHMM or CHMP credential.)

Mr. Burke will address the Federal Program: "*USEPA Incentives for Self-Policing*" and state programs with a focus on KY, IN, and OH. His presentation will provide an excellent synopsis of the program requirements, which are 'policy' vs. 'law' and the balancing act of answering to 'two masters' (Fed and State programs), when conducting an audit at your facilities. He will also address disclosure requirements, the distinction of "voluntary" disclosure, "required" wording in reports, proper documentation and disclosure / compliance time limits. Mr. Burke will also review various pitfalls in the process that may increase a self-reporter's exposure.

The level of 'protection' each program offers, the impact of a 'repeat offender' history and 'immunity' from civil (percent penalty reductions), criminal and 'substantial economic benefit' exposure and penalties will be discussed. The presentation will also address the extent that each agency is bound by "Privilege & Confidentiality" for self reporting and the public availability of disclosed data via FOIA , regardless of agency action or inaction.

About the Speaker:

Mr. Burke serves as co-chair of Taft's Environmental Practice. He graduated from the University of Pittsburgh School of Law in 1980. After working for the Bureau of Legal Services of the Pennsylvania Department of Environmental Resources, Mr. Burke became associated with a Pittsburgh law firm specializing in litigation and environmental matters. In 1981 Mr. Burke joined the Taft law firm, where he has concentrated in environmental law areas and has represented clients in all media. Mr. Burke has represented clients in numerous environmental litigation, Superfund, RCRA, CAA, CWA and remediation matters in more than 25 states. Mr. Burke also counsels clients as part of Taft's Sustainability Initiative, including design, construction, engineering, permitting, operation and maintenance of sustainable buildings.

Please RSVP including your name and number of reservations before 5:00 PM on Friday, May 6, to our Treasurer, Vickie Sammons, via [sammonsvl@cdm.com](mailto:sammonsvl@cdm.com). **NOTE: RESERVATIONS MADE AFTER 5:00 PM ON 5/6/2011 WILL NOT QUALIFY FOR THE \$5 DISCOUNT.**

Visitors are always welcome! Please feel free to pass this meeting notice on to a friend or colleague. They need not be a member to attend (just RSVP by 5/6 and pay the \$25 discounted meeting fee).

Our dinner meeting schedule: Chapter Board Meeting 4:00 to 5:30 p.m., Social hour begins at 5:30 p.m. in the Hotel Lounge, Dinner served at approximately 6:15 p.m. in the Conference Room, Business Meeting will start at around 6:50 p.m., with Technical presentation immediately following (7:00 - 8:00 p.m.)

Meeting Costs: Cost for the meeting is \$25 for those that RSVP before 5 PM on Monday 5/6/2011, or \$30 if you do not RSVP. If you make a reservation and do not attend, an invoice for \$25 will be mailed to you. Make all checks payable to KCHMM.

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Ralph Y. McCord, P.E., in collaboration with Rengao Song, Ph.D. Eric Zhu, Ph.D., P.E. and Christopher Bobay, Scientist*

### **THEN – WATER QUALITY**

The History of Water Treatment in Louisville first began in 1854 when the Kentucky General Assembly chartered and incorporated the Louisville Water Company on March 6th. The City of Louisville purchased 5,500 shares in 1856, becoming the principal stockholder. By 1860, Louisville Water Company completed the construction of Pumping Station No. 1, the Water Tower, the first reservoir located near the present day Veterans Hospital, and distribution piping. On October 16<sup>th</sup>, water was first pumped to the reservoir from which it was distributed to 512 customers with an average daily pumpage of 650,000 gallons.

Chief Engineer Charles Hermany was interested in providing cleaner potable water for the customers of the Louisville Water Company and developed a strategy of extended settlement of sedimentation and the pursuit of better purification through filtration. The first stage was realized in 1879 when the current 100 million gallon Crescent Hill Reservoir was completed to provide improved water quality increased settlement time and more pressure with a capacity by benefit of the higher elevation than the first Reservoir.

In 1896, Chief Engineer Hermany gained the approval of the Board of Water Works to initiate water purification experiments and research in order to find ways of rapidly filtering particles from the water. Led by George W. Fuller, Bacteriologist & Chief Chemist (aka the Father of Sanitary Engineering), the Company tested methods of filtration, including: rapid sand filters, coagulants, electricity, chlorine, and combinations thereof. Following the publication of Fuller's Experiments, the BOWW approved the design and construction of a Water Filter Plant utilizing a new filtration method named rapid sand filtration in 1897. Construction of the filter house and clear water (potable) well was initiated in 1898 followed by the start of construction of the pump station and boiler house. A little over ten years later, the Crescent Hill Filtration Plant began operation on July 21, 1909 with 6 "Hermany" rapid sand filtration filters which were rated at 6.25 MGD including original coagulation basins. As a result, water bacteria and turbidity were reduced by over 99%. The number of typhoid deaths reduced from 58 to 26 per 100,000 of population. Never to sit still, LWC began to experiment with chlorination as a disinfectant to improve treatment on 1909.

As the decades continued, LWC continued to expand capacity and improve the water treatment plant's effectiveness in improving water quality. By 1914, an additional twelve filters with a capacity of 36 MGD were installed and were known as the North Filters. In 1928, a new filter building was constructed along with eight filters with a new design and capacity of 41.75 MGD. These East Filters brought the plant's total water filtration capacity to 84 MGD. The original "Hermany Filters" which had badly corroded were replaced with the new East Filter design and were renamed the South Filters in 1931. Two coagulation and softening basins were added in 1946. With the addition of Fluoride in 1951, Louisville was one of the first cities in the nation to be provided with this tooth decay preventative dosage.

1957 – Addition of the New, or Far, East Filters increased total filtration capacity to 126 MGD. First use of dual media filtration with anthracite added to the sand & gravel layers.

1958 – Softening Basins 3 & 4 are brought on line.

1950's & 1970's – The construction of present day North (1955) and South (1971) Coagulation Basins. This allowed for more effective chemical coagulation (alumina sulfate and now ferric chloride), and original coagulation/softening basins converted to solely softening and clarifying.

1962 – After success was seen in the New East Filters, anthracite is added to the filters in the East, South, and North galleries allowing longer filter runs and higher throughput capacity of approx. 2-3 GPM per ft<sup>2</sup> of filter surface area. Total firm filtration capacity raised to 180 MGD.

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 7*

1973 – Softening Basins 5 & 6 are brought on line.

1977 – Bert E. Payne Water Treatment Plant opened with 45 MGD firm capacity in Prospect (60 MGD design capacity).

2005 – The B. E. Payne Water Treatment Plant was renovated and upgraded the filters with the following features: 1) deeper filter bed media enabling higher filtration capacity (5 gpm per ft<sup>2</sup> of surface area), 2) a low profile under-drain system allowing for an air scour system & more effective cleaning, 3) capability to “waste” filter effluent water when during the filter ripening phase when the poorest operating performance occurs, and 4) an air scour system for a more effective cleaning of the filter beds.

The pursuit of high quality drinking water remains an integral philosophy of LWC. It routinely participates in the analysis and development of national drinking water quality regulations and requirements with the United States Environmental Protection Agency (EPA). LWC participated in the rule making for several new requirements that have forthcoming compliance dates that will help water utilities in the United States address current water quality challenges.

### **NOW – WATER QUALITY**

There are new EPA regulations that must be met no later than April, 2012. Specifically, they are the Long-term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfection and Disinfection By-product Rule. There remain several other major water quality concerns that need to be considered when determining how a water utility proceeds with coming into compliance with these new water quality treatment rules. They include organics in the raw water caused by chemical spills & pesticide contamination, taste & odor concerns caused by MIB (2-methylisoborneol) and geosmin that are generated by phytoplankton from diatoms to blue-green algae and actinomycetes, as well as inorganics natural and man-made sources. Other water quality concerns include black water and nitrification.

The Long-term 2 Enhanced Surface Water Treatment Rule (LT2) is intended to reduce disease incidence associated with *Cryptosporidium* and other pathogenic microorganisms in drinking water. Based upon operating data of the removal capability of a water treatment plant, the rule establishes criteria for how much of *Cryptosporidium* and other pathogenic microorganisms are being removed by the facility that is measured by mathematical removal in log function above the drinking water standard. Based upon LWC current treatment practice provides 3.5 to 4.0-Log credit for the removal of *Cryptosporidium*. It also establishes Bins for determining how much additional treatment removal capability must be added to a particular treatment plant based upon its source of supply. Monitoring results for LWC's CHFP source water determined that CHFP will be placed in Bin 2 and need 1-log additional *Cryptosporidium* removal. CHFP source water (Ohio River) is in Bin 2 of a possible 4 Bins that requires additional treatment for *Cryptosporidium* by April 2012.

The Stage 2 Disinfection and Disinfection By-product Rule (Stage 2 B/DBPR) to prevent high concentrations of trihalomethanes (TTHM) and haloacetic acids (HAA5). It requires that the locational running annual average (LRAA) for total TTHM does not exceed 80 µg/L at any monitoring location and that total HAA5 does not exceed 60 µg/L at any monitoring location. Current LWC treatment can meet the requirement.

There are additional water quality requirements for the removal of turbidity and organics as well as monitoring herbicides in the source water. There are two Filter Turbidity Goals that LWC pursues with



# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 8*

one being the Enhanced Surface Water Treatment Rule (ESWTR) and the other being the Partnership for Safe Water (PSW) Phase IV. The ESWTR requires a combined filter turbidity efficiency of less than or equal to 0.3 NTU 95% of the time with a maximum or spill of no greater than 1 NTU. If those levels are achieved, then the treatment plant earns a Cryptosporidium removal credit of 0.5-Log. The PSW Phase IV requires a combined filter turbidity efficiency of less than or equal to 0.1 NTU 95% of the time with a maximum or spill of no greater than 0.3 NTU. If those levels are achieved, then the treatment plant earns a Cryptosporidium removal credit of 0.5-Log.

LWC has an active daily and seasonal monitoring program for its source water. It uses information from the monitoring to assure the removal of organic compounds from the water as part of the treatment process. LWC is part of the Ohio River Sanitation Commission (ORSANCO) organic detection system. This system is designed to detect 21 purge-able organic compounds. LWC conducts seasonal monitoring which it reports to ORSANCO for daily spill monitoring by conducting daily immuno-assay and gas chromatography/mass spectrometry (GC-MS) from April to August and weekly immuno-assay and GC-MS from Sept. to March. Additionally, LWC monitors for taste and odor aesthetic qualities of its water from April through November each year. It uses human Taste & Odor Panels. Believe it or not, the human senses are more sensitive than most laboratory techniques. It also analyses with solid-phase microextraction (SPME) combined with GC/MS.

As a result of this source water and finished drinking water monitoring, LWC is able to adjust its treatment processes to remove organic compounds and treatment Taste & Odor problems with adding powder activated carbon at various locations in the treatment processes. This treatment technique is effective and efficient in removing those water quality constituents of concern. Of course, it is an additional cost for this treatment.

### **FUTURE – WATER QUALITY**

Emerging contaminants of concern for water quality in addition to those previously addressed by water quality regulations include Endocrine Disrupting Compounds (EDCs), Pharmaceutically Active Compounds (PhACs), Pharmaceuticals & Personal Care Products (PPCPs), Nitrosamines, Algae Toxins, as well as microbial and chemical contaminants listed in EPA's Contaminant Candidate List (CCL).

EDC is an exogenous agent which mimics natural hormones including binding with endocrine receptors, affecting synthesis, transport, metabolism, and excretion of hormones, and producing "unnatural" outcomes. Examples include pesticides, certain steroids, certain industrial chemicals (polychlorinated biphenyls (PCBs), dioxins, phenols, etc.), natural hormones found in animals, phytoestrogens found in soybeans, alfalfa, and other agriculture vegetative crops, as well as synthetically-produced hormones. Though there are several PPCPs that are EDCs, it is important to note that not all PPCPs are EDCs. So, don't feel like you have to give up your favorite deodorant.

There are various classes of PhACs. The classes include hormones and hormone-mimickers, antibiotics, blood lipid regulators, anti-depressants, tranquilizers, impotence drugs as well as X-ray contrast media. One of the major concerns is that these PhACs in the environment will result in the propagation of bacteria that are resistant to pharmaceutical drugs that are used today to cure humans of the effects of the precursor bacteria.

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 9*

Emerging Contaminants are a clear challenge to water utilities in producing potable water. Though their concentrations are very low, EDC and PPCP constituents are being detected in drinking water. Initial research indicates that some of these contaminants may cause eco-toxicological effects. Though acute reactions are not considered to be a human health problem concern as the pharmaceuticals detected in drinking water are several orders of magnitude below the therapeutic dosage, there are concerns pertaining to chronic effects. Of concern are those populations that are at sensitive life stages (e.g., infants, critically ill of all ages, and the elderly). Additionally, certain low-level drug combinations are being found to impact human cells. In the absence of current regulations, there is little to anticipate for future regulations especially given that the EPA's CCL seems to always be changing. There is the struggle with analytical capability to measure these compounds in the parts per trillion (ppt) concentration as well as capacity of all utility and commercial analytical laboratories to handle the anticipated regulatory required testing. Water utilities will have to determine how to modify their treatment processes to address these emerging contaminants as well as the need to educate their customers to alleviate their fears and uncertainty over these new perceived health risks.

The concentration levels that these emerging contaminants are being measured are in the ppt range. This level of analytical testing requires complex instrumentation and staff with advanced degrees. There are very few US water utilities that have this analytical ability. Further complicating the analytical testing market is that there are fewer than 10 commercial labs with the required capability. This leads to a perplexing problem for the regulating agencies. If pharmaceuticals cannot be monitored by most large utilities, it makes it difficult for those contaminants to be regulated at such low levels.

Traditional treatment technologies such as coagulation, softening, and chlorination are generally not effective for the removal of many of these contaminants. The good news is that there are treatment technologies available that can effectively treat and remove these emerging contaminants. Good treatment technologies for these emerging contaminants are ozone (structure related), activated carbon (powder (PAC) and/or granular (GAC)), membrane (especially nano-filtration (NF) and reverse osmosis (RO)), and river bank filtration. The best treatment approach is the combinations of "good" technologies in series such as ozone and biologically active carbon (BAC).

Even given the knowledge that the emerging contaminants can be treated, there is a growing disconnect between water utilities and customers over water quality. For the customer or public, safe drinking water is not enough. The public awareness of the occurrence of emerging contaminants continues to grow, and uncertainty over the health effects of sub-therapeutic levels of PPCPs muddies the water for customer confidence even more. There are certain population groups that are more sensitive to these contaminants such as the more immune-compromised and/or aged population due to medical progress. Misinformation from the press, other media and advertising create a sense of urgency that promotes the public's uncertainty. Functionally, the concern falls down to real risk versus perceived risk that leads to "safe is not enough" view point. What is a safe drinking water? When contaminants are at levels of 0.000, 001 (1 ppm)? When contaminants are at levels of 0.000,000,001 (1 ppb)? When contaminants are at levels of 0.000,000,000,001 (1 ppt)? Removal of 100% of all contaminants is not a reality.

### **NECESSITY OF TREATMENT PLANT IMPROVEMENTS**

LWC has an approach to meeting the current and anticipated regulations for producing high quality drinking water at its Crescent Hill Filter Plant in a two (2) pronged approach. The first is an interim plan

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 10*

to rebuild the existing treatment processes while improving their effectiveness and capacity by 2012. The second is the final plan to implement an Advanced Treatment Technology (ATT) for the Crescent Hill Filter Plant.

The Interim Plan will result in the rebuilding and improving the effectiveness, efficiency and capacity of the primary treatment processes. This includes the rapid sand filtration filters, the filter backwash system, the coagulation/ flocculation/sedimentation basins, the softening and clarifying basins, and the introduction of on-site chlorine generation to replace railcar deliveries of chlorine gas. The rebuild and upgrade of the filters will allow them to meet both combined filter and individual filter turbidity goals for a 1 log removal credit and increase their capacity from 1-3 gallons per minute (gpm) per ft<sup>2</sup> to 3-7 gpm per ft<sup>2</sup>.

The rebuild and upgrade of the eight coagulation/ flocculation/sedimentation basins and the six softening and clarifying basins will allow them to achieve two stage clarification that qualifies for a 0.5 log removal credit. This brings the total plant capability for the removal of Cryptosporidium and other pathogenic microorganisms above that required by the forthcoming regulations. No additional removal or inactivation of Cryptosporidium and other pathogenic microorganisms will be required.

### **Rebuilding Crescent Hill Filter Plant Treatment Processes**

#### **On Site Chlorine Generation Plant**

To construct an on-site Chlorine generation system (0.8% bleach in solution) to meet the disinfection needs of the Crescent Hill Filter Plant's treatment process by replacing liquid chlorine gas delivered in 90-ton rail cars. This project had a Contract Value of \$8,872,000 and construction began in October 2009 and was completed in September 2010. This Chlorine generation system eliminates the need to have 90-ton rail cars of liquefied chlorine gas delivered and emptied at the water treatment plant, a recurring high risk activity that has now been mitigated.

#### **Filter & Backwash System Renovations**

This project is to renovate / upgrade the east & new east filters at CHFP with the following features: 1) deeper filter bed media enabling higher filtration capacity (5 gpm per ft<sup>2</sup> or 15 MGD each filter), 2) a low profile under-drain system allowing for an air scour system & more effective cleaning, and 3) capability to "waste" filter effluent water when during the filter ripening phase when the poorest operating performance occurs. Additionally, it will construct a new backwash system that provides: 1) a robust backwash water flow (pumped and elevated storage), and 2) an air scour system for cleaning the filter beds periodically. And finally, it is to increase the treatment plant's firm filtration capacity to an impressive 230 MGD in firm capacity. This project has a total design and construction budget of \$37,610,080 and has the distinction of being the largest renovation project at the Crescent Hill Filter Plant. It is planned to be completed by August 2012.

#### **Renovation of Softening Basins 1-4**

This project is to place the horizontal mixing and clarifier equipment in the Softening Basins (and associated appurtenances) with vertically orientated mixers that will provide more efficient and effective mixing capability for softening and clarifying water. Additionally, it will provide for an overall upgrade of the equipment ancillary but integral to the operation of the softening basins by replacing handrails and installing new electrical controls and general electrical upgrades as well as concrete rehabilitation,

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 11*

and sluice gate valve rehabilitation. This \$14,844,000 was awarded in March 2010 with a planned completion by December 2011.

### **Renovation of North Coagulation, Flocculation and Sedimentation Basins**

The renovation of the north Coagulation, Flocculation and Sedimentation Basins will include the replacement of the horizontal mixing equipment and clarifier equipment with horizontal in Coagulation Basins Nos. 1 – 4. It includes the installation of flash mixers, and replacement of lighting, handrails and power distribution systems in the north coagulation area. Additionally, rehabilitation of concrete and perform leak repair in the north coagulation basin area. This project has a total budget of \$9,372,740 and construction is expected to commence in April 2011 with completion by March 2012.

### **ATT for the Crescent Hill Filter Plant**

The Final Plan focuses on implementing ATT at the Crescent Hill Filter Plant. The ATT selected will provide further capability for the treatment plant to more effectively and more efficiently treat emerging contaminants and aesthetic aspects of water quality. To that end, LWC has evaluated a number of ATTs as well as conduct pilot test ATT approaches that potentially meet all the major LWC treatment goals.

Three options were approved by the BOWW for further investigation. They included Riverbank Filtration (RBF), Ozone with biological activated carbon (BAC) filters, and Ozone with Biologically-Active Filters (BAF). Each of these three options were evaluated for water quantity, water quality, constructability and cost including a cost-benefit analysis by an LWC Technical Work Group.

RBF treats surface water through natural physical, chemical, and biological processes by collecting water that filters through the riverbank sediments. The riverbank sediment and alluvial zone serve as the primary removal mechanisms for organic contaminants through adsorption and biodegradation. Key benefits from RBF include Microbial Reduction, Particle Reduction, Disinfection By-Product Reduction, Trace Organic Contaminant Reduction, Spill Dampening, and Temperature Moderation (Potential reduction in nitrification). Some potential adverse effects have been identified such as increased radon, increased hardness and other inorganics, limitation in supply volume, future or previous groundwater contamination, and a considerably high capital cost to construct.

Ozonation injects ozone into the water where it reacts with a wide variety of impurities. Key benefits from Ozonation include its organic removal capability as a strong oxidant (SOCs, EDCs, & PPCPs), serves as a powerful disinfectant for inactivation of pathogen (cryptosporidium, giardia, and virus), controls taste and odor aesthetics, it reduces TTHM and HAA5, it promotes micro-flocculation that aids coagulation, and it assists in oxidizing iron, manganese, color, etc. Like RBF, Ozonation has some potential adverse effects such as bromate formation, increased assimilable organic carbon, biodegradable organic carbon, unknown disinfection byproducts, and increased dissolved oxygen that promotes corrosion for ductile and cast iron pipe and steel pipe.

The Board of Water Works for LWC took action at its September 2011 Meeting and selected Ozone with Biologically-Active Filters (BAF)/Non- Biologically-Active Filters (NBAF). By selecting both BAF and NBAF, the Board of Water Works recognized the benefits of transitioning from NBAF to BAF filtration and the accompanying flexibility for the company to optimize its overall treatment performance.

# THEN, NOW, AND THE FUTURE OF WATER QUALITY: NECESSITY OF TREATMENT PLANT IMPROVEMENTS

*Continued from page 12*

## **SUMMARY**

Louisville Water Company is well positioned to meet or exceed all known forthcoming Water Quality Regulations. Further, it is taking action now in planning treatment processes on how to best address emerging contaminants be it man-made such as endocrine disrupting compounds, pharmaceuticals, pharmaceutically active compounds or personal care products or be it new bacterial strains or viruses that evolve over time.

### *Environmental Stewardship in Action - KCHMM at the Science Fair, continued from page 4:*

First, the Chapter would like to thank and recognize our very own Gary Spanyer, PE, CHMM, who, for several years now, has given of himself to serve as Chair of the LRSF Judging Committee. Gary volunteers countless hours recruiting and coordinating local scientific professionals who enable the Fair to be competitive and, well, fair. We are proud to claim Gary as one of our own. Thanks for all you do, Gary, and for representing our profession in such an admirable way! In addition to Gary, active KCHMM members Michelle Baker (Zeon), Andrew Clifton (Microbac), Karen Crook (Environmental Laboratories, Inc.), Corinne Greenberg (Industrial Container Services - KY), Tom Herman (Zeon), Larry Schumer (Tetra Tech), Mark Spaulding (BAE Systems) and Sandy Tucker (BAE Systems) all participated as judges for four hours on a Saturday morning in mid-March. Thanks to all who gave of their time and experience. The Chapter is very proud of our representation.

Second, the KCHMM Board initiated a special award by committing \$200 from the Chapter treasury as seed money for a special award to be given to a high school exhibitor in either Environmental Science or Environmental Management. Individual Chapter members also made donations to build that award up to a \$300 total, making ours one of the more sizable monetary awards given at the Fair. We are proud to share that Ballard High School 10<sup>th</sup> grader Emma Burch earned this award for her project on "The Effects of Soil Type When Filtering Pollutants." She conducted an experiment to show the extent to which various contaminants pass through or are retained by sand, loam, and clay. Emma has accepted an invitation to join us at our May 11 meeting where we will award her with the \$300 stipend for her future college expenses. Hopefully she will bring her display board for all to see, and hopefully many of you will turn out to recognize her achievement and to further support her scientific aspirations!

Finally, we are pleased to share that the combination of these efforts – our members' volunteerism, the Chapter donation, and individuals' additional financial contributions – together have earned KCHMM recognition as an "Environmental Advocate" in the KY Excellence in Environmental Leadership program (see <http://dca.ky.gov/kyexcel/Pages/default.aspx> for more information about this initiative). This is the first time, after several years' deliberation, that the Chapter has successfully applied for and received this honor. Now, it is incumbent upon us to make this not a one-time project but to continue in future years to meet our obligations as environmental stewards – an obligation that I am confident we will continue to address. Thanks to all for making this happen.



**KCHMM Presents  
Red Cross Adult CPR/AED  
4-hr Certified Course  
Wednesday, April 27, 2011  
8:00 AM – 12:00 PM  
Swain Student Activities Center,  
University of Louisville,  
2100 Floyd Street**



KCHMM is teaming with the American Red Cross to bring you an informative and economical Adult CPR/AED course.

Michelle Baker, a fellow CHMM, will be your instructor for the day.

This course teaches easy to learn emergency procedures that prepare participants to respond to breathing and cardiac emergencies. Participants will learn how to perform abdominal thrusts, rescue breathing, CPR, and care for an unconscious choking victim. Use of the Automated External Defibrillator (AED) is also included in the training. This is a certified Red Cross Class.

KCHMM will offer the discounted rate to members of only \$25. (The course is \$45 if taken at the Louisville Red Cross Chapter). Course tuition includes a course manual, hands-on practice sessions and a certificate of competency wallet card.

Information about your trainer: Michelle Baker is a CHMM with more than 20 years of EHS experience. She is Product Stewardship Manager at Zeon Chemicals L.P. in Louisville, KY and a volunteer for the American Red Cross. She is a certified Red Cross instructor who routinely teaches CPR, First Aid and other preparedness courses.

# KCHMM Sponsored Adult CPR/AED

## Course Dates and Times:

Where: the Swain Student Activities Center, University of Louisville Campus, 2100 Floyd Street

Date: April 27<sup>th</sup>, 2011 (Wednesday)

Time: 8:00 AM – 12:00 PM

Cost: \$25/person for KCHMM members in good standing (dues paid)\*

\$35/person for non-KCHMM members

*\*KCHMM member rate applies to early bird registrations only. All registrations made after the 4/20/2011 cut-off will be at the \$35/person rate.*

All attendees interested in attending are requested to complete and email or fax the registration to [mbaker@zeonchemicals.com](mailto:mbaker@zeonchemicals.com) or [paul.hoza@louisville.edu](mailto:paul.hoza@louisville.edu) or fax (502) 775-7784.

**Payment is due on the day of the course. Please make checks payable to: KCHMM**

### Registration Form:

Name: \_\_\_\_\_  KCHMM Member

Name: \_\_\_\_\_  KCHMM Member

Name: \_\_\_\_\_  KCHMM Member

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: (\_\_\_\_) \_\_\_\_\_ Fax: (\_\_\_\_) \_\_\_\_\_

Email invoice to: \_\_\_\_\_

For questions or further information, contact Michelle Baker at:

[mbaker@zeonchemicals.com](mailto:mbaker@zeonchemicals.com) (502) 775-7724 or Paul Hoza at [paul.hoza@louisville.edu](mailto:paul.hoza@louisville.edu)