OKI GROUNDWATER COMMITTEE
September 13, 2017 - 10:00 AM
OKI Board Room
720 East Pete Rose Way (at the corner of Eggleston Avenue)
Cincinnati, Ohio 45202

AGENDA

1. Welcome/Introductions (3 minutes)

2. Announcements

3. Update on Local Groundwater Management Efforts (30 minutes)
   Andreas Eddy, Scott Kirk and Rick Fueston

4. OKI Staff Update (10 minutes)

5. Air Stripping in the Valley (30 minutes)
   Mike Lippert, Wyoming Water Works

6. Ohio EPA’s Manganese Compliance Strategy (30 Minutes)
   Susan Schell, Ohio EPA

7. Other Business

ADJOURNMENT
Air Stripping in the Valley

PRESENTATION TO OKI
SEPTEMBER 13, 2017
Outline of Presentation

1. Wyoming Water System background
2. Millcreek Buried Valley Aquifer
3. Water Treatment Considerations for Potential VOC’s
4. Construction of the Air Stripper
5. Air Stripping in the Valley – How is it going?
6. Looking to the Future
1. Wyoming Water System Background
City of Wyoming John E. Leavell Water Treatment Plant
Wyoming Water Statistics

- 3 MGD Water Treatment Plant (Opened in 2000)
- Average 700,000 gpd
- Serve 3,300 accounts - approximately 9,000 residents
- Overwhelmingly residential
- Plant Operates 10-16 hrs/day
- Lime Softening
  - Aeration, softening, recarbonation, chlorine, fluoride, filters
Wyoming Water

Raw Water Challenges
- Hardness ~ 500 mg/L CaCO3
- pH ~ 7.3
- Iron (5.1-6.5 mg/L)
- Manganese (0.25-0.54 mg/L)
- Hydrogen Sulfide
- VOC’s

Finished Water
- Hardness ~ 180 mg/L CaCO3
- Alkalinity ~ 70 mg/L
- pH ~ 8.7
- Iron (0.03 mg/L)
- Best Tasting 2011
- No VOC’s detected in finished water
2. Millcreek Buried Valley Aquifer
Time of Travel
3. Water Treatment Considerations for Potential VOC’s
Alternatives Considered

- 1. Partner with Lockland
- 2. Work with Greater Cincinnati Water Works
- 3. Development of a new wellfield
- 4. Adding new Treatment Technology
PROPOSED TREATMENT PROCESS

WELLS → AERATOR → CLARIFIER → CO2 → FILTER → CLEARWELL → DISTRIBUTION

AIR STRIPPER
4. Construction of the Air Stripper

BEFORE

AFTER
Interior Water Plant Work
Exterior Work, utilities and air stripper fdn (disinfection chamber)
Tower Installation
Install top
5. Air Stripping in the Valley – How is it Going?
Scada
6. Looking to the Future
Questions?
Outline

• Health Concerns
• Occurrence
• Regulations
• Manganese Compliance Strategy
• Treatment
Health Concerns

• Above health advisory levels, the main target of manganese toxicity is the central nervous system.
• In children it can result in lowered intelligence quotient (IQ), poor motor functions, decreased attention span and hyperactivity.
• Young children are especially at risk since they absorb more than their digestive systems can release.
• In the elderly, it can cause a disorder similar to Parkinson’s disease.
Occurrence

- Manganese is naturally occurring in many surface water and ground water sources and in soils that may erode into these waters.
- It has been detected in approximately 97% of surface waters nationally, generally below levels of public health concerns.
Occurrence

- It has been shown to be detectable in approximately 70% of the groundwater in the United states, generally at levels below public health concerns.
- Most groundwater levels over 0.3 mg/L are found in the eastern half of Ohio.
Manganese in Ohio

Manganese Distribution AGWQMP GW Data

Manganese (well mean, ug/L)

- < 50
- 50 - 300
- 300 - 600
- 600 - 1000
- > 1000

Major Aquifers

- Sand and Gravel Aquifers
- Interbedded Sandstone/Shale
- Sandstone Aquifers
- Carbonate Aquifers
- Interbedded Carbonate/Shale

Ohio Counties

Ohio Environmental Protection Agency

September 2016
Unregulated Contaminant Monitoring Rule (UCMR)

- EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) to collect data for contaminants that are suspected to be present in drinking water and do not have health-based standards set under the Safe Drinking Water Act (SDWA).

- EPA’s selection of contaminants for a particular UCMR cycle is largely based on a review of the Contaminant Candidate List (CCL). The UCMR program was developed in coordination with the CCL.
UCMR

- The CCL is a list of contaminants that:
  - Are not regulated by the National Primary Drinking Water Regulations
  - Are known or anticipated to occur at public water systems
  - May warrant regulation under the SDWA
How are Contaminants Selected?

• EPA reviews contaminants that have been evaluated through existing prioritization processes, including previous UCMR contaminants and the CCL. Additional contaminants may be identified based on current research on occurrence and health effect risk factors.

• EPA prioritizes contaminants based on more extensive health effects evaluations, typically performed by the Office of Water’s Office of Science and Technology.
What Are The Public Health Benefits of UCMR?

• UCMR provides EPA and others with scientifically valid data on the occurrence of these contaminants in drinking water. This permits assessment of the population being exposed and the levels of exposure.

• This data set is one of the primary sources of occurrence and exposure information the Agency uses to develop regulatory decisions for emerging contaminants.
Health Advisory Levels (HALs)

- Manganese being looked at on UCMR4
- USEPA established HALs for manganese in 2012
- Point of compliance is entry point to the distribution system
- Health Advisories (HAs) provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water
Definitions

• **One-Day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to one day of exposure. The One-Day HA is intended to protect a 10-kg child consuming 1 liter of water per day.

• **Ten-Day HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for up to ten days of exposure. The Ten-Day HA is also intended to protect a 10-kg child consuming 1 liter of water per day.
Definitions

• **Lifetime HA:** The concentration of a chemical in drinking water that is not expected to cause any adverse *noncarcinogenic effects* for a lifetime of exposure, incorporating a drinking water RSC factor of contaminant-specific data or a default of 20% of total exposure from all sources. The Lifetime HA is based on exposure of a 70-kg adult consuming 2 liters of water per day.
HALs for Manganese

• One-day       1 mg/L
• Ten-day       1 mg/L
• Life-time     0.3 mg/L
HALs

• Manganese levels below 300 ug/L are generally not a health concern. Infants should not consume water that is above the life-time Health Advisory Level (HAL) of 300 ug/L.
Future Rules

• In the future, we will be writing rules to require routine finished water monitoring for all community and nontransient noncommunity water systems, regardless of existing treatment, or lack thereof.

• This would provide an equivalent level of protection for the all customers of those systems.
Manganese Compliance Strategy

- The purpose of the Manganese Compliance Strategy is to protect people from manganese that may be in drinking water at concentrations that can affect human health.
- The strategy identifies manganese levels that will be used to make use advisory decisions.
- It also provides monitoring guidelines and sampling protocols, and recommends contingency planning for public water systems.
- It will also assure that treatment for the removal of manganese is being properly operated and maintained.
Raw Water Manganese

• When a raw water analysis shows manganese levels above the Secondary Maximum Contaminant Level (SMCL) for community and nontransient noncommunity water systems, in accordance with OAC 3745-91-09, the system is notified of the options to provide treatment, drill a new well or connect to another PWS.

• For transient systems that have manganese in their raw water at the time of installing their source are notified of the risks of elevated manganese and treatment recommended.
Existing PWSs With Fe/Mn/As Treatment

• Systems that treat for manganese or use permanganate solution as an oxidizing agent, are now required to monitor weekly for manganese and report the results to Ohio EPA.

• If a system is treating to remove iron, manganese is assumed to be present unless four quarters of sampling demonstrates otherwise.
Response to Finished Water Exceedances (Comm & NTNC)

• When manganese is detected in the finished water above 0.3 mg/L, the system is required to immediately notify Ohio EPA and the County Health Department of the results.

• If the level in the finished water is at or above 1 mg/L, the system is required to immediately issue a Do Not Drink advisory.

• Confirmation samples may be allowed if they are rushed to the lab for analysis.
Response to Finished Water Exceedances (Comm & NTNC)

• For levels between 0.3 mg/l and 1 mg/L, the local health department may require the system to issue a precautionary use advisory, depending on the sensitive population of customers being served by the water system, for example a school or a daycare.
Response to Finished Water Exceedances (Comm & NTNC)

• The system must initiate an investigation of the water system components to determine the source of manganese

• Once the source has been determined, the appropriate remediation must be implemented on a schedule acceptable to the director
Response to Finished Water Exceedances (Comm & NTNC)

• The system must remain on the applicable advisories until the finished water is shown to be reliably and consistently below the HALs for manganese

• The system then must continue to complete operational optimization to produce a finished water below the SMCL
Source Water Surveillance

• Public water systems should be aware that raw water quality can change over time depending on demand for groundwater and seasonal changes for surface water.

• To adequately treat the raw water, water systems should routinely monitor their raw water sources.

• Yearly monitoring is recommended for all wells and monthly monitoring is recommended for surface water sources.
Treatment

• Sequestration – no longer approvable
• Most common method is oxidation, detention and greensand filtration
• Biological Treatment
• Ion Exchange
Sequestration

• We will no longer approve sequestration for addressing manganese levels
• Still subjects the consumers to the manganese, only addresses aesthetic issues
• Sequestered manganese is still bioavailable so the health effects are still a concern
## Oxidant Comparison

<table>
<thead>
<tr>
<th>Oxidant</th>
<th>Air</th>
<th>Chlorine</th>
<th>Permanganate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxidation Rate</td>
<td>Extremely slow and not very effective</td>
<td>Faster but still requires detention time</td>
<td>Fastest but not compatible with some filter medias</td>
</tr>
<tr>
<td>Detention Time</td>
<td>Needs a pH above 9.5 to work, very long detention time</td>
<td>When coupled with regular sand filtration, not very good for removing manganese, works better when paired with a proprietary media and 20 minutes of detention time</td>
<td>Rate of reaction is pH dependent, but in general only 1-2 minutes is necessary</td>
</tr>
</tbody>
</table>
Permanganate Precautions

- If using regular sand, the dose has to be very carefully controlled to avoid pink water events.
- If greensand is used, dose needs to be high enough to address iron/manganese demand and demand of filter media.
Filtration Media

- Reference Table 1 in the Greenbook
- Table 1 provides general information regarding alternative media and treatment and is a guide for design purposes
- In most cases, manufacturer’s design criteria will be accepted unless the District Office’s experience determines other criteria or more stringent standards should be followed
- See Greenbook Sections 4.4 E-H
Benefits of Anthracite Cap

• Anthracite caps are good for solids storage especially when both iron and manganese are being removed

• Can prevent precipitated solids from penetrating sand bed and potentially breaking through filter

• Anthracite is easier to fluidize during backwash and precipitated solids are easily removed from filter
Biologically Active Filtration

- Often ozone is used as a pre-oxidant
- Biological activity converts soluble manganese to precipitated form that can be removed by filter media
- Pilot study required
Ion Exchange

- Iron, manganese, or a combination of the two, should not exceed 0.3 mg/L in the water as applied to the ion exchange resin.
- Pre-treatment is required when the content of iron, manganese, or a combination of the two, is 1 mg/L or more.
- The blended water delivered to the distribution system should be noncorrosive, with a total hardness of at least 80 mg/L expressed as CaCO₃.
- The recommended range for finished water hardness for lead and copper corrosion control is 120 mg/L to 150 mg/L expressed as CaCO₃.
Legacy Manganese

- Legacy manganese in distribution system is to be avoided
- Manganese that enters the distribution system can be difficult to effectively remove because it forms a thin slime on pipe surfaces that is resistant to flushing
- Manganese can absorb other metals, such as lead, arsenic and chromium and later release them in slugs
- There are also some indications that manganese can inhibit the formation of scale on the inside of lead pipes
Questions

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OKI GROUNDWATER COMMITTEE MEETING SUMMARY
Wednesday, June 28th, 2017
OKI Board Room- 10:00 a.m.

Attendees:
Bruce Whitteberry, Greater Cincinnati Water Works, Groundwater Committee Chair
Jack Thornsberry, Butler County Water & Sewer Department, Groundwater Committee Vice-Chair
Al Aspacher, Fishbeck, Thompson, Carr & Huber
Tom Benge, Southwest Regional Water District
Chris Brausch, Warren County Water and Sewer Department
Cheri Bush, Metropolitan Sewer District of Greater Cincinnati
Dave Combs, City of Trenton
Elmer Dudas, City of Springboro, Development District
Andreas Eddy, City of Fairfield
Rick Fueston, Clermont County Water resources Department
Doug Hunter, Leggette, Brashears & Graham, Inc.
M. Scott Kirk, Western Water Company
Mike Lippert, City of Wyoming
Megan Marhelski, Ohio EPA
Tim McLelland, Hamilton to New Baltimore Groundwater Consortium
Terry Morris, City of Springboro
Dave Morrison, Southwest Regional Water District
Bill Paulin, Southwest Regional Water District
Richard Renneker, former Warren County Sanitary Engineer who is now citizen member
Adam Sackenheim, City of Fairfield Public Utilities
Phil Sackenheim, Southwest Regional Water District
Terry Smith, City of Springboro
Richard Stuck, Greater Cincinnati Water Works
Robert Wildey, Clermont General Health District
Alauddin Aluaddin, Ohio EPA, Division of Environmental Financial Assistance (DEFA)
Pejmaan Fallah, Ohio EPA, DEFA
Dan Sowry, Ohio EPA, DEFA
Kelly Gill, Ohio Bureau of Underground Storage Tank Regulation

OKI Staff:
Regina Fields, Bruce Koehler, Andy Meyer, Travis Miller, David Rutter, Kari Merrill

Welcome/Introductions
Groundwater Committee Chair Bruce Whitteberry opened the meeting at 10:08 a.m., reminded attendees that certificates for contact hour credits were available on the table in the back of the room.

Update on Local Groundwater Management Efforts:
Cheri Bush, Metropolitan Sewer District of Greater Cincinnati, (MSD) reported the district has several activities that have impact on water resources in and around Hamilton County.
The largest water quality impact is being made by the implementation of Project Groundwork. It includes two federal consent decrees to mitigate sewer overflows from the combined sewer system where sanitary sewage is mixed with stormwater. This includes:
- an Interim Partial Consent Decree on sanitary sewer overflows (SSOs), signed in 2002
- a Global Consent Decree on combined sewer overflows (CSOs) and treatment plants signed in 2004
and a Wet Weather Improvement Plan (WWIP) signed in 2010

The WWIP is estimated to cost $3.1 billion in 2006 dollars. The consent decree is phased. Phase 1 began in 2009 and is ending in December 2018. MSD is in full compliance with Phase 1 timing and work.

Accomplishments to date include:
- completed 89% of the projects required under Phase 1, or 102 of 114 total projects.
- eliminated 146 combined sewer overflows (CSOs), with 201 active CSOs remaining.
- eliminated or controlled 43 Sanitary Sewer Overflows (SSOs), with 51 active SSOs remaining.
- eliminated 22 pump station overflows (PSOs), with 22 active PSOs remaining.
- reduced overflow activations at SSO 700 (MSD’s largest SSO) from 47 a year to about 8 during a typical year of rain (41 inches).
- Phase 1 costs are trending at about $1.05 billion (in 2006 dollars) as compared to the original estimate of $1.14 billion.

MSD has included Green Infrastructure and Green Solutions for stormwater control in this effort. To date, MSD is capturing about 120 million gallons of stormwater runoff annually during a typical year of rain (41 inches), based on design and watershed assumptions. By the end of 2018, MSD should capture more than 1 billion gallons of stormwater a year. Green solutions help keep rainwater out of combined sewers and also clean the water by filtering it through soil, rocks and plants. Early on, MSD partnered with about 20 local organizations to evaluate the effectiveness of smaller-scale stormwater controls.

The Enabled Impact Program installed stormwater controls at St. Francis, Cincinnati State and the Cincinnati Zoo. The U.S.G.S. monitored the St. Francis site and determined that its bioinfiltration basins have capacity for more stormwater flows. A University of Alabama study demonstrated that the stormwater controls were successful in removing stormwater from the combined sewer system at several sites. Stormwater controls installed on the southwestern (Central Parkway) side of the Cincinnati State campus (the side near Central Parkway) captured over 85% of the stormwater. That same study showed that pervious pavers at the main entrance of the Cincinnati Zoo captured 80% of the stormwater and the Zoo’s African Savanah rain harvesting system captured 70% of the stormwater.

MSD also completed a stream restoration project at Ault Park to reduce CSOs into the Little Miami River.

The sewer district is now focusing on larger-scale green infrastructures, such as bioswales, stream restoration installations and stormwater detention basins. This effort largely focuses on the lower Mill Creek watershed with the nationally recognized Lick Run Project. It is comprised of 12 separate stormwater management/CSO reduction projects that will remove about 500 million gallons of stormwater from the Lick Run/Mill Creek combined sewer system by the end of 2018.

Lick Run Greenway (formerly called the Valley Conveyance System) is the central project component. It includes a mile-long urban waterway through the heart of South Fairmount. The other 11 projects are designed to collect and convey stormwater to the VCS, which discharges into the Mill Creek. Project construction contracts were recently awarded for just under $90M. Related projects in the watershed have been ongoing for several years. Construction activities will continue through 2019.

MSD had a Lick Run Project public meeting on July 20, 2017, in the South Fairmount neighborhood to give project updates, construction schedule and traffic impacts. MSD showed a big greenway map.

MSD is a partner of the National Green Infrastructure Certification Program (NGICP), which helps certify construction, inspection and maintenance workers. In partnership with the Civic Garden Center of Greater Cincinnati, MSD offers training this fall for an NGICP exam in November 2017.
**David Rutter, OKI Regional Council of Governments**, reported on the status of OKI’s progress with treesandstormwater.org. The website will emphasize the importance of soils and infiltration practices, which partly determine whether trees grow to maturity. The delayed website should be available soon.

**Rich Stuck, Greater Cincinnati Water Works (GCWW),** said the drinking water utility has remodeled its 1970s-era laboratory with more floor space, new benches, and better equipment. Elsewhere, GCWW has replaced a high-flow, variable speed service pump and plans to replace another one soon. Each replacement costs $800,000. Work has begun on a riverbank stabilization project along the Great Miami River in Fairfield, near GCWW’s Bolton Wellfield Water Treatment Plant. During the September 13 meeting of the Groundwater Committee, GCWW should be ready to report on the results of a nano-filtration pilot study. The utility is continuously monitoring water levels, groundwater quality, and well efficiencies. Online nitrogen monitoring was expected to begin that week, though some of the monitors have problems with manganese.

Megan Marhelski of the Ohio EPA asked how nitrate monitoring is confirmed. Rich replied that GCWW will collect samples at continuous monitoring sites and submit them to a lab for comparative readings.

**OKI Staff Update**

**Bruce Koehler of OKI Regional Council of Governments** introduced the planning agency’s new water quality intern, Kari Merrill. Born in Boston, Massachusetts, and raised since age 5 in Fairfield, Ohio, Kari is a recent graduate of Miami University with a Bachelor of Arts in Environmental Earth Science. For an undergraduate research project, she learned to operate a powdered X-ray diffraction machine and a scanning electron microscope. Kari was the intern for Tim McLelland at the Groundwater Consortium, which gave her experience sampling perched groundwater monitoring wells of the Great Miami Buried Valley Aquifer System. She also served as Co-Chair of the Race for Global Water, a 5-kilometer fun run.

In other business, OKI continues to map and analyze concentrations of home sewage treatment systems in areas without centralized sewage collection and treatment service. OKI also is working on a table and map of proposed wastewater infrastructure projects to keep better track of development patterns. Growth areas are more likely to attract sewer line extensions and wastewater treatment plant upgrades, but may also present more potential sources of groundwater contamination.

**Sensitive Area Designations and Chemicals-of-Concern Rule Changes Proposed by Ohio’s Bureau of Underground Storage Tank Regulations**

**Kelly Gill of Ohio’s Bureau of Underground Storage Tank Regulation (BUSTR)** thanked Bruce Koehler for persisting several months to arrange a BUSTR presentation to the Groundwater Committee. “BUSTR regulates the safe operation of underground storage tanks (USTs) and supervises appropriate investigations and cleanups of suspected and confirmed releases from such tanks to protect human health and preserve the environment for the citizens of Ohio,” Gill said. “BUSTR leadership and staff conduct inspections, educate the UST owners and operators, and enforce state laws in compliance with federal regulations and guidelines.” BUSTR’s main focus is to ensure USTs operate safely and if leakage occurs to ensure cleanups. It does not, however, regulate heating fuel tanks or farm tanks.

Most of the BUSTR program is focused on release prevention and corrective action. Release prevention conducts UST compliance inspections statewide to ensure owners meet current installation, construction, design, release detection, and operational standards while corrective action monitors releases and oversees remediation activities conducted by environmental consultants at leaking UST sites. BUSTR also reviews environmental reports submitted by consultants for compliance.
Most facilities regulated by BUSTR average has 3 tanks: 2 gasoline and 1 diesel. BUSTR deals with 3,639 active owners, 7,264 active facilities and 21,542 active tanks. As a part of the release prevention program, BUSTR conducted 2,970 facility inspections in 2016. They inspect about 40% of all USTs per year. It is required that every UST facility be inspected at least once every 3 years. As a part of the corrective action program, BUSTR confirmed 1,200 active petroleum releases and 9,681 file/report reviews in 2016. The state agency has overseen, 29,694 cleanups to date, and have 10 environmental scientists on staff.

In the OKI region, confirmed active petroleum releases total 166 in Hamilton County, 36 in Warren County, 32 in Butler County and 22 in Clermont County. Nevertheless, no public water supplies have been endangered. Petroleum releases are known to have a correlation among population, number of tanks present, and number of releases.

BUSTR’s proposed rules are required by the Ohio Revised Code (ORC) to have a 5-year rule review. Currently, 19 rules are undergoing proposed revisions, with 17 proposed for amendment and 2 proposed for removal. These changes are filed with the Joint Committee on Agency Rule Review (JCARR) and have a target effective date of September 1, 2017. The 2015 federal rule required spill prevention equipment and overfill prevention to be tested at least every three years. Existing and new emergency generator UST systems require leak detection by October 2018. The systems installed on or after May 16, 2011, require leak detection. In vent lines, flow restrictors are not allowed on any suction systems, coaxial stage vapor recovery, pressurized fuel deliveries, or any type of new installation. Field-constructed tanks and airport hydrant systems are subject to corrective action and proposed for closure assessment. Whenever a UST equipment is removed, soil must be tested and removed where contamination is detected.

The Sensitive Area Rule (Ohio Administrative Code 1301:7-9-09) became effective on September 1, 1992, to designate areas in Ohio as being sensitive for the protection of human health and the environment. Its main goal is to protect drinking water sources from releases by USTs containing petroleum and hazardous substances and to protect human health from ingestion of UST contaminants. To qualify for sole source aquifer protection of the Safe Drinking Water Act, the U.S. EPA expects an area to satisfy these criteria:

- No existing alternative sources can provide water to 50% or more of the area
- No cost effective potential water sources are available to replace existing source
- Contamination of aquifer creates significant hazard to public health

The rule protects 5 sole source aquifers
1) Pleasant City (Guernsey County)
2) Catawba Island (Ottawa County)
3) Allen County Area Combined Aquifer System (Allen, Auglaize, Mercer, Putnam, Van Wert counties)
4) Great Miami/Little Miami River basin of Southwestern Ohio (Northern section)
   - Champaign, Clark, Greene, Logan, Miami, Montgomery, Preble, Shelby Counties
   - Petitioned by the Miami Regional Planning Committee of Dayton, Ohio
5) Great Miami/Little Miami River basin of Southwestern Ohio (Southern section)
   - Butler, Clermont, Hamilton and Warren counties
   - Petitioned by the OKI Regional Council of Governments

The sensitive area rule also protects areas with USTs that are: within 50 feet of a private well located off site, 100 feet of a man-made tunnel, 200 feet of a lake or reservoir, 1,000 feet upstream of public water intake, 100 feet of public water supply pumping up to 10,000 gallons a day, 200 feet of public water supply pumping of 10,000 to 50,000 gallons a day, or 300 feet of public water supply pumping up to 50,000 gallons a day. Mapping of the sensitive areas was “archaic” because entire land survey sections were designated as sensitive, even if most of a section did not overlie an aquifer. BUSTR is addressing this.
All UST systems in Ohio were subject to upgrade in federal requirements from 1988 through 1998. UST system product compatibility, corrosion protection on metal components (if applicable), spill protection, overfill protection and release detection upgrades were implemented. The sensitive area rule was a part of the federal upgrade requirements, necessitating owners/operators to meet specific upgrade requirements for new USTs. Rule 10 was placed in effect for 1992 and 1999 BUSTR rules. These new requirements must have secondary containment of tanks/piping (both double walled) and containments/sump sensors. These sump sensors are required at the lowest point in the sump of a UST system. On May 16, 2011 rule 10 was ceased and Rules 6 & 7 where implemented.

Rule 6 requires the design, construction, installation, modification and major repair for UST systems. USTs that were installed in Ohio on or after March 1st, 2005, must have secondarily contained piping, containments and sensors in all locations. All USTs installed in Ohio on or after May 16, 2011, must have a secondarily contained tank, piping, and containments/sensors in all areas containing regulated substances. USTs that were installed prior to September 1st, 1992, must have work performed that affects greater than 50% of product piping. A system must upgrade to secondary containment if 50% of the equipment is removed, however, a grandfathered system can remain a single-wall piping/tank. Single walled USTs installed prior to September 1, 1992, that are removed/replaced must have new USTs that are secondarily contained with interstitial monitoring. These USTs must also meet the rules that were in effect at the time of installation unless the piping, UST or entire system is removed.

Petroleum UST Corrective Action (OAC 1301:7-9-13) uses the current criteria for drinking water to aid in the determination for petroleum release sites and the surrounding area. It proposes to add 4 new chemicals of concern to BUSTR’s action level cleanup list. These chemicals are naphthalene and 1,2,4-trimethylbenzene (aromatics in gasoline) and 1,2-dibromoethane (EDB) and 1,2-dichloroethane (EDC) (additives formerly in leaded gasoline). Naphthalene and 1,2,4-trimethylbenzene should be added to the Petroleum UST Corrective Action due to naphthalene being listed as a potential human carcinogen and their relative abundance in light distillate petroleum products. They have lower OEPA VAP-CIDAR (Ohio EPA’s Voluntary Action Program in concert with the Chemical Information Database and Regulatory Standard) cleanup standards compared to previous versions of CIDAR data. EDB and EDC were phased out of use by 1986 because catalytic converters were unable to handle lead and were banned by 1996. In May of 2010, U.S. EPA requested states to investigate and clean up EDB and EDC at UST release sites. Tanks installed before 1996 will require soil and groundwater testing of EDB and EDC.

The term Sensitive Area was replaced by the term Sole Source Aquifer (SSA) in OAC 1301:7-9-13. Mapping of SSAs can be found on Ohio EPAs Division of Drinking and Ground Waters website. The mapping tool can be taken down to street level and shows communities where their drinking water originates.

Kelly concluded his presentation and invited questions. Megan Marhelski of Ohio EPA addressed the importance of accurate source water protection area maps and pumping rates, saying, “Look at your delineation documents and make sure what you modeled is what you’re actually pumping right now.” Rich Stuck said Ohio EPA had 2 Bolton wells in wrong locations until he advised the state agency of the correct locations. Bruce Whiteberry of Greater Cincinnati Water Works asked if BUSTR determines what percent contaminant leaks from tanks and what percent leaks from the tanks piping systems. Kelly answered that BUSTR finds contamination in places with tanks that don’t leak due to the frequency of overfill practices. Rich Stuck asked where one can research requirements for above-ground storage tanks and Kelly answered that above-ground storage tanks are only inspected by state fire marshals. Jack Thornsberry of Butler County Water & Sewer Department suggested the Local Emergency Planning Committee (LEPC) and the Ohio EPA as information sources on above-ground storage tanks.
DEFA and Drinking Water

Alauddin Alauddin of Ohio EPA's Division of Environmental and Financial Assistance (DEFA), complimented Cheri Bush of MSD for being a good partner, then started describing the busy division of Ohio EPA. DEFA has three main offices; Office of Compliance Assistance and Pollution Prevention (OCAPP), Office of Financial Assistance (OFA), and Office of Outreach and Customer Support (OCS). Alauddin Alauddin and Pejmaan Fallah work in the OCS, however, but the presentation focuses on OFA.

OFA administers the Water Pollution Control Loan Fund (WPCLF) and Water Supply Revolving Loan Account (WSRLA). It also administers the recycling/litter prevention grant program and the wastewater treatment facility compliance assistance program (for small villages). DEFA was supposed to receive capitalization grants for only 5 years, however, Ohio’s program is the most successful. Because of this, the federal seeding continues. Ohio has the nation’s third largest program. Its default rate on loans is 0%.

Ohio has two state revolving funds available for eligible applicants;

1) WPCLF was authorized in 1987 with a total of 2,000 ($7 billion) loans since its first loan approval in September of 1989. WPCLF funds wastewater treatment for any municipality or other political subdivision, inter-municipal, interstate, or state agency. While WPCLF focuses on public entities for nonpoint source pollution control projects, it serves both public and private entities. Of a required $2.05 billion in federal seed money, the state will match the fund at $395 million with an annual capacity of $500 million per year. DEFA almost always has the lowest interest rate available. This year they introduced structured payments to even out debt. Technical materials last up to 30 years now so DEFA can extend loan terms from 20 years to 30 years. The agency offers:
   - CSO (combined sewer overflow) Discount
   - Nutrient Reduction Discount
   - Extended-Term Financing
   - Principal Forgiveness for HSTS (home sewage treatment systems)
   - Back-up Power Discount
   - Discounted Planning Loans

Eligible projects include:
   - New wastewater treatment plants (WWTP)
   - WWTP upgrades and rehabilitation
   - New sanitary sewers for unsewered areas
   - Sanitary sewer rehabilitation/replacement
   - CSOs (New Incentives)
   - Nutrient Reduction (Incentive)
   - NPS Projects:
     - Stream protection and stream restoration
     - HSTS replacement programs
   - Landfill closure
   - Leachate collection systems
   - Sludge handling/disposal
   - Anything else with water quality connection

“We fund things you wouldn’t typically think of,” Alauddin said.

2) WSRLA was authorized in 1996 with a total of 550 ($1.2 billion) loans since its first loan approval in February of 1999. WSRLA funds Community Water Systems and Non-Community Public Water Systems. Of a required $493 federal seed money, the state will match $98 million with an annual capacity of $150 million per year. WSRLA has a long-term loan market rate of 1.25%. Ohio chose to
always remain below this prime rate no matter how low the rate may go. In 2016 WSRLA funded 36 loans ($100.3 million) ranging from $43,000 to $17 million. WSRLA offers:

- Regionalization
- Asset Management Planning
- Harmful Algal Bloom Discount
- Disadvantaged Community Assistance
- Lead Service Line Replacement
- All planning Loans -0%
- Back-up Power Discount

Eligible projects include:

- New water treatment plants
- New waterlines
- Water tanks/towers
- Regionalization projects
- Standby/back-up power
- Emergency interconnections
- Water treatment plant rehab
- Waterline rehabilitation/replacement
- Pump/booster stations
- New water meters
- New well fields
- Asset Management Plans

Alauddin was unsure whether Source Water Protection can be funded for buying land and fencing it off.

DEFA is working on making principal forgiveness available for some smaller communities in 2017. For the past 2-3 years the project management fund hasn’t turned down anyone who has submitted a nomination for a certain project. Alauddin stated, “We issue our own debt bonds and have high credit ratings”. The plan will be ready on July 1st, 2017. A WSRLA bond issue sells out in as little as four hours.

In 2016, DEFA awarded $717,938,460 for 131 projects. MSD stated they have a $100 million project starting in July. Alauddin added that DEFA is making drinking water infrastructure loans more robust.

For the 2018 fiscal year, Ohio EPA is anticipating making $200 million available. About $6 to $8 million will be available for principal forgiveness to disadvantaged communities. Depending on the total demand for a fund, the proportionate share could be matched at $40 million or more. DEFA will continue the Harmful Algal Bloom (HAB) discount. Since 2015 Ohio EPA has awarded 10 projects at over $78 million. Funds will be offered at 0% interest rate and 20-year terms to address HAB issues at surface water treatment plants.

HAB Eligible Projects (avoidance projects are favorable):

- Treatment processes to address toxins produced from HABs
- Projects that implement avoidance strategies such as interconnections with other water supplies
- New elevated storage facilities
- Installation of alternative sources of raw water

Cyanotoxin testing equipment grants are available for up to $30,000 per surface water treatment system. The $15,000 limit no longer applies. DEFA encourages regionalization. Projects that consolidate disadvantaged communities into larger systems that exhibit capability will be eligible for up to 50% principal forgiveness, with the remainder of loan at 0% interest rate.

Each year, Ohio EPA produces a Project Management Plan (PMP) for these purposes:

- Listing of intended projects
- Description of interest rates/discounts
- Description of program administration details
- Description of new program features

So as long as its funding lasts, Ohio EPA can set generous terms with moderate losses. WSRLA principal forgiveness will be 50% rather than 75%. Informed applicants can fill out a loan request in 30 minutes. Not every listing on the intended projects list will be immediately funded. In FY 2018, WSRLA offers:

**Emergency Power** offers principal forgiveness (up to $10,000) for auxiliary power (50%) and applicable to emergency generators and quick connect switchgear to facilitate connection to an emergency generator.

**Asset Management** projects usually cost more than $10,000 so DEFA offers 0% loan interest for 5 years. Ohio EPA offers $150,000 in principal forgiveness for program development and is open for a nomination period. In the future DEFA will require asset management programs for all public water systems to increase sustainability. A legislative bill has been introduced this year to change the statue to incorporate asset management as a requirement. It will be used to make a demonstration of technical, managerial, and financial capability. Alauddin said DEFA spends much time with small utilities that seem overwhelmed by the complexities of managing infrastructure.

**Lead Service Line Replacement** will offer 0% loans for projects that perform complete replacement of lead service lines, from the main to the customer’s premise, including the portion that is on the customer’s property. The remainder of the loan will be funded at the water system’s normal interest rate if the water mains are included in the project.

**Planning Loans** has an open nomination period and offers 0% interest rate for 5 years. This may be rolled into subsequent design/construction loans through Ohio EPA. Planning loans often fund flow monitoring for wastewater projects.

**Disadvantaged Community Application** is a separate application that is not applicable for planning loans. It is available for any system that would like to apply for subsidy on their construction and/or design loans. The community must have a health related factor and economic affordability mandatory score of one point. It is based upon the community’s population, median household income (MHI) and poverty rate.

Submitted documents must have an Ohio EPA approved general plan for design and construction loans for new, upgraded or expanded water treatment plants. The documentation is required for design and construction projects that address distribution systems and their components. Some ineligible projects are: 1) dams/rehabilitation of dams, 2) reservoirs, 3) laboratory fees for monitoring (non-capital improvement projects), 4) operation and maintenance expenses, 5) projects needed mainly for fire protection, and 6) projects primarily intended to serve future growth.

Alauddin said DEFA works hard to streamline revolving loan fund requirements to maintain them as the largest sources of wastewater or water infrastructure funding in Ohio. In other work, DEFA offers grant funding for recycling and litter prevention to 1) strengthen recycling markets, 2) encourage sustainable practices, 3) stimulate economic growth, and 4) support litter prevention efforts. Every year Ohio has made the federal maximum for principal forgiveness and has given multiple grants to communities to set up equipment for litter management. DEFA also offers WWTP compliance assistance to help identify performance limiting factors and cost-effective solutions. Alauddin said unless raw sewage is going out the back door, DEFA tries to offer confidential help. Some services available include:

- Plant performance evaluations
- Troubleshoot complex plant problems
- Innovative and cost effective solutions for improving plant performance
- Determine plant loadings and capacities
- Investigate concerns over industrial discharges to the system
- Help formulate and implement a preventative maintenance program
- Help facilitate an inflow and infiltration evaluation of the sewer system
- Review and evaluate new treatment technologies
- Onsite training personnel

OCAPP (Office of Customer Assistance and Pollution Prevention) provides regulatory technical assistance, helps complete permit applications or reports, helps maintain on-site records, conducts free on-site compliance, recycling and waste reduction visits, and operates the Encouraging Environmental Excellence (E³) program. OCAPP is confidential by statute and will not turn calls over to the enforcement side. In 2016, OCAPP assisted 4,300 businesses, made 222 site visits, and conducted 70 outreach events. Call (800) 329-7518 for confidential help. Recorded calls and notes are stored in private locked offices.

DEFA has a materials exchange website to foster re-use and recycling. It resembles Craig’s List. The OCS, provides outreach, marketing and division support services. OCS facilitates meetings with customers and is DEFA’s “front door” to ensure customers get connected to the right people and resources.

During the questions and answers period, Chris Brausch of Warren County asked if OWDA (Ohio Water Development Authority) loans can be paid off early. Alauddin answered that no, that is not in the rule change. Consultant Al Aspacher inquired about the nomination period and Alauddin responded that in regards to drinking water, nominations are available in January and February and public announcements are made at the end of June. For wastewater, nominations are in August and funding announcements will be made next January.

**Other Business**

With no other business at hand, Groundwater Committee Chair Bruce Whitteberry adjourned the meeting shortly after 12:00 noon.