

SESSION 19 | WASTEWATER
COVID-19 AND WASTEWATER

BERKS COUNTY WATER AND SEWER ASSOCIATION
VIRTUAL CONFERENCE | JULY 29, 2020

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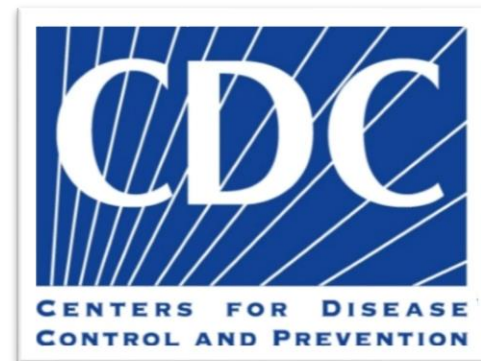
COVID-19 AND WASTEWATER



COVID-19 AND SANITARY SEWERS

What we'll discuss today.

- Collection of experts best thinking on the topic today
- Resource document to help you navigate your decisions
- Best Practices in our field
- What the experts are saying



COVID-19 AND SANITARY SEWERS

History

Most, but not all, pathogens of concern in drinking water are spread by the fecal-to-oral route

- 1854, John Snow
 - cholera could be transmitted through the contamination of drinking water by human feces
- 1856, William Budd
 - typhoid fever
- 1883, Robert Koch and Karl Eberth
 - isolated the specific microorganisms responsible for both of these diseases
- Middle of the nineteenth century, public health practitioners and researchers focus on preventing the contamination of water supplies by sewage



History in the United States

- Water Quality and Disease Association
 - recognized for more than a hundred years
 - transmission of waterborne diseases is still a major public health
 - collecting statistics since 1920
 - one of a few countries to have a national surveillance system for waterborne disease outbreaks.
 - Most European and developing countries do not have adequate surveillance system for waterborne
 - UK is the exception



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Sources of Contamination

- First: type and source of contamination
- Fecal or nonfecal origin?
- Coliform index - contamination by human feces number one issue
- Human pathogens occur in other environments as well



Indicators for waterborne pathogens

- Indicators:
 - Coliform
 - fecal coliform
 - *Escherichia coli*
 - enterococci.
- However no single indicator can determine presence of contamination.



United States Regulations

- 1948 FWPCA Amendments of 1972
- Clean Water Act of 1977
- Water Quality Act of 1987
 - Collectively are the Clean Water Act and provides the foundation for protecting the nation's waters.
- 1974 SDWA
 - administered by EPA
 - most important and comprehensive law to protect the public from man-made or naturally occurring contaminants in drinking water.
 - amended regularly
 - 1986,1996 significant changes



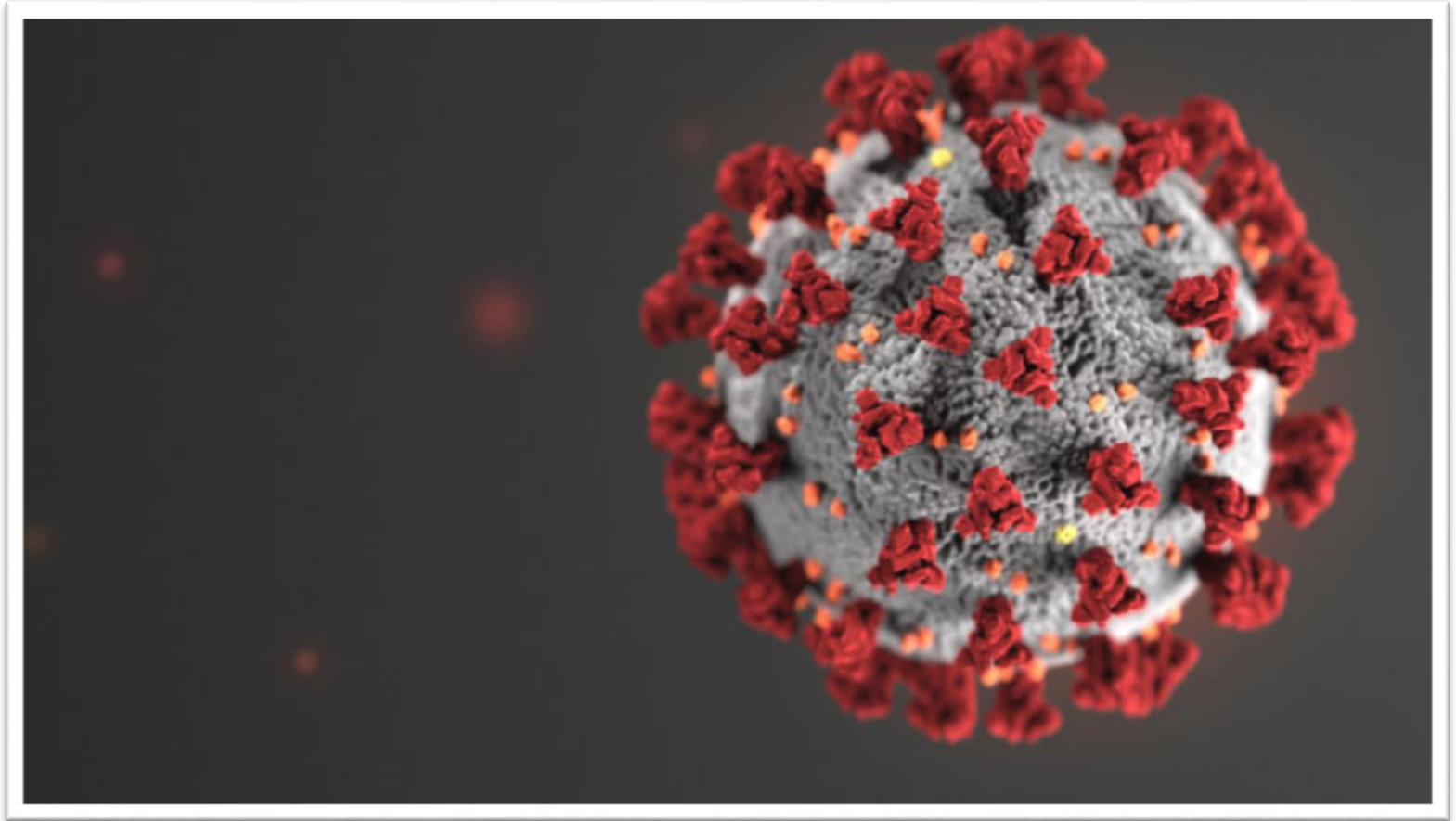
Pennsylvania Regulations

- State, territorial, and local public health agencies are responsible for detecting and investigating WBDOs while CDC, as a federal agency, participates in outbreak investigations only by invitation or when an outbreak involves multiple states.
- Pennsylvania's two key regulations are the:
 - The Pennsylvania Clean Streams Law (PCSL).
 - The Pennsylvania Safe Drinking Water Act (PSDWA).



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Current Affairs Associated with COVID-19



How does this all apply to COVID-19?

- Mid-1960s a review cited waterborne outbreak starting in 1946
 - 50 outbreaks of infectious hepatitis
 - 8 outbreaks of polio
- Currently studies being conducted to detect COVID – 19 in wastewater
 - Can we use it to track and predict potential outbreak locations?



COVID-19 AND SANITARY SEWERS

In the News

- WaterWorld article highlights
- TPO Magazine article highlights



The image shows a screenshot of a WaterWorld article. The article title is 'Wastewater test could provide early warning of COVID-19'. The sub-headline states 'Cranfield University are working on a new test to detect SARS-CoV-2 in the wastewater of communities infected with the virus.' The date is 'Mar 31st, 2020'. Below the text is a photograph of a small, dark, rectangular paper device with a white circle on it, being held by tweezers. The article text continues: 'The paper device is folded and unfolded in steps to filter the nucleic acids of pathogens from wastewater samples, then a biochemical reaction with preloaded reagents detects whether the nucleic acid of SARS-CoV-2 infection is present. Results are visible to the naked eye: a green circle indicating positive and a blue circle negative.' The article is dated 'CRANFIELD, UK, MARCH 31, 2020 -- Researchers at Cranfield University are working on a new test to detect SARS-CoV-2 in the wastewater of communities infected with the virus.' The text further explains: 'The wastewater-based epidemiology (WBE) approach could provide an effective and rapid way to predict the potential spread of novel coronavirus pneumonia (COVID-19) by picking up on biomarkers in feces and urine from disease carriers that enter the sewer system.' The article concludes: 'Rapid test kits using paper-based devices could be used on-site at wastewater treatment plants.' On the right side of the article, there are two 'Vaughan' webinar banners. The top one says 'NOW SHOWING DISCOVER OUR INDUSTRY-LEADING, EDUCATIONAL ONLINE WEBINARS'. The bottom one says 'NOW SHOWING DISCOVER OUR INDUSTRY-LEADING, EDUCATIONAL ONLINE WEBINARS'. The WaterWorld logo and navigation menu are visible at the top of the page.



Protecting Ourselves and Others

- What We Can Do



Potential Wastewater Exposures

- Raw sewage contaminated feces with COVID - 19
- Collection system debris
- Equipment surfaces
- Treatment plant splash
- Spilled wastewater
- Aerosols from wastewater treatment units
- Spray from equipment treatment wash-down
- Shared surfaces and spaces



Where are the potential exposures?

- Sewage collection system manholes
- Sewage collection cleaning and maintenance equipment
- Wastewater treatment plant influent
- Samplers and laboratory
- Wastewater treatment units
- Sludge and biosolids treatment
- Shared vehicles, tools, equipment, etc.
- Shared working spaces, common areas, etc.
- Contact with an infected individual



Professional Association Highlights

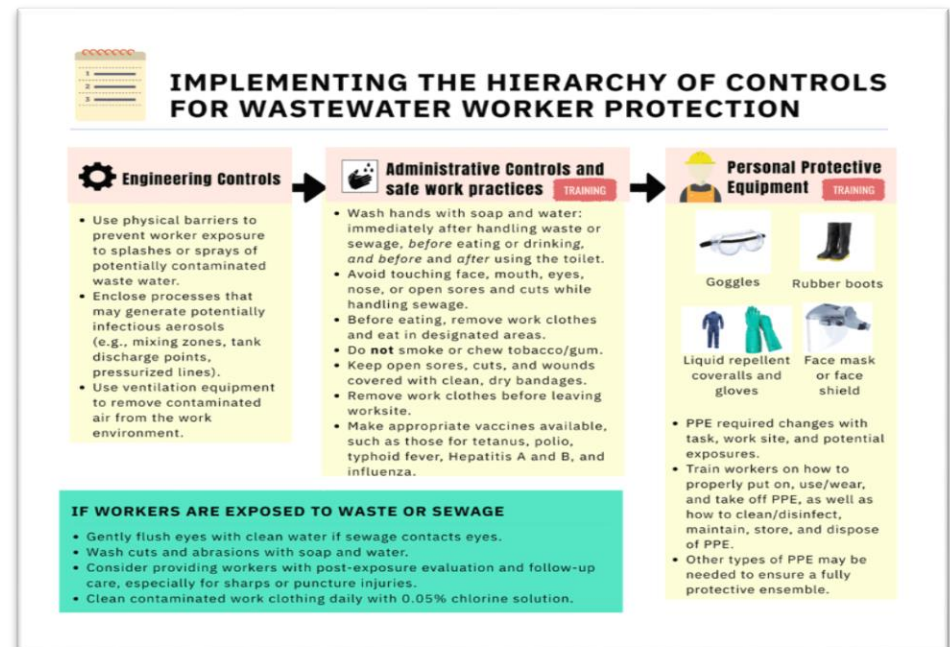
- Water Environment Federation (WEF) highlights
- Occupational Safety and Health Administration (OSHA) highlights
 - Specific to the wastewater and solid waste industry



COVID-19 AND SANITARY SEWERS

Protection Steps

- Engineering Controls
- Administrative Controls
- Safe Work Practices
- Personal Protective Equipment



Protections Steps

- Engineering Controls
 - Physical barriers
 - Enclosures
 - Ventilation
- Administrative Controls
 - Provide vaccinations
 - Update SOGs and SOPs to include appropriate health instructions
 - Add warning signage where appropriate
 - Update the emergency response plan
 - Training and recurring refresher training
 - Monitor employee practices to assure compliance
- Safe Work Practices
 - Wash hands
 - Wear an appropriate mask
 - Avoid touching your face
 - Remove work clothes when appropriate
 - Avoid smoking, etc.
- Personal Protective Equipment
 - Face masks and/or face shields and/or goggles
 - Rubber boots where appropriate
 - Proper hand protection that is liquid repellent
 - Proper clothing that is applicable for the assigned task and work location
 - Other personal protective equipment (PPE) as needed



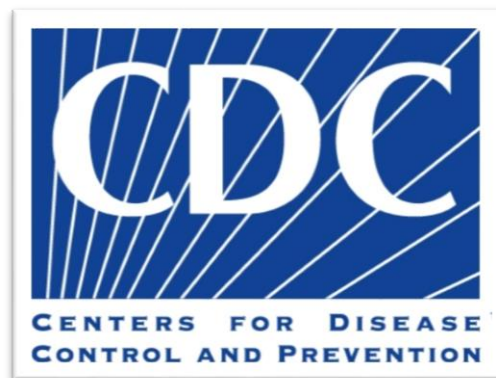
What can you do to manage the future?

- COVID-19 pandemic debriefing session
- Document the findings
- Update emergency response manual
- Update ALL standard operating guidelines and standard operating procedures
- Evaluate needs / implement controls
- Determine proper administrative controls
- Assure maximum protection
- Determine PPE needs
- Obtain and PPE and make guidelines for use



Up-to-Date Resources

- Here's where we look when we're looking for an expert opinion:
 - COVID-19 is an emerging, rapidly evolving situation. Get the latest public health information from CDC: <https://www.coronavirus.gov>
 - Get the latest research from NIH: <https://www.nih.gov/coronavirus>
 - Find NCBI SARS-CoV-2 literature, sequence, and clinical content: <https://www.ncbi.nlm.nih.gov/sars-cov-2/>.



What We've Learned Today

- History of disease in sewage dates back to 1854
- In the United States state and local governments maintain quality and safety of water
- The United States has a national surveillance system for waterborne disease outbreaks
- Source of contamination can be of fecal or nonfecal origin
- No single indicator can predict all threats
- Use current best practices
- Protective practices
- Steps and resources to manage the future



Closing Remarks

- Routinely monitor your COVID-19 plan
 - Assure your plan is up to date
 - Assure your plan is being followed
- Stay current on the latest findings and adapt practices as appropriate
- Common sense and good hygiene go a long way
 - Wash your hands, wear your mask, don't touch your face and routinely wash your clothes daily
- You are in control of your health and safety as well as your fellow workers around you
- You are also responsible for health and safety of the constituents you serve
- Perhaps most important of all is you are also you are in control of your family's safety and health



QUESTIONS





Thanks for joining us!
Download the slides at ssmgroup.com

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