DATE: June 29, 2020

TO: Clean Water Services Advisory Commission Members
and Interested Parties

FROM: Mark Jockers, Government & Public Affairs Director

SUBJECT: REMINDER AND INFORMATION FOR JULY 8, 2020, CWAC MEETING

This is a reminder that a Clean Water Services Advisory Commission (CWAC) meeting is scheduled for **Wednesday, July 8, 2020.**

In support of Governor Brown's Executive Order No. 20-12, entitled, "Stay Home, Save Lives," CWS is making the following changes to the format of the July meeting:

- The meeting will be held virtually using the Webex platform.
    - Webex offers the option to connect to video, slides and audio via a device with internet access, or an audio-only connection through any telephone line.
    - CWAC members should watch for an email containing Webex connection details. For those who experienced technical difficulties during the May meeting, please call 503.681.5143 in advance of the meeting for assistance.
    - Interested parties should register for this meeting by July 7 by following the instructions on the website.
- The meeting will begin at 5:30 p.m. Please plan to establish your connection to the meeting 10-15 minutes before the start time to allow the meeting to begin promptly.
- Dinner will not be provided.

The CWAC meeting packet will be mailed to Commission members on Monday, June 29, and posted to the CWAC section of the Clean Water Services' website.

Please call or send an email to Stephanie Morrison (morrisons@cleanwaterservices.org; 503.681.5143) by July 6 to advise about your attendance at this meeting.

Enclosures in this packet include:

- July 8 Meeting Agenda and Materials
- May 13 Meeting Notes

Clean Water Services Advisory Commission

July 8, 2020

AGENDA

5:30 p.m. **Welcome & Introductions**

5:35 p.m. **Review/Approval of Meeting Notes of May 13, 2020**

5:40 p.m. **Sub-Basin Planning Priority Screening**
Staff will provide an update on the results of the sub-basin planning prioritization methodology screening presented at the March meeting and discuss next steps.

- Chris Faulkner, Water Resources Program Manager

Requested action: *Informational*

5:55 p.m. **Update on Tracking Coronavirus in Sewage**
Dr. Ken Williamson will provide an update on CWS research projects to track evidence of COVID-19 in wastewater. This report will be a follow-up to Dr. Williamson's May presentation to the Commission.

- Dr. Ken Williamson, Research & Innovation Director

Requested action: *Informational*

6:45 p.m. **Invitation for public comment**

6:50 p.m. **Announcements**

7:00 p.m. **Adjourn**

Next Meeting: August 12, 2020

SUB-BASIN PLANNING PRIORITIZATION SCREENING

July 8, 2020

CWAC
Chris Faulkner
Water Resources Program Manager



PRESENTATION AGENDA

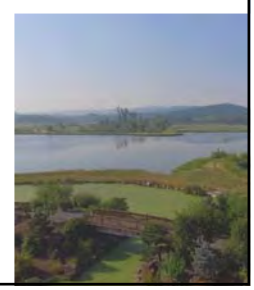
- Previous Meeting Recap
- Methodology Summary
- Prioritization Results Table
- Prioritization Results Map
- Next Steps

PREVIOUS MEETING RECAP

- Board charge
  - Provide feedback on prioritization methodology
- Prioritization intent
  - Provide an approach for CWS to sequence strategy development and analysis in largely in-fill areas within the UGB

METHODOLOGY SUMMARY

- Excludes established priority areas
- Compare Hydromod Risk with Land-Use Stressors
- Break each criteria into quintiles
- Rank each 1 (lowest) – 5 (highest)
- Create a composite score to determine priority watersheds
- Conduct 2nd-tier analysis on top XX watersheds



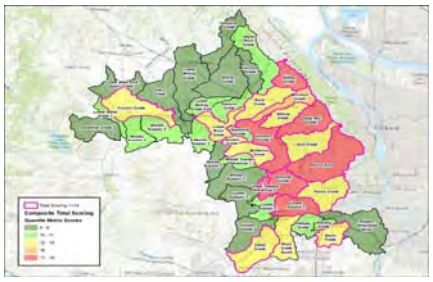
PRIORITIZATION DATA

- Hydromodification Risk Level
  - Existing dataset showing streams' risk of being impacted by hydromodification
- Potential Single Family Units
  - Reflects future impervious cover
- Existing Impervious Cover (%)
  - Provides a proxy for existing watershed health and potential impacts
- Building Rate
  - Average annual tax-lot creation based on data from 2011-2017, reflects potential immediacy of development

PRIORITIZATION RESULTS TABLE

CWS Planning Basin	SFR Units Score	Impervious Score	High Risk Score	Dev Rate Score	Composite Score
Cedar_Mill_Creek	5	4	5	5	19
Fanno_Ash	5	4	5	4	18
Johnson_Creek	5	4	4	5	18
Summer_Creek	4	4	4	5	17
Abbey_Creek	5	2	5	5	17
Lower_Tualatin_1	5	3	4	5	17
Lower_Tualatin_Perennial_1	5	3	4	5	17
Bronson_Creek	4	3	5	4	16
Butternut_Creek	5	4	3	3	15
Willow_Creek	4	4	3	4	15
Golf_Creek	4	5	3	3	15
Fanno_Creek	4	4	3	4	15
Rock_Creek	3	5	2	5	15
Cedar_Creek	4	2	5	3	14
Lower_Rock_Creek	3	5	2	4	14
Council_Creek	5	3	2	4	14
Saum_Creek	3	3	5	3	14
Gordon_Creek	3	5	1	5	14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Upper_Rock_Creek	3	1	3	4	11
Lower_McKay_Creek_Fork	3	5	1	2	11
Dawson_Creek	2	5	1	3	11
Reedville_Creek	2	5	1	3	11
Lower_Gales_Creek_1	3	2	4	2	11
Middle_Tualatin_4	2	3	2	3	10
Hedges_Creek	2	4	2	2	10
Nyberg_Creek	2	5	1	2	10
Middle_Tualatin_5	2	2	4	2	10
Lower_Tualatin_2	4	2	3	1	10
Middle_Tualatin_3	3	3	1	3	10
Middle_Tualatin_Perennial_1	4	2	3	1	10
Tualatin_Willamette_River	2	3	2	2	9
Lower_McKay_Creek	2	2	1	4	9
Chicken_Creek	1	1	5	2	9
Middle_Tualatin_1	3	1	4	1	9
Lower_West_Fork_Dairy_Creek	1	1	5	1	8
Carpenter_Creek	1	1	3	1	6
Middle_Tualatin_2	1	1	2	2	6
Lower_Tualatin_3	1	1	2	1	5
Storey_Creek	1	2	1	1	5
Dairy_Creek	1	2	1	1	5
Holcomb_Creek	1	1	1	2	5
Jackson_Creek	1	1	1	1	4

PRIORITIZATION RESULTS MAP



IMPORTANT REMINDERS

- CWS already working on strategies in multiple areas
- Opportunities will continue to be considered as they come up
- Further analysis may reshuffle "priorities"
- This work serves as an initial screen to help allocate internal resources for additional work
- CWS is always available to receive feedback and input on where strategy work might be useful

NEXT STEPS

- Conduct 2nd Tier Analysis
  - Highlight hotspots in priority CWS Planning Basins
  - Consider other stormwater management tools as appropriate
  - Coordinate internally on how other CWS Divisions might plug in
- Scoping for CWS planning

QUESTIONS?

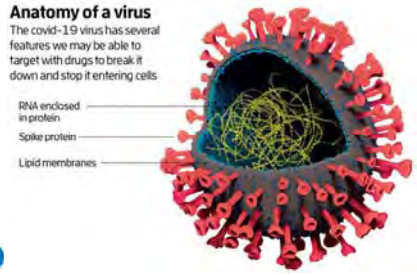
TRACKING THE CORONAVIRUS IN SEWERSHEDS

July 8, 2020

Dr. Kenneth Williamson, PhD, PE
Research & Innovation Director



EXAMPLE OF GENES, RNA, REMNANTS OF INACTIVE VIRUS

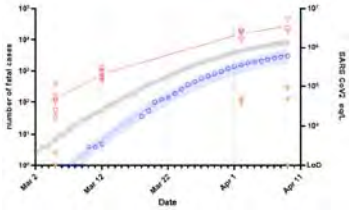


Marshall, M. "We're beginning to understand the biology of the COVID-19 virus." New Scientist, https://www.newscientist.com/article/mg24532743-500-were-beginning-to-understand-the-biology-of-the-covid-19-virus/ (accessed March 19, 2020). Permission pending.

USE CASES

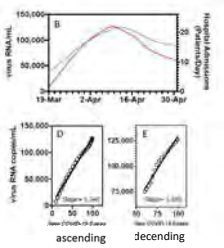
ADDED VALUE OF SEWER SURVEILLANCE

- Virus concentrations in wastewater must be correlated with a health response
- Collaboration is needed between water utilities and local, state and national health professionals



Wurtzer, et al., 2020

NEW HAVEN DATA



virus RNA, red
Admission, gray

Peccia, 2020

OSU/CWS COLLABORATIVE RESEARCH

- Two objectives:
  - Compare influent sample results to Biobot study, improve sampling and analysis techniques
  - Sample within selected areas of concern (micro-sewersheds), such as nursing homes, hospitals, food processing plants, prisons, schools, etc.
- Dr. Tyler Radniecki and Dr. Christine Kelly
- Funded by the National Science Foundation's Rapid Response Research (RAPID), Award No. 1519467, on April 27, 2020

College of Engineering

SEWERSHED SAMPLING

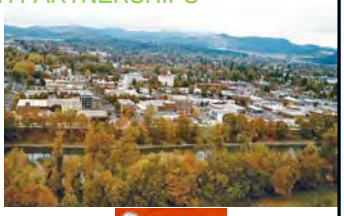
- Targeted research at 23 sites
- Mix of land uses, business types and communities
  - Hospitals
  - Food industries
  - Jail
  - Nursing homes
  - Retirement communities
  - Low-income communities
- Weekly data for 1 year

IMPACT OF NON-RESIDENT POPULATIONS

- Wastewater influent sampling for Yachats and Depoe Bay (resident populations, 780 and 1,500, respectively)
- Weekly sampling, Wed and Sat, June-September
- Yachats - summer tourist numbers, ~3,000
- Depoe Bay - summer tourist numbers, ~12,000

EXPANDING RESEARCH PARTNERSHIPS

- OSU Colleges of Public Health and Human Sciences, Science, Veterinary Medicine, and Agricultural Sciences - TRACE program
  - Conduct sewer surveillance for Corvallis, Bend, and Newport to compare with spatial distribution of positive cases
  - Conduct leading surveillance at OSU for one year



Oregon State University
TRACE-COVID-19

EXPANDING RESEARCH PARTNERSHIPS

- Oregon Health & Science University
  - Identify areas to conduct public health tracing (symptomatic and asymptomatic infections) in minority communities in Portland

OREGON HEALTH & SCIENCE UNIVERSITY

EXPANDING RESEARCH PARTNERSHIPS

- Oregon Health Authority
  - Expand influent testing in 41 wastewater treatment plants in Oregon over 30 months to track the spread, recession and any potential new waves of COVID-19 infections

Oregon Health Authority

THANK YOU

Clean Water Services

Clean Water Services Clean Water Advisory Commission

Date: May 13, 2020

Location: The meeting was conducted on Webex

MEETING NOTES

Attendance

Attending the meeting from CWAC:

- Tony Weller (Homebuilder-Developer), Commission Chair
- Mike McKillip (District 3/Rogers), Commission Vice Chair
- Andy Duyck (District 4/Willey)
- Art Larrance (At-Large/Harrington)
- David Waffle (Cities/nonvoting)
- John Jackson (Agriculture)
- Lori Hennings (Environmental)
- Matt Wellner (Homebuilder-Developer)
- Nafisa Fai (District 1/Schouten)
- Stu Peterson (Business)
- Terry Song (Business)
- Diane Taniguchi-Dennis (Clean Water Services Chief Executive Officer (nonvoting)

Absent:

- Molly Brown (District 2/Treece)

Attending the meeting from Clean Water Services:

- Mark Jockers, Government & Public Affairs Director
- Gerald Linder, General Counsel
- Nora Curtis, Utility Operations & Services Managing Director
- Ken Williamson, Research & Innovation Director
- Bob Baumgartner, Regulatory Affairs Director
- Joy Ramirez, Environmental Services Supervisor
- Chris White, Public Involvement Coordinator
- Shannon Huggins, Public Involvement Coordinator
- Stephanie Morrison, Office Manager
- Jody Newcomer, Technical Editor & Communications Specialist
- Dave Cebula, Information Technology Enterprise Architect

Attending the meeting from the public:

- Dale Feik, Chair of Washington County Citizen Action Network and Project Director of Hillsboro Air & Water
- Jan Wilson, Executive Director, Tualatin Riverkeepers

1. CALL TO ORDER

Tony Weller called the meeting to order at 5:35 pm.

Mr. Jockers addressed the challenges of holding the meeting on Webex. Public comment will be at the end of the meeting, with each person allotted up to 3 minutes.

Ms. Morrison announced the meeting is being recorded and recognized all attendees. She reviewed the features and functions of the platform.

2. REVIEW/APPROVAL OF MEETING NOTES

There were no comments regarding the notes from the meeting on March 11, 2020. The notes were approved.

3. PRETREATMENT ORDINANCE CHARGE

- Bob Baumgartner, Regulatory Affairs director
- Joy Ramirez, Environmental Services supervisor

In a follow-up to the March presentation regarding the CWS pretreatment ordinance, staff appeared before the CWS Board of Directors on March 31 and received a charge to work with CWAC for the public input process on a proposed update to the ordinance.

Mr. Baumgartner reviewed the Environmental Services program. Environmental Services specialists are involved in complaint response; pollution prevention; the fats, oil and grease program; industrial stormwater; and the pretreatment program, which has federal, state and local components. The goals of the pretreatment program are protecting worker safety, public health, the environment, infrastructure and beneficial reuse.

CWS must conduct and enforce its pretreatment program as approved by the Oregon Department of Environmental Quality and comply with the general pretreatment regulations (40 CFR 403). The federal government established responsibilities for federal, state and local government; industry and the public to implement national pretreatment standards to control pollutants, which could pass through the treatment facilities, interfere or contaminate sewage sludge at a POTW, or publicly owned treatment works. DEQ and the Environmental Protection Agency oversee CWS work and conduct audits.

Environmental Services specialists implement the pretreatment program on several levels. They focus on industrial sources and work with industries to ensure the required pretreatment systems are in compliance with federally mandated programs. They also provide oversight to industries that are not required to be in the federal program, but are required to meet provisions of the local sewer use ordinance. The local program also provides a method for cost recovery.

In the past few years, CWS has examined its program looking for ways to improve environmental and public health outcomes. CWS regulations are included in Ordinance 27 and several Resolutions and Orders. Staff has created a new draft ordinance, which combines elements of existing older rules, to update and clarify requirements relating to domestic and nondomestic wastewater.

A recent audit by DEQ and EPA noted the regulatory documents are confusing and include areas of inconsistency. Enforcement protocols are out of date and do not serve as deterrents. The audit also noted core documents needed to be improved. Historically, there aren't many industries that fall out of compliance, and most instances are resolved in early stages.

The goals for the ordinance are to combine all the regulations in a single document with a single set of rules. We hope to bring transparency and clarity to the enforcement process.

Changes include clarifying regulation of nondomestic types of wastes, rules on hauled wastes, applicability of discharge prohibitions, permit application procedures and requirements, and process for permit modification; incorporating provisions of federal dental mercury program; and allowing administrative extension of expired permits. Another goal is to improve the process for enforcement and appeals.

The team has produced a draft ordinance, briefed the board and received a charge to work with CWAC on the public process. The document also has been reviewed by an external legal team. CWS has made initial contact with industries and is seeking input from CWAC on the public process.

The team has proposed a process for public input to include industries, environmental groups and interested community members. The Board has to pass the ordinance after outreach occurs and DEQ must approve.

QUESTIONS, COMMENTS

Q: Have you or will you contact every permit holder?

A: We have reached out to a majority of industries, but we have not provided a draft to review. That will happen. The ordinance is ready for public distribution, but Mr. Baumgartner said he wanted to talk with CWAC before making it available to industries.

Q: You indicated you wanted to remove inconsistencies between R&Os and ordinances, but you drafted a new ordinance. What's left to be handled by the R&O?

A: We are dispensing with the R&O and will create a single document.

Q: What is the role of CWAC in the new process? Previously the group has been involved in fact-finding hearings or making recommendations to the Board.

A: CWAC is not explicitly identified in a process for a hearing, but the CEO has the discretion to task CWAC with a hearing. Most of the hearing process will be at the administrative level.

Q: Is this process separate from the Design & Construction Standards, or is there some overlap?

A: The pretreatment program is entirely separate from the D&C Standards.

Q: Will you follow the D&C model by posting revisions, comments and responses to comments? It worked well for the process.

A: We want a full and open discussion of the ordinance. We can use that experience as a model.

Q: Will you send a link to CWAC when the ordinance is posted to the website?

A: Yes.
Mr. Jockers called attention to a fact sheet that summarizes the issue. It was included in the agenda packet. He said the Board acknowledged the important role of CWAC in stakeholder outreach and engagement.

4. TRACKING THE CORONAVIRUS IN SEWAGE

- Dr. Ken Williamson, Research & Innovation Director

Scientists have long known that our wastewater tells a story about our health and how we live. Viruses, bacteria, pharmaceuticals and drugs are excreted from our bodies and can be tracked in wastewater. CWS is involved in two research projects to track evidence of the coronavirus in wastewater entering the District's four water resource recovery facilities. At a time when COVID-19 testing is limited, these data can provide more ways for public health officials to track the virus, monitor the effectiveness of public health strategies, and provide an early warning on the presence of the virus in a community.

Dr. Williamson provided background to the research project and foundational information about viruses in general. Viruses attack cell membranes. Many viruses are selective; COVID-19 is primarily associated with the cells lining the alveoli of the lungs. Why is the coronavirus in the wastewater? Our bodies expel the viruses that ended up in our guts or have been killed by antibodies. The excretion contains a genetic signal of RNA that is specific to the COVID-19 disease. There is no evidence that COVID-19 is transmitted to humans through feces.

Studies in Paris, Australia, the Netherlands and Denmark show we can use indicators in wastewater to monitor a virus. CWS chose to join a national research project conducted by Biobot Analytics, a technology spinoff from MIT. Biobot is analyzing influent wastewaters over a 12-week period from more than 100 communities across the nation to track the spread of the coronavirus. CWS began sending weekly composite samples from each of its four water resource recovery facilities during the week of March 30.

Data from the four CWS treatment plans is relatively flat aside from a spike in virus concentrations in Forest Grove. The exercise shows we can measure a response at the plants.

The National Science Foundation awarded research funding to an Oregon State University/CWS collaboration to track evidence of the coronavirus in Washington County's sewage collection and treatment system. The project was one of six proposals funded out of hundreds of applications. The research will examine the quality of the Biobot data and analyze genetic evidence of the coronavirus in wastewater from portions of the sewershed, which could give us the ability to identify specific local sources such as hospitals, schools and retirement homes. CWS staff began collecting samples from 15 sites within the wastewater collection system and at each of the four water resource recovery facilities in April. The research team has since increased the number of sampling sites to respond to the number of cases in our community and to monitor specific institutional sites of interest. CWS collects and concentrates the samples before sending them to OSU for genetic analysis and interpretation.

The OSU/CWS research team has developed a cooperative proposal with the Oregon Health Authority to sample about 30 treatment plants in Oregon for the next year. OHA is interested in

using sewer surveillance to identify potential outbreaks of infection, especially in smaller communities.

The OSU/CWS research team has also developed a cooperative proposal with Oregon Health & Science University to expand the sewershed program to include Portland and Lake Oswego and to expand the number of sites tested in Hillsboro. Under the proposal, if an area of concern is found, OHSU is interested in testing infected people for both COVID-19 and antibodies to get the exact number of cases. Sampling would be conducted in Portland by the Bureau of Environmental Services and in Lake Oswego by the Lake Oswego Public Works Department.

The OSU/CWS research team is also expanding testing to support a large public health data gathering effort at Oregon State University called TRACE — Team-based Rapid Assessment of Community-level coronavirus Epidemics. TRACE is seeking to randomly sample communities or cities to determine symptomatic and asymptomatic infections through testing and personal interviews. The data collected is extensive and used to map where the infection came from and where it has gone. We are measuring virus concentration in wastewaters in two cities, Corvallis and Bend, to correlate with the TRACE data sets.

This effort will expand sample processing and analysis, so we need to improve our techniques and bring down costs. We'll need to process 200-300 samples a week, up from 20-30.

There's a lot of interest nationally on programs that link public health and wastewater.

QUESTIONS, COMMENTS

Mr. Jockers said the work has generated a lot of local and national media interest. The Water Research Foundation invited CWS to be one of three utilities at a congressional briefing on environmental surveillance of COVID-10 in sewersheds on May 21 for staff in the House and Senate that work on environment, public health and appropriations committees. Dr. Williamson will contribute a 10-minute presentation addressing issues such as use cases, sampling design, approaches to analysis and communications with public health officials and the broader community.

Q: Are byproducts contagious for people drinking groundwater.

A: Groundwater is not a concern. The primary – maybe only – way to get infected is through aerosols in lungs.

Q: How quickly can viruses invade cells? Minutes? Hours?

A: All indications is it happens in minutes. That's why immune system needs to attack immediately. You don't get infected by a single virus. Have to have enough to overwhelm the immune system.

Q: When you find signals in wastewater, do you have to know the codes first?

A: Yes. We can only measure signals if we know the genetic code. Initially, there was concern about bringing pathogens into the lab. The Chinese sequenced and published the genetic code and we learned the virus is not infectious in wastewater. Those factors enabled us to proceed.

Q: How are you identifying eDNA?

A: We don't use eDNA because we know the sequence. (eDNA or Environmental DNA is organismal DNA that can be found in the environment.) We look at just a piece of RNA rather than the entire sequence. "We don't measure Humpty Dumpty, we measure the pieces of Humpty Dumpty after he fell off the wall." It's an elaborate procedure that's done at the gene lab at OSU.

Q: How does that compare to the testing we're doing on people?

A: The test done on people is a yes or no process. The test looks for a match; if there's a match, you have the disease. The technique we're using is called quantitative PCR, which means we're trying to get numbers. The analysis is much more complex, so the process is more elaborate, more expensive than tests for the virus on blood or saliva.

Q: Does the governor know about this, and could it help determine whether and where we need more temporary shutdowns?

A: I'm sure Gov. Brown knows via the Oregon Health Authority. We haven't had direct contact with the governor. The OHA study is designed to detect the virus in smaller communities, with a smaller public health presence. It could be a very good early warning system.

Mr. Jockers said we are hopeful this study can provide feedback on the public health pieces. We are the researchers; we can provide data to public health officials and epidemiologists.

Q: Can you correlate the number of cases we know or suspect and those that we don't, the asymptomatic cases?

A: The Netherlands found 25 asymptomatic cases for every one positive case. That result was replicated in the Paris and Australia studies. There are probably 20-25 cases of COVID-19 in the human population for every single case identified. We just haven't found them yet.

Q: Can we get an update from Dr. Williamson at the next CWAC meeting?

A: Yes. And we'll send links to stories that have appeared in the media and the Congressional briefing scheduled for May 21.

5. PUBLIC COMMENT

Dale Feik said Dr. Williamson's research project is fascinating and applauds the nationwide collaboration. He said he's glad CWS is taking the time to do the work. He asked if the lab at the new research center will be expanded and more staff hired.

He's also pleased that CWS is taking EPA feedback seriously regarding the pretreatment program. He said he appreciates the hard work by CWS staff and acknowledged the role of essential staff in the community.

Mr. Weller also recognized the essential work CWS is doing.

Dr. Williamson said he and Mr. Baumgartner have been working for the past year to develop a program in the lab to measure viruses because the EPA is working on standards for virus limits on wastewater discharges. The new lab will have facilities to do the necessary levels of microbiology, including PCR. The arrival of COVID-19 accelerated the process.

6. ANNOUNCEMENTS

- The Budget Committee meeting will be held June 5, 2020, in the auditorium of the Washington County Public Services Building. There will be resources to participate virtually. Budget documents will be delivered to Budget Committee members on May 22.
- The next CWAC meeting is June 10, 2020.
- We've received several applications for the open Environmental position. Mr. Jockers is hopeful he can take the applications to the Board for consideration in June.

7. ADJOURNMENT

Mr. Weller adjourned the meeting at 7:09 pm.

(Meeting notes compiled by Jody Newcomer.)

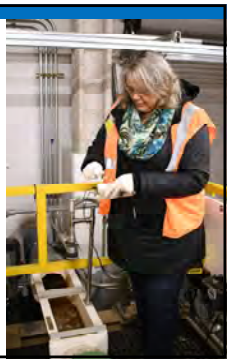
New Non-Domestic Waste Ordinance: Introduction and Public Process

May 13, 2020

Clean Water Services CWAC
Bob Baumgartner, Regulatory Affairs Director
Joy Ramirez, Environmental Services Supervisor

ENVIRONMENTAL SERVICES

- Program area
  - Environmental response
  - Commercial and cost recovery
  - Industrial stormwater
  - Pretreatment program
- Goals
  - Environmental protection
  - Worker safety and public health
  - Plant operations
  - Protect infrastructure
  - Compliance and enforcement



PRETREATMENT PROGRAM

- Federal program - mandatory
  - Specific industrial sources
  - Permitting, monitoring, enforcement
  - Legal authority
- Local program
  - Expand to where federal program has not kept pace
  - Allows addressing local issues
  - Cost recovery

WHY UPDATE ORDINANCE?

- Currently exists in two documents (ordinance and R&O)
- Bring consistency and clarity to the regulations
- Different “nontraditional” users
- Response to regulatory agency audits

RECENT DEQ/EPA AUDIT FOUND:

- Regulatory documents confusing
- Areas of inconsistency between ordinance and R&Os
- Areas inconsistent with federal requirements
- Enforcement not up to date, not a deterrence
- Permits and other implementation documents need improvement

GOALS FOR ORDINANCE

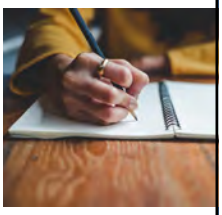
- Single document
- Single set of rules
- Transparency
- Clarity
- Meet regulatory guidance and rules

CHANGES

- Clarifies regulation of non-domestic types of wastes, regardless of origin
- Clarifies rules on hauled wastes
- Clarifies applicability of discharge prohibitions
- Incorporates provisions of federal dental mercury program
- Clarifies permit application procedures and requirements
- Clarifies process for permit modification
- Allows administrative extension of expired permits

MORE

- Enforcement and appeal procedures improved and clarified
  - Penalty computation easier
  - Refined authority for issuing corrective orders
  - Clarified process for suspending and revoking permits
  - Updated statement of authority for inspections, including obtaining administrative search warrants, if needed
  - More expedient process for hearings and appeals



STATUS

- Produced draft ordinance
- Briefed Board. Received charge to work with CWAC on the public process
- Received external legal review
- Made initial contact with industries
- Seeking CWAC input on public process

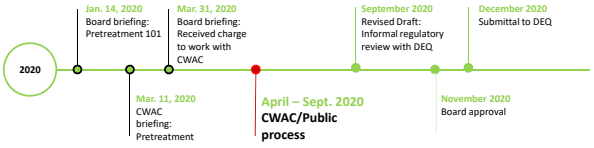
PROPOSED PUBLIC PROCESS

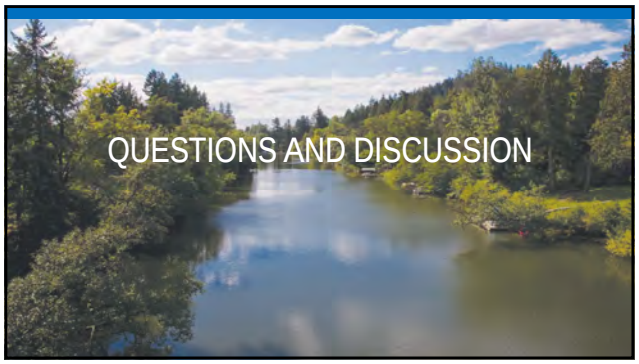
- Targeted outreach to industries, environmental groups, interested community members
  - Provide draft ordinance
  - Provide opportunity for individual briefing
  - Provide opportunity for input
  - Provide draft on public website
  - Summarize responses
- Brief CWAC on responses
- Receive input from CWAC
- Provide revised ordinance draft
- Board presentation

WHAT WE HEARD FROM INDUSTRIES

- ES Specialists calling permitted industries individually
- Providing background on proposed changes
- Asking how they would like to interact
  - Some want only a copy of the final rule when done
  - Some want a draft to review and may want further interaction
  - Few expressing interest in individual virtual meetings

PROPOSED SCHEDULE





THANK YOU

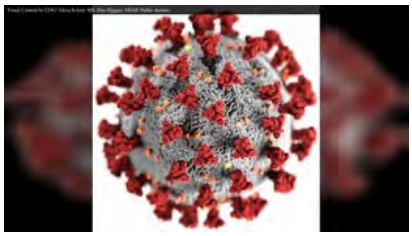
Sewer Surveillance of Coronavirus in Wastewater

Kenneth Williamson, Ph.D., P.E.
Director of Research and Innovation

A LITTLE ABOUT VIRUSES AND COVID-19

- Genetically, viruses are coded with RNA, not DNA
- Viruses attack other living organisms by attaching to the cell membrane, penetrating to the cytoplasm, duplicating its RNA to create a DNA match, inserting that matched DNA into the DNA of the living organism, turning on the DNA of the living organism to replicate the virus' DNA, remaking new RNA from the replicated DNA to create new viruses, breaking out of the host organism (budding) and repeating the cycle.
- Many viruses are selective for cell host types (COVID-19 is primarily associated with the cells lining the alveoli of the lungs).

SARS-Cov-2



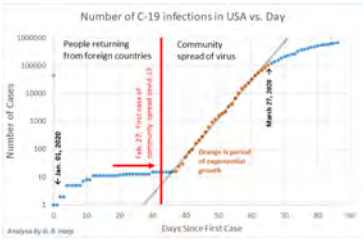
A LITTLE ABOUT VIRUSES AND COVID-19

- Humans have a long history of battle with viruses.
- Viruses are controlled by the human immune system; primary medical approach is immunization.
- Widespread viruses historically have caused smallpox, yellow fever, hepatitis, measles, poliomyelitis, colds, and flu.
- Newer ones include viruses that cause hemorrhagic fevers (Lassa fever, Ebola, Hantavirus), Severe Acute Respiratory Syndrome (SARS), West Nile Virus, Human Immunodeficiency Virus (HIV); and SARS-Cov-2, which causes COVID-19.

WE ARE IN A PANDEMIC

- Worldwide, 3.8 million cases, 270,000 dead
- US, 1.25 million cases, 75,000 dead
- Oregon, 2,800 cases, 79 dead
- Washington County, 540 cases, 12 dead

(as of May 7, 2020)



WHY IS COVID-19 IN WASTEWATER?

- The body attacks viruses by two main mechanisms:
  - Macrophages (T cells) kill and remove them like lots of other foreign material
  - Antibodies kill and cover them so that they cannot penetrate the cell membrane
- The body excretes the macrophages, dead viruses, used antibodies, etc.
- This excretion contains a genetic signal of RNA that is specific to the COVID-19 virus
- No evidence that COVID-19 is transmitted to humans through feces.

DATA FROM PARIS, FRANCE

Quantification of SARS-CoV2 genomes in raw (open inverted red triangles) or treated wastewater (full inverted red triangles) from 3 WWTP of the Parisian area. The numbers of COVID-19 fatal cases in France (in grey) or in the Parisian area (open circle in dark blue) are indicated. Gaussian curves were fitted on data (r^2> 0.98) for modeling the Parisian area where information was lacking.

Wurtzler, et al., 2020

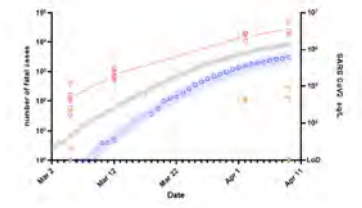


Figure 1: Quantitative time-course monitoring of SARS-CoV2 in wastewater samples from Paris area

OSU/CWS COLLABORATIVE STUDY

- Collaborators: Tyler Radniecki and Christine Kelly, School of Chemical, Biological and Environmental Engineering
- Two objectives:
  - Collect samples from our four WWTP's influents, compare results to Biobot study, improve analysis techniques
  - Sample within selected areas of the sewershed that could be areas of concern (nursing homes, hospitals, food processing plants, prisons, schools, etc.)
- Funded by the National Science Foundation RAPID program, Division of Chemical, Bioengineering, Environmental, and Transport Systems, on April 27

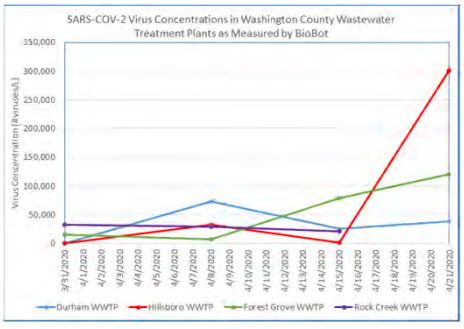
BIOBOT STUDY

- Biobot Analytics began a study of ~100 treatment plants in the US in March, 2020
- CWS provided samples of WWTP influent beginning in late March
- Data results in virus counts/liter
- Some concern about the quality of data

SEWERSHED SAMPLING

- 15 sites, Forest Grove and Rock Creek
- Looking at adding 4 to 5 sites in Hillsboro
- Metadata of manhole placement, land use, collection area, flow
- Mix of hospitals, prisons, retirement communities, nursing homes, low-income communities, food industries, other industries
- Will measure wastewater metadata
- Have been collecting samples for three weeks

CWS DATA FROM BIOBOT STUDY



NEXT STEPS

- Expand micro sewershed program to include Portland and Lake Oswego. Partner with OHSU to provide human testing symptomatic and asymptomatic virus infections and antibodies
- Expand testing of treatment plants statewide in partnership with OHA
- Expand testing of treatment plants for cities studied by TRACE research group at OSU (Corvallis, Bend, Newport(?))
- Expand sample processing and analysis, improvement of techniques

THANKS!!!!!

- CWS Management: Diane, IC Team of Nora, Nate, Bob, Holly, and Mark
- RAD and R&I staff: Scott Mansell, Steve Thompson, Leila Barker, Katie Corliss, Mercie Hodges, Jason Cook
- Durham support: Peter Schauer, Pat Orr
- Business support: Heidi Blasingame, Erin Lowry, Kathy Leader