Swim Beach Safety:
Monitoring, Testing, and Investigating
August 22\textsuperscript{nd}, 2018
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Our Mission

- We collaborate with partners to protect and improve the health of and the environment for all people in Clark County. Together we:
  - *Prevent* disease and injury.
  - *Promote* healthier choices.
  - *Protect* food, water, soil, and air.
  - *Prepare* for and respond to emergencies.
Where do we sample?

- Designated Swim Beaches
  - Vancouver Lake
  - Klineline Pond
  - Battle Ground
- What we monitor
  - *E. Coli*
  - Cyanobacteria Toxins
  - Outbreaks
  - Drownings

We sample and/or monitor other bodies of water as needed.
Cyanobacteria Monitoring Caution

- **Bloom present**, Photo taken 7/23/18 at Vancouver Lake Flushing Channel

CAUTION

TOXIC ALGAE MAY BE PRESENT
Lake may be unsafe for people and pets

Until further notice:
- **Do not swim or water ski in areas of scum.**
  No nadar o practicar esquí acuático en áreas con espuma o verdín.
- **Do not drink lake water.**
  No tome el agua del lago.
- **Keep pets and livestock away.**
  Mantenga alejados las mascotas y el ganado.
- **Clean fish well and discard guts.**
  Limpie bien el pescado y deseche las tripas.
- **Avoid areas of scum when boating.**
  Evite las áreas con espuma o verdín cuando ande en lancha.

Call your doctor or veterinarian if you or your animals have sudden or unexplained sickness or signs of poisoning.

Report cyanobacteria blooms to Department of Ecology: 360-407-6000
Call your local health department:

For more information: www.doh.wa.gov/dph/algae/
www.ecy.wa.gov/programs/wq/cyanobacteria/index.html

- **Toxin below threshold**
- **Steps taken:**
  - Sample when visible
  - Inform PIO and Parks Department
  - Issue press release
Cyanobacteria Monitoring Warning

- Bloom present
- Toxins above threshold, in area not easily accessible by public
- Steps taken:
  - Sample when visible
  - Inform Parks Department
  - Issue press release
Cyanobacteria Monitoring Closure

- Bloom present
- Toxins elevated in area easily accessible by public, i.e. swim beach

Steps taken:
- Inform PIO and Parks Dept.
- Close beach
- Resample beach
- Issue press release
Cost This Year

- Sample analysis and materials paid for by Department of Ecology
- Shipping paid by CCPH
  - Cost this year: $105
- Staff hours paid for by CCPH
  - Hours this year: 42 approx.
**E. Coli Monitoring**

- **One sample above Beach Action Value (BAV is 236 CFU/100mL water)**
  - Contact PIO and Parks
  - Issue Press release
  - Resample until all levels are below BAV
  - Upgrade to CLOSED if more than 1 hit

- **Two or more samples above BAV**
  - Contact PIO and Parks
  - Close beach
  - Issue press release
  - Sample until all samples are under BAV
  - Downgrade to CAUTION if one sample is still over
E. coli Sampling Flow Chart

This chart is meant to be a guidance for posting advisories related to E. coli sampling. Confirm steps with appropriate management/leadership prior to taking any actions.

- **Number of samples greater than 236 MPN/100 mL water**
  - 0: No action
  - 1: Post beach at WARNING
  - 1+: BEACH TEMPORARILY CLOSED

- **Inform PIO as well as operators of the park. Ask lab if they are receiving samples at this time.**
  - Resample beach

- **Receive report. Number of samples greater than 236 MPN/100 mL**
  - 0: If posted at WARNING remains at WARNING
  - 1: Change to CLOSED and close the beach
  - 1+: Remove signs and reopen the beach

- **If posted at CLOSED**
  - 0 or 1: Change to WARNING
  - 1+: Remain at CLOSED
Cost This Year

- Routine samples for Klineline Pond paid for by Clark County Parks
- Investigative Samples paid by CCPH
  - Cost this year: $2,475
- Staff hours paid for by CCPH
  - Hours this year: 50 approx.
Outbreak Investigations

• CCPH investigates all illness complaints
  ▫ **Waterborne Illness**
  Outbreak is declared when
  1. Two or more epidemiologically-linked persons experience a similar illness after exposure to the same water source **OR**
  2. Epidemiologic evidence implicates the water as the likely source of illness

1999 *E.coli* O157:H7 Battle Ground Lake
2012 Shigella Klineline Pond
2014 Shigella Klineline Pond
2014 VGE Lewisville Park
BG Lake Outbreak Investigation -- Timeline

• **July 20 (AM)**
  - CD notified of lab-confirmed Shigella case. During interview, mother reports case and ill sibling swam at Battle Ground Lake on July 14.
  - Mother also reports children saw fecal matter in the water at Battle Ground Lake.
  - After interview, CD immediately debriefs EPH Swim Beach Safety Team.

• **July 20 (PM)**
  - CD notifies Health Officer.
  - Health Officer distributes Health Alert and Media Release.
  - EPH issues WARNING advisory for Battle Ground Lake.
  - EPH collects samples of lake water to test for E.coli.
BG Lake Outbreak Investigation -- Timeline

- **July 21**
  - Test results from 7/20 all below threshold.
  - WARNING still posted until another round of samples show levels below threshold.

- **July 23**
  - EPH staff resample Battle Ground Lake for E.coli.

- **July 24**
  - Multnomah County reports 3 Shigella cases who swam in Battle Ground Lake on **July 14** (same day as Clark cases).
  - Multnomah and Clark cases appear socially unrelated.

- **July 26**
  - Test results from 7/23 all below threshold.
  - WARNING lifted from Battle Ground Lake.
  - Press release issued for lifted advisory.

- **July 25 – Early August**
  - CD completes epidemiological investigation with Oregon partners.
BG Lake Outbreak Investigation - Epi Curve

Onset of Confirmed and Probable Shigella Cases* who Visited Battle Ground Lake, Washington and Oregon, July - August 2018

*Preliminary and subject to change
BG Lake Outbreak Investigation-- Conclusions

- **Conclusions**
  - 11 total cases* – 6 primary, 7 secondary.
  - Genetic testing of the Shigella strains show similarities among the cases – suggests a common source.
  - Swimming in the water remains the leading hypothesis for the following reasons:
    - Report of fecal incident in water.
    - 2 unrelated groups with lab confirmed Shigella who swam.
    - History of Shigella-recreational water outbreak in Clark County (Klineline Pond, 2012).

*Preliminary and subject to change
Cost This Year

- Investigative Samples paid by CCPH
  - Cost this year: $550
- Staff hours paid for by CCPH
  - Hours this year: 45 approx.
Daily High Temperature and Number of Transactions

- **High Temp**
- **Transactions**
- **Warning Issued**
Number of Transactions Versus Plate Counts

- KLN075
- KLN076
- KLN077
- KLN078
- KLN079
- Duplicate
Summary of Data

• The daily high temperature has a direct correlation to the number of transactions
• Number of transactions considers beach warnings and closures
  ▫ However, this is a number of people paying to park, not necessarily entering the swim beach
  ▫ This is used as a proxy for bather load
• Increased number of transactions had higher plate counts of *E. coli*
• Increased *E. coli* counts can be attributed to higher bather load
Lessons Learned for Next Swim Year

- Swim Safety Campaign Spring 2019
  - Working with PIO to have focus messages during a month this Spring
  - Focus on educating parents about swim diapers, reminding to take on frequent bathroom breaks, and other healthy swimming behaviors
  - Work with Green Neighbors Program to provide education on natural gardening

- Working with Clark County Parks
  - Install diaper changing stations inside restrooms