MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

# Flushing Guidance for School Building Drinking Water Quality

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www.Michigan.gov/SchoolWater

# Items for Discussion

- Importance of quality drinking water
- Importance of moving building water
- Establishing a flushing program
- Flushing methods & general procedures
- Resources and website
- Questions and discussion

# Importance of Quality Drinking Water

Children spend a significant portion of their day in school buildings

Courtesy of EPA

# Importance of Quality Drinking Water

Public water must meet state and federal water quality standards

Courtesy of Ken Schulze/Shutterstock

Westerly Public Schools website

# Poll Question #1

# Importance of “Moving” Building Water

Prevent stagnation

Improve quality

Maintain system



*Moving “old” water out and “fresh” water in*

# Establishing a Flushing Program

Water quality management practices can and should be done to prevent water stagnation and promote quality drinking water

Google Image

# Poll Questions 2 & 3

# Establishing a Flushing Program

Decisions about when and how-to flush are specific to the building, plumbing system, and potential, suspected or known contaminant(s).

# Establishing a Flushing Program

- Understand your building plumbing system
  - Age, condition & complexity
  - Materials (service line, pipes, valves, fixtures)
  - Flow of water from entry to furthest point in the building
  - Location of all water outlets, fixtures & water use devices
  - Identify potential cross connections & pressure loss
  - Water usage/non-usage patterns
  - Water quality history

A flushing program is dynamic!



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# Establishing a Flushing Program

- Understand factors and categories of contaminants
  - Acute vs chronic
  - Aesthetic vs public health concern
  - Time required to flush contaminant out
  - Ability of contaminant to attach to pipe surfaces
  - Ability of contaminant to volatilize (evaporate or disperse in vapor)

# Establishing a Flushing Program

- Determine who is on your team, who can help
- Develop a communication strategy
- Develop the procedures
- Address safety & budget
- Impact on water disposal
- What determines effectiveness?
- Write it up!
- Plan, implement, maintain & revise

# Establishing a Flushing Program

- Communications with the public
  - Flushing categories
    - Emergency
    - Routine/Regular
    - Maintenance & awareness
  - Action plan
    - Bag fixtures
    - Signage
    - Bottle water

# Poll Question 4

# Establishing a Flushing Program

- When should flushing occur?
  - Prior to re-opening a school building
    - After extended breaks (summer, winter, spring, in-service, etc.)
    - After emergency shut down's
  - Throughout the school year
    - After weekends
    - Every use, every day, once a week, once a month
  - After plumbing or fixture changes or disturbances to the system
  - In response to system or fixture contamination

# Flushing Methods

**“Fresh Tap Method”**

- Refreshing the water
- Drinking or food preparation fixtures
- Remove soluble contaminants
- Individual fixture flushing
- Flush for 30 seconds to a minute
- Daily, weekly, or monthly
- Every use flushing

**“High Velocity Method”**

- Remove “old” water
- Removes sediments & biofilms
- Based on maintaining 3 ft/sec velocity
- Flush of all water outlets
- Flushing occurs in zones
- Zone flushing for at least 15 minutes
- Once to twice a year
- A week to a few days before re-opening

# General Flushing Procedures

- Plan & Communicate
- Integrity check
  - Inspect plumbing for leaks, corrosion, broken pipes
  - Make sure drains can handle flush
- Safety equipment check
  - Use as needed for potential airborne hazards during flushing
- Remove or by-pass devices
  - Point of entry treatment
  - Point of use aerators & filters
- Flush cold-water plumbing first, then hot water
- Follow manufacturer recommendations for flushing water use devices
- Replace devices (install new cartridge filters)

# “Fresh Tap Method” Procedure

- Begin at drinking/food prep fixture closest to water entry
- Flush for at least 10 minutes
- Next flush farthest fixture in each wing on each floor
- Flush for at least 10 minutes
- Then flush each fixture for 30 seconds to a minute
- Work your way back towards the water entry point
- Refrigerated water fountains need about 15 minutes to flush
- Other water-using devices may require different procedures

# “Fresh Tap” Before Every Use





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# “High Velocity Method” Procedure

- *Pre-determine* flushing zones
- Begin at first zone & open all cold-water fixtures
  - Ensure average of 3 ft/sec flow through meter
  - Start timer & flush for at least 15 minutes
  - Systematically flush toilets
  - Make frequent rounds to monitor water levels in sinks or adjust zone
- Close all fixtures in first zone and proceed to next zone
- Repeat process

# Poll Question 5 & 6

# Summary

- Children need quality drinking water for health & development
- Building plumbing factors may negatively impact the water
- Flushing is an essential part to water quality management
- A flushing program takes planning & communication
- A flushing program is dynamic – implement/maintain/revise
- Flushing is an effective, low cost tool
- The only way to know the quality of water is to test it!

# Other Resources

- The U.S. Centers for Disease Control and Prevention (CDC) Guidance for Reopening Buildings After Prolonged Shutdown or Reduced Operation: https://www.cdc.gov/coronavirus/2019-ncov/php/building-water-system.html.
- CDC guidance: Toolkit: Developing a Water Management Program to Reduce *Legionella* Growth and Spread in Buildings: https://www.cdc.gov/legionella/wmp/toolkit/index.html.
- The US Environmental Protection Agency (EPA) posted information that building owners should use to minimize water stagnation during extended closures and to address building water quality: https://www.epa.gov/coronavirus/information-maintaining-or-restoring-water-quality-buildings-low-or-no-use
- Purdue University Center for Plumbing Safety, Flushing Plan videos: https://engineering.purdue.edu/PlumbingSafety/resources/flushing-plans
- Environmental Science, Policy & Research Institute: https://esprinstitute.org/wp-content/uploads/2020/04/FINAL_Coronavirus-Building-Flushing-Guidance-20200403-rev-1.pdf and https://esprinstitute.org/wp-content/uploads/2020/05/FINAL_Reducing-Risk-to-Staff-Flushing-Buildings-20200501.pdf

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# Poll Question 7 & 8