# Introduction to the Michigan School Water Training Program

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# Today’s Talk

- General overview of the program & what we are trying to do
- Basics of drinking water quality
- Importance of keeping the water moving
- How to be effective with limited resources

# On Any Given Day

- Over 1.4 million Michigan children spend a significant portion of their day in school buildings
- Environmental hazard exposure can negatively impact the health of students and staff
- Poor indoor environments in schools have negative impacts on teacher productivity and student performance

# General Overview of the Program

- Michigan is rolling out the **School Water Training Program** (**SWTP**) to promote quality drinking water in school buildings & protect public health
- The **SWTP** is a partnership between MDE, MDEQ, DLARA
- Provide instruction, training and guidance materials on
  1. Water testing
  2. Facility flushing programs designed to move water through systems after periods of stagnation
  3. Other beneficial water system operations
- This is a voluntary, proactive activity by schools on community water

# Drinking Water Quality Focus

School building plumbing may harbor potentially harmful substances

- Bacteria
- Lead
- Copper


# Water In Schools – Who Is Responsible?

- The Michigan Safe Drinking Water Act
  - Water system classification
    - Nontransient Noncommunity Water System – you control your own source (well)
    - Community Water System – you do not control the source, the city/town/village does
- Governmental responsibilities
  - Department of Environmental Quality (DEQ)
  - Local Health Departments
- Schools on community water supply responsibilities
  - Building plumbing (premise plumbing)

# Key Messages

- Providing quality drinking water is important for public health & child development
- There is no safe level of lead in drinking water so reducing all sources is important
- Bacteria in the water is an indicator of a breech in the plumbing system
- Proper operation and maintenance of a water system within a building can
  1. Ensure quality drinking water for the health and safety of all who drink it
  2. Reduce costs and workloads
  3. Prevent problems
- Proper public communication and transparency will
  1. Inform parents and staff
  2. Reduce parental concerns and complaints

# An Ounce of Prevention....

...Is Worth a Pound of Cure

# Water System Best Management Practices (BMP)

- Plumbing & fixture assessment
- Keeping the water moving in the plumbing system
- Routine cleaning or replacement of tap aerators & screens
- Routine cleaning of drinking fountains & other water outlets
- Evaluation for the presence of water system cross-connections
- Maintaining continuous positive pressure in drinking water plumbing
- Sanitary plumbing repair/replacement procedures
- Record keeping & communication
- Water testing

# Guidance and Toolbox

*Free* DEQ resources: www.michigan.gov/drinkingwater

- Drinking Water Best Management Practices for Schools
- MDEQ Guidance on Drinking Water Sampling for Lead and Copper at Schools and Daycares on Community Water Supplies (version 3.0 – August 1, 2016)
- Flushing guidance
- Templates for school use
- Webinars
- Instructional videos
- Free technical assistance

- Your community water supplier

# Basic Understanding of Drinking Water Quality

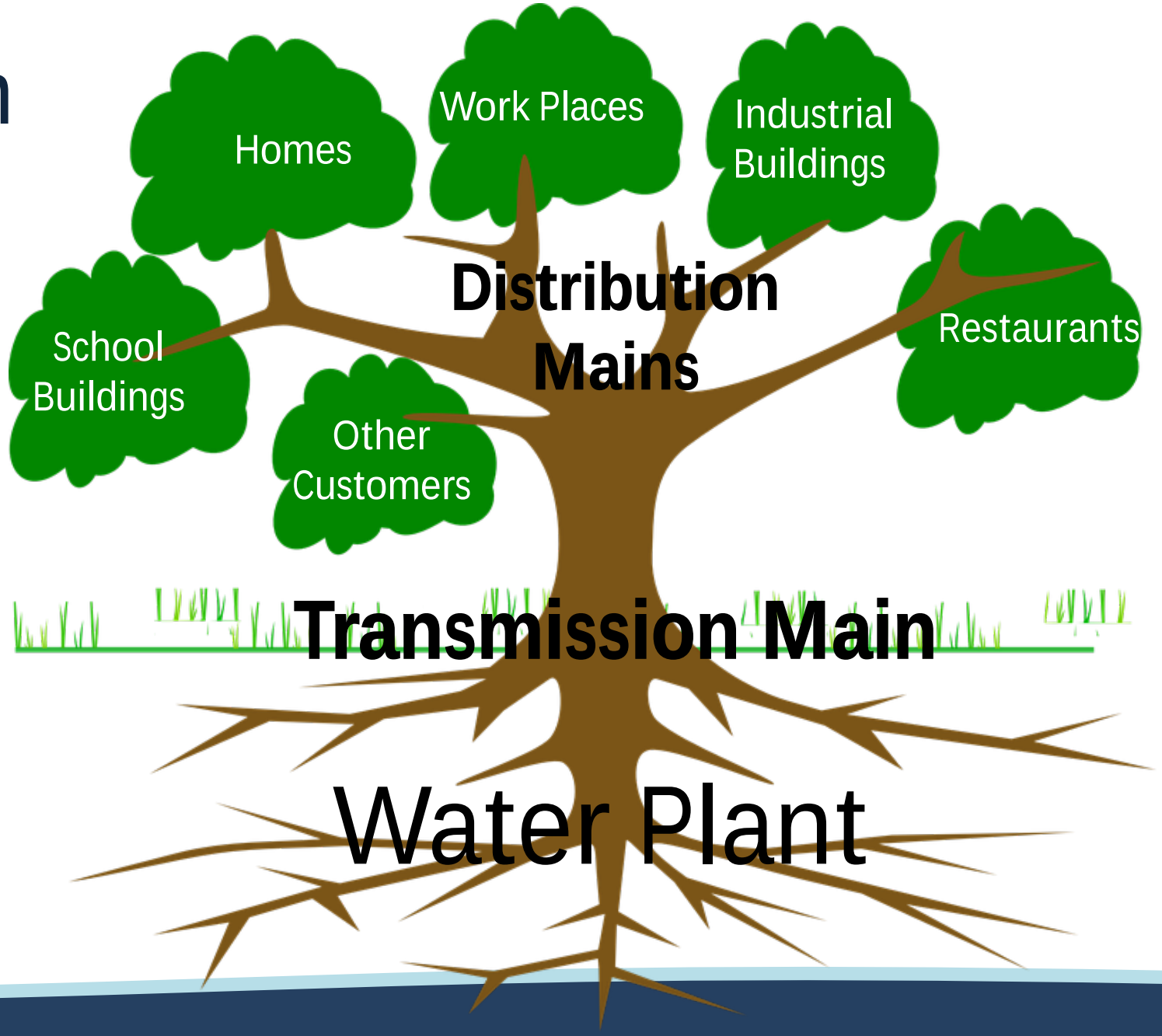
- Source water
- Water systems
- Distribution systems
- Premise plumbing & fixtures
- Water contamination & public health impact
  - How contaminates get into plumbing
  - Cross connections
  - Bacteria
  - Lead
  - Copper

# Source Water

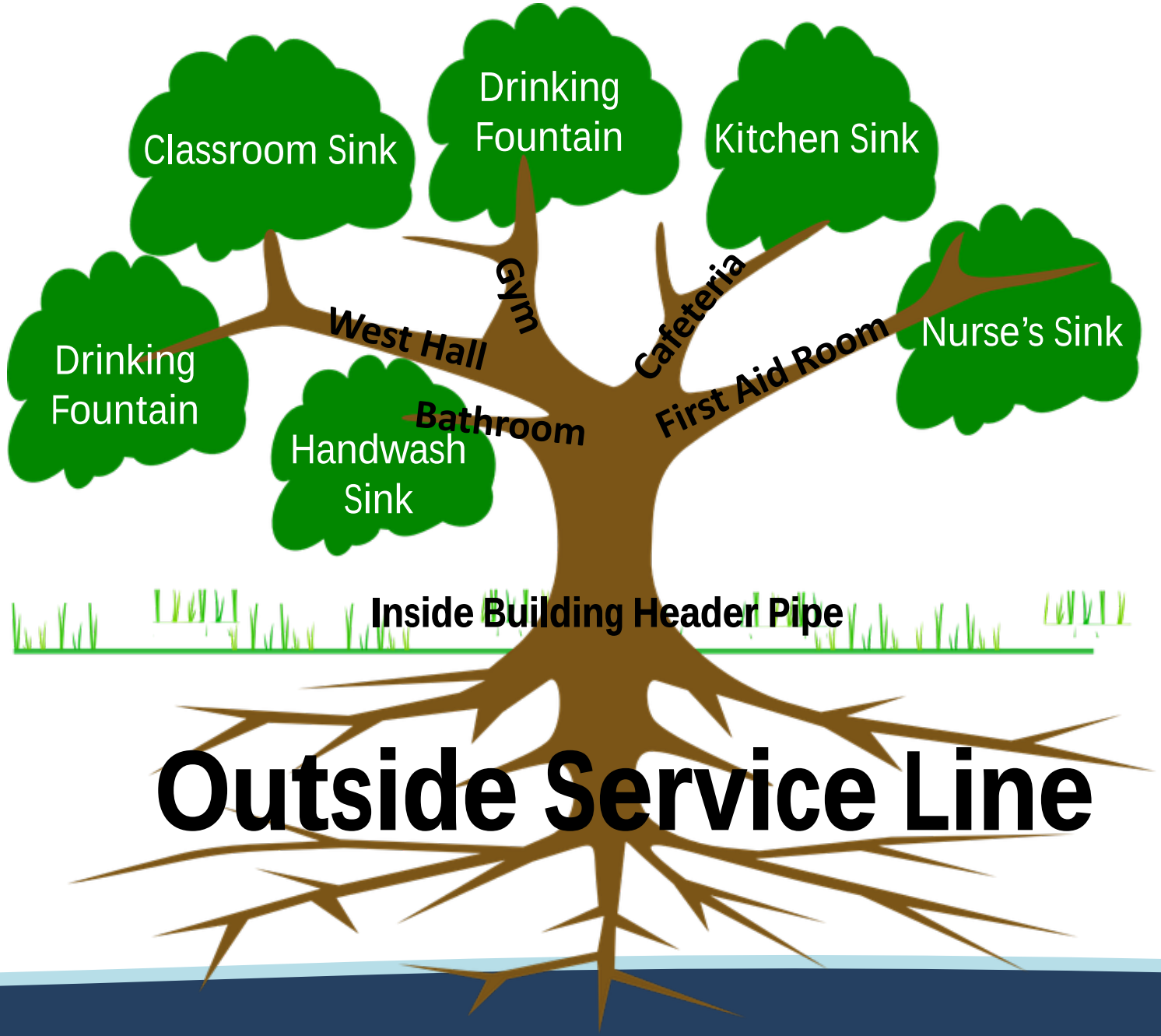
- Water comes from lakes, rivers, streams and underground
  - “Surface Water” vs “Ground Water”
- Devices used to get the water out of its natural environment
  - Water plant intake pumps and pipes
  - Water well structures and pumps
- Water is not “Pure”
  - All water has stuff in it – some won’t “hurt” you, others may
  - Surface water must be filtered & treated to limit the amount of certain contaminants

**Because of the Safe Drinking Water Act,**
**source water delivered to you must be safe for consumption**

# Water System



# School System



# Drinking Water Contamination

- Naturally occurring material in water may or may not be harmful to health
- Water for drinking & food prep needs to meet certain quality standards
- Harmful things can be removed from water, but can also be “re-introduced”
- A building water system is a “closed” system & unless breeched, contaminants will not be “introduced” into the water
- Once quality drinking water is delivered to your building, it is your responsibility to keep it that way

# Water Age

- Water quality deteriorates with age
- Stagnant and low flow water may
  - Be a potential breeding ground for microorganisms
  - Cause biofilm in pipes
  - Increase scale/sediment
  - Cause an increase in the corrosion of metals and their alloys
  - Increase water pipe breaks

# How Do Contaminants Get Into Building Plumbing?

- Breech in the plumbing system
  - Leaks & breaks – pinholes, bad gaskets/seals, physical damage
  - Pressure loss, low pressure, backflow
  - Repairs & replacement – not following sanitary practices
- Old pipes and fixtures
  - Don’t meet the current standards (lead-free)
- Poorly designed or altered plumbing system
- Improper management of source water
- Improper management of building water (including stagnation)

# Plumbing Cross Connections

- A connection between drinking water and a contaminant
- Backflow
- Backsiphonage
- Facility inspection
- Devices and control

# Bacteria in Drinking Water

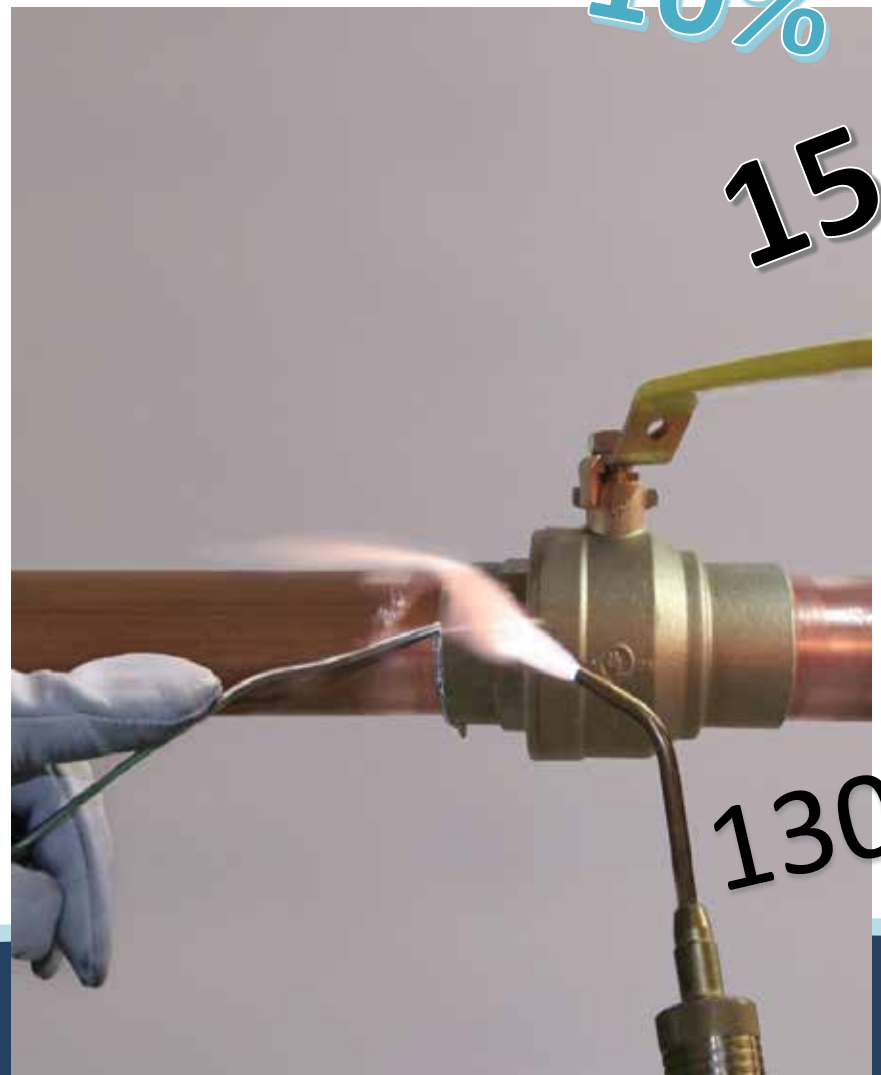
- Single- cell living organisms
- Commonly found in the environment
- May be harmless or pathogenic
- Coliform bacteria presence indicates plumbing breech

# Lead and Copper In Drinking Water

90%

10%

- High risk health implications
- Enter through plumbing system
- Sampling is important
- 15 ppb lead is a *water supply* <u>*system*</u> action level
- 5 ppb lead is a *health based* <u>*tap*</u> action level



15 ppb

5 ppb

1300 ppb

# Get Proactive

- Determine your school/district goals based on needs & resources
- Establish partnerships and roles
- Develop a drinking water best management practice plan
- Develop a plumbing profile for each of the school buildings
- Create a school district sampling plan

# Importance of a Team Approach

- Effective and efficient investigation
- “Ownership” or “Buy-In” by those involved
- Who will you involve?
  - Superintendent
  - Custodial staff
  - Teachers
  - State officials
  - Others?
  - Students?

# Development of a Best Management and Water Sampling Plan

- Defines overall goals and objectives
- Describes steps for implementation, evaluation, and communication
- Provides a high level of confidence in results
- Ensures appropriate remediation measures are quickly identified & implemented

# Conducting a Plumbing Profile

- What are you really trying to do?
  - Determine the kind or type of plumbing in each building that supplies drinking water **to the building** (outside & underground)
  - Determine the kind or type of plumbing in each building that supplies drinking water **to all water fixtures** (inside & mostly visible/accessible)
- What do you do with it?
  - Document it so others know when you last did it
  - Determine if upgrades or eliminations are needed
  - Evaluate & monitor for the presence of cross connections or age-related potential problems
  - Develop routine water management and sampling plans

# Identification of Drinking Water Fixtures to be Tested

- Drinking fountains
- Bubblers
- Kitchen food prep sinks
- Classroom faucets
- Nurse’s sink
- Teacher’s lounge sink
- Home economics’ sinks

# Sampling Plan Elements


- Sampling plan coordination
  - Identify sampling team members and roles
- School sampling priority
  - Don’t have to sample all buildings at the same time
- Building walk through (floor plan & fixture documentation)
- Identifying & listing sample locations
- Identification of certified laboratory
- Sampling procedures
  - Collectors, materials, timeline, collection

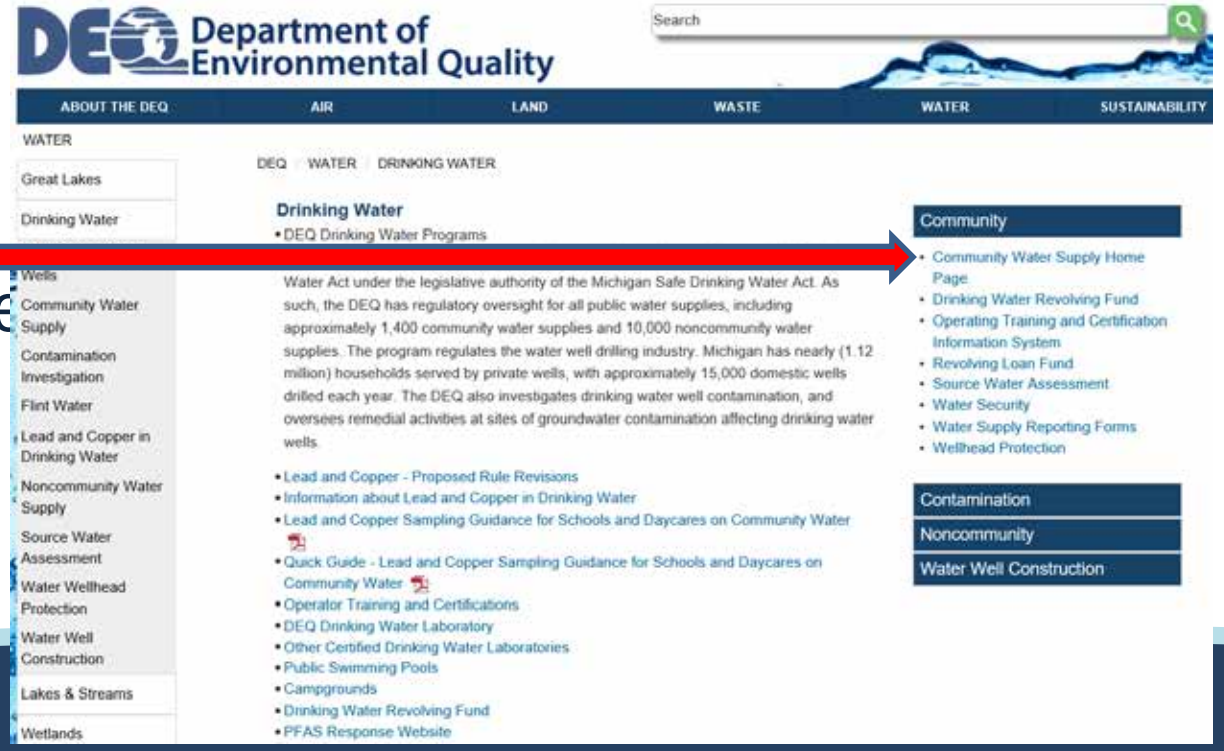
# Importance of a Certified Laboratory

- Send samples to a State of Michigan certified laboratory for accuracy of analysis, quality control measures, and reliability of results (certified for lead/copper/bacteriological)

www.michigan.gov/drinkingwater

-Community Water Supply Home Page

-Certified Laboratories



# Important Aspects of Investigative Sampling for Lead & Copper

- Sample taps for drinking or food preparation
- Identify high risk drinking water fixtures
- Collect all samples before any water is used for at least 8 hours (not greater than 24 hours)
- Use a 250 milliliter (ml) bottle
- Do not take sample immediately after vacations, week-ends or holidays
- Sample during the school year when water is being used daily
- Sample Tuesday – Saturday


# Important Aspects of Sampling for Bacteria

- Collecting only once at one tap does not represent a reliable level of comfort – periodic testing is important
- Sample only at drinking water fixtures
- Sampling must be sanitary
- Can sample any time, no wait time needed
- Have to get sample to the lab within 24 hours of collection

# Recommended Remediation Actions

- For Taps with Lead >5 ppb or Copper >1300 ppb
  - Immediately  discontinue tap use
  - Consider providing water from a known lead-free source (bottled water)
  - Investigate with more sampling if needed
  - Test other drinking water fixtures that may not have been tested
  - Look for lead solder, brass valves & grounding wires
  - If there is a water softener, check for “over-softening”
  - Check other water quality parameters


# Other Remediation Actions

- Replacement of plumbing
  - Expensive & disruptive
  - Budget for when renovations are needed
- Replace fixtures
  - Less expensive
  - Must be Lead-free certified
- Designating non-drinking fixtures
  - Policies of “no drinking or bottle filling” in bathrooms & maintenance rooms
  - Use signage (handwash only, etc.)
- Elimination of unnecessary, unused sinks (CAUTION NEEDED!)
- Teaching & communication

# Water Movement (Flushing) Protocol

- Preventative maintenance or solution to a problem
- Two primary types of flushing programs
  - Individual taps
  - Building plumbing
- Advantages
  - Move stagnant water
  - Remove contaminants
- Disadvantages
  - Time consuming
  - Risk of clogging drains & sewer back up

# Communication Plan

- Develop a communication plan before you begin any work
  - Why?
    - Prepares you for concerns & questions as you proceed
    - Gives parents a reason to trust the answers you give & be optimistic about the water quality
  - Who is your audience?
  - What information/message do you send?
    - What you have done already, what you are going to do
    - Public health information
    - Sampling results & corrective actions
- How will you communicate?
  - Use varied & multiple methods

# Communication Methods

- Letters
- Press release
- Newsletter
- School web page
- Social media
- Meetings

# Summary & Determining Your Next Step

- Take action
- Start now
- Get help

# When You Need Help or Resources…

…Please call me!

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# Upcoming Webinars

- 8/21 - Know Your Plumbing System and How to Develop an Investigative Drinking Water Sampling Plan
- 8/28 - How to Sample Your Drinking Water for Lead and Copper, Interpret Results and Remediate
- 9/19 - Get the Water Moving and Best Management Practices