Is the water safe to drink?
Decision making under uncertainty

Risk Perception and Institutional Complexity in the 2014 West Virginia Chemical Spill
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SESYNC Teaching Case, December 2014
4-Methylcyclohexanemethanol (MCHM)
Areas determined “safe” based upon 1ppm MCMH standard which was developed by the CDC (with very limited data).
Due to limited availability of data, and out of an abundance of caution, pregnant women may wish to consider an alternative drinking water source until the chemical is at non-detectable levels in the water distribution system. For mothers with babies, there is no research that suggests consuming water with these low levels of MCHM poses any health risk to their baby. However, if you have any concerns, please consult your doctor.

http://emergency.cdc.gov/chemical/MCHM/westvirginia2014/
“Should we be drinking the water?”

“It’s your decision. If you do not feel comfortable drinking or cooking with this water then use bottled water. I’m not going to say absolutely, 100 percent that everything is safe. But what I can say is if you do not feel comfortable, don’t use it.”
– West Virginia Governor Tomblin
February 17, Recent School Closure(s)
1. Congressional Hearing In Charleston, West Virginia (1:34)
   February 10, 2014
   Congresswoman Capito: Is the water safe?
   WV American Water
   https://www.youtube.com/watch?v=OadFXDi62b8&feature=player_embedded

2. February 6, 2014
   West Virginia elementary school cook
   Listen from 1:45-3:08
   http://youtu.be/AXeYdBWdrAo?t=1m45s

   http://wvpublic.org/post/it-really-safe-testing-west-virginias-water
Think/pair/share:

Why were schools closed when no MCHM was detected in the water in the schools?

What did you find surprising or confusing about the data you downloaded for the Water Quality Homework?
Group Discussion: Would you drink the water? What would you need to know about the system to determine if the water is safe?
Ensuring Safe Drinking Water Through the Multiple-Barrier Approach

The Water Cycle

- Volcanic steam
- Ice and snow
- Precipitation
- Snowmelt runoff
- Streamflow
- Infiltration
- Seepage
- Groundwater flow
- Freshwater
- Spring
- Groundwater storage
- Atmosphere
- Condensation
- Sublimation
- Desublimation
- Evaporation
- Evapotranspiration
- Fog and dew
- Surface runoff
- Plants
- Animals
- Vents and volcanos
- Oceans

U.S. Dept. of the Interior
U.S. Geological Survey
John Evans, Howard Perlman, USGS
http://ga.water.usgs.gov/edu/watercycle.html
Ensuring Safe Drinking Water Through the Multiple-Barrier Approach

Steps for Source Water Protection

1. DELINEATE your drinking water source protection area
2. INVENTORY known and potential sources of contamination within these areas
3. DETERMINE THE SUCEPTIBILITY of your water supply system to these contaminants
4. NOTIFY AND INVOLVE THE PUBLIC about threats identified in the contaminant source inventory and what they mean to their PWS.
5. IMPLEMENT MANAGEMENT MEASURES to prevent, reduce or eliminate threats
6. DEVELOP CONTINGENCY PLANNING STRATEGIES to deal with water supply contamination or service interruption emergencies

Ensuring Safe Drinking Water Through the Multiple-Barrier Approach

Risk Management Barrier

Source: EPA (2009)
Water on Tap: What you need to know
Ensuring Safe Drinking Water Through the Multiple-Barrier Approach

Risk Monitoring and Compliance Barrier

Ensuring Safe Drinking Water Through the Multiple-Barrier Approach

• Small group exercise: Please develop an argument for or against three potential sources of MCHM in the system:
  – Source Water: The Elk River
  – Treatment Plant: Filters releasing MCHM
  – Distribution System: MCHM reservoirs (e.g. storage tanks)

• Draw on information from this news article: *Trace amounts’ of MCHM found in Elk plant water.* (2014, March 25 Charleston Gazette)
All humanly used resources are embedded in complex, social-ecological systems. – Ostrom (2009)