

# Drinking Water Compliance: *The Role of Oversight*

Megan Fuller

Civil and Resource Engineering  
Dalhousie University



November 21, 2024

# Outline for Today's Discussion



Oversight in the drinking water industry – an overview



Types of reporting

What to do when results are out of compliance

The importance of record keeping

Questions and discussion

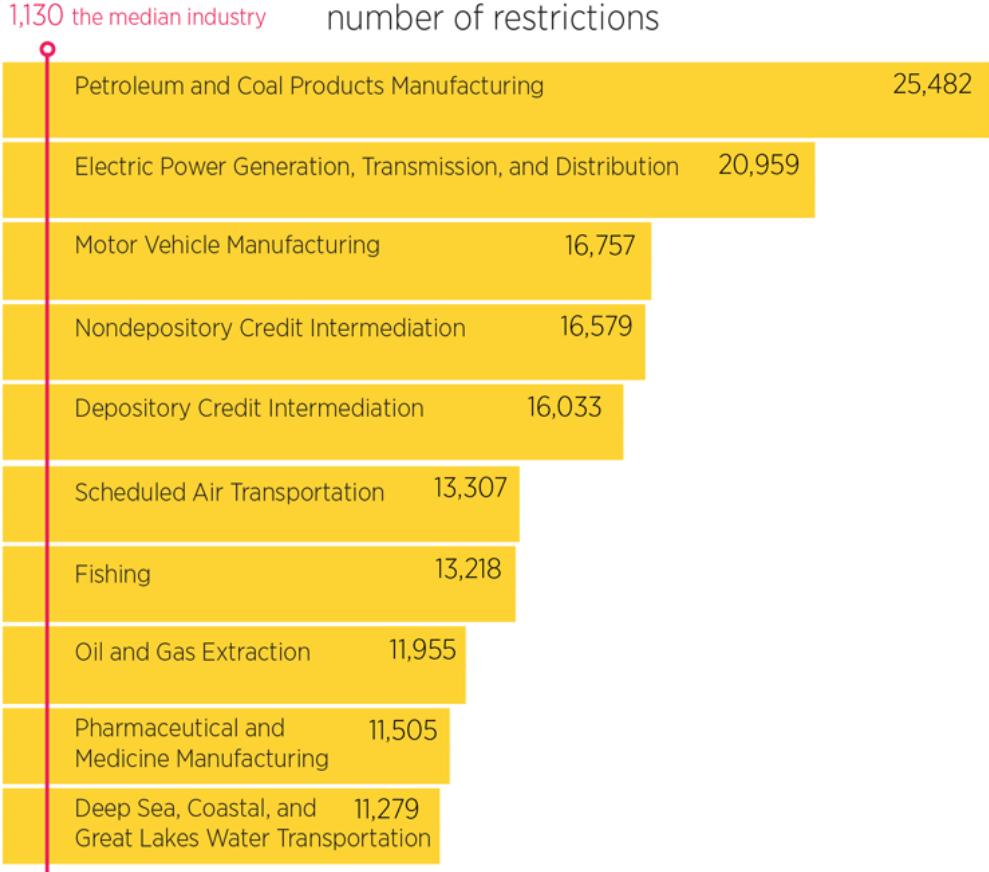


# OVERSIGHT ENTITIES: Enforcement

- What industries, services, and sectors do YOU most want to have regulated?

# OVERSIGHT ENTITIES: Enforcement

The McLaughlin-Sherouse List: The 10 Most-Regulated Industries in 2014



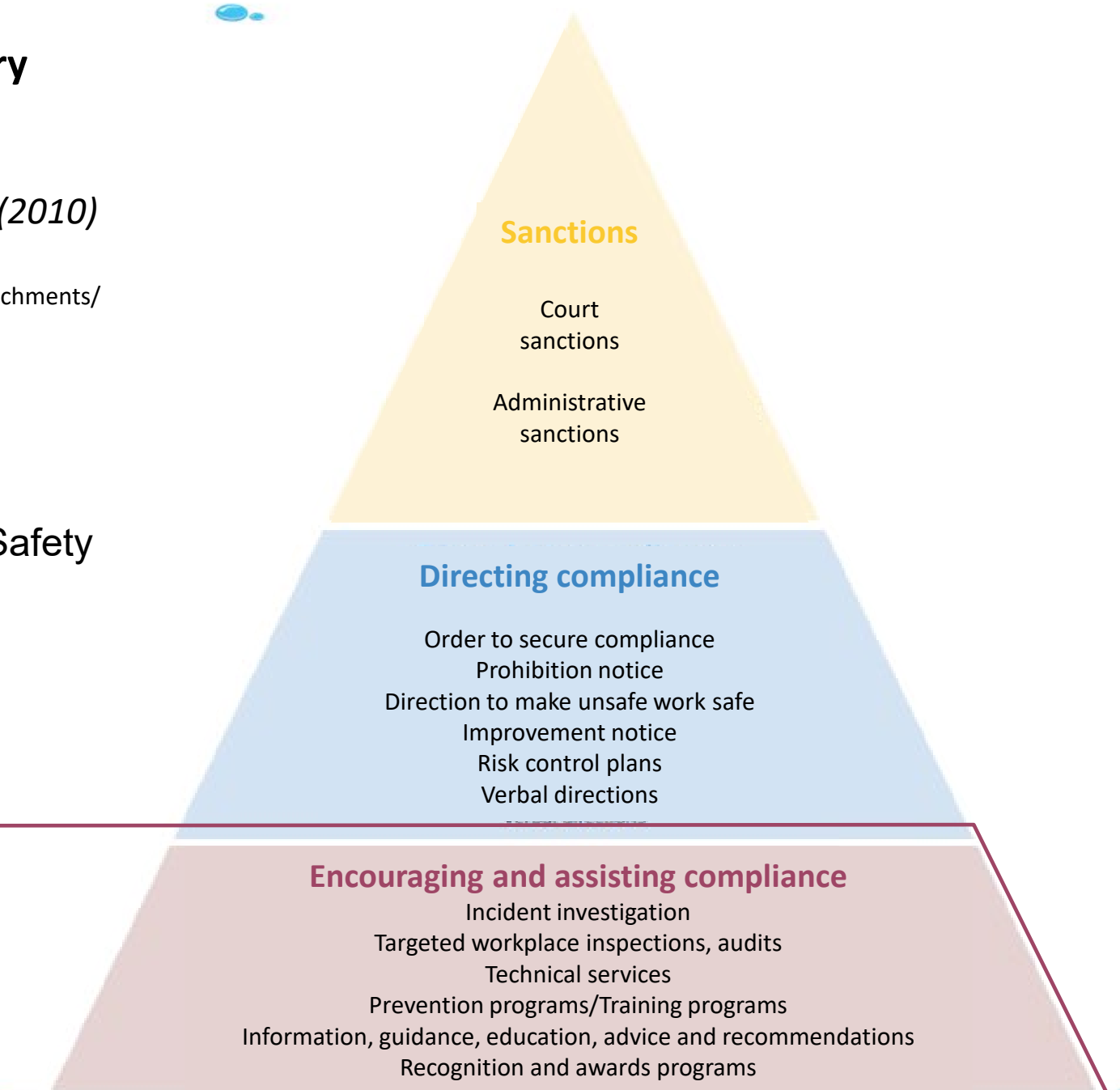
# Applications of Responsive Regulatory Theory in Australia and Overseas

Wood, C., Ivec, M., Job, J., Braithwaite, V. (2010)

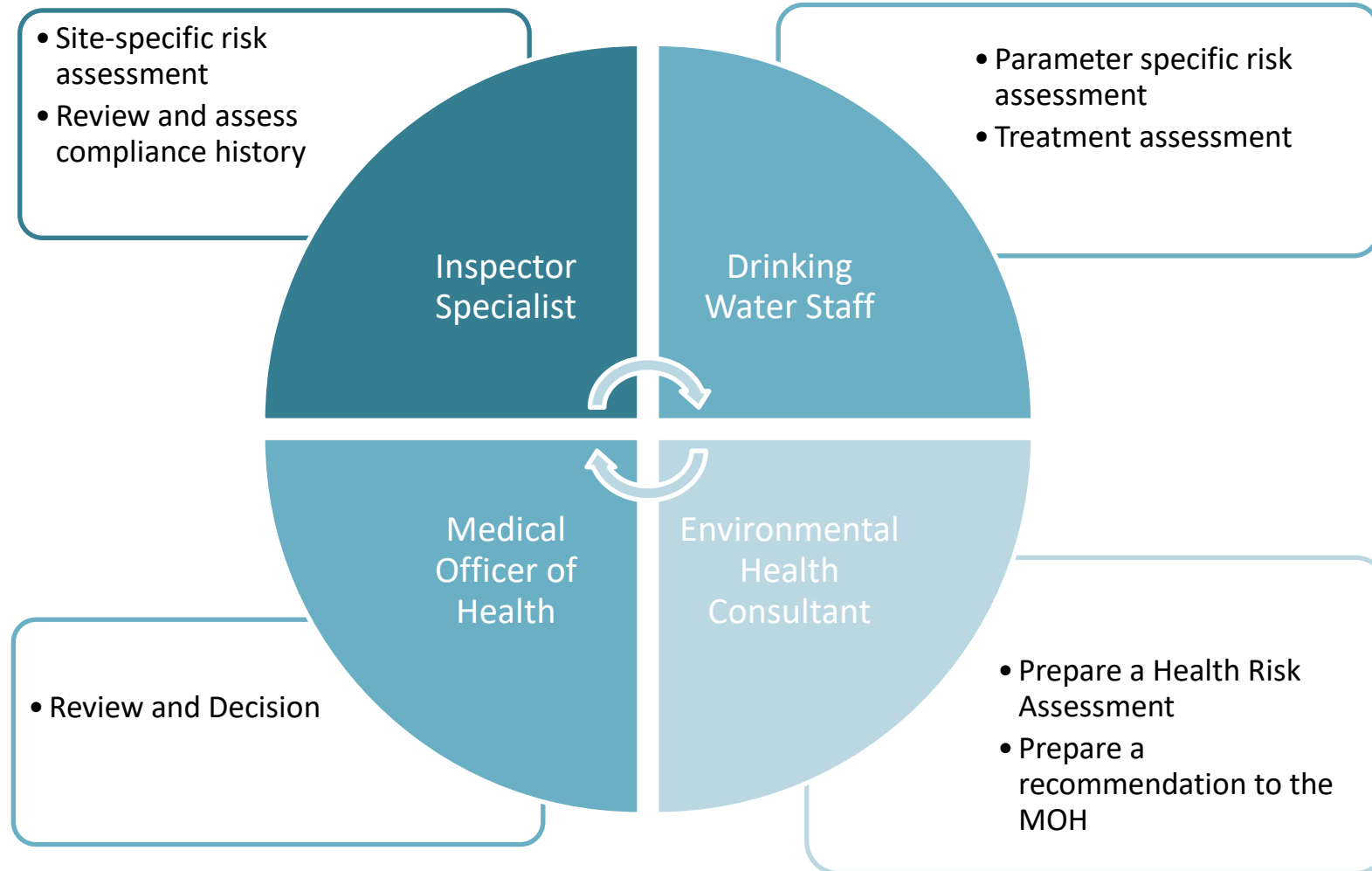
[https://regnet.anu.edu.au/sites/default/files/publications/attachments/2015-05/ROP15\\_0.pdf](https://regnet.anu.edu.au/sites/default/files/publications/attachments/2015-05/ROP15_0.pdf)

## Queensland's Workplace Health and Safety Compliance and Management Policy

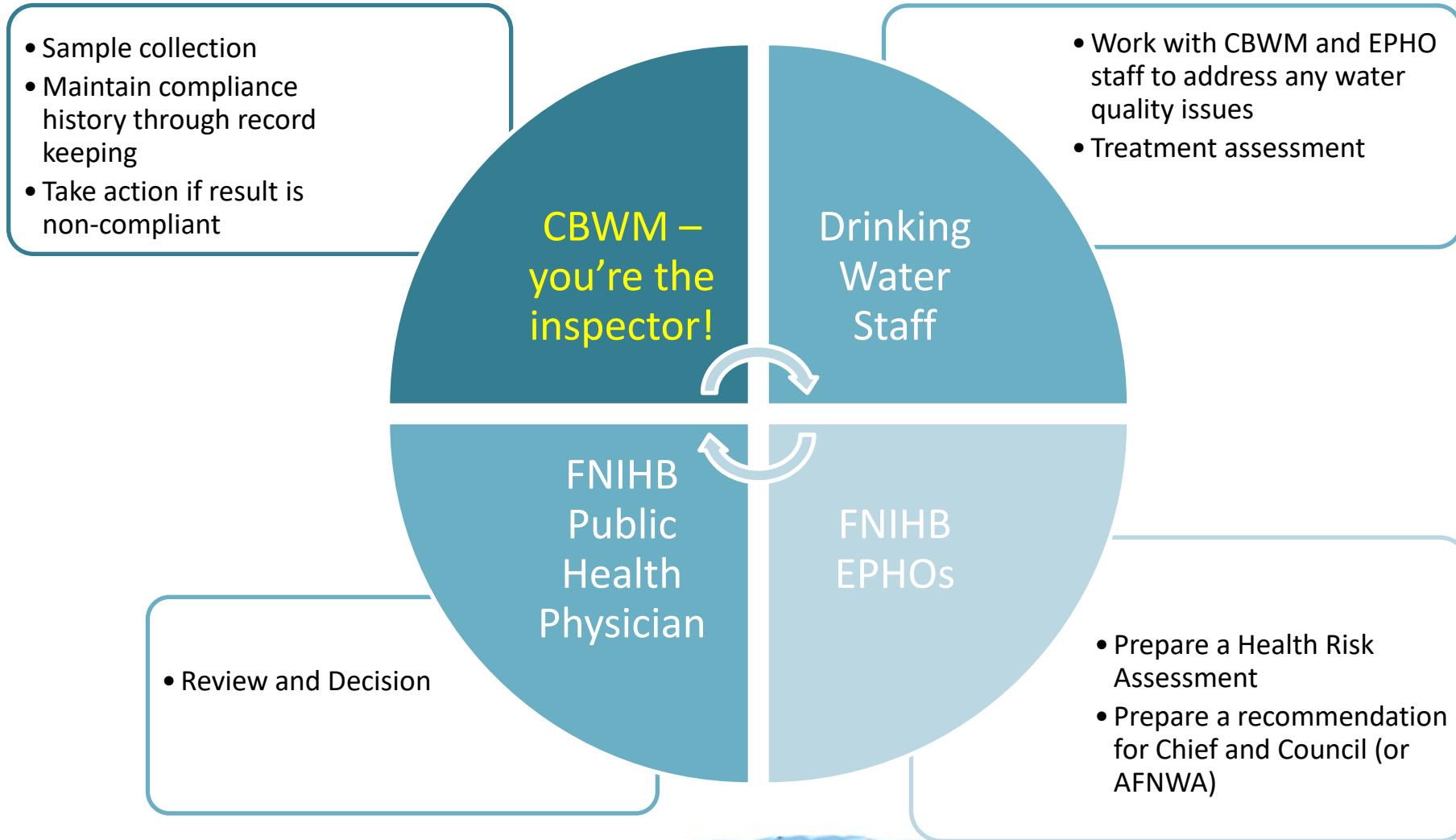
**Activities used to support compliance to standards, guidelines, and policies**



# NSECC Drinking Water Context: Collaborative Consultation



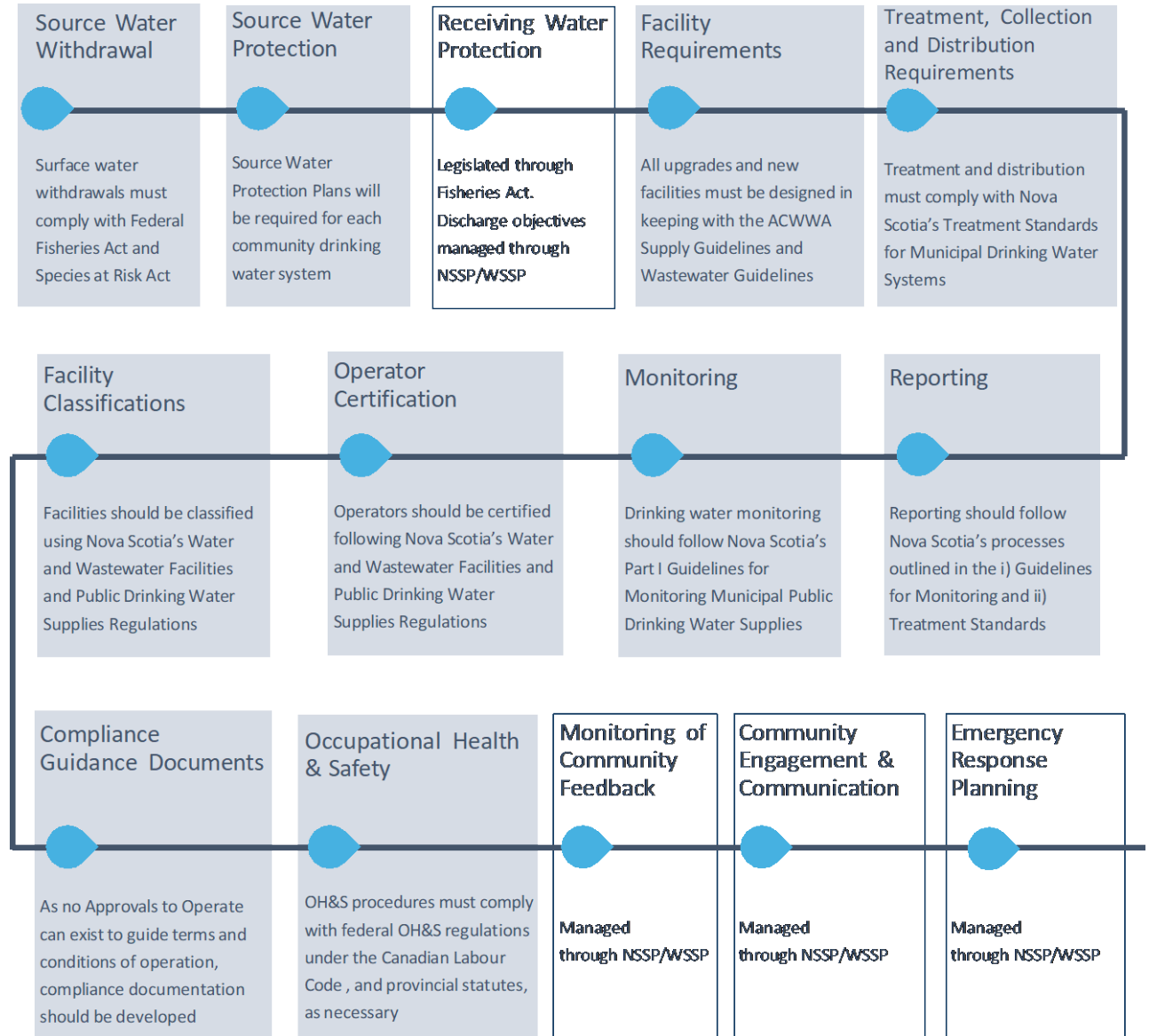
# First Nations Drinking Water Context: Collaborative Consultation





ATLANTIC FIRST NATIONS  
WATER AUTHORITY INC.

## DRINKING WATER REGULATORY GUIDANCE AND COMPLIANCE STANDARDS





# Outline for Today's Discussion



Oversight in the drinking water industry – an overview

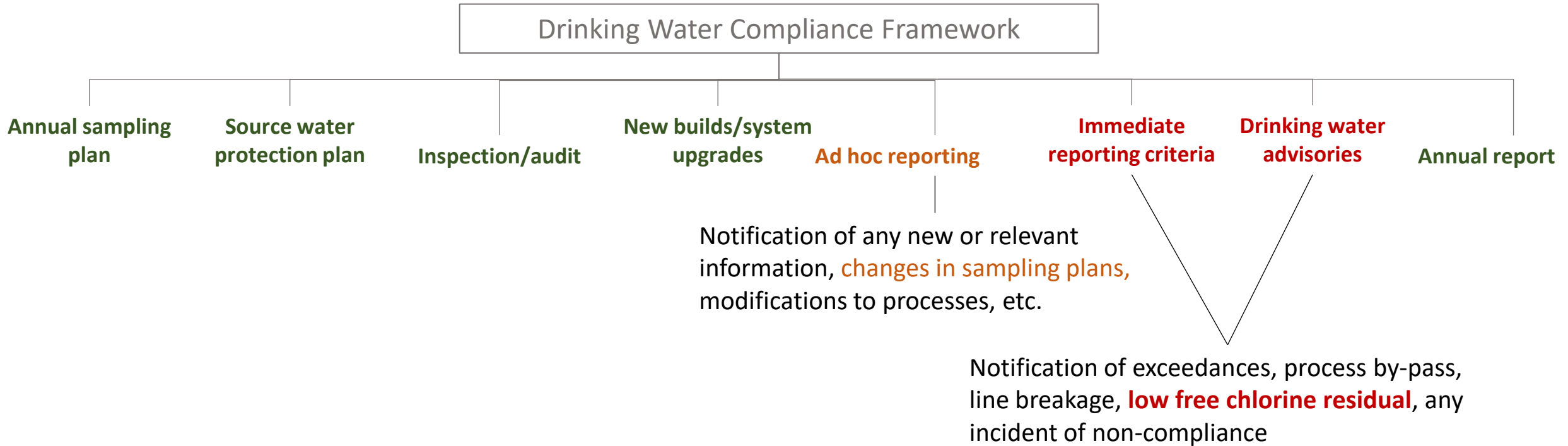
Types of reporting



What to do when results are out of compliance

The importance of record keeping

Questions and discussion



When should you call someone?

Who should you call?

How do you record issues of non-compliance?

# Outline for Today's Discussion



Oversight in the drinking water industry – an overview

Types of reporting

What to do when results are out of compliance



The importance of record keeping

Questions and discussion

# Immediate Reporting – NS perspective

“Immediate Notification” means **as soon as you become aware** of an issue. Notification must be made to a “live” person at the Department

## The following circumstances required Immediate Notification:

- Reportable Concentrations of Spills/Releases
- Spills in the watershed
- Prior to the use of a backup water system
- Treatment by-passes or failure of key treatment processes
- **Exceedance of a MAC for health-related Parameters** in the Guidelines for Canadian Drinking Water Quality
- Failure of an integrity test (membrane plants)
- Line breakage that may result in cross-contamination
- **Exceedance of turbidity** values outlined in Approval
- **Free chlorine residual <0.02 mg/L in the distribution System**
- Any incident of non-compliance

# Immediate Reporting – FNIHB perspective

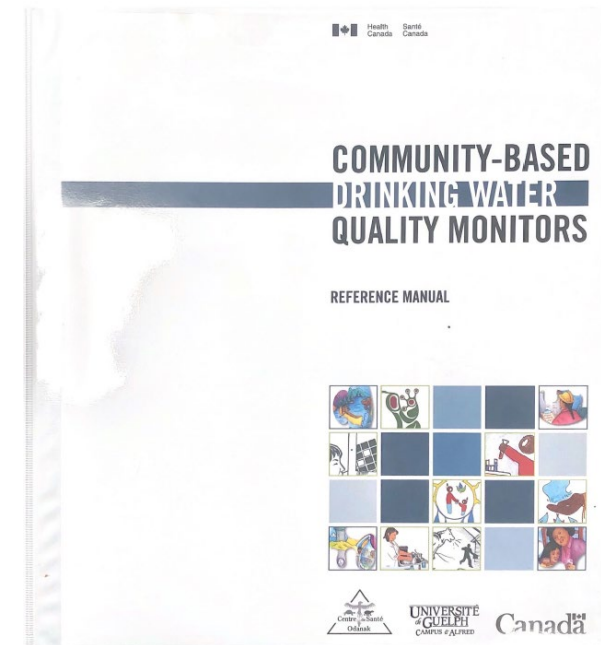
“Immediate Notification” means **as soon as you become aware** of an issue. Notification must be made to an EPHO

Immediately contact your EHO when your testing finds:

- Positive bacteria results (total coliforms and/or E. coli) in a drinking water sample
- Chlorine residuals outside recommended limits (generally  $< 0.20$  mg/L)

Your EHO will:

- Give you advice and interpret the results
- Advise what to do



# Immediate Reporting – AFNWA perspective

“Immediate Notification” means **as soon as you become aware** of an issue. Notification must be made to an AFNWA staff member

## **From the Water Quality Sampling *Field Guide*:**

**If chlorine residual measurements are not within the required range, action much be taken:**

- ❖ If chlorine is **higher** than 4.0 mg/L Call supervisor.
- ❖ If chlorine is **less** than 0.20 mg/L flush for 10 more minutes and measure again.
- ❖ If chlorine is still less than 0.20 mg/L Call supervisor.

When should you call someone?

Who should you call?

How do you record issues of non-compliance?

# Immediate Reporting – AFNWA perspective

“Immediate Notification” means **as soon as you become aware** of an issue. Notification must be made to an AFNWA supervisor.

## From the Distribution Sampling – Weekly Monitoring SOP

### Results Interpretation:

- If the chlorine residual is 0.20 mg/L or greater, follow through with pH, temperature and turbidity measurements and collect the bacteria sample. See below for procedures.
- If the chlorine residual is **less than** 0.20 mg/L, increase the flush rate and allow the water to flush until the 10-minute mark, recording the end time. If the chlorine residual is greater than 0.20 mg/L after the 10 minutes of flushing, measure and record the chlorine, pH, temperature and turbidity field data associated with the 10-minute flush and collect the bacteria sample. Turn off the water.
- If the chlorine residual is **less than** 0.20 mg/L after 10 minutes of flushing, measure and record the chlorine, pH, temperature and turbidity field data associated with the 10-minute flush and collect the bacteria sample. Increase the flush rate and allow for water to flush for an additional 30 minutes, taking field readings for chlorine, turbidity, pH and temperature every 5 minutes. Document all field readings at each 5-minute interval. Turn off water. \*\*Sampling for the additional field parameters can be stopped once/if chlorine residual is observed to be compliant (max time 30 minutes). You must observe two values at or above 0.20 mg/L in order to stop the profile earlier than 30 minutes.
- If after 30 minutes of flushing, the chlorine reading is still **less than** 0.20 mg/L, notify appropriate persons via phone according to SOP-\_\_\_ “Out-of-Range Distribution Field Sample Results” SOP.

# Immediate Reporting – AFNWA Additional Reporting for Oversight

## Section 13.3 - Immediate Reporting Requirements

The AFNWA shall immediately [notify the oversight entity](#) when the following occurs:

- a) whenever the presence of total coliforms or *E.coli* bacteria is detected;
- b) upon receipt of results that indicate a maximum acceptable concentration has been exceeded;
- c) lack of disinfection or failure of key water treatment process, including when it is necessary to use a treatment by-pass (see Section 9.3.1.1 for details);
- d) use of emergency water supply from an untreated or inadequately treated source;
- e) a serious incident of raw water contamination;
- g) prior to the use of a back-up water supply;
- h) any incidents of non-compliance with the system-specific Compliance Guidance Document, including but not limited to failure of an integrity test and exceedance of turbidity values outlined in system-specific Compliance Guidance Document;
- i) any other incident that may adversely affect the quality of water within the system, (i.e. line breaks that result in loss of service, aesthetic water quality issues or deemed to potentially result in contamination of part of the distribution system);
- j) **if the chlorine residual in the water distribution system is non-compliant;**
- k) if the GUDI status of a well changes (for groundwater only);
- l) if a system loses its Operator in Direct Responsible Charge (ODRC) and there is no back up ODRC.



# Outline for Today's Discussion

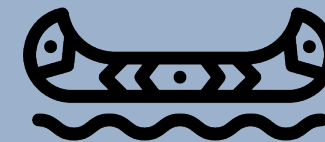


Oversight in the drinking water industry – an overview

Types of reporting

What to do when results are out of compliance

The importance of record keeping



Questions and discussion

# The importance of record keeping

- Record keeping of all compliant and non-compliant results allows for an evaluation of how the system is performing and provides data to **review operational, seasonal, or other risks that might be a threat to water quality**
- Having access to records helps in case of a potential outbreak to track where and when contamination may have occurred
- Records demonstrate that a level of 'due diligence' and 'duty of care' was taken to ensure safe drinking water
- **Missing records**, even of compliant water quality results, represents a lack of 'due diligence' and raises questions as to the quality of water being provided to a community

# The importance of record keeping

## What Is Due Diligence?

Due diligence means taking every reasonable precaution to the extent of your ability and authority to do so. The degree of diligence required to meet your duty can vary significantly from situation to situation. The 'care' you provide must be based on 'risk.' The greater the risk of harm, the more care, or precautions that must be taken.

In layman's terms, due diligence means taking all reasonable steps to ensure that the system is working.

In most cases, it is just good common sense:

- take the time to look at what you are doing
- identify risks
- eliminate the risk if possible
- if the risk cannot be eliminated, set up a system to control, mitigate, or manage the risk
- make sure that the system you have set up is working in practice

(Source: Ferguson, 2000, Chapter 2)

## How Much Care Is Required?

Due diligence requires a municipality or other public water system owner to prepare for risks that a "reasonable person" could have foreseen and to provide the associated "reasonable care." To show due diligence, municipalities and other public water system owners must establish an effective system to prevent problems, monitor the results of the system, and improve the system if problems recur.

The best measure of "reasonable care" comes from comparing "what was done" with "what could reasonably have been done." With regard to due diligence, this involves any reasonable alternatives that would have avoided or minimized the harm that the "reasonable person" either knew or ought to have known existed.

# Outline for Today's Discussion



Oversight in the drinking water industry – an overview

Types of reporting

What to do when results are out of compliance

The importance of record keeping

Questions and discussion



**Wela'lin!**

**Woliwon!**



# Compliance and Nujo'tme'k Samuqwan Components



**(Interim) Compliance Components:**

Source water protection plans  
WSER  
Deposits out of normal course (DONCE)

ACWWA guidelines for system designs  
Nova Scotia Treatment Standards (GUDI protocol; 3, 3, 4 log reduction for Crypto., Giardia, and viruses)

Interim Regulator will oversee drinking water compliance  
ECCC will continue to regulate wastewater systems

All compliance monitoring will be conducted by the AFNWA  
\*\* Discussions are still ongoing regarding the role of CBWMS \*\*

Disinfection residuals, microbial, disinfection byproduct, turbidity monitoring etc. will follow Nova Scotia Standards

Metals testing and microbial monitoring will follow Nova Scotia's standards (which follow the Guidelines for Canadian Drinking Water Quality (GCDWQ))

Corrosion control program [minimize lead leaching]

**Nujo'tme'k Samuqwan Components:**

Withdrawal monitoring plans  
Contingency plans  
Environmental Risk Assessments (ERAs) and Effluent Discharge Objectives (EDO)

Sanitation Safety Plan for wastewater systems  
Water Safety Plan for drinking water systems

An external firm will be contracted by AFNWA to perform OWSP auditing to ensure risk management practices are being followed

Optimization monitoring can be done as needed to guide the OWSP

Cross-connection control program to prevent backflow

Inflow & Infiltration reduction program

Water loss control program [leakage reduction]

Corrosion testing  
Other health-related monitoring

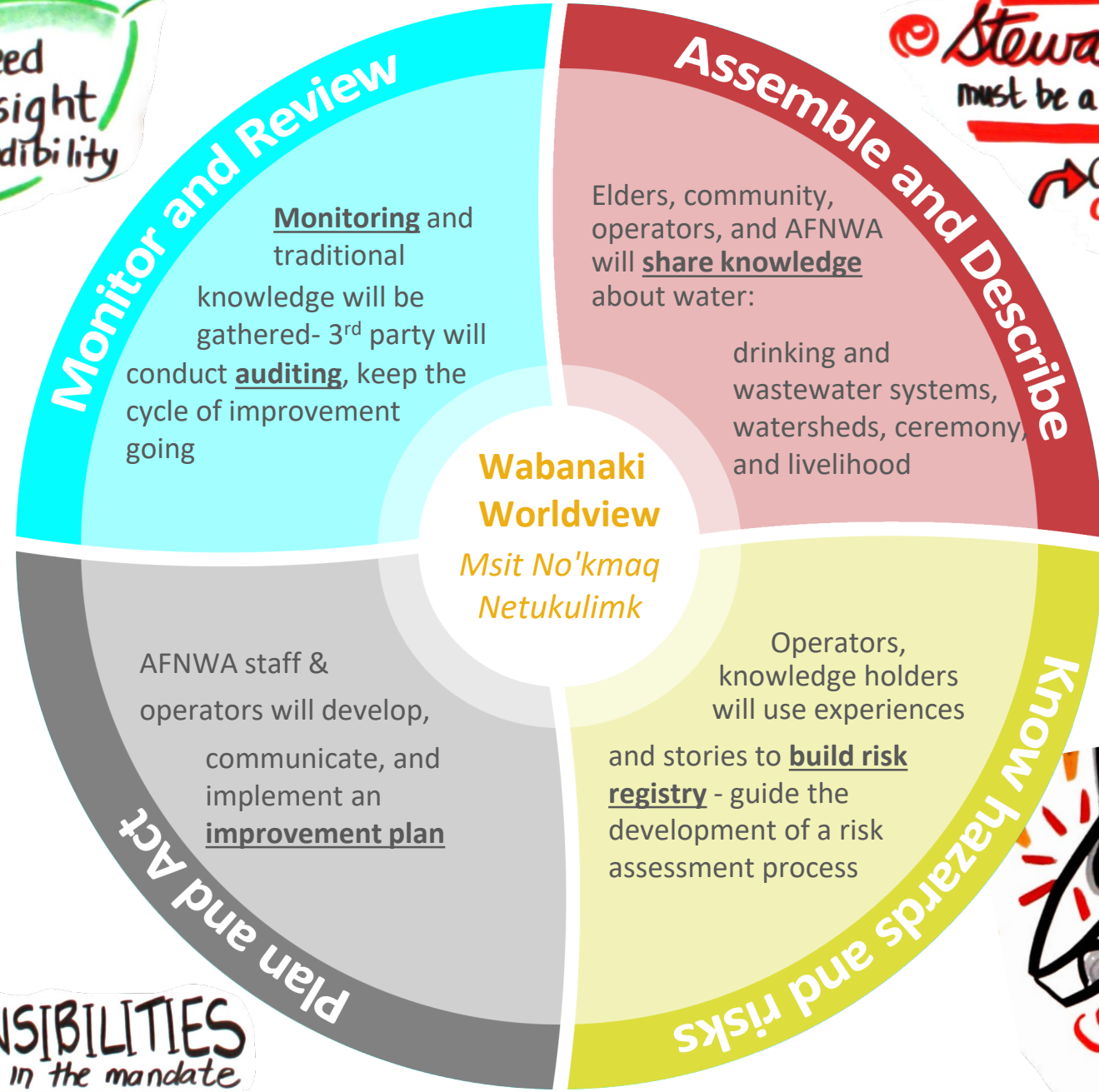
# Nujo'tme'k Samqwan – Indigenous risk management: Keep improving

Need Oversight for credibility

Ensure ALL Communities are brought to a **\*standard**



RESPONSIBILITIES must be in the mandate



**Stewardship** must be a role-collectively

Cultivate a **COLLECTIVE** mindset

