Best Practices in Water Utility Risk Management

Jeff Betton

Jordan Valley Water Conservancy District

What is Risk?

1   : possibility of loss or injury : <u>PERIL</u>

2   : someone or something that creates or suggests a hazard

3   **a**   : the chance of loss or the perils to the subject matter of an insurance contract

           also : the degree of probability of such loss

   b   : a person or thing that is a specified hazard to an insurer

   c   : an insurance hazard from a specified cause or source
           // war *risk*

4   : the chance that an investment (such as a stock or commodity) will lose value

What is Risk Management?

ISO 31000 (INTERNATIONAL ORGANIZATION FOR STANDARIZATION)

- Risk Management is the identification, evaluation, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of unfortunate events or to maximize the realization of opportunities.

ASSP (American Society of Safety Professionals)

- Risk Management in OSH (occupational safety and health) is a formal process for identifying hazards, evaluating and analyzing risk associated with those hazards, then taking action to eliminate the hazards or control the risks that can't be eliminated to minimize injury or illness potential.

Emergency Response Plan (ERP)

What is an Emergency Response Plan?

- Actions a system would take during an event or disaster

- Assigns specific responsibilities to individuals and teams

- Sets a command structure

- Should be updated annually

- Prepared by local officials (City, District)

Four Phases In Emergency Response Planning

1. <u>Preparedness</u>- preparing emergency response plans

2. <u>Response</u>- are initial actions taken during an emergency or disaster

3. <u>Recovery</u>- actions taken to return to normal after an emergency or disaster

4. <u>Mitigation</u>- actions taken to prevent an emergency or to lessen the harmful effects of an emergency

Emergency Action Plans

- Written procedure detailing the response to various types of emergencies
  - Evacuation procedures
  - Reporting procedures (internal and external i.e., police)
  - Accounting for staff and visitors.
- An action plan should be a short, concise summary of the emergency response plan
- Train employees on their role within the EAP
- Accessed by need-to-know personnel only

Emergency 123

JORDAN VALLEY WATER CONSERVANCY DISTRICT

EARTHQUAKE

- **Stay where you are.** Chances of injury increase with movement.
- **"Drop, Cover, and Hold on."** Get under a sturdy table or other piece of furniture, cover your face and head with your arms, and hold on.
- **Stay away** from glass, windows, brick walls, outside doors and walls, lighting fixtures, wall hangings, or furniture that could fall.
- **Use a doorway** for shelter only if it is in close proximity and if it is a strong, load-bearing doorway.
- **Expect aftershocks;** stay covered.
- **Stay inside** until the shaking stops.
- **Do not use the elevators.**
- **Open cabinets cautiously.** Beware of falling and shifted objects.
- **Stay away** from damaged areas unless your assistance is specifically requested.
- **Report** to your assigned assembly location, which is _____, once the shaking stops.

IF TRAPPED

- **Do not light a match or lighter.**
- **Do not move** about or kick up dust.
- **Cover your mouth** with clothing.
- **Tap on a pipe or walls** so rescuers can locate you. Shout as a last resort.
- **Listen** to a battery-operated radio or TV for latest emergency information.
- Use your cell phone to **call for help.**

WHEN DRIVING

- **Pull over** to the side of the road and stop. Stay inside your vehicle until the shaking stops.
- **Avoid overpasses and power lines.**

ARMED INTRUSION

AVOID CONFRONTATION

- **Do not risk your safety** to protect JVWCD assets.
- **Call 911** when it is safe to do so.
- **Try to note a physical description of the intruder and the number of intruders and weapons.** Have an escape route and plan in mind.
- **Warn others to avoid the risk.** Help others escape.
- **Evacuate** even if other will not follow.
- Keep your hands visible when police officers arrive.
- Follow the instructions of police officers.
- Do not attempt to move wounded people.
- Once the premises are considered safe, report your whereabouts and condition to your supervisor.

HIDE

- **Hide away** from the shooter's view if evacuation is not possible.
- **Find protection** if shots are fired.
- **Lock and blockade a door** with heavy furniture.
- **Close, cover, and move away from windows.**
- **Silence your cell phone - no vibrations.**

AS A LAST RESORT TAKE ACTION

- **Act as aggressively as possible.** Throw items and improvise weapons.

PHONE THREAT

- **For a bomb threat, call 911** and evacuate if warranted.
- **For a water contamination threat, inform a supervisor or manager immediately.**
- **If the caller talks with you, remain calm and courteous.** Try to engage the caller in conversation to learn more.
- **Record the call or take notes.** In a safe place, complete the appropriate checklist in the Emergency Response Plan.
- **Keep the caller on the line as long as possible. Get a co-worker to call 911.**
- **If the caller hangs up, leave the phone off the hook.**

BUILDING FIRE

- **Pull the fire alarm** or announce on the PA system.
- **Call 911.**
- **Use a fire extinguisher,** if you are trained and the fire is of a reasonable size.
- **"Stop, drop and roll"** if your clothes catch on fire.
- **Direct visitors to the exits.**
- **Do not use the elevators.**
- **Check closed doors for heat** before you open them. Use the back of your hand to feel the top of the door, the doorknob, and the crack between the door and frame before opening.
- **Do not open hot doors.** Seek another route, or seal door openings and put a sign on a window.
- **Open cool doors slowly.**
- **"Stay low and go."** Crawl low under any smoke to your exit. Heavy smoke and poisonous gases collect first along the ceiling.
- **Stay outdoors.** Do not re-enter the building. **Go to the designated assembly location** for your facility which is

_____.

NOTES

_____
_____
_____
_____
_____
_____
_____
_____
_____

JORDAN VALLEY WATER
CONSERVANCY DISTRICT

EMERGENCY RESPONSE PLAN
POCKET GUIDE

CONTENTS

7. Fire Response

A. Preparations BEFORE a fire
1. Know the locations of fire alarms, fire extinguishers, exit routes, and assembly areas around your usual work areas.

B. DURING a fire
1. Pull the fire alarm or announce the fire over the building paging system.
2. Call 911.
3. Evacuate the building and go to your designated assembly area. Direct visitors to the exits.
4. Use a fire extinguisher only if you have been trained and the fire is a reasonable size.
5. "Stop, drop, and roll" if your clothes catch on fire. If you see someone on fire, force them to the ground and use a coat or blanket to smother the flames.
6. Do not use elevators.
7. Check closed doors for heat before you open them. Feel the top of the door, the doorknob, and the crack between the door and frame before opening.
   a. Open cool doors slowly.
   b. Do not open hot doors. Seek another route. If an alternate route is not available, seal the door edges and notify others of your location (i.e. call, text, or put a sign in the window).
8. "Stay low and go." Crawl low under any smoke to the nearest safe exit. Heavy smoke and toxic gases collect first along the ceiling.
9. Stay outdoors once you have evacuated. Do not re-enter the building until instructed to do so by your Department Manager.

Incident Command System

- A model tool for command, control, and coordination of an emergency response to a public crisis

- Emergency Response to Life, Property, and Environmental Incidents

- FEMA – Emergency Management Courses – ICS100, ICS200

Communication

Outreach

- How will you contact all customers within 24 hours of an emergency?
- Contact nursing homes, hospitals, schools, & prisons or anywhere immune-compromised people may reside
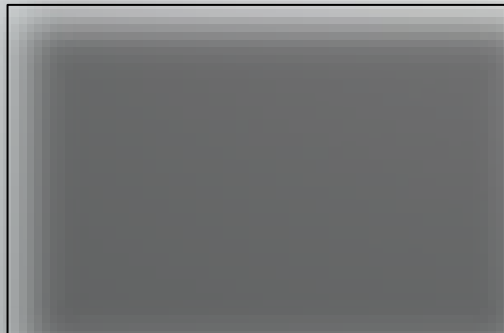
Public Relations

- One spokesperson
- Restrict sensitive information distribution
- Procedure for public notification in the event of an incident
- Procedures for customer complaint calls on taste, odor, color or other physical changes in water quality
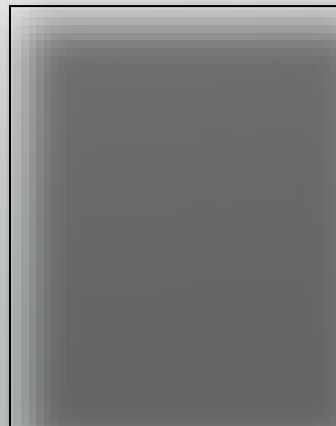
Vulnerability Assessments

What is a Vulnerability Assessment?

- Systematic process to evaluate susceptibility

- VA's (& ERP's) viewed only by need-to-know personnel

- Determines types of assailants, threats, & probability

- Required for water systems serving populations of 3,300 or more

List Critical Components

- Source Types
  - Ground Water
  - Surface Water
  - Purchased Water
- Distribution System
  - Pumps
  - Pipes
  - Valves
  - Appurtenances- Flush Hydrants, Backflow Assemblies, Meters, Regulators, etc.

- Treatment Plants
  - Buildings
  - Pumps
  - Equipment- Basins, Clearwell, Filters, etc.
  - Process Controls
  - Treatment Chemicals & Storage
  - Lab Chemicals and Storage
- Offices
  - Buildings
  - Computers, Servers
  - Files
  - Transportation- Work Vehicles

- Storage
  - Storage Tanks- Buried, Elevated, Above Ground
- Power
  - Primary Sources- Power Company
  - Auxiliary Sources- Diesel, Natural Gas, & Gasoline Powered Generators.
- Communications
  - Telephones
  - Cell Phones
  - Radio
  - SCADA

Threats

- 3 stages of threat management are possible, credible, & confirmatory

- Water contamination threat: collection of samples for analysis helps determine the credibility of a threat. Analytical confirmation is the most reliable means of confirming a water contamination incident

- Survivability of a biological agent in the water determines the severity of an event & they are difficult to detect

- Elevating the threat level should be based on evidence such as a security breach, along with signs of contamination, and abnormal test results

Methods of Estimating Contamination Spread

- Water flow analysis

- Hydraulic modeling

- Areas of customer complaints

- Field analysis

- Precursors to a contamination event can be on-line monitors that detect an unexpected change in pH and chlorine residual.
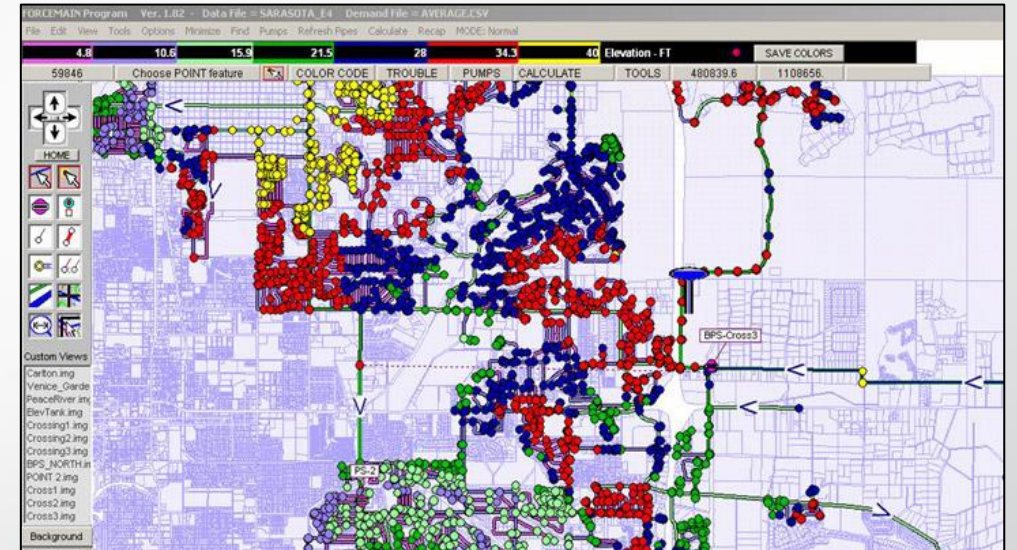
Disasters

- FEMA lists 3 classifications: natural, technological, and national security

- Natural hazards are determined by geological location and do not occur as a result of something man-made

- Require resources beyond the capability of local government

- Cyber attacks would be considered technological

- SARA (superfund amendments & reauthorization act) is legislation requiring utilities to report chemicals stored on site

Emergency Preparedness

Emergency Storage

Emergency Preparedness Employee Training

- First Aid, CPR

- Fire Extinguisher

- Chemical Spills

- Earthquake – Great Utah Shakeout

- Active Shooter

- Evacuation Drills

Security

Vandalism

- A thorough investigation should be conducted

- Record the condition of premises

- Check water quality.

- Report damages and/or questionable conditions to supervisor.

Alarm Systems

- Alarm system that notifies authorities and system personnel of intrusion

- Should be considered for buildings, tanks, pump houses, & treatment facilities.

Key Control

- Interlocking locks

- Contractor keys

- Control key access to critical components of system

- Accountability for those having access

- Do not duplicate engraved on keys

- Change pass codes and retrieve keys when employees are terminated from employment

Clear Areas

- Tall vegetation

- Overhanging trees

- Landscaping that can hide intruders

- Trim trees and shrubs

- Unobstructed view of critical facilities

Exterior Lighting

- Good deterrent
- Intruders can be seen and detected
- Motion Sensors
- Perimeter Lighting

Fencing Critical Infrastructure

- All critical facilities should have perimeter security fencing

- Should be inspected frequently

- Secured with chains & tamper proof locks

Warning Signs

- Hazardous chemical buildings should have secure & restricted access

- Facility Protected by Federal Law

- Unauthorized Access Prohibited

- Employees Only

- Authorized Personnel Only

NO ADMITTANCE
EMPLOYEES ONLY
VENDORS & VISITORS
MUST REGISTER
AT MAIN OFFICE

DANGER
CHEMICAL STORAGE

Sensitive Information

- Remove sensitive information from Web

- Are maps, records and sensitive information in a secure location and labeled "Confidential"?

- Secure vehicles: maps, sensitive information, keys, etc. could be stolen and should not be left in vehicle

Public Awareness

- Uniforms

- Employee I.D. cards for personnel

- System logos on water system vehicles

Cyber Security

- Staff trained on cyber security threats (phishing, email scams…)
- System access, password protected
- Firewall protection
- Virus software that allows continuous upgrades
- Cyber attack is an example of a technological threat
- Backup files should be stored at an off-site location

Treatment Plants & Distribution System

- Chemicals delivered with system personnel present

- Chemicals w/tamperproof seals

- Discuss security with suppliers

- Store hazardous chemicals properly

- Monitor raw water

- Match all delivered goods with manifest and purchase order

- Control use of fire hydrants and valves with locks

- Monitor system for constant positive pressure

- Implement backflow prevention program

Backflow Prevention

Protecting Water, Protecting Yourself

Workplace Safety

Potential Hazards

- Slips, trips, and falls
- Strains and sprains
- Cuts, lacerations, and punctures
- Engulfment
- Burns (fire, chemical)
- Electrocution
- Struck by/against object

- Repetitive motion
- Caught in, compressed by
- Suffocation
- Air (toxic, O2 deficient…)
- Flooding
- Explosions
- Etc.

Workplace Safety Management Program

A study of small employers in Ohio found that workers' compensation claims fell dramatically after working with OSHA's SHARP program to adopt programs similar to those described in these recommended practices.

average number of claims DECREASED 52%

cost per claim DECREASED 80%

average lost time per claim DECREASED 87%

claims (per million dollars of payroll) DECREASED 88%
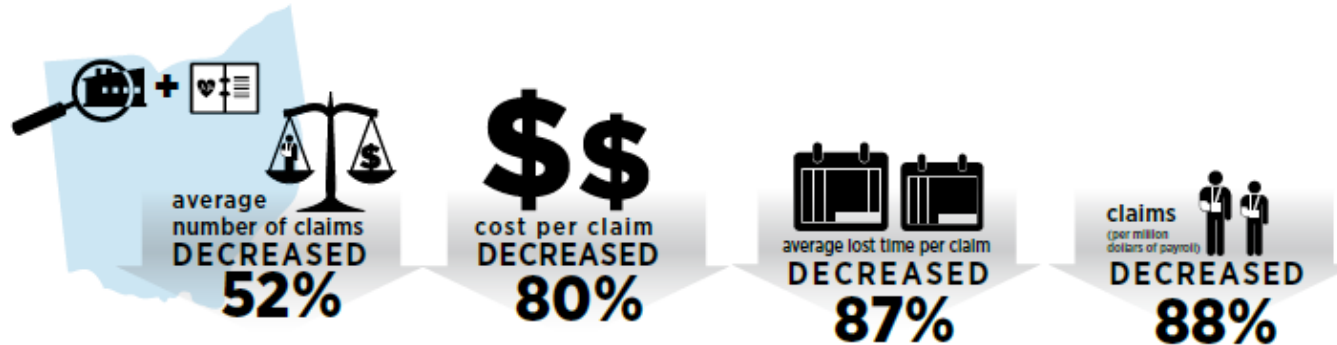
Source: Ohio Bureau of Workers' Compensation (2011), Ohio 21(d) SHARP Program Performance Assessment.

Management Leadership

Worker Participation

Find and Fix Hazards

Recommended Practices for Safety and Health Programs

OSHA®
Occupational Safety and Health Administration
www.osha.gov/shpguidelines
OSHA 3885   October 2016

Hazard Prevention

Hierarchy of Controls

Most effective

Least effective

Elimination — Physically remove the hazard

Substitution — Replace the hazard

Engineering Controls — Isolate people from the hazard

Administrative Controls — Change the way people work

PPE — Protect the worker with Personal Protective Equipment
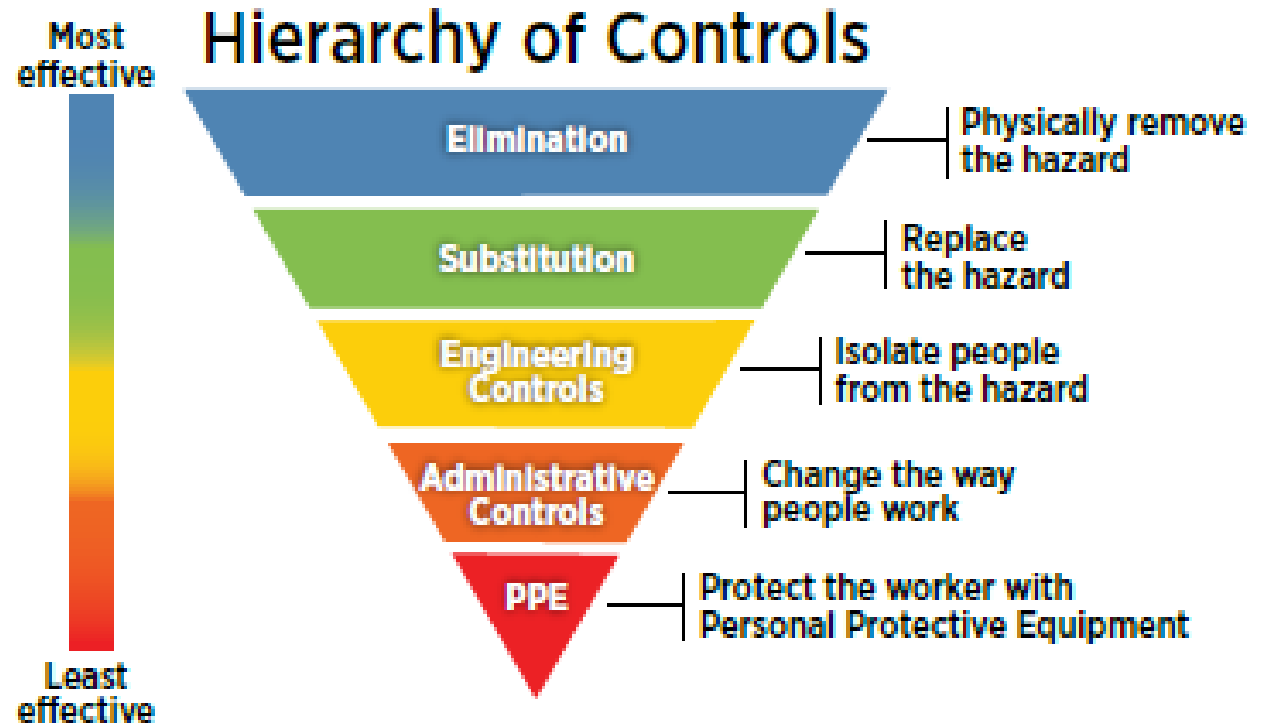
Source: NIOSH

Workplace Safety Manual

Home > Safety And Security > 🛡 Workplace Safety Manual

Documents

- 0-Cover and Index
- Chapter 02: Progressive Discipline Policy
- Chapter 04 - General Safety Rules
- Chapter 06 - Hazard Communication
- Chapter 08 - Trenching and Excavation
- Chapter 10 - Heavy Equipment
- Chapter 12 - Respiratory Protection
- Chapter 14 - Return to Work Program
- Driver Vehicle Inspection Report (DVIR)
- PPE Hazard Assessment Supervisor Checklist

- Chapter 01 - Training Policy
- Chapter 03 - Incident Policy
- Chapter 05 - Vehicle Safety
- Chapter 07 - Personal Protective Equipment
- Chapter 09 - Lock-Out/Tag-Out
- Chapter 11 - Confined Spaces
- Chapter 13 - Forklifts
- Chapter 15 - Electrical Safety Program
- Hot Work Permit
- Safety Policy

- Gets everyone on the same page
- Tailored to your company
- Training tool

Safety Policy

- All of the main points pertain to prevention, a key point in Risk Management

SAFETY POLICY

The personal safety and health of each District employee is of the highest importance. The District is committed to maintaining an occupational injury- and illness-free workplace in compliance with all applicable state and federal statutes and regulations. To this end, the District will provide all the necessary safety equipment and provisions required for personal safety and health.

To be successful, such a program must embody the proper attitudes toward injury and illness prevention on the part of both supervisors and employees. It also requires cooperation in all safety and health matters, not only between supervisor and employee, but also between each employee and his/her fellow workers.

The District's objective is a safety and health program that will reduce the number of disabling injuries and occupational illnesses to a minimum. Our goal is no lost time injuries and no vehicle incidents caused by District employees. Our safety and health program will include:

- Providing safety equipment for employees and physical safeguards for District facilities, to minimize exposure to injuries.

- Conducting a program of safety inspections to identify and eliminate unsafe working conditions or practices.

- Training all employees in good safety and health practices.

- Providing the necessary personal protective equipment for each employee and instructions for its use.

- Developing and enforcing safety and health rules and requiring that employees comply with these rules as a condition of employment.

- Thoroughly and promptly investigating every incident to determine the cause, correct the problem, and prevent recurrence.

Incidents of personal injury and property damage can be avoided by the use of good judgment, common sense and adherence to the District's Safety Program.

Bart Forsyth
General Manager

Safety Training

- New Employee Safety Orientation

- Monthly Safety Meetings

- Weekly Risk Talks

- Group/User Specific Training (flaggers, forklift operators, respirator users, man lift operators...)

Site assessment

- Take a general look around
  - Are things as expected? If not, you may need to reevaluate (tools, equipment, PPE…).
- Look for potential hazards and determine how you will address each one
- Consider JSA/JHA/THA, especially for a new task.
  - It is a method for systematically identifying and evaluating hazards associated with a particular job or task.
- Review SOP for existing task

# Incident Reporting & Reviews

Committees

Safety Committee

- Front line employees, various departments, rotate annually
- Reviews incidents (injuries, crashes)
- Reviews safety suggestions
- Make recommendations for improved safety and security practices

Risk Management Committee

- Department Managers, Safety Manager, Controller, HR Manager, Security Coord.
- Oversees risk management issues (safety, security, emergency response, written programs, property insurance reports…)
- Assists in development and updates of safety program
- Reviews and decides on safety suggestion implementation

JVWCD OSHA Recordable Injuries Incident Rates

ORI Incident Rates*   <5.70   5.70-8.00   >8.00
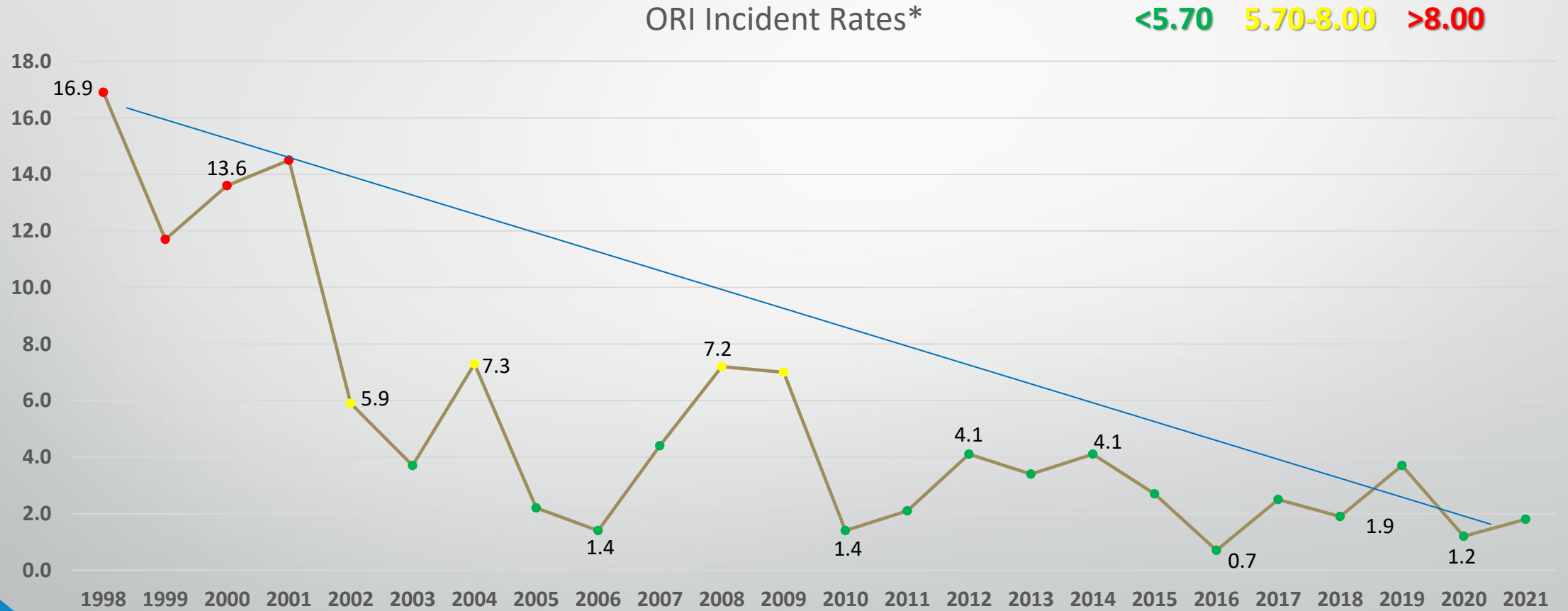
*Injury total x 200,000 ÷ by "Number of Employee Hours Worked"
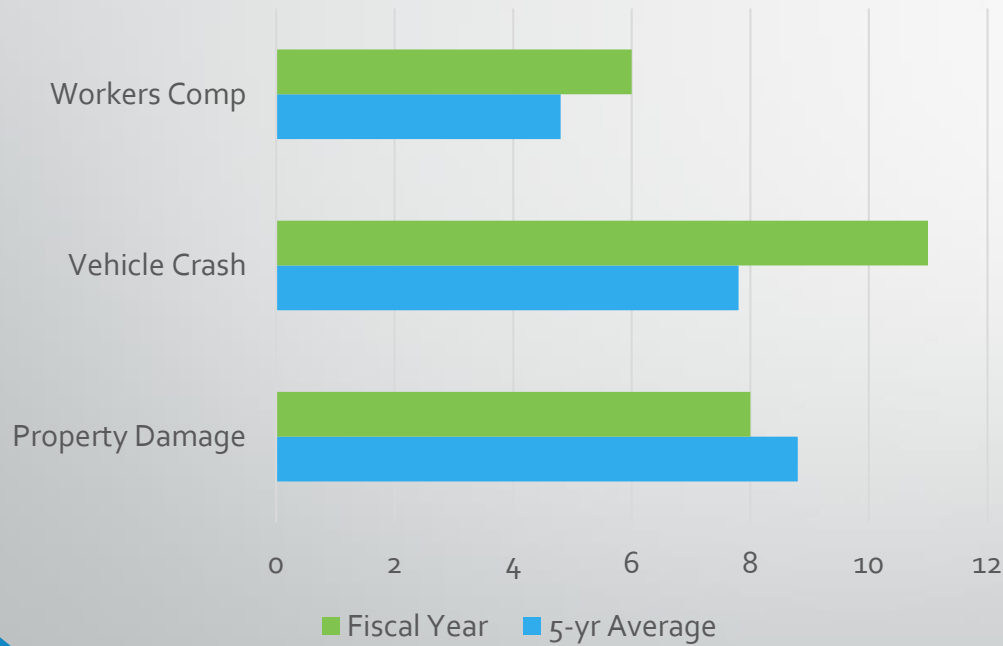
Claims

Claims Process

- Designate employees to handle the different types of claims that may come up (property damage, vehicle crashes, water quality complaints...)

- Train field employees on who to direct claims or customer complaints to

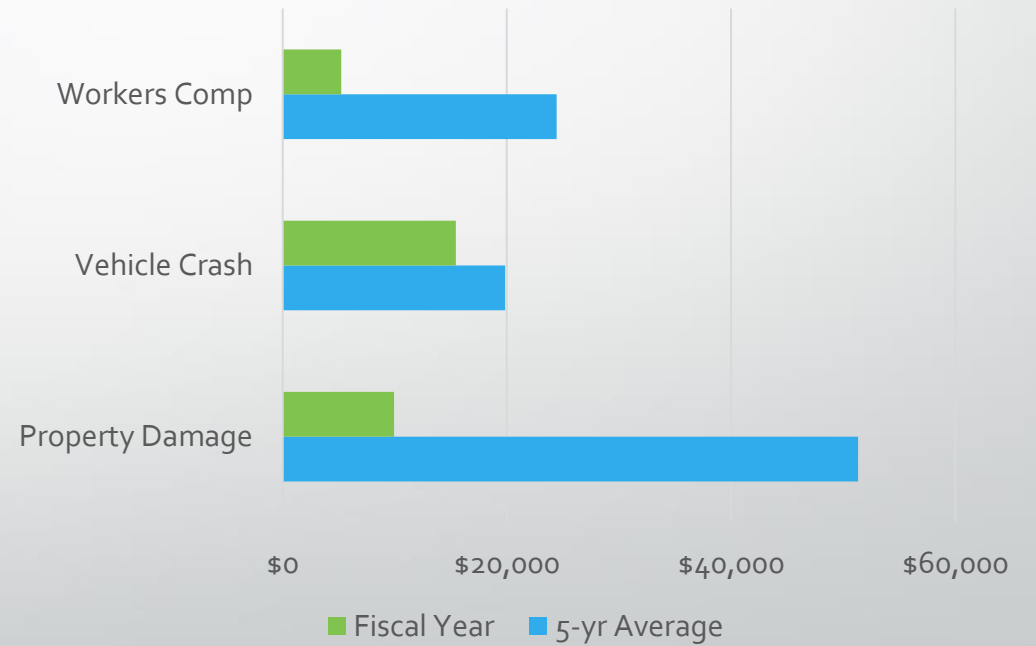- Procedures to handle claims: forms, investigation, follow-up

Claims Tracking

- Document and file all complaints for proper tracking, reference, risk determination…

- Be careful to who access to these files. May contain personal or sensitive information.
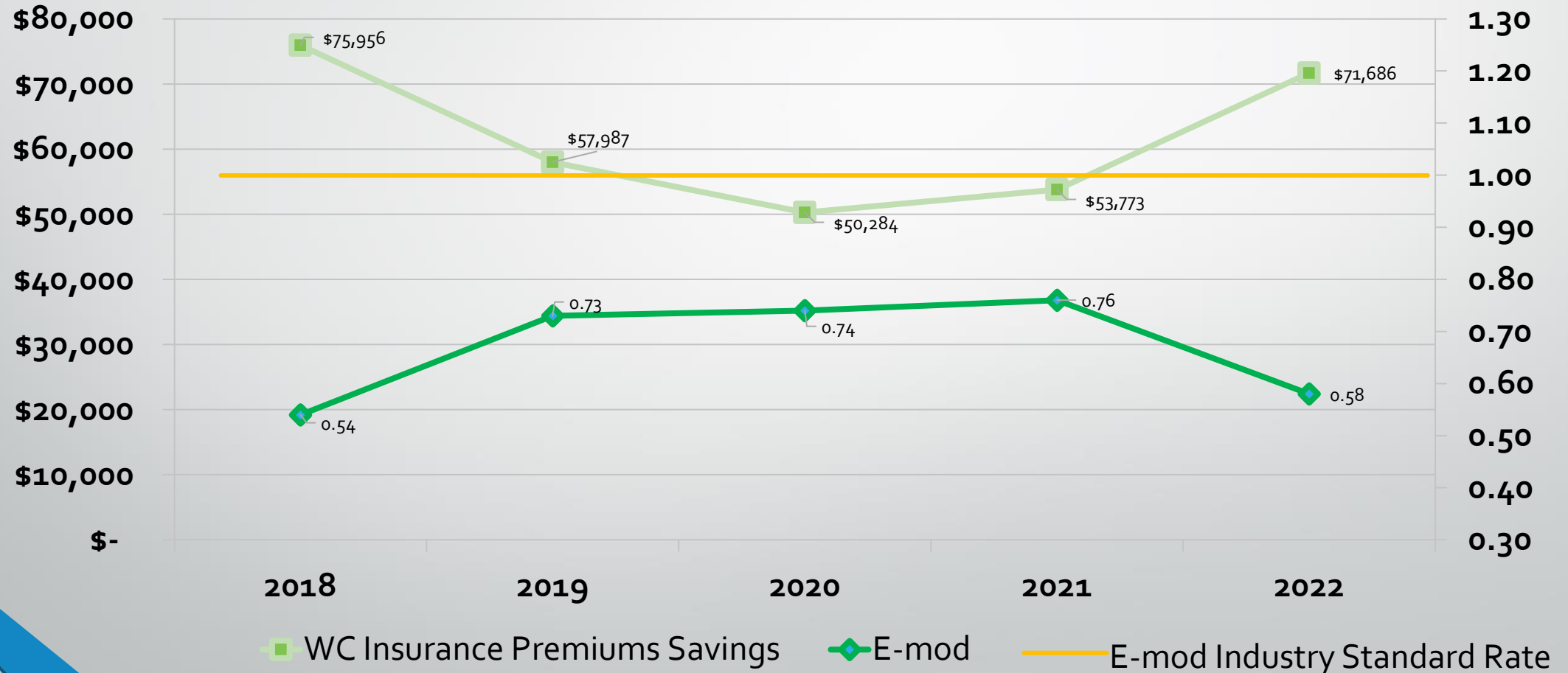
Insurance Site Visits

- Outside perspective

- Specifically look for ways to avoid claims

- Recommendations to improve site

  - Property Insurer: fire protection systems, flood damage potential, seismic infrastructure…

  - Worker's Comp Insurer: safe working areas and behaviors

Best Practices in Water Utility Risk Management - Summary

- Emergency Response Plan

- Vulnerability Assessment

- Emergency Preparedness

- Take Security Measures

- Take Workplace Safety Measures

- Claims Management

Jeff Betton

JeffBe@jvwcd.org

801-565-4300