



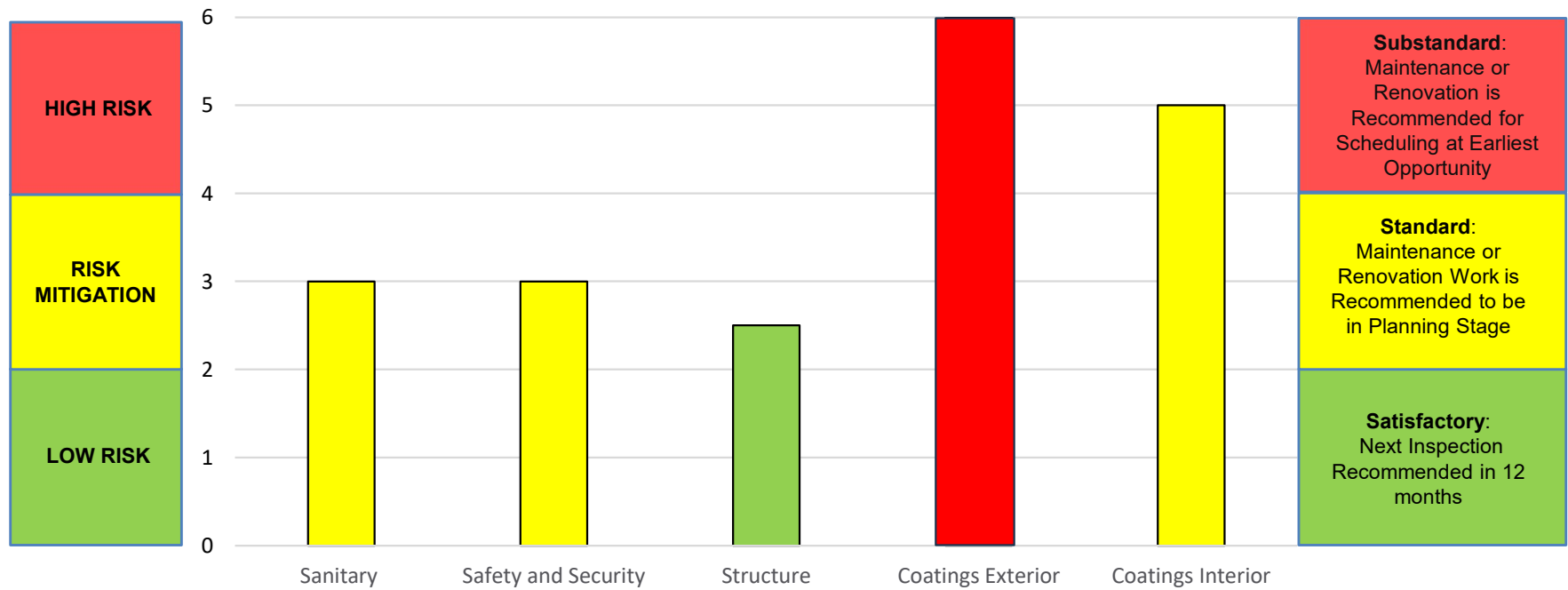
# 2023 Condition Assessment

City of Buhl, MN  
Cone Top Tank  
100,000 Gallon Elevated

Inspection Date: January 2, 2024  
Water System Consultant: Jim Olson



# INSPECTION SUMMARY



# PROJECT INTENT AND RESULTS

Utility Service Co., Inc. conducted an inspection of the Water Storage Tank based on OSHA, AWWA and local requirements for Sanitary, Safety, Security, Coatings, and the overall condition of the Structure. A summary of the inspection results, including photographs and recommendations, outlining the urgency for any items we feel require additional attention to maintain and preserve the Structure are as follows:

Results <b>SANITARY:</b>	Results <b>SAFETY AND SECURITY:</b>	Results <b>COATING:</b>	Results <b>STRUCTURE:</b>
<ul style="list-style-type: none"> <li>Low Risk (Yellow) ▪ Vent</li> <li>Low Risk (Green) ▪ Leaks, Holes, or Points of Intrusion</li> <li>Low Risk (Green) ▪ Water Quality</li> <li>Low Risk (Yellow) ▪ Overflow</li> </ul>	<ul style="list-style-type: none"> <li>Low Risk (Green) ▪ Access Hatches, Manways or Doors</li> <li>Low Risk (Yellow) ▪ Fences, Gates, Guards or Vandalism</li> <li>Low Risk (Yellow) ▪ Ladders, Platforms, Handrails or Stairs</li> <li><del>Low Risk (White) ▪ Lightning, Alarm Systems or Telecommunications</del></li> </ul>	<ul style="list-style-type: none"> <li>High Risk (Red) ▪ Exterior</li> <li>Low Risk (Yellow) ▪ Water Chamber</li> <li><del>Low Risk (White) ▪ Dry Interior</del></li> </ul>	<ul style="list-style-type: none"> <li>Low Risk (Green) ▪ Roof</li> <li>Low Risk (Green) ▪ Shell</li> <li>Low Risk (Green) ▪ Supporting Members</li> <li>Low Risk (Green) ▪ Appurtenances</li> <li>Low Risk (Yellow) ▪ Anchors and Foundation</li> </ul>

## During the inspection, the following scope of work was performed:

- Visual Inspection of the tank interior and exterior accessible without rigging, to include appurtenances.

## Legend and Methodology

- Low Risk (Green) = Next Inspection Recommended in 12 months
- Low Risk (Yellow) = Maintenance or Renovation Work is Recommended to be in the **Planning Stage**
- High Risk (Red) = Maintenance or Renovation is Recommended for **Execution** at earliest Opportunity
- N/A (White) = Not Applicable

# EXTERIOR



SANITARY

SAFETY AND SECURITY

*Tank Asset Management*



COATINGS AND CORROSION

STRUCTURE

# EXTERIOR



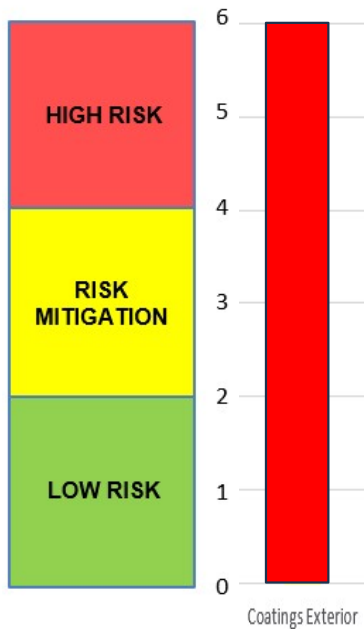
SANITARY

SAFETY AND SECURITY

COATINGS AND CORROSION

STRUCTURE

## EXTERIOR - Summary



- Exterior Coating Condition is Poor
- Heavy Corrosion occurring on the sidewall
- Delamination present on the legs & roof
- Heavy chalking from UV

 SANITARY

 SAFETY AND SECURITY

 COATINGS AND CORROSION

 STRUCTURE

# WATER CHAMBER



SANITARY

SAFETY AND SECURITY



COATINGS AND CORROSION

STRUCTURE

# WATER CHAMBER



SANITARY

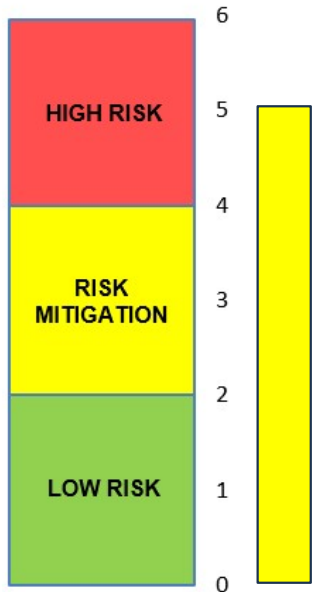
SAFETY AND SECURITY

COATINGS AND CORROSION

STRUCTURE



# WATER CHAMBER



- Overall Water Chamber Coatings Condition is Fair
- Moderate crevice corrosion is present on several ceiling weld seams
- Mild corrosion occurring on the ceiling rods
- Significant amount of sediment was present  
Washouts are recommended once every 2 years

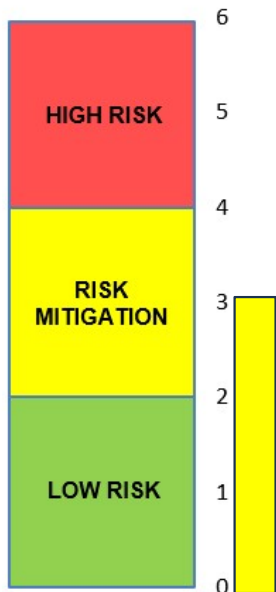
 SANITARY

 SAFETY AND SECURITY

 COATINGS AND CORROSION

 STRUCTURE

# SANITARY



- Installation of a flapper valve/mesh screen assembly at overflow termination point
- Replace existing vent assembly with 24" Pallet type vent



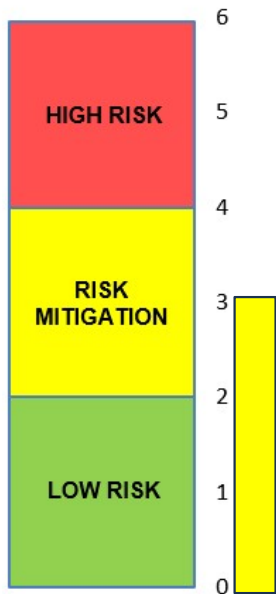
 SANITARY

 SAFETY AND SECURITY

 COATINGS AND CORROSION

 STRUCTURE

# SAFETY & SECURITY



- Install new cable safety climb
- Remove existing ladder cage
- Install new ladder gate (existing is heavily damaged)



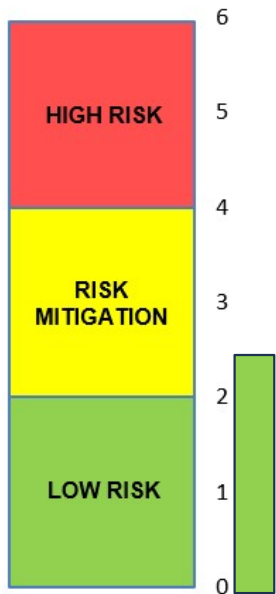
 SANITARY

 SAFETY AND SECURITY

 COATINGS AND CORROSION

 STRUCTURE

# STRUCTURAL



- Concrete Riser Foundation repair suggested (damage is present, partially covered by grass)
- A tank leg is surrounded by small trees & bushes (remove trees & bushes to prevent coatings damage)



 SANITARY

 SAFETY AND SECURITY

 COATINGS AND CORROSION

 STRUCTURE

# SUGGESTED SCOPE OF WORK DETAILS

## Tank Exterior:

- Repair Foundation
- Paint & Seal the Foundation (elevated)
- Full Tower Containment (Lead is present in existing coating system)
- Surface prep to consist of an abrasive blast to SP-6 (gray)
- Application of a three-coat coating system (Primer, Intermediate, Finish)
- Stripe Coat all rivet seams
- Replicate existing tank logo
- Supply & Install Cable Safety-Climb System (remove existing system & ladder cage)
- Supply & Install new ladder gate (remove existing damaged ladder gate)
- Supply & Install overflow flapper screen assembly
- Welding Repairs as may be required
- Supply & Install a 24 inch in diameter pressure pallet style vent to comply with the requirements of AWWA and Minnesota Department of Health regulations

# SUGGESTED SCOPE OF WORK DETAILS

## Tank Wet Interior:

- Surface prep to consist of an abrasive blast to SP-10 (near white metal)
- Application of a two-coat epoxy coatings system in compliance with NSF-600
- Application of a strip coat to all seams
- Welding repairs as may be required

# Replacement versus Renovation

*The existing tank is structurally sound, with proper and timely maintenance the tank could continue provide viable elevated water storage for the next 50 years at a substantial cost savings versus replacement.*



Tan

<b>Replacement Tank Maintenance Costs</b>	<b>Replacement Tank Maintenance with Capital Cost*</b>
<i>Estimated Savings</i>	
<b>160%</b>	<b>224%</b>

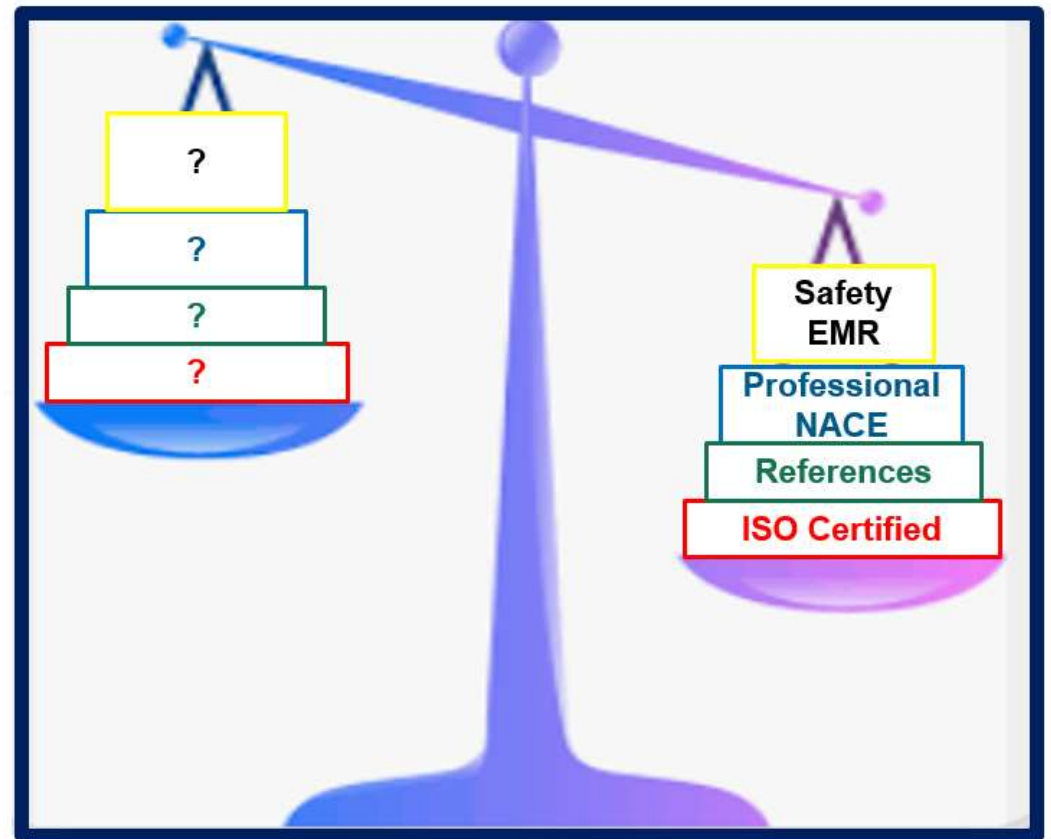
*\*Model assumes replacement tank to be 150k to 200k in capacity, total borrowed capital to be 1 million dollars @3% for 20 years and average Inflation rate to be 4%.*



# Water Tower Projects Require Careful Review



- EMR Rating of .67
- Over 30 NACE Certified Professionals
- Local References / across the United States
- ISO Certified Asset Management Provider





# THANK YOU



January 2, 2024

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