DIXON
ENGINEERING, INC.

Maintenance Inspection

150,000 Gallon Spheroid

Ontonagon, Michigan

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Inspection Performed: August 25, 2025
Reviewed by: Joseph T. Hoban, P.E.: November 15, 2025

CONCLUSIONS:

1. The exterior coating is a urethane system on the basebell and riser, and an acrylic system over insulation on the spheroid. The coating is in good to fair condition overall. Coating deterioration includes spot failures to the substrate with rust undercutting and erosion. There are a few coating failures throughout.

2. The dry interior coating is an epoxy system. The coating is in good condition overall with no significant failures.

3. The wet interior coating is an epoxy system. The coating is in good condition overall. Below the high-water level coating deterioration includes spot failures to the substrate and rust bleedthrough on the access tube and sidewall. Above the high-water level coating is deteriorating at the welded lap seams.

RECOMMENDATIONS (GENERAL):

Annually inspect the roof vent, hatches, and any other health or security items on the tank. The work could be performed by in-house personnel or contracted as part of a regular maintenance program.

Schedule regular cleanings and inspections of the tank by an independent third party once every five years as recommended by AWWA.

1. Install a suspended ring, impressed current cathodic protection system in the wet interior. The estimated cost is $32,000.

RECOMMENDATIONS (PRIORITY WORK TO MEET EGLE REQUIREMENTS):

EGLE may allow some of the required changes to be delayed until the next paint project. These items are listed as priority work since they are currently out of compliance.

1. Replace the screen at the overflow pipe discharge to meet current EGLE requirements. The cost would be incidental to the next painting project or could be performed by in-house personnel.

2. Replace the roof vent screens with 24 mesh screens to meet current EGLE requirements. The cost would be incidental to the next painting project or work could be performed by in-house personnel.

3. Replace the threaded sample tap on the fill/draw pipe with a smooth ended sample tap to meet current EGLE requirements. The work can be performed by in-house personnel.

4. Install a threaded coupling on the fill/draw pipe for a chemical feed line to meet current EGLE requirements. The cost would be incidental to the next painting project.

RECOMMENDATIONS (WITH THE NEXT PAINT PROJECT):

Complete the recommended work in one to two years. The repairs and upgrades should be completed during the next major tank rehabilitation project when coating repairs are made.

1. Abrasive blast clean the exterior riser and basebell inside a dust tight containment system and repaint with a urethane system. Repair any deteriorated insulation on the ball and apply an acrylic system. The estimated cost is $180,000.

2. Coat the foundation to help prevent deterioration. The cost would be incidental to exterior painting.

3. Install grounding for the tank. The estimated cost is $4,000.

4. Install a painter's railing outside the existing roof handrail. The estimated cost is $8,000.

5. Install additional rigging couplings on the roof for temporary fall prevention of workers in the wet interior. The cost would be incidental to the next painting project.

6. Reroute the antenna cables through penetrations equipped with rubber boots at the top of the access tube. The estimated cost is $3,000.

7. Install handholds at the wet interior roof hatch, at the access tube roof hatch, and above the painter's (bird) hatch. The handholds would assist the climber while entering and exiting the openings. The cost would be incidental to the next painting project.

8. Install a rigging lug on the transition cone above the top platform opening. The cost would be incidental to the next painting project.

9. Install a mud valve in the bottom of the tank that is operable from the dry interior. The estimated cost is $5,000.

A DISCUSSION ON RESCUE AND RETRIEVAL OPERATIONS FROM ELEVATED STORAGE TANKS

Working on elevated water storage tanks is inherently dangerous. OSHA regulations give guidelines for climbing on elevated structures. Contractors and Engineers/Consultants are responsible for their own employees, but even with safety training and proper equipment, accidents can occur. Most rescue squads are local or neighboring fire departments, with some departments having more experience than others. Water storage tanks are designed to store water and are not suited for rescue or retrieval convenience. We recommend that you meet with your local rescue personnel and draft a rescue plan. A copy of the plan should be kept at the tank and with the rescue crew.

OSHA does not require 30 inch manways or hatches, but for rescue purposes 30 inch openings would allow enough room for a rescue basket with an injured person on it to pass through. Smaller openings may not be sufficient for retrieval.

Rescue personnel would gain access to the injured person using the existing ladders while attached to fall prevention devices. If possible, the basket would be lowered through the riser and out the opening in the bottom. If needed, the rescue crew would work from the roof inside a handrail. A tripod would be used to attach a winch to the basket. If the basket cannot fit through the riser, then it would need to be raised to the roof.

From the roof it is possible to lower the basket over the side to ground level, but that would require a large winch and increased loading on the attachment point. On a rainy, windy, or snowy day, the objective would be to get rescue personnel off the roof as soon as possible, so lowering through the dry interior is preferred. A helicopter rescue would need to be performed if it is not possible to lower the rescue basket down the dry interior.

Upgrades intended to make a rescue easier are included in this report. Dixon recommends 30 inch manways or hatches where possible, and fall prevention devices on all ladders.

COST SUMMARY:

Exterior repaint with containment	$180,000
Cathodic protection system	32,000
Grounding	4,000
Roof painter's railing	8,000
Antenna cable penetrations	3,000
Mud valve	5,000
Sub Total	$232,000
Engineering and Contingencies	$47,000
Total	$279,000

Notes: Exterior coating is primarily for aesthetics and can be delayed since the next paint job cannot be an overcoat. While the appearance will deteriorate the structural integrity should not be impacted. Note that the insulation should be coated as soon as possible though, so that the insulation does not get damaged enough from weather to require replacement.

Exterior repainting will require temporary removal and relocation of the antennas and cables. This cost is not included in these estimates and is assumed to be the responsibility of the antenna owners. Cost is also not included for coordinating with the antenna carriers or for any redesign work needed for antenna mounting or cable routing.

INSPECTION:

August 25, 2025, Dixon Engineering Inc. performed a maintenance inspection on the 150,000 gallon spheroid elevated water storage tank owned by the Village of Ontonagon, Michigan. Purposes of the inspection were to evaluate the interior and exterior coating's performance and life expectancy, assess the condition of metal surfaces and appurtenances, review safety and health aspects, and make budgetary recommendations for continued maintenance of the tank. The inspection was performed from existing ladders and platforms. No special rigging and no disassembly of any items was conducted by the inspector. All recommendations with budgeting estimates for repairs are incorporated in this report.

The inspection was performed by Josh Grover, Engineering Technician. The inspector was assisted by Lane Tremblay, ROV/Drone Operator, and Michael Sedlmayer, Engineering Technician.

The wet interior inspection was completed with a remotely operated vehicle (ROV). Video of the inspection and still photos are included with this report. No cleaning was performed in the wet interior during the ROV inspection.

GENERAL INFORMATION:

The tank was built in 2002 by Maguire Iron with a height to high-water level of 122 feet.

CONDITIONS AND RECOMMENDATIONS:

EXTERIOR COATING CONDITIONS:

Information provided by the Owner to DIXON indicates that the exterior was last painted in 2002. The exterior was abrasive blast cleaned to a SSPC-SP6 commercial condition. The coating applied on the basebell and riser was a urethane system. The spheroid was covered with spray foam insulation and coated with an acrylic system. The coating is in good to fair condition overall. The coating is beginning to chalk and fade and there is loss of gloss. Surfaces have faded due to exposure to ultraviolet light which is a normal occurrence for an exterior coating system.

The basebell coating is in good condition with a few failures. Primary methods of deterioration are spot failures to the substrate with rust undercutting and erosion.

The riser coating is in good condition with a few areas of erosion.

The bowl, sidewall, and roof is covered with spray foam insulation with an acrylic coating. The coating is in fair condition with areas of erosion. The insulation on the roof has deteriorated.

EXTERIOR COATING RECOMMENDATIONS:

Budget for exterior coating removal and repainting on the basebell and riser in approximately one to two years or when aesthetics dictate. Fading will continue and more coating failures will occur decreasing the tank's aesthetic appearance. Repair any damaged insulation on the ball and apply an acrylic system.

Remove the existing coating on the basebell and riser by dry abrasive blast cleaning the steel to a commercial (SSPC-SP6) condition and apply a urethane system. All blast work would be performed inside a dust tight containment system using negative air pressure.

The coating system would consist of a full prime coat on the bare metal, a full coat of epoxy, and followed by two full coats of urethane. The urethane system offers excellent abrasion resistance with high gloss and sheen retention. The life expectancy of this system is fifteen years. The system can be overcoated in fifteen years, and a second time approximately fifteen years after the first overcoat, extending the total life of the coating to approximately forty-five years before total removal would be necessary. The tank would be removed from service during the coating project. This is necessary to reduce condensation on the tank's surface. Urethane coatings have a minimum temperature requirement for application and are sensitive to moisture during the curing process. If moisture is present during the curing process, the appearance will become cloudy with little or no gloss. The estimated cost is $180,000.

DRY INTERIOR COATING CONDITIONS:

The dry interior on this tank is defined as the non-water contact surfaces consisting of the basebell, riser, transition cone, and access tube.

Information provided by the Owner to DIXON indicated the dry interior was last painted in 2002. The dry interior was abrasive blast cleaned to a SSPC-SP6 commercial condition. The coating applied was an epoxy system.

The coating is in good condition overall with no significant failures.

DRY INTERIOR COATING RECOMMENDATIONS:

The existing coating system has not deteriorated to the point where replacement is warranted.

WET INTERIOR COATING CONDITIONS:

Information provided by the Owner to DIXON indicated the wet interior was last painted in 2002. The wet interior was abrasive blast cleaned to a SSPC-SP10 near-white condition. The coating applied was an epoxy system.

The roof coating is in good condition with a few failures. Primary methods of deterioration are spot failures to the substrate and rust bleedthrough. Most of the deterioration is along the welded lap seams.

The sidewall and access tube coating is in good condition with a few failures. Primary methods of deterioration are spot failures to the substrate and rust bleedthrough. There is no significant coating damage at the high-water level which would be the area most affected by ice movement.

The visible coating on the bowl is in good condition with no significant deterioration.

The transition cone was partially covered with approximately 2 inches of sediment that limited the amount of surface visible with the ROV.

The surfaces below the normal operating water level are covered with mineral staining which does not affect the integrity of the coating system.

WET INTERIOR COATING RECOMMENDATIONS:

The existing coating system has not deteriorated to the point where replacement is warranted assuming a cathodic protection system is installed. A cathodic protection system would adequately protect all areas below the high-water level where the coating has deteriorated. Reinspect in five years to update conditions and recommendations. Long term budget to repaint in approximately ten years. The estimated cost is $80,000.

CATHODIC PROTECTION CONDITIONS:

There is no cathodic protection system in the wet interior.

CATHODIC PROTECTION RECOMMENDATIONS:

Install an impressed current cathodic protection system. The system is designed with a horizontal ring configuration suspended into the lower one third of the tank connected to the sidewall or access tube. This design is considered ice-free as formation of ice normally occurs at the high-water level and some along the sidewall. When the tank is operated in the upper one half of its capacity, the probability of ice damage is very low. The anode used is a platinized niobium or titanium wire with a design life of approximately ten years. The system also incorporates copper/copper sulfate reference anodes.

The system is automatically controlled by monitoring the water-to-tank potential. It provides protection to the exposed steel surfaces. Cathodic protection operates by inhibiting galvanic cell corrosion where steel is exposed. The system creates an equipotential across the tank and drives the tank potential down to a point (-850 millivolts) where corrosion is essentially nonexistent. Only surfaces that are in contact with water are protected because water acts as the electrolyte for the circuit. Therefore,

areas of the roof and upper sidewall are not protected by the system. The estimated cost is $32,000.

FOUNDATION AND ANCHOR BOLT CONDITIONS:

The exposed concrete foundation is in good condition with no deterioration. The foundation is not coated.

There are anchor bolts evenly spaced on the baseplate around the basebell. The anchor bolts are in good condition with no deterioration.

FOUNDATION AND ANCHOR BOLT RECOMMENDATIONS:

Coat the exposed concrete with an epoxy coating system to help prevent deterioration. The cost would be incidental to exterior painting.

GROUT CONDITIONS:

The grout between the steel baseplate and the concrete foundation is in good condition with none damaged or missing.

GROUNDING CONDITIONS:

There are no grounding wires visible on the tank.

GROUNDING RECOMMENDATIONS:

Install grounding for the tank. The estimated cost is $4,000.

LIGHTING AND ELECTRIC COMPONENTS CONDITIONS:

There are light fixtures located in the dry interior. The light fixtures are in good condition and were functioning during the inspection.

ROOF HANDRAIL, PAINTER'S RAILING, AND ROOF RIGGING CONDITIONS:

There is a handrail on the roof surrounding the roof hatches and the vent. The handrail is in good condition. The handrail is being used for antenna mounting. The handrail conforms to current OSHA requirements.

There is not a painter's railing around the roof handrail.

There are not enough roof rigging couplings for fall prevention and staging lines during wet interior coating work.

ROOF HANDRAIL, PAINTER'S RAILING, AND ROOF RIGGING RECOMMENDATIONS:

Install a painter's railing outside the existing roof handrail. The railing gives the contractor a rigging point for staging. The estimated cost is $8,000.

Install additional rigging couplings on the roof under the new painter's railing for fall prevention of workers in the wet interior. The cost would be incidental to the next painting project.

ANTENNA CONDITIONS:

There are eight roof antennas and miscellaneous antenna equipment attached to the handrail. The antenna cable routing is in good condition and does not interfere with climbing or tank operations. The cables are routed through openings in the screens in the access tube neck.

ANTENNA RECOMMENDATIONS:

Reroute the antenna cables through penetrations equipped with rubber boots on the roof. The estimated cost is $3,000.

OVERFLOW PIPE CONDITIONS:

The overflow pipe extends along the access tube in the dry interior, down through the dry riser, and exits near the bottom of the basebell. The overflow pipe discharge is horizontal. The discharge end of the overflow pipe is screened. The screen is in good condition but is oversized. The end of the pipe is equipped with a solid flap gate that is in good condition. The pipe discharges to a concrete splash pad. The air gap does not meet the required 12 to 24 inches. The discharge area is in good condition.

OVERFLOW PIPE RECOMMENDATIONS:

Replace the screen at the overflow pipe discharge to meet current EGLE requirements. The cost would be incidental to the next painting project or could be performed by in-house personnel.

HATCH AND MANWAY CONDITIONS:

There is a 30 inch diameter roof hatch to the wet interior that is in good condition. The hinged cover is in good condition. There is no handhold next to the hatch to aid the climber while entering and exiting the opening. The hatch was not secured. The hatch neck curb height meets the minimum height requirement of 4 inches. The hatch cover lip meets the minimum height requirement of 2 inches. There is a gasket on the hatch that is in good condition.

There is a 30 inch diameter roof hatch into the dry interior access tube that is in good condition. The hinged cover is in good condition. There is no handhold next to the hatch to aid the climber while entering and exiting the opening.

There is a 24 inch diameter manway in the transition cone to the wet interior that is in good condition. The manway gasket showed no signs of leakage and the bolt is in good condition.

There is a service door in the basebell that is in good condition. The door operated properly during the inspection.

The condensate platform ladder opening is 28 x 30 inches. The opening is equipped with a hinged cover. There is a handhold next to the opening.

There is a painter's hatch (bird hatch) at the top of the riser that is in good condition. There is no handhold above the hatch.

The top platform ladder opening is 28 x 30 inches. The opening is equipped with a hinged cover. There is a handhold next to the opening.

There is not a rigging point on the transition cone for rescue retrieval line attachment.

HATCH AND MANWAY RECOMMENDATIONS:

Install handholds at the wet interior roof hatch, at the access tube roof hatch, and above the painter's (bird) hatch. The handholds would assist the climber while entering and exiting the openings. The cost would be incidental to the next painting project.

Install a rigging lug on the transition cone above the top platform opening. The cost would be incidental to the next painting project.

VENT CONDITIONS:

The roof vent is a pressure vacuum design that is in good condition. The screened pressure vacuum plate was found to be properly aligned. There is a large external screen intended to keep birds out and a smaller mesh screen on the interior intended to keep insects out. The screens are in good condition. The interior screen mesh size is larger than the recommended 24 mesh. This is a possible entry point for insects, though none were observed inside the tank. There is a rain shield over the outer screen.

There are screened openings in the access tube roof hatch neck. Holes were cut in screens for antenna cable routing.

VENT RECOMMENDATIONS:

Replace the roof vent screens with 24 mesh screens to meet current EGLE requirements. The cost would be incidental to the next painting project or work could be performed by in-house personnel.

LADDER CONDITIONS:

The dry interior ladders located in the basebell, riser, and access tube are in good condition. The ladders meet current OSHA size requirements. The ladders are equipped with cable-type fall prevention devices that are in good condition.

There is a wet interior ladder from the roof to the bowl that appears to be in good condition. The ladder meets current OSHA size requirements. The ladder is equipped with a cable-type fall prevention device that was not used during the ROV inspection.

FILL/DRAW PIPE CONDITIONS:

The tank fills and draws from a single pipe. The pipe routes through the dry interior into the bottom of the transition cone and extends approximately 12 inches into the wet interior. There are deflector bars over top of the pipe in the wet interior.

There is a sample tap on the fill/draw pipe located in the basebell. The tap has a threaded end, faces downward, and is inside a heated room. There is not a threaded coupling on the fill/draw pipe for future attachment of a chemical feed line.

FILL/DRAW PIPE RECOMMENDATIONS:

Replace the threaded sample tap on the fill/draw pipe with a smooth ended sample tap to meet current EGLE requirements. The work can be performed by in-house personnel.

Install a threaded coupling on the fill/draw pipe for a chemical feed line to meet current EGLE requirements. The cost would be incidental to the next painting project.

EXPANSION JOINT CONDITIONS:

The fill/draw pipe is equipped with a bellows expansion joint located in the basebell. The expansion joint appears to be in good condition.

INSULATION CONDITIONS:

The fill/draw pipe is covered with rigid foam insulation. The insulation is covered with an aluminum jacket. The insulation and cover are in good condition.

MUD VALVE CONDITIONS:

There is a drain plug located in the bottom of the tank to aid in removal of sediment during inspections and routine maintenance. The drain plug is only operable from the wet interior and was not operated during the ROV inspection.

MUD VALVE RECOMMENDATIONS:

Install a mud valve in the bottom of the tank that is operable from the dry interior. The estimated cost is $5,000.

CONDENSATE PLATFORM DRAIN CONDITIONS:

There is a condensate drain line that routes from the platform to the overflow pipe. There is a check valve in the line to stop backflow during overflow conditions. The line is in good condition. The drain opening appeared to be operational.

WET INTERIOR METAL CONDITIONS:

The steel tank is in good condition overall. No pitting was observed at the coating failures on the sidewall or access tube.

DIXON ENGINEERING, INC.

STEEL TANK FIELD INSPECTION REPORT

PEDESTAL TANK

DATE: **August 25, 2025**

OWNER: **Village of Ontonagon**
CLIENT CODE: **22-66-01-02**
TANK NAME: **Ontonagon**
LOCATION: Address: **Giesau Drive**
City: **Ontonagon**
State: **Michigan**
TANK SIZE: Capacity: **150,000 gallons**
Bottom (LWL): **89 feet 6 inches (from nameplate)**
Overflow (HWL): **122 feet 0 inches (from nameplate)**
CONSTRUCTION:
Type: **Spheroid**
YEAR CONSTRUCTED: **2002**
MANUFACTURER: **Maguire Iron**
USE: **Potable water and fire protection**

Coating information below is from: **Exterior coating sample taken for type**

COATING HISTORY	EXTERIOR	WET INTERIOR	DRY INTERIOR
YEAR COATED	**2002**	**2002**	**2002**
CONTRACTOR	**Maguire Iron**	**Maguire Iron**	**Maguire Iron**
SYSTEM	**Urethane with acrylic over spray foam insulation on the ball**	**Epoxy**	**Epoxy**
SURFACE PREPARATION	**SSPC-SP6**	**SSPC-SP6**	**SSPC-SP10**
HEAVY METAL COATING SAMPLES	**No**	**No**	**No**
HEAVY METAL BEARING	**No**	**No**	**No**

PERSONNEL: Lead inspector **Josh Grover**, ROV/Drone operator **Lane Tremblay**, Crew member **Michael Sedlmayer**
METHOD OF INSPECTION: **ROV**

SITE CONDITIONS

Fenced: **Yes**
Site large enough for contractor's equipment: **Yes**
Control building: **No**
Antenna control site: **No**
Power lines within 50 feet: **No**
Site drainage: **Away from the tank**
Indications of underground leakage: **No**
Vegetation, tree, etc. encroachment: **No**
Rubbing on the tank: **No**
Would there be interference with future containment: **No**

EXPOSED PIPING

N/A

FOUNDATION

Foundation exposed: **Yes**
Exposed height: **3-4 inches**
Exposed foundation condition: **Good**
Damage or deterioration: **No**
Foundation coated: **No**
Grout condition: **Good**
Amount missing: **0 feet**
Undermining of foundation: **No**

EXTERIOR COATING

Adhesion Testing:

N/A

Basebell:

Topcoat condition: **Good**
Previous coat condition: **Good**
Describe coating: **Fading, spot coating failures to substrate, rust undercutting, erosion**
Dry film thickness: **5-10 mils**
Metal condition: **Good**
Bottom shell steel thickness: **0.354 inch**
Basebell comments: **There are five coating failures that are ½ inch diameter on the baseplate and areas of erosion throughout**

EXTERIOR COATING

Riser:

Topcoat condition: **Good**
Previous coat condition: **Good**
Describe coating: **Fading, erosion**
Mildew growth: **No**
Metal condition: **Good**

Bowl:

Topcoat condition: **Fair**
Previous coat condition: **Fair**
Describe coating: **Fading, erosion**
Mildew growth: **No**
Metal condition: **Good**
Bowl comments: **The bowl is covered in insulation and coating, the insulation is in good condition**

Sidewall:

Lettering: **No**
Logo: **No**
Topcoat condition: **Fair**
Previous coat condition: **Fair**
Describe coating: **Fading, erosion**
Metal condition: **Good**
Sidewall comments: **The sidewall is covered in insulation and coating, the insulation is in good condition**

Roof:

Topcoat condition: **Fair**
Insulation condition: **Fair**
Describe coating: **Erosion**
Metal condition: **Good**
Roof comments: **The roof is covered in insulation and coating, the insulation is beginning to deteriorate**

EXTERIOR APPURTENANCES

Basebell Door:

Size: **36 x 80 inches**
Metal condition: **Good**

EXTERIOR APPURTENANCES

Anchor Bolts:

Number: **8**
Diameter: **1 ¾ inches**
Location: **Exterior**
Metal condition: **Good**

Grounding (for the tank not equipment):

N/A

Overflow Pipe:

Diameter: **12 inches**
Metal condition: **Good**
Discharge orientation: **Horizontal**
Screen condition: **Good**
Percent of screen open: **100**
Mesh size: **4**
Flap gate at the discharge: **Yes**
Type: **Solid**
Condition: **Good**
Air gap: **Yes**
Lowest part of discharge to the ground distance: **40 inches**
Height to basebell penetration: **40 inches**
Overflow discharges to: **Concrete splash pad, riprap**
Condition: **Good**

Roof Handrail:

Diameter: **12 feet**
Height: **42 inches**
Midrail height: **25 inches & 13 inches**
Kick plate height: **4 inches**
Vertical post type: **Angle**
Size: **2 x 2 inches**
Top rail type: **Angle**
Size: **2 x 2 ½ inches**
Midrail type: **Plate**
Size: **¼ x 2 inches**
Metal condition: **Good**

Painter's Railing:

N/A

EXTERIOR APPURTENANCES

Roof Rigging Points:

Number: **2**
Couplings covered: **Yes**
Covered with: **Plugs**
Metal condition: **Good**

Removable Cathodic Covers:

N/A

Wet Interior Roof Hatch:

Neck size: **30 inches**
Distance from center of the tank (to outer edge): **5 feet**
Shape: **Round**
Handhold at opening: **No**
Curb height: **8 inches**
Cover overlap: **2 inches**
Gasket on cover/neck curb: **Yes**
Hatch security: **None**
Metal condition: **Good**

Access Tube Roof Hatch:

Neck size: **30 inches**
Shape: **Round**
Handhold at opening: **No**
Hatch security: **None**
Metal condition: **Good**

Bolted Ventilation Hatch:

N/A

Access Tube Air Gap:

N/A

Roof Vent:

Number: **1**
Distance from center of the tank (to outer edge): **5 feet**
Type: **Pressure vacuum**
Neck diameter: **24 inches**
Flange opening diameter: **24 inches**
Vertical screen condition: **Good**
Mesh size: **4**

EXTERIOR APPURTENANCES

Interior screen condition: **Good**
Mesh size: **4**
Rain shield: **Yes**
Pressure plate condition: **Good**
Plate free to move: **Yes**
Plate screened: **Yes**
Mesh size: **4**
Height of the lowest opening above the roof: **28 inches**
Metal condition: **Good**

Aviation Lights:

N/A

Antennas:

Roof number: **8**
Attached to: **Handrail**
Riser number: **0**
Roof cable penetrations sealed: **No**
Antenna or cables interference: **No**
Antenna comments: **Cables route through screens in the neck of the dry interior hatch at the top of the access tube**

DRY INTERIOR COATING

Basebell:

Insulation condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**
Floor: **Concrete**
Drain line present: **No**

Condensate Platform:

Platform design: **Full**
Coating condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**
Ladder opening size: **28 x 30 inches**
Shape: **Rectangle**
Opening covered: **Yes**
Handhold at opening: **Yes**
Drain: **Yes**
Diameter: **2 inches**

DRY INTERIOR COATING

Type: **To the overflow**
Check valve: **Yes**

Riser above the Condensate Platform:

Coating condition: **Good**
Describe coating: **No significant coating deterioration**
Dry film thickness: **10-12 mils**
Metal condition: **Good**

Intermediate Platform:

N/A

Top Platform:

Platform design: **Full**
Material: **Steel plate**
Coating condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**
Ladder opening size: **28 x 30 inches**
Shape: **Rectangle**
Opening covered: **Yes**
Handhold at opening: **Yes**

Riser above the Top Platform:

Insulation condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**

Transition Cone:

Insulation condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**
Rigging lug above opening: **No**

Access Tube:

Diameter: **36 inches**
Insulation condition: **Good**
Describe coating: **No significant coating deterioration**
Metal condition: **Good**

DRY INTERIOR APPURTENANCES

Electric Components:

Exposed wiring: **No**
Lights functioning: **Yes**
Missing covers (globes and cages): **No**
Additional lights needed: **No**
Electrical outlet/conduit condition: **Good**
Used during inspection: **Yes**

Sample Tap:

Location: **In the basebell on the fill/draw pipe**
Pipe diameter greater than ¼ inch: **Yes**
12 inches or more above the floor: **Yes**
Down turned: **Yes**
Smooth end: **No – it's threaded**
In heated room: **Yes**
Condition: **Good**

Threaded Coupling (for chemical feed on the piping):

N/A

Expansion Joint on Fill/Draw Pipe:

Location: **Bottom of the pipe**
Accessible for inspection: **Yes**
Type: **Bellows**
Coating condition: **Good**
Metal condition: **Good**

Fill/Draw Pipe Insulation:

Insulation cover: **Yes**
Type: **Aluminum**
Condition: **Good**
Seams loose: **No**

Basebell Ladder:

Toe clearance: **7 inches or greater**
Width of rungs: **16+ inches**
Thickness of rungs: **¾ inch**
Shape of rungs: **Diamond**
Metal condition: **Good**
Fall prevention device: **Yes**
Type: **Cable**

DRY INTERIOR APPURTENANCES

Function properly: **Yes**

Cage: **No**

Riser Ladder:

Toe clearance: **7 inches or greater**
Width of rungs: **16+ inches**
Thickness of rungs: **¾ inch**
Shape of rungs: **Diamond**
Metal condition: **Good**
Fall prevention device: **Yes**
Type: **Cable**
Function properly: **Yes**
Cage: **No**

Painter's (bird) Hatch:

Handhold above hatch: **No**
Metal condition: **Good**
Hatch security: **Pin**

Manway to Wet Interior:

Diameter: **24 inches**
Location: **In the transition cone**
Metal condition: **Good**

Drain Plug:

Number: **1**
Discharge material: **Hose**
Discharge slope: **Downward**
Functioning properly: **Not used during inspection**
Metal condition: **Good**
Drain plug comments: **The drain plug is only operable from the wet interior**

Access Tube Ladder:

Toe clearance: **7 inches or greater**
Width of rungs: **16+ inches**
Thickness of rungs: **¾ inch**
Shape of rungs: **Diamond**
Metal condition: **Good**
Fall prevention device: **Yes**
Type: **Cable**
Function properly: **Yes**

WET INTERIOR COATING

Roof:

Topcoat condition: **Good**
Primer coating condition: **Good**
Describe coating: **Spot coating failures to substrate, rust bleedthrough**
Metal condition: **Good**
Lap seams: **Welded**
Condition of lap seams: **Good**
Roof comments: **The coating failures are mainly on the welded lap seams**

Sidewall:

Topcoat condition: **Good**
Primer coating condition: **Good**
Describe coating: **Spot coating failures to substrate, rust bleedthrough**
Mineral deposits: **Light**
Metal condition: **Good**
Active pitting: **No**
Previous pitting: **No**

Access Tube:

Topcoat condition: **Good**
Primer coating condition: **Good**
Describe coating: **Spot coating failures to substrate**
Mineral deposits: **Light**
Metal condition: **Good**
Active pitting: **No**
Previous pitting: **No**
Access tube comments: **There are a few minor spot coating failures near the high-water level**

Tank Bottom:

Partially covered in sediment, not completely inspected with the ROV
Type: **Transition cone and bowl**
Topcoat condition: **Good**
Primer coating condition: **Good**
Describe coating: **No significant coating deterioration**
Mineral deposits: **Light**
Metal condition: **Good**
Active pitting: **No**
Previous pitting: **No**
Sediment depth: **1-2 inches (estimated) in the transition cone**

WET INTERIOR APPURTENANCES

Ladder:

Toe clearance: **7 inches or greater**
Width of rungs: **16+ inches**
Thickness of rungs: **¾ inch**
Shape of rungs: **Diamond**
Shape of side rails: **Flat**
Metal condition: **Good**
Fall prevention device: **Yes**
Type: **Cable**
Function properly: **Unknown, not used during the inspection**

Cathodic Protection:

N/A
Clips: **No**
Pressure fitting: **No**

Roof Stiffeners:

N/A

Sidewall Stiffeners:

N/A

Overflow Pipe Inlet:

Type: **Weir box**
Metal condition: **Good**

Fill/Draw Pipe:

Diameter: **10 inches**
Height above the tank bottom: **12 inches (estimated)**
Deflector over end: **Yes**
Type: **Bars**
Metal condition: **Good**

Mixer:

N/A

150,000 gallon spheroid elevated water storage tank located by the Village of Ontonagon, Michigan.

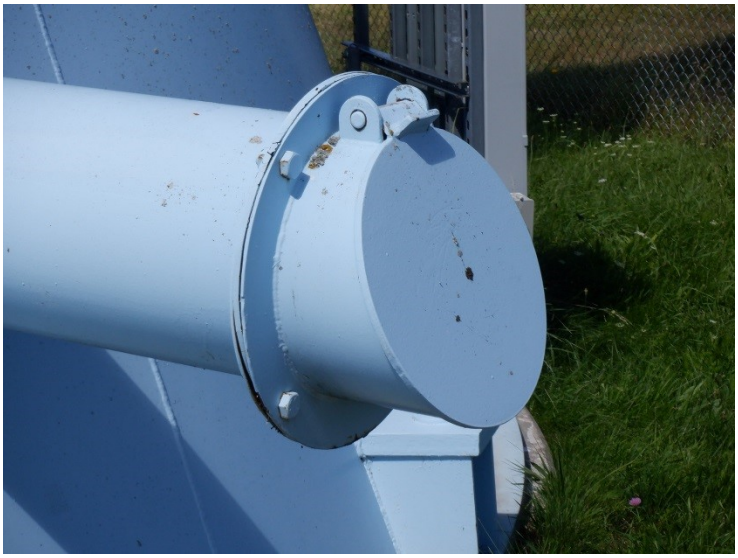
1) The concrete foundation is in good condition with no significant deterioration.

2) The grout between the steel baseplate and concrete foundation is intact.

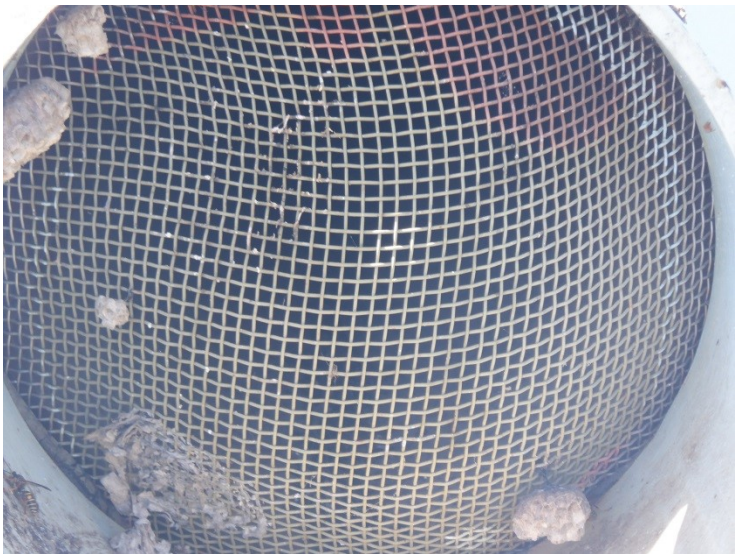
3) The anchor bolts are in good condition.

4) The service door in the basebell operated properly during the inspection.

5) The overflow pipe discharges to a concrete splash pad and riprap.



6) The solid flap gate at the overflow pipe discharge operated properly.



7) The screen at the overflow pipe discharge is intact but oversized.

8) There are a few coating failures on the baseplate.

9) Same.

10) There are a few minor coating failures on the basebell.

11) Same.

12) The basebell coating is in good condition overall.

13) Same.

14) There are no coating failures on the riser.

15) Same.

16) Same.

17) The bowl is covered with spray foam insulation. The coating on the insulation is in fair condition.

18) Same.

19) Same.

20) The sidewall is covered with spray foam insulation. The coating on the insulation is in fair condition.

21) Same.

22) Same.

23) Same.

24) Same.

25) The insulation on the roof has deteriorated.

26) Same.

27) The coating on the roof insulation is in fair condition with areas of erosion.

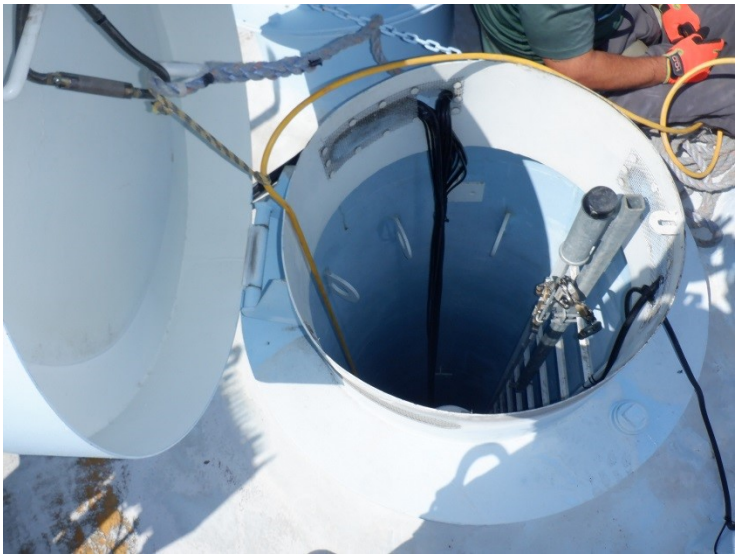
28) Same.

29) Same.

30) The roof handrail is being used for antenna mounting.

31) The roof handrail is in good condition.

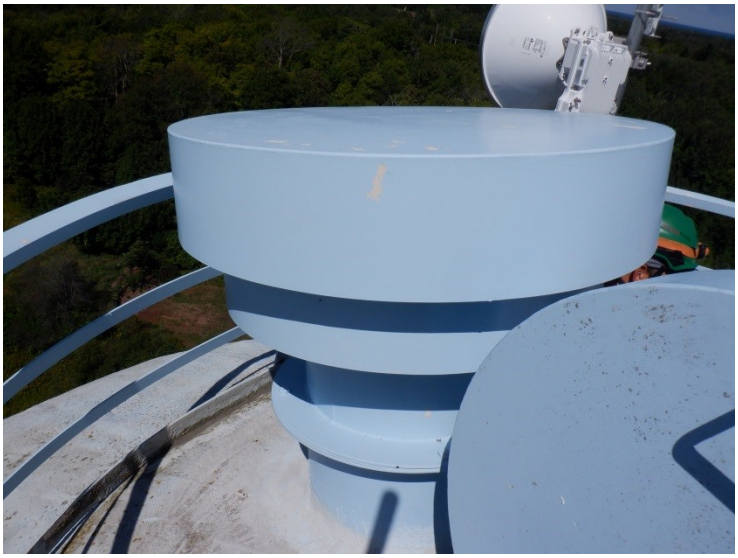
32) There is no handhold at the access tube roof hatch.



33) Antenna cables are routed through the screens on the access tube roof hatch neck. The screen are oversized.

34) There is a gasket on the wet interior roof hatch.

35) The roof rigging couplings are properly capped.



36) The pressure vacuum roof vent is in good condition.

37) The external roof vent screens are in intact.

38) The screened roof vent pressure plate was found to be properly aligned.

39) The interior roof vent screen is in good condition but oversized.

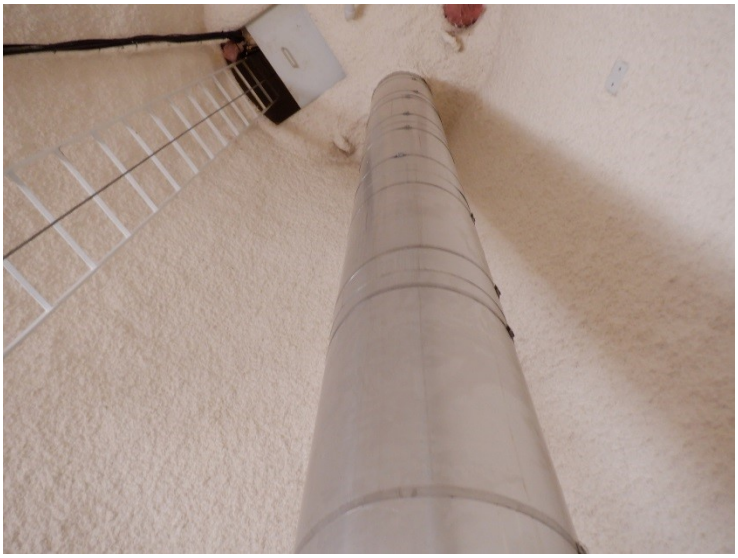
40) The dry interior baseball coating is covered with insulation and not visible for inspection. The insulation is in good condition.

41) Same.

42) Same.

43) The sample tap on the fill/ draw pipe in the basebell has a threaded end.

44) The bellows expansion joint on the fill/draw pipe in the basebell appears to be in good condition.



45) The fill/draw pipe insulation and aluminum cover are in good condition.

46) The basebell ladder is in good condition. The ladder is equipped with a fall prevention device.

47) The condensate platform drain with a check valve is in good condition.

48) The ladder opening in the condensate platform is equipped with a hinged cover.

49) The condensate platform coating is in good condition.

50) There are no coating failures in the dry riser.

51) Same.

52) Same.

53) Same.

54) The dry interior lighting is in good condition.

55) The riser ladder is in good condition. The ladder is equipped with a fall prevention device.

56) The ladder opening in the top platform is equipped with a hinged cover.

57) The are no significant coating failures on the top platform.

58) Same.

59) There is no handhold above the painter's hatch at the top of the riser.

60) The drain plug can only be opened from the wet interior.

61) The wet interior manway in the transition cone is in good condition.

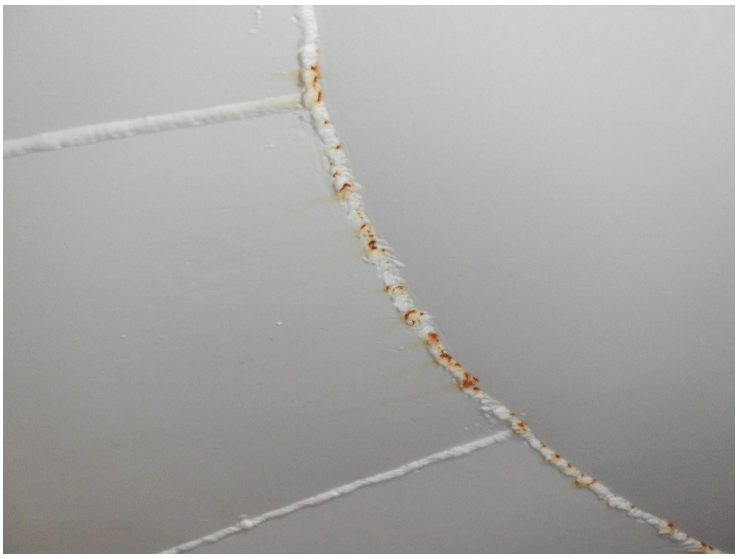
62) The transition cone coating is covered with spray foam insulation and not visible for inspection. The insulation is in good condition.

63) Same.

64) The access tube coating is in good condition with no failures.

65) Same.

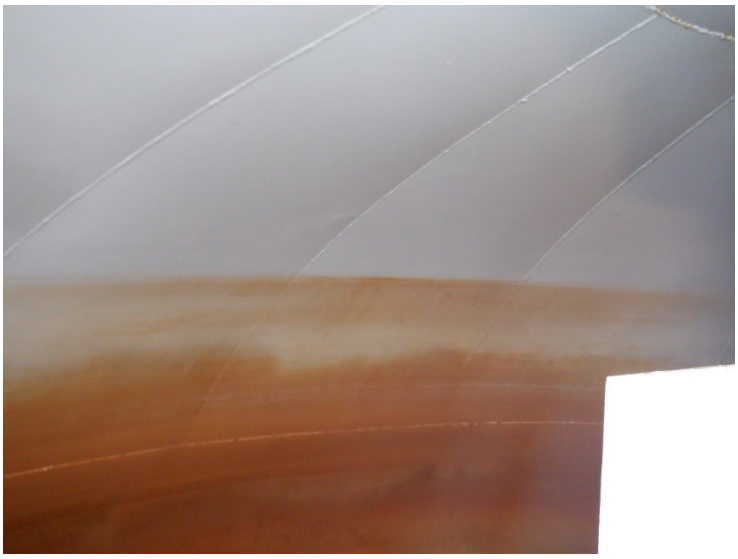
66) The access tube ladder is in good condition. The ladder is equipped with a fall prevention device.



67) There are a few coating failures at the welded lap seams on the wet interior roof.

68) Same.

69) The wet interior roof coating is in good condition overall.



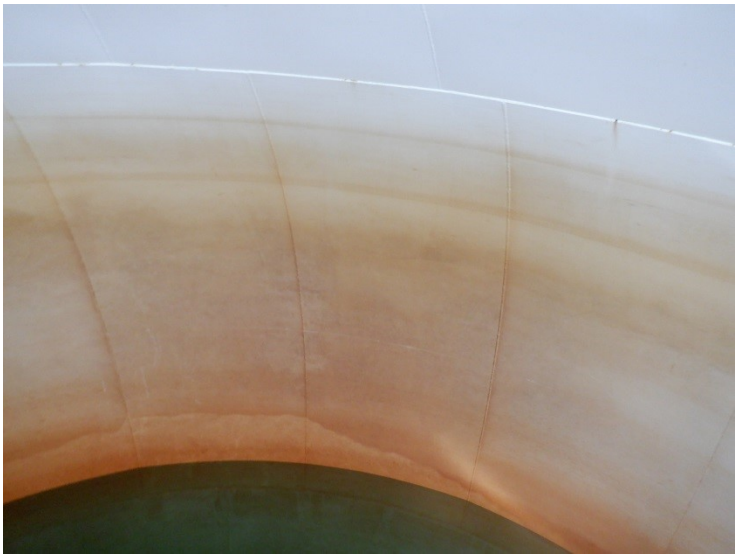
70) Same.

71) Same.

72) Same.

73) Same.

74) There are a few minor coating failures on the wet interior sidewall.



75) The wet interior sidewall coating is in good condition overall.

76) Same.

77) Same.

78) Same.

79) The overflow pipe weir box at the top of the access tube is in good condition.

80) The access tube coating is in good condition overall.

81) Same.

82) The wet interior ladder appears to be in good condition. The ladder is equipped with a fall prevention device that was not used during the ROV inspection.

83) There are no visible coating failures on the bowl.

84) Same.

85) The transition cone is covered with sediment that limited the amount of surface visible with the ROV.

86) Same.

87) There are deflector bars over the fill/draw pipe in the wet interior.