



Baxter, Minnesota

Inspection Report:
400,000-Gallon Capacity
South Tower

Prepared by:



KLM Engineering, Inc.
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May 2022

Project No.: 1320-22

1.0 | PROJECT INFORMATION

KLM Project No.: 1320-22 **Customer P. O. Number:** N/A

Tank Owner: City of Baxter, Minnesota **Phone:** 218-513-3453

Street/City/State/Zip: PO Box 2626, Baxter, MN 56425

Tank Owner Contact: Brian Berent, Streets & Utilities Supervisor

Owner's Tank Designation: South Tower

Tank Description: Toro Ellipsoidal

Tank Street Location: 7091 Foley Road, Baxter, MN 56425

Purpose of Inspection: Condition Assessment

Date of Inspection: May 3, 2022

Inspected By: Devin Severson NACE #78234 and David Robelia

Type of Inspection: KLM Standard Dry Tank Cleanout Evaluation

Manufacturer: Universal Tank & Iron Works, Inc. **Construction Date:** 1977

Serial No.: 6435.400 **Design Code:** AWWA D100-73

Capacity: 400,000 Gallons

Type of Construction: Welded

Tank Diameter: ~50 feet

Height to: Overall ~140 feet

Height to: HWL 135'-0" LWL 104'-9"

Tank Construction Drawings: Unavailable to KLM

Previous Inspection Records: 2012 and 2018 KLM Reports

EXISTING COATING INFORMATION

	Interior Wet	Exterior
Date Last Coated	2000	2000
Full or Spot Repair	Full	Full
Coating Contractor	Odland Protective Coatings	Odland Protective Coatings
Surface Preparation	SSPC-SP 10	SSPC-SP 6
Paint System	Epoxy	Epoxy/Urethane
Paint Manufacturer	Tnemec	Tnemec
Paint Chip Samples	N/A	N/A

May 11, 2022

by E-Mail

Mr. Brian Berent
Streets and Utilities Supervisor
City of Baxter
PO Box 2626
Baxter, MN 56425

RE: Dry Tank Cleanout Evaluation and Disinfection of the 400,000-Gallon Elevated Reservoir (South Tower) in the City of Baxter, MN. KLM Project No. 1320-22.

Mr. Berent,

On May 3, 2022, KLM performed a dry tank cleanout evaluation and disinfection of the 400,000-gallon elevated reservoir (South Tower) and offers the following comments.

Analysis:

The tower was constructed and originally painted by Universal Tank & Iron Works, Inc. in 1977. Records indicate the interior wet and exterior coatings were last replaced by Odland Protective Coatings in 2000.

The interior wet coating is in overall good condition with less than two (2) percent visible coating failures. Failures consist of spot corrosion randomly located on the shell, pinole corrosion on the bowl, and surface corrosion on top of the fill pipe. While not affecting the integrity of the coating, brown staining is visible on the shell and bowl, likely due to the presence of iron and manganese in water. See attached photos.

The exterior coating is in good condition with less than two (2) percent visible coating failures throughout the tower. Failures consist of UV deterioration, pinhole corrosion on typical wear areas such as the handrails, ladders, and manways, and surface corrosion on the overflow pipe screen retainer. See attached photos.

Summary:

Overall conditions were compared to the past KLM evaluation reports. The rate of corrosion occurring is minimal and virtually unchanged from the 2018 report. Based on the overall good condition of the coatings, the interior and exterior should be considered for spot repair within the next one to two years to prolong the need for full reconditioning and reduce corrosion associated damage. For budgetary purposes, if spot repairs were performed to the interior wet coating and the exterior was washed, the estimated current cost would be between \$55,000 and \$65,000. If the City wanted to improve the exterior appearance in addition to the wash, the tower is likely a candidate for a full overcoat of paint, which would increase the cost by approximately \$60,000 to \$70,000. These costs do include engineering and inspection services. Performing proper spot repairs and a possible overcoat now could greatly extend the service life of the coating system and appearance of the tower for as much as ten years, or more as determined by future inspections, for a fraction of the cost of full reconditioning. Not only would this extension provide plenty of time to prepare and budget for the next full

reconditioning, but it could result in significant savings by undergoing fewer reconditioning cycles over the life of the tower.

If the City of Baxter elects to forego any repairs, it should be anticipated the interior coating may require replacement in approximately five (5) to seven (7) years, depending on corrosion advancement. At which time, the exterior should also be planned for replacement even if it remains in better conditions than the interior. Under most circumstances, reconditioning the interior and exterior at the same time is the most cost-effective long-term approach to tower rehabilitation and keeps future rehabilitations on the same schedule. The estimated current cost to completely recondition the tower is approximately \$575,000 to \$625,000.

Sincerely,

KLM Engineering, Inc.

Report prepared by:

Thomas Brown

Thomas Amarvi-Brown, P.E.
Civil Engineer
MN License No. 58770

Report reviewed by:

Rodney Ellis

Rodney Ellis
Vice President/COO
NACE Coating Inspector No. 1686
AWS/CWI 04040311

Attached: Photos

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Photo No. 1
Overall view of the tower



Photo No. 2
View of interior wet roof



Photo No. 3
Condition of roof plate coatings
Overflow weir box visible



Photo No. 4
Condition of roof plate coatings



Photo No. 5
View of shell



Photo No. 6
View of shell



Photo No. 7
Shell coating conditions
Large corrosion spot visible



Photo No. 8
Shell coating conditions



Photo No. 9
Bowl conditions
Corrosion on bowl visible



Photo No. 10
Bowl conditions



Photo No. 11
Top of cone

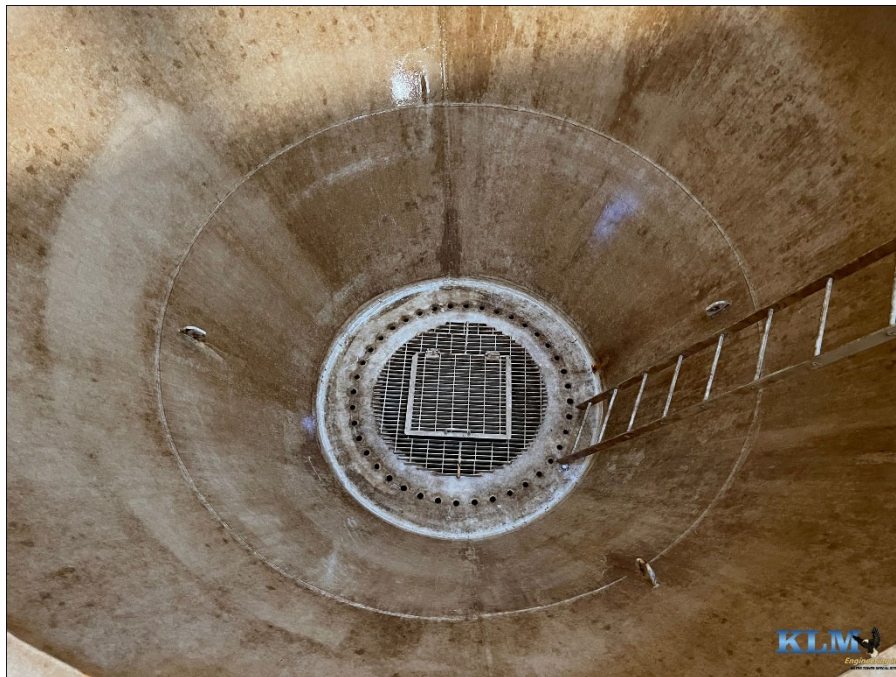


Photo No. 12
Cone conditions
Top of wet riser visible



Photo No. 13
Condition of wet riser grating



Photo No. 14
Bottom of wet riser



Photo No. 15
Condition of fill pipe



Photo No. 16
View of roof



Photo No. 17
Condition of finial vent



Photo No. 18
Aviation light



Photo No. 19
Roof plate coating conditions
Ventilation manway visible



Photo No. 20
Roof plate coating conditions



Photo No. 21
Roof handrail



Photo No. 22
Wet access manway



Photo No. 23
Roof access ladder



Photo No. 24
Shell coating conditions



Photo No. 25
Shell coating conditions



Photo No. 26
Balcony and handrail



Photo No. 27
Balcony and handrail



Photo No. 28
Balcony access



Photo No. 29
Column ladder

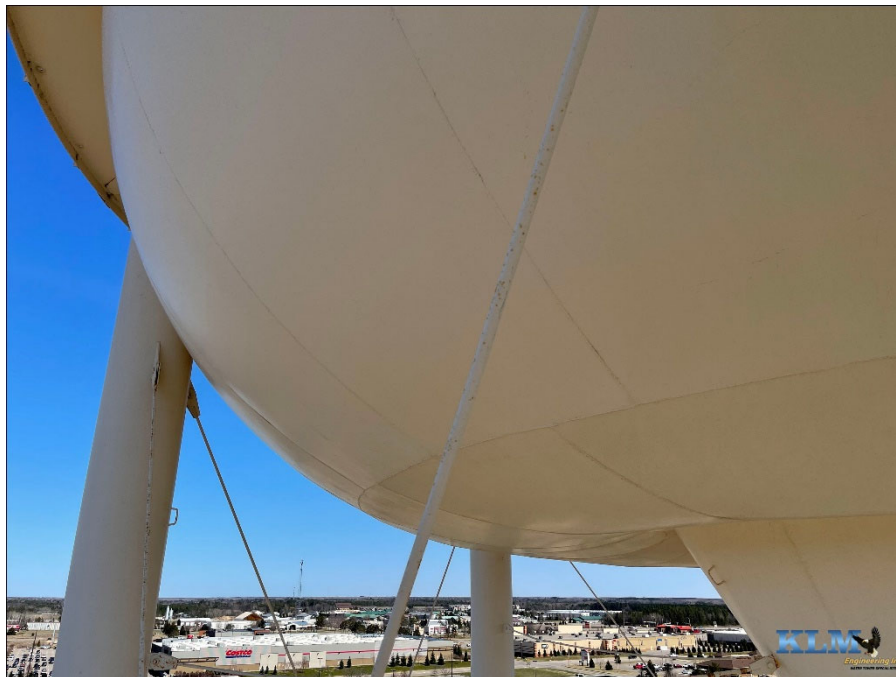


Photo No. 30
Bowl coating conditions



Photo No. 31
Bowl and cone coating conditions



Photo No. 32
View of shell and bowl
Lettering visible



Photo No. 33
View of columns and wet riser



Photo No. 34
Base of wet riser



Photo No. 35
Base of wet riser



Photo No. 36
Overflow pipe and grating



Photo No. 37
Condition of overflow pipe screen



Photo No. 38
Valve pit manway



Photo No. 39
View of valve pit



Photo No. 40
View of valve pit