



Lake Shastina Community Services District Field Report

25-Apr-17

Underwater Cleaning & Inspection
500,000 Gallon
Tank 1
Potable Water Storage Tank

Submitted To:

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David Harvey Dive Supervisor

EXTERIOR ROOF

Safety Rail			
Satisfactory	Fair	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating	Good needs touch up		
Welds	Good		
Corrosion	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Satisfactory	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Corrosion	<2%	Y <input checked="" type="checkbox"/>	N <input type="checkbox"/>
Seams/Welds	Good		
Low Spots	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Cathodic Protection Plates	Good		



Conclusion/Discrepancies: A few low spots around the outer edges
 Coating is oxidized but in good condition needs minor touch up work
 around the outer edges in the low areas and a few spots near the center
 Hand railing also needs minor touch up work

ACCESS HATCH

Satisfactory	Fair	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Corrosion	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Proper Design	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Locked	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Gasket	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Hinge	Good		
Hatch Size	2.5 FT	X	2.5 FT



Conclusion/Discrepancies Needs new gasket
 present one is not sealing
 Corrosion on the underside of the lid

VENTS

Satisfactory	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Coating			
Corrosion	% Y	<input type="checkbox"/>	N <input checked="" type="checkbox"/>
Proper Design	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Screens	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Sealed Edges & Seams	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>
Cap/Cover	Y	<input checked="" type="checkbox"/>	N <input type="checkbox"/>



Conclusion/Discrepancies Screen in place and
 well secured Vent is in good condition
 no problematic concerns

EXTERIOR SHELL

Rings

Chime	Good
2nd Weld Ring	Good
3rd Weld Ring	Good
4th Weld Ring	Good
5th Weld Ring	Good
Ring(s) 5 in all	Good
Wall to Roof Seam	Good

Coating

Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>

Conclusion/Discrepancies Coating is oxidized but holding up well no discrepancies noted



EXTERIOR LADDER

Construction	Coated Steel
Satisfactory	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>

Coating

Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	2% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Welds/Joints	Good
Supports	Good
Safety Cage/Climb	Y <input checked="" type="checkbox"/> N <input type="checkbox"/>

Conclusion/Discrepancies Ladder, cage and braces all in working condition, minor rust noted



OVERFLOW STRUCTURE

Coating

Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	10% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Welds/Joints	Good
Supports	Good

Screens Y N

Attachments In ground

Foundation Good

Conclusion/Discrepancies Pipe and braces are in good condition with minor rust that needs touched up on the back side of the pipe



FOUNDATION

Concrete Slab/Ring Retention				
Satisfactory	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Spalling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Exposed Aggregate	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Erosion Undermining	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Seismic Restraints None				
Corrosion	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Tight	Y	<input type="checkbox"/>	N	<input type="checkbox"/>
Conclusion/Discrepancies Retention ring in place and in good condition no undermining or erosion noted overall satisfactory				



MANWAY ENTRIES

Coating				
Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Oxidized	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Delamination	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	<1%	Y	<input checked="" type="checkbox"/>	N
Welds/Joints Fair				
Conclusion/Discrepancies Both man ways are in satisfactory condition with no discrepancies				



MANUAL LEVEL INDICATOR

Float	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wires	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wire Anchors	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cable / Hardware	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Corrosion	%	Y	<input type="checkbox"/>	N
Operation	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Conclusion/Discrepancies: Indicator appears to be in good condition



INTERIOR ROOF

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	30%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Trusses				
Gussets	Fair			
Coating				
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5%	Y	<input checked="" type="checkbox"/>	N
Vent Penetration	Good			
Roof Hatch	Fair			



Conclusion/Discrepancies: Surface corrosion covers the plates, minor corrosion on the trusses and hardware. Coating is at the end of its service life and needs redone

INTERIOR SHELL

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	15%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Poor heavily blistered			
Rings				
Chime	Fair			
2nd Weld Ring	Poor heavily blistered			
3rd Weld Ring	Poor heavily blistered			
4th Weld Ring	Fair			
5th Weld Ring	Fair			
Ring(s)	5 in all	Fair		
Wall to Roof Seam	Fair			
Baffle/Support Walls	None			



Conclusion/Discrepancies: Weld seams are heavily blistered with corrosion present above the water line corrosion and cracking more extensive

SUPPORT COLUMNS

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	10%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Floor/Base Plates	Fair			
Construction	Coated steel			
Conclusion/Discrepancies:	Blistering and surface corrosion noted from exposed steel. Coating has failed sandblast and recoat			



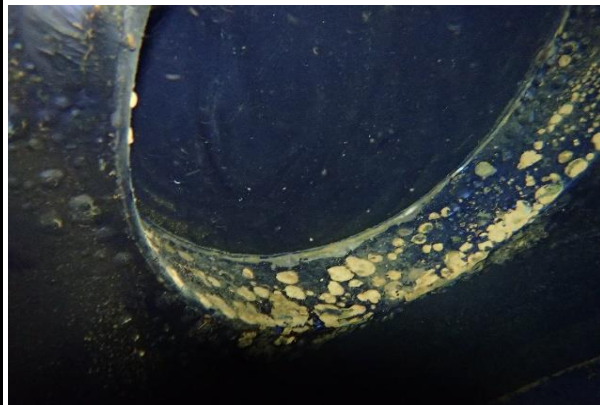
FLOOR

Coating				
Satisfactory	Fair	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	3%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Conclusion/Discrepancies:	Majority if the coating is in good shape with no major discrepancies A few sporadic spots of corrosion / bare steel			
Sediment Depth	1/4 of an inch			



MANWAY ENTRIES

Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	10%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Conclusion/Discrepancies:	Blistering and surface corrosion noted around the outer edges and interior of the doorway extension			



LADDER

Construction	Coated Steel			
Satisfactory	Fair	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Coating				
Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	3%	Y	<input checked="" type="checkbox"/>	N
Seams/Welds	Fair			
Safety Cage/Climb	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>



Conclusion/Discrepancies: Coating has failed blistering and bare steel present. Little to no corrosion present

OVERFLOW

Coating				
Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	%	Y	<input type="checkbox"/>	N
Seams/Welds	Good			

Conclusion/Discrepancies: funnel and welds are in good condition



MANUAL LEVEL INDICATOR

Float	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wires	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Guide Wire Anchors	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cable / Hardware	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Corrosion	1%	Y	<input checked="" type="checkbox"/>	N
Operation	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>

Conclusion/Discrepancies: Minor corrosion on the floor anchor otherwise in good condition



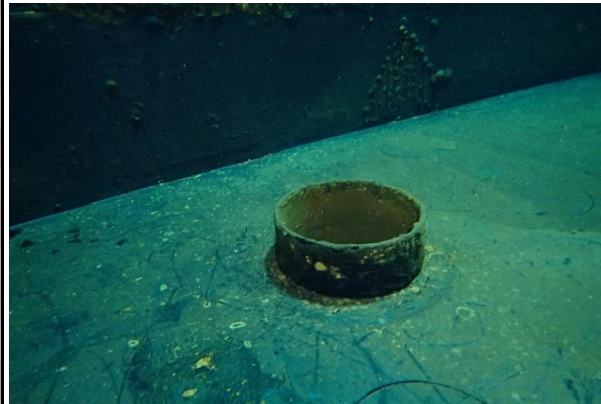
APPURTENANCES

Influent

Coating

Satisfactory	Fair	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			

Conclusion/Discrepancies: Blistering and corrosion noted around the top edge of the pipe



Effluent

Coating

Satisfactory	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Blistering	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Cracking	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			

Conclusion/Discrepancies: Blistering and corrosion noted around the weld seam



Drain

Coating

Satisfactory	Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Blistering	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Cracking	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Peeling	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Holidays	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Pitting	Y	<input type="checkbox"/>	N	<input checked="" type="checkbox"/>
Corrosion	5% Y	<input checked="" type="checkbox"/>	N	<input type="checkbox"/>
Seams/Welds	Fair			

Conclusion/Discrepancies: Corrosion on the interior of the pipe. Welds and coating are intact and in good condition



Conclusion

Based on the results of this underwater inspection and the cleaning which took place, it appears this tank is in operational condition and should continue to provide a reliable water storage capacity for potable water use with and after proper maintenance.

Interior coating is at the end of its service life, the tank needs to be sandblasted and recoated in the near future.

Recommendations

PDI concurs with the recommendations of AWWA that all potable water reservoirs or storage tanks be cleaned and inspected at least every five years and in some cases, depending upon source waters, type and quantities of sediment, and presence (or lack thereof) of cathodic protection systems, more frequently.

The following recommendations are made to provide continued, uninterrupted service of your water storage tank:

- 1 Your tank should be inspected and cleaned every five years, as suggested by the AWWA. Routine inspections and cleanings provide ample time to perform remedial repairs to abnormalities discovered before having a chance to become problematic.
- 2 The entry hatch needs a new gasket put in place as the current one is not sealing
- 3 The exterior roof needs touch up work done around the outer edges, the low spots have minor surface corrosion present
- 4 The interior coating on the floor, shell, and roof, in addition to all the appurtenances need to be sandblasted and recoated as the coating has exceeded its useful service life. Blisters, and corrosion are present with some bare steel exposed as well. Sandblast and recoat the interior in the near future.