



Lake Shastina Community Services District Field Report

25-Apr-17

Underwater Cleaning & Inspection
300,000 Gallon
Tank 2
Potable Water Storage Tank

Submitted To:

Lake Shastina Community Services District
Robert Moser
16320 Everhart Dr.
Weed, CA 96094

Phone: 530-938-3281

Submitted By:

Potable Divers Inc.
PO Box 474
Vernal, UT 84078-0474

Phone: (866) 789-3483

Fax: (866) 913-4905

E-mail david@potabledivers.com

David Harvey Dive Supervisor

EXTERIOR ROOF

| | | | |
|--------------------|-------------------|-------------------------------------|---------------------------------------|
| Safety Rail | | | |
| Satisfactory | Y | <input checked="" type="checkbox"/> | N <input type="checkbox"/> |
| Coating | Oxidized and thin | | |
| Welds | Good | | |
| Corrosion | Y | <input type="checkbox"/> | N <input checked="" type="checkbox"/> |
| Coating | | | |
| Satisfactory | Fair | <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"/> |
| Seams/Welds | Good | | |
| Low Spots | Y | <input checked="" type="checkbox"/> | N <input type="checkbox"/> |

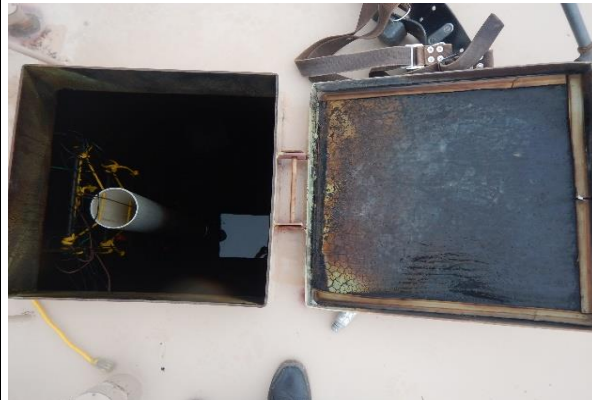


Cathodic Protection Plates Sealed and in place

Conclusion/Discrepancies: Coating is thin and oxidized primer still intact corrosion very minimal. A few low spots around the outer edges with surface water staining noted
Cathodic plates are in place and well secured with no corrosion

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 FT | X | 2 FT |



Conclusion/Discrepancies Three sides have gasket in place, minor corrosion on the underside of the lid

VENTS

| | | | |
|----------------------|-------|-------------------------------------|----------------------------|
| Satisfactory | Y | <input checked="" type="checkbox"/> | N <input type="checkbox"/> |
| Coating | | | |
| Corrosion | <2% Y | <input checked="" type="checkbox"/> | N <input 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 Vent is in good condition with proper 24 gauge screen in place minor rust staining from the humidity escaping from the vent

EXTERIOR SHELL

Rings

| | |
|-------------------|------|
| Chime | Good |
| 2nd Weld Ring | Good |
| 3rd Weld Ring | Good |
| 4th Weld Ring | Good |
| 5th Weld Ring | |
| Ring(s) 4 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 <2% | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |



Conclusion/Discrepancies Minor nicks and scratches, no coating adhesion problems shell is in satisfactory condition

EXTERIOR LADDER

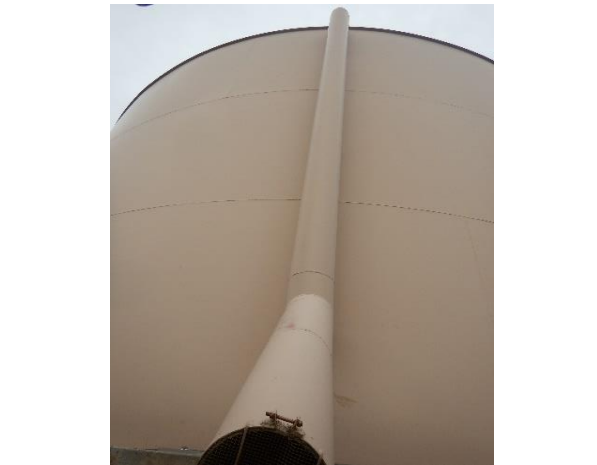
| | |
|-------------------|--|
| Construction | Coated Steel |
| Satisfactory | Y <input checked="" type="checkbox"/> N <input type="checkbox"/> |
| Coating | |
| Satisfactory | Y <input checked="" type="checkbox"/> N <input type="checkbox"/> |
| Oxidized | Y <input checked="" type="checkbox"/> N <input 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 hardware satisfactory minor nicks and scratches

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 % | Y <input type="checkbox"/> N <input checked="" type="checkbox"/> |
| Welds/Joints | Good |
| Supports | Good |
| Screens | Y <input checked="" type="checkbox"/> N <input type="checkbox"/> |
| Attachments | Piped to ground |
| Foundation | Good |



Conclusion/Discrepancies Coating on pipe is thin primer peaking through, overall satisfactory

FOUNDATION

| | | | | |
|---|---|-------------------------------------|---|-------------------------------------|
| Concrete Slab/Ring Retention | | | | |
| Satisfactory | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Cracking | Y | <input checked="" type="checkbox"/> | N | <input 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 Minor superficial cracking noted commonly found no concerns | | | | |



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 | <2% | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Welds/Joints Good | | | | | |
| Conclusion/Discrepancies Minor spots of rust around the interior of the door. Otherwise 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 | % | Y | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Operation | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> | |
| Conclusion/Discrepancies: All hardware is present and appears to be working properly | | | | | |



INTERIOR ROOF

| | | | | |
|---|-------|-------------------------------------|---|-------------------------------------|
| Coating | | | | |
| Satisfactory | Fair | <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 checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Corrosion | 15% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Seams/Welds | Fair | | | |
| Trusses | Fair | | | |
| 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 checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Corrosion | 10% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Vent Penetration | Good | | | |
| Roof Hatch | Good | | | |
| Conclusion/Discrepancies: More corrosion than typically found or expected. Corrosion forms due to the high humidity. | | | | |



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 checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Holidays | Y | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Pitting | Y | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Corrosion | 20% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Seams/Welds | Poor | | | |
| Rings | | | | |
| Chime | Poor | | | |
| 2nd Weld Ring | Poor | | | |
| 3rd Weld Ring | Poor | | | |
| 4th Weld Ring | Poor | | | |
| 5th Weld Ring | | | | |
| Ring(s) | 4 in all | Poor-fair | | |
| Wall to Roof Seam | Fair | | | |
| Baffle/Support Walls | None | | | |
| Conclusion/Discrepancies: Coating is severely blistered, numerous areas of bare steel; corrosion has begun, no pitting currently present | | | | |



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 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 checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Corrosion | 15% | Y | <input checked="" type="checkbox"/> | N |
| Seams/Welds | Fair | | | |
| Floor/Base Plates | Fair | | | |
| Construction | Coated steel | | | |
| Conclusion/Discrepancies: | Coating has failed | | | |
| corrosion is present with slight pitting | | | | |



FLOOR

| 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 |
| Seams/Welds | Fair | | | |
| Conclusion/Discrepancies: | Coating is blistered | | | |
| a few areas of bare steel with minor corrosion starting | | | | |
| 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 | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Seams/Welds | Fair | | | |
| Conclusion/Discrepancies: | Coating has failed | | | |
| corrosion and blistering around outer edges | | | | |



LADDER

| | | | | |
|--|--------------|-------------------------------------|---|-------------------------------------|
| Construction | Coated Steel | | | |
| Satisfactory | Y | <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 checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Corrosion | 15% | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Seams/Welds | Fair | | | |
| Safety Cage/Climb | Y | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Conclusion/Discrepancies: Coating is failing severe blistering with minor corrosion noted. | | | | |



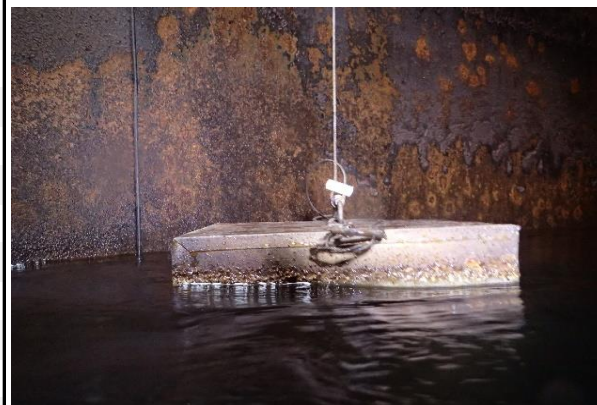
OVERFLOW

| | | | | |
|---|------|-------------------------------------|---|-------------------------------------|
| 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 | % | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Seams/Welds | Good | | | |
| Conclusion/Discrepancies: Overflow pipe and welds appeared to be satisfactory | | | | |



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 | % | <input type="checkbox"/> | N | <input checked="" type="checkbox"/> |
| Operation | Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |
| Conclusion/Discrepancies: Float and hardware were found to be in satisfactory condition | | | | |



APPURTENANCES

Influent

Common in out

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 | 2% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |

Seams/Welds Fair

Conclusion/Discrepancies: Minor corrosion around the outer edges with blistering on the interior



Effluent

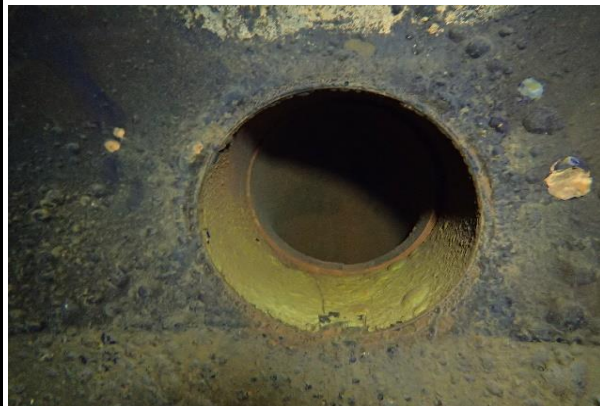
Common in out

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 | 2% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |

Seams/Welds Fair

Conclusion/Discrepancies: Minor corrosion around the outer edges with blistering on the interior



Drain

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 | 25% Y | <input checked="" type="checkbox"/> | N | <input type="checkbox"/> |

Seams/Welds Fair

Conclusion/Discrepancies: Corrosion on the screen and interior of the pipe other wise in working 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.

The interior coating is at the end of its service life and needs to be redone before the steel is compromised from present corrosion

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 roof lid needs to have a new gasket put in place as part is missing.
- 3 The exterior coating on the shell and the roof is heavily oxidized and thinning out. Touch up these areas along with the nicks and scratches to minimize corrosion and extend the service life of the coating.
- 4 The interior coating is at the end of its service life exhibiting severe blistering, minor cracking, with some pitting and bare steel exposed. The interior of the tank needs to be sandblasted and recoated at the earliest convenience.