



Northgate Reservoir #1



Northgate Reservoir #1
04-18-2018

ATTN: Chris Struffert - P.E.
Principal Engineer
Client: Truckee Meadows Water Authority
ADDRESS: 1355 Capital Blvd, Reno, NV 89502
Phone: (775) 834-8080

Tank: Welded Steel
Height: 23'
Diameter: 122'
Year Built: 1988
Water Appearance - Good
Capacity – 2 MG
Number of Rings – 3
Coating Type - Epoxy

Approximate Measurement for all Penetrations:

- Manway – 2 @ 30" Diameter
- Overflow – 12" Diameter
- Access Hatch – 24" x 24" Diameter
- Inlet/Outlet/Drain – 14" Diameter
- Probe Pipe - 2" Diameter
- Center Roof Vent - 24"

Date: 04/18/2018

Northgate #1

On April 18th, 2018, Blue Locker Commercial Diving Services, L.L.C. performed a cleaning and inspection of the Northgate Reservoir #1 for Truckee Meadows Water Authority. This report, along with the provided video, documents the findings of the inspection. All observations are observed strictly for your own considerations.

The tank is inspected and mapped using clock coordinates with the access hatch at 12:00. Appurtenance locations are described using their location on the clock. General areas of the tank are divided into quadrants starting with Quadrant A covering 12:00 to 3:00.

Section 1: Shell

- **Shell – Coating is in good condition.**
- No cracking, peeling, or blisters observed.
- Rust spots mostly near floor.
- Heavy sediment staining in bottom 2 rings.
- Ceiling coating is beginning to deteriorate in several areas.
- No other flaws observed.
- Observations:
 - Consider incorporating an epoxy program to touch up the coating on floor and shell with an NSF approved epoxy at regular scheduled inspections.
 - Prepare funding for a blast and recoat.

Section 2: Floor

- **Floor – Coating is in good condition.**
- No cracking, peeling, or blisters observed.
- 5+ isolated rust spots on floor.
- 1/8" – 1/4" sediment coating chips and rusty debris from ceiling beams on floor removed prior to inspection.
- Observations:
 - See shell.

Section 3: Ceiling

- **Ceiling – Coating is in poor condition.**
- **Cracking and peeling on beams exposing rusted steel.**
- Steel on beams is beginning to delaminate.
- Rust and rust staining on ceiling panels and on beams near center.
- Observations:
 - Blast and recoat is recommended due to the condition of coating on ceiling.
 - Prepare funding for a blast and recoat and check the condition of the beams prior to performing work. (Delamination of the steel is occurring)
 - Use caution when walking on top of reservoir.

Section 4: Columns/Support Poles:

- **Center Support Pole – (9) 8 around 1 in center all are in good condition and structurally sound.**
- Rust in crevices where bases meet floor and at top of each pole, including cone at top of center support pole.
- Observations:
 - See shell.

Section 5: Water Level Indicators

- **PVC Probe Pipe - 2” Diameter at 12:00 position in good condition and appears functional.**
- Hi-water level sensors at 12:00 position are also in good condition and appear functional.
- Observations:
 - Ensure electronic level measurement is functioning to remain in compliance with NAC 445A.6708.7

Section 6: Roof Vent

- **Center Roof Vent –24” diameter is in good condition with screen intact.**
- Observations:
 - Ensure screen mesh is 22-24 mesh per NAC 445A.6708.5

Section 7: Exterior Ladder

- **Exterior Ladder – Is structurally sound and secure to shell.**
- Worn spots on rungs exposing undercoating and rust.
- No other flaws observed on rungs, runners, or cage.
- Observations:
 - Recoat ladder when tank rehab is performed.

Section 8: Interior Ladder

- NA.

Section 9: Access Hatch

- **Access Hatch – 24” x 24” diameter in good condition with rust on opening edge and on cover where it hits opening edge. (No Gasket)**
- Observations:
 - Consider installing a gasket to ensure better seal around hatch cover.

Section 10: Inlet/Outlet/Drain

- **Inlet/Outlet/Drain – 14” diameter opening with mud-guard in good condition and unobstructed.**
- Heavy sediment staining inside and out with rust spots on interior pipe.
- No other flaws observed.
- Observations:
 - NA.

Section 11: Overflow

- **12” Diameter exterior pipe and interior elbow - good condition.**
- No flaws observed on exterior pipe.
- Sediment staining on interior elbow.
- Interior overflow opening flares out and appears unobstructed.
- Observations:
 - NA.

Section 14: Manway

- **Manway – 2 @ 30” diameter - good condition with seals intact.**
- Rust spots observed on edge of both manway covers and in crevices of both swing-arms.
- Observations:
 - When recoat is performed it will get rid of the rust on both penetrations.

Section 15: Miscellaneous Penetrations

- **NA.**
- Observations:
 - NA.

Section 16: Cathodic Protection

- **NA.**
- Observations:
 - NA.

General Notes:

- **Keep up with regularly scheduled maintenance & cleanings on a 3-5 year rotation.**
- **Blast and recoat recommended.**
- **This tank has coating and structural issues.**
- **Delamination of a few beams is occurring and the steel is beginning to divide itself into multiple layers. These issues need to be addressed before a blast and recoat is performed.**
- **Although delamination was only spotted on a few beams this may be an indication of more to come as time goes on.**

**Sincerely,
Kelan Gondrezick
Blue Locker Commercial Diving Services, L.L.C**



Blue Locker Diving - Photo Documentation

Members - AWWA & NvRWA

Northgate Reservoir #1

T.M.W.A.

04/18/2018

1. Northgate Reservoir #1



2. Exterior Shell at Chine - Seismic



3. Exterior Shell



4. Exterior Shell



5. Rood Edge - Seismic



6. Roof - Seismic



7. Floor



8. Floor



9. Floor



10. Floor



11. Floor



12. Floor



13. Floor



14. Floor At Shell



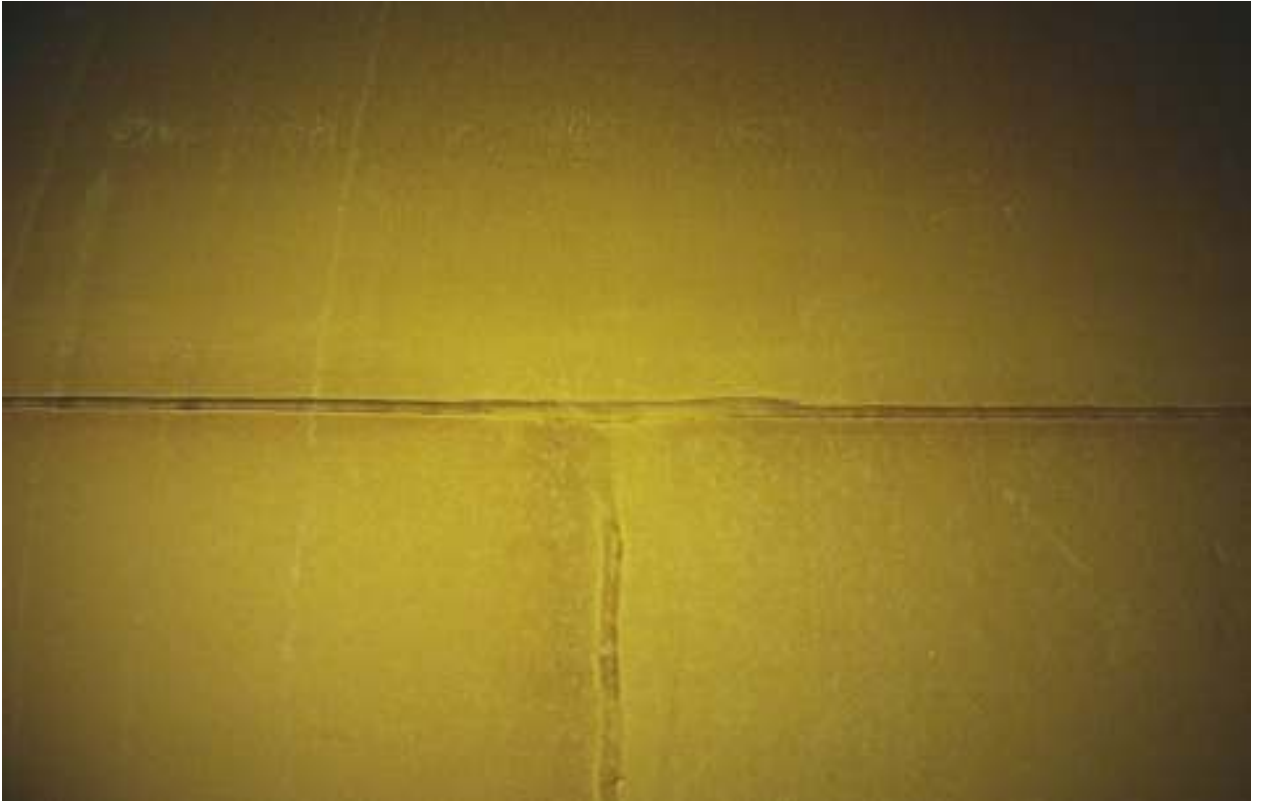
15. Floor At Shell



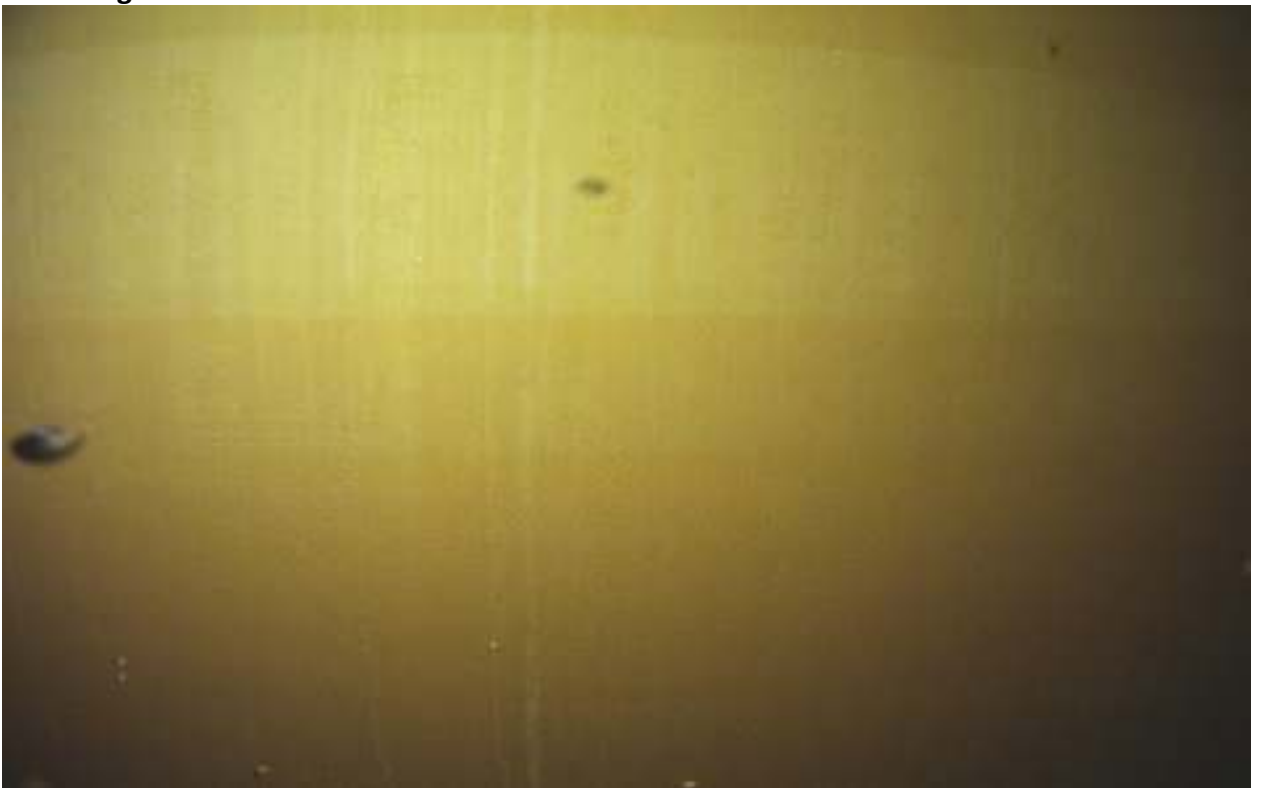
16. Shell Ring #1



17. Shell Seam Rings #1-#2



18. Shell Ring #2



19. Shell Seam Rings #2-#3



20. Shell Ring #3



21. Shell At Ceiling



22. Shell At Ceiling



23. Ceiling At Shell



24. Ceiling Seismic



25. Ceiling



26. Ceiling



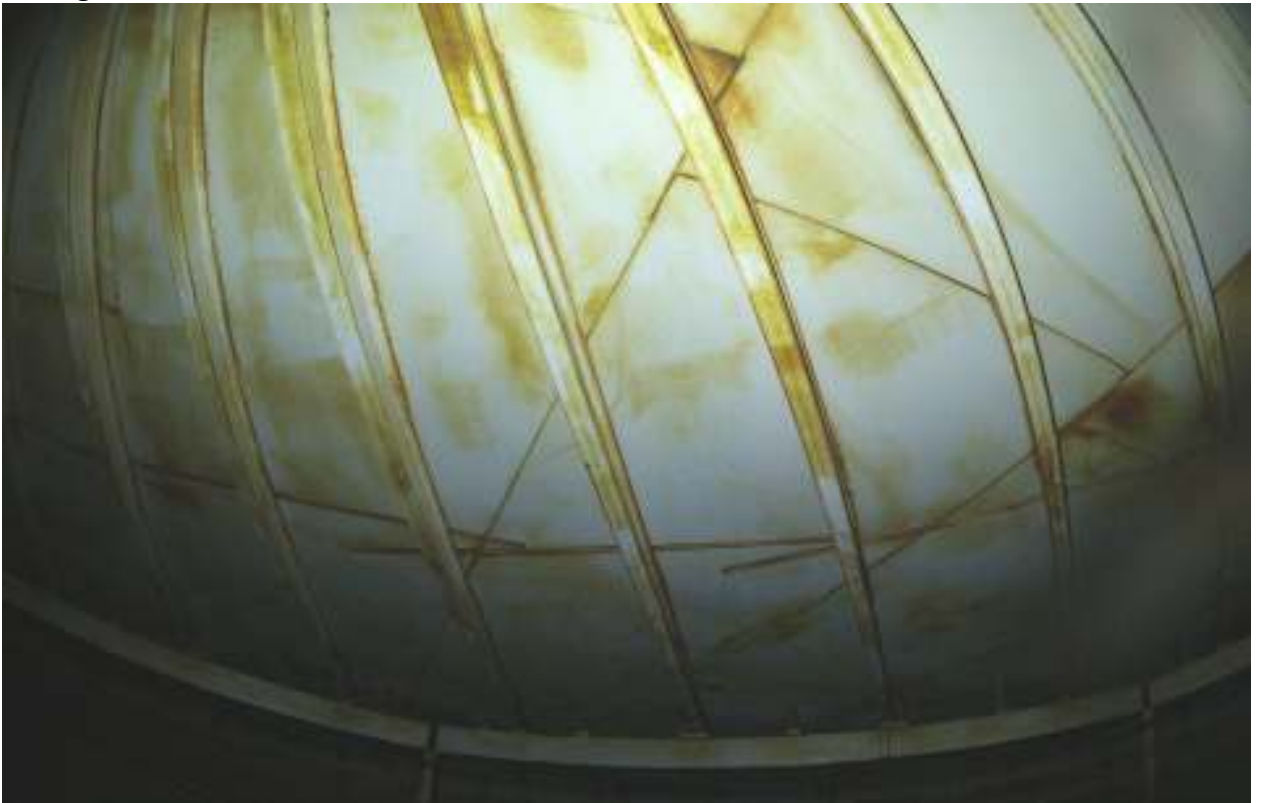
27. Ceiling



28. Ceiling



29. Ceiling



30. Ceiling



31. Perimeter Support Pole Base



32. Perimeter Support Pole Middle



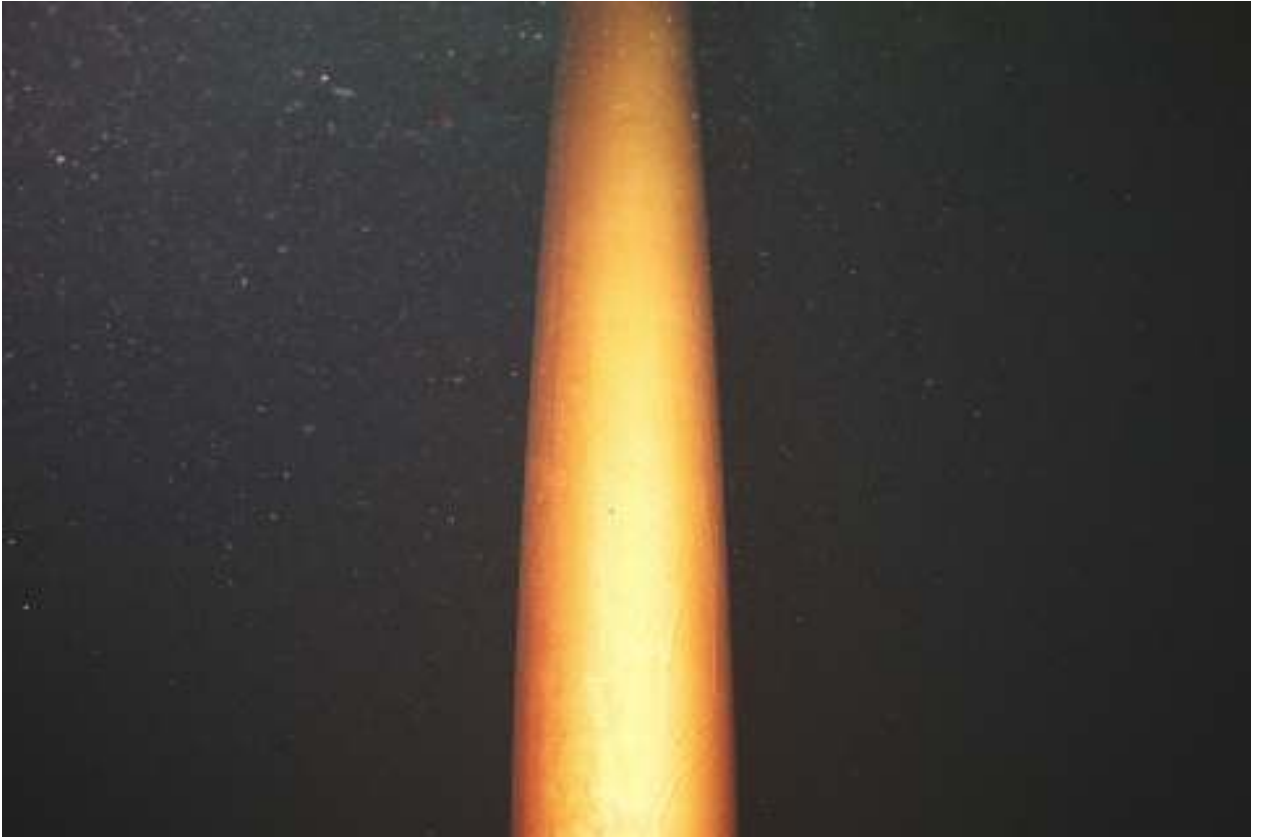
33. Perimeter Support Pole Top



34. Center Support Pole Base



35. Center Support Pole Middle



36. Center Support Pole Top



37. W.L.I. Probe Pipe At Top



38. W.L.I. Probe Pipe - Middle



39. W.L.I. Probe Pipe - Bottom



40. Hi Water Level Sensors



41. Center Roof Vent



42. Exterior Ladder



43. Access Hatch



44. Inlet-Outlet-Drain



45. Overflow Bottom



46. Overflow Near Top



47. Overflow Elbow



48. Overflow - Top



49. Manway #1



50. Manway #1



51. Manway #1 Swing-Arm



52. Manway #2



53. Manway #2



54. Manway #2 Swing-Arm





Horizon Hills #1

04-13-18

ATTN: Chris Struffert - P.E.
Principal Engineer
Client: Truckee Meadows Water Authority
ADDRESS: 1355 Capital Blvd, Reno, NV 89502
Phone: (775) 834-8080

Tank: Welded steel
Height: 24'
Diameter: 52'
Year Built: 1995
Water Appearance - Good
Capacity – 350,000GL.
Number of Rings - 3
Coating Type - Epoxy

Approximate Measurement for all Penetrations:

- Manway 2 @ - 30" Diameter
- Center Roof Vent – 10" Diameter
- Sample Tap – 2.5" Diameter
- Overflow – 6" Diameter
- Access Hatch – 24" – 24" Hatch
- Inlet/Outlet – 8" Diameter
- Drain – 4" Diameter
- Capped Floor Penetration - 2" Diameter
- Floor Penetration - 3" Diameter

Date: 04/13/18

Horizon Hills #1

On April 13th, 2018, Blue Locker Commercial Diving Services, L.L.C. performed a cleaning and inspection of the Horizon Hills #1 reservoir for Truckee Meadows Water Authority. This report, along with the provided video, documents the findings of the inspection. All observations are observed strictly for your own considerations.

The tank is inspected and mapped using clock coordinates with the access hatch at 12:00. Appurtenance locations are described using their location on the clock. General areas of the tank are divided into quadrants starting with Quadrant A covering 12:00 to 3:00.

Section 1: Shell

- **Interior coating – poor condition.**
- Alligator cracking and peeling of coating in Ring #3 and mostly on south ½” of reservoir, exposing rusted steel.
- Isolated rust spots and patches of blisters on bottom 2 rings along with heavy sediment staining.
- Observations:
 - This reservoir is overdue for a blast and recoat.
 - Put this one at the top of the list for interior coating rehabilitation.

Section 2: Floor

- **Floor coating – good condition.**
- No cracking, peeling or blisters observed.
- Isolated rust spots on floor, some may be staining from debris.
- Heavy Sediment staining on 80% of floor and mostly in the middle.
- 1/8” sediment and debris (coating chips and rust from shell and ceiling) on floor removed prior to inspection.
- Observations:
 - See shell.

Section 3: Ceiling

- **Ceiling coating – poor condition.**
- Alligator cracking and peeling on ceiling panels and beams exposing rusted steel.
- Observations:
 - See shell.

Section 4: Columns/Support Poles:

- **(1) Center support pole is structurally sound and coating is in fair condition.**
- Sediment staining on lower 2/3 of pole and base.
- Crevice corrosion and peeling on top hat exposing rusted steel.
- Observations:
 - See shell.

Section 5: Water Level Indicators

- **Mechanical W.L.I. is no longer in service with float wire broken.**
- **W.L.L. Transducer at 12:00 position is in good condition and touching floor.**
- Observations:
 - Ensure electronic level measurement is functioning to remain in compliance with NAC 445A.6708.7
 - Install a new guide wire for float assembly at tank rehab.

Section 6: Roof Vent

- **10” diameter center roof vent - good condition with screen intact.**
- Observations:
 - Ensure screen mesh is 22-24 mesh per NAC 445A.6708.5

Section 7: Exterior Ladder

- **Exterior Ladder is structurally sound and secure to shell with no flaws observed on runners on cage.**
- Worn spots on rungs exposing undercoating and metal.
- Safety climbing device, none present.
- Observations:
 - Touch up with lead free high visibility paint.

Section 8: Interior Ladder

- **Interior ladder – Good condition and secure to shell.**
- Coating is in good condition, 2 or 3 spots have peeled away exposing stainless steel underneath.
- Observations:
 - Recoat with an epoxy coating at tank rehab.

Section 9: Access Hatch

- **24” x 24” Access hatch with cracking and peeling of coating around interior of opening exposing rusted steel.**
- Rust and rust staining on hatch cover. (No gasket)
- Observations:
 - Consider installing a gasket to ensure better seal around hatch cover.
 - See shell.

Section 10: Inlet/Outlet

- **8” diameter opening with a mud-guard in good condition and unobstructed.**
- Heavy sediment staining inside and out with blisters on interior of mud-guard.
- Observations:
 - NA.

Section 11: Overflow

- **6” Diameter exterior overflow pipe and interior overflow box are in good condition with no flaws observed.**
- Observations:
 - NA.

Section 12: Drain

- **4” Diameter opening with no mud-guard - good condition and unobstructed.**
- Rust spots around opening edge and heavy sediment staining on interior.
- Observations:
 - NA.

Section 13: Man Way

- **2 @ 30" diameter manways - good condition with seals intact.**
- Heavy sediment staining on both manways similar to surrounding shell.
- Rust spots on penetration edge of both manways.
- Observations:
 - **NA.**

Section 14: Miscellaneous Penetrations

- **2.5" Diameter pipe used for sample tap - good condition.**
- Interior pipe is PVC with one short and open and a longer pipe that goes across tank, which is capped.
- Heavy sediment staining otherwise no flaws observed.
- **2" Diameter capped floor penetration – good condition.**
- **3" Diameter floor penetration in good condition and unobstructed with rust forming on edge of opening.**

Section 15: Cathodic Protection

- **NA**
- Observations:
 - Consider installing a passive cathodic protection system after the tank is recoated.

General Notes:

- **Keep up with regularly scheduled maintenance & cleanings on a 3-5 year rotation.**
- **Blast and recoat recommended.**
- **See all observations at the bottom of each section.**

Sincerely,

Kelan Gondrezick

Blue Locker Commercial Diving Services, L.L.C



Blue Locker Diving - Photo Documentation

Members - AWWA & NvRWA

Horizon Hills #1

T.M.W.D.

04/13/2018

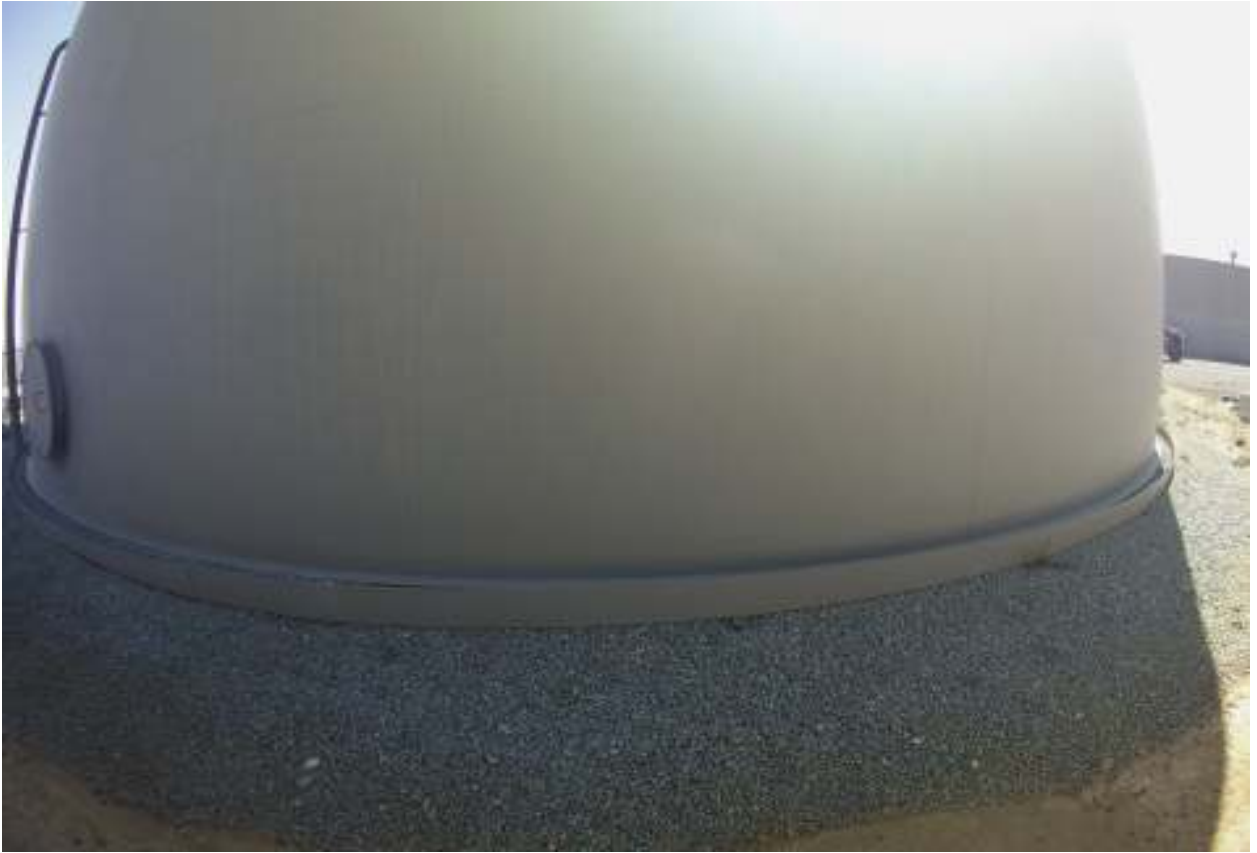
1. Horizon Hills #1



2. Exterior Shell at Chine - Seismic



3. Exterior Shell



4. Exterior Shell



5. Roof Edge - Seismic



6. Roof - Seismic



7. Floor



8. Floor



9. Floor



10. Floor



11. Floor



12. Floor



13. Floor At Shell



14. Floor At Shell



15. Shell Ring #1



16. Shell Seam Rings #1-#2



17. Shell Ring #2



18. Shell Seam Rings #2 - #3



19. Shell At Ceiling - North Side



20. Shell At Ceiling - South Side



21. Shell At Ceiling - South Side



22. Shell At Ceiling - South Side



23. Ceiling - Seismic



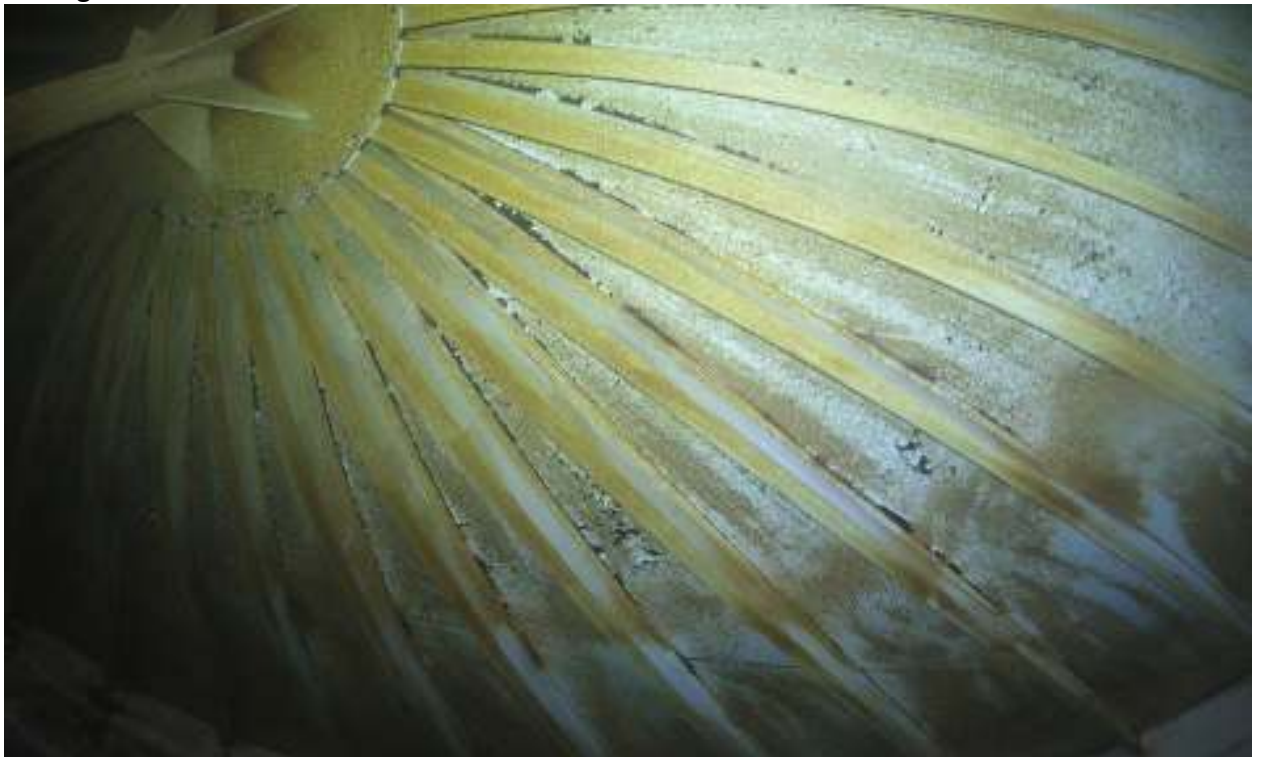
24. Ceiling



25. Ceiling



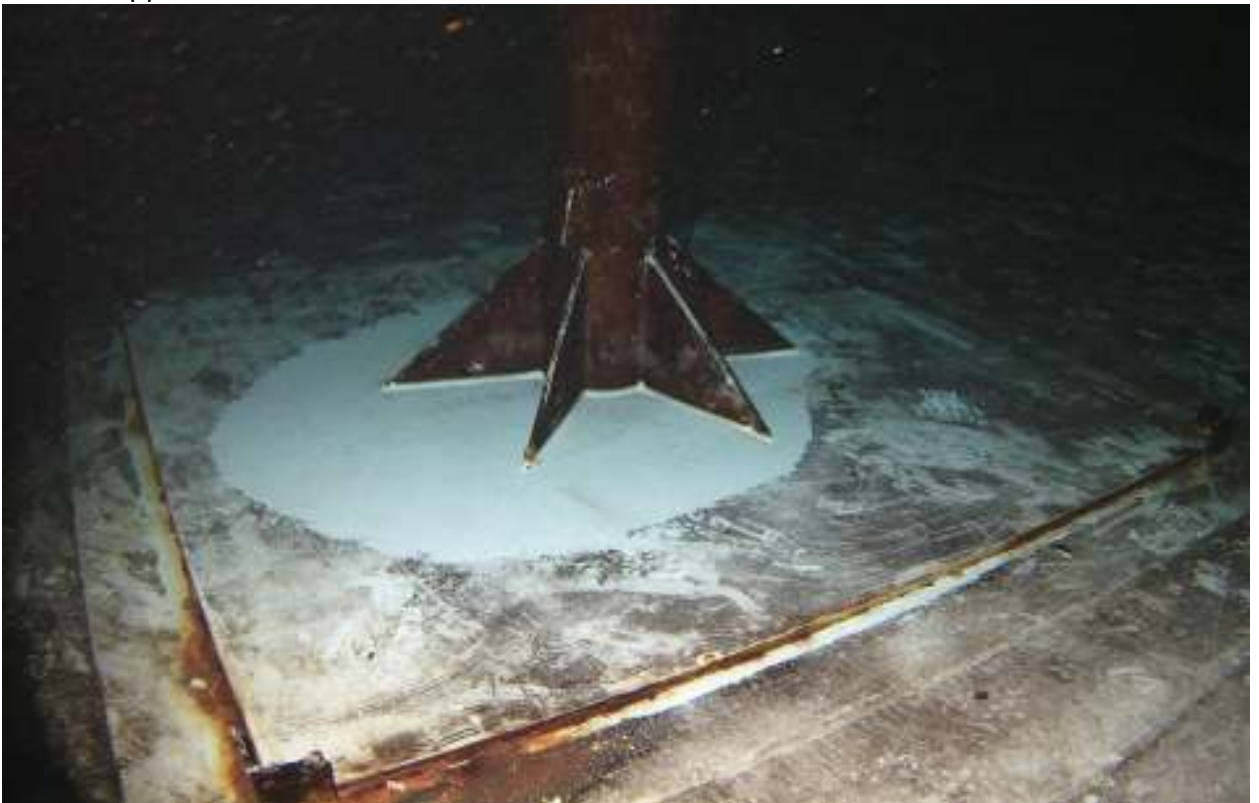
26. Ceiling



27. Ceiling



28. Center Support Pole - Base



29. Center Support Pole - Middle



30. Center Support Pole - Top



31. W.L.I. Abandoned



32. W.L.I. Float At Surface - Abandoned



33. W.L.I. Guide Wires At Floor



34. W.L.I. Transducer



35. Center Roof Vent



36. Exterior Ladder



37. Access Hatch



38. Interior Ladder - Top



39. Interior Ladder - Middle



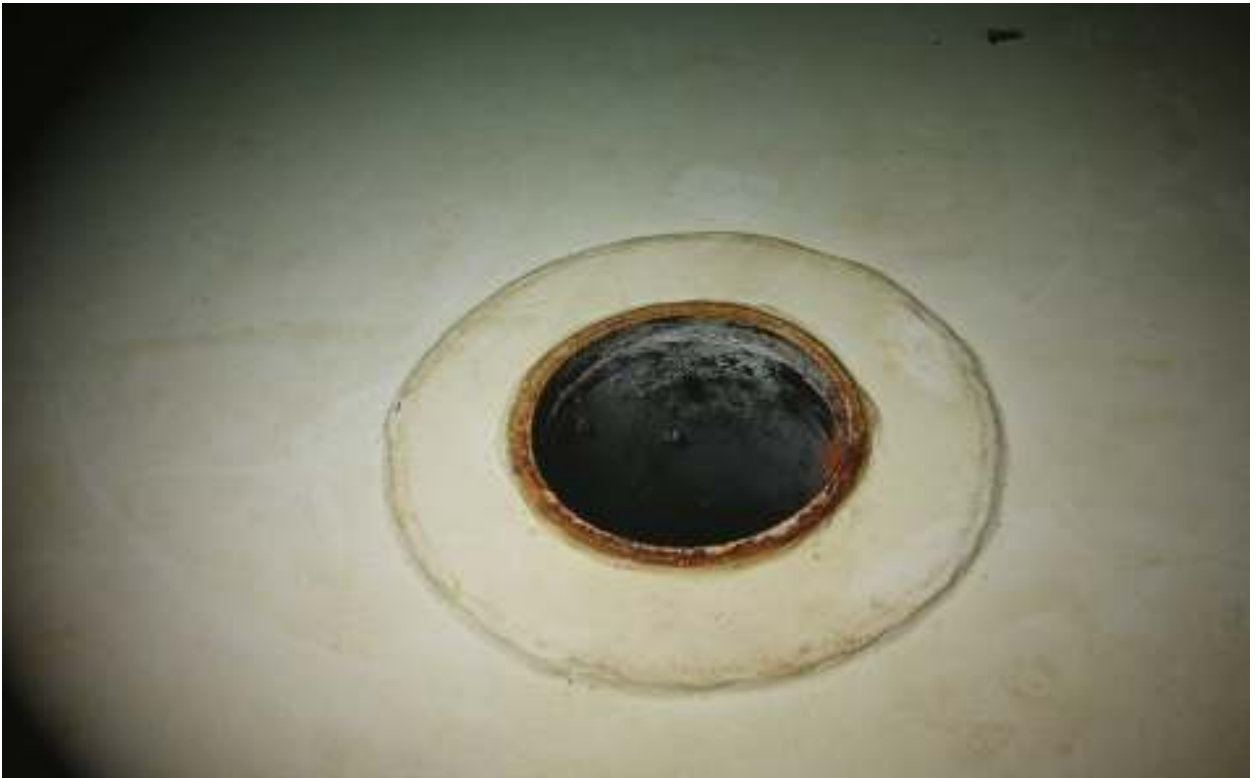
40. Interior Ladder - Bottom



41. Inlet-Outlet



42. Drain



43. Overflow - Bottom



44. Overflow - Near Top



45. Overflow Box



46. Manway #1



47. Manway #1



48. Manway #2



49. Manway #2



50. Sample Tap



51. Sample Tap - Pipe



52. Sample Tap - Pipes



53. Sample Tap - Pipe



54. Sample Tap - Pipe End



55. Capped Penetration



56. Floor Penetration

