

WPCA

HAND OUTS

Virtual Meeting – February 4, 2021

Aquarion Water Company January 2021 Report

Torrington Water Company January 2021 Report

CorrTech Water Storage Tank Inspection - 1/26/2021



**NEW HARTFORD WATER POLLUTION CONTROL AUTHORITY**  
**Monthly Summary Detail**  
**January 2021**

- Daily and weekly effluent samples collected by Aquarion Water Company (AWC) were in compliance with the respective federal and state permit limits. AWC is awaiting the laboratory results for the January 27<sup>th</sup> sampling event.
- Sludge thickening operations included two trucks hauling sludge off-site during the month: one on January 14<sup>th</sup> and one on January 29<sup>th</sup>. Flows to WPCF are averaging about 15% more than normal average and the effluent BOD5 loading has been elevated resulting in more solids to accumulate in the sludge handling process.
- There was one call out to WPCF after normal work hours. AWC operator responded to an Effluent Filter Fail alarm on January 7<sup>th</sup>. The alarm was cleared and it was assessed that the level sensors needed to be adjusted. Level sensors were adjusted and Effluent Filter tested. No alarms were triggered.
- On January 4<sup>th</sup> and January 27<sup>th</sup> snow removal at the WPCF and pump stations was completed.
- There was a sewer odor complaint in the town hall area on January 20<sup>th</sup>, AWC responded. With assistance from the New Hartford Fire Department manholes were inspected in and around the area. There were no signs of backups in sewer. The fire department used a hand held gas detector to check manholes. The gas detector showed low level detection.
- The contingency Pandemic Action Plan continues to be implemented by AWC.
- The average (total) flow from the WPCF during January was 0.046 million gallons per day (MGD) and the estimated (total) volume of wastewater treated was 1.417 MG.
- A total of 22 CBYD responses were completed during the month.



# Torrington Water Company

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## NEW HARTFORD WPCA Monthly Report January 2021

### **Total System Production**

In January the Town's two wells produced a total of 2,489,500 gallons for an average of 80,306 gallons per day (gpd). The Diversion Permit limit is a maximum of 454,000 gpd. A total of 131 gallons of sodium hydroxide (caustic acid) was used and 17 gallons of hypochlorite was used.

### **Black Bridge Well Production and Operations**

In January the Black Bridge Well was on-line for 4 days and produced a total of 434,300 gallons for an average of 108,575 gallons per day gpd.

### **Pine Meadow Well Production and Operations**

In January the Pine Meadow Well was on-line for 31 days and produced a total of 2,055,200 gallons for an average of 66,296 gallons per day gpd.

### **Quality and Treatment**

During the month all state and federal treatment standards were met. On February 3, 2021 the January Treatment Plant Effluent Monitoring and Reporting Forms for Black Bridge and Pine Meadow were electronically submitted to CT Department of Public Health (CTDPH). Client copies are submitted with this monthly report. The two Routine Monthly Bacteriological and Physical Parameter Samples were collected on January 7, 2021. A table containing a summary of these routine monthly monitoring results are available upon request.

**Distribution System**

Call Before You Digs – (15)

1/29/2021 – Production up per Bud Butler checked vacant houses for leaks. If none found possible check entire system.

Blackbridge Backwash flow on control valve – worked with Brad Small

Tank Inspection/tank #2 with CorrTeck

Walk through Blackbridge/Pinemeadow & Industrial park tanks with Bud and (AWS)

**Work Order Report**

See Attached

**Meter Reading/Billing**

Late Notices will be sent on February 11, 2021

**Accounts Receivable**

The month end account summary is as follows:

|                  |                     |
|------------------|---------------------|
| Current          | \$100,894.36        |
| 31 to 60 days    | \$ 0.00             |
| 61 to 90 days    | \$ 20,007.79        |
| 91 days and over | <u>\$ 33,477.97</u> |
|                  | \$154,380.12        |

- 4 accounts are on a payment plan.

**STATE OF CONNECTICUT  
DEPARTMENT OF PUBLIC HEALTH  
DRINKING WATER SECTION**

**TREATMENT EFFLUENT MONITORING AND REPORTING FORM**

**1. Public Water System (PWS) Information:**

PWS ID:   
PWS Name:   
City/Town:

**2. Compliance Information:**

Water System Facility ID:   
Month:  Year:   
Certified Operator:

**3. Analytical Results:**

| Day | Status <sup>1</sup> | Chlorine Residual (mg/L) | pH (pH units) | Phosphate (mg/L) | Fluoride (mg/L) | Day | Status <sup>1</sup> | Chlorine Residual (mg/L) | pH (pH units) | Phosphate (mg/L) | Fluoride (mg/L) |
|-----|---------------------|--------------------------|---------------|------------------|-----------------|-----|---------------------|--------------------------|---------------|------------------|-----------------|
| 1   | Offline             |                          |               |                  |                 | 17  | Offline             |                          |               |                  |                 |
| 2   | Offline             |                          |               |                  |                 | 18  | Offline             |                          |               |                  |                 |
| 3   | Offline             |                          |               |                  |                 | 19  | Offline             |                          |               |                  |                 |
| 4   | Offline             |                          |               |                  |                 | 20  | Online              | 0.52                     | 7.11          |                  |                 |
| 5   | Offline             |                          |               |                  |                 | 21  | Online              | 0                        | 7.26          |                  |                 |
| 6   | Online              | 0                        | 7.04          |                  |                 | 22  | Offline             |                          |               |                  |                 |
| 7   | Offline             |                          |               |                  |                 | 23  | Offline             |                          |               |                  |                 |
| 8   | Offline             |                          |               |                  |                 | 24  | Offline             |                          |               |                  |                 |
| 9   | Offline             |                          |               |                  |                 | 25  | Offline             |                          |               |                  |                 |
| 10  | Offline             |                          |               |                  |                 | 26  | Offline             |                          |               |                  |                 |
| 11  | Offline             |                          |               |                  |                 | 27  | Offline             |                          |               |                  |                 |
| 12  | Online              | 0                        | 7.02          |                  |                 | 28  | Offline             |                          |               |                  |                 |
| 13  | Offline             |                          |               |                  |                 | 29  | Offline             |                          |               |                  |                 |
| 14  | Offline             |                          |               |                  |                 | 30  | Offline             |                          |               |                  |                 |
| 15  | Offline             |                          |               |                  |                 | 31  | Offline             |                          |               |                  |                 |
| 16  | Offline             |                          |               |                  |                 |     |                     |                          |               |                  |                 |

**4. Summary Information (Check all summary types that are applicable regardless of Status):**

| Summary Type                        | Treatment Summary Name            | Monitoring Requirements |           |                               |      | Highest Daily Reading | Monthly Average | Lowest Daily Reading | Level Compliance (Y/N) <sup>4</sup> |
|-------------------------------------|-----------------------------------|-------------------------|-----------|-------------------------------|------|-----------------------|-----------------|----------------------|-------------------------------------|
|                                     |                                   | Number of Days          |           | Compliance (Y/N) <sup>3</sup> |      |                       |                 |                      |                                     |
|                                     |                                   | Required <sup>2</sup>   | Completed |                               |      |                       |                 |                      |                                     |
| <input checked="" type="checkbox"/> | <b>CHLR</b> Monthly Chlorine Log  | 4                       | 4         | Y                             | 0.52 | 0.13                  | 0               |                      |                                     |
| <input checked="" type="checkbox"/> | <b>PHRD</b> Monthly pH Log        | 4                       | 4         | Y                             | 7.26 | 7.11                  | 7.02            |                      |                                     |
| <input type="checkbox"/>            | <b>PHOS</b> Monthly Phosphate Log |                         |           |                               |      |                       |                 |                      |                                     |
| <input type="checkbox"/>            | <b>FLRD</b> Monthly Fluoride Log  |                         |           |                               |      |                       |                 |                      |                                     |

1 Status indicates a Water System Facility was offline on any particular day of the month. Fill with "offline" when applicable.  
2 The Number of Samples Required is contingent on the number of days the Water System Facility or treatment process was online. If the facility or treatment process was not online but monitoring is normally required Number of Days Required = "0" and the Summary Type must be checked.  
3 The M&R (Monitoring & Reporting) Complied field is an indicator ensuring Number of Samples Taken ≥ Number of Samples Required.  
4 The Level Complied field is an indicator ensuring that the Highest and Lowest Readings are within required ranges for treatment effluents. Operating Limits are provided in the current Schedule of Water Quality Monitoring Requirements.

**STATE OF CONNECTICUT  
DEPARTMENT OF PUBLIC HEALTH  
DRINKING WATER SECTION**

**TREATMENT EFFLUENT MONITORING AND REPORTING FORM**

**1. Public Water System (PWS) Information:**

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|-----|---------------------|--------------------------|---------------|------------------|-----------------|-----|---------------------|--------------------------|---------------|------------------|-----------------|
| 1   | Online              |                          | 8.6           |                  |                 | 17  | Online              |                          | 7.02          |                  |                 |
| 2   | Online              |                          | 8.5           |                  |                 | 18  | Online              |                          | 7.3           |                  |                 |
| 3   | Online              |                          | 8.8           |                  |                 | 19  | Online              |                          | 7.11          |                  |                 |
| 4   | Online              |                          | 7.08          |                  |                 | 20  | Online              |                          | 7.2           |                  |                 |
| 5   | Online              |                          | 7.04          |                  |                 | 21  | Online              |                          | 7.24          |                  |                 |
| 6   | Online              |                          | 8.86          |                  |                 | 22  | Online              |                          | 7.53          |                  |                 |
| 7   | Online              |                          | 7             |                  |                 | 23  | Online              |                          | 7.55          |                  |                 |
| 8   | Online              |                          | 7.01          |                  |                 | 24  | Online              |                          | 7.3           |                  |                 |
| 9   | Online              |                          | 7.8           |                  |                 | 25  | Online              |                          | 7.62          |                  |                 |
| 10  | Online              |                          | 8.59          |                  |                 | 26  | Online              |                          | 7.7           |                  |                 |
| 11  | Online              |                          | 6.89          |                  |                 | 27  | Online              |                          | 7.35          |                  |                 |
| 12  | Online              |                          | 7.12          |                  |                 | 28  | Online              |                          | 7.54          |                  |                 |
| 13  | Online              |                          | 7.22          |                  |                 | 29  | Online              |                          | 7.26          |                  |                 |
| 14  | Online              |                          | 7.4           |                  |                 | 30  | Online              |                          | 7.42          |                  |                 |
| 15  | Online              |                          | 7.46          |                  |                 | 31  | Online              |                          | 8.56          |                  |                 |
| 16  | Online              |                          | 7.04          |                  |                 |     |                     |                          |               |                  |                 |

**4. Summary Information (Check all summary types that are applicable regardless of Status):**

| Summary Type                        | Treatment Summary Name            | Monitoring Requirements |           |                               | Highest Daily Reading | Monthly Average | Lowest Daily Reading | Level Compliance (Y/N) <sup>4</sup> |
|-------------------------------------|-----------------------------------|-------------------------|-----------|-------------------------------|-----------------------|-----------------|----------------------|-------------------------------------|
|                                     |                                   | Number of Days          |           | Compliance (Y/N) <sup>3</sup> |                       |                 |                      |                                     |
|                                     |                                   | Required <sup>2</sup>   | Completed |                               |                       |                 |                      |                                     |
| <input type="checkbox"/>            | <b>CHLR</b> Monthly Chlorine Log  |                         |           |                               |                       |                 |                      |                                     |
| <input checked="" type="checkbox"/> | <b>PHRD</b> Monthly pH Log        | 31                      | 31        | Y                             | 8.86                  | 7.55            | 6.89                 |                                     |
| <input type="checkbox"/>            | <b>PHOS</b> Monthly Phosphate Log |                         |           |                               |                       |                 |                      |                                     |
| <input type="checkbox"/>            | <b>FLRD</b> Monthly Fluoride Log  |                         |           |                               |                       |                 |                      |                                     |

<sup>1</sup> Status indicates a Water System Facility was offline on any particular day of the month. Fill with "offline" when applicable.  
<sup>2</sup> The Number of Samples Required is contingent on the number of days the Water System Facility or treatment process was online. If the facility or treatment process was not online but monitoring is normally required Number of Days Required = "0" and the Summary Type must be checked.  
<sup>3</sup> The M&R (Monitoring & Reporting) Complied field is an indicator ensuring Number of Samples Taken ≥ Number of Samples Required.  
<sup>4</sup> The Level Complied field is an indicator ensuring that the Highest and Lowest Readings are within required ranges for treatment effluents. Operating Limits are provided in the current Schedule of Water Quality Monitoring Requirements.

**Town of New Hartford - 175k GST  
Water Storage Tank Inspection**

**CorrTech Report No. 14845-FOR-01-1**



**Prepared For:**

**New Hartford WPCA  
PO Box 316  
530 Main St.  
New Hartford, CT 06057**

**CORRTECH**  
CORROSION UNDERSTOOD  
25 South Street  
Hopkinton, MA 01748

**1/26/2021**

## STATEMENT OF LIMITATION

The conclusions presented in this document are based on the services described and not on tasks or procedures beyond the scope of the described procedures or the time and budgetary constraints imposed by the contract limitations.

CorrTech, Inc. has performed this assessment in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent consultants, and in accordance with the procedures established within CorrTech's quality assurance, quality control protocol.

CorrTech, Inc. shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld or not fully disclosed at the time the evaluation was performed.



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Report Prepared by: Max Miezejeski, Technician



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Report Reviewed by: Garth Lund, Project Manager  
NACE CIP II #49983  
January 31, 2022



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## INTRODUCTION

On January 20, 2021 CorrTech representatives, Ben Palmer and Bob Meskill performed a corrosion and structural assessment of the exterior and interior of a drinking water storage tank for The Town of New Hartford. The inspection was conducted to establish the current condition of the tank's coatings and steel substrate. The tank inspected included:

### **Tank 2 174,000 Gallon Steel GST**

For applicable standards used in this inspection, please see below.

The interior of the reservoir was inspected with the TankRover remotely operated vehicle, while full. The TankRover is the only piece of equipment like it in the United States and was developed by CorrTech. By using the TankRover the interior of the tank was inspected with no special preparation, confined space entry, no additional disinfection and no downtime.

The TankRover is equipped with a surface-cleaning tool used to remove loose rust or debris in order to view the potential metal loss under the coating. The unit has high-powered thrusters, which are used to maneuver throughout the tank and are used to wash away bottom sediment for observations. Video is recorded with audio narration on site with digital stills captured for the report.

The TankRover and all tether were prepared for the inspection by disinfecting equipment with a 200ppm chlorine spray in accordance with AWWA C652-11.

The exterior portions of the tank were inspected by walking the roof and shell portions that were accessible from the ground.

The objectives of the assessment were to:

1. Perform field inspections and tests to assess the structural integrity of the tank.
2. Assess condition of any protective coatings present
3. Review the safety compliance of tank ladders and access.
4. Review sanitary protection equipment
5. Provide recommendations for rehabilitation.

## APPLICABLE STANDARDS

AWWA C652, AWWA Standard for Disinfection of Water-Storage Facilities  
AWWA D100, AWWA Standard for Welded Steel Tanks for Water Storage  
AWWA D101, 1986, AWWA Standard for Inspection of Finished Water Storage Tanks  
AWWA M42, AWWA Tank Guidance Manual, Steel Water Storage Tanks  
CT DPH RCSA Section 19-1

## EXECUTIVE SUMMARY

The condition and recommendations for the tank are briefly summarized in this section. For detailed information regarding detailed tank conditions and the specific recommendations please refer to the designated section for the tank.

The exterior coating has heavy biological staining with some minor areas of corrosion. No significant coating loss or adhesion loss was observed.

Corrosion has formed on seams throughout the interior roof and shell of the tank. No significant coating loss or adhesion loss was observed.

A 1/8-in layer of sediment has accumulated across the floor of the tank.

No sanitary deficiencies were found during the inspection.

No structural deficiencies were found during the inspection.

In accordance with current AWWA recommendations this tank should be inspected again in 2026.

In order to be in compliance with OSHA Standard 1910.23(a)(2) all railing openings or platform pass through openings shall be equipped with a self-closing swing gate.

Exterior shell and roof surfaces should be cleaned using high pressure water to remove biofilm that is unsightly and may contribute to degradation of the coating system.

An impressed current cathodic protection system (ICCP) should be installed to prevent metal loss of the submerged portions of the tank.

A mixing system should be considered to prevent stratification and other short-circuit issues that affect overall water quality.

### Tank Data

| TANK DATA FOR 174,000 Gallon GST #2 |  |                       |                    |                               |                      |                       |                      |
|-------------------------------------|--|-----------------------|--------------------|-------------------------------|----------------------|-----------------------|----------------------|
| <b>Site Information</b>             | Fencing in Place:                      | Yes                   |                    |                               | Locks on Gates:      | Yes                   |                      |
| Address:                            | 63 Industrial Park Rd New Hartford, CT |                       |                    |                               | Vault Lock in Place: | Yes                   |                      |
| <b>Tank Information</b>             | Tank Name:                             | 174,000 GST #2        |                    |                               | Tank Diameter:       | 30'                   |                      |
| Tank Height:                        | 33'                                    | Tank Capacity:        | 174,000            | Previous Cleaning Date:       | Unk.                 |                       |                      |
| Previous Inspect. Date:             | Unk.                                   |                       |                    | Previous Coating Application: | 2002                 |                       |                      |
| <b>Foundation</b>                   | Height:                                | 13"                   | Adequate Drainage: | Yes                           | Chime Plate Size:    | 2"                    |                      |
| # of Anchors:                       | 10                                     | Anchor Bolt Diameter: | 1"                 |                               | Chair Thickness      | 1/2"                  |                      |
| Anchor Chair Dimensions:            | 7" x 7"                                |                       |                    |                               |                      |                       |                      |
| <b>Shell Manhole</b>                | # of Manholes                          | 2                     |                    |                               | Diameter:            | 36"                   |                      |
| <b>Ladder</b>                       | Height from Ground:                    | 12'                   |                    |                               | Safety Cage:         | No                    |                      |
| Anti Climb Lock :                   | Yes                                    |                       |                    | Climbing Safety System Style: | Rail climb           |                       |                      |
| Rung to Rung Dim:                   | 12"                                    | Distance from Shell:  | 9"                 |                               | Width:               | 16"                   |                      |
| <b>Overflow</b>                     | Diameter:                              | 12"                   | Air Gap            | 26"                           |                      | Overflow Protection   | Flapper              |
| Screen Condition:                   | Intact                                 | Screen Type:          | Fine and coarse    |                               |                      | Splash Pad            | Np                   |
| <b>Roof Hatch</b>                   | Dimensions:                            | 24" x 24"             |                    |                               | Sanitary Neck        | 9"                    |                      |
| # of Hatches:                       | 2                                      | Hatch Cover Overlap   | 2"                 |                               | Lock                 | Yes                   |                      |
| <b>Roof Vent</b>                    | Style:                                 | Mushroom              |                    |                               | Diameter:            | 16"                   |                      |
| Cap to Roof Distance:               | 22"                                    | Screen Condition:     | Intact             |                               |                      | Type:                 | Fine and coarse      |
| <b>Roof Handrail Hts</b>            | Top Rail:                              | 4"                    |                    | Mid Rail:                     | 23"                  |                       | Toe Kick Plate: 6.5" |
| <b>Interior</b>                     | Sediment Depth:                        | 1/16" - 1/8"          |                    |                               | Sediment Coverage:   | Even                  |                      |
| Inlet/Outlet Pipe:                  | Combined                               |                       | Sediment Ring:     | Yes                           |                      |                       |                      |
| <b>Interior Ladder</b>              | Climbing Safety System:                | N/A                   |                    |                               | Style:               | N/A                   |                      |
| <b>Columns:</b>                     | None                                   |                       | Column Number:     | N/A                           |                      | Interior Column Style | N/A                  |

**OBSERVATIONS**

Photos provided in the report were created from a digital camera and interior pictures were captured in digital format from the interior video. The interior images are as clear as our printed technology will allow. The copies in the report provide a reference for our comments. Keep in mind that for underwater video snaps, the video provides the greatest detail and should be viewed as part of the report.

Narration on the video is done in the field and some of the comments may be different than the written report.

**TESTING**

Dry Film Thickness Readings

A Positector 6000 gauge was used to take dry film thickness readings on the exterior shell and roof coatings. These reading measure the thickness of the paint remaining on the substrate. For complete data, see APPENDIX II.

Dry Film Thickness Readings

| Location      | Number of Readings | Average | Minimum | Maximum |
|---------------|--------------------|---------|---------|---------|
| Shell - Batch | 45                 | 16.12   | 11.74   | 25.19   |
| Roof - Batch  | 45                 | 19.7    | 10.22   | 39.21   |

(All measurements taken in mils)

**INTERIOR**

Roof Structure

The tank roof is a self-supporting dome structure. No deformations, bowing or buckling, or any metal loss was observed in any of the roof plates.

Roof Coating

The roof had 30% corrosion focused along weld seams. No large areas of delamination were noted.

Shell Structure

No deformations, bowing or buckling, or any metal loss was observed in any of the shell rings.

Shell Coating

The shell coating was mostly intact with 5% of weld seams covered in corrosion cells. Some cells were brushed and little to no coating remained.

### Floor Structure

No deformations, bowing or buckling, or any metal loss was observed in any of the floor plates.

### Sediment

There was an even 1/8" layer of sediment across most of the tank floor. The sediment around the inlet/outlet pipe had been disturbed exposing the floor coating.

### Floor Coating

From what could be observed no corrosion cells or delamination was identified on the tank floor.

### Piping

The inlet/outlet pipe penetrates the tank floor and is equipped with a sediment ring. The overflow has a funnel at the top of tank near the roof access hatch.

## EXTERIOR

### Foundation

The tank foundation was free from any cracking or spalling. The caulking under the chime plate was covered in biological growth and bio-staining but was intact.

### Manholes

The tank has two shell manholes. All bolts are engaged on both and no signs of any leakage were identified.

### Ladder

The ladder was intact. No deformations or corrosion was observed.

### Overflow

The overflow has an interior weir funnel. The pipe exits the top of the tank next to the ladder and runs down the side of the tank towards the ground where it discharges. The pipe is equipped with a flapper valve and has an intact fine and coarse mesh screen.

### Shell Coating

The exterior shell coating was mostly intact with only 1% suffering from delamination. 40% of the shell was covered in biological growth.

### Roof Hatch

The roof hatch showed no signs of any perforations and no signs of leakage were found. The hinges allowed the hatch to move freely.

### Roof Vent

The roof vent had an intact fine mesh screen. Some of the bolts have corrosive staining around them but there were no signs of any perforations into the tank.

### Handrails

The handrails enclose the roof access hatch and lead up towards the roof vent. Some minor corrosion was observed but the handrails were still intact. They meet all OSHA standards.

### Roof Structure

No deformations, bowing or buckling, or any metal loss was observed in any of the roof plates.

### Roof Coating

A single area of corrosive staining was noted near the roof vent while the rest of the roof coating was free from any corrosion or delamination. Minor chalking was noted,

## RECOMMENDATIONS

Per AWWA guidelines it is recommended that this tank be inspected again in 2026

### Self-Closing Swing Gates

In order to be in compliance with OSHA Standard 1910.23(a)(2) all railing openings or platform pass through openings shall be equipped with a self-closing swing gate. Although this standard strictly addresses new construction after 11/19/2018 it is advisable to modify existing tanks with this safety device. If existing ladders are modified or replaced on an existing tank then this new standard applies.

### Exterior Cleaning

Exterior shell and roof surfaces should be cleaned using high pressure water to remove biofilm that is unsightly and may contribute to degradation of the coating system. Pressure washing should be performed with no more than 2,500 psi water.

### Impressed Current Cathodic Protection

An impressed current cathodic protection system (ICCP) should be installed to prevent metal loss of the submerged portions of the tank. ICCP will protect pitted surfaces from further metal loss and preserve the life of the existing coating. Cathodic protection systems will not provide protection to above water and roof surfaces of the tank. Systems installed where freezing can occur should be underwater suspended systems. ICCP system if properly designed and installed will operate for 15-20 years and consume a very small amount of energy.

Applicable standard:

- NACE International SP0388, latest revision "Impressed Current Cathodic Protection of Internal Submerged Surfaces of Carbon Steel Water Storage Tanks" and/or AWWA D104-11: Automatically Controlled, Impressed-current Cathodic Protection for the Interior Submerged Surfaces of Steel Water Storage Tank".

### Mixing System

A mixing system should be considered to prevent stratification and other short-circuit issues that affect overall water quality. Certain tanks with a single combined inlet/outlet pipe can have low

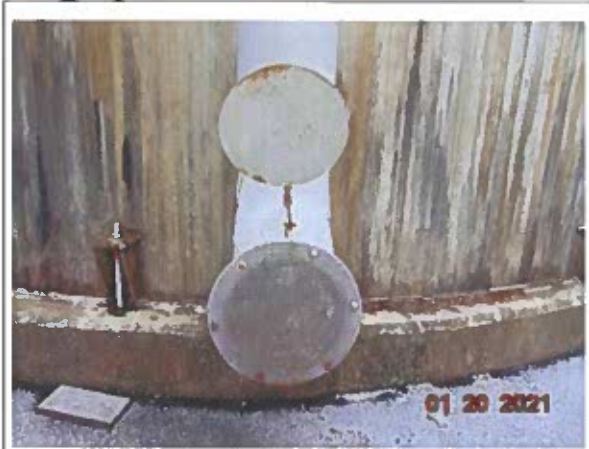
turnover and dead zones where water becomes stale and there is no chlorine residual. Mixing systems promote full mixing of the tank to make a homogeneous fluid. Mixers can also help prevent or minimize ice cap formation on top of the water column.



## Appendix I: Photographs



#1 Tank overview



#4 Overflow with flapper valve and intact screen



#2 Overview of lower shell rings



#5 Shell manhole



#3 Overflow pipe



#6 Typical view of upper shell rings



#7 Typical view of lower shell rings



#10 Typical view of chime grouting



#8 Delamination on lower shell rings



#11 Typical view of tank anchor



#9 Typical view of tank foundation



#12 Tank ladder height from grade



#13 Tank ladder



#16 Secondary roof hatch



#14 Roof overview



#17 Roof vent overview and corrosive staining



#15 Typical view of roof plates



#18 Roof vent with intact fine screen



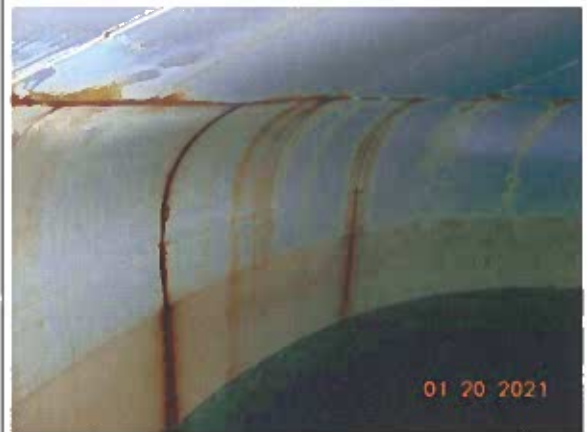
#19 Overview of roof access hatch and tank ladder



#22 Interior view of overflow weir funnel



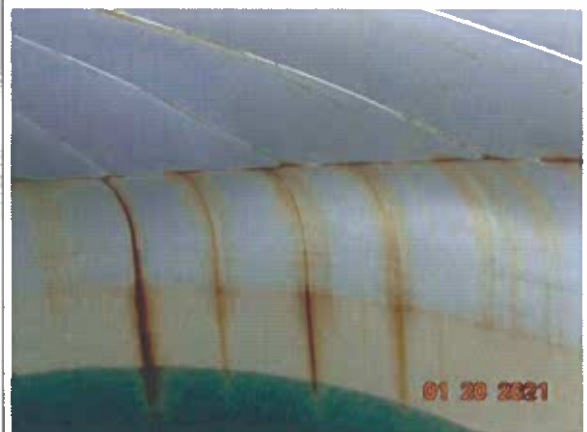
#20 Roof access hatch



#23 Interior view of shell



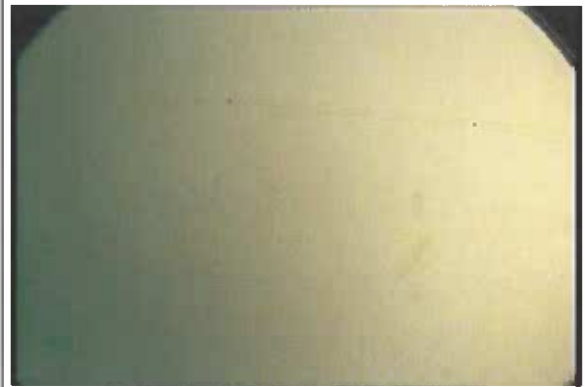
#21 Interior view of roof



#24 Interior view of shell



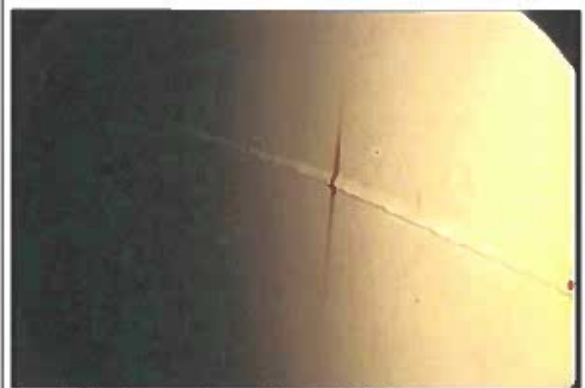
0:58 Typical view of roof plates



4:30 Typical view of shell rings



1:23 Secondary roof access hatch



4:49 Corrosive staining from weld seam



2:24 Interior view of roof vent



5:29 Staining on upper shell rings



6:52 Brushed corrosion cell



12:14 Sell manhole



9:38 Corrosion cells on lower shell rings



12:39 Typical view of tank floor



11:06 Exposed weld seam



14:02 Sediment depth of 1/8"



14:57 Inlet/outlet pipe with sediment ring

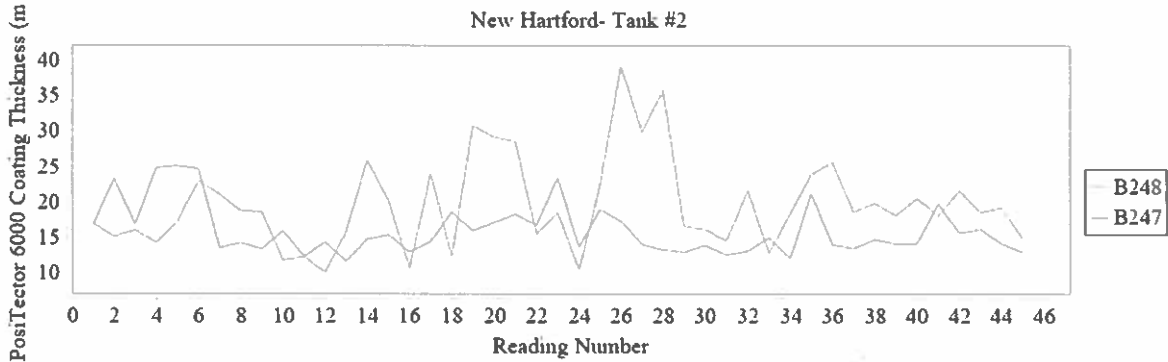
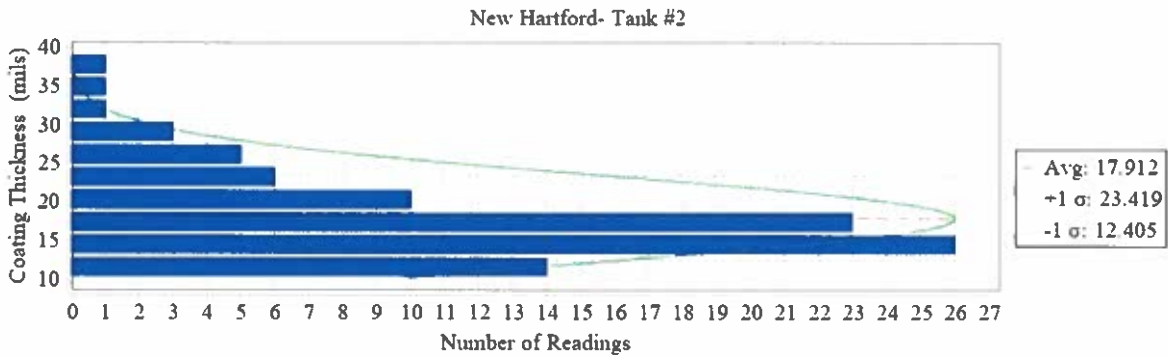
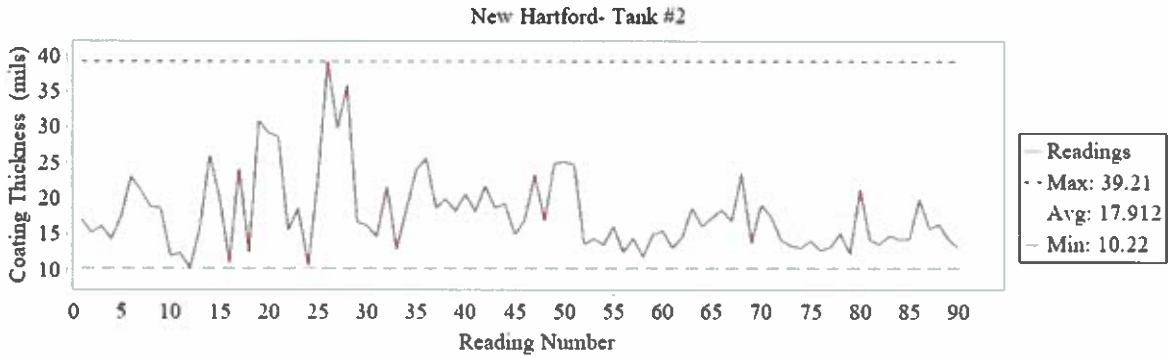
**Appendix II**  
**Exterior Paint Thickness Readings**



B247 Shell  
 B248 Roof

### New Hartford- Tank #2 Summary

|                          | #  | $\bar{x}$ | $\sigma$ | ↓     | ↑     |
|--------------------------|----|-----------|----------|-------|-------|
| Coating Thickness (mils) | 90 | 17.912    | 5.507    | 10.22 | 39.21 |



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B248

Created: 2021-01-20 10:36:09  
PosiTector Body S/N: 722083  
Probe Type: PosiTector 6000 FS  
Probe S/N: 178008  
CAL: Cal 1

### Summary

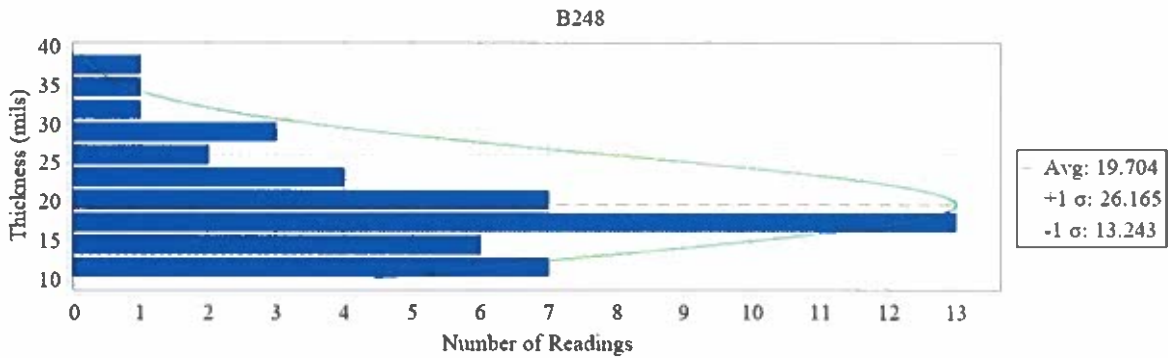
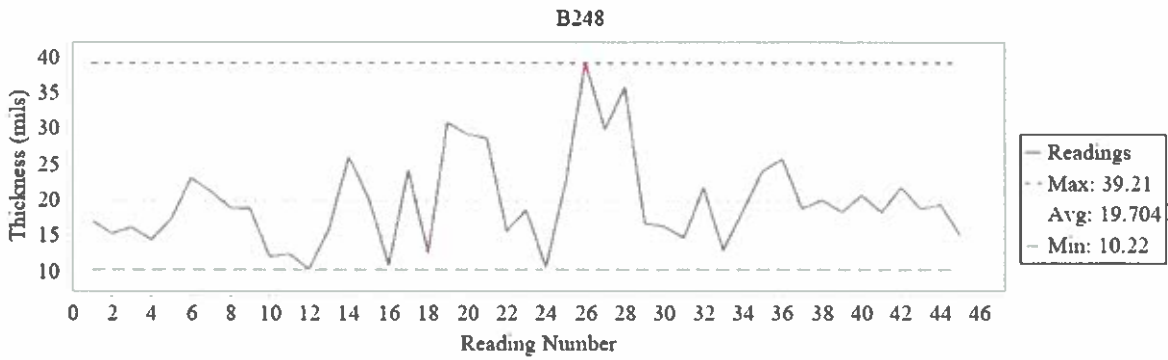
|                  | #  | x      | $\sigma$ | ↓     | ↑     |
|------------------|----|--------|----------|-------|-------|
| Thickness (mils) | 45 | 19.704 | 6.461    | 10.22 | 39.21 |

### Readings

| #  | Thickness (mils) | Time                |
|----|------------------|---------------------|
| 1  | 17.00            | 2021-01-20 10:36:11 |
| 2  | 15.21            | 10:36:14            |
| 3  | 16.10            | 10:36:15            |
| 4  | 14.30            | 10:36:16            |
| 5  | 17.31            | 10:36:18            |
| 6  | 23.01            | 10:36:19            |
| 7  | 21.16            | 10:36:20            |
| 8  | 18.81            | 10:36:21            |
| 9  | 18.71            | 10:36:22            |
| 10 | 11.94            | 10:36:24            |
| 11 | 12.34            | 10:36:25            |
| 12 | 10.22            | 10:36:26            |
| 13 | 15.91            | 10:36:29            |
| 14 | 25.99            | 10:36:30            |
| 15 | 20.20            | 10:36:31            |
| 16 | 10.81            | 10:36:34            |
| 17 | 24.15            | 10:36:34            |
| 18 | 12.44            | 10:36:35            |
| 19 | 30.84            | 10:36:37            |
| 20 | 29.22            | 10:36:38            |
| 21 | 28.63            | 10:36:39            |
| 22 | 15.56            | 10:36:41            |
| 23 | 18.55            | 10:36:42            |
| 24 | 10.58            | 10:36:43            |
| 25 | 22.44            | 10:36:45            |
| 26 | 39.21            | 10:36:45            |
| 27 | 29.89            | 10:36:46            |
| 28 | 35.84            | 10:36:48            |
| 29 | 16.66            | 10:36:49            |
| 30 | 16.23            | 10:36:50            |
| 31 | 14.61            | 10:36:52            |
| 32 | 21.71            | 10:36:53            |
| 33 | 12.86            | 10:36:55            |
| 34 | 18.48            | 10:36:56            |
| 35 | 23.96            | 10:36:57            |
| 36 | 25.68            | 10:36:58            |

## B248 Readings

| #  | Thickness (mils) | Time     |
|----|------------------|----------|
| 37 | 18.68            | 10:37:01 |
| 38 | 19.91            | 10:37:02 |
| 39 | 18.20            | 10:37:03 |
| 40 | 20.61            | 10:37:05 |
| 41 | 18.16            | 10:37:06 |
| 42 | 21.71            | 10:37:07 |
| 43 | 18.65            | 10:37:09 |
| 44 | 19.29            | 10:37:10 |
| 45 | 14.93            | 10:37:11 |



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B247

Created: 2021-01-20 09:37:57  
PosiTector Body S/N: 722083  
Probe Type: PosiTector 6000 FS  
Probe S/N: 178008  
CAL: Cal 1

### Summary

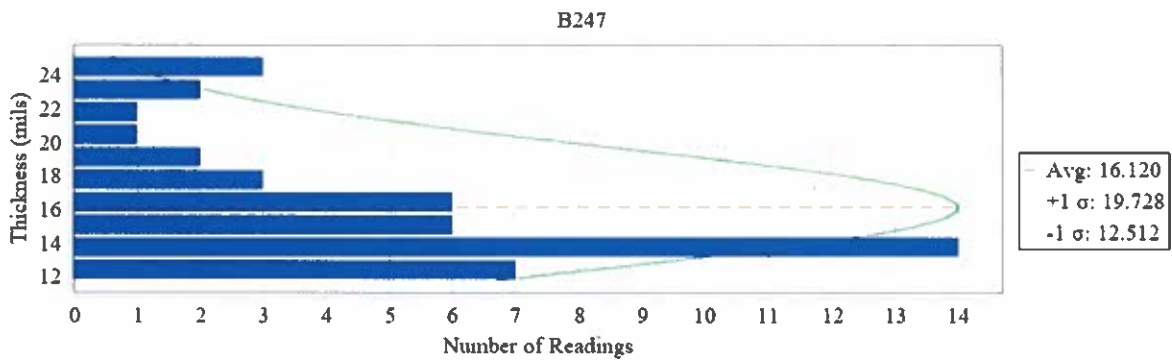
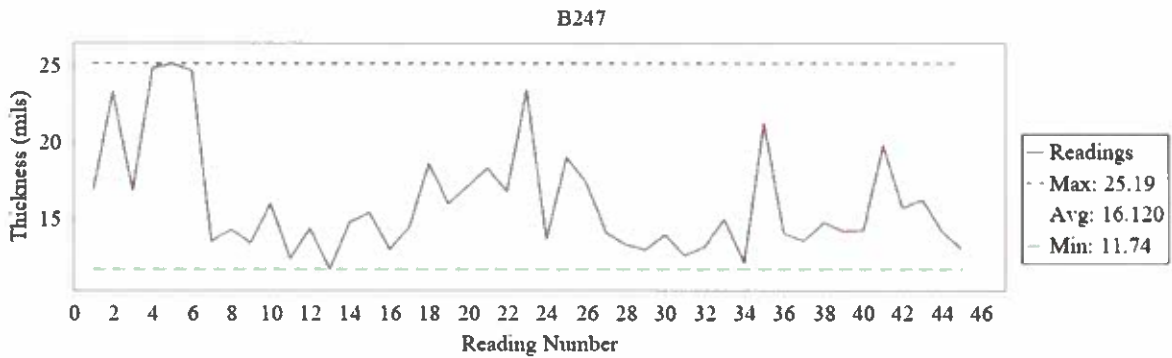
|                  | #  | x      | $\sigma$ | ↓     | ↑     |
|------------------|----|--------|----------|-------|-------|
| Thickness (mils) | 45 | 16.120 | 3.608    | 11.74 | 25.19 |

### Readings

| #  | Thickness (mils) | Time                |
|----|------------------|---------------------|
| 1  | 16.92            | 2021-01-20 09:38:00 |
| 2  | 23.36            | 09:38:00            |
| 3  | 16.91            | 09:38:01            |
| 4  | 24.89            | 09:38:05            |
| 5  | 25.19            | 09:38:06            |
| 6  | 24.72            | 09:38:07            |
| 7  | 13.59            | 09:38:11            |
| 8  | 14.35            | 09:38:12            |
| 9  | 13.47            | 09:38:13            |
| 10 | 16.03            | 09:38:14            |
| 11 | 12.44            | 09:38:15            |
| 12 | 14.42            | 09:38:16            |
| 13 | 11.74            | 09:38:17            |
| 14 | 14.85            | 09:38:19            |
| 15 | 15.45            | 09:38:20            |
| 16 | 13.06            | 09:38:25            |
| 17 | 14.48            | 09:38:26            |
| 18 | 18.67            | 09:38:27            |
| 19 | 16.04            | 09:38:28            |
| 20 | 17.19            | 09:38:29            |
| 21 | 18.35            | 09:38:30            |
| 22 | 16.82            | 09:38:34            |
| 23 | 23.46            | 09:38:35            |
| 24 | 13.70            | 09:38:36            |
| 25 | 19.05            | 09:38:38            |
| 26 | 17.40            | 09:38:39            |
| 27 | 14.10            | 09:38:40            |
| 28 | 13.35            | 09:38:47            |
| 29 | 13.03            | 09:38:48            |
| 30 | 13.99            | 09:38:49            |
| 31 | 12.64            | 09:38:50            |
| 32 | 13.19            | 09:38:51            |
| 33 | 15.01            | 09:38:52            |
| 34 | 12.16            | 09:38:53            |
| 35 | 21.28            | 09:39:03            |
| 36 | 14.07            | 09:39:04            |

## B247 Readings

| #  | Thickness (mils) | Time     |
|----|------------------|----------|
| 37 | 13.58            | 09:39:05 |
| 38 | 14.78            | 09:39:06 |
| 39 | 14.22            | 09:39:08 |
| 40 | 14.28            | 09:39:10 |
| 41 | 19.85            | 09:39:11 |
| 42 | 15.73            | 09:39:12 |
| 43 | 16.30            | 09:39:13 |
| 44 | 14.21            | 09:39:14 |
| 45 | 13.06            | 09:39:15 |



## GLOSSARY OF TERMS FOR STEEL/CONCRETE TANKS

**Adhesion-** State in which two surfaces are held together by interfacial forces which may consist of valence forces or interlocking action or both

**Aggregate-** Granular material, such as sand, gravel, crushed stone, crushed hydraulic-cement concrete, or iron blast-furnace slag used with a hydraulic cementing medium to produce either concrete or mortar.

**Bugholes-** Small regular or irregular cavities, usually not exceeding 15 mm in diameter, resulting from entrapment of air bubbles in the surface of formed concrete during placement and compaction.

**Cathodic Protection** - The use of a sacrificial metal or energized substance to polarize the structures surfaces and prevents corrosion.

**Chalking** - The degradation of a paint binders when exposed to ultra-violet light which creates a loose residue on the surface.

**Chemical Attack-** Decomposition of a coating or concrete due to the action of a chemical.

**Chime-** Portion of tank floor plate that extends outside the tank shell and rests on top of the foundation.

**Contraction Joint-** Formed, sawed, or tooled groove in a concrete structure to create a weakened plane and regulate the location of cracking resulting

**Corrosion Cell** - A concentrated localized site of accelerated corrosion that creates pitting.

**Disbondment-** The loss of adhesion between a coating and the substrate.

**Dry Film Thickness** - Total thickness of a paint film when completely cured.

**Efflorescence-** A white crystalline or powdery deposit on the surface of concrete. Efflorescence results from leaching of lime or calcium hydroxide out of a permeable concrete mass over time by water, followed by reaction with carbon dioxide and acidic pollutants.

**Finish-** The texture of a concrete surface after compaction and finishing operations have been performed.

**Finial Vent** - The central roof vent on top of a water tank.

**Grout-** A plastic mixture of cementitious materials and water used as a filler for cracks, or other void spaces, in concrete surfaces to be coated.

**Holiday** - A hole or void in a protective coating that may be invisible to the unaided eye that extends to the substrate.

**Honey Comb-** Voids left in concrete due to failure of the mortar to effectively fill the spaces among coarse aggregate particles.

**Hydraulic, Hydrostatic Pressure-** A force exerted on the concrete/coating interface due to the level of the ground water.

**Isolation Joint-** A separation between adjoining parts of a concrete structure

**Joint Sealant-** Compressible material used to exclude water and solid foreign materials from joints.

**Lap Joint Seam-** Overlapping seam between roof plates that is open and un-welded on the interior.

**Laitance-** A thin, weak brittle layer of cement and aggregate fines on a concrete surface. The amount of laitance is influenced by the degree of working or the amount of water in the concrete

**Lead Abatement** - The removal of a lead bearing paint system.

**Lead Encapsulation** - The covering over of a lead based paint by applying a compatible topcoat

**Osmotic Blister** - Raised coating area created by buildup of fluid under the coating. Fluid moves through coating in response to water/solvent concentrations between coating and tank water.

**Osmotic Pressure-** A force exerted on the concrete /coating interface through the capillaries in the concrete due to a moisture differential across the coating.

**Overflow Weir Box-** internal or external box that captures water above the operating height of the tank and directs it to an overflow pipe.

**Pack Rust/Crevice Corrosion-** Advanced form of steel corrosion that forms visible layers of oxidized steel swollen larger than the original steel plate thickness, usually found between steel plates or surfaces.

**Pinholes-** Film defect characterized by small pore-like flaws in a coating which extend entirely through the applied film and have the general appearance of pinpricks, fine holes, or voids when viewed by reflected light.

**Plastic Cracking or Shrinkage-** Cracking that occurs in the surface of fresh concrete soon after it is placed and while it is still plastic,

**Porosity-** The ratio usually expressed as a percentage, of the volume of voids in a material to the total volume of the material, including the voids.

**Reflective Cracking-**Cracking that develops in a coating directly over a dynamic crack in concrete.

**Rigging plug-** Thread steel nipple welded to a tank roof for the purposes of rigging painting cables. Usually sealed with a threaded plug when not in use.

**ROV** - Remotely operated vehicle, underwater inspection device "TankRover" by CorrTech

**Screen Mesh-** Number of openings per linear inch of screen.

**Silt** - Material that accumulates in the bottom of a water tank originating from treatment by products, raw water particles and distribution system debris.

**Silt Stop-** Solid cylinder installed on a floor inlet or outlet pipe to extend the pipe above the floor. Pipe prevents floor sediment from being stirred up or sucked out of the tank during flow.

**Static Cracks-** A crack in the concrete surface whose width does not change.

## GLOSSARY OF TERMS FOR STEEL/CONCRETE TANKS

**Stitch or Skip Weld**- Method of welding two pieces of steel together with intermittent short sections of weld bead. Leaves open lap joints along the unwelded sections.

**Tubercle** - Domed shaped buildup of corrosion products over an active corrosion site. Promotes metal loss through pitting due to differential oxygen concentrations.

**Ultrasonic Measurement** - The use of high frequency sound waves passed through a material to measure the time required to return. The time required to pass through the material is correlated to the speed of sound in the substrate to yield an actual thickness at a specific location.

**Vapor Barrier**- Waterproof membrane placed under concrete floor slabs that are placed on grade.