

Utility Service Group

Scott Kelley Water Systems Consultant
843 N. Barnstead Rd
Center Barnstead, NH 03225
603-724-8226
skelley@utilityservice.com



Mitchell Field Navy Facility Tank 100,000 Gallon Elevated Tank Condition Assessment Report

Town of Harpswell, ME



Prepared For:

Kristie Elaine
Town of Harpswell, ME

Assessment Performed July 1, 2014

TANK DATA

TANK NAME:	Mitchell Field Navy Tank				
TANK DESIGN:	Elevated	CONSTRUCTION TYPE:	Welded Steel		
LOCATION:	1410 Harpswell Neck Rd				
	CITY:	Harpswell	STATE:	ME	
CAPACITY:	100,000 gallons	HEIGHT:	104'	DIAMETER:	28'
BUILDER:	Unknown	YEAR:	1950±	CONTRACT #	N/A
EXT. COATING:	Polyurethane	LEAD:	47,000 mg/kg	CHROMIUM:	290 mg/kg
INT. COATING:	Epoxy	LEAD:	180 mg/kg	CHROMIUM:	14 mg/kg
INSPECTOR(S):	MA Service Center		DATE:	July 1, 2014	

SUMMARY

Overall the tank is in good sanitary and structural condition with no immediate sanitary or structural repairs required. There are no significant deficiencies that could not be rectified if the tank were to be returned to active service.

The coatings on both the interior and exterior of the tank range from fair to poor condition depending on the location and exposure as noted below and further detailed in this report.

The exterior coatings are heavily weathered to the point the mid coat is exposed with additional degradation to the base metal and subsequent light to medium grade rust formation of the exposed substrate. The exterior coatings have tested positive for elevated lead and chromium levels therefore strict containment methodologies should be employed during any future maintenance programs.

The tank was not in service and was completely empty at the time of this inspection. The coatings on the underside of the interior roof are in only fair to poor condition with corrosion ranging from a light to heavy grade rust at least as viewed from the roof hatch. The shell coatings are in generally good condition with little visible degradation however there is evidence of extensive erection burrs and pitting throughout. The bowl surfaces are heavily stained from what appears to be minerals in the water supply and there are scattered areas of coating breakdown visible along the surfaces adjacent to the access ladder.

If this tank is to be returned to active service the following work should be performed.

EXTERIOR COATING RECOMMENDATIONS

If this tank is to be returned to active service the exterior should be schedule for complete maintenance prior to doing so. The exterior coatings have tested positive for lead (up to 47,000 mg/kg) therefore at such time as maintenance is performed it will be necessary to completely encapsulate the exterior in a Class 1A containment system as outlined in SSPC-Guide-6 (CON) to protect the surrounding neighborhood.

All exterior surfaces should be abrasive blast cleaned to an SSPS-SP#6 Commercial blast grade. The exterior surfaces should then be re-coated with a zinc/epoxy/urethane coating system. This coating system should be comprised of (1) coat of a moisture cured zinc rich

primer applied to a dry film thickness of 2.5 to 3.5 mils, (1) coat of a high-build catalyzed epoxy applied to a dry film thickness of 3.0 to 5.0 mils per and (2) top coats of a Aliphatic Polyurethane applied to a dry film thickness of 2.5 to 3.5 mils per coat.

INTERIOR COATING RECOMMENDATIONS

All interior surfaces of the roof, shell, bowl and riser should be abrasive blast cleaned in accordance with SSPC-SP #10 Near-White Metal standards followed by the application of (1) coat of NSF approved zinc rich urethane primer applied at 2.5 to 3.5 mils and (1) stripe coat of an NSF approved 100% solids epoxy applied to all seams from the high water level down, as well as to any heavily pitted surfaces which do not meet the criteria for spot welding repairs. All interior surfaces should then receive (1) full coat of an NSF approved 100% solids epoxy coating applied at 20.0 to 30.0 mils.

STRUCTURAL RECOMMENDATIONS

In order to restore the subject tank back to a sound structural condition, and ensure compliance with current state standards, the following items should be addressed.

1. There is one broken overflow pipe support bracket above the balcony level, and an additional severely deteriorated bracket at ground level which is exhibiting severe metal loss and is missing a retention nut that will require repairs when this tank is next maintained. In order to ensure the structural integrity of the pipe during future overflow events, the bracket at the balcony level should be repaired and welded back into place and the bracket at ground level should be replaced in its entirety.
2. The overflow pipe opening should be equipped with a screen and flapper assembly.
3. The roof hatch cover hinges were found to be in poor condition with one broken at the welded connection to the roof and the other severely bent and damaged. The cover was removed to ground level during this inspection but should be replaced if this tank is to be returned to active service.
4. Any pitting and/or metal loss representing a 35% or greater reduction in corresponding plate thickness on the interior shell and/or bowl should be spot and/or seal welded in such a manner so as to ensure 100% fusion with the parent metal and bring areas flush with the original plate surfaces. At this time it is estimated that less than (500) pits may require welding repairs.
5. The interior ladder connection points to the roof hatch should be reinforced with new metal to ensure the structural integrity is maintained.
6. The leg column concrete foundations are in poor condition with extensive cracking and general degradation taking place which should be repaired.
7. The riser foundation is in poor condition and should be resurfaced to prevent additional degradation.
8. There are several ladder cage straps that are severely bent from an unknown external force. At least one of the straps is no longer welded to the adjoining strap and therefore requires welding repairs to be performed.

SANITARY RECOMMENDATIONS

At such time as the subject is scheduled for rehabilitation consideration should be given to performing the following improvements and/or modifications.

1. Given the degree of existing corrosion and potential for metal fatigue currently taking place along the stub to roof junction and the outdated design of the vent itself, it is recommended that the vent assembly be replaced in its entirety with a new aluminum vacuum/pressure relief assembly with equal or greater airflow characteristics during the next tank maintenance operations.

SAFETY & SECURITY RECOMMENDATIONS

In order to enhance the safety and security of the subject tank the following items should be considered.

1. The shell is equipped with an open access ladder with no fall prevention system present. The leg column ladder is equipped with a cage but is also not equipped with a fall prevention system. A flexible cable fall prevention system should be installed to both the shell and leg column ladders.
2. In order to help prevent unauthorized access to the top of the tank consideration should be given to installing a hinged, lockable ladder gate that encloses the bottom 8' of the leg column ladder.
3. To improve the tank security the roof top access hatch should be equipped with locking hasps and locks.

WATER STORAGE TANK CONDITION ASSESSMENT REPORT



Utility Service Group
 Merithew Service Center
 128 Elm St Bridgewater MA 02324
 508-279-9965 Fax: 508-279-9948

Date: 7/1/14	Project: 130564	Task: 1.01
Tank Name: Mitchell Field Navy Facility		
Location: 1410 Harpswell Neck Rd	City: Harpswell	State: ME
Capacity: 100,000 gallons	Tank Type: Elevated	Construction: Welded Steel
HWL: 104'±	LWL: 80'±	Diameter: 28'
Yr Built: 1950	By:	Tank ID Plate: No
		Contract:

Exterior Roof Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Roof Coating	Coating visual assessment? (G/F/P)	Fair	<p>Coating Type: Lead Bearing: DFT:</p> <p>The roof coating is in only fair condition with heavy weathering and chalking noted throughout the majority of the roof plates which has exposed intact underlying intermediate paint. In addition there are isolated areas of top coat checking which has also resulted in the exposure of the intermediate coat and in some cases the bare steel substrate. Where the coating has degraded further there is evidence of light grade surface rust affecting an additional 10%-15% of the roof.</p> <p>Abrasion damage from the revolving roof ladder has resulted in medium grade rust where the base metal has been exposed.</p>
	Actionable checking / delamination?	No	
	Actionable corrosion / deterioration?	Yes	
	Is there any graffiti paint or etchings?	No	
	Coating adhesion assessment? (G/F/P)	Fair	
	Does soiling impact visual appearance?	No	
	Will antenna equipment impact recoat?	NA	
Roof Structure	Structural visual assessment? (G/F/P)	Good	<p>The roof appears in sound structural condition with no metal loss or significant deterioration noted. There is a 1"Ø open coupling in the roof adjacent to the access hatch that was originally used for cathodic wiring at one point in time. Remnants of wires remain but the opening is not sealed. The referenced wires should be removed and the coupling sealed if the tank is to be returned to service at any point in time.</p>
	Are all plate seams sealed?	Yes	
	Significant pitting or metal loss visible?	No	
	Rigging holes / access ports sealed?	Yes	
	Other unsealed penetrations present?	Yes	
	Is the roof perimeter watertight?	Yes	
Roof Vent	Design meets state standards?	No	<p>Finial Stub OD: 12" diameter</p> <p>The roof is equipped with a 27"Ø finial ball assembly that has an overall height of approximately 30", with a 13" tall x 12"Ø neck and six 9" x 4" oval vent openings in the ball. The 12" neck is open to the tank interior. All vent openings are equipped with screens however two of the screens are damaged with large holes present which allows for the possibility for birds and/or vermin to enter the tank through the open neck into the tank interior. At a minimum the screens should be repaired if this tank is to be returned to service however for long term serviceability consideration should be given to replacing the finial ball assembly with a new vacuum/pressure relief vent assembly of equal or greater air flow capacity.</p> <p>The coatings on the exterior of the finial are in generally sound condition with only light to medium grade surface rust on the neck behind the revolving ladder bracket and general weathering on the remainder of the surfaces. The interior of the finial is in poor condition with light to medium grade rust on 100% of all surfaces visible through the openings in the vent screens.</p>
	Screen intact?	No	
	Vacuum pallet functional?	NA	
	Unsealed penetrations present?	Yes	
Roof Access	At least two hatches to WC present?	No	<p>The roof is equipped with one 24" x 24" hatch with an overlapping cover assembly which is in poor condition. One of the hatch cover hinges was bent and twisted and the welded connection point to the roof on the second was completely broken free making for an unsafe condition.</p> <p>The tank is not in use at this time therefore the damaged cover was removed and lowered to the ground to prevent accidental damage if the remaining hinge were to break off.</p> <p>The coatings on the exterior of manhole assembly are in fair condition similar the the adjacent roof however the coatings on the interior neck portion are in poor condition with medium to heavy grade surface rust on the entire raised neck.</p>
	Primary meets state standards?	No	
	Additional meet state standards?	NA	
	All roof access points secured?	No	
	Antenna equipment affects roof entry?	NA	

Roof Safety	Is there a roof ladder / stair present?	Yes	The 2'2" wide revolving ladder with 4 sets of wheel assemblies spanning from the finial ball down to the balcony appears in sound structural condition. Scattered medium grade rust and areas of top coat delamination were observed on the side rails and ladder rungs consistent with that found on the roof surfaces with more significant medium to heavy grade rust noted on the revolving ladder wheel assemblies and associated mounting brackets. Overall the referenced corrosion and or coating deficiencies is affecting approximately 15 to 20% of the ladder surfaces. Two notches in the siderails cut to allow the ladder to follow the roof curvature should be welded.
	Is there a guardrail system present?	No	
	Required fall arrest system present?	No	
	Are the roof FAA lights operational?	No	

Exterior Shell, Bowl & Riser Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Shell Coating	Coating visual assessment? (G/F/P)	Good	Coating Type: Polyurethane Lead Bearing: Yes DFT: NR The shell coating is in fair to poor condition with severe weathering throughout at least 50-60% of the surfaces. Light rust is breaking through the coatings on an additional 10% of the shell and there is more significant medium grade rust specifically where the coating has been damaged by the revolving ladder wheels. Sprayed graffiti on the shell is unsightly but does not appear to be affecting the integrity of the underlining coatings. The balcony and handrails appear intact and being adequately protected by the coatings except for medium to heavy rust and in some cases heavy rust scale buildup primarily where the walkway meets the supporting angle framework. Slight to moderate metal loss should be anticipated along the areas exhibiting rust scale buildup. Areas of light grade surface rust is also affecting an additional 10% of the top face of the balcony walkway and handrails. The coatings on the riser and bowl are in a similar condition as reported for the shell with extensive weathering noted throughout with scattered areas of light rust where the coating has failed to the substrate. Fair adhesion characteristics and the extent of weathering and corrosion noted above suggest the coatings would not be a good candidate for overcoating. The exterior shell and riser coatings were tested and found to contain 47,000 mg/kg lead and 290 mg/kg chromium and 690 mg/kg lead and 28 mg/kg chromium respectively. The high lead content dictates the need for a comprehensive Class 1 containment system as outlined in SSPC Guide 6 latest revision thereof to be employed during the exterior tank maintenance.
	Actionable checking / delamination?	No	
	Actionable corrosion / deterioration?	No	
	Logo visual assessment? (G/F/P)	NA	
	Is there any graffiti paint or etchings?	Yes	
	Coating adhesion assessment? (G/F/P)	Fair	
	Balcony visual assessment? (G/F/P)	Fair	
	Bowl coating assessment? (G/F/P)	Fair	
	Riser coating assessment? (G/F/P)	Fair	
	Does soiling impact visual appearance?	No	
	Will antenna equipment impact recoat?	No	
Shell Structure	Structural visual assessment? (G/F/P)	Good	It was reported that this tank is no longer being used and has been empty for a number of years. The exterior shell appears in good sanitary and structural condition with no evidence of leaks or other structural deficiencies. There is evidence of numerous erection burrs remaining on the tank after the tank was constructed. These burrs have been flat topped in most instances and the coating remains generally sound but there is evidence of numerous burrs are sharp and were not ground smooth therefore when this tank is next maintained it is recommended that all sharp burrs be ground smooth and stripe coated with the new coating system being applied to ensure total coverage.
	Are all plate seams sealed?	Yes	
	Significant pitting or metal loss visible?	No	
	Unsealed penetrations present?	No	
	Riser base plate condition? (G/F/P)	Good	
	Any active leakage observed?	NA	
Riser Foundation	Structural visual assessment? (G/F/P)	Fair	The riser foundation is degrading with evidence of significant spalling of the top layer of concrete which has resulted in exposure of the underlying stone aggregate. Concrete repairs should be performed if this tank is to be returned to active service.
	Riser anchor bolts in sound condition?	Yes	
	Grout or sealer in sound condition?	Yes	
	Does grade promote good drainage?	Yes	
	Failure or undermining of foundation?	Yes	
Shell Access	At least two manholes present?	No	There are no shell manholes present.
	Primary meets state standards?	NA	
	Additional meet state standards?	NA	
	Structural damage / leakage visible?	NA	

Shell Safety	Balcony handrail meets standards?	No	<p>Balcony Handrail Hght: 41.5" Safety Climb Type: NA</p> <p>The balcony handrail is 41.5" tall and the walkway is 23.5" wide with the entire assembly supported by steel angles and braces from underneath the balcony as shown in the attached photographs.</p> <p>Currently the balcony appears in sound structurally condition however water retention along the edges of the walkway to support angle has resulted in accelerated corrosive activity with associated heavy rust and scale buildup.</p> <p>The type and grade of rust scale suggests at least slight to moderate metal loss is occurring therefore welding repairs and/or sectional replacement may be required during future tank maintenance. Abrasive blast cleaning will be required before the extent of repairs will be fully known.</p>
	Water retention on balcony walkway?	Yes	
	Required shell ladder present?	Yes	
	Required safety climb system present?	No	
	Is shell ladder equipped with a cage?	No	
	Are there rest platforms present?	No	
	Actionable corrosion / deterioration?	Yes	
	Crossover platform handrails sound?	NA	
	Do antennas / cables impact climbing?	NA	
Overflow	Extends to near ground level?	Yes	<p>Pipe OD: 6"±</p> <p>The overflow system is comprised of an internal weir box and piping that exits the bottom of the box then transitions thru the roof knuckle to the exterior tank where it follows the tank shell and leg column down to ground level where it terminates in a 90° elbow approximately 20" above grade.</p> <p>The weir box is an atypical design with open narrow slots between the box and roof. The box is held in place by steel tabs welded to the box and roof plate as illustrated in the attached photographs.</p> <p>The interior portion of the weir box is inaccessible to properly apply a protective coating and therefore in poor condition with extensive corrosion present along the majority of the box interior. The exterior portion of the box and adjacent piping is in generally good condition except for light rust on the backside of the pipe as viewed from the roof hatch.</p> <p>The coatings on the exterior portions of the overflow pipe outside of the tank are in fair to poor condition with light grade surface rust along the majority of the backside of the pipe and the pipe brackets. There is also evidence of one broken pipe support bracket at the balcony level and an additional severely deteriorated bracket at ground level which is exhibiting severe metal loss and is missing a retention nut that will require repairs when this tank is next maintained.</p> <p>The pipe opening is not equipped with a screen or flapper assembly.</p>
	External weir box sealed / secured?	NA	
	Actionable corrosion / deterioration?	Yes	
	Unsealed penetrations present?	No	
	Required air gap present?	Yes	
	Screen is intact or was replaced?	No	
	Flapper is functional or was replaced?	No	
	Drain, spillway or rip-rap present?	No	

Support Structure Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Support Structure Coatings	Column / strut coatings? (G/F/P)	Fair	<p>Coating Type: Not Tested Lead Bearing: NR DFT:</p> <p>The support structure coatings are in fair condition with little corrosive activity observed however there is severe weathering throughout the majority of all surfaces.</p> <p>Localized areas of light rust were observed on various turnbuckles, yokes and clevises and there are scattered areas of coating delamination at various interfaces of the struts. The total extent of corrosion does not appear to be affecting more than 10% of the support structure while at least 60% of the surfaces are exhibiting the referenced weathering.</p>
	Actionable checking / delamination?	No	
	Actionable corrosion / deterioration?	No	
	Support rod conditions? (G/F/P)	Fair	
Support Structure	Column / strut visual condition? (G/F/P)	Fair	<p>Column Type: Tubular</p> <p>The tank support structure, sway rods and struts all appear in sound condition with no significant corrosive activity affecting the structural integrity observed.</p> <p>There is a small ~3/4"Ø hole in the bottom of the leg column that supports the overflow pipe whose purpose is undetermined.</p>
	Are sway / radial rods taugt?	Yes	
	Sway / radial rod connections secure?	Yes	
Column Footings	Column shoe / base conditions? (G/F/P)	Fair	<p>The column footings are showing evidence of cracking in the top layer of concrete however no significant spalling has occurred to date. If left in its current state additional cracking and subsequent degradation should be expected.</p>
	Actionable corrosion / deterioration?	No	
	Failure or undermining of footings?	Yes	
	Grout or sealer in sound condition?	Yes	
	Does grade promote good drainage?	Yes	

Support Structure	Actionable corrosion on column ladder?	No	Safety Climb Type: NA The leg column ladder appears in good condition however there are several bent cage straps and at least one strap that has broken free from it's point of attachment to an adjoining strap.
	Required safety climb system present?	No	
Safety	Is ladder equipped with cage / platform?	Yes	The coatings on the leg column ladder and cage assembly are exhibiting heavy weathering throughout and scattered areas of light grade surface rust affecting 20% of the cage and up to 5% of the ladder.
	Functional security gate present?	No	
	Do antennas / cables impact climbing?	NA	

Interior Roof Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Roof Coating	Coating visual assessment? (G/F/P)	Fair	Coating Type: Epoxy Lead Bearing: No DFT: The interior coating was tested for lead and chromium content with 180 mg/kg lead and 14 mg/kg chromium found in the submitted samples. The coatings on the underside of the roof and knuckle are in fair to poor condition with light rust throughout 15-20% of surfaces with additional areas of coating delamination down to the bare substrate exposing medium to heavy rust and affecting another 5-10% of the center roof area. Light to medium grade rust is also present under and adjacent to the four roof seam backing strips.
	Actionable blistering / delamination?	No	
	Actionable corrosion / deterioration?	No	
	Coating adhesion assessment? (G/F/P)	Fair	
	Rafter visual assessment? (G/F/P)	NA	
	Roof to shell junction? (G/F/P)	Good	
Roof Structure	Structural visual assessment? (G/F/P)	Good	The roof and knuckle plates appear to be in sound structural condition with no evidence of metal loss affecting the structural or sanitary condition of the tank. There is one open penetration in the roof for previously existing cathodic wiring assembly which should be sealed if this tank is to be returned to active service. There is a direct opening into the tank through the base of the finial ball to allow for venting of the tank interior however the vent screens are damaged allowing for a potential unsanitary condition and should be repaired/replaced. The underside of the roof is equipped with four backing strips where the four roof plate sub assemblies were field welded together during original construction of the tank. The remaining seams are butt welded along both the interior and exterior faces.
	Are all plate seams sealed?	Yes	
	Significant metal loss on plates visible?	No	
	Significant metal loss on rafters visible?	No	
	Roof bolted connections sound?	NA	
	Light leaks visible from the interior?	Yes	

Interior Shell & Bowl Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Shell & Bowl Coatings	Coating visual assessment? (G/F/P)	Good	Coating Type: Epoxy Lead Bearing: No DFT: All observations were made from the roof hatch. The coatings on the interior shell are in good condition with no significant degradation observed. There is evidence of 300 or more old erection burrs present throughout the shell the majority of which appear to be well coated and protected by the coating system but several are exhibiting light to medium grade rust along sharp edges and/or voids in the paint. In addition there is evidence of extensive past pitting throughout the majority of the shell plates. As with the burrs, the pits appear to be adequately coated with little degradation observed. The pit depths could not be accurately determined due to a lack of access. The coatings on the bowl are heavily stained and there is evidence of at least three distinct areas of degradation along the lower bowl surfaces where the coatings appears to have become completely disbanded from the base metal with medium to heavy grade rust and possible slight to moderate metal loss occurring.
	Actionable blistering / delamination?	No	
	Actionable corrosion / deterioration?	No	
	Coating adhesion assessment? (G/F/P)	Good	
Shell & Bowl Structure	Structural visual assessment? (G/F/P)	Good	The interior shell and bowl appear in sound structural condition with no leakage or holes observed however there is evidence of extensive past pitting throughout the majority of the visible shell plates. As reported above, the shell plates were not accessible to measure the pit depths however they do not appear deep and for the most part adequately sealed by the current coating system. Interior bowl is equipped with a grate covering the top of the riser and there is a circulation line that passes thru the grate and a short distance into the bowl.
	Are all plate seams sealed?	Yes	
	Significant pitting or metal loss visible?	Yes	
	Bowl plate assessment? (G/F/P)	Good	
	Riser transition in sound condition?	Yes	
	Safety bars or grate present over riser?	Yes	

Shell Safety	Is an interior shell ladder present?	Yes	<p>Safety Climb Type: NA</p> <p>The tank is equipped with a ladder spanning from the roof hatch to the bowl with only the top and bottom secured with no secondary lateral bracing present. The ladder was not used to gain access to the tank interior due to a concern that the interior ladder was not adequately welded at the upper connection point to the roof hatch neck thereby posing a potential safety hazard. All observations were made from the roof hatch.</p> <p>The coatings on the ladder are in fair condition with scattered areas of medium to heavy corrosion along the ladder rungs, rails, and where the ladder is welded to the roof hatch neck.</p> <p>When and/or if this tank is next maintained it will be necessary to reinforce the upper ladder connections to the hatch neck to ensure the structural integrity is maintained.</p>
	Required safety climb system present?	No	
	Actionable corrosion / deterioration?	Yes	
	Internal balcony or platform present?	No	
Water Quality	Water quality visually acceptable?	NA	<p>The tank was empty at the time of inspection. The interior is equipped with a floating cathodic protection system subsended from ropes attached to clips welded to the bottom shell ring. The cathodic wiring passes through a water tight fitting secured to a coupling welded in the bottom ring. The cathodic system appears intact but non functional.</p>
	Significant staining or biofilm present?	NA	
	Significant floor sediment present?	No	
	Is there a mixing system present?	Yes	
	Is there a cathodics system present?	Yes	
	Is there a level indicator present?	No	

Interior Riser Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Riser	Is the tank equipped with a dry riser?	No	<p>Riser OD:</p> <p>The riser surfaces were not readily visible but appear in good condition as viewed from the roof hatch.</p>
	Coating visual assessment? (G/F/P)	Fair	
	Actionable corrosion / deterioration?	No	
	Structural visual assessment? (G/F/P)	Good	
Riser Safety	Is an interior riser ladder present?	No	<p>Safety Climb Type:</p> <p>The presence of a riser ladder could not be confirmed however none was visible from the roof hatch.</p>
	Required safety climb system present?	NA	
	Actionable corrosion / deterioration?	NA	
	Is the riser equipped with a floor drain?	NR	

Site Conditions: All questions are Yes / No / NA / NR unless listed (G/F/P) for Good / Fair / Poor / NA / NR

Tank Area	Item of Concern	Status	Comments
Site	Is site equipped with a security fence?	Yes	<p>The tank is surrounded by a locked perimeter fence that was found to be in good condition with no signs of damage.</p> <p>There are two buildings on site one of which is immediately adjacent to the riser and the 2nd is adjacent to a leg column. The building is open and appears abandoned. There are wires spanning from a penetration in the leg column to the building presumably from the cathodic system or from old antennae which are no longer on the tank.</p>
	Any signs of damage to the fence?	No	
	Are fence gates secured with locks?	Yes	
	Is a vault or pump house present?	Yes	
	Sample tap onsite?	NR	
	Is there telemetry / SCADA onsite?	NR	
	Is there non-tank pooling water onsite?	No	
	Is there electrical service onsite?	Yes	

Regina Arthur
Utility Service Group
PO Box 1350
Perry, GA 31069-1330



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 133267

Client Identification: Mitchell Field Navy Facility 100,000 Elevated | Town of Harpswell, ME

Date Received: 7/7/2014

Dear Ms. Arthur :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:

- Solid samples are reported on a dry weight basis, unless otherwise noted
- < : "less than" followed by the reporting limit
- > : "greater than" followed by the reporting limit
- %R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,


Lorraine Olashaw, Lab Director

7.11.14
Date

3
of pages (excluding cover letter)



SAMPLE CONDITIONS PAGE

EAI ID#: 133267

Client: **Utility Service Group**

Client Designation: **Mitchell Field Navy Facility 100,000 Elevated | Town of Harpswell, ME**

Temperature upon receipt (°C): **24**

Received on ice or cold packs (Yes/No): **N**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
133267.01	AFM 130564 Interior	7/7/14	7/1/14	solid		Adheres to Sample Acceptance Policy
133267.02	AFM 130564 Exterior	7/7/14	7/1/14	solid		Adheres to Sample Acceptance Policy
133267.03	AFM 130564 Addt'l	7/7/14	7/1/14	solid		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.

Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

- 1) EPA 600/4-79-020, 1983
- 2) Standard Methods for Examination of Water and Wastewater, 20th Edition, 1998 and 22nd Edition, 2012
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992



LABORATORY REPORT

EAI ID#: 133267

Client: **Utility Service Group**

Client Designation: **Mitchell Field Navy Facility 100,000 Elevated | Town of Harpswell, ME**

Sample ID:	AFM 130564 Interior	AFM 130564 Exterior	AFM 130564 Add't'l						
Lab Sample ID:	133267.01	133267.02	133267.03						
Matrix:	solid	solid	solid						
Date Sampled:	7/1/14	7/1/14	7/1/14						
Date Received:	7/7/14	7/7/14	7/7/14						
				Analytical Matrix	Units	Date of Analysis	Method	Analyst	
Chromium	14	28	290	SolAsRec	mg/kg	7/10/14	6010C	DS	
Lead	180	690	47000	SolAsRec	mg/kg	7/10/14	6010C	DS	



CHAIN - OF - CUSTODY RECORD

133267

TYPE SAMPLE: PAINT CHIPS (PAINT CHIPS, SPENT ABRASIVE, SOIL) STATE: ME

1. TANK INFO: Mitchell Field Navy Facility 100,000 Elevated Town of Harpswell, ME

2. CUSTOMER / LOCATION:

3. NAME OF SAMPLER: Amanda Maier/Scott Kelley EMPLOYEE DEPT #: 119 5. DATE: 07/03/14

4. SIGNATURE:

6. RETURN ADDRESS: UTILITY SERVICE CO., INC.
ATTN: REGINA ARTHUR / LARA ANDERSON
P O BOX 1350
PERRY, GA 31069

RETURN COPY OF THIS RECORD WITH RESULTS

7. SAMPLE NO.	8. SAMPLE REMOVAL DATA			9. ANALYSIS REQUESTED	
	DATE	TIME	SPECIFIC LOCATION	LEAD	OTHER (ARSENIC, CADMIUM, CHROMIUM)
AFM 130564	07/01/14	9:00am	Roof	X	Chromium
AFM 130564	07/01/14	8:00am	Riser	X	Chromium
AFM 130564	07/01/14	8:10am	Exterior Shell	X	Chromium

10. SAMPLES RELINQUISHED BY: Amanda Maier/Scott Kelley USPS

11. SAMPLES RECEIVED BY: REGINA ARTHUR

Date: 07/03/14 Time: 10:52 AM

Date: 7/3/14 Time: 10:15

UTILITY SERVICE COMPANY INC. WATER TANK MAINTENANCE

amanda@merithwinc.com rarthur@utilityservice.com REGINA ARTHUR (478) 988-5234

laraanderson@utilityservice.com LARA ANDERSON (478) 988-5274

skelley@utilityservice.com FAX: (478) 987-2991

Invoices to: accountspayable@utilityservice.com

24.0% NDIV

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Overall view of the 100KG Mitchell Field elevated tank.



Roof finial ball has six 9"x4" oval vent screens, two of which have large holes.



Showing a hole in the finial ball screen.



Showing a hole in the finial ball screen that should be repaired if the tank is to be returned to service.



Showing corrosion on the interior of the finial ball which is open to the tank interior



The finial ball neck appears to be in good condition

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The hinges on the single 24"x24" hatch cover are broken



Showing one of two broken hatch hinges.



The second hinge is bent and twisted



Showing a lock hasp present on the hatch neck but there was no lock



The hatch cover was removed for safety reasons due to poor structural integrity of the hinges



Extensive corrosion on the hatch neck does not appear to be affecting the structural integrity at this time

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The revolving roof ladder connection bracket to the final ball neck appears in sound condition but there is corrosion on the neck surfaces



Roof revolving ladder appears in sound structural condition.



Showing corrosion of the roof ladder side rails.



Showing extensive corrosion on the ladder rungs and rails.



Shows medium grade corrosion on the underside of the ladder and wheel assembly.



The coatings on the revolving ladder are delaminating at the prime coat

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Shows medium grade corrosion where the coating has delaminated from the roof ladder siderails



Showing a notch in the roof ladder side rail to allow for proper fit to curvature of the roof siderails



Showing a notch in the roof ladder side rail to allow for proper fit to curvature of the roof siderails



Shows abrasion damage on shell coating from the revolving ladder



The exterior roof is in fair to poor condition with heavy weathering revealing the underlying coatings.



Roof appears in sound structural condition with only light rust and weathering noted.

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Light rust and severe weathering was observed throughout the roof plates



Shows evidence the top coat is chalked and degraded



Showing weathering and abrasion damage along the center roof area



Showing abrasion damage around the center dollar plate due to the roof ladder wheels



Shows light rust breaking through the coatings on the roof



There is an open hole in the roof for wiring that should be sealed if the tank is returned to service

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Shows adhesion testing on roof surfaces indicating generally sound interfacial adhesion



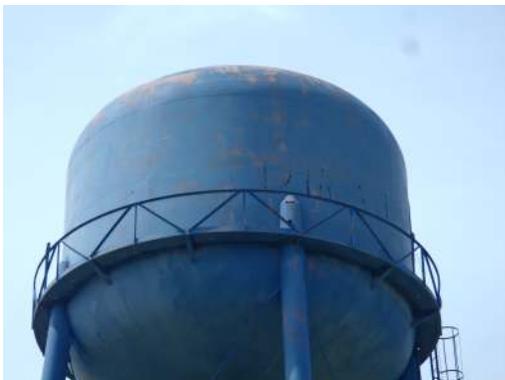
Shows adhesion testing on roof surfaces indicating generally fair interfacial adhesion



The coatings on the roof knuckle are weathered and there is evidence of abrasion damage from the revolving ladder



Showing abrasion damage from the rotating roof ladder.



Overall view of the coatings on the roof knuckle and shell exhibiting significant weathering and areas of light rust



There are no open or unsealed penetrations in the shell plates to affect the sanitary condition of the tank

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Shows light rust and soiling present on the shell plates



Showing top coat weathering along the upper shell surfaces



Showing top coat weathering on the shell and leg column post heads



Shows what appears to be erection burrs adjacent to the shell plate weld seams



Showing graffiti on the exterior shell.



Showing light rust and weathering on the exterior shell

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing wiring protruding from a pipe stub in the leg column post head at the balcony level



Showing corrosion on a cover plate installed to one of the leg column post heads



Showing a junction box and associated conduit for cathodic wiring at the balcony level.



Showing heavy corrosion with possible metal loss at the shell to balcony junction



The balcony walkway are in generally good condition except for heavy corrosion along the edges.



There is heavy corrosion and slight to moderate metal loss at the balcony to shell angle junction

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing a gap at the shell to balcony junction with heavy rust on the shell plate



Shows evidence of heavy rust and scale with slight to moderate metal loss of associated surfaces



Shows scattered areas of coating failure and corrosion on the handrails.



The balcony handrails are in good structural condition although there is scattered areas of degradation



Shows a davit assembly secured to the balcony handrail



Shows an area of significant light to medium grade rust on the balcony handrail

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Shows an area of significant light to medium grade rust on the balcony walkway



Showing corrosion along the bolts and edges where a leg column attaches to the balcony.



Showing corrosion along the underside of the balcony walkway at the junction with what appears to be a supporting angle



Showing corrosion and at least slight to moderate metal loss along the underside of the balcony.



The coatings on the visible balcony support braces appear in sound condition



Shows a pass through in the balcony handrail which allows for access onto the balcony

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The leg column access ladder appears in sound structural condition with no obvious deficiencies observed



The coatings on the ladder safety cage are in only fair to poor condition



Several of the vertical ribs of the ladder cage are bent which has compromised the welds at several locations



Showing corrosion on one of the cage connections to the ladder



Light rust on the weld seams of several ladder to leg column brackets does not appear to be affecting the structural integrity



The leg column access ladder terminates at ground level and there is no security gate to prevent unauthorized access

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The bowl surfaces visible from the access ladder are weathered but exhibit little corrosion



Shows significant weathered coating on the bowl surfaces



Shows significant weathered coating and scattered areas of light rust on the bowl surfaces



The riser to bowl junction appears in sound structural condition with no obvious deficiencies observed



Shows an overall view of the riser and associated radial rods

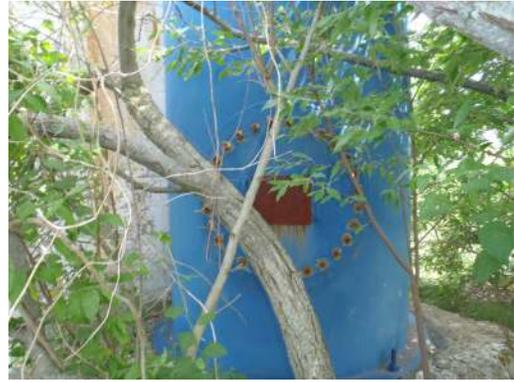


Shows rust on a riser radial rod with no evidence of any structural issues

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Shows areas of weathered coating on the riser



Corrosion is present on all bolted connections as well as where the tank ID plate was originally attached



The riser foundation is in poor condition with significant degradation of the concrete exposing large aggregate



Shows the base of the riser adjacent to a concrete block building



Shows concrete rubble from the degraded riser foundation

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



There is an unused penetration in the side of the riser adjacent to the hatch



The coatings on the leg columns are weathered but exhibit little corrosion



Shows significant weathering on the leg columns



Shows the sway rod and strut connections to the leg columns to be in good condition



The sway rod turnbuckles are experiencing light rust but appear in good structural condition.



Showing rust on the interior of a sway rod yoke and coating delamination and surface corrosion on the adjacent strut

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing localized areas of light rust on various connections to the support structure



The sway rod connections appear structurally sound but are exhibiting light rust on the threads



Shows the coatings on the leg columns to be weathered but there is little corrosion



The leg column base plates appear in sound structural condition with no significant coating degradation observed



Shows what appears to be surface cracking in one of the leg column footings

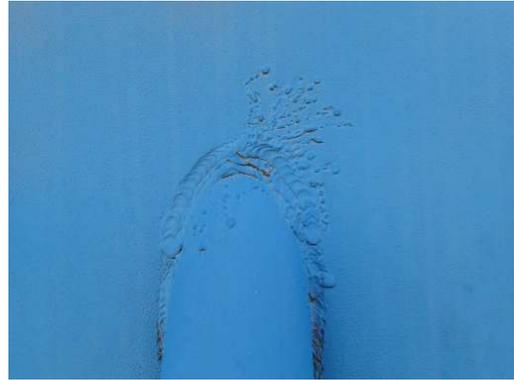


Shows an old cathodic protection control center attached to the base of the leg column

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



There is an ~3/4"Ø hole in the base of the leg column that supports the overflow pipe



Showing rough weld and spatter where the overflow pipe attaches to the shell.



Showing corrosion on the underside of the overflow pipe and adjacent shell surfaces.



The coatings on the overflow pipe bracket above the balcony is in poor condition and there is evidence of a cracked weld



Showing a crack on the overflow pipe standoff bracket at the balcony level



Showing corrosion on the backside of the overflow pipe as viewed from the balcony

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing where the overflow pipe penetrates the balcony.



The overflow pipe is supported at multiple levels on the leg column



Showing corrosion occurring on the backside of the overflow pipe.



The overflow pipe coatings are in fair condition with scattered areas of corrosion mostly along the backside of the pipe



Shows heavy rust, scale and associated moderate metal loss as well as a missing nut on the lower overflow bracket



The overflow terminates approximately 20"± from grade with no evidence of a splash pad or riprap area for drainage

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The overflow pipe is not equipped with a screen or flapper assembly



Shows a concrete block wall building under the tank and adjacent to the riser pipe



Shows wiring spanning from a wood framed building to an adjacent leg column



Shows a wood building adjacent to the tank



The building appears to be run down and no longer in use and there is significant vegetation growth nearby



The perimeter fence surrounding the tank site appears in sound condition

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



There is a heavy growth of trees/shrubs and grass both inside and outside of the perimeter fence



Shows large tree/shrub present under the tank



Shows the perimeter fence and access gate surrounding the tank site



View of the closed access gate upon completion of the inspection



The access gate is equipped with a lock.



Shows the close proximity of an access road and building to the tank

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Overall view of the area as viewed from the top of the tank



Overall view of the area as viewed from the top of the tank



Overall view of the area as viewed from the top of the tank



Interior roof coatings are in only fair to poor condition with areas of complete delamination to the substrate and associated medium to heavy rust as well as scattered areas



Delamination was noted along the center roof as seen near the vent opening.



Showing delamination along the roof plates and seams.

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing delamination and corrosion along the roof plates and seams.



Showing light rust breaking thru the coatings on the underside of the roof plates.



Shows backing strip in place on the underside of the roof and knuckle plates



Showing light rust on the erection burrs remaining on the knuckle and shell plates



Shows corrosion under the backing straps along the roof and knuckle plates



Showing delamination along the upper roof plates and seams with additional light rust present on the lower surfaces

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The roof appears in sound condition with no metal loss or open penetrations noted.



Showing an adhesion test performed on the underside of the roof indicating generally good adhesion



Sideview of the weir box configuration showing the box is stepped off of the roof and supported by gusset plates only with no access for painting



Interior view of the weir box showing corrosion along inaccessible surfaces



Corrosion is occurring on the internal portion of the overflow pipe.



Corrosion is occurring on the internal portion of the overflow pipe.

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The shell coatings are in good condition and past pitting appears to be well sealed by the coating



Shows past pitting on the upper shell ring which is being afforded good protection by the existing coating system



Shows no significant coating degradation occurring on the interior shell



Showing rigging points for the cathodic protection system on the interior shell.



Showing cathodic equipment on the interior shell.



The interior bowl is stained and there appears to be three separate areas of degradation. The cathodic protection system appears intact.

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



Showing an area of coating delamination and corrosion on the interior bowl.



Showing delamination of the coatings on the bowl surface at the base of the interior ladder.



View of the floating cathodic system.



The top of the riser is equipped with a grate thru which a circulation line penetrates



The riser grate and circulation line appear intact



The weld integrity at the top of the interior ladder is questionable and should be reinforced

**Mitchell Field Navy Tank Harpswell, ME
Inspected on 7/1/14**



The interior ladder siderails connections to the manhole neck should be extended and reinforced during future maintenance



Showing corrosion on the backside of the interior ladder siderails adjacent to the roof.



The interior ladder appears in sound structural sound condition but there is significant corrosion along the rungs and rails. There are no mid point stabilizers.



Closeup of corrosion on the interior ladder.



Closeup of corrosion and past metal loss on the interior ladder.