

Screw Anchor Work Plan 2019 Interim Report

**United States v. Enbridge Energy et al Case 1:16 –cv-914
(January 22, 2020)**

Consent Decree	VII. Injunctive Measures, E. Measures To Prevent Spills In The Straits Of Mackinac, ¶ 68, Span Management Program		
Version	1.0	Version Date	January 22, 2020

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Introduction and Objective

Paragraph 68 of the Consent Decree entered in Case 1:16-cv-00914 (ECF No. 14, 05/23/17) establishes requirements for the installation of screw anchors on the Dual Pipelines that cross the Straits of Mackinac. Enbridge is providing this interim report to update the United States Environmental Protection Agency (EPA) on Enbridge's efforts to install screw anchors over the course of the 2019 construction season in accordance with the EPA-approved Screw Anchor Work Plan ("SAWP").

This report includes the following information:

- Summary of activities completed in 2019
- An aggregate number of anchors installed to date (2018 and 2019)
- Any deviations from the SAWP in 2019

As explained below, due to permitting delays, Enbridge did not receive the permits necessary to install all 73 screw anchors required under Paragraph 68 in advance of the onset of winter weather conditions at the Straits of Mackinac ("Straits") to complete installation. Once Enbridge completes those activities in 2020, Enbridge will submit to EPA a final report to the EPA within sixty (60) days of completion of the SAWP, as per ¶ 68.e of the Consent Decree

Background

In the June 1, 2017 First Modification of the Consent Decree, the deadlines for screw anchor installations were modified by the parties as set forth in ECF No. 15 (filed 06/01/17). Under the modified deadlines, the date for installation of required screw anchors was extended to October 1, 2018.

On May 16, 2018, Enbridge submitted the 2018 Screw Anchor Work Plan ("SAWP") to the EPA outlining the planned scope and schedule of the work related to screw anchor installations. Enbridge submitted a revised SAWP on May 17, 2018, and on May 22, 2018, the EPA approved the SAWP. The EPA-approved SAWP was developed to be consistent with both the existing provisions of the Consent Decree (as modified) and the Third Modification of the Decree, which was approved by the United States District Court, Western District of Michigan on September 20, 2019.

Enbridge received a permit from the U.S. Army Corps of Engineers ("USACE") on September 20, 2019, authorizing the installation of 54 screw anchors. Enbridge initiated screw anchor installation work on September 22, 2019, within 48 hours of receipt of the USACE permit. Enbridge continued work in the Straits to install the remaining screw anchors until November 23, 2019, at which time installation activities were suspended due to winter weather conditions. In 2019, Enbridge was able to install 34 anchors out of the remaining 54 anchors authorized for installation by the USACE permit.

On November 8, 2019 Enbridge notified the EPA of a Force Majeure resulting from the permitting delay that prevented the completion of installation of the remaining 54 anchors prior to October 1, 2019.

Screw Anchor Scope of Work and Schedule

Screw Anchor Installation Permitting

The SAWP scope of work originally included the installation of seventy (70) screw anchors on both Dual Pipelines within the Straits. As of March 22, 2018, Enbridge obtained permits from the Michigan Department of Environmental Quality ("DEQ") to install twenty-two (22) screw anchors. The USACE issued a permit for installation of the same twenty-two (22)

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anchors in 2017, but later concluded that additional authorization was needed to install three of these anchors, thereby authorizing the installation of only nineteen (19) anchors. In 2018, Enbridge installed a total of nineteen (19)¹ of the seventy (70) planned screw anchors referenced in the SAWP, leaving fifty-one (51) anchors to be installed upon obtaining the required DEQ and USACE permits authorizing installation of these anchors.

On March 15, 2018, Enbridge applied for permits from the DEQ and the USACE to install 48 anchors required under the Third Modification. Enbridge's application to the USACE also sought authorization to install the three (3) anchors requiring excavation that were not covered under the 2017 USACE permit.

Following additional analysis of the 2018 Dual Pipeline inspection information, Enbridge identified that three (3) additional screw anchors would be required to meet the span management criteria set forth in ¶ 68.b of the Third Modification of the the Consent Decree. Therefore, Enbridge determined that the modified SAWP scope of work for 2019 would require installation of fifty-four (54) screw anchors, bringing the total SAWP scope of work to installation of 73 anchors. In September 2018, Enbridge sent a modification to the DEQ and the USACE to seek authorization to install these 3 additional anchors. As such, Enbridge requested permits from the Michigan DEQ and the USACE to install a total of 54 anchors on the Dual Pipelines.

On November 30, 2018, the DEQ provided the notice of authorization to allow Enbridge to install 54 anchors. However, Enbridge could not proceed with the installation of the 54 anchors until the USACE also issued its permit. Enbridge anticipated receiving a permitting decision from the USACE by mid-July 2019; this timeframe was based on correspondence/conversation with the USACE on May 17, 2018 where Enbridge was advised the permit process typically takes 6-9 months for a final decision. Enbridge then received two sets of information requests from the USACE concerning its pending application. The first set of information requests was received on June 11, 2019 to which Enbridge provided responses on June 24, 2019. The second set of information requests was received on July 1, 2019. Enbridge submitted responses on July 23, 2019.

On August 9, 2019, Enbridge sent a letter to the EPA advising of potential delays in installing all screw anchors by the October 1, 2019 deadline; delays attributed to the USACE permit not yet received. As noted above, Enbridge received the USACE permit on September 20, 2019 authorizing the installation of 54 screw anchors.

Screw Anchor Installation Execution

Enbridge's 2019 SAWP objective was to install all 54 remaining screw anchors by October 1, 2019. This objective was established based on the assumption that all required permitting to install the 54 anchors would be received by July 15, 2019. In preparation for the program to begin, Enbridge held a Kick off Meeting on May 29, 2019 with all contractors and sub-contractors, where they were provided the SAWP. The specific locations of the anchors to be installed in 2019 were provided to both the marine contractor, Ballard Marine Construction ("Ballard"), as well as the ITP prior to commencement of work.

On June 2, 2019, in anticipation of receiving the USACE permit by June/July 2019, Enbridge commenced inspecting the specific locations where anchors were to be installed. Enbridge inspected forty-nine (49) (out of 54) of the anticipated anchor landing locations and repaired coating where required. Enbridge could not complete the coating inspection on the remaining five (5) sites as doing so would required Enbridge to await the USACE permit authorizing excavation.

¹ Following consultation with the Independent Third Party (ITP), two (2) screw anchors were installed more than 5 ft from the initially planned locations. This decision was made to maximize the anchors by installing them 75 ft. North and South of existing adjacent anchors. Coating inspections were performed prior to screw anchor installation to ensure that saddles were not installed directly on calcareous deposits and/or bare metals. Enbridge chose to complete coating repairs at two (2) locations prior to the anchor installations due to calcareous deposits or bare metals being discovered at the desired landing locations.

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On September 24, and following receipt of the USACE permit, Enbridge installed the first screw anchor in 2019. This installation was prioritized to eliminate an 81ft span on the Dual Pipelines at E-01B-B. Following this installation, Enbridge continued with additional screw anchor installations through the duration of the 2019 work season.

Enbridge worked in the Straits until November 23, 2019, at which time the weather became less favorable for diving operations. Enbridge was able to install 34 anchors out of the 54 anchors originally planned for installation, as noted above.

Enbridge has installed an aggregate of 53 anchors out of 73 planned anchors included in the SAWP. The remaining screw anchors are planned to be installed in 2020. Screw anchor installation work was performed safely and in accordance with Enbridge's screw anchor installation procedures and in compliance with applicable federal, state, and local regulations.

Screw Anchor Procedures

Ballard Marine executed the work in accordance with the Procedures that were incorporated into the SAWP, and are outlined below.

Summary of "Screw Anchor Installation Procedure," Ballard Marine Construction – this procedure is utilized to ensure both a safe and quality install of each screw anchor.

Enbridge "Line 5 Coating Inspection During Screw Anchor Installation" Work Instruction – detailed work instruction to ensure sufficient pre and post-inspection of the pipe coating occurs to identify any coating damage, or bare metal caused by anchor installation.

Enbridge "Application of Underwater Repair Coatings for Line 5 Straits" – this procedure outlines required installation instructions to ensure the coating is repaired in accordance with the coating manufacturer's and Enbridge's specifications.

Diver Training and Qualification

Ballard Marine was the primary contractor performing the screw anchor installations, coating inspections and any required coating repairs. In order to support the successful implementation of the screw anchor installation, the divers were Operator Qualified (OQ) for the work to be completed. To meet 49 CFR 195.559 requirements for Operator Qualifications, any contractor that is performing an OQ task is required to complete training modules and hands-on training to demonstrate they are qualified. This training process is designed to deliver the basic skills required for each task. Each crew was trained in 2019 and OQ training for the crew from the 2019 scope of work met all requirements. The results of the OQ training have been uploaded to ISNET world, Enbridge's contractor credential management tool. To supplement the OQ certification process, Enbridge representatives of the coating manufacturers, performed specific training for divers concerning the materials and coating applications that were to be used for any underwater coating repairs.

Monitoring of Screw Anchor Locations and Compliance Verification

Enbridge's marine contractor utilized an ROV with an Ultra Short Baseline (USBL) sonar positioning system that provides GPS coordinates of the remotely operated vehicle. This system allows the marine contractor to verify the GPS coordinates of both existing anchors as well as a new anchor installation location. Due to the requirement to safeguard critical infrastructure information, the GPS coordinates are not included in this report, however, chainage values have been reported herein. As chainage values are based on inline inspection pipe coordinates vs. USBL remotely operated vehicle (ROV) GPS

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coordinates, additional calculation is required to compare chainage distances to one another. The results of these calculations are summarized in Table 1 and have been previously reviewed by the ITP prior to inclusion in this report.

The ITP was given access to verify the anchor installation location in real-time through reviewing the GPS position of the ROV at the time of installation, as well as the GPS position of any reference anchors. Compliance consultation was documented during execution and is summarized in Table 1 below.

Screw Anchor Work Plan Deviations

Screw Anchor Location Deviations

As outlined in the SAWP, "if Enbridge determines that it is impracticable to complete installation of any screw anchor at the location specified, then Enbridge may modify the location after consulting with the ITP. The decision that a location is impracticable to complete the installation will be made by the Project Manager in consultation with the ITP, third party marine contractor, and Enbridge's Pipeline Integrity department. The alternative location will be selected to ensure that the spans do not exceed 75 feet. Any deviation needs to be documented on the Screw Anchor Installation Inspection - L5 Straits of Mackinac Compliance Verification Checklist." In 2019, there were two screw anchor installation location deviations of note. Enbridge followed the deviation procedures described in the SAWP to ensure the appropriate approvals were received.

During the 2019 work season, through the work of divers, Enbridge learned that one unsupported span identified in 2018 had extended to eighty-one (81) feet, six (6) feet longer than the maximum allowable span length of seventy-five (75) feet as specified in the Consent Decree. Further, on the north side of this span, the sandy lake bottom supporting the pipeline had shortened to less than forty (40) feet, which is less than the length of sandy lake bottom required to provide adequate support for the pipeline, as specified under the proposed Consent Decree Third Modification. Accordingly, Enbridge proposed to relocate one of its 2017 proposed screw anchors, EAP-5, twenty-three (23) feet north of the Third Modification proposed location to eliminate the 81-foot unsupported span while ensuring the anchor was adequately supported in firm lakebed on the north end of the span. The proposed relocation was communicated to the ITP in advance of anchor installation. Enbridge received no objection from the ITP regarding the proposed new location.

Additionally, though Enbridge has not observed any change in length of the unsupported span, Enbridge proposed moving the location of one additional screw anchor as a preventive measure to ensure that the pipeline will be supported in the event that the span grows to exceed 75 feet in the future. Specifically, the screw anchor, known as EAP-15 was located approximately 21 feet to the north of the location set forth in Table 1 of the Consent Decree Third Modification (approved September 20, 2019).

Table 1 below summarizes location information for the screw anchors installed in 2019, including two (2) anchor installation locations which had to be moved by approximately 22.5 ft, based on the GPS data. This decision was made to maximize the anchors by installing them 75 ft. North and South of existing adjacent anchors. Enbridge modified the location of those two anchors after consulting with the ITP. None of the modified anchor locations caused spans in excess of 75 ft.

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Table 1: Line 5 Straits 2019 Anchor Installation Location Confirmation Summary

Proposed Screw Anchors	Actual Location within 5 ft of the Target Location? (Y/N)	Location Deviation >5 ft Consulted with the ITP? (Y/N)	Proposed Location of the Anchor (Chainage)	Actual Location Deviation (ft)	Any Span Exceeding 75 feet Post Deviation (Y/N)	Comments
2019 Installed Anchors						
WP-17-17	Y		2008190.9	0.0	N	
EAP-1	Y		1999326.4	2.75	N	
EAP-5	N	Y	2000477.3	22.5	N	The ITP representative was consulted about the final anchor location on June 30, 2019. The ITP representative had no objection to the final anchor location.
EAP-13	Y		2002791.7	1.6	N	
EAP-14	Y		2003900.1	3.9	N	
EAP-15	N	Y	2004284.9	22.25	N	The ITP representative was consulted about the final anchor location on June 29, 2019. The ITP representative had no objection to the final anchor location.
EAP-16	Y		2004441.2	1.0	N	
EAP-17	Y		2005871.7	1.5	N	
EAP-18	Y		2006087.0	1.08	N	
EAP-19	Y		2007120.0	2.0	N	
EAP-20	Y		2007206.8	4.9	N	
EAP-21	Y		2007279.2	1.8	N	
EAP-22	Y		2007341.1	0.0	N	
EAP-23	Y		2007762.1	2.9	N	

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EAP-24	Y		2007811.5	2.3	N	
EAP-26	Y		2008651.4	0.0	N	
EAP-27	Y		2008876.4	2.0	N	
EAP-30	Y		2007996.7	2.75	N	
WAP-1	Y		1999044.3	1.6	N	
WAP-2	Y		1999255.9	0.3	N	
WAP-5	Y		2003279.8	2.0	N	
WAP-7	Y		2003977.5	1.5	N	
WAP-8	Y		2004173.4	0.4	N	
WAP-9	Y		2004955.4	5.0	N	
WAP-10	Y		2005242.1	0.0	N	
WAP-11	Y		2006542.4	0.6	N	
WAP-13	Y		2007376.7	0.6	N	
WAP-14	Y		2007440.5	0.5	N	
WAP-15	Y		2007509.7	0.3	N	
WAP-16	Y		2007877.7	0.8	N	
WAP-17	Y		2008591.6	2.4	N	
WAP-18	Y		2008635.3	2.3	N	
WAP-19	Y		2008853.4	0.0	N	
WAP-20	Y		2009656.5	2.2	N	

Coating Repairs

As outlined in the SAWP, Enbridge will repair the coating at any discovered areas of (i) bare metal or (ii) coating damage caused by screw anchor installation.

During the 2019 work period, Enbridge completed pre-installation inspection of all of the remaining proposed anchor installation sites with the exception of five (5) sites requiring some degree of excavation of the lakebed prior to completion of inspection (WP-17-14, EAP-28, WAP-4, WAP-12, and WAP-21). Through the 2019 pre-installation inspections activities, Enbridge identified one (1) site meeting the coating holiday criteria (WAP-11). Enbridge completed a coating repair at this location on June 3, 2019. Spanning all of Enbridge's implementation of the SAWP (2018 – present), Enbridge has identified a total of two (2) sites meeting the coating holiday criteria (WAP-11 (2019) and WAP-19 (2018)). The bare metal at both sites has been successfully repaired. Post-installation inspections of the coating at anchor installation sites has confirmed that no coating damage has been caused by the 2019 screw anchor installations.

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Enbridge opted to extend coating activities beyond the repaired area at the WAP-19 site, to help ensure the quality of the original coating's transition to the newly applied coating. As a result of this coating transition work, an area of 0.2499 square feet was left bare near WAP-19, which will be coated during the 2020 work season. The bare area is at a very low risk of developing any kind of corrosion defect as the close interval survey confirmed that the existing cathodic protection system continues to perform as intended.

Table 2: Coating Inspection Results and Repairs at the 2019 Screw Anchor Installation Locations

Anchor Location	Repair Necessary	Date Repair Completed (MM/DD/YYYY)	Pre-Installation Inspection	Post-Installation Inspection
			Bare Metal	Coating Damage
WP-17-17	N	N/A	0	No
EAP-1	N	N/A	0	No
EAP-5	N	N/A	0	No
EAP-13	N	N/A	0	No
EAP-14	N	N/A	0	No
EAP-15	N	N/A	0	No
EAP-16	N	N/A	0	No
EAP-17	N	N/A	0	No
EAP-18	N	N/A	0	No
EAP-19	N	N/A	0	No
EAP-20	N	N/A	0	No
EAP-21	N	N/A	0	No
EAP-22	N	N/A	0	No
EAP-23	N	N/A	0	No
EAP-24	N	N/A	0	No
EAP-26	N	N/A	0	No
EAP-27	N	N/A	0	No
EAP-30	N	N/A	0	No
WAP-1	N	N/A	0	No
WAP-2	N	N/A	0	No
WAP-5	N	N/A	0	No
WAP-7	N	N/A	0	No
WAP-8	N	N/A	0	No
WAP-9	N	N/A	0	No
WAP-10	N	N/A	0	No
WAP-11	Y	6/3/2019	0.2083	No
WAP-13	N	N/A	0	No
WAP-14	N	N/A	0	No
WAP-15	N	N/A	0	No

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WAP-16	N	N/A	0	No
WAP-17	N	N/A	0	No
WAP-18	N	N/A	0	No
WAP-19	Y	10/1/2018	0.0521	No**
WAP-20	N	N/A	0	No

** 0.2499 sq. ft. of pipe was left bare as a result of coating transition activities at WAP-19.

Reporting

Per ¶ 68.e. of the Consent Decree, Enbridge will submit a final report to the EPA within 60 days of completion of the SAWP.

Appendix A: 2019 Screw Anchor Work Plan – Interim Report - Coating Repair Forms for L5 Straits of Mackinac

Screw Anchor Work Plan

2019 Interim Report

Appendix A:

Coating Repair Forms for L5 Straits of Mackinac

United States v. Enbridge Energy et al Case 1:16 –cv-914

(January 22, 2020)

Consent Decree	VII. Injunctive Measures, E. Measures To Prevent Spills In The Straits Of Mackinac, ¶ 68, Span Management Program		
Version	1.0	Version Date	January 22, 2020

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General Information

Date:	06/11/19, 06/26/19	Diver:	[REDACTED]
AFE / W.O.#:	20016144	Company Inspector:	[REDACTED]
Segment:	WAP-11	Water Depth (ft):	127
Longitude:	[REDACTED]	Latitude:	[REDACTED]

Material Information

Product Name/Batch Number	Belzona 1161 / A: 18010056 B:18010058	Expiration Date:	01/2021
Product Name/Batch Number		Expiration Date:	
Product Name/Batch Number		Expiration Date:	
Product Name/Batch Number		Expiration Date:	

Temperature (°F):	45, 50	Wall Thickness Measurements (mil):	AVG: .800
Location of the Coating Repair:	Feature 3: 3' South 1:30 Feature 4: 3' South 12:30	Coating Repair Method #:	3

Quality Assurance During Application

<input checked="" type="checkbox"/>	The steel surface was cleaned using scarpers, hydroblasting cleaning, wet abrasive blasting, or wire wheel brush. The repair area was abraded to bare metal and the majority of the existing primer has been removed (4.1).
<input checked="" type="checkbox"/>	Feathering removed the sharp edge at the transition from the parent coating. The parent coating was roughened (abraded) using a cup disk brush to remove the loosely adherent biota, coating and provide a surface for overcoating (4.2).
<input checked="" type="checkbox"/>	HOLD POINT – Diver cannot proceed without approval from the Inspector that the surface preparation is acceptable for coating application. The Diver removed any flash rust and/or accumulated debris (silt, clay, etc.) using a wire brush or other method approved by the Manufacturer (5.1). <i>The majority of the existing primer has been removed.</i>
<input checked="" type="checkbox"/>	The diver applied sufficient epoxy filler so that the bare steel is completely covered and the repair area is flush with the adjacent parent coating (5.2).
	If using Method #1 or #2, the Full Circumferential Composite Wrap Repair (5.3) or Composite Patch Repair (5.4) applied in accordance with the coating procedure.
<input checked="" type="checkbox"/>	Release film or alternative protective wraps/encasements allowed by the coating Manufacturer applied over the composite wrap, patch repair, or epoxy filler.

After Cure of Coating Repair

Date:	06/26/19	Cure Time (days):	15
Temperature (°F):	50	Shore D Hardness:	Avg: 85
Total thickness measurements of the Coating Repair (mil):	DFT verified via "straight edge. Parent Coating AVG: 72		

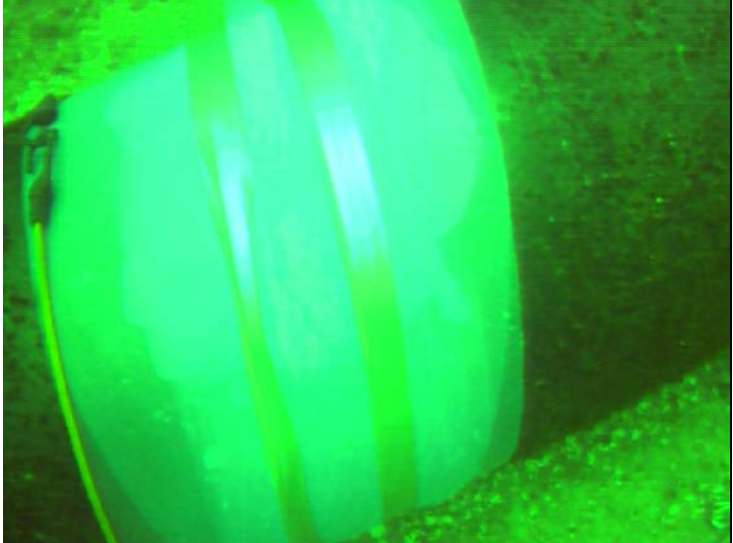
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Comments/Issues/Discussion

1/24/2020

Signed by:

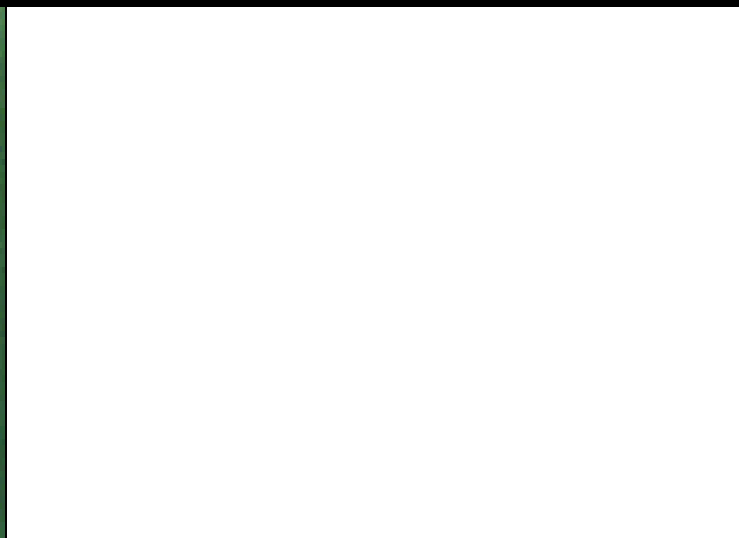
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Surface of the pipe after composite wrap (if applicable).				Surface of the pipe after release film application.			
							

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Surface of the pipe after cure and removal of release film.

[Additional Photograph Caption]



Date:	06/26/19	Frame (HH:MM:SS)	00:08:36	Date:		Frame (HH:MM:SS)	
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General Information

Date:	08/29/18, 08/31/18, 09/13/18, 09/14/18, 09/15/18, 09/17/18, 10/01/18	Diver:	
AFE / W.O.#:	20008990	Company Inspector:	
Segment:	WAP-19	Water Depth (ft):	77
Longitude:		Latitude:	

Material Information

Product Name/Batch Number	PRT BIO DUR 563SW/A:17T-715 B:17T-717	Expiration Date:	11/06/19
Product Name/Batch Number	X100UW A: 18T-268 B: 18T269	Expiration Date:	05/21/20
Product Name/Batch Number	PRT X-100 UW Composite Repair Reinforcement Wrap	Expiration Date:	N/A
Product Name/Batch Number		Expiration Date:	

Temperature (°F):	50, 55, 63, 60, 62, 60, 60	Wall Thickness Measurements (mil):	AVG: 0.832
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Location of the Coating Repair:	Repair area 1: 3'5" South 6:00	Coating Repair Method #:	1
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Quality Assurance During Application

<input checked="" type="checkbox"/>	The steel surface was cleaned using scarpers, hydroblasting cleaning, wet abrasive blasting, or wire wheel brush. The repair area was abraded to bare metal and the majority of the existing primer has been removed (4.1).
<input checked="" type="checkbox"/>	Feathering removed the sharp edge at the transition from the parent coating. The parent coating was roughened (abraded) using a cup disk brush to remove the loosely adherent biota, coating and provide a surface for overcoating (4.2).
<input checked="" type="checkbox"/>	HOLD POINT – Diver cannot proceed without approval from the Inspector that the surface preparation is acceptable for coating application. The Diver removed any flash rust and/or accumulated debris (silt, clay, etc.) using a wire brush or other method approved by the Manufacturer (5.1). <i>The majority of the existing primer has been removed.</i>
<input checked="" type="checkbox"/>	The diver applied sufficient epoxy filler so that the bare steel is completely covered and the repair area is flush with the adjacent parent coating (5.2).
<input checked="" type="checkbox"/>	If using Method #1 or #2, the Full Circumferential Composite Wrap Repair (5.3) or Composite Patch Repair (5.4) applied in accordance with the coating procedure.
<input checked="" type="checkbox"/>	Release film or alternative protective wraps/encasements allowed by the coating Manufacturer applied over the composite wrap, patch repair, or epoxy filler.

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After Cure of Coating Repair

Date:	10/01/18	Cure Time (days):	14
Temperature (°F):	60	Shore D Hardness:	AVG: 78
Total thickness measurements of the Coating Repair (mil):	AVG: 180		

Comments/Issues/Discussion

1/24/2020

[Redacted Signature]

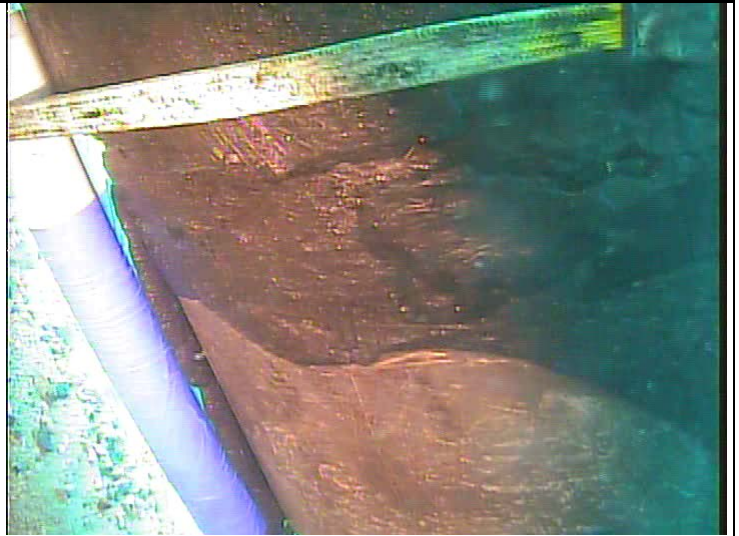
Signed by:

[Redacted Signature]

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Surface of pipe after surface preparation.

Surface of the pipe after epoxy filler application.



Date:	09/14/18	Frame (HH:MM:SS)	01:31:38
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Date:	09/14/18	Frame (HH:MM:SS)	00:25:25
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Surface of the pipe after composite wrap (if applicable).

Surface of the pipe after release film application.



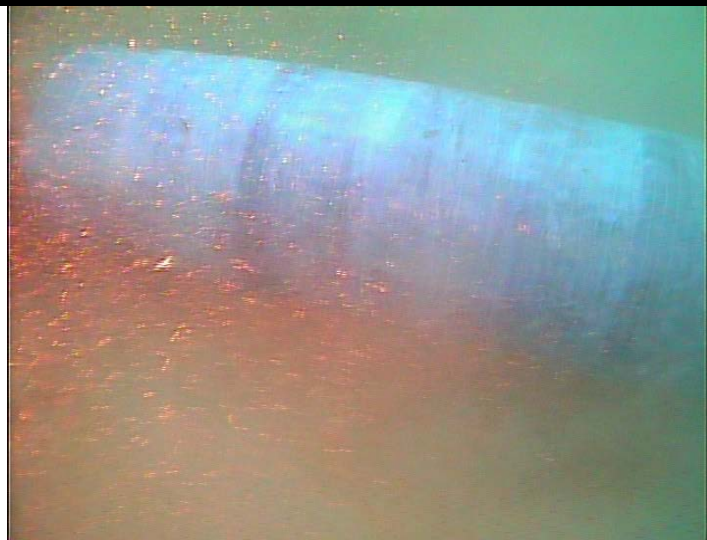
Date:	09/17/18	Frame (HH:MM:SS)	00:14:42
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Date:	09/14/18	Frame (HH:MM:SS)	01:26:25
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Surface of the pipe after cure and removal of release film.

[Photograph of 2 wraps applied]



Date:	10/01/18	Frame (HH:MM:SS)	00:14:11	Date:	09/15/18	Frame (HH:MM:SS)	01:03:20
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