NW Natural®

250 SW Taylor Street
Portland, OR 97204

503-226-4211
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February 24, 2023

Mr. Randall Bailey
Oregon Department of Environmental Quality
Northwest Region
700 NE Multnomah St.
Suite 600
Portland, OR 97232

Subject: Annual Flow Meter and Outfall Inspections, NW Natural Source Control Groundwater Treatment Facility, 7900 NW St. Helens Road, Portland, NPDES Permit Number 103061 (permit renewal application pending)

Dear Mr. Bailey:

We have conducted an annual inspection of the NW Natural Groundwater Treatment System effluent flow meter and outfall/diffuser. As per our past flow meter and outfall inspection reports, I am providing the following summary of the inspection procedures and the results of those inspections.

Flow Meter Calibration

Schedule F, Paragraph C2 of the NPDES permit requires that the flow meters read accurately within +/- 10% to ensure that the measurements of the volume of monitored discharges are accurate. The compliance flow meter (FIT-600) was tested on December 15, 2022. The manufacturer's flow meter calibration tests for this meter are attached.

The manufacturer's calibration tests were performed at a range of conditions to verify that the compliance effluent flow is measuring flow accurately, within the limits of the flow meter technology. The manufacturer's tests indicated that the flow meter accuracy range is **+/-0.05%**, far more accurate than the required standard.

Note that a concern was raised about the magnetic test which was slightly outside of prescribed manufacturer's limits. We have questioned the results with the manufacturer (correspondence

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attached to this letter) and have been advised that the FIT-600 result was impacted by the temperature difference measured in the field versus the standard factory temperature. We were also advised in the same correspondence that this magnetic test result had no impact on the accuracy of the flow meter.

Outfall Inspection Report

Table B2 of the NPDES permit requires that the condition of the GTS plant outfall and diffusers be inspected on an annual basis. On November 15, 2022 a dive team inspected the outfall and diffuser and provided us with a written report and video of the inspection. The inspectors found that, although marine growth was prevalent on the underwater portions of the outfall and diffuser, both the outfall and diffuser were in good condition and operating normally. The installed sacrificial anode was noted to be working well to reduce corrosion of the outfall pipe.

The outfall inspection summary report is attached. A video of the outfall and diffuser, safety protocols, and pre-dive procedures are on file in the GTS plant office.

Certification

I certify under penalty of law that this document and all documents were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violation.

If you have any questions about If this package, please contact Terry Driscoll at Aponowich, Driscoll & Associates, Inc., at (404) 641-8107, tpdriscoll@mindspring.com.

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Very truly yours,

Kathryn Williams
Vice President of Public Affairs
NW Natural

Attachments:

- December 15, 2022 Siemens Factory Flow Meter Calibration Report for FIT 600 and Factory Correspondence
- Dive Inspection Report from Advanced American Construction, Inc. dated November 23. 2022

Advanced American Construction

Advanced-American.com

DIVE INSPECTION REPORT

NW Natural - Gasco Willamette River Outfall Diffuser Inspection

Sevenson Environmental Services, Inc

REPORT DATE: **November 23, 2022**

PREPARED FOR: **William "Chip" Byrd**

PREPARED BY: **Dan Simpson**
Advanced American Construction

AAC Job Number: 1121-100

November 23, 2022

William “Chip” Byrd
Sevenson Environmental Services, Inc
2749 Lockport Rd
Niagara Falls, NY 14305

Phone: 716-583-2754
Email : wbyrd@sevenson.com

Diving Inspection Report

NW Natural Gasco Willamette River Outfall Diffuser Inspection

Inspection Date November 15th, 2022

Job Location: 7900 NW Saint Helens Rd, Portland, OR / Willamette RM 6

On November 15th, 2022, Advanced American Construction, Inc. (AAC) supplied a three-man dive crew for inspection at the NW Natural Gasco Willamette River Outfall Diffuser. The dive team was equipped with a surface supplied air dive system, underwater video and topside communication. The crew was staged from a 26’ dive boat and secured to the dock. The crew launched the dive boat at AAC’s shop and traveled to the site.

Background: The outfall consists of an 8’’ diameter steel pipe that extends downward into the water. A flange connection then directs the pipe 90 degrees to the horizontal direction inshore. Four - 2” diffuser ports are attached to the crown of the main outfall pipe and have a 24’’ spacing, extending 22” vertically with a 45-degree bend at the top pointing downstream. At the end of the outfall pipe is a blind flange bolted to the pipe. The main pipe is welded to a horizontal member above surface for support. Additionally, a piece of vertical channel extends down into the water and is welded to the main outfall pipe between diffusers #3 and #4.

Scope of Work:

AAC dive crew performed an inspection of the outfall piping to determine current conditions and functionality

- Main 8” outfall pipe condition
- All flange connections and hardware conditions
- Diffusers #’s 1, 2, 3, and 4 conditions
- Welded supports conditions
- Anode Inspection

Conditions Found

Main 8” outfall pipe:

- Pipe had both minor corrosion and marine growth build up present.
- The overall integrity of the pipe was determined to be good with no discrepancies noted.
- Pipe was securely hanging in the water column with very little movement when checked by the diver.

Flange connections:

- Both the vertical flange that was installed prior to the 8” main pipe turns horizontal in water and the blind flange had all hardware present and tight. Hardware and flange corroded and marine growth build-up present.

Diffusers:

- Diffuser #1 – Welded connection to crown of main 8” pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. The diffuser was not obstructed, and no cover or screen was present. A light amount of air bubbles exited the diffuser with the effluent.
- Diffuser #2 - Welded connection to crown of main 8” pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. The diffuser was not obstructed, and no cover or screen was present.
- Diffuser #3 - Welded connection to crown of main 8” pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. The diffuser was not obstructed, and no cover or screen was present.
- Diffuser #4 - Welded connection to crown of main 8” pipe was in good condition with no cracks. Pipe had both rust corrosion and marine growth build up present. The diffuser was not obstructed, and no cover or screen was present.

Welded metal supports:

- Above surface horizontal support welded to 8” outfall pipe was in good working order with no broken welds present.
- Below water vertical channel that is welded to 8” outfall pipe was in good working order with no broken welds present. The Below water section was covered with marine growth and minor pitting is present.

Effluent Flow:

- The diver noted that diffuser #1 had the strongest flow and it began tapering down as he moved down to each diffuser with #4 being the weakest.

Sacrificial Anode:

- An 8-pound sacrificial zinc anode was welded to the 8” mainline between diffusers #2 and #3 in 2020. The anode is in good condition with approximately 95% life remaining.
- The Diver reported minor pitting of the steel throughout the outfall estimating approx. 1/16” deep, virtually the same as observed in previous years. The sacrificial anode seems to be functioning as intended.

A link for the final inspection video will be provided by email.

Thank you for the opportunity to work with you on this project. If you have questions, please contact me directly at 503-445-9000.

Sincerely,

Dan Simpson
Advanced American Construction, Inc.

DIAGRAMS & PICTURES

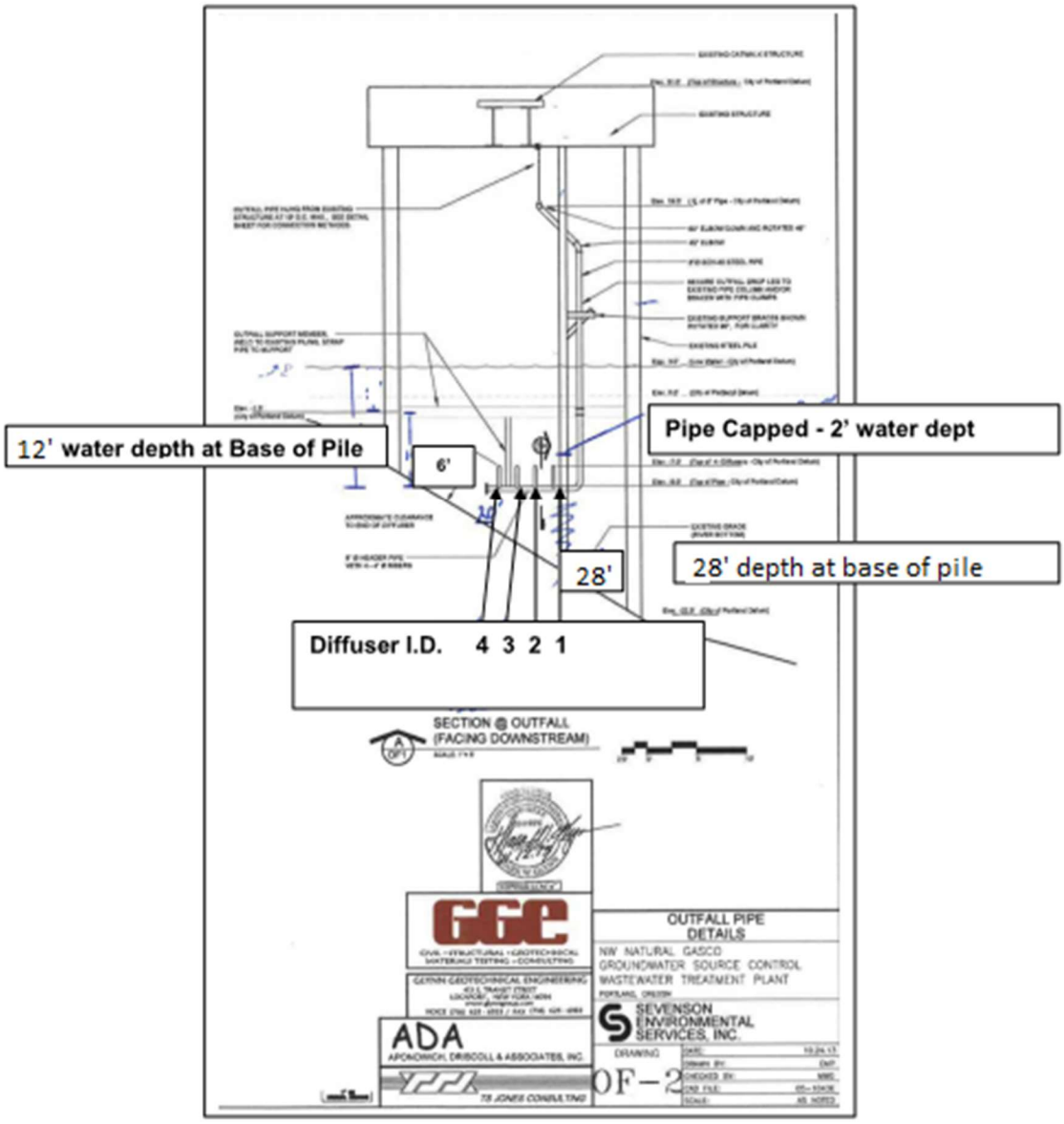


Figure 1- Sevenson Environmental Services, Inc Outfall Pipe Details. Dwg. No. OF-2 Section A

Figure 2 - Gasco outfall as it enters the water.

Figure 3 - Outfall channel iron support.

Figure 4 - AAC Diver cleaned the hardware and connections.

Figure 5 - Flow from diffuser #1

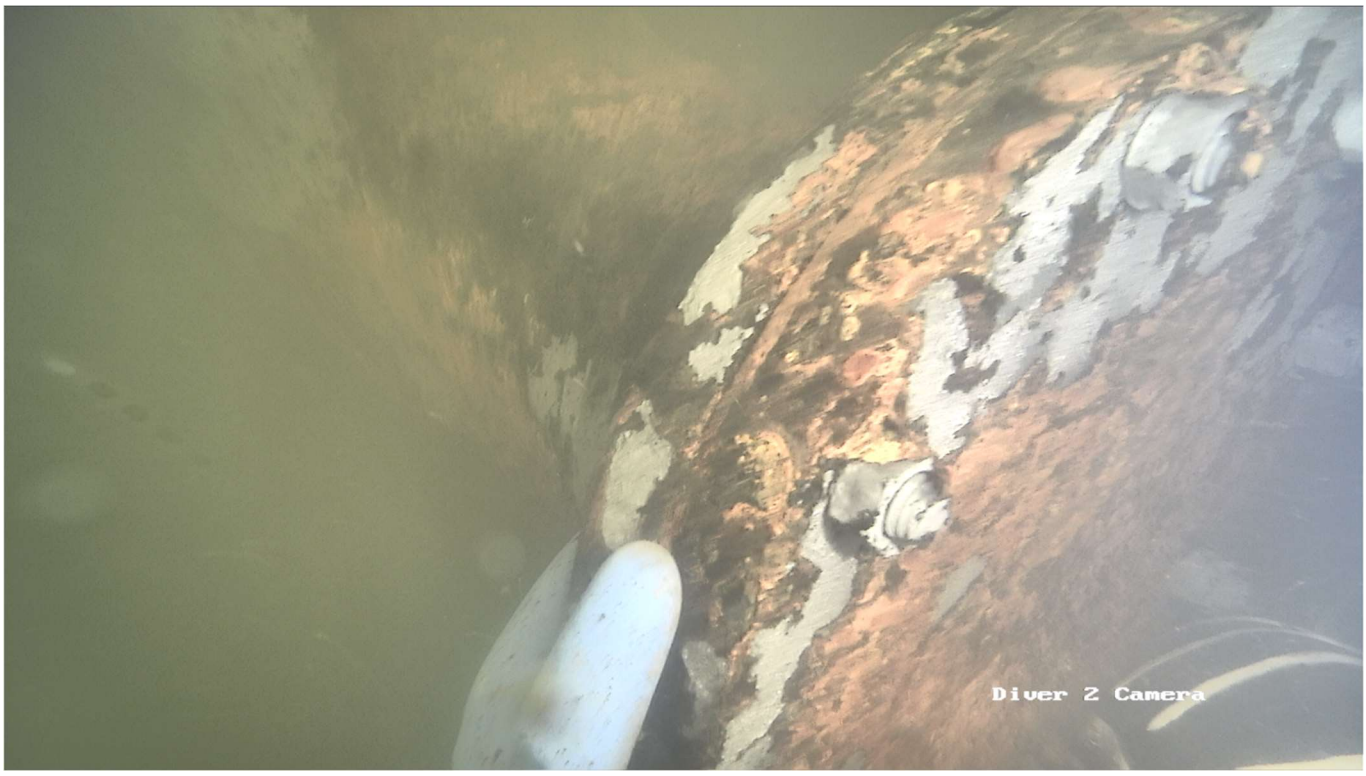


Figure 6 - Blind flange hardware in good condition.

Figure 7 - Sacrificial anode in good condition.

Figure 8 - Weld connection diffuser #1

Figure 9 - Minor pitting present (typical).

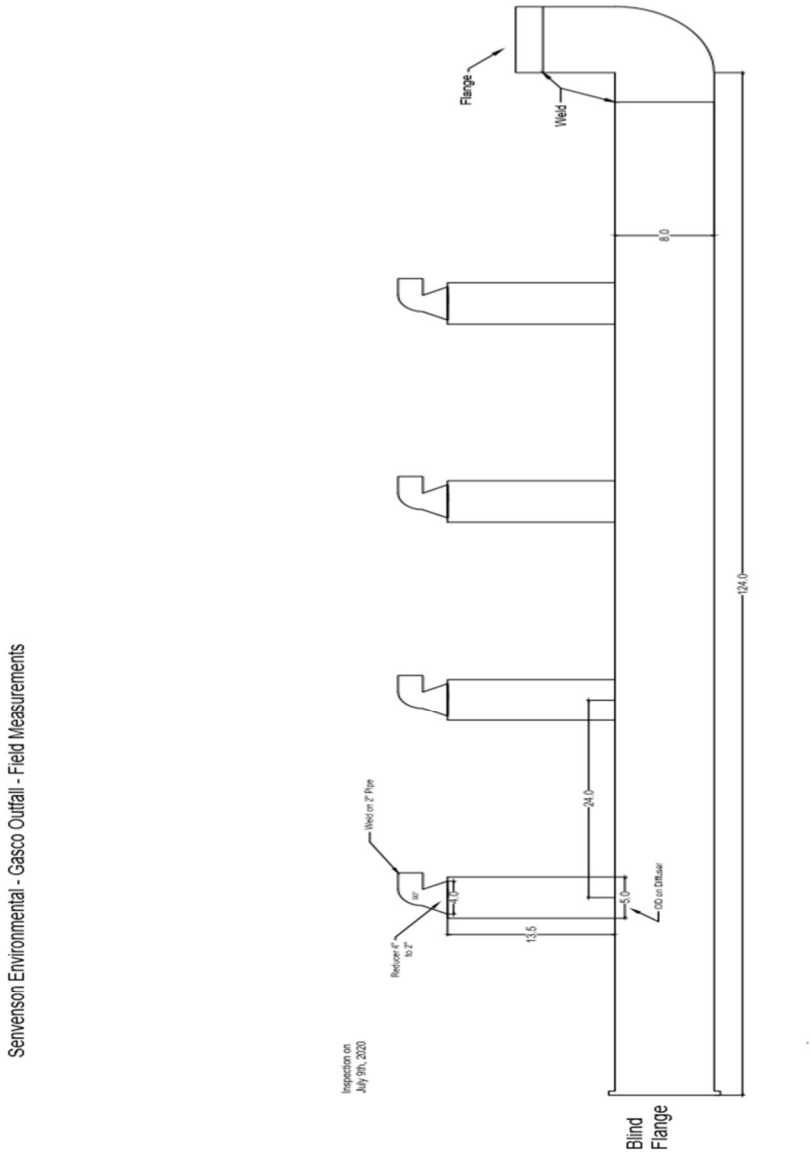


Figure 10 – Diffuser Section Field Measurements, 2020

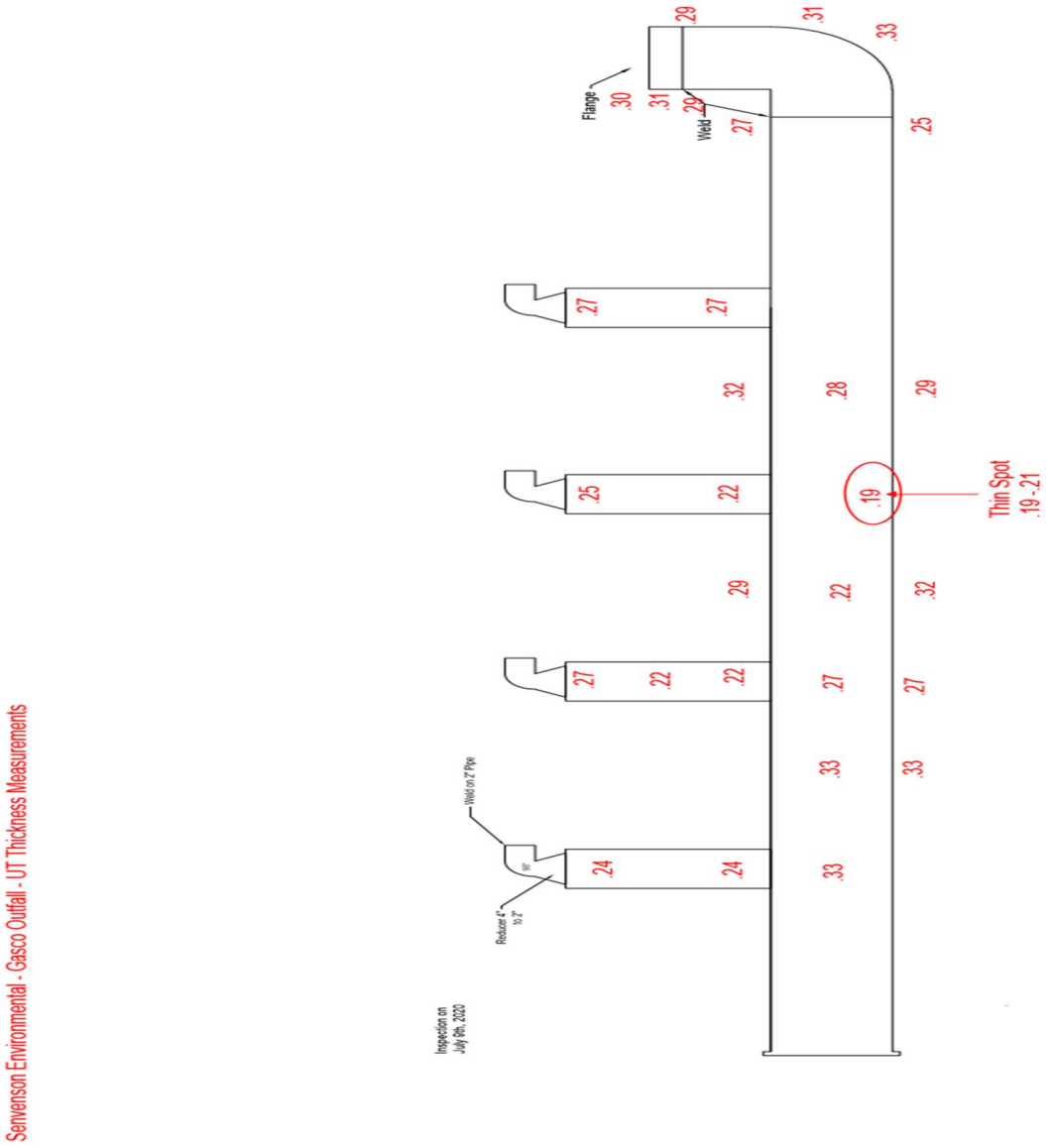
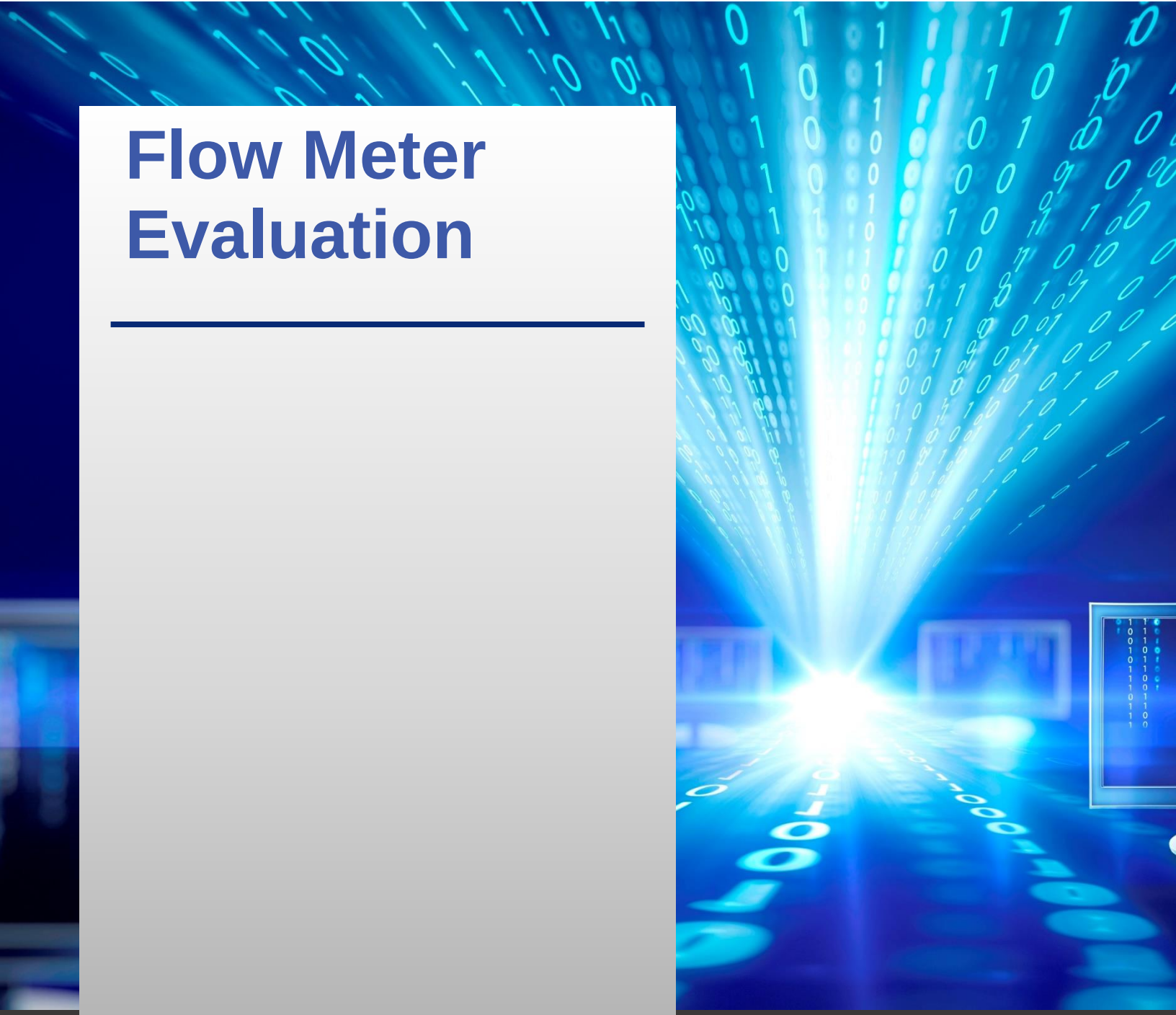


Figure 11 – Diffuser Section UT Thickness Measurements, 2020



Flow Meter Evaluation

JANUARY 23, 2023

Sevenson Environmental
FIT-600 – Flow Meter Testing

Industrial Systems Inc.

EXECUTIVE SUMMARY

Sevenson Environmental Services has asked Industrial Systems to verify the flow meter which measures the effluent from the Gasco main plant which is discharged into the river. The flow meter instrument number is FIT-600 which is a Siemens MAGFLO 5000.

This report includes the testing method as well as the results of testing which was performed in December of 2022. Industrial Systems worked with the local Siemens Representative for the testing.

ANALYSIS METHOD

During the site visit the FIT-600 meter was confirmed using the Siemens SITRANS F M Verificator. The Verificator is a highly advanced instrument used to carry out the complex verification and performance check, according to unique Siemens patented principles. The Verificator checks not only the general operating conditions of the flow meter, but also that the flow meter is within specification. This includes the sensor's magnetic integrity.

The Verificator was rented from Siemens and undergoes annual testing and calibration to a NIST-Traceable standard using a third party. It was last calibrated on 09/21/2022.

The Verificator software interface allows for the user to print the test results in PDF format which is included as attachment A. The SensorProm holds the Fingerprint (unique sensor coil value) which is determined the day of calibration, and the Verificator does an “as found” value to compare it to the original value to see if the flow sensor tube has changed significantly from calibration day.

EQUIPMENT TESTS PERFORMED

1. Transmitter Test

a. The transmitter test verifies that the meter electronics are functional and within manufacturer tolerances.

2. Insulation Test

a. The insulation test verifies that the integrity of the sensor and system are within manufacturer tolerances.

3. Magnetism Test

a. The SensorProm holds the Fingerprint (unique sensor coil value) of the flow tube which is determined the day of calibration. The Verificator does an “as found” value to compare it to the original value to see if the flow sensor tube has changed significantly from calibration day.

b. It should be noted that the ambient temperature of the calibration laboratory and local flow meter are not the same. This will cause a deviation and if greater

than 2% the meter will fail this test. Siemens has reviewed the TST file data from the Verificator and states that the accuracy of the meter is not affected and also that the recorded 2.54% deviation is acceptable. (See Attachment B)

FINDINGS

a. FIT-600 receives a pass on calibration based on the Verificator testing performed. (See Attachment A)

Attachment A

SIEMENS MAGFLO® Verification Certificate

Customer:

Name	Sevenson\Gasco
Address	7900 St. Helens Rd.
	Portland, OR. 97210
Phone	503-286-1785
Email	wbyrd@sevenson.com

MAGFLO® Identification:

TAG No./Name	0
Sensor Code No.	7ME634
Sensor Serial No.	PBD-N2104501
Transmitter Code No.	7ME691
Transmitter Serial No.	N1N1130051
Location	Main Plant Effluent

Results:

Verification file name or No.		FIT-600
Transmitter		Passed
Sensor	Insulation	Passed
	Magnetic Circuit	Failed

Velocity	Current Output			Frequency Output		
Theoretical	Theoretical	Actual	Deviation	Theoretical	Actual	Deviation
0.5m/s	4.800mA	4.800mA	-0.01%	0.500kHz	0.499kHz	-0.17%
1.0m/s	5.600mA	5.601mA	0.04%	1.000kHz	1.000kHz	-0.03%
3.0m/s	8.800mA	8.801mA	0.03%	3.000kHz	3.001kHz	0.02%

Current Output 4-20mA Frequency Output 0-10kHz

Transmitter Settings:

Basic	Qmax.	2800.00 US G /min
	Flow Direction	Positive
	Low flow Cut-off	1.50%
	Empty Pipe	OFF
Output	Current Output	ON (4-20mA)
	Time Constant	5.0 Sec.
	Relay Output	OFF
	Digital Output	OFF
	Frequency Range	N/A
	Time Constant	N/A
	Volume/pulse	0.0 US G/p
	Pulse width	0.066 sec.
	Pulse polarity	Positiv
Totalizer 1 value before test		123.84276855 US MG
Totalizer 1 value after test		123.84276855 US MG
Totalizer 2 value before test		0.00628738 US MG
Totalizer 2 value after test		0.00628776 US MG
Operating time in days		390

Sensor Details:

Size	DN 150 6 IN
Cal. Factor	15.89269543
Correction Factor	1.0
Excitation Freq.	7.5Hz

Verificator Details (083F5061)

Serial No.	N1J7060001
Device No.	170022
Software Version	1.40
PC-Software Version	5.01
Cal. date	2022.09.21
ReCal. date	2023.09.21

Comments

Flow meter failed the Magnetism test, however, this is considered normal according to Siemens. See Attachment B for technical explanation.

These tests verify that the flowmeter is functioning within 2% deviation of the original test parameters.

Verification is traceable to National and International Standards.

Date and signature

Mike Ambert

2022.12.15 Mike Ambert

Mike W. Ambert

To: DI&SI Support USA
Subject: RE: SR= 1-6865155440 Need to speak with someone regarding the calibration test.

From: DI&SI Support USA <support.usa.automation@siemens.com>
Sent: Friday, January 20, 2023 10:35 AM
Subject: SR= 1-6865155440 Need to speak with someone regarding the calibration test.

To: mwa@industrialsystems-inc.com X-Mailer: Siebel 22.10.0.0 SIA [2022_10] X-MSMail-Priority: Normal X-Priority: 3

Hello Mike,

Below is the factory addressing the magnetism failure. They ask for a few items below.

Let me know if you have other units failing.

From Factory:

What do we measure during the Magnetism test? We measure the buildup time of the magnetic field of the coil. The coils are from copper and this material is sensitive to the temperature variations. Depending of the external/weather conditions of the sensor, the coil are reacting accordingly. That's why test results can vary between the factory and customer measures. It's effectively the case here. According to our analysis, the temperature during the tests by the customer has been lower than during the tests at factory.

The failed tests appears when the results are outside +/-2% but we know that this tolerance is too restrictive. That causes a lot of concerns for the customer experiencing a failed result at the magnetism test. That's why it's very important to highlight that the accuracy is not impacted at all and the sensor is working well. The 0.54% is of course above the tolerance but we consider it as acceptable.

Best Regards,
Frank Fromm

Siemens Industry, Inc.
Customer Services
Technical Support
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Outside USA +1 423 262 5710