

TEST SPECIFICATIONS						Date:		Select Routing:																																																									
Saddle Butte Rockies Midstream, LLC - Hydrostatic Pressure Test						28-Nov-2017																																																											
Rangeview D - Phase 2						Test Number: 1		of 1																																																									
Project Name: Rangeview D			Project I.D. / AFE Number 17C006A			Facility Name or Number Rangeview D - Phase 2																																																											
Installation Location (M.P. or S.S.):		State:	County/Parish:	Class Location Designation	N/A	Selected Design Pressure	1480	Planned MAOP	1400																																																								
181+56.4 to 288+86.6		CO	Weld																																																														
Project Description:																																																																	
Hydrostatic pressure test of the 8" lateral pipeline. * included piping for Elbert well connect																																																																	
Testing at 1.25*MAOP = 1850 psig minimum test pressure. 2092 psig Target Test Pressure at Chart Location																																																																	
Max Test Pressure for ANSI 600 Valves and Fittings is 2640 psig where they are located.																																																																	
Test shall be compliant with all test specifications in Exhibit D "Pipeline Construction Specifications" and all other Construction Documents.																																																																	
LEAK ONLY TEST <input type="checkbox"/> STRENGTH TEST <input checked="" type="checkbox"/> FABRICATION <input type="checkbox"/> NEW CONSTRUCTION <input checked="" type="checkbox"/> REPLACEMENT <input type="checkbox"/> RETEST <input type="checkbox"/> REFERENCE DRAWINGS ATTACHED <input type="checkbox"/>																																																																	
POST-INSTALLATION TEST <input checked="" type="checkbox"/> PRE-INSTALLATION TEST <input type="checkbox"/>																																																																	
Minimum Component Characteristics			Test Design Criteria			Test Section - Reference Data																																																											
Pipe Information <table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>O.D.</td><td>8.625</td></tr> <tr><td>Wall Thickness</td><td>0.219</td></tr> <tr><td>SMYS</td><td>52,000</td></tr> </table>			O.D.	8.625	Wall Thickness	0.219	SMYS	52,000	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> Input minimum and maximum pressure of test</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Input minimum and maximum %SMYS of test</td> <td></td> <td></td> </tr> <tr> <td></td> <td style="text-align: center;">Pressure (psig)</td> <td style="text-align: center;">% PIPE SMYS</td> </tr> <tr> <td>Max. Test Pressure (Pipe)</td> <td style="text-align: center;">2350</td> <td style="text-align: center;">89.0%</td> </tr> <tr> <td>Max. Test Pressure (Valves and Fittings)</td> <td style="text-align: center;">2640</td> <td style="text-align: center;">100.0%</td> </tr> <tr> <td>Min.</td> <td style="text-align: center;">1850</td> <td style="text-align: center;">70.1%</td> </tr> </table>			<input type="checkbox"/> Input minimum and maximum pressure of test			<input type="checkbox"/> Input minimum and maximum %SMYS of test				Pressure (psig)	% PIPE SMYS	Max. Test Pressure (Pipe)	2350	89.0%	Max. Test Pressure (Valves and Fittings)	2640	100.0%	Min.	1850	70.1%	<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td>Test Medium</td><td colspan="3">Water</td></tr> <tr><td>Test Duration</td><td>8</td><td colspan="2">Hours (min)</td></tr> <tr><td>Section Length</td><td>10,730</td><td colspan="2">Ft.</td></tr> <tr><td>Section Fill Volume</td><td>32,565</td><td colspan="2">Gal</td></tr> <tr><td>Max. Elevation Change</td><td>46</td><td colspan="2">Ft.</td></tr> <tr><td>Station Equations:</td><td>1</td><td>2</td><td>3</td></tr> <tr> <td>Back</td> <td style="text-align: center;">0+00</td> <td style="text-align: center;">0+00</td> <td style="text-align: center;">0+00</td> </tr> <tr> <td>Ahead</td> <td style="text-align: center;">0+00</td> <td style="text-align: center;">0+00</td> <td style="text-align: center;">0+00</td> </tr> </table>				Test Medium	Water			Test Duration	8	Hours (min)		Section Length	10,730	Ft.		Section Fill Volume	32,565	Gal		Max. Elevation Change	46	Ft.		Station Equations:	1	2	3	Back	0+00	0+00	0+00	Ahead	0+00	0+00	0+00
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Ahead	0+00	0+00	0+00																																																														
Valve/Flange ANSI Class Rating 600# Valves/Fittings																																																																	
Test Pressures																																																																	
Location	Station	Elevation (feet)	Max. psig.	% SMYS @ Max.	Min. psig.	% SMYS @ Min.	Variance psig.	Target psig.	% SMYS @ Target																																																								
BEGIN -	181+56.4	4650	2,330	88.2%	1,850	70.1%	480	2,090	79.1%																																																								
HIGH ELEVATION	181+56.4	4650	2,330	88.2%	1,850	70.1%	480	2,090	79.1%																																																								
LOW ELEVATION	260+00	4604	2,350	89.0%	1,870	70.8%	480	2,109	79.9%																																																								
END	288+86.6	4644	2,333	88.3%	1,853	70.2%	480	2,092	79.2%																																																								
Chart Location (Test Point)	288+86.6	4644	2,333	88.3%	1,853	70.2%	480	2,092	79.2%																																																								
REMARKS:																																																																	
ASME B16.5 2.6 System Hydrostatic Testing 2003: Flanged joints and flanged fittings may be subjected to system hydrostatic tests at a pressure of 1.5 times the 38°C (100°F) rating rounded off to the next higher 1 bar (25 psi) increment. Testing at any higher pressure is the responsibility of the user, taking into account the requirements of the applicable code or regulation.																																																																	
Test shall be compliant with all test specifications in Exhibit D "Pipeline Construction Specifications" and all other Construction Documents.																																																																	
PRE-TEST SPECIFIED / REVIEWED BY:			TEST PERFORMED / ACCEPTED BY:			POST-TEST REVIEWED BY:																																																											
Originator (Signature)	Date:	Test Performed by (Signature):			Date:	Compliance (signature)		Date:																																																									
Designed Reviewed if applicable (Signature)	Date:	Company Name (for Contractor or for Employee):			Date:	Engineering or Operations (Signature)		Date:																																																									
Compliance (Signature)	Date:	Witnessed & Accepted by Company Representative:			Date:	Actual MAOP																																																											



April 2006

MOP Establishment and Pressure Testing of Pipelines
TG1601.190

PAGE 1 OF 9

LIQUID PIPELINE
PRESSURE TEST
REPORT

Pressure Test Number

1

MOP of tested facility is

1400

PSIG

12-3-17

Company: Saddle Butte

Operations Area:

Project: Rangerview D

AFE: 17C006A

Pipeline:

Section:

Phase 2

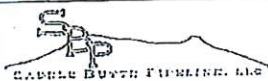
Station or Milepost

From:

181 + 56

To:

288 + 86

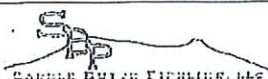


INSTRUCTIONS

PAGE 2 OF 9

In this worksheet, cells containing formulas are protected against input.
Cells with **BLUE** text labels allow or require input.

<i>General Information</i>	<ul style="list-style-type: none"> Complete this Report and attached necessary exhibits for all SBP installed pipelines or pipeline segments or those re-qualified for service. Fill in all applicable information. If information is not applicable, write NA in the corresponding space on the Report.
<i>Pipe Data</i>	<ul style="list-style-type: none"> Record the details for each pipe section tested, including lengths, line fill, pipe fittings, etc. Add together pipe section lengths and line fill for a total pipe section length and line fill.
<i>Test Water Data</i>	<ul style="list-style-type: none"> Enter water source information (i.e., from municipal supply, well, river, lake, pond) in the Test Log or notes section of the Report. Source water temperature compared to ground temperature can assist with understanding the time for the water to stabilize.
<i>Pressure Calculations</i>	<ul style="list-style-type: none"> Elevation of high and low points and the elevation of the test pressure measure sites is required for calculation of the target test pressures.
<i>Test Log</i>	<ul style="list-style-type: none"> Fill out the Test Log at the time of the test. This is the actual log of the test. From the start of filling the test section, record pressure readings from the calibrated test gauge or deadweight tester used in the test. Record the test pressure and temperatures at intervals of 30 minutes to an hour and as necessary to represent the test pressure during the test period. The below ground pipe temperature sensor should be placed away from exposed pipe and far enough from the water injection point so that water injected will not affect the readings. In the Remarks column, enter start of test, end of test, and any remarks concerning unusual events, such as liquid added or withdrawn, weather conditions, etc.
<i>Notes</i>	<ul style="list-style-type: none"> Enter all pertinent comments about the test, including such things as weather conditions, radical weather changes, equipment malfunctions, or any other noteworthy event that may affect testing.
<i>Profile</i>	<ul style="list-style-type: none"> An elevation profile is required for any test section where the elevation varies more than 100 feet. The following items should be noted on the profile: <ul style="list-style-type: none"> Location and elevation where test pressure measurements are taken High and low points Stationing or mileposts Horizontal and vertical scale of the drawing Elevation data is available in electronic format from the KPL mapping system. If electronic elevation data is not available, take profile elevations from survey information or from U.S. Geological Service 7 1/2 minute topographical maps.
<i>Failure Log</i>	<ul style="list-style-type: none"> Record each failure event that causes the line to be taken "off test". Enter the date, time, and pressure at the time of failure. List the apparent cause of the failure if the actual cause cannot be determined. Pipe seam failure or leaking flange, for example, could be entered as the cause of test failure. Describe the repair method (i.e., changed-out pipe or tightened flange).
<i>Supplementary Documentation</i>	<ul style="list-style-type: none"> Check each supplementary documentation attached as part of this test record (i.e., test charts and/or equipment certifications). Write the corresponding Exhibit Number on the attached supplementary documentation.
<i>Certification</i>	<ul style="list-style-type: none"> Signatures of the Company and Contractor representatives in charge of the test are MANDATORY.



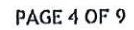
PRESSURE CALCULATIONS

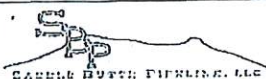
PAGE 3 OF 9

Location of Test Point <u>Elbert Pad</u>	Elevation of Test Point <u>4644</u> Ft. (Elevation) <u>288+86</u> Ft. (Station)	High Point <u>4650</u> Ft. (Elevation) <u>181+56</u> Ft. (Station) Location Name	Low Point <u>4604</u> Ft. (Elevation) <u>260+00</u> Ft. (Station) Location Name
Target MOP: <u>1400</u>	Test Duration: <u>6</u> hr	Start Point <u>4650</u> Ft. (Elevation) <u>181+56</u> Ft. (Station) Location Name	End Point <u>4644</u> Ft. (Elevation) <u>288+86</u> Ft. (Station) Location Name
Target Test Pressure Range 1st Min: <u>2092</u> Maximum: <u>2350</u> 2nd Min:	High Point Low Point		

TEST LOG

DATE	TIME	PRESSURE	AMBIENT TEMP	BELOW GROUND TEMP	ABOVE GROUND TEMP	REMARKS
12-3-17	5:30A	0	25	39	71	
	5:45	0	25	39	72	Build to 500
	5:45	515	25	39	72	
	6:00	515	26	39	73	Pressure Pump Froze up
	6:15	515	26	39	75	
	6:30	515	26	39	76	Build to 1000
	7:00	1001	26	39	77	
	7:15	1001	26	39	79	Build to 1500
	7:30	1502	26	39	79	
	7:45	1502	27	39	79	Build to 2000
	8:00	2000	28	39	79	
	8:15	2000	30	39	80	Build to 2092 +
	8:20	2110	30	39	80	
*	8:30	2110	31	39	80	* Begin TEST *
	8:45	2110	31	39	82	
	9:00	2110	31	39	84	Check for leaks, check 1" valves
	9:15	2110	32	39	85	cloudy
	9:30	2110	34	39	87	
	9:45	2110	36	39	88	
	10:00	2110	38	39	90	All Above ground and exposed pipe is covered and heated
	10:15	2110	39	39	91	
	10:30	2110	40	39	92	
	10:45	2110	42	39	93	
	11:00	2111	43	39	94	
	11:15	2111	44	39	95	
	11:30	2111	45	39	96	
	11:45	2111	46	39	96	
	12:00	2111	47	39	97	
	12:15	2111	48	39	98	
	12:30	2112	49	39	98	Check for leaks Cloudy
	12:45	2112	50	39	99	Check 1" valves
	1:00	2112	50	39	99	
	1:15	2112	51	39	100	
	1:30	2112	52	39	101	
	1:45	2112	52	39	102	
	2:00	2113	53	39	104	
	2:15	2113	54	39	105	
	2:30	2113	54	39	106	Cloudy
	2:45	2113	54	39	107	





TEST EQUIPMENT

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PRESSURE RECORDER 1:

Mfg. Barton
Model _____
Serial No. 2025-007
Range 0-2000 PSI
0-150" F
Notes: Cal on 8/24/2017

PRESSURE RECORDER 2:

Mfg. _____
Model _____
Serial No. _____
Range _____
Notes: _____

DEADWEIGHT TESTER OR CALIBRATED TEST GAUGE:

Mfg. Crystal Engineering
Model XP2 5000
Serial No. 364359
Date of last Calibration 10/31/17
Calibrated by APEX Instruments
Range 0-5000 PSI
Notes: _____

TEMPERATURE RECORDER:

Mfg. Barton
Model _____
Serial No. 202A-161894
Range 0-150" F
Notes: Cal on 9/16/2017

CALIBRATION OF TEMPERATURE RECORDER

Temperature recorder reading	Test mercury thermometer reading	Remarks

CALIBRATION OF PRESSURE RECORDER 1

Pressure recorder reading	Deadweight tester reading	Remarks

CALIBRATION OF PRESSURE RECORDER 2

Pressure recorder reading	Deadweight tester reading	Remarks

NOTES



EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET

PAGE 6 OF 9

1. Test Information:

Target MOP 1400
Enter the desired MOP,
If less than pipe
internal design
pressure.

Date 12/3/17 Time 5:30 Am
Test Point Location Elbert Pad
Test Medium Water Test Duration 8:00 Am
Specific Gravity of Test Medium _____
Min. Test Press. at test site 125% of min. MOP + elev. _____ 110%
Maximum allowable % of SMYS = 100%

2. Pipe Specifications:

Manufacture Type _____

Pipe (#1) O.D. 8.625 MOP 1400
Grade X-52 SMYS 52,000 Seam Joint Factor _____
Wall thickness .219 Design Factor (F) _____
Length (ft.): 10,730 Volume _____
Max allowable test pressure, psig _____

3. Pipe Specifications:

Manufacture Type _____

Pipe (#2) O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Length (ft.): _____ Volume _____
Max allowable test pressure, psig _____

4. Pipe Specifications:

Manufacture Type _____

Pipe (#3) O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Length (ft.): _____ Volume _____
Max allowable test pressure, psig _____

5. Pipe Specifications:

Manufacture Type _____

Pipe (#4) O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Length (ft.): _____ Volume _____
Max allowable test pressure, psig _____

6. Pipe Specifications:

Manufacture Type _____

Pipe (#5) O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Length (ft.): _____ Volume _____
Max allowable test pressure, psig _____

7. Pipe Specifications:

Manufacture Type _____

Pipe (#6) O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Length (ft.): _____ Volume _____
Max allowable test pressure, psig _____

8. Pipe Fittings Specifications:

Manufacture Type _____

Fitting Description _____

Pipe Fitting O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Max allowable test pressure, psig _____

9. Pipe Fittings Specifications:

Manufacture Type _____

Fitting Description _____

Pipe Fitting O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Max allowable test pressure, psig _____

10. Pipe Fittings Specifications:

Manufacture Type _____

Fitting Description _____

Pipe Fitting O.D. _____ MOP _____
Grade _____ SMYS _____ Seam Joint Factor _____
Wall thickness _____ Design Factor (F) _____
Max allowable test pressure, psig _____



EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET
(continued)

PAGE 7 OF 9

11. Manufactured:	Weldolet, etc. O.D.	Working Pressure
Manufacture Type	Grade	
Fitting Description		
Max allowable test pressure, psig		
12. Manufactured:	Pipe Flanges O.D.	Working Pressure
Manufacture Type	Class	
	Temperature Derating Factor (T)	
Max allowable test pressure, psig		
13. Manufactured:	Pipe Flanges O.D.	Working Pressure
Manufacture Type	Class	
	Temperature Derating Factor (T)	
Max allowable test pressure, psig		
14. Manufactured:	Block Valve Size	Working Pressure
Manufacture Type	Class	
	Temperature Derating Factor (T)	
Max allowable test pressure, psig		
15. Calculated MOPs (psi):		
Test Pressure Range @Test Site, psig	125% to psig	110% to psig
Note: Add 0 psi to min. test range		
Maximum test pressure at test site, psig		

CALCULATED TARGET MOP OF PIPELINE SECTION

PSIG



FAILURE LOG

PAGE 8 OF 9

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____

FAILURE:

Date: _____ Time: _____ am / pm Failure Pressure: _____

Apparent Cause: _____

REPAIR:

Describe Repair Method: _____



SUPPLEMENTARY DOCUMENTATION

PAGE 9 OF 9

The following marked exhibits are attached as a part of this Test Report:

- EXHIBIT NO. 1 ☐ Sketch of Tested Piping (Including how section is isolated), with material list
- EXHIBIT NO. 2 ☐ Profile of pipeline section and/or segment
- EXHIBIT NO. 3 ☐ Pressure Chart, with pressure test number, date, test section name, Inspector name and signature
- EXHIBIT NO. 4 ☐ Temperature Chart, with pressure test number, date, test section name, Inspector name and signature
- EXHIBIT NO. 5 ☐ Pressure Recorder Certification Papers
- EXHIBIT NO. 6 ☐ Temperature Recorder Certification Papers
- EXHIBIT NO. 7 ☐ Deadweight or Calibrated Test Gauge Certification Papers
- EXHIBIT NO. 8 ☐ Field test data log, if hand written
- EXHIBIT NO. 9 ☐ Pressure Test Procedure, if applicable, with MOP Area Representative and Engineer signature approval

CERTIFICATION

I certify this pipeline or pipeline section has been tested and successfully met the terms of SBP MOP Establishment and Pressure Testing of Pipelines Technical Guideline and, where applicable, the contract document between SBP and its prime contractor.

MOP Area Representative

By: _____ Date: _____
(Please print) (Signature)

Engineer

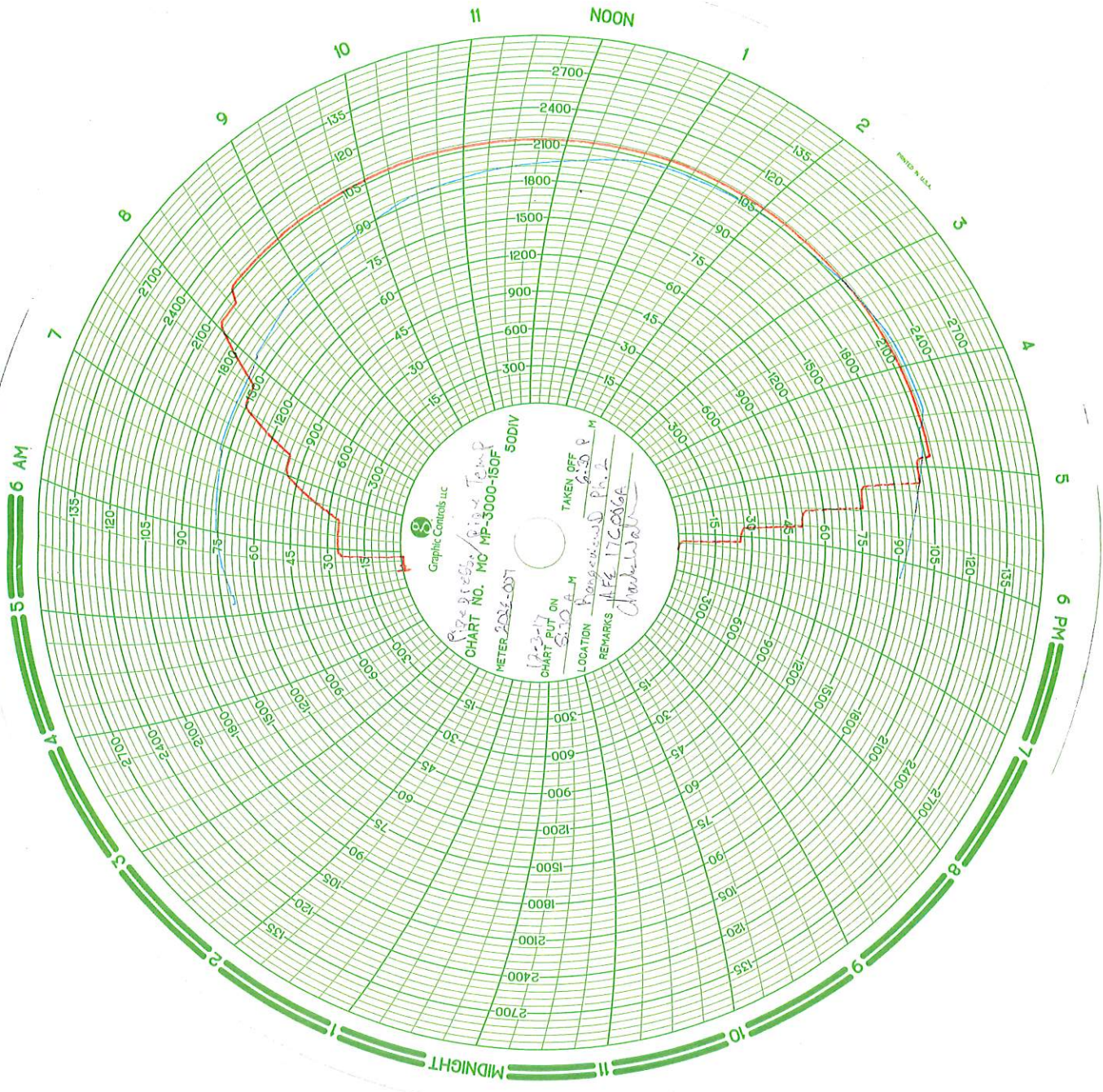
By: _____ Date: _____
(Please print) (Signature)

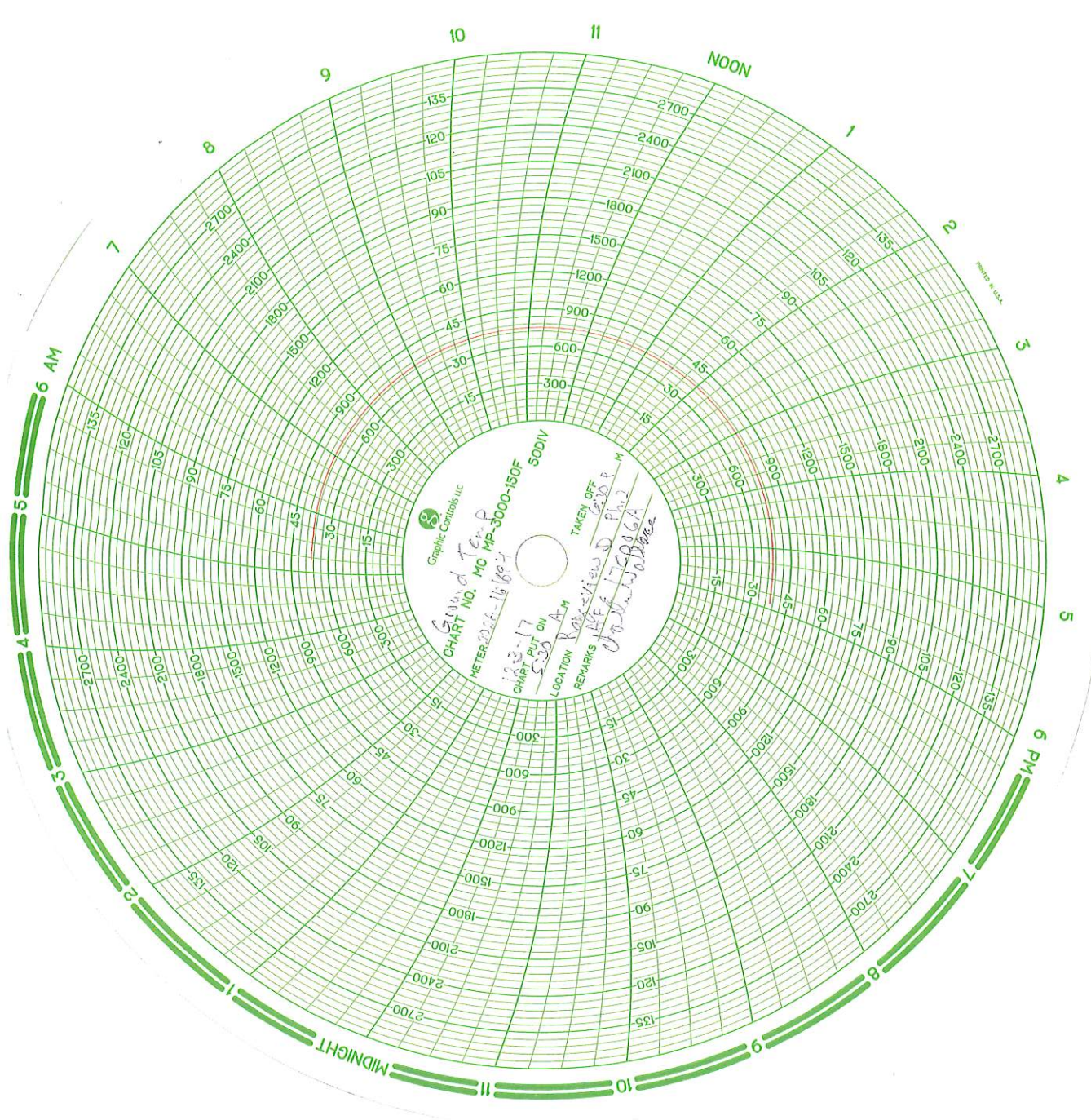
Inspector

By: Charles Wallace Charles Wall Date: 12-3-17
(Please print) (Signature)

Name of Testing Contractor

Northwind IS of upland
By: Dennis Kays Dennis Kays Date: 12-3-17
(Please print) (Signature)





Graphic Controls, Inc.

C-4

PSS-COMPANIES



9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 09/16/2017

DUE DATE: 09/15/2018

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 202A-161894

MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268; KESSLER TEST THERMOMETERS; SERIAL NO. CALIBRATION DATE: JANUARY 30, 2017

ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.
ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

CALIBRATED BY: NICK BEDFORD



7200 E. Dry Creek Rd, STE C-102, Centennial, CO 80112
Ph. 303-804-0667 Cal.Lab@Apex-Instruments.com

Calibration Certificate

Certificate Number: 172993

Customer:

Pipeline Supply & Service
Henderson, CO

Manufacturer: Crystal Engineering
Model Number: XP2i 5000 psi
Serial Number: 364359
Description: Digital Test Gauge
Procedure: CRY_P_XP2i
Calibrated To: Manufacturer's Specifications
Technician: Austin Molyneux

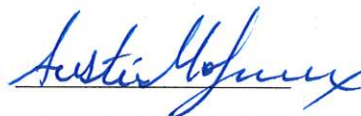
Calibration Date: 10/31/2017
Due Date: 10/31/2018
As Found: In Tolerance
As Left: In Tolerance
Temperature: 72 F
Humidity: 30 %

Tolerance Specs:

0 - 20%: +/- (0.02% of FS)
20% - 100%: +/- (0.1% of Rdg)

Technician Notes:

As Left Userspan: 1.00049

Approved Signatory: 

Apex Instruments certifies that the instrument listed above meets the specifications of the manufacturer at the completion of its calibration. Standards used are traceable to the National Institute of Standards and Technology (NIST), or have been derived from accepted values, natural physical constants, or through the use of the ratio method of self-calibration techniques.

Methods used are in accordance with the procedure listed above. This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

This certificate does not guarantee the continued performance of the instrument listed above. Any modifications or services performed hereafter may void this certificate.

This certificate is not to be reproduced other than in full, except with prior written approval from Apex Instruments Inc.

Standards Used

Description	Model Number	Serial Number	Calibration Date	Due Date	ID
Electronic Deadweight Tester	RPM4-E-DWT A100M/A10M	1709	11/2/2016	11/2/2017	APX00024



APX03447

Pipe pressure
Temp

C-3

PSS-COMPANIES



9700 E. 104TH AVE, UNIT F- HENDERSON, CO 80640 - Phone (303)857-7986 - Fax (303)389-4945

CALIBRATION CERTIFICATE

CERTIFICATE NUMBER: CO

Details +/-: 1.0% ACCURACY

DATE CALIBRATED: 08/24/2017

DUE DATE: 08/24/2018

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 202E-007

MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

INSTRUMENT FINDINGS/STATUS: UNIT IS IN TOLERANCE/ INSTRUMENT MEETS OR EXCEEDS SPECIFICATIONS.

BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO. CALIBRATION DATE: JANUARY 30, 2017

ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

CALCULATED USING MASS VALUES, AREA, AO, AND STATED GRAVITY.
ROOM TEMPERATURE/HUMIDITY (AT TIME OF TEST): 66°F / 25%.

CALIBRATED BY: NICK BEDFORD


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7200 E. Dry Creek Rd, STE C-102, Centennial, CO 80112
Ph. 303-804-0667 Cal.Lab@Apex-Instruments.com

Calibration Certificate

Certificate Number: 172993

Customer:

Pipeline Supply & Service
Henderson, CO

Manufacturer: Crystal Engineering
Model Number: XP2i 5000 psi
Serial Number: 364359
Description: Digital Test Gauge
Procedure: CRY_P_XP2i
Calibrated To: Manufacturer's Specifications
Technician: Austin Molyneux

Calibration Date: 10/31/2017
Due Date: 10/31/2018
As Found: In Tolerance
As Left: In Tolerance
Temperature: 72 F
Humidity: 30 %

Tolerance Specs:

0 - 20%: +/- (0.02% of FS)
20% - 100%: +/- (0.1% of Rdg)

Technician Notes:

As Left Userspan: 1.00049

Approved Signatory: 

Apex Instruments certifies that the instrument listed above meets the specifications of the manufacturer at the completion of its calibration. Standards used are traceable to the National Institute of Standards and Technology (NIST), or have been derived from accepted values, natural physical constants, or through the use of the ratio method of self-calibration techniques.

Methods used are in accordance with the procedure listed above. This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

This certificate does not guarantee the continued performance of the instrument listed above. Any modifications or services performed hereafter may void this certificate.

This certificate is not to be reproduced other than in full, except with prior written approval from Apex Instruments Inc.

Standards Used

Description	Model Number	Serial Number	Calibration Date	Due Date	ID
Electronic Deadweight Tester	RPM4-E-DWT A100M/A10M	1709	11/2/2016	11/2/2017	APX00024



APX03447

Compass Import 5000PSI					
		As Found			Pass
Test Description	Nominal	Test Results	Tolerance (+/-)	UUT Error	Status
0	-0.04 psi	0.00 psi	1.00 psi	0.04 psi	Pass
1000	1001.69 psi	1000.81 psi	1.00 psi	-0.88 psi	Pass
2000	2001.45 psi	1999.71 psi	2.00 psi	-1.74 psi	Pass
3000	3000.82 psi	2998.09 psi	3.00 psi	-2.73 psi	Pass
4000	4000.14 psi	3996.42 psi	4.00 psi	-3.72 psi	Pass
5000	5002.16 psi	4997.69 psi	5.00 psi	-4.47 psi	Pass
4000	4000.19 psi	3996.48 psi	4.00 psi	-3.71 psi	Pass
3000	3002.68 psi	3000.06 psi	3.00 psi	-2.62 psi	Pass
2000	2005.89 psi	2004.22 psi	2.00 psi	-1.67 psi	Pass
1000	1002.35 psi	1001.54 psi	1.00 psi	-0.81 psi	Pass
0	-0.02 psi	0.00 psi	1.00 psi	0.02 psi	Pass

Compass Import 5000PSI					
		As Left			Pass
Test Description	Nominal	Test Results	Tolerance (+/-)	UUT Error	Status
0	-0.05 psi	0.04 psi	1.00 psi	0.09 psi	Pass
1000	1000.89 psi	1001.30 psi	1.00 psi	0.41 psi	Pass
2000	2002.18 psi	2002.96 psi	2.00 psi	0.78 psi	Pass
3000	3001.46 psi	3002.51 psi	3.00 psi	1.05 psi	Pass
4000	4003.42 psi	4004.63 psi	4.00 psi	1.21 psi	Pass
5000	5000.63 psi	5002.32 psi	5.00 psi	1.69 psi	Pass
4000	4000.05 psi	4001.33 psi	4.00 psi	1.28 psi	Pass
3000	3000.72 psi	3001.80 psi	3.00 psi	1.08 psi	Pass
2000	1999.76 psi	2000.64 psi	2.00 psi	0.88 psi	Pass
1000	1003.65 psi	1004.19 psi	1.00 psi	0.54 psi	Pass
0	-0.06 psi	-0.10 psi	1.00 psi	-0.04 psi	Pass

— End of measurement results—



