TEST SPECIFICATIONS

Rangeview Pipeline Gathering System Hydrostatic Pressure Test

Connie Well Connect

Date:	Select Routing:
6-Mar-2017	

Test Number: 1 of 1

Project Name:	Project I.D. / AFE Number	Facility Name or Number
Connie Well Connect	16W020A	Connie Well Pad

Installation Location (M.P. or S.S.):			State:	County/Parish:	Class Location Designation	2	Selected Design Pressure	1480	Planned MAOP	1400
0+00	to	20+59.1	CO	Weld						

Project Description:

Hydrostatic pressure test of the 4" well connect pipeline.

Testing at 1.25*MAOP = 1850 minimum test pressure. **2216 psig Target Test Pressure at Chart Location**

Max Test Pressure for ANSI 600 Valves and Fittings is 2660 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 ☐ STRENGTH TEST ☑ FABRICATION ☐ NEW CONSTRUCTION ☑ REPLACEMENT ☐ RETEST ☐ REFERENCE DRAWINGS ATTACHED ☐

POST-INSTALLATION TEST ☑ PRE-INSTALLATION TEST ☐

Test Design Criteria

Minimum Component Characteristics

Pipe Information

O.D.	4.5
Wall Thickness	0.188
SMYS	52,000

Valve/Flange ANSI Class Rating
600# Valves/Fittings

Test Pressure Calculations

☐ Input minimum and maximum pressure of test
☐ Input minimum and maximum %SMYS of test

	Pressure (psig)	% PIPE SMYS
Max. Test Pressure (Pipe)	2590	59.6%
Max. Test Pressure (Valves and Fittings)	2660	61.2%
Min.	1850	42.6%

Test Section - Reference Data

Test Medium	Water	
Test Duration	8	Hours (min)
Section Length	2,059	Ft.
Section Fill Volume	1,429	Gal
Max. Elevation Change	18	Ft.

Station Equations:	1	2	3
Back	0+00	0+00	0+00
Ahead	0+00	0+00	0+00

Test Pressures

Location	Station	Elevation (feet)	Max. psig.	% SMYS @ Max.	Min. psig.	% SMYS @ Min.	Variance psig.	Target psig.	% SMYS @Target
BEGIN -	0+00	4606	2,582	59.4%	1,850	42.6%	732	2,216	51.0%
HIGH ELEVATION	0+00	4606	2,582	59.4%	1,850	42.6%	732	2,216	51.0%
LOW ELEVATION	16+80	4588	2,590	59.6%	1,858	42.8%	732	2,223	51.2%
END	20+59.1	4602	2,584	59.5%	1,852	42.6%	732	2,217	51.0%
Chart Location (Test Point)	**0+00**	**4606**	**2,582**	**59.4%**	**1,850**	**42.6%**	**732**	**2,216**	**51.0%**

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): Deanna Kelly Date: 3-14-17	Compliance (signature) Date:
Designed Reviewed if applicable (Signature) Date:	Company Name (for Contractor or for Employee): North Winds of Wyoming Date: 3-14-17	Engineering or Operations (Signature) Date:
Compliance (Signature) Date:	Witnessed & Accepted by Company Representative: (Signature) Chad Walline Date: 3-14-17	Actual MAOP

LIQUID PIPELINE PRESSURE TEST REPORT

Pressure Test Number 1

MOP of tested facility is _____ PSIG

Company: Saddle Butte
Operations Area: _____
Project: Connie Well Connect
AFE: 16W 028A
Pipeline: _____
Section: ALL
Station or Milepost From: 0+00 To: 20+59

INSTRUCTIONS

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

General Information	· 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.
Pipe Data	· 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.
Test Water Data	· 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.
Pressure Calculations	· Elevation of high and low points and the elevation of the test pressure measure sites is required for calculation of the target test pressures.
Test Log	· 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.
Notes	· 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.
Profile	· 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: - 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.
Failure Log	· 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).
Supplementary Documentation	· 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.
Certification	· Signatures of the Company and Contractor representatives in charge of the test are MANDATORY.

CABOT OIL & GAS PIPELINE, LLC

PRESSURE CALCULATIONS

Location of Test Point	Elevation of Test Point	High Point	Low Point
Connie Well Pad	4606 Ft. (Elevation) 0+00 Ft. (Station)	4606 Ft. (Elevation) 0+00 Ft. (Station) Location Name	4558 Ft. (Elevation) 16+80 Ft. (Station) Location Name

Target MOP:	Test Duration: 8 hr	Start Point	End Point
Target Test Pressure Range 1st Min: Maximum: 2590 2nd Min:	High Point / Low Point: 2220	4606 Ft. (Elevation) 0+00 Ft. (Station) Location Name	4602 Ft. (Elevation) 20+59 Ft. (Station) Location Name

TEST LOG

	DATE	TIME	PRESSURE	AMBIENT TEMP	BELOW GROUND TEMP	ABOVE GROUND TEMP	REMARKS
	3-14-17	6:00AM	0	36	51	40	
		6:15	0	36	52	40	Build to 500
		6:16	501	36	52	40	
		6:30	501	36	52	46	Build to 1000
		6:31	1002	36	52	40	
		6:45	1003	36	52	40	Build to 1500
		6:46	1501	36	52	40	
		7:00	1504	36	53	40	Build to 2000
		7:01	2002	36	53	40	
		7:15	2004	37	54	40	Build to 2216 +
*		7:15	2220	37	54	40	* BEGIN TEST * Sun is
		7:30	2220	38	54	40	up, mostly cloudy, about half
		7:45	2221	39	54	40	of above ground pipe is heated
		8:00	2222	41	55	40	
		8:15	2224	43	55	40	
		8:30	2226	46	54	40	
		8:45	2228	46	54	40	
		9:00	2230	47	53	41	
		9:15	2232	48	53	41	Warming up nicely but still
		9:30	2234	48	53	42	mostly cloudy
		9:45	2237	49	53	42	
		10:00	2239	49	53	44	
		10:15	2242	49	52	47	
		10:30	2245	50	51	51	
		10:45	2249	50	51	53	
		11:00	2252	51	50	55	
		11:15	2256	51	50	57	
		11:30	2259	52	49	60	
		11:45	2262	53	49	63	
		12:00	2264	55	49	65	Still overcast or hazy
		12:15	2266	58	48	67	
		12:30	2269	60	48	69	
		12:45	2272	63	48	69	
		1:00	2274	65	48	70	More sun, less clouds
		1:15	2275	67	48	71	Wind picked up
		1:30	2275	67	48	73	
		1:45	2275	68	48	75	Wind blew plastic off of piping
		2:00	2275	69	48	74	on Bihain end.
		2:15	2275	69	48	74	

EAGLE BUTTE PIPELINE, LLC

TEST LOG (CONTINUED)

DATE	TIME	PRESSURE	AMBIENT TEMP	BELOW GROUND TEMP	ABOVE GROUND TEMP	REMARKS
3-14-17	2:30P	2276	69	48	79	Partly Cloudy
	2:45	2276	69	48	79	
	3:00	2276	69	49	79	
	3:15	2277	69	48	79	
*	3:25	2277	69	48	79	*END TEST* Bleed to 2000
	3:26	2000	69	48	79	
	3:40	2000	69	48	79	Bleed to 1500
	3:42	1500	69	49	78	
	3:55	1500	68	48	77	Bleed to 1000
	3:57	999	68	48	77	
	4:10	999	67	48	76	Bleed to 500
	4:12	500	67	49	74	
	4:25	500	67	49	74	Bleed to 0
	4:30	0	67	49		
	4:45	0	67	49		

CABLE DUTCH PIPELINE, LLC

TEST EQUIPMENT

PRESSURE RECORDER 1:

Mfg. Barton
Model
Serial No. 202E - 007
Range 0 - 3000 PSI
0 - 150° F
Notes:
Cal on 11-12-16

PRESSURE RECORDER 2:

Mfg.
Model
Serial No.
Range
Notes:

DEADWEIGHT TESTER OR CALIBRATED TEST GAUGE:

Mfg. Crystal Engineering
Model XP 2i
Serial No. 364359
Date of last Calibration 11-2-16
Calibrated by PMC
Range 0 - 5000 PSI
Notes:

TEMPERATURE RECORDER:

Mfg. Barton
Model
Serial No. 202A - 121213
Range 0 - 150° PSI
Notes:
Cal on 11-12-16

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

CABLE RUN PIPELINE, LLC

EQUIPMENT CALCULATED MOP SUMMARY WORKSHEET

1. Test Information:

Target MOP [ ]
Enter the desired MOP, if less than pipe internal design pressure.

Date 3-14-17 Time 6:00 Am
Test Point Location Connie Well Pad
Test Medium Water Test Duration 8 hr
Specific Gravity of Test Medium
Min. Test Press. at test site 125% of min. MOP + elv. 110%
Maximum allowable % of SMYS = 100%

2. Pipe Specifications:

Manufacture Type
Grade X52 Pipe (#1) O.D. 4.5 MOP
SMYS Seam Joint Factor
Wall thickness .188 Design Factor (F)
Length (ft.): 2059 Volume
Max allowable test pressure, psig

3. Pipe Specifications:

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

4. Pipe Specifications:

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

5. Pipe Specifications:

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

6. Pipe Specifications:

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

7. Pipe Specifications:

Manufacture Type
Grade Pipe (#6) O.D. MOP
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
Grade Pipe Fitting O.D. MOP
SMYS Seam Joint Factor
Wall thickness Design Factor (F)
Max allowable test pressure, psig

9. Pipe Fittings Specifications:

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

10. Pipe Fittings Specifications:

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

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 presssure at test site, psig

CALCULATED TARGET MOP OF PIPELINE SECTION PSIG

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

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 applicaple, 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: _____ (Please print) _____ (Signature) Date: _____

Engineer

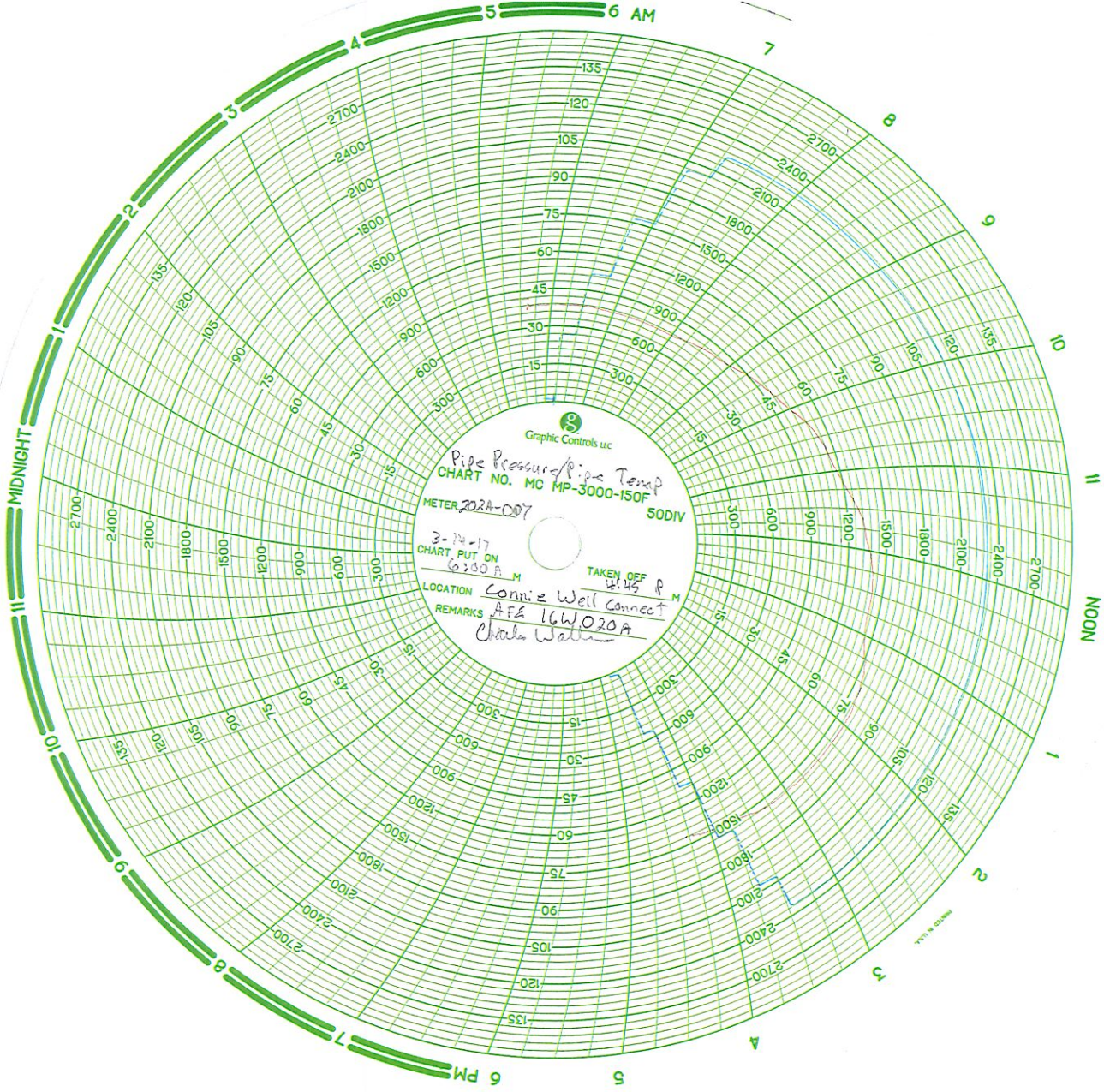
By: _____ (Please print) _____ (Signature) Date: _____

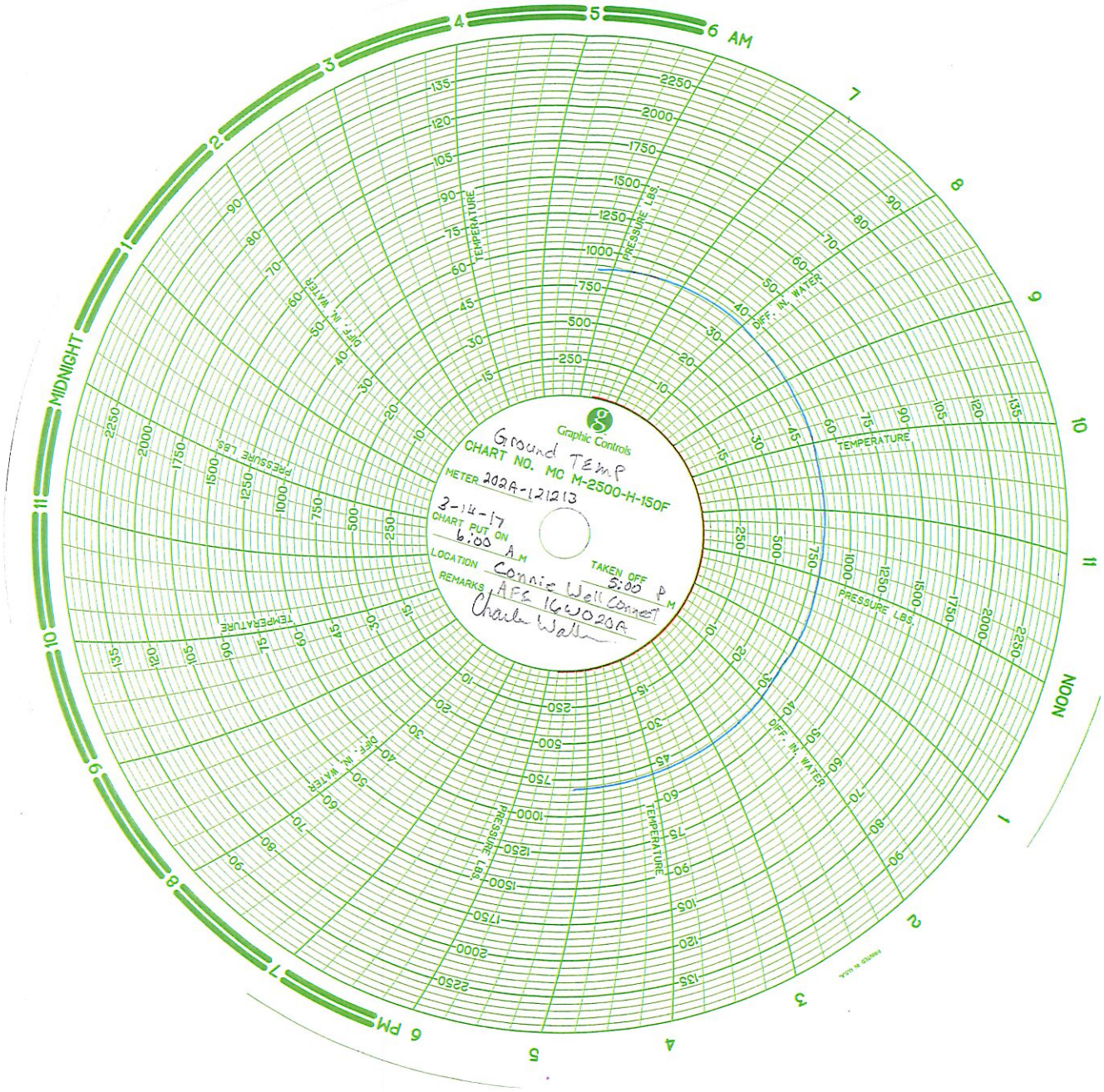
Inspector

By: Charles Wallace (Please print) Charles Wallace (Signature) Date: 3-15-17

Name of Testing Contractor North Winds of Wyoming

By: Penelope Kings (Please print) Penelope Kings (Signature) Date: 3-15-17


Graphic Controls LLC
Pipe Pressure/Pipe Temp
CHART NO. MC MP-3000-150F
METER 2024-007
50DIV
3-24-17
CHART PUT ON
6:00 A M
TAKEN OFF
11:45 A M
LOCATION Connie Well Connect
REMARKS AFE 16W020A
Charles Watts
MIDNIGHT
6 AM
NOON
6 PM


Graphic Controls
Ground Temp
CHART NO. MC M-2500-H-150F
METER 202A-121213
2-14-17
CHART PUT ON 6:00 A.M
TAKEN OFF 5:00 P.M
LOCATION Connie Well Connect
REMARKS AFB 16W020A
Charla Walker
MIDNIGHT
6 AM
NOON
6 PM
TEMPERATURE
PRESSURE LBS.
DIFF. IN. WATER

Non-Conformance Report

PROCESS MEASUREMENT COMPANY
2475 W. 2ND AVE 34A DENVER, CO , 80223
303-937-7226 Fax: 303-936-2731
www.pmc-calibration.com

Calibration Performed By:
PMC-DENVER
2475 W. 2ND AVE 34A
DENVER, CO , 80223

For:
PIPELINE SUPPLY AND SERVICE
9700 E 104TH AVE

I.D.: CR-2
Description: PRESSURE GAGE
Manufacturer: CRYSTAL
Gage Type:
Temp./RH: 71.9 F / 21.8
Cal. Interval: 12 MONTHS

Serial Number: 364359
Model Number: XP2I
Performed By: MATTHEW KNOWLES
Cal. Due Date: 11/2/2017
Calibration Result: ADJ.
Cal Date: 11/2/2016

Equipment Used To Calibrate Equipment:

Company	I.D.	Description	Last Cal.	Cal. Due Date
02-PMC DENVER	PMCD-064	TEMP/ HUMIDITY METER	5/16/2016	5/16/2017
03-PMC OMAHA	PMCO-134	DEAD WEIGHT TEST SET 0-20	5/3/2016	5/3/2017

Procedures Used In Event:

Company	Procedure Name	Description	Revision Level	Revision Date
PROCESS MEASUREI	SCP05-022	PRESSURE AND VACUUM GAUGES	0	2/9/2015

P-S-S-COMPANIES

WASATCH SUPPLY · PSS PIPELINE SUPPLY & SERVICE · NORTH STATE SUPPLY

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: 11/12/2016
DUE DATE: 11/12/2017

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: SEPTEMBER 14, 2015

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

P-S-S-COMPANIES

WASATCH SUPPLY

PSS PIPELINE SUPPLY & SERVICE

NORTH STATE SUPPLY NS

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: 11/12/2016
DUE DATE: 11/12/2017

INDICATED TEMPERATURE RANGE: # 0 – 150°F
INDICATED PRESSURE RANGE: #0 – 2500 PSI
SERIAL NO: 202A-121213
MANUFACTURER: BARTON/ 12" RECORDER

TYPE OF INSTRUMENT CALIBRATED: TEMPERATURE / PRESSURE RECORDER

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

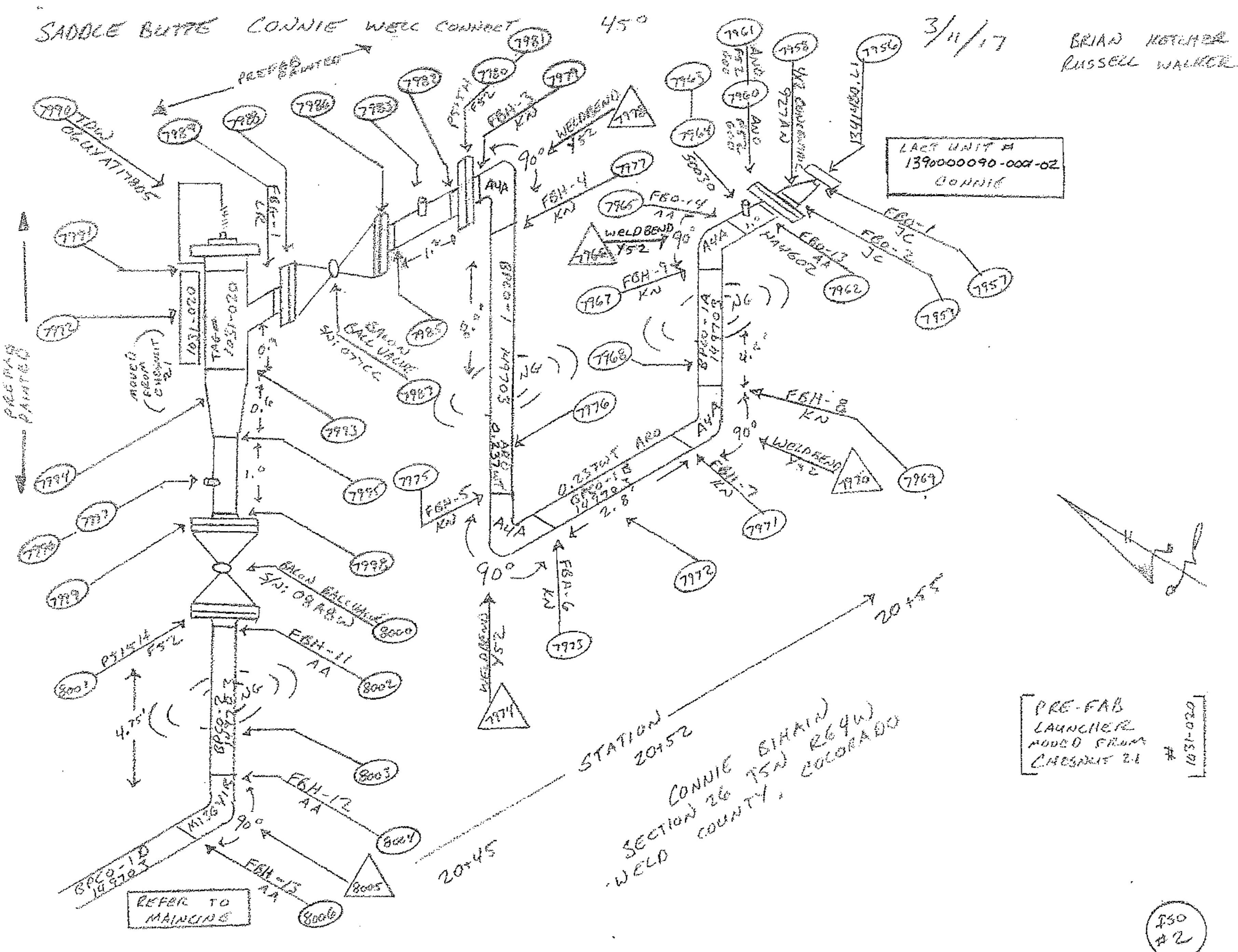
BASED ON INTERNATIONAL STANDARDS OF GRAVITY: (980.665 cm./sq.).

TYPE OF STANDARD USED TO CALIBRATE: REFINERY DEADWEIGHT TEST UNIT SPT. (35225-3) SERIAL No. 5268: KESSLER TEST THERMOMETERS; SERIAL NO, CALIBRATION DATE: SEPTEMBER 14, 2015

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



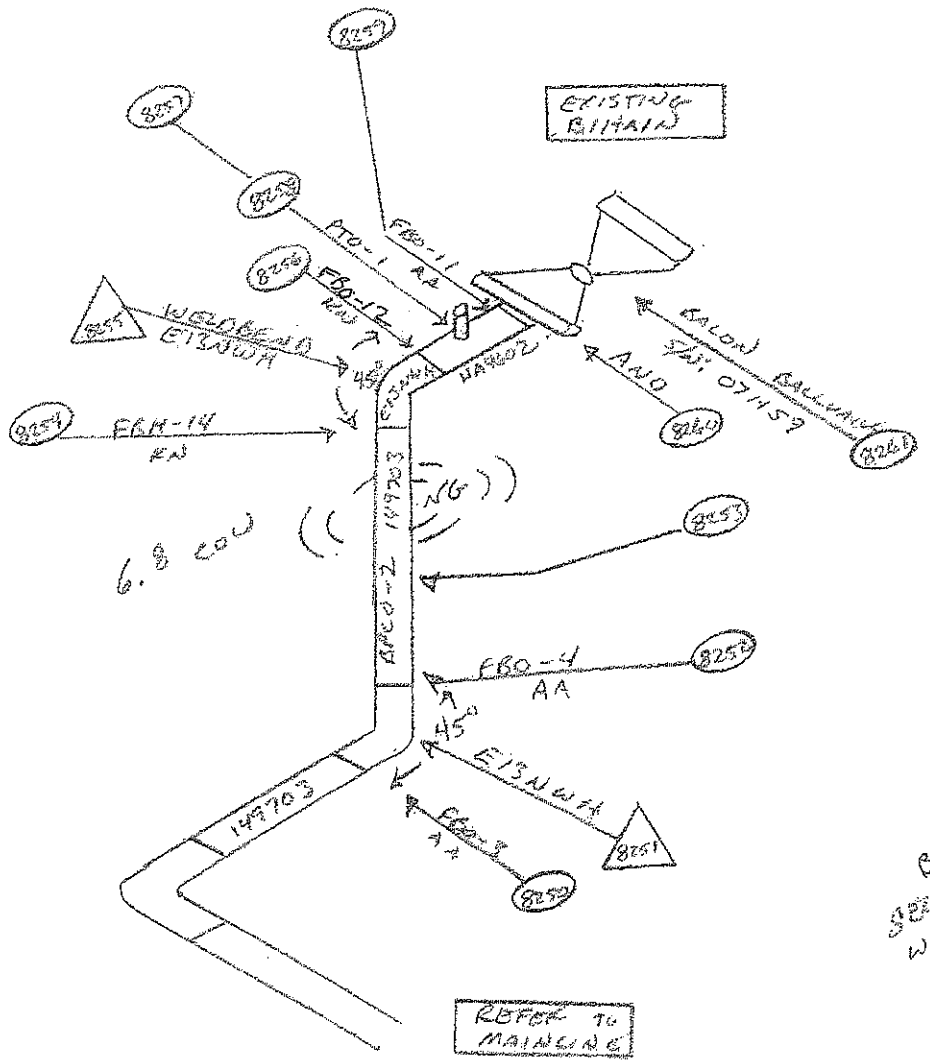
SADDLE BUTTE CONNIE WELL CONNECT 45°
3/11/17
BRIAN KETCHER
RUSSELL WALKER
PREFAB PAINTED
LACT UNIT #
1390000090-000-02
CONNIE
WELDBEND
90°
A4A
NG
0.237WT ARO
FBH-4 KN
FBH-5 KN
FBH-6 KN
FBH-7 KN
FBH-8 KN
FBH-9 KN
FBH-11 AA
FBH-12 AA
FBH-13 AA
FBO-1 JC
FBO-2 JC
FBO-13 AA
FBO-14 AA
BALON BALL VALVE
REFER TO MAINLINE
STATION 20+52
20+45
20+55
CONNIE BIHAIN
SECTION 26 T5N R64W
WELD COUNTY, COLORADO
PRE-FAB LAUNCHER MOVED FROM CHESNUT 2.1
1031-020
ISO #2

SADDLE BUTTE
CONNIE well connect
16W020A

60°

3/15/17

BRIAN KORMOS
RANGE WATCH



BIHAIN WELL PAD
SEC. 26 T5N R64W
WELD COUNTY, COLORADO

BKA-031517-38-CO

PTIC MAT