

<div style="text-align: center;"> TEST SPECIFICATIONS Black Diamond Gathering, LLC - Pressure Test PDC Thistle Down Well Connect </div>		Rev3													
		Date:	Select Routing:												
		13-Jun-2019													
Project Name: PDC Thistle Down Well Connect Contractor / Testing Company: Northwinds		Project I.D. / AFE Number: 5000421 Technician:	Facility Name or Number: Thistle Down Connect - BDO-04-RVA-100-L6												
Installation Location (M.P. or S.S.): 0+00 to 11+01 Lat: 40°21'4.76"N to 40°21'7.48"N Long: 104°35'33.46"W to 104°35'45.77"W		State: CO County/Parish: Weld	Class Location Designation: N/A Selected Design Pressure: 1480 Planned MAOP: 1480												
Project Description: Hydrostatic pressure test of 1,101' of 4" Carbon Steel. Testing at 1.25*MAOP = 1850 psig minimum test pressure. 2038 psig Target Test Pressure at Chart Location Max Test Pressure for ANSI 600 Valves and Fittings is 2660 psig where they are located.															
LEAK ONLY TEST <input type="checkbox"/> STRENGTH TEST <input type="checkbox"/> FABRICATION <input type="checkbox"/> NEW CONSTRUCTION <input type="checkbox"/> REPLACEMENT <input type="checkbox"/> RETEST <input type="checkbox"/> REFERENCE DRAWINGS ATTACHED <input type="checkbox"/>															
POST-INSTALLATION TEST <input type="checkbox"/> PRE-INSTALLATION TEST <input type="checkbox"/>															
Minimum Component Characteristics Pipe Information O.D. 4.5 Wall Thickness 0.188 SMYS 52,000 Grade X52 Valve/Flange ANSI Class Rating 600# Valves/Fittings		Test Design Criteria Test Pressure Calculations <input type="checkbox"/> Input minimum and maximum pressure of test <input type="checkbox"/> Input minimum and maximum %SMYS of test <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Pressure (psig)</th> <th>% PIPE SMYS</th> </tr> </thead> <tbody> <tr> <td>Max. Test Pressure (Pipe)</td> <td>2220</td> <td>51.1%</td> </tr> <tr> <td>Max. Test Pressure (Valves and Fittings)</td> <td>2220</td> <td>51.1%</td> </tr> <tr> <td>Min.</td> <td>1850</td> <td>42.6%</td> </tr> </tbody> </table>			Pressure (psig)	% PIPE SMYS	Max. Test Pressure (Pipe)	2220	51.1%	Max. Test Pressure (Valves and Fittings)	2220	51.1%	Min.	1850	42.6%
	Pressure (psig)	% PIPE SMYS													
Max. Test Pressure (Pipe)	2220	51.1%													
Max. Test Pressure (Valves and Fittings)	2220	51.1%													
Min.	1850	42.6%													
		Test Section - Reference Data Test Medium Water Test Duration 8 hour Hours (min) Section Length 1,101 Ft. Section Fill Volume 910 Gal Max. Elevation Change 14 Ft. Station Equations: 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	4806	2,220	51.1%	1,856	42.7%	364	2,038	46.9%						
HIGH ELEVATION	7+80	4820	2,214	51.0%	1,850	42.6%	364	2,031	46.7%						
LOW ELEVATION	0+00	4806	2,220	51.1%	1,856	42.7%	364	2,038	46.9%						
END	11+01	4814	2,217	51.0%	1,853	42.6%	364	2,034	46.8%						
Chart Location (Test Point)	0+00	4806	2,220	51.1%	1,856	42.7%	364	2,038	46.9%						
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.															
PRE-TEST APPROVAL / REVIEWED BY:															
Originator/Project Manager (Signature) Craig Melton Date: 06/13/2019		TEST PERFORMED / ACCEPTED BY: Test Performed by (Signature): Emmanuel Zeeb / J. O. P. S. Date: 6-25-19 Company Name (for Contractor or for Employee): Northwinds of Wyoming Date: 6-25-19				POST-TEST REVIEWED BY: Construction Manager (signature): [Signature] Date: 6-25-19									
Designed Reviewed if applicable (Signature) Date:		Witnessed & Accepted by Company Representative: [Signature] Date: 6-25-19				Actual MAOP									
Compliance (Signature) Date:															



Pipeline Pressure Test Documentation

Pressure Test Report

Form :

Revision
3

Revision Date

Project Name : PDC Thistle Down Well Connect

AFE No. : 5000421

Contractor / Testing Company : Northwinds

Technician : Mannie

Test Section No. : 0

From Station No. : 0+00

Test Description : Hydrostatic pressure test of 1,101' of 4" Carbon Steel.

To Station No. : 11+01

Test Type : Subpart E Test

Start of Test Period :

Date : 6-25-2019

Time : 6:00 AM

Min. Test Duration : 8 hour

End of Test Period :

Date : 6-25-2019

Time : 4:20 PM

Class Location : Not Applicable (Liquids)

Low Strength Pipe :

O.D. : 4.500

W.T. : 0.188

SMYS : 52,000

Grade : X52

Station Piping :

Yes

Test Medium : Water

Source of Medium :

N/A

Corrosion Inhibitor : No

Inhibitor Type :

N/A

Rate :

N/A

Leak Detection : No

Material Type :

N/A

Rate :

N/A

Deadweight Tester : Mfg : Crystal Engineering

Serial # : 352036

Calibration Date : 6-14-19

Deadweight Tester Location : Station No. (ESN) :

0+00

Elevation (ft) :

4,806

Pressure Recorder : Mfg : Barton

Serial # : 265A-3511

Calibration Date : 6-19-19

Pipe Temp. Recorder : Mfg : Barton

Serial # : 265A-3511

Calibration Date : 6-19-19

Target Test Pressure Range

Pre-approved Target Test Pressure : 2,038.0 psig

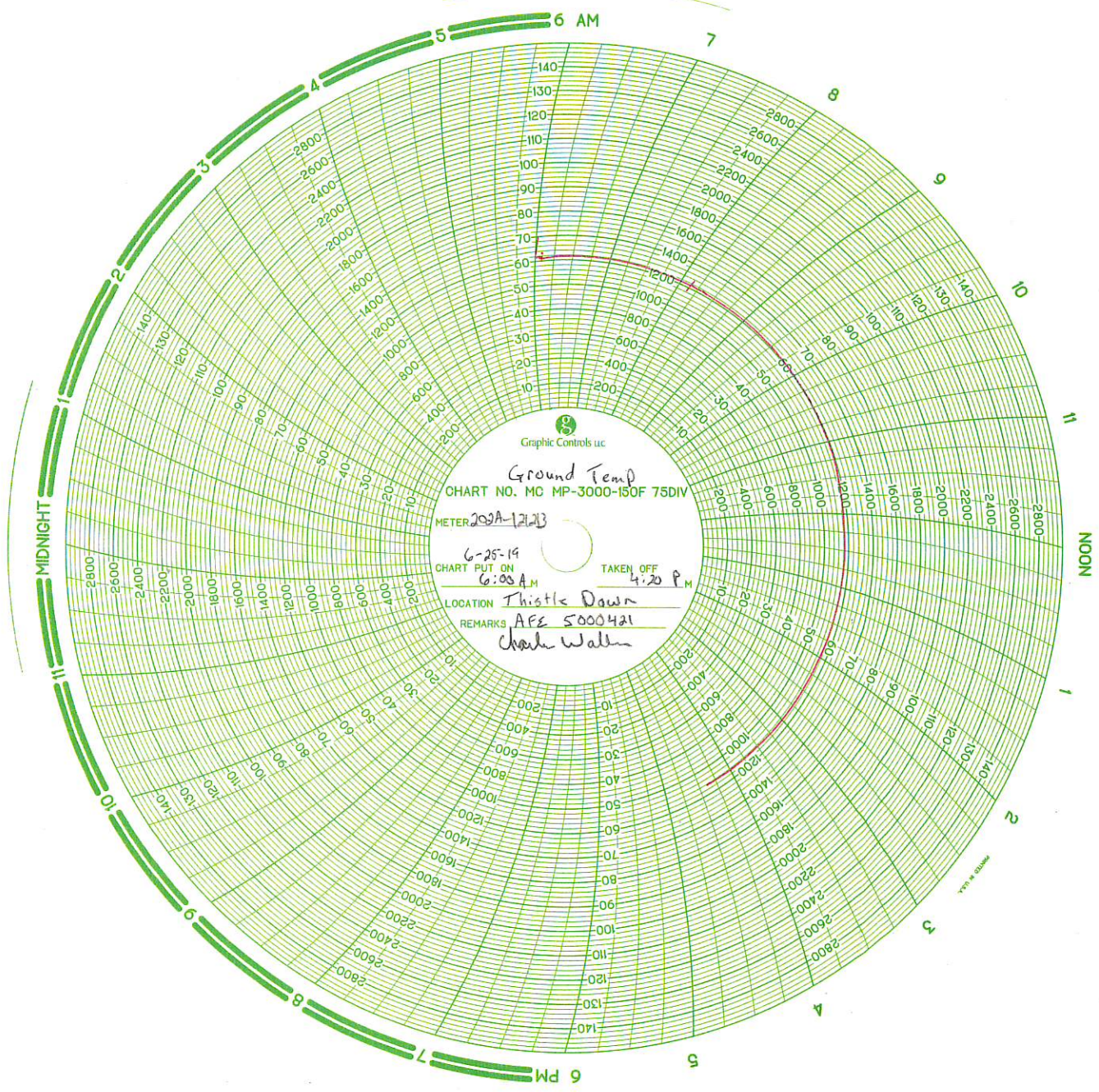
Maximum Test Pressure : 2,220.0 psig

Max Elevation Change : 14

Minimum Test Pressure : 1,850.0 psig

Time	Pressure (psig)	Pipe Temp.	Amb. Temp.	Weather	Visual Inspection	Comments
6:00 AM	0	52	57	Mostly Sunny		
6:15	0	52	57			Build to 1019
6:18	1020	52	57		OK	Hold 15 minutes
6:33	1020	52	58			Build to 1630
6:37	1631	52	58		OK	Hold 15 minutes
6:52	1631	52	59			Build to 2038
6:54	2040	52	59			Hold
* 7:00	2040	52	59	Mostly Sunny	OK	BEGIN TEST *
7:15	2040	52	60	0 wind	OK	Check for leaks
7:30	2040	52	61			
7:45	2040	52	62	1		
8:00	2041	52	63		OK	
8:30	2043	54	67			
9:00	2047	55	69			
9:30	2052	57	72			
10:00	2057	58	74			Bleed down to 2040
10:30	2044	61	76			
11:00	2049	64	77			
11:15	2057	79	78			Bleed down to 2040
11:30	2042	75	79			The receiver has
12:00 PM	2047	76	80	Partly Sunny		been in the shade of
12:30	2053	77	82	Wind @ 10		the sound wall until 11:30
12:45	2064	78	83			Bleed down to 2040
1:00	2043	79	83	Mostly Cloudy		
1:30	2050	82	83	wind @ 10		

[illegible]



Graphic Controls Inc

Ground Temp
CHART NO. MC MP-3000-ISO 75DIV

METER 200A-12123

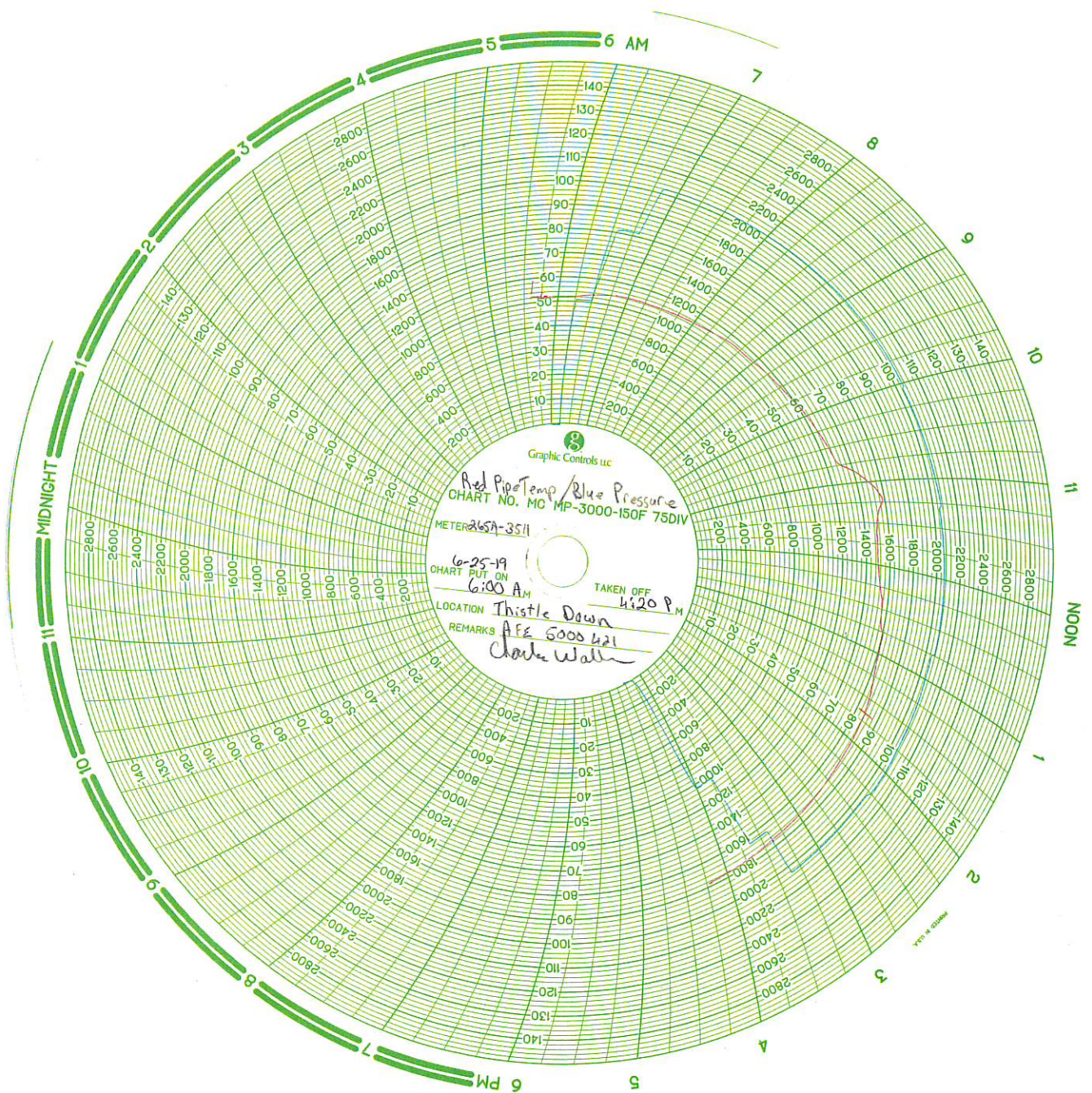
6-25-14
CHART PUT ON 6:00 AM

TAKEN OFF 4:20 P.M.

LOCATION Thistle Down

REMARKS AFE 5000421

Charles Wallen



C1

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: 06/19/2019

DUE DATE: 06/19/2020

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 265A3511

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

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


SIGNATURE



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

Calibration Certificate

CR-1

Certificate Number: 192453

Customer:

Pipeline Supply & Service
Henderson, CO

Manufacturer: Crystal Engineering
Model Number: XP2i 5000 psi
Serial Number: 352036
Description: Digital Test Gauge
Procedure: CI-001
Calibrated To: Manufacturer's Specifications
Technician: Austin Molyneux


Calibration Date: 6/14/2019
Due Date: 6/14/2020
As Found: In Tolerance
As Left: In Tolerance
Temperature: 69.7 F
Humidity: 38.2 %

Tolerance Specs:

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

Technician Notes:

As Left Userspan: 1.00075

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.

Unless otherwise contractually specified, a binary decision rule, utilizing simple acceptance, and simple rejection criteria will be used for the determination of compliance. When compliance statements are present, they are reported without factoring in the effects of uncertainty and the limits are defined by the manufacturer's stated accuracy.

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.



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P-SS-SS-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: 06/19/2019

DUE DATE: 06/19/2020

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 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

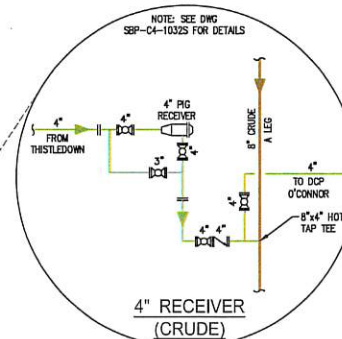
ALL STANDARD DIRECTLY TRACEABLE TO NATIONAL INSTITUTE OF STANDARDS & TECHNOLOGIES TEST NO: (N.I.S.T.) 2.6/172490 & 6.6/139577.

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

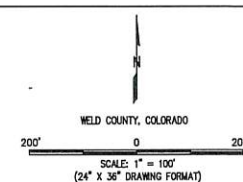
CALIBRATED BY: NICK BEDFORD







4" CRUDE (1,098')
BDO-04-RVA-100-L6



4" RECEIVER
(CRUDE)





LEGEND

 BLACK DIAMOND CRUDE GATHERING PIPELINE
 BLACK DIAMOND CRUDE TRUNK PIPELINE
 LAUNCHER (CRUDE)
 RECEIVER (CRUDE)
 WELL LOCATIONS

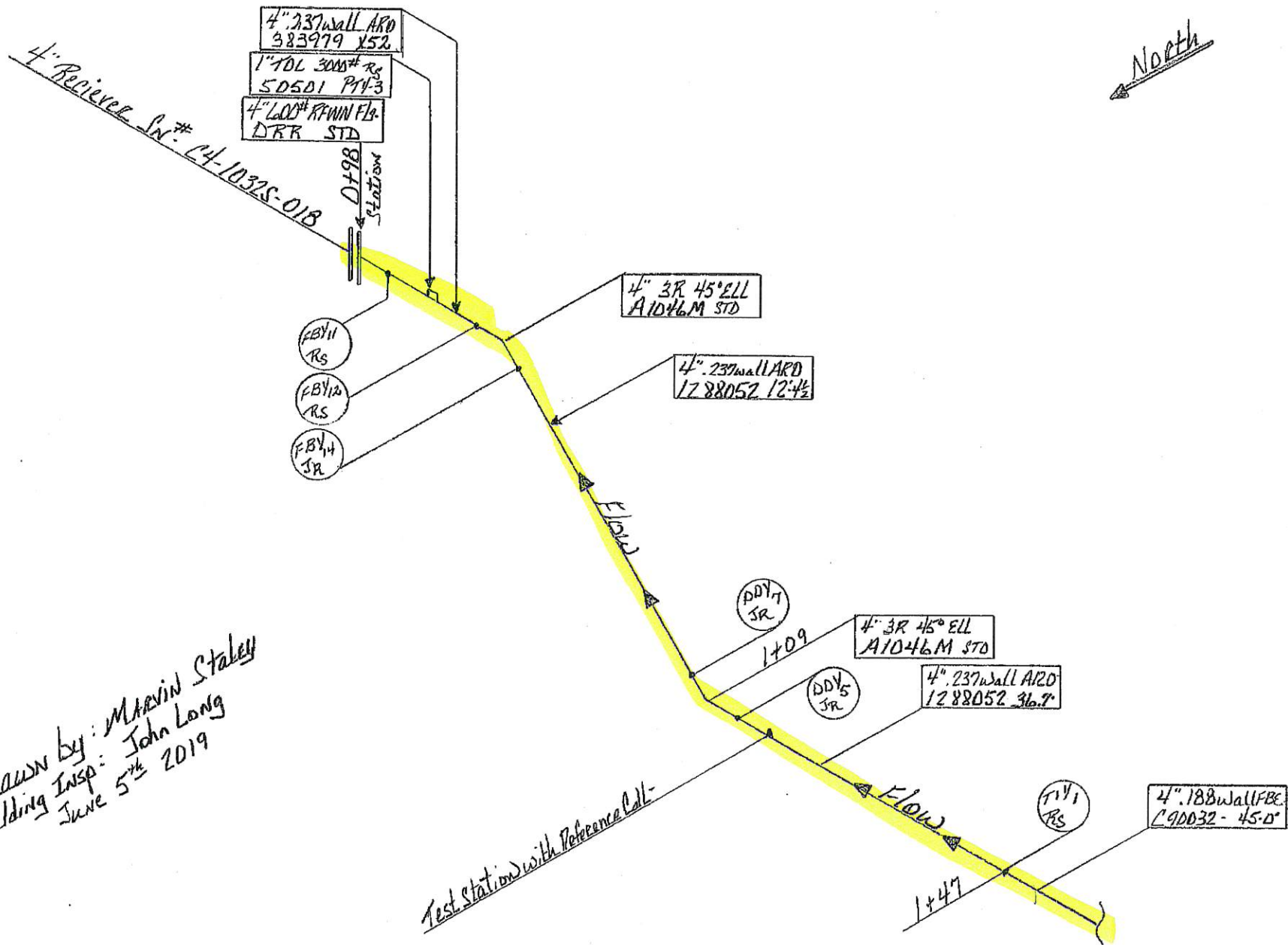
NOTES:

- 1) FLOW SCHEMATIC IS FOR GRAPHICAL REPRESENTATION ONLY.
- 2) ALL GAS, WATER AND UTILITY LINES SHOULD BE LOCATED PRIOR TO ANY EXCAVATING, DRIVING, OR TRENCHING ANYWHERE ON OR NEAR THIS SITE.
- 3) CALL ENGINEERING ASSUMES NO RESPONSIBILITY FOR THE EXACT LOCATION OF ANY BURIED GAS, WATER, OR UTILITY LINES THAT MAY BE PRESENT ON OR NEAR THIS SITE, NOR IS ANY LIABILITY ASSUMED FOR ANY LEGAL ACTION WHICH RESULTS FROM A DISCOVERY OF GAS, WATER, OR UTILITY LINES IN ADDITION TO OR IN A DIFFERENT LOCATION THAN SHOWN ON THIS PLAN.
- 4) COORDINATE SYSTEM BASED ON NAD 83 COLORADO STATE PLANE, NORTH ZONE.
- 5) PROPOSED PIPELINE ROUTES FROM IMPORTED SHAPE FILES PROVIDED BY BLACK DIAMOND GATHERING.

REFERENCE DRAWINGS			REVISIONS										SHEET NO.		PREPARED FOR:					
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4" Dogleg for receiver-Thistle Downs 4" W.C. AFE. 5000421



Drawn by: Marvin Staley
Welding Insp: John Long
June 5th 2019



Whistle Downs Lact Unit fabrication - 4" Vertical Launcher

Lact Unit on Site # 1500000036-DD04-D1

