



## FIELD HYDROSTATIC TEST REPORT (C-7.a)

Project DSU-46 PW AFE/Work Order No. 5000146  
 Pipeline \_\_\_\_\_ (Name) (Location)

Testing Contractor Wood \_\_\_\_\_ (Name) (Contract No.)

Construction Contractor Wood \_\_\_\_\_ (Name) (Contract No.)

Pipe O.D. \_\_\_\_\_ Wall thickness 0.4535 Grade CL300 MFG'R: FlexSteel  
 Test Fluid Fresh Water Frac Tank \_\_\_\_\_ (Type) (Source) (Temperature)

Additive N/A N/A \_\_\_\_\_ (Type) (Quantity)

Section Tested No. \_\_\_\_\_ From: 0+00 To: 14+95 Volume: 20 BBL  
 Pump Location: Sta# 0+00 Pump No. N/A Gal./Stroke N/A  
 Deadweight Tester Location: 0+00 MFG'R: \_\_\_\_\_ S/N 790655

Time	Pressure PSIG	Ambient Temp.
2:20 PM	999	44.0
2:45 PM	995	42.0
3:00 PM	993	42.0
3:20 PM	989	40.1
3:45 PM	989	40.1
4:15 PM	993	38.2
4:45 PM	999	34.4
5:00 PM	1002	33.8
5:30 PM	1010	34.1
6:00 PM	1017	33.5
6:30 PM	1024	34.4

Time	Pressure PSIG	Ambient Temp.
6:53	1015	34.7
7:30	1016	33.01
8:00	1016	32.0
8:30	1016	32.31
9:00	1016	30.95
9:30	1017	30.61
10:00	1016	30.40
10:30	1015	28.20
11:00	1015	27.77
11:34	750	28.12
11:52	753	27.85

Time	Pressure PSIG	Ambient Temp.
12:17	500	26.35
12:37	505	25.01
1:01	250	24.0
1:22	257	25.0
1:54	0	25.0
	End Test	250

Strokes per 10 PSIG: First 100 PSIG N/A Last 100 PSIG N/A  
 Test Started 2:20 AM/PM 12-1-18 Test Ended 11:00 AM/PM 12-1-18  
 (Time) (Date) (Time) (Date)

Section Accepted: \_\_\_\_\_ Section Leaking: No Section Ruptured: No  
 Location and Type of Failure: Bled Down at 11:00 To 750 at 11:34  
 Remarks: Hold Till 11:54, Drop To 505 at 12:17 Hold Till 12:37  
Drop To 250 at 1:01 AM Hold Till 1:22 To 0 PSI at

Bled Down at 6:30 From 1024 To 1015 PSI  
 Weather: Gusty Wind, Partly Cloudy

Testing Contractor's Representative Kirt Hale Tester [Signature] 12-2-18  
 (Name) (Title) (Signature) (Date)

Constr. Contractor's Representative Kirt Hale Tester [Signature] 12-2-18  
 (Name) (Title) (Signature) (Date)

Company Representative William Hartline Inspector [Signature] 12-2-18  
 (Name) (Title) (Signature) (Date)

Construction Superintendent David Burkomeyer Superintendent [Signature] 12/2/18  
 (Name) (Title) (Signature) (Date)



## Title: Pipe Testing Report

QA-QC

Effective Date: 09-07-2006

Work Order Number:

## FACILITY DESCRIPTION

Facility Name <b>DSU 46-4" PW</b>	Location	Area	District	County <b>Weld</b>	State <b>CO</b>
		Section	Township	Range	
Facility Type <input checked="" type="checkbox"/> Gathering <input type="checkbox"/> Transmission		Pipe Manufacturer <b>FLEX STEEL</b>			
<input checked="" type="checkbox"/> Line Pipe <input type="checkbox"/> Plant/Station <input type="checkbox"/> Vessel <input type="checkbox"/> Hot Tap <input type="checkbox"/> Line Junction <input type="checkbox"/> Well Setting <input checked="" type="checkbox"/> Fabrication <input type="checkbox"/> Other		Diameter <b>4"</b>		Wall Thickness	
Description of Portion Tested (From-To):		Spec. & Grade		Length of Test Section <b>1492</b>	

## TEST SPECIFICATIONS

Type of Test <input type="checkbox"/> Strength <input checked="" type="checkbox"/> Both <input type="checkbox"/> Leak	Test Stations and Elevation	Begin Location <b>0+00</b>	End Location <b>14+92</b>	Dead Weight <b>0+00</b>
Reason for Test <input checked="" type="checkbox"/> New Facility <input type="checkbox"/> Pre-Test <input type="checkbox"/> Retest <input type="checkbox"/> Repair		High Point	Low Point	Pressure Pump <b>0+00</b>
Test Method <input checked="" type="checkbox"/> Hydrostatic <input type="checkbox"/> Pneumatic <input type="checkbox"/> Service	Applicable Code	Design Pressure		<input checked="" type="checkbox"/> Above Ground <input type="checkbox"/> Underground
Preliminary Leak Pressure	Begin Station Minimum Pressure	End Station Minimum Pressure		
Required Test Pressure <b>900 1100</b>	High Point Minimum Pressure	Low Point Maximum Pressure		
Required Test Duration <b>8h</b>	Test Limitations (Valves, Fittings, etc.)			

Test Medium

Water

## CALIBRATION DATA

Chart Recorder ID <b>265 4840 pipe temp</b>	Date of Calibration <b>4-26-18</b>	Static Range <b>0-300/0-1509</b>
Test Gauge ID <b>790655</b>	Date of Calibration <b>6-6-18</b>	Gauge Range <b>0-10000</b>
Test Gauge ID <b>788687</b>	Date of Calibration <b>6-7-18</b>	Gauge Range
Dead Weight ID <b>Ground Temp 747-120500</b>	Date of Calibration <b>11-29-18</b>	Range <b>0-3000/0-1508</b>

## TEST RESULTS

Test Start Date <b>12-1-18</b> Hour <b>4:15 AM</b>	Test Completed Date <b>12-2-18</b> Hour <b>2:30 AM</b>	Weather <b>High Windy</b>		
Comments: <b>THE PIPE TEMP WAS SO UP AND DOWN DUE TO THE WIND AND LETTING THE HEAT OUT. WINTER TIME TESTING</b>				
Time	D.W. Pressure	Amb. Temp. °F	Pipe Temp. °F	Remarks
838	256	34		
859	216	35		258
900	255	35		High Wind
915	247	36		
930	245	36		
931	516	38		
949	495	36		508
952	520	36		
1000	5	39		
1017	514	39		
1022	785	39		758
1030	745	39		
1032	765	40		
1045	760	40		
1100	757	40		High Wind
1108	766	40		
1124	763	40		
1130	761	41		START one hour hold
1145	760	41		Pipe covered between with Heaters
1200pm	757	40		

Document No:

Revision 0



## Title: Pipe Testing Report

Effective Date: 09-07-2006

Time	D.W. Pressure	Amb. Temp. °F	Pipe Temp. °F	TEST RESULTS (CONT.)
				Remarks
1215	755	42		Windy
1230 <sup>PM</sup>	752	44		
1250	750/1002	44		Test pressure
102 <sup>PM</sup>	995	44		Pressure BACK UP
104	1002	44		Test pressure
124	995	44		Pressured BACK UP
125	1003	44		Sunny clear High Winds
140	999	45		
146	997	44		Pressure BACK UP
148	1000	44		
2:00	998	45		
210	1001	44		Pressured BACK UP
* 220	999	44		START TEST
230	998	44		
245	995	42		
3:00	993	42		
3:15	989	41		Windy c
3:30	980	40		
3:45	987	40		
4:00	990	38		
4:30	995	37		
5:00	1003	35		
5:30	1003	35		

SKETCH

## APPROVALS

Performed By:

Date:

Superintendent Approval:

Date:

Client / AI Approval:

Date:

Witnessed By:

Date:



## Title: Pipe Testing Report

Effective Date: 09-07-2006

Work Order Number:

FACILITY DESCRIPTION					
Facility Name	Location	Area	District	County	State
		Section	Township	Range	
Facility Type <input type="checkbox"/> Gathering <input type="checkbox"/> Transmission <input type="checkbox"/> Line Pipe <input type="checkbox"/> Plant/Station <input type="checkbox"/> Vessel <input type="checkbox"/> Hot Tap <input type="checkbox"/> Line Junction <input type="checkbox"/> Well Setting <input type="checkbox"/> Fabrication <input type="checkbox"/> Other _____		Pipe Manufacturer			
Pipe Data		Diameter	Wall Thickness		
Description of Portion Tested (From-To):		Spec. & Grade	Length of Test Section		

TEST SPECIFICATIONS					
Type of Test <input type="checkbox"/> Strength <input type="checkbox"/> Both <input type="checkbox"/> Leak	Reason for Test <input type="checkbox"/> Pre-Test <input type="checkbox"/> Retest <input type="checkbox"/> New Facility <input type="checkbox"/> Repair	Test Stations and Elevation	Begin Location	End Location	Dead Weight
Test Method <input type="checkbox"/> Hydrostatic <input type="checkbox"/> Pneumatic <input type="checkbox"/> Service	Applicable Code		High Point	Low Point	Pressure Pump
Design Pressure					<input type="checkbox"/> Above Ground <input type="checkbox"/> Underground
Pressure Data	Preliminary Leak Pressure	Begin Station Minimum Pressure		End Station Minimum Pressure	
	Required Test Pressure	High Point Minimum Pressure		Low Point Maximum Pressure	
	Required Test Duration	Test Limitations (Valves, Fittings, etc.)		Test Medium	

CALIBRATION DATA		
Chart Recorder ID	Date of Calibration	Static Range
Test Gauge ID	Date of Calibration	Gauge Range
Test Gauge ID	Date of Calibration	Gauge Range
Dead Weight ID	Date of Calibration	Range

TEST RESULTS		
Test Start Date	Test Completed Date	Weather
Hour	Hour	
Comments:		

Time	D.W. Pressure	Amb. Temp. °F	Pipe Temp. °F	Remarks
6:00 AM	1016	37		
6:30	1024	34		dark pipe covered
6:55	1025	33		
7:00	1015	33		Blew down to 1015.
7:15	1015	33		opened up N end of C blankets
7:20	1016	33		
7:45	1016	32		windy/clear.
8:00	1016	32		
8:15	1016	32		
8:30	1016	31		windy/clear
8:45	1016	30		
9:00	1016	30		
9:15	1016	30		windy/clear.
9:30	1017	30		
9:45	1016	29		
10:00	1016	29		
10:15	1015	28		
10:30	1015	28		
10:45	1015	27		
11:00	1015	27		



Effective Date:09-07-2006

**SKETCH**

### APPROVALS

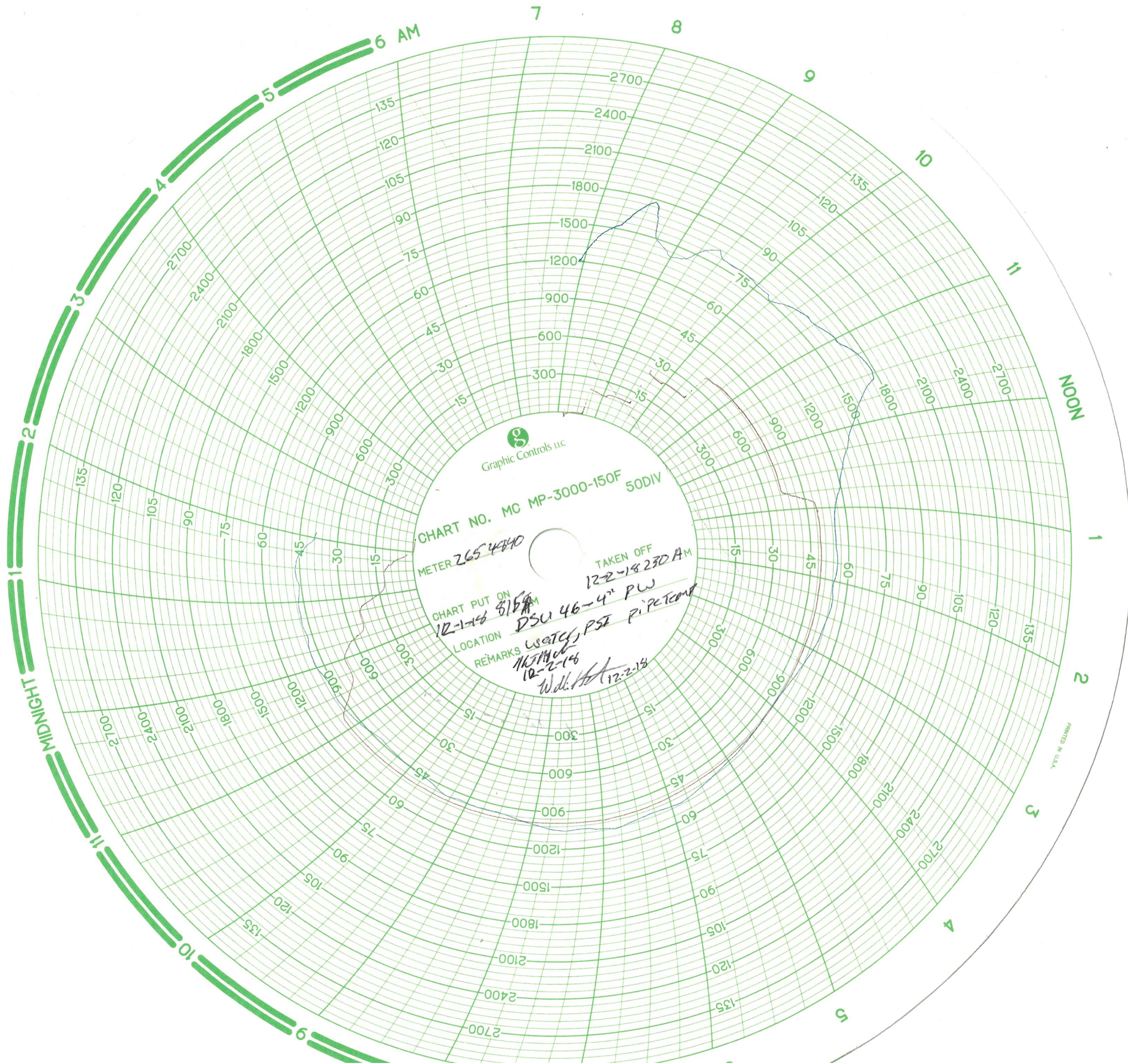
12-2-158

Date:

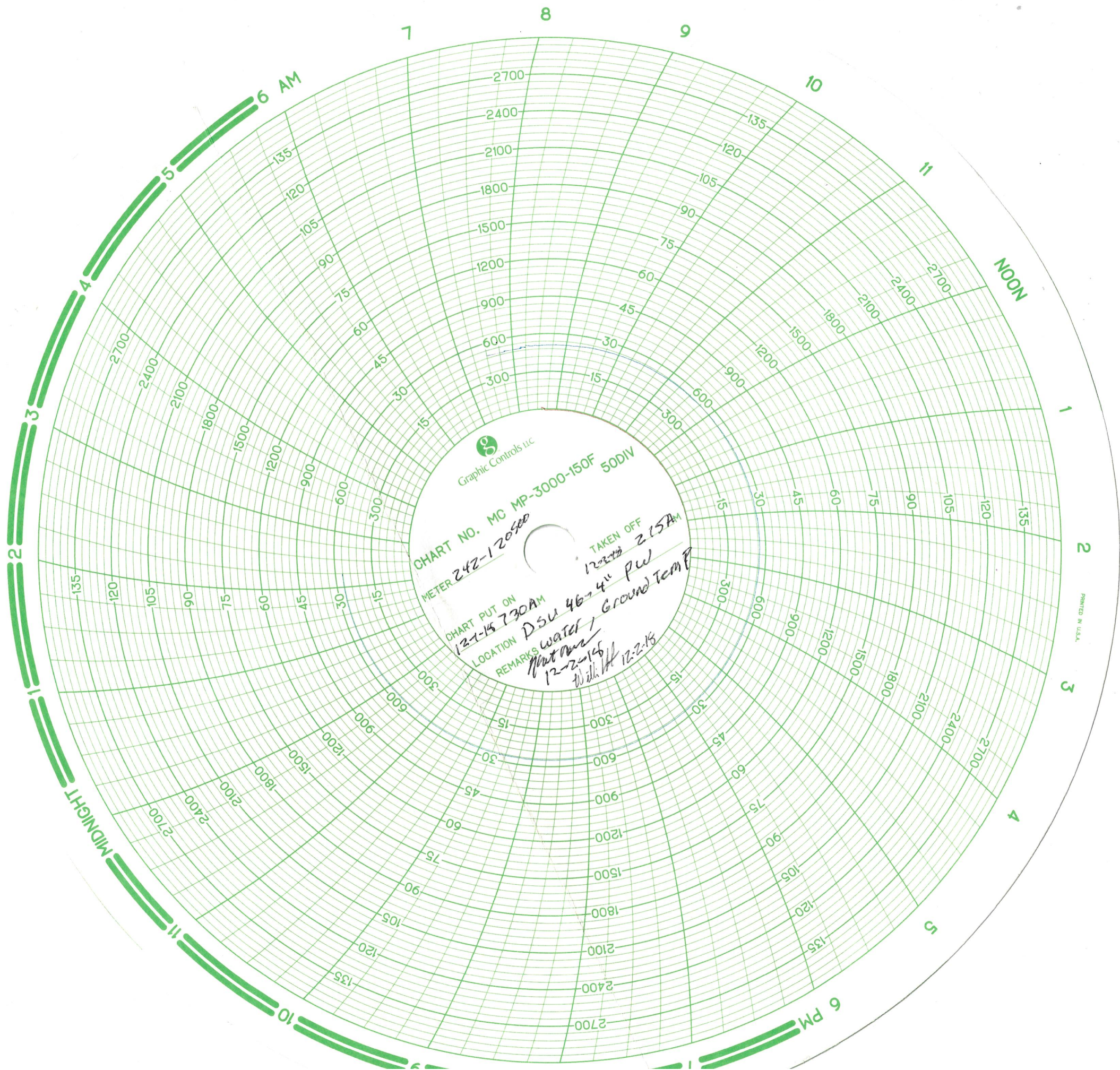
12-2-18

Date: \_\_\_\_\_











# PSS-COMPANIES



9700 E. 104<sup>TH</sup> 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: 11/29/2018

DUE DATE: 11/29/2019

INDICATED TEMPERATURE RANGE: # 0 – 150°F

INDICATED PRESSURE RANGE: #0 – 3000 PSI

SERIAL NO: 242-120500 ID No: 004255

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): 73°F / 31%.

CALIBRATED BY: NICK BEDFORD

SIGNATURE



# PSS-COMPANIES



9700 E. 104<sup>TH</sup> 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: 04/26/2018  
DUE DATE: 04/26/2019

INDICATED TEMPERATURE RANGE: # 0 – 150°F  
INDICATED PRESSURE RANGE: #0 – 3000 PSI  
SERIAL NO: 265-4840  
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

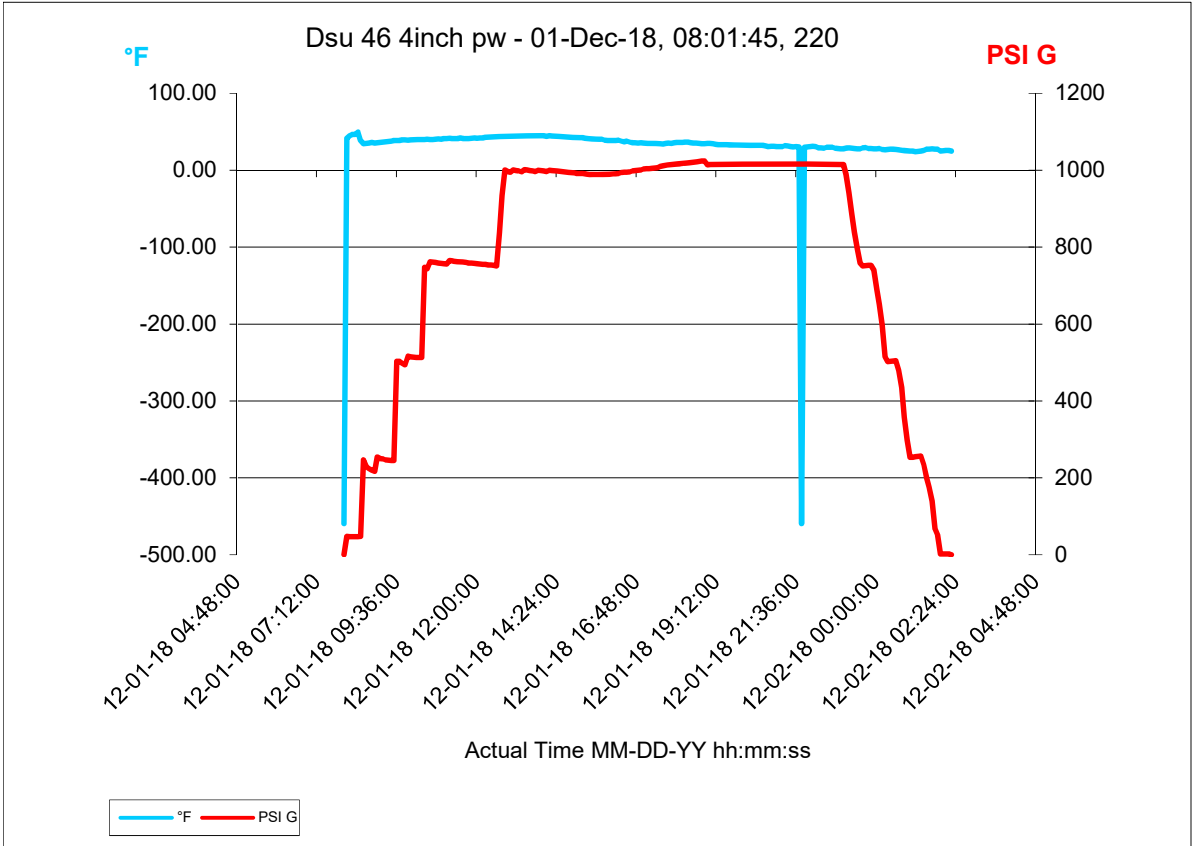


# Data Collection Report

	Chassis	Left Scale	Right Scale
Serial Number	790072	788687	790655
Datatype		Upper	Lower
Units		°F	PSI G

Upper

Lower





	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype						
Units		PSI G	°F		Upper °F	Lower PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

Data Points			
Point #	Time	Left - °F	Right - PSI G
1	12-01-18 8:01:45	-459.67	0
2	12-01-18 8:06:45	41.77	48
3	12-01-18 8:11:45	44.95	47
4	12-01-18 8:16:45	46.40	47
5	12-01-18 8:21:45	46.47	47
6	12-01-18 8:26:45	49.66	47
7	12-01-18 8:31:45	38.86	48
8	12-01-18 8:36:45	34.61	247
9	12-01-18 8:41:45	34.83	229



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
10	12-01-18 8:46:45	35.56	224			
11	12-01-18 8:51:45	36.23	220			
12	12-01-18 8:56:45	35.56	217			
13	12-01-18 9:01:45	35.66	254			
14	12-01-18 9:06:45	35.99	250			
15	12-01-18 9:11:45	36.61	249			
16	12-01-18 9:16:45	36.99	247			
17	12-01-18 9:21:45	37.35	246			
18	12-01-18 9:26:45	38.05	245			
19	12-01-18 9:31:45	38.61	245			
20	12-01-18 9:36:45	38.54	503			
21	12-01-18 9:41:45	38.73	503			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

22	12-01-18 9:46:45	39.32	498
23	12-01-18 9:51:45	39.33	494
24	12-01-18 9:56:45	39.18	516
25	12-01-18 10:01:45	39.50	515
26	12-01-18 10:06:45	39.32	514
27	12-01-18 10:11:45	40.10	513
28	12-01-18 10:16:45	40.00	513
29	12-01-18 10:21:45	40.01	513
30	12-01-18 10:26:45	39.99	748
31	12-01-18 10:31:45	40.25	744
32	12-01-18 10:36:45	39.95	762
33	12-01-18 10:41:45	40.04	761



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

34	12-01-18 10:46:45	40.36	760
35	12-01-18 10:51:45	40.92	759
36	12-01-18 10:56:45	40.55	758
37	12-01-18 11:01:45	41.13	757
38	12-01-18 11:06:45	41.31	756
39	12-01-18 11:11:45	41.59	765
40	12-01-18 11:16:45	41.28	764
41	12-01-18 11:21:45	41.35	763
42	12-01-18 11:26:45	41.17	762
43	12-01-18 11:31:45	41.88	762
44	12-01-18 11:36:45	41.27	761
45	12-01-18 11:41:45	41.38	760



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
46	12-01-18 11:46:45	41.21	759			
47	12-01-18 11:51:45	41.77	759			
48	12-01-18 11:56:45	42.07	758			
49	12-01-18 12:01:45	41.65	757			
50	12-01-18 12:06:45	42.02	756			
51	12-01-18 12:11:45	42.13	755			
52	12-01-18 12:16:45	42.68	755			
53	12-01-18 12:21:45	43.29	754			
54	12-01-18 12:26:45	43.15	754			
55	12-01-18 12:31:45	43.21	753			
56	12-01-18 12:36:45	43.59	751			
57	12-01-18 12:41:45	44.05	838			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
58	12-01-18 12:46:45	43.97	934			
59	12-01-18 12:51:45	44.30	1001			
60	12-01-18 12:56:45	44.14	997			
61	12-01-18 13:01:45	44.31	995			
62	12-01-18 13:06:45	44.27	1001			
63	12-01-18 13:11:45	44.52	999			
64	12-01-18 13:16:45	44.68	998			
65	12-01-18 13:21:45	44.71	996			
66	12-01-18 13:26:45	44.62	1002			
67	12-01-18 13:31:45	44.84	1001			
68	12-01-18 13:36:45	44.95	999			
69	12-01-18 13:41:45	45.07	998			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

70	12-01-18 13:46:45	44.99	997
71	12-01-18 13:51:45	44.77	1000
72	12-01-18 13:56:45	44.80	999
73	12-01-18 14:01:45	44.85	998
74	12-01-18 14:06:45	44.13	997
75	12-01-18 14:11:45	44.81	1000
76	12-01-18 14:16:45	44.32	999
77	12-01-18 14:21:45	44.14	999
78	12-01-18 14:26:45	44.18	998
79	12-01-18 14:31:45	43.98	997
80	12-01-18 14:36:45	43.64	996
81	12-01-18 14:41:45	43.14	995



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

82	12-01-18 14:46:45	42.80	995
83	12-01-18 14:51:45	42.82	994
84	12-01-18 14:56:45	42.70	993
85	12-01-18 15:01:45	42.25	992
86	12-01-18 15:06:45	42.40	992
87	12-01-18 15:11:45	42.51	992
88	12-01-18 15:16:45	41.79	991
89	12-01-18 15:21:45	41.27	989
90	12-01-18 15:26:45	40.66	989
91	12-01-18 15:31:45	40.60	989
92	12-01-18 15:36:45	40.47	989
93	12-01-18 15:41:45	40.34	989

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
94	12-01-18 15:46:45	40.15	989			
95	12-01-18 15:51:45	39.21	989			
96	12-01-18 15:56:45	38.49	989			
97	12-01-18 16:01:45	38.62	990			
98	12-01-18 16:06:45	38.85	991			
99	12-01-18 16:11:45	38.55	991			
100	12-01-18 16:16:45	39.16	992			
101	12-01-18 16:21:45	37.95	994			
102	12-01-18 16:26:45	36.99	995			
103	12-01-18 16:31:45	37.80	995			
104	12-01-18 16:36:45	36.54	996			
105	12-01-18 16:41:45	35.81	998			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
106	12-01-18 16:46:45	35.80	999			
107	12-01-18 16:51:45	35.52	1000			
108	12-01-18 16:56:45	35.70	1001			
109	12-01-18 17:01:45	35.36	1003			
110	12-01-18 17:06:45	35.11	1004			
111	12-01-18 17:11:45	34.95	1004			
112	12-01-18 17:16:45	34.96	1005			
113	12-01-18 17:21:45	34.87	1006			
114	12-01-18 17:26:45	34.43	1007			
115	12-01-18 17:31:45	34.37	1010			
116	12-01-18 17:36:45	34.18	1012			
117	12-01-18 17:41:45	34.86	1013			

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
118	12-01-18 17:46:45	35.31	1014			
119	12-01-18 17:51:45	35.06	1015			
120	12-01-18 17:56:45	35.61	1016			
121	12-01-18 18:01:45	36.16	1016			
122	12-01-18 18:06:45	36.31	1017			
123	12-01-18 18:11:45	36.29	1018			
124	12-01-18 18:16:45	36.62	1018			
125	12-01-18 18:21:45	36.42	1019			
126	12-01-18 18:26:45	35.65	1020			
127	12-01-18 18:31:45	35.46	1021			
128	12-01-18 18:36:45	35.40	1022			
129	12-01-18 18:41:45	34.79	1023			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
130	12-01-18 18:46:45	34.37	1024			
131	12-01-18 18:51:45	34.64	1024			
132	12-01-18 18:56:45	34.81	1014			
133	12-01-18 19:01:45	35.14	1015			
134	12-01-18 19:06:45	34.40	1015			
135	12-01-18 19:11:45	33.68	1015			
136	12-01-18 19:16:45	33.28	1015			
137	12-01-18 19:21:45	33.18	1015			
138	12-01-18 19:26:45	33.14	1016			
139	12-01-18 19:31:45	33.26	1016			
140	12-01-18 19:36:45	32.83	1016			
141	12-01-18 19:41:45	32.83	1016			

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

142	12-01-18 19:46:45	32.86	1016
143	12-01-18 19:51:45	32.82	1016
144	12-01-18 19:56:45	32.97	1016
145	12-01-18 20:01:45	32.47	1016
146	12-01-18 20:06:45	32.58	1016
147	12-01-18 20:11:45	32.32	1016
148	12-01-18 20:16:45	32.38	1016
149	12-01-18 20:21:45	32.42	1016
150	12-01-18 20:26:45	32.27	1016
151	12-01-18 20:31:45	32.33	1016
152	12-01-18 20:36:45	32.33	1016
153	12-01-18 20:41:45	31.48	1016



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
154	12-01-18 20:46:45	30.98	1016			
155	12-01-18 20:51:45	31.17	1016			
156	12-01-18 20:56:45	31.08	1016			
157	12-01-18 21:01:45	30.79	1016			
158	12-01-18 21:06:45	30.98	1017			
159	12-01-18 21:11:45	30.92	1017			
160	12-01-18 21:16:45	32.06	1017			
161	12-01-18 21:21:45	31.55	1017			
162	12-01-18 21:26:45	30.80	1017			
163	12-01-18 21:31:45	30.28	1017			
164	12-01-18 21:36:45	30.66	1017			
165	12-01-18 21:41:45	30.53	1017			

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
166	12-01-18 21:46:45	-459.67	1016			
167	12-01-18 21:51:45	30.13	1016			
168	12-01-18 21:56:45	30.32	1016			
169	12-01-18 22:01:45	30.78	1016			
170	12-01-18 22:06:45	31.09	1016			
171	12-01-18 22:11:45	30.98	1016			
172	12-01-18 22:16:45	29.11	1016			
173	12-01-18 22:21:45	29.11	1016			
174	12-01-18 22:26:45	28.69	1016			
175	12-01-18 22:31:45	29.92	1015			
176	12-01-18 22:36:45	29.81	1015			
177	12-01-18 22:41:45	29.99	1015			



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
178	12-01-18 22:46:45	28.65	1015			
179	12-01-18 22:51:45	28.31	1015			
180	12-01-18 22:56:45	27.72	1015			
181	12-01-18 23:01:45	27.99	1015			
182	12-01-18 23:06:45	28.85	989			
183	12-01-18 23:11:45	28.96	942			
184	12-01-18 23:16:45	28.75	886			
185	12-01-18 23:21:45	28.39	839			
186	12-01-18 23:26:45	27.97	797			
187	12-01-18 23:31:45	28.05	759			
188	12-01-18 23:36:45	29.06	751			
189	12-01-18 23:41:45	29.34	752			

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
190	12-01-18 23:46:45	28.38	753			
191	12-01-18 23:51:45	28.40	753			
192	12-01-18 23:56:45	28.06	740			
193	12-02-18 0:01:45	27.73	691			
194	12-02-18 0:06:45	28.12	651			
195	12-02-18 0:11:45	27.07	597			
196	12-02-18 0:16:45	26.46	515			
197	12-02-18 0:21:45	27.09	502			
198	12-02-18 0:26:45	27.29	503			
199	12-02-18 0:31:45	27.37	504			
200	12-02-18 0:36:45	26.87	505			
201	12-02-18 0:41:45	26.68	480			

	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					

202	12-02-18 0:46:45	25.93	435
203	12-02-18 0:51:45	25.79	357
204	12-02-18 0:56:45	25.36	298
205	12-02-18 1:01:45	25.13	253
206	12-02-18 1:06:45	24.86	253
207	12-02-18 1:11:45	24.29	255
208	12-02-18 1:16:45	24.75	256
209	12-02-18 1:21:45	25.04	257
210	12-02-18 1:26:45	25.70	234
211	12-02-18 1:31:45	27.34	199
212	12-02-18 1:36:45	27.44	176
213	12-02-18 1:41:45	27.82	139



	Chassis	Lower Module	Upper Module	BARO Module	Left Scale	Right Scale
Serial Number	790072	790655	788687		788687	790655
Model	NV	10KPSI	RTD100			
Message Store						
Userspan		0.99982	1.00021			
Offset						
Datatype					Upper	Lower
Units		PSI G	°F		°F	PSI G
Tare						
Average						
User Factor						
User Offset						
User Resolution						
Firmware Version	R080016	R090009	R100006			
Calibration Due		6-Jun-19	7-Jun-19			
Run Index	0					
Run Start Time			1-Dec-18/08:01:45			
Run Duration			18 hours 15 minutes			
Run Tag			Dsu 46 4inch pw			
Logging Interval	300.0					
214	12-02-18 1:46:45	27.65	68			
215	12-02-18 1:51:45	27.52	52			
216	12-02-18 1:56:45	24.88	2			
217	12-02-18 2:01:45	25.54	2			
218	12-02-18 2:06:45	25.78	2			
219	12-02-18 2:11:45	25.88	2			
220	12-02-18 2:16:45	24.83	0			

6/6/2018

Compass Import  
10000PSI

Test Description	As Found - As Left				Status	Pass
	Nominal	Test Results	Tolerance (+/-)	UUT Error		
0	-0.01 psi	0.0 psi	1.5 psi	0.0 psi	Pass	
2000	2000.91 psi	2000.5 psi	1.5 psi	-0.4 psi	Pass	
4000	3999.97 psi	3999.8 psi	2.0 psi	-0.2 psi	Pass	
6000	5999.86 psi	5999.5 psi	3.0 psi	-0.4 psi	Pass	
8000	8000.37 psi	7999.5 psi	4.0 psi	-0.9 psi	Pass	
10000	10000.45 psi	9999.6 psi	5.0 psi	-0.9 psi	Pass	
8000	7999.26 psi	7998.7 psi	4.0 psi	-0.6 psi	Pass	
6000	6001.27 psi	6001.1 psi	3.0 psi	-0.2 psi	Pass	
4000	3999.66 psi	4000.0 psi	2.0 psi	0.3 psi	Pass	
2000	2000.74 psi	2000.8 psi	1.5 psi	0.1 psi	Pass	
0	-0.03 psi	0.0 psi	1.5 psi	0.0 psi	Pass	

- End of measurement results -

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

## Calibration Certificate

Certificate Number: 185546

Customer:  
Cross Country Pipeline Supply  
Aurora, COManufacturer: Crystal Engineering  
Model Number: nVision RTD100  
Serial Number: 788687  
Description: Temperature Module (RTD)  
Procedure: CRY\_R\_RTD100p  
Calibrated To: Manufacturer's Specifications  
Technician: Steven LaupanCalibration Date: 6/7/2018  
Due Date: 6/7/2019  
As Found: Indeterminate  
As Left: In Tolerance  
Temperature: 73 F  
Humidity: 37 %

## Tolerance Specs:

Range: 0 to 400 ohms ; -328 to 1562 degF (PT100 0.00385)

Resistance 0 to 100% of FS: +/- (0.015% of R<sub>dg</sub> + 0.02 ohms)  
Class B Probe Temperature Deviation: +/- (0.3 + 0.005\*°T) degC

## Technician Notes:

As Found: Indeterminate - Upon receipt, the RTD terminal connector was found to be worn out and provided inconsistent "As Found" data. As a result, no "As Found" data was recorded and the connector was replaced. Adjustments were required to achieve the "As Left" results.

As left userspan: 1.00021  
As left R0: 100.000

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
Digital Multimeter, 8 1/2 Digit	3458A	2823A11060	1/9/2018	1/9/2019	APX00012
Reference Thermometer Readout / PRT	1502A / 5628-12-D	B64070 / 3526	7/17/2017	7/17/2018	APX00014
Decade Resistor	1433-28	E1-17295164	7/26/2017	7/26/2018	APX02856



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APX03752

Certificate Number: 185546

6/7/2018

Crystal nVision RTD100 w/Probe

Manual Template

Test Description	Nominal	Test Results	As Left	Tolerance (+/-)	UUT Error	Status	Pass
<b>Measure Resistance</b>							
5 Ohms	5.00 $\Omega$	5.00 $\Omega$		0.02 $\Omega$	0.00 $\Omega$	Pass	
100 Ohms	100.00 $\Omega$	100.01 $\Omega$		0.03 $\Omega$	0.01 $\Omega$	Pass	
200 Ohms	200.00 $\Omega$	200.01 $\Omega$		0.04 $\Omega$	0.01 $\Omega$	Pass	
300 Ohms	300.00 $\Omega$	299.99 $\Omega$		0.06 $\Omega$	-0.01 $\Omega$	Pass	
400 Ohms	400.00 $\Omega$	400.00 $\Omega$		0.08 $\Omega$	0.00 $\Omega$	Pass	

RTD Probe Verification

Class B / 3-Wire / PT100 0.00385

Serial Number						788687-1
32 F	32.08 °F	32.16 °F	0.56 °F	0.08 °F	Pass	
250 F	250.03 °F	250.58 °F	1.64 °F	0.55 °F	Pass	

- End of measurement results -



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

## Calibration Certificate

Certificate Number: 185547

## Customer:

Cross Country Pipeline Supply  
Aurora, CO

Manufacturer: Crystal Engineering

Model Number: nVision 10,000 psi

Serial Number: 790655

Description: Pressure Module

Procedure: CRY\_P\_nVPM

Calibrated To: Manufacturer's Specifications

Technician: Steven Laupan

Calibration Date: 6/6/2018

Due Date: 6/6/2019

As Found: In Tolerance

As Left: As Found

Temperature: 73 F

Humidity: 34 %

## Tolerance Specs:

0 to 30% of FS: +/- 0.015% of FS  
30% to 110% of FS: +/- 0.05% of Rdg

## Technician Notes:

As Left Userspan: 0.99982

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	11/13/2017	11/13/2018	APX00024



APX03752

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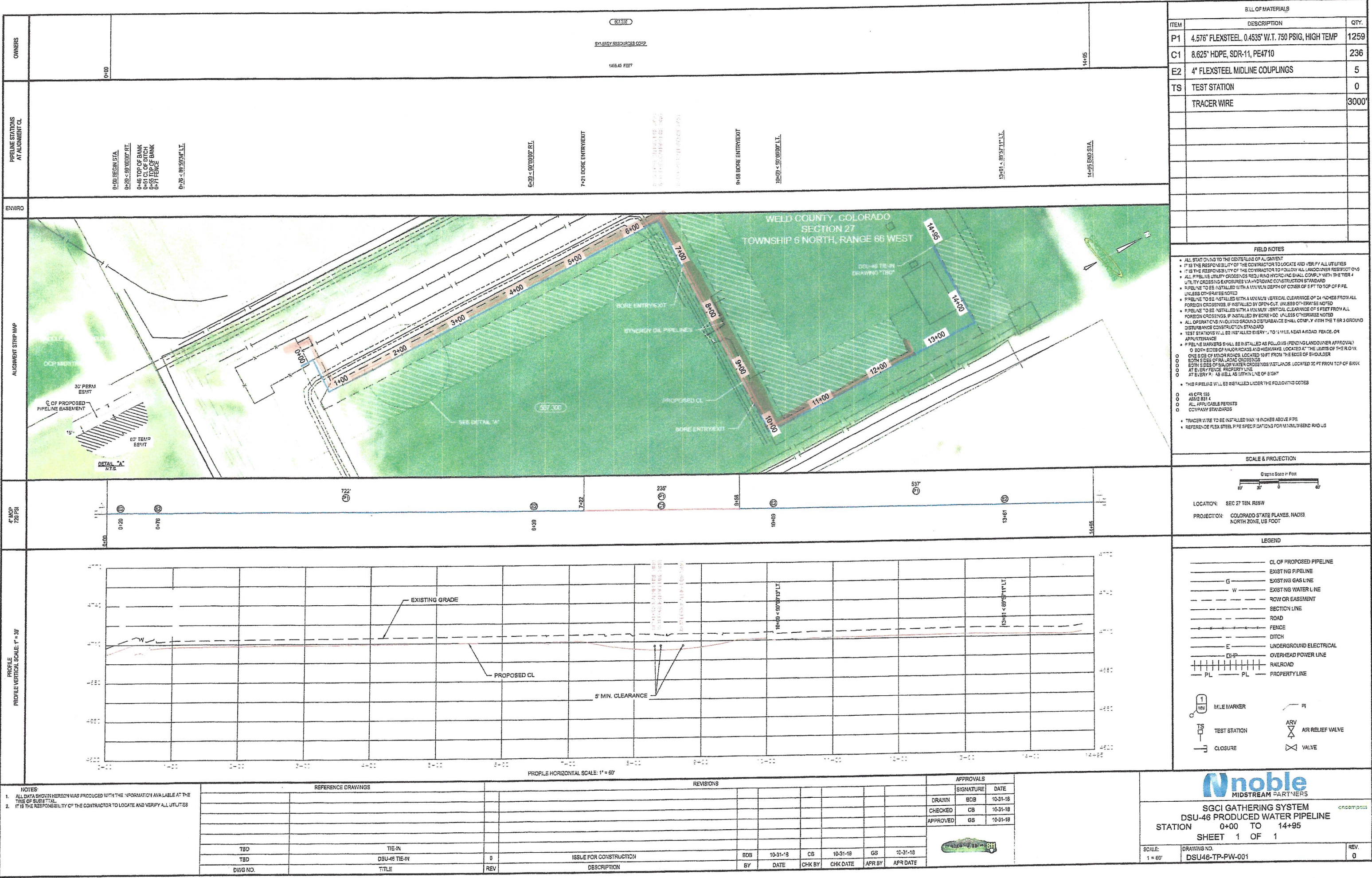


APX03751

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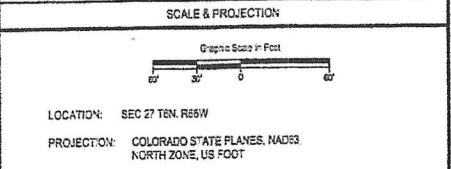
Apex Instruments Inc.





BILL OF MATERIALS		
ITEM	DESCRIPTION	QTY.
P1	4.576" FLEXSTEEL, 0.4535" W.T. 750 PSIG, HIGH TEMP	1259
C1	8.625" HDPE, SDR-11, PE4710	236
E2	4" FLEXSTEEL MIDLINE COUPLINGS	5
TS	TEST STATION	0
	TRACER WIRE	3000'

- FIELD NOTES
- ALL STATIONS TO THE CENTERLINE OF ALIGNMENT
  - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND VERIFY ALL UTILITIES
  - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW ALL LANDOWNER RESTRICTIONS
  - ALL FLEXSTEEL UTILITY CROSSINGS INCLUDING HYDROVAC SHALL COMPLY WITH THE TIER 4 UTILITY CROSSING EXPOSURE AND PROTECTION CONSTRUCTION STANDARD
  - PIPELINE TO BE INSTALLED WITH A MINIMUM DEPTH OF COVER OF 5 FT TO TOP OF PIPE, UNLESS OTHERWISE NOTED
  - PIPELINE TO BE INSTALLED WITH A MINIMUM VERTICAL CLEARANCE OF 24" FROM ALL FOREIGN CROSSINGS, IF INSTALLED BY OPEN-CUT, UNLESS OTHERWISE NOTED
  - PIPELINE TO BE INSTALLED WITH A MINIMUM VERTICAL CLEARANCE OF 5 FEET FROM ALL FOREIGN CROSSINGS, IF INSTALLED BY BORE-HOOD, UNLESS OTHERWISE NOTED
  - ALL OPERATIONS INVOLVING GROUND DISTURBANCE SHALL COMPLY WITH THE TIER 3 GROUND DISTURBANCE CONSTRUCTION STANDARD
  - TEST STATIONS WILL BE INSTALLED EVERY 1/2 MILE, NEAR A ROAD, FENCE, OR APPURTENANCE
  - PIPELINE MARKERS SHALL BE INSTALLED AS FOLLOWS (PENDING LANDOWNER APPROVAL):
    - BOTH SIDES OF MAJOR ROADS AND HIGHWAYS LOCATED AT THE LIMITS OF THE ROW.
    - ONE SIDE OF MINOR ROADS, LOCATED 10 FT FROM THE EDGE OF SHOULDER
    - BOTH SIDES OF RAILROAD CROSSINGS
    - BOTH SIDES OF MAJOR WATER CROSSINGS (WETLANDS LOCATED 30 FT FROM TOP OF BANK AT 5-6% FENCE, PROPERTY LINE AT EVERY 1/2 MILE, AS WELL AS WITHIN LINE OF SIGHT
  - THIS PIPELINE WILL BE INSTALLED UNDER THE FOLLOWING CODES:
    - AS PER 105
    - ASME B31.4
    - ALL APPLICABLE PERMITS
    - COMPANY STANDARDS
  - TRACER WIRE TO BE INSTALLED MAX 18 INCHES ABOVE PIPE
  - REFERENCE FLEX STEEL PIPE SPECIFICATIONS FOR MINIMUM BEND RADIUS



- LEGEND
- CL OF PROPOSED PIPELINE
  - EXISTING PIPELINE
  - G EXISTING GAS LINE
  - W EXISTING WATER LINE
  - ROW OR EASEMENT
  - SECTION LINE
  - ROAD
  - FENCE
  - DITCH
  - E UNDERGROUND ELECTRICAL
  - CHP OVERHEAD POWER LINE
  - RAILROAD
  - PL PROPERTY LINE
  - 1 MILE MARKER
  - TEST STATION
  - CLOSURE
  - PI
  - ARV AIR RELIEF VALVE
  - VALVE