K360 DEF MFL GMFL SMFL XYZ LGT

2013

Pipeline Inspection Report

T.D. Williamson
Pipeline Performance™

Company Name

Hiland Crude, LLC

Project Name

Bainville to Dore Junction

Pipe Size

8"

Inspection Date(s)

Oct 1, 2013

Report Date(s)

Dec 3, 2013

TDW Regional Office

TDW Services, Inc.

Executive Summary - GMFL Inspection

RUN INFORMATION

Hiland Crude, LLC
Heber Briceno

Bainville to Dore Junction
8" Crude

	Launcher	Receiver
Location:	Bainville	Dore Junction
Date/Time:	9/30/2013 11:24:46 PM	10/1/2013 7:23:34 AM
Stationing:	0+00	763+72
GPS - LAT:	48.067369536	47.924109898
GPS - LONG:	-103.885223487	-103.783802054

Duration of run - Hours: 7.98
Pipeline Length: 76,974.00 ft
On-site Representative: Jesse Child
Contact: Heber Briceno

Average Velocity: 2.68 ft/sec
Maximum Velocity: 4.16 ft/sec
Data Analyst: Ben Stehling

Tool Tracking By: Cherokee Pipeline Services

INSPECTION FINDINGS

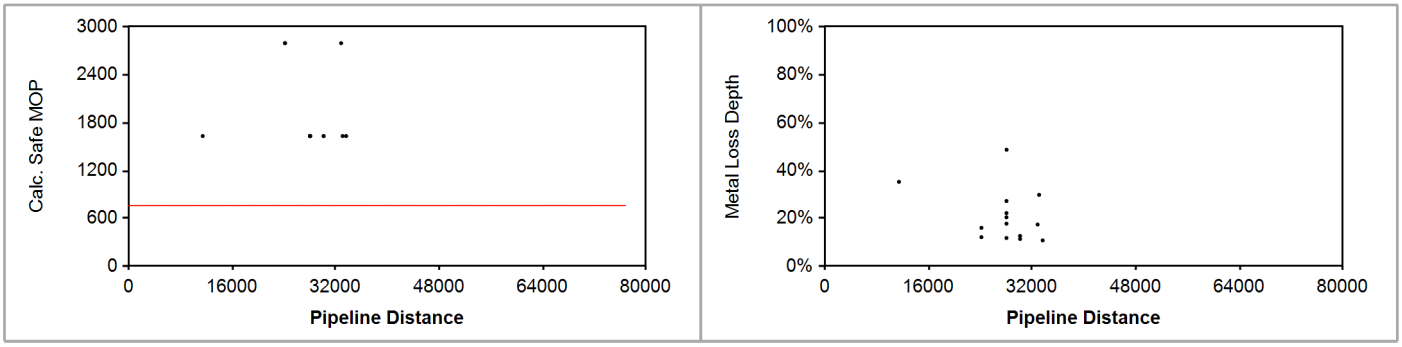
Current Established Maximum
Operating Pressure of Pipeline: 750 psi

Criteria Used: ASME B31G: Modified
Defect Interaction Rule: 1 inch between pits

Welds Detected: 1,880 **Valves Detected:** 6 **Fittings Detected:** 5 **Markers Detected:** 14 **Gains Detected:** 10
Casings Detected: 1 **Tees Detected:** 7 **Flanges Detected:** 15 **Repairs Detected:** 0 **Deformations Detected:** 0

P'<P*: 0 **M/L pits:** 14 **M/L grouping:** 14

Internal groups: 8 **External groups:** 6



** The number of anomalies where P' (calculated safe max. pressure for an anomaly) is less than P (current established maximum pressure of pipeline) - see ASME B31G*

INSPECTION DETAILS

A total of 14 metal loss groups (8 Internal/6 External) were detected on the inspection survey, of which the deepest is reported at 49%. Using an established maximum operating pressure of 750 psi, 0 of the metal loss features appear to be pressure reducing.

Inspection data was obtained for the full length (76,974 feet / 14.58 miles) of the survey. The quality of the inspection data is satisfactory for a comprehensive assessment of this pipeline segment.

One GMFL and one IDOD sensor failed at 65,881 feet into the run resulting in 99.8% and 99.4% coverage respectively; however, tool rotation is good and an acceptable analysis was completed. Client was notified of the incomplete sensor coverage and accepted the run.

Executive Summary - GMFL Inspection

The inspection tool for this project included TDW XYZ Mapping module consisting of a high resolution Inertial Measurement Unit (IMU). The precision navigation data recorded by the IMU along with survey data supplied for specified control points and AGM locations provides a calculation of X, Y and Z coordinates for all objects and features listed in this report. The reported Latitude and Longitude are in NAD83 datum format. Z coordinates are Orthometric heights reported in feet. The final accuracy of reported coordinates is dependent upon the accuracy of the survey points and distance between these points, as well as uniform tool speed; however, the Survey Data Provided for AGM/Control Points is not at the required Sub-Centimeter accuracy level as specified in the document: XYZ Survey Data Requirements (D1902 Rev D).

Executive Summary - Deformation

RUN INFORMATION

Hiland Crude, LLC *Bainville to Dore Junction*

Heber Briceno *8" Crude*

	Launcher	Receiver
Location:	Bainville	Dore Junction
Date/Time:	9/29/2013 9:43:39 PM	9/30/2013 6:48:44 AM
Stationing:	0+00	763+72
GPS - LAT:	48.067369536	47.924109898
GPS - LONG:	-103.885223487	-103.783802054

Duration of run - Hours: 9.08
Pipeline Length: 76,836.00 ft
On-site Representative: Jesse Child

Average Velocity: 2.35 ft/sec
Maximum Velocity: 3.83 ft/sec
Data Analyst: Ben Stehling

Tool Tracking By: Cherokee Pipeline Services

INSPECTION FINDINGS

Deformations Detected: 0 **Ovalities Detected:** 0 **Expansions Detected:** 0 **Heavy Weld Detected:** 0 **Valves Detected:** 6

No dents found meeting minimum report parameters	**No dents found meeting minimum report parameters**

INSPECTION DETAILS

Inspection data was obtained for the full length (76,836 feet / 14.55 miles) of the survey. The quality of the inspection data is satisfactory for a comprehensive assessment of this pipeline segment.

A total of 0 deformations were detected on the inspection survey.

Metal Loss - Immediate Prioritized Repairs

ID#	Distance (ft)	Depth	Length	Width	Orientation	PSI (P')	% of Est. psi (P'/P)	Latitude	Longitude	Altitude

Nothing found in this pipeline inspection meets the criteria for Immediate Repair conditions relating to METAL LOSS.

Metal Loss - 180 Day Prioritized Repairs

ID#	Distance (ft)	Depth	Length	Width	Orientation	PSI (P')	% of Est. psi (P'/P)	Latitude	Longitude	Altitude

Nothing in the inspection meets the criteria for 180 Day Repair conditions relating to METAL LOSS.

Dent - Immediate Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description

Nothing found in the pipeline inspection meets the criteria for Immediate Repair conditions relating to DENTS.

Sorted by depth then distance

Dent - 60 Day Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description

Nothing in the inspection meets of the criteria for 60 Day Repair conditions relating to DENTS.

Sorted by depth then distance

Dent - 180 Day Prioritized Repairs

ID#	Distance (ft)	Depth (in)	Depth (%)	Orientation	Metal Loss	On a Weld	Ovality	Description

Nothing in the inspection meets of the criteria for 180 Day Repair conditions relating to DENTS.

Sorted by depth then distance

Metal Loss Summary

DEFINITIONS

This Metal Loss Summary Report provides information regarding indicated anomalies found in this inspection. Anomalies detected during the inspection are sized and assigned a length, width, and depth. The specified formula for determining remaining-strength of the anomaly is then applied to the predicted sizes. The predicted size accuracy is described in the contract specifications.

The Metal Loss Summary Report is a listing of metal loss indications in the pipeline, sorted first by the calculated safe maximum operating pressure (P') ascending, then by depth descending. As an aid in locating these anomalies, the upstream and downstream references are included, as well as distances from the defect to the reference.

ID#	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Dist.	Given in either feet or meters, based on contractual agreements, this is the absolute distance from launch.
Depth	Predicted depth of the defect as a percentage of nominal wall.
Length	Predicted length of the defect, reported in either inches or millimeters.
Width	Predicted width of the defect, reported in either inches or millimeters.
ID/OD	Determination whether the defect exists on the inside (INT) or outside (EXT) surface of the pipe.
Orientation: Deg / O'Clock	Orientation is reported in degrees and o'clock (0 degrees/12:00 at top of pipe) as viewed looking downstream.
P'	Based on the specified formula for determining remaining-strength, it is the predicted safe maximum allowable pressure for the defect (P').
% Est. Press. (P'/P)	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure reducing.
Aboveground References	The name of the closest upstream and downstream references, usually either an AGM or a Valve.
Distance from Defect	The distance to the upstream and downstream reference listed in the previous column. Used for locating defects in the field.

See Appendix C for Dig Sheet Preparation

Metal Loss Summary

ID#	Dist (ft)	Depth	Length	Width	ID/OD	Orientation Deg	Orientation O'clock	P'	% Est. Press. (P'/P)	Above-Ground References		Distance from Defect
40000008	28,054.7	48.7%	0.88	0.69	INT	359	11:45	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5921.91
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2536.29
40000000	11,435.9	35.3%	0.67	0.43	INT	226	7:30	1632.2	100.0	**U/S:**	AGM 020, Sta. 93+91, ROW -- Han #3825	1924.94
										D/S:	AGM 030, Sta. 153+57, ROW -- Han #8740	4040.06
40000012	33,079.2	29.9%	1.01	1.30	INT	80	2:30	1632.2	100.0	**U/S:**	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2488.18
										D/S:	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	2426.22
40000007	28,039.0	27.3%	0.74	0.70	INT	204	6:45	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5906.23
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2551.96
40000005	28,036.3	22.2%	0.62	0.88	INT	170	5:30	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5903.50
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2554.70
40000004	28,036.1	20.5%	1.02	1.06	INT	140	4:30	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5903.27
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2554.92
40000003	28,035.9	17.8%	1.10	1.78	INT	220	7:15	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5903.13
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2555.06
40000009	30,137.0	12.7%	0.69	0.40	EXT	13	12:15	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	8004.26
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	453.94
40000006	28,036.3	11.8%	0.51	0.33	EXT	205	6:45	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	5903.52
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2554.67
40000010	30,142.0	11.4%	0.69	0.59	EXT	47	1:30	1632.2	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	8009.20
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	449.00

Metal Loss Summary

ID#	Dist (ft)	Depth	Length	Width	ID/OD	Orientation Deg	Orientation O'clock	P'	% Est. Press. (P'/P)	Above-Ground References		Distance from Defect
40000013	33,628.0	10.8%	1.19	0.79	INT	150	5:00	1632.2	100.0	**U/S:**	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	3037.04
										D/S:	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	1877.36
40000011	32,844.9	17.5%	0.74	0.41	EXT	351	11:30	2795.5	100.0	**U/S:**	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	2253.90
										D/S:	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	2660.50
40000001	24,171.1	16.1%	0.63	0.50	EXT	355	11:45	2795.5	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	2038.31
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	6419.89
40000002	24,171.8	12.2%	0.70	0.38	EXT	350	11:30	2795.5	100.0	**U/S:**	AGM 040, Sta. 219+94, Drive Way -- Han #8740	2039.07
										D/S:	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	6419.13

This report shows a maximum of 100 metal loss groups.

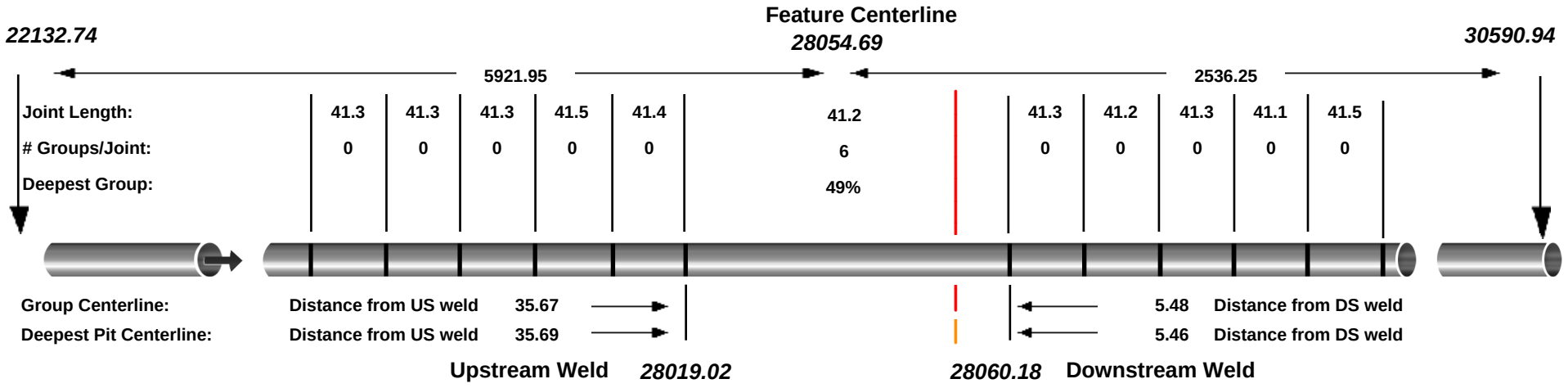
Type	Number
Metal Loss	14

TDW Services, Inc.
Hiland Crude, LLC
Bainville to Dore Junction

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

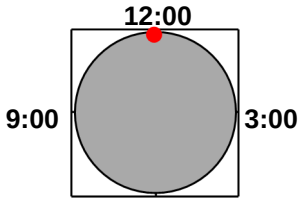
ID:	**40000008**	Distance from Launcher:	***28054.69***	***Feature Description***	
Time:	**14281.88**	Orientation on Pipe Wall:	**11:45**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02156727**	Longitude:	**-103.82781798**	Altitude:	**1849.189**

Upstream Locations		Downstream Locations	
1450.41	Bend right - 65 deg., 5D	2585.40	Bend left - 90 deg., 6D
3926.20	Bend left - 90 deg., 6D	4070.56	Bend right - 35 deg., 3D
4254.67	Bend right - 90 deg., 6D	4778.72	Bend right - 35 deg., 3D
7620.25	Bend left - 15 deg., 3D	7448.26	Bend up - 45 deg., 3D
10662.66	Bend right - 45 deg., 3D	7460.84	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **49%**
Length: **0.883**
Width: **0.689**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

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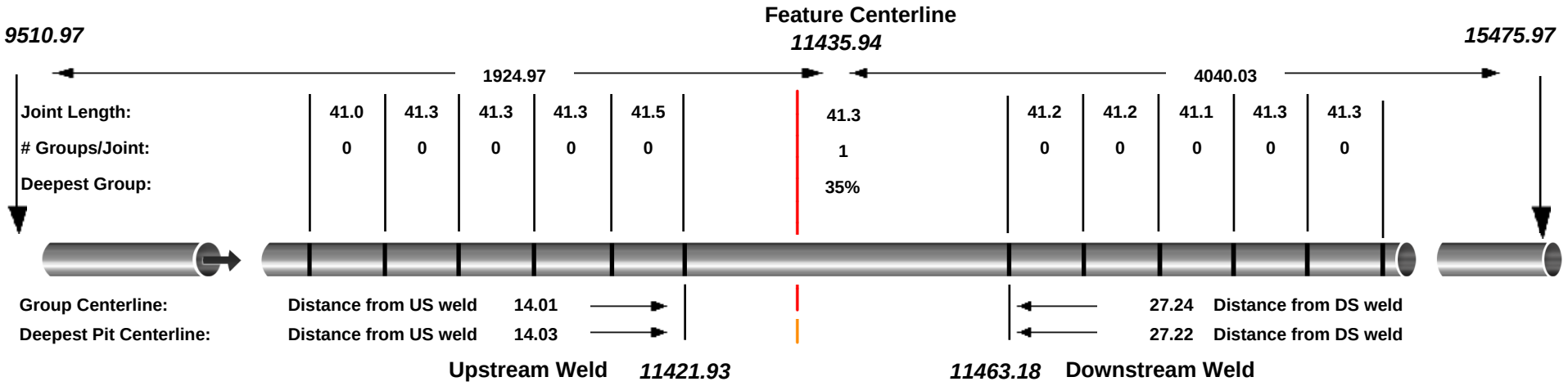
GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 020, Sta. 93+91, ROW -- Han #3825

DOWNSTREAM REFERENCE
AGM 030, Sta. 153+57, ROW -- Han #8740



Feature Information

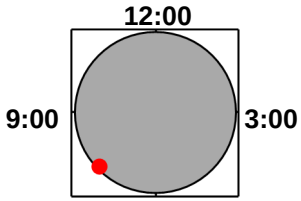
ID:	**40000000**	Distance from Launcher:	***11435.94***	***Feature Description***	
Time:	**8912.57**	Orientation on Pipe Wall:	**7:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.03740900**	Longitude:	**-103.87866720**	Altitude:	**1898.262**

Upstream Locations		Downstream Locations	
817.65	Bend right - 15 deg., 1.5D	3606.08	Bend left - 45 deg., 3D
828.52	Casing End	4041.48	Tee at 90 deg.
1540.24	Casing Begin	5956.09	Bend right - 45 deg., 3D
2904.08	Bend right - 45 deg., 3D	8998.50	Bend left - 15 deg., 3D
3695.02	Bend left - 45 deg., 3D	12364.08	Bend right - 90 deg., 6D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **35%**
Length: **0.670**
Width: **0.427**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

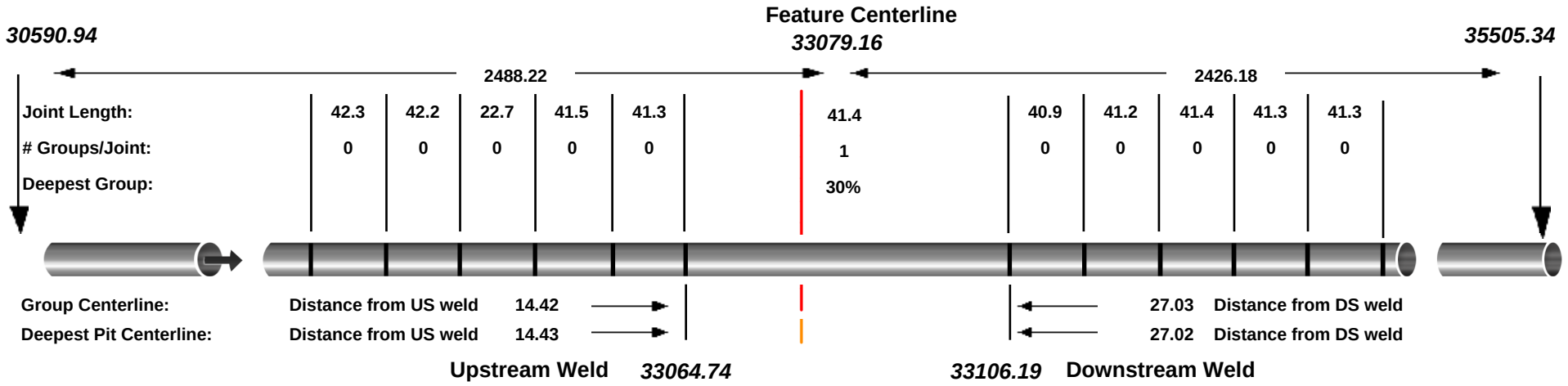
GROUP - Dig Site Information Report

UPSTREAM REFERENCE

AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point

DOWNSTREAM REFERENCE

AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745



Feature Information

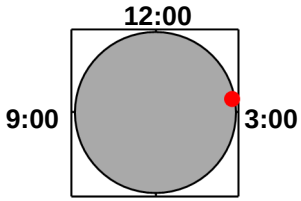
ID:	**40000012**	Distance from Launcher:	***33079.16***	***Feature Description***	
Time:	**15664.24**	Orientation on Pipe Wall:	**2:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02388699**	Longitude:	**-103.81338193**	Altitude:	**1850.635**

Upstream Locations		Downstream Locations	
245.75	Bend right - 35 deg., 3D	2423.79	Bend up - 45 deg., 3D
953.91	Bend right - 35 deg., 3D	2436.37	Bend down - 45 deg., 3D
2439.07	Bend left - 90 deg., 6D	2438.43	Fitting on top of pipe
6474.88	Bend right - 65 deg., 5D	2440.35	Flange
8950.67	Bend left - 90 deg., 6D	2441.43	Valve, Sta. 354+24, 42nd St. NW

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **30%**
Length: **1.008**
Width: **1.305**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

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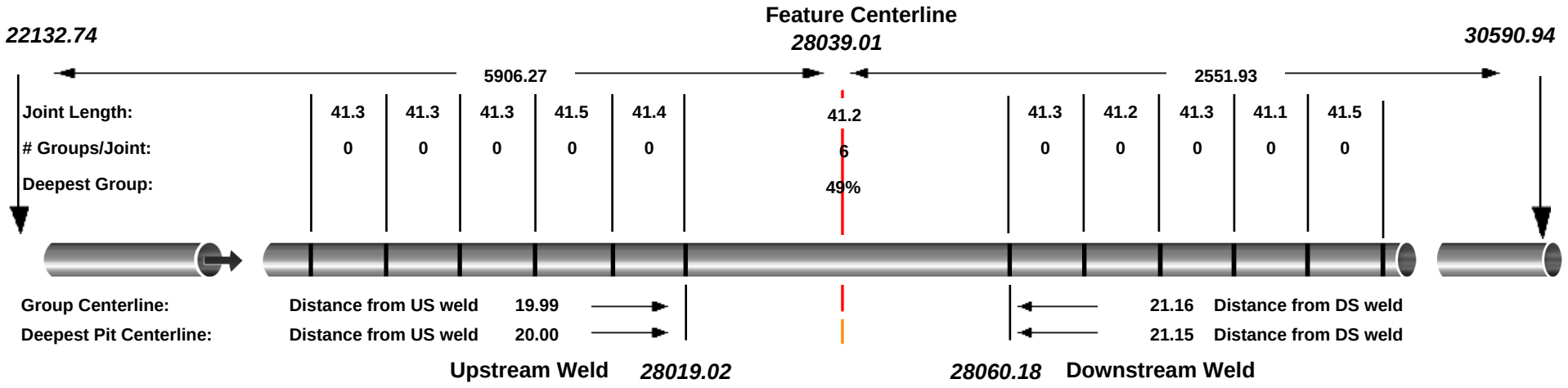
TDW Services, Inc.
Hiland Crude, LLC
Bainville to Dore Junction

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

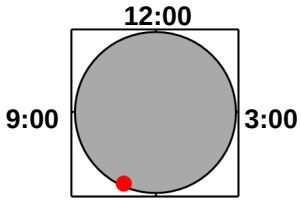
ID:	**40000007**	Distance from Launcher:	***28039.01***	***Feature Description***	
Time:	**14277.56**	Orientation on Pipe Wall:	**6:45**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02159136**	Longitude:	**-103.82787051**	Altitude:	**1849.377**

Upstream Locations		Downstream Locations	
1434.73	Bend right - 65 deg., 5D	2601.08	Bend left - 90 deg., 6D
3910.52	Bend left - 90 deg., 6D	4086.24	Bend right - 35 deg., 3D
4238.99	Bend right - 90 deg., 6D	4794.40	Bend right - 35 deg., 3D
7604.57	Bend left - 15 deg., 3D	7463.94	Bend up - 45 deg., 3D
10646.98	Bend right - 45 deg., 3D	7476.52	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **27%**
Length: **0.744**
Width: **0.698**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

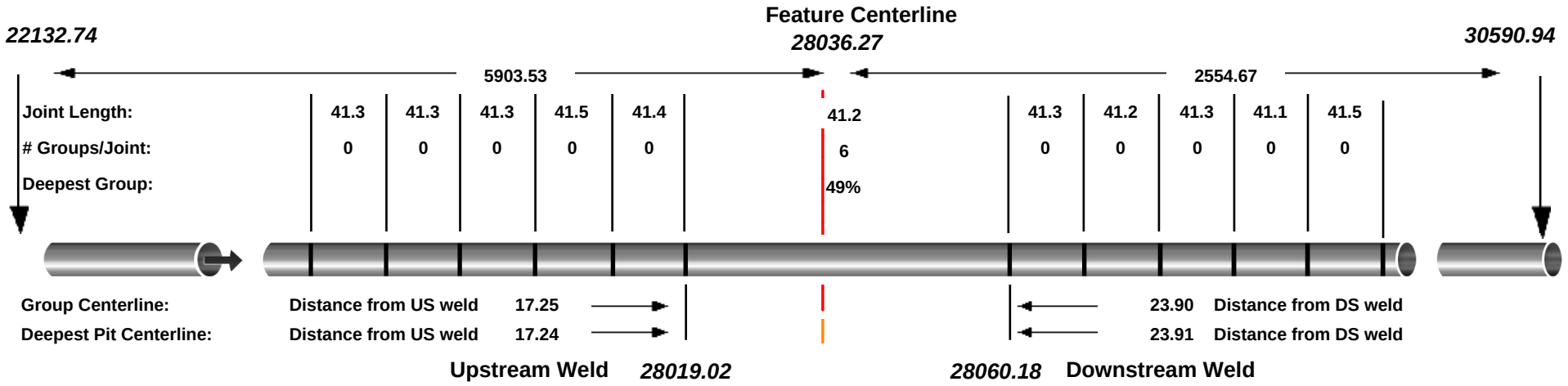
1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

Generated: 12/3/2013

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

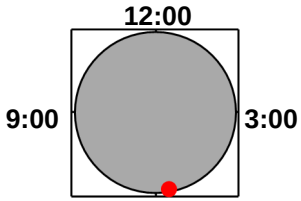
ID:	**40000005**	Distance from Launcher:	***28036.27***	***Feature Description***	
Time:	**14276.81**	Orientation on Pipe Wall:	**5:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02159556**	Longitude:	**-103.82787968**	Altitude:	**1849.396**

Upstream Locations		Downstream Locations	
1431.99	Bend right - 65 deg., 5D	2603.82	Bend left - 90 deg., 6D
3907.78	Bend left - 90 deg., 6D	4088.98	Bend right - 35 deg., 3D
4236.25	Bend right - 90 deg., 6D	4797.14	Bend right - 35 deg., 3D
7601.83	Bend left - 15 deg., 3D	7466.68	Bend up - 45 deg., 3D
10644.24	Bend right - 45 deg., 3D	7479.26	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **22%**
Length: **0.623**
Width: **0.877**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

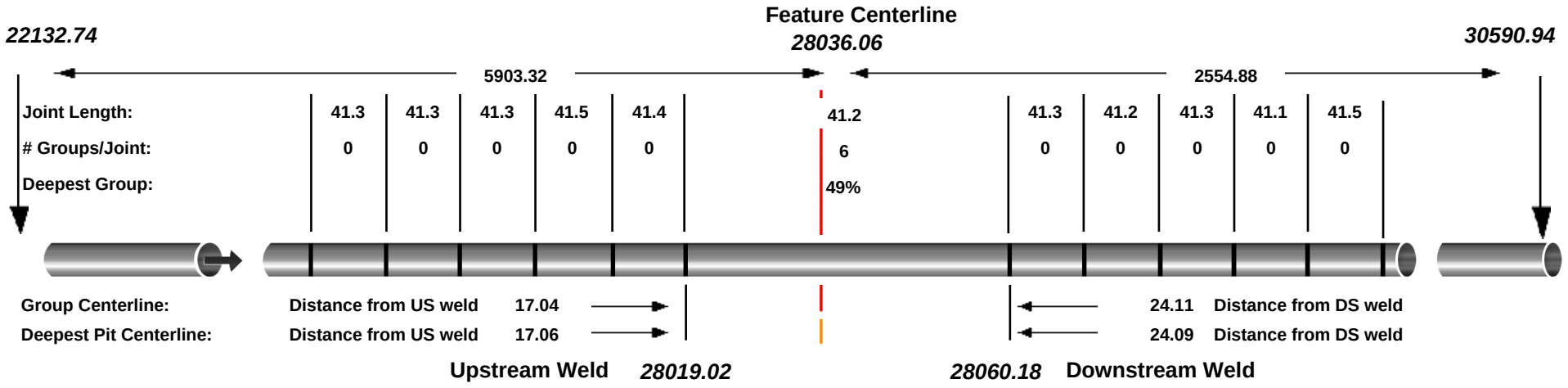
1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

TDW Services, Inc.
Hiland Crude, LLC
Bainville to Dore Junction

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

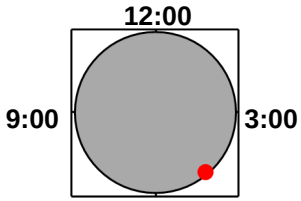
ID:	**40000004**	Distance from Launcher:	***28036.06***	***Feature Description***	
Time:	**14276.75**	Orientation on Pipe Wall:	**4:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02159588**	Longitude:	**-103.82788040**	Altitude:	**1849.397**

Upstream Locations		Downstream Locations	
1431.78	Bend right - 65 deg., 5D	2604.03	Bend left - 90 deg., 6D
3907.57	Bend left - 90 deg., 6D	4089.19	Bend right - 35 deg., 3D
4236.04	Bend right - 90 deg., 6D	4797.35	Bend right - 35 deg., 3D
7601.62	Bend left - 15 deg., 3D	7466.89	Bend up - 45 deg., 3D
10644.03	Bend right - 45 deg., 3D	7479.47	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **20%**
Length: **1.025**
Width: **1.057**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

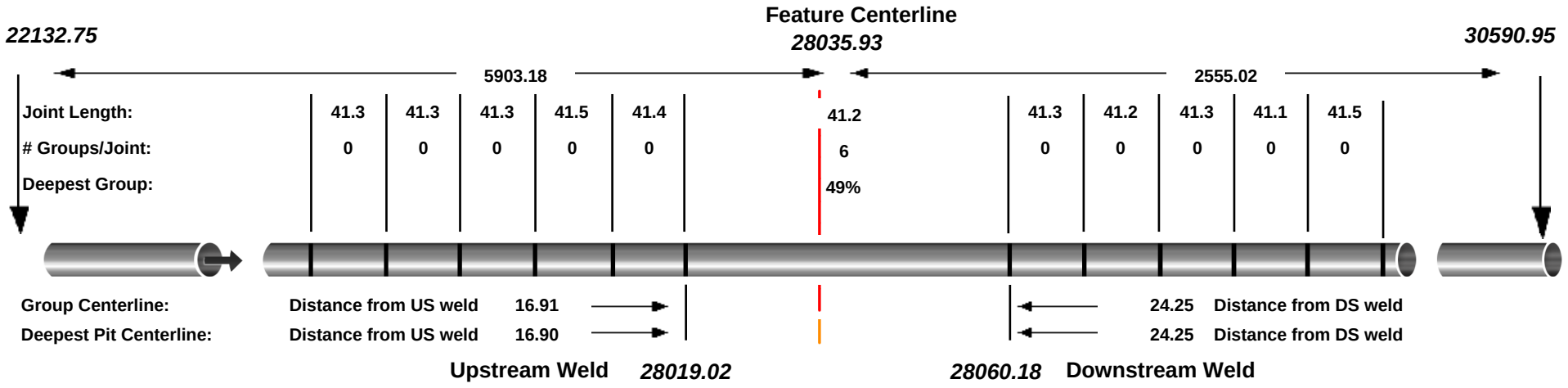
Generated: 12/3/2013

TDW Services, Inc.
Hiland Crude, LLC
Bainville to Dore Junction

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

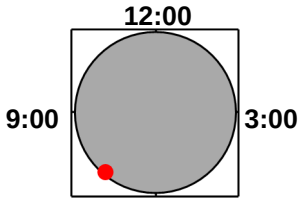
ID:	**40000003**	Distance from Launcher:	***28035.93***	***Feature Description***	
Time:	**14276.71**	Orientation on Pipe Wall:	**7:15**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.02159609**	Longitude:	**-103.82788087**	Altitude:	**1849.398**

Upstream Locations		Downstream Locations	
1431.65	Bend right - 65 deg., 5D	2604.16	Bend left - 90 deg., 6D
3907.44	Bend left - 90 deg., 6D	4089.32	Bend right - 35 deg., 3D
4235.91	Bend right - 90 deg., 6D	4797.48	Bend right - 35 deg., 3D
7601.49	Bend left - 15 deg., 3D	7467.02	Bend up - 45 deg., 3D
10643.90	Bend right - 45 deg., 3D	7479.60	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **18%**
Length: **1.104**
Width: **1.779**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

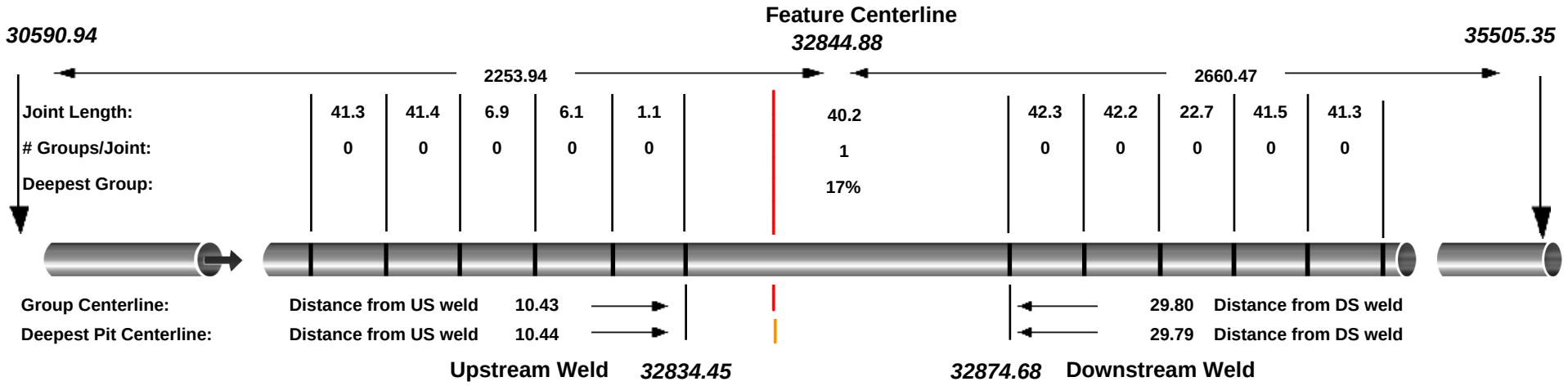
Generated: 12/3/2013

TDW Services, Inc.
Hiland Crude, LLC
Bainville to Dore Junction

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point

DOWNSTREAM REFERENCE
AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745



Feature Information

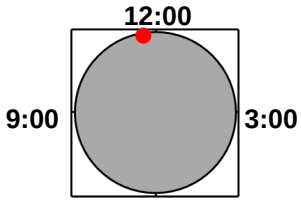
ID:	**40000011**	Distance from Launcher:	***32844.88***	***Feature Description***	
Time:	**15600.96**	Orientation on Pipe Wall:	**11:30**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.322**
Latitude:	**48.02386894**	Longitude:	**-103.81433388**	Altitude:	**1852.149**

Upstream Locations		Downstream Locations	
11.47	Bend right - 35 deg., 3D	2658.07	Bend up - 45 deg., 3D
719.63	Bend right - 35 deg., 3D	2670.65	Bend down - 45 deg., 3D
2204.79	Bend left - 90 deg., 6D	2672.71	Fitting on top of pipe
6240.60	Bend right - 65 deg., 5D	2674.63	Flange
8716.39	Bend left - 90 deg., 6D	2675.71	Valve, Sta. 354+24, 42nd St. NW

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **17%**
Length: **0.745**
Width: **0.412**
ERF: **0.268**
Safe Operating Pressure: **2796 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

Generated: 12/3/2013

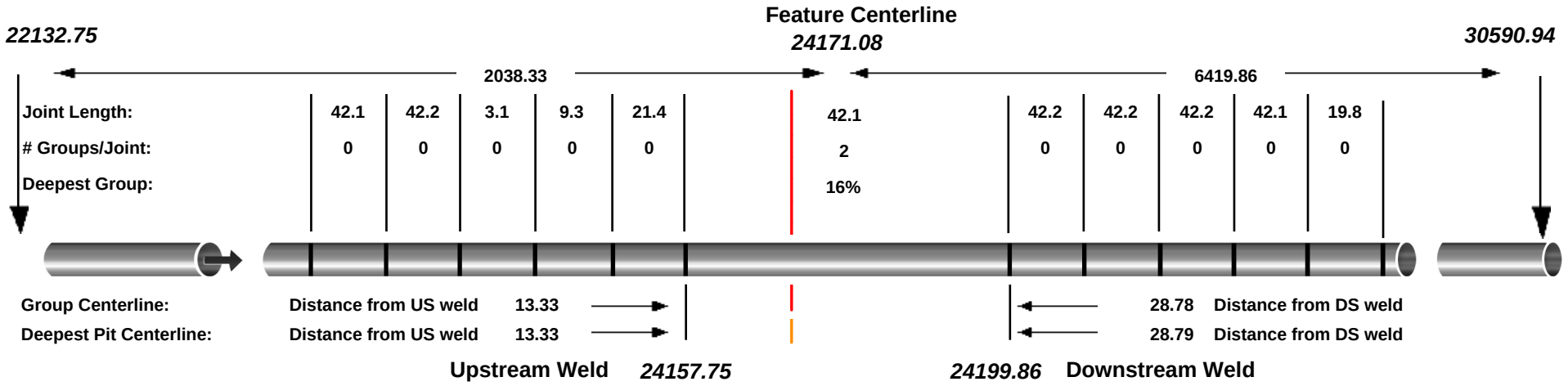
GROUP - Dig Site Information Report

UPSTREAM REFERENCE

AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE

AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

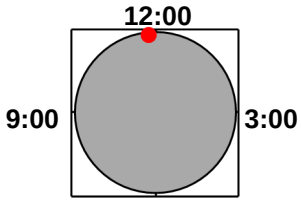
ID:	**40000001**	Distance from Launcher:	***24171.08***	***Feature Description***	
Time:	**13219.67**	Orientation on Pipe Wall:	**11:45**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.322**
Latitude:	**48.02401258**	Longitude:	**-103.84192018**	Altitude:	**1851.282**

Upstream Locations		Downstream Locations	
42.59	Bend left - 90 deg., 6D	2433.20	Bend right - 65 deg., 5D
371.06	Bend right - 90 deg., 6D	6469.01	Bend left - 90 deg., 6D
3736.64	Bend left - 15 deg., 3D	7954.17	Bend right - 35 deg., 3D
6779.05	Bend right - 45 deg., 3D	8662.33	Bend right - 35 deg., 3D
8693.66	Tee at 90 deg.	11331.87	Bend up - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **16%**
Length: **0.627**
Width: **0.499**
ERF: **0.268**
Safe Operating Pressure: **2796 psi**

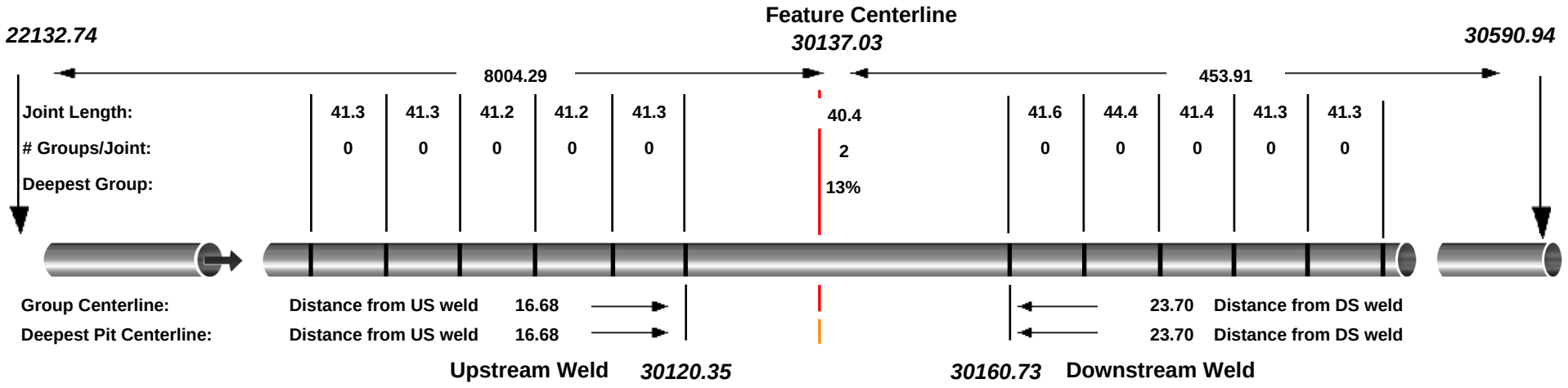
1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

Generated: 12/3/2013

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 219+94, Drive Way -- Han #8740

DOWNSTREAM REFERENCE
AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point



Feature Information

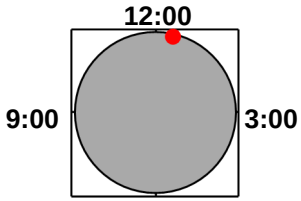
ID:	**40000009**	Distance from Launcher:	***30137.03***	***Feature Description***	
Time:	**14856.91**	Orientation on Pipe Wall:	**12:15**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**48.01911380**	Longitude:	**-103.82021209**	Altitude:	**1849.606**

Upstream Locations		Downstream Locations	
3532.75	Bend right - 65 deg., 5D	503.06	Bend left - 90 deg., 6D
6008.54	Bend left - 90 deg., 6D	1988.22	Bend right - 35 deg., 3D
6337.01	Bend right - 90 deg., 6D	2696.38	Bend right - 35 deg., 3D
9702.59	Bend left - 15 deg., 3D	5365.92	Bend up - 45 deg., 3D
12745.00	Bend right - 45 deg., 3D	5378.50	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **13%**
Length: **0.691**
Width: **0.401**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

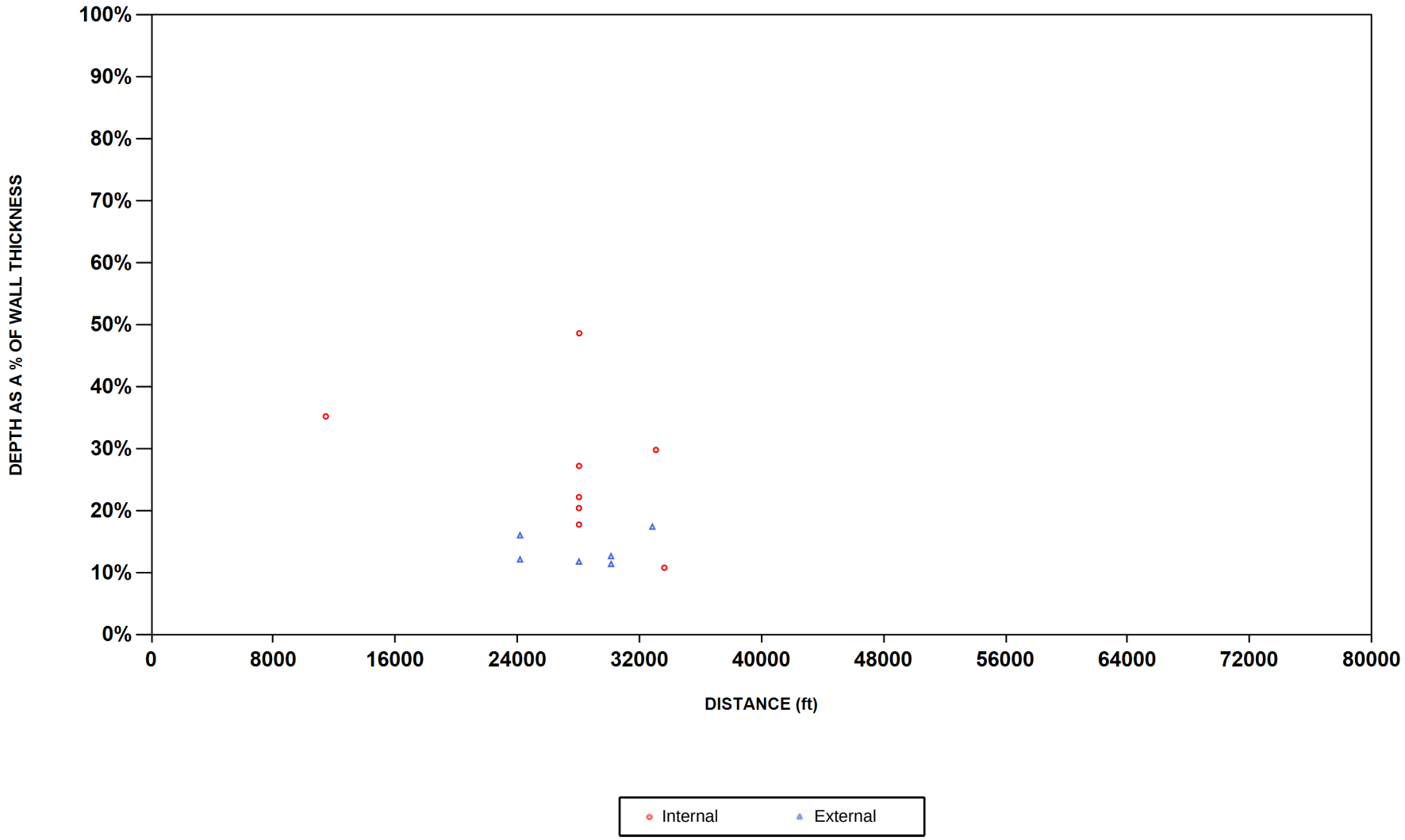
Charts

The Pipeline Summary report provides an overview of the pipeline condition.

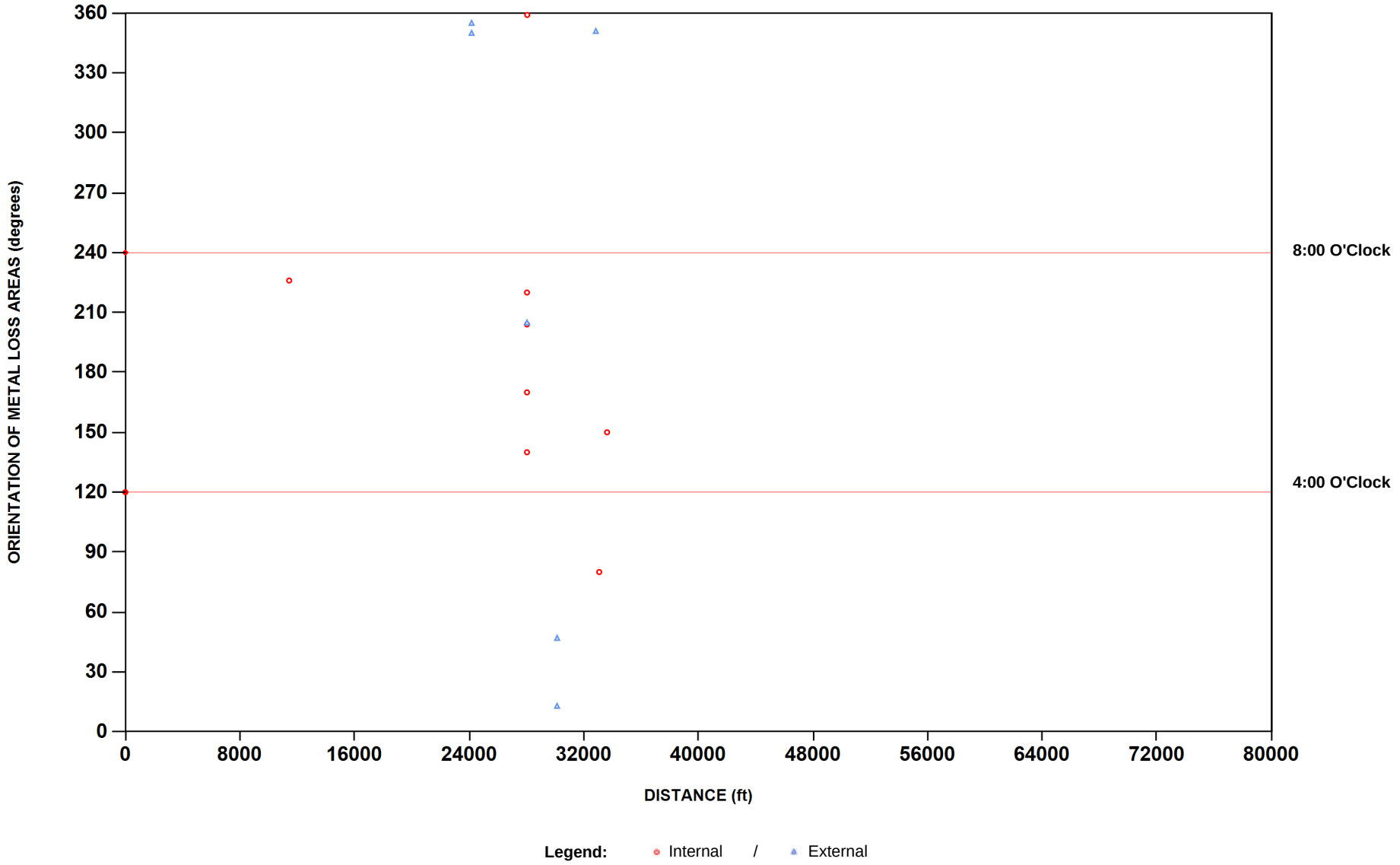
The following charts are utilized in this report:

Metal Loss Depth	This chart highlights the predicted depths of defects as a percentage of wall thickness compared to distance. Areas of concentrated metal loss are easily detected as defects group.
Metal Loss Orientation	The distance from launch is plotted against the orientation of the defect. Orientation is based on 360° in a circle, with 0°or 360° marking the top of the pipe (180° the bottom). Displaying the orientation of defects around the circumference of the pipeline may aid in determining the type of corrosion mechanism present. For example, the majority of defects along the bottom of the pipe might indicate internal channel corrosion.
Metal Loss - Calculated Safe Max. Operating Pressure	The calculated safe maximum operating pressure of each defect is plotted compared to distance.
Velocity - MFL	Displays the speed of the tool relative to distance during the inspection. The specified contractual velocity of the inspection tool is 10 feet per second. If the tool exceeds this speed, the data collected by the tool may be degraded.
Defect Depth Histogram	Displays the total number of defects (pressure reducing groups/defects and non-pressure reducing groups /defects (where P'<P)) by predicted depth of the defect as a percentage of nominal wall.
Dent Depth	This chart highlights the predicted depths of deformations in inches or mm compared to distance.
Dent Orientation	The distance from launch is plotted against the orientation of the deformation indications. Orientation is based on 360° in a circle, with 0°or 360° marking the top of the pipe (180° the bottom).
Velocity - DEF	Displays the speed of the tool relative to distance during the inspection. The specified contractual velocity of the inspection tool is 10 feet per second. If the tool exceeds this speed, the data collected by the tool may be degraded.

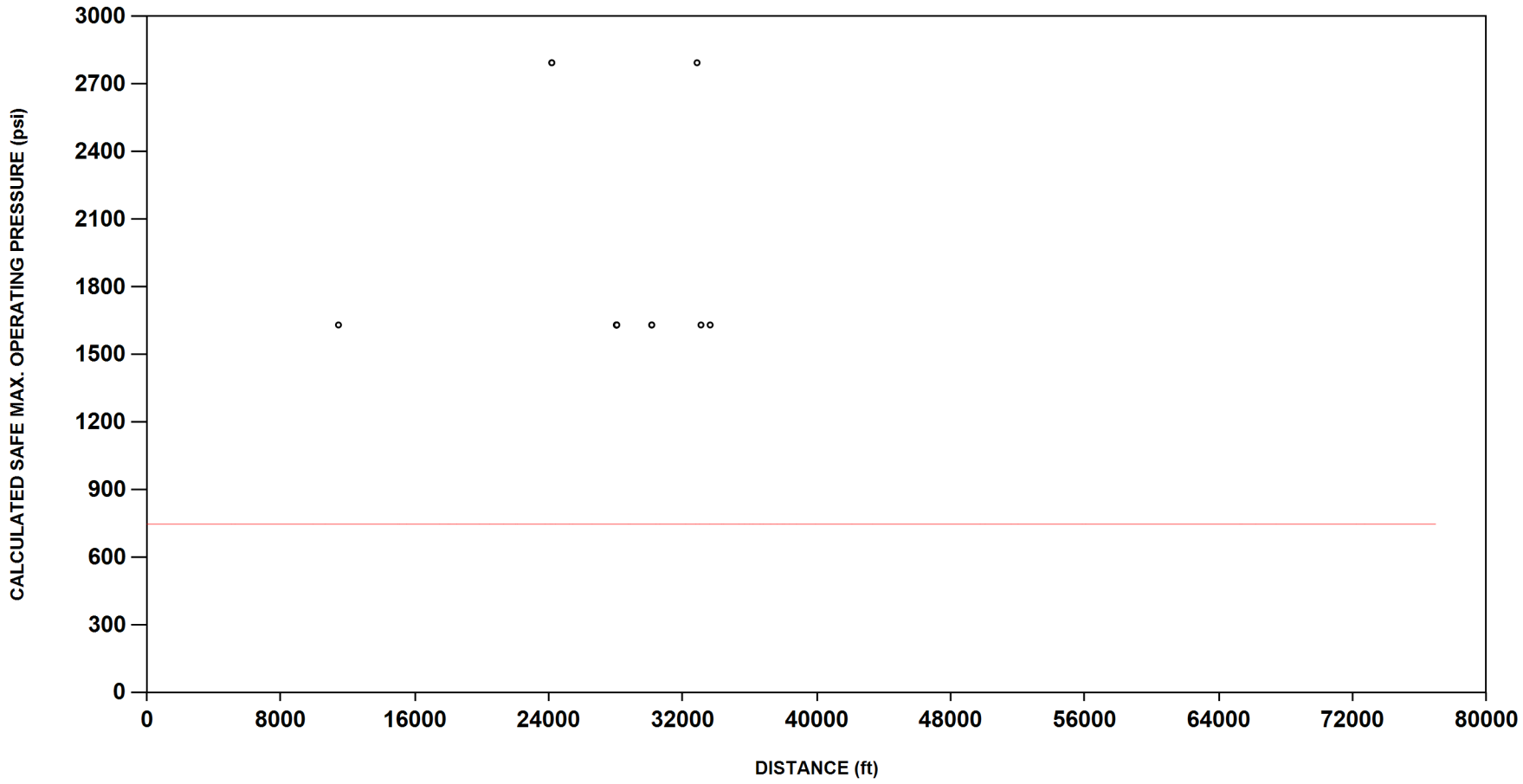
Metal Loss Depth Graph



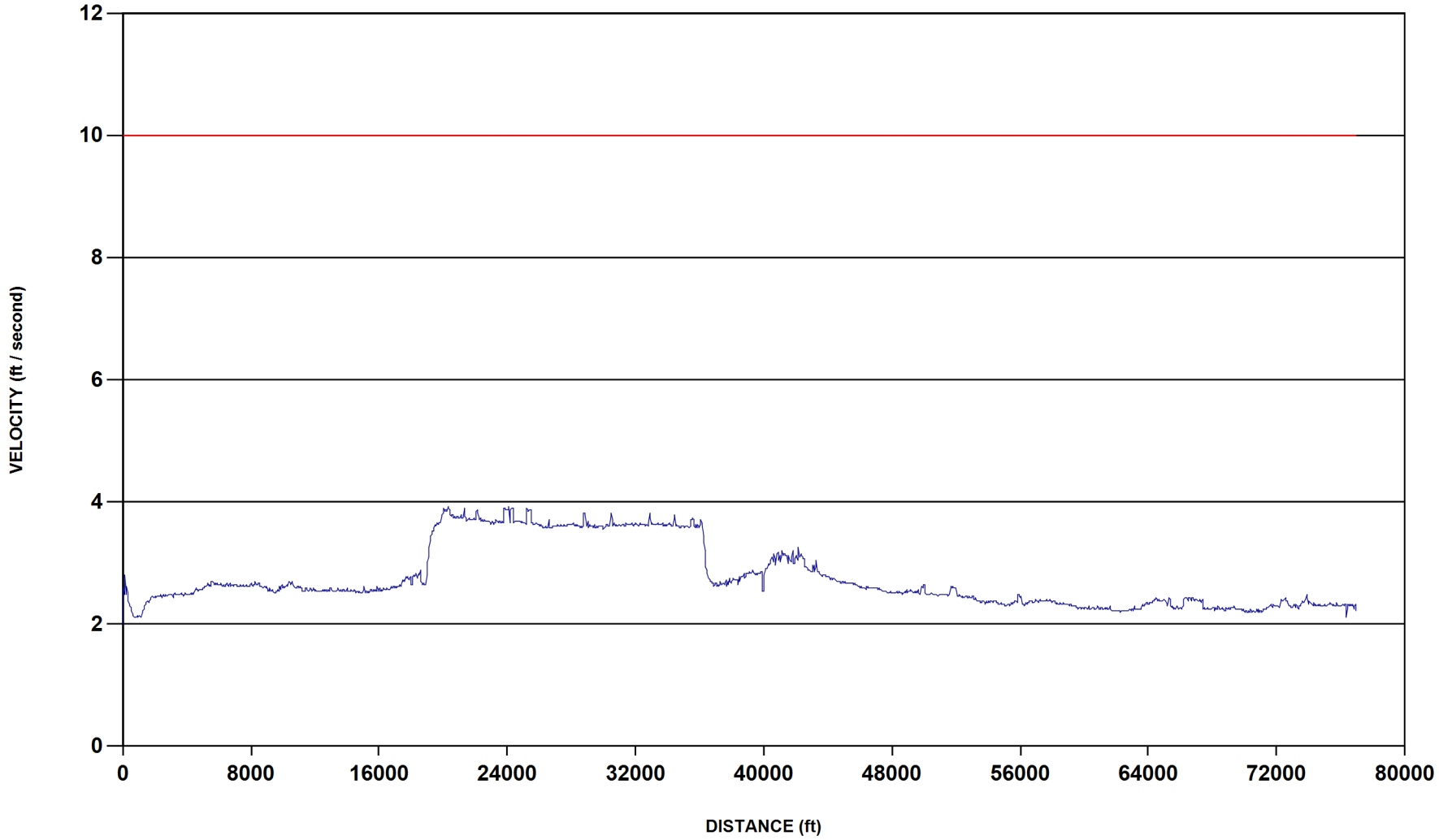
Metal Loss Orientation Graph



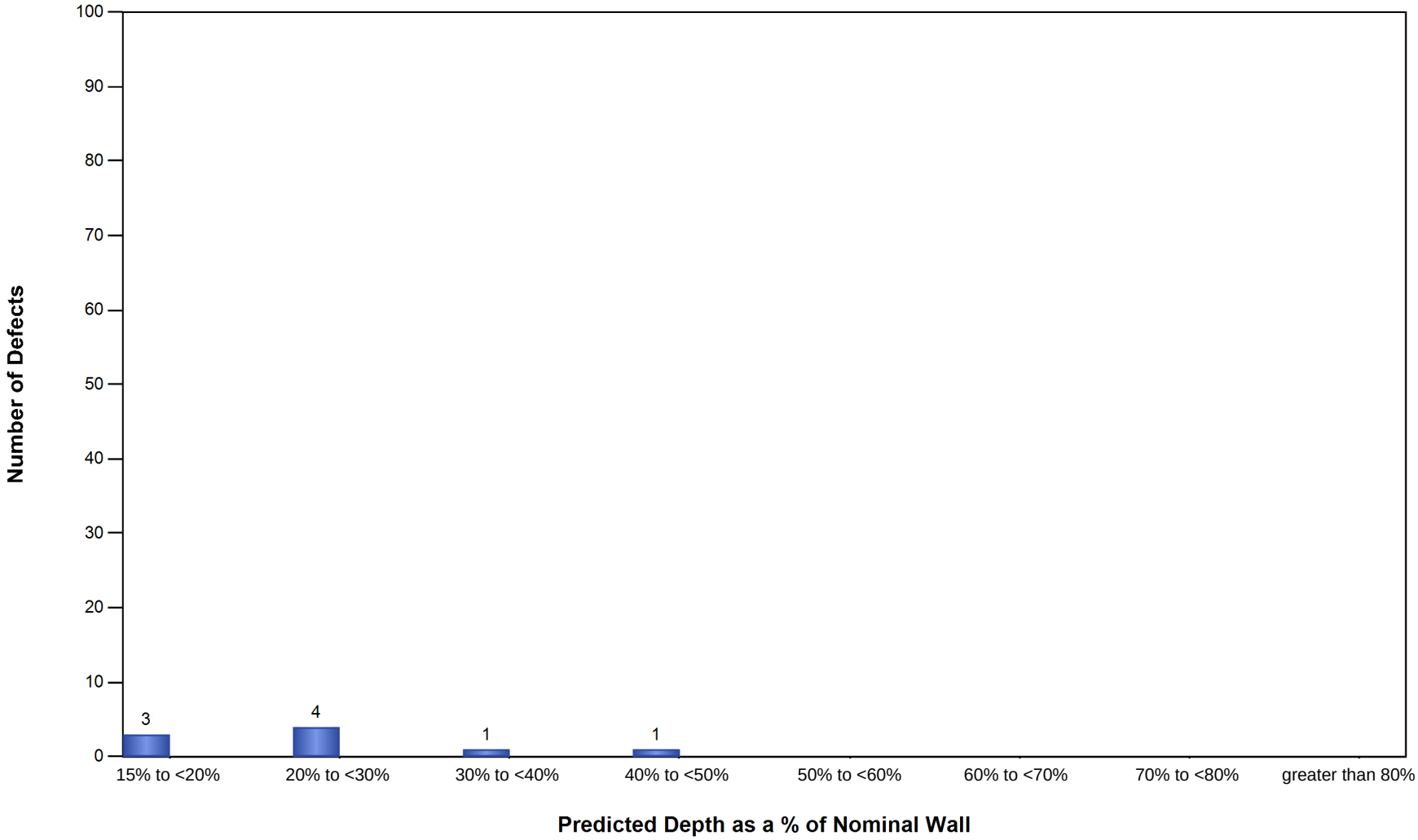
Metal Loss - Calculated Safe Max. Operating Pressure Graph



Velocity Graph - MFL



Defect Depth Histogram

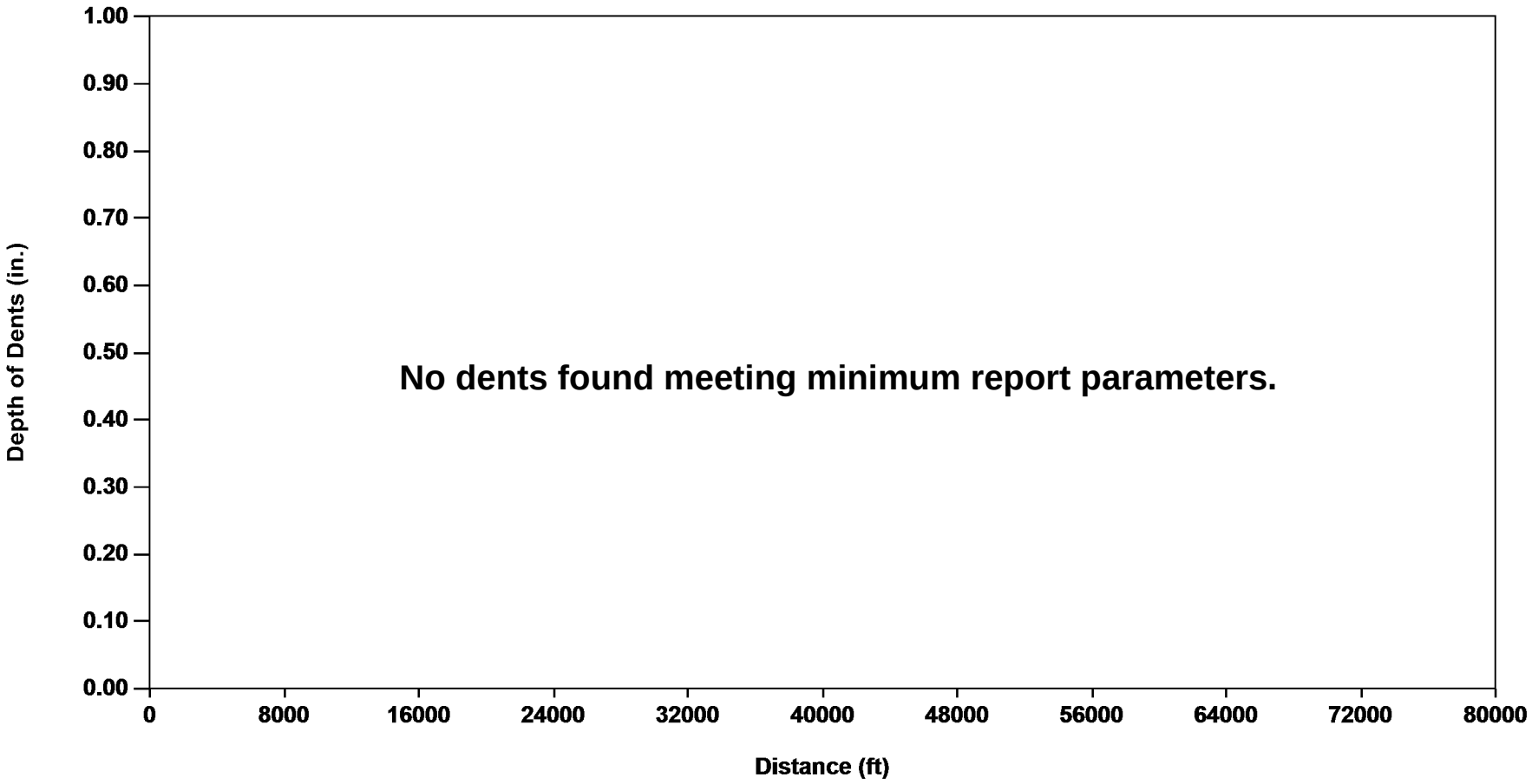


Total Defects: **14**

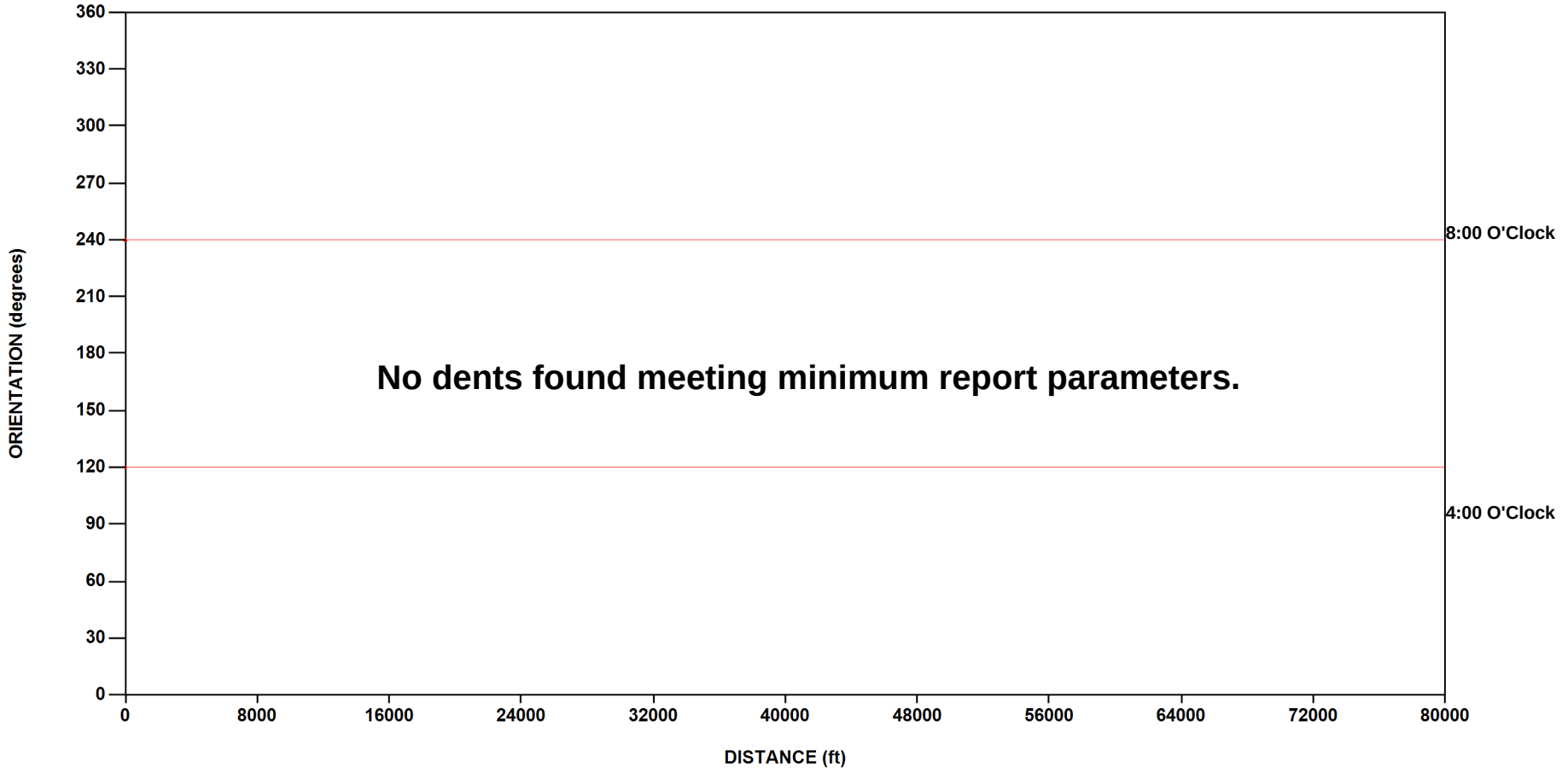
Non-Pressure-Reducing Groups

Pressure-Reducing Groups (where P' < P)

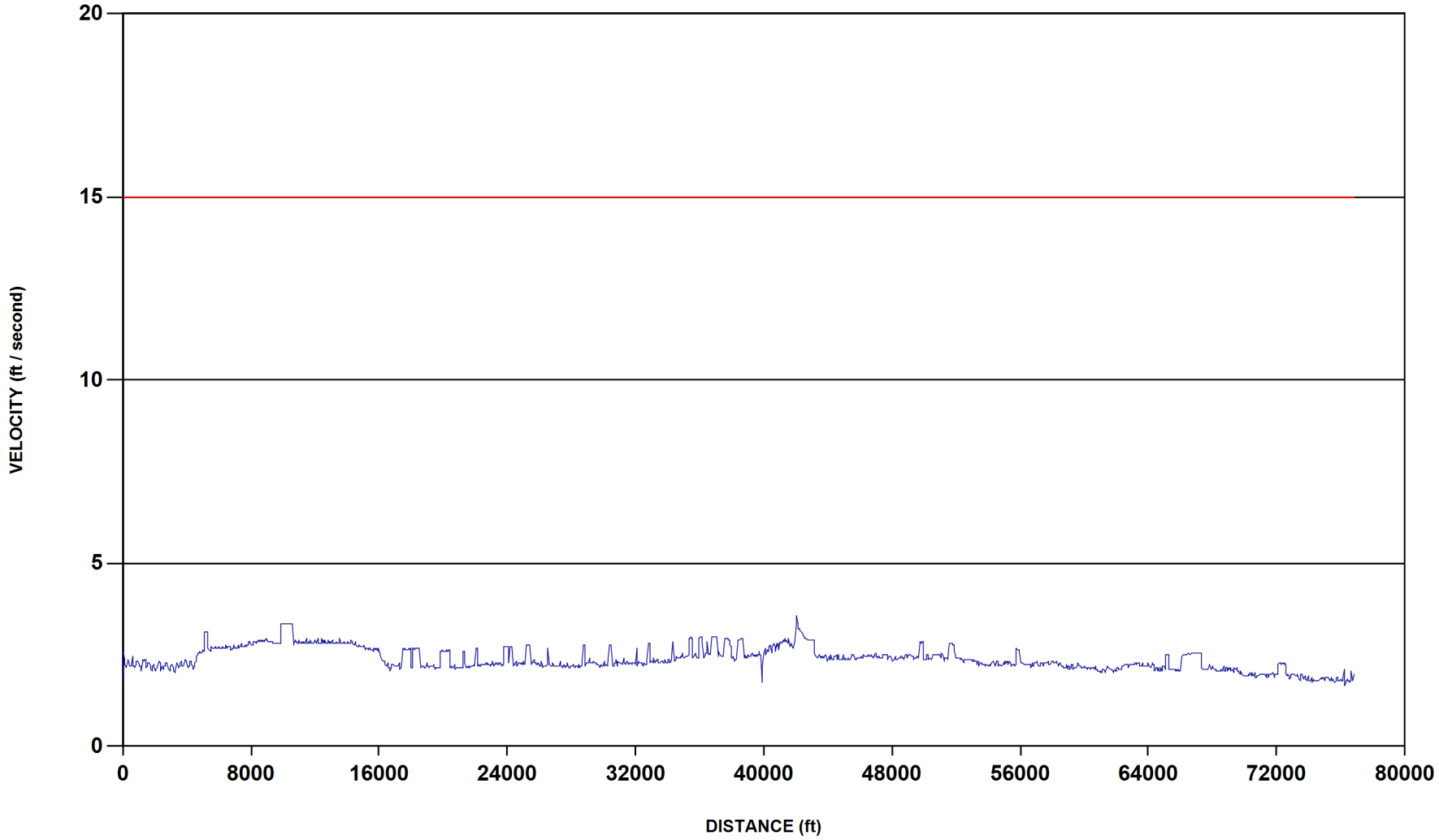
Dent Depth Graph



Dent Orientation Graph



Velocity Graph - DEF



Locations Summary

DEFINITIONS

A location is a feature in the pipeline that can be used to correlate the inspection tool data to above ground references. Common location features include valves, fittings, flanges, tees, casings, repairs and aboveground markers (AGMs).

For example, a metal loss area could be referenced as being 200 feet down stream from a valve. Not all locations can be easily found from above ground. Some locations might not be useful if they are not above ground.

ID#	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Time	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Joint #	This unique number identifies the girth weld number.
U/S Weld Dist.	The distance to the upstream (U/S) weld (in feet or meters).
D/S Weld Dist.	The distance to the downstream (D/S) weld (in feet or meters).
Description	Describes the location in greater detail. Possible entries include valves, flanges, fittings, tees, markers, etc.
Latitude	This shows the north/south position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
Longitude	This shows the east/west position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
Altitude	For XYZ mapping runs, this shows the elevation above sea level of the location as supplied by the customer or calculated by the tool.

Zeroes in Latitude and Longitude mean that no data was supplied by the customer. Calculated or estimated values can be viewed in the Pipe Listing report.

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000001	4,385.11	0.0	110	1.5	1.6	Valve (Launcher), Sta. 0+00, Bainville Injection	48.06736954	-103.88522349	2103.754
10000002	4,385.66	1.1	110	2.6	0.5	Flange	48.06736698	-103.88522141	2103.795
10000003	4,386.85	3.3	120	1.6	2.2	Pipe Support	48.06736196	-103.88521738	2103.911
10000004	4,388.23	5.9	130	0.2	1.0	Tee at 270 deg.	48.06735585	-103.88521234	2104.054
10000005	4,389.42	8.2	140	1.6	1.0	Pipe Support	48.06735062	-103.88520814	2104.165
10000006	4,390.09	9.5	150	0.5	0.5	Flange	48.06734775	-103.88520580	2104.223
10000007	4,391.76	12.6	160	2.5	2.5	Pipe Support	48.06734073	-103.88520009	2104.374
10000008	4,393.00	15.5	170	0.1	1.1	Tee at 270 deg.	48.06733402	-103.88519454	2104.523
10000009	4,393.54	16.8	180	0.5	0.7	Pipe Support	48.06733120	-103.88519225	2104.587
10000010	4,394.00	17.9	190	0.5	2.6	Flange	48.06732871	-103.88519019	2104.639
10000011	4,394.45	18.9	190	1.6	1.6	Valve	48.06732626	-103.88518818	2104.693
10000012	4,394.90	20.0	190	2.7	0.5	Flange	48.06732379	-103.88518610	2104.750
10000013	4,395.20	20.8	200	0.2	11.3	Pipe Support	48.06732213	-103.88518473	2104.790
10000014	4,397.92	27.5	200	6.9	4.5	Fitting on top of pipe	48.06730682	-103.88517201	2105.096
10000015	4,399.68	32.6	210	0.2	1.0	Tee on bottom of pipe	48.06729541	-103.88516255	2105.328
10000016	4,401.23	37.0	220	3.7	0.7	Pipe Support	48.06728544	-103.88515426	2105.520
10000017	4,401.58	38.0	230	0.4	2.7	Flange	48.06728323	-103.88515241	2105.563
10000018	4,401.97	39.0	230	1.5	1.6	Valve	48.06728076	-103.88515042	2105.611
10000019	4,402.36	40.2	230	2.6	0.5	Flange	48.06727823	-103.88514830	2105.669
10000020	4,402.66	41.0	240	0.2	1.0	Pipe Support	48.06727635	-103.88514680	2105.711
10000021	4,403.22	42.4	250	0.1	1.1	Tee at 270 deg.	48.06727306	-103.88514409	2105.781
10000022	4,403.62	43.5	260	0.5	0.4	Flange	48.06727059	-103.88514203	2105.834
10000023	4,405.24	47.7	280	0.1	1.5	Bend down - 45 deg., 3D	48.06726108	-103.88513415	2105.968
10000024	4,408.59	56.6	290	8.1	1.8	Pipe Entering Ground -- Han #8404	48.06724620	-103.88512169	2100.536
10000025	4,409.43	58.9	300	0.1	0.9	Bend up - 30 deg., 3D	48.06724220	-103.88511833	2099.082
10000026	4,600.29	525.7	440	0.1	0.9	Bend right - 33 deg., 1.5D	48.06615042	-103.88418342	2042.277
10000027	6,543.41	5,228.8	1,600	25.6	16.6	AGM 010, Sta. 51+80, CR 2 -- Han #8740	48.05331498	-103.88411899	1949.291
10000028	7,495.11	7,741.6	2,230	0.1	1.5	Bend left - 45 deg., 3D	48.04652333	-103.88267347	1989.498
10000029	7,794.67	8,532.5	2,450	0.1	1.4	Bend right - 45 deg., 3D	48.04521161	-103.88012886	1970.459
10000030	8,174.40	9,511.0	2,720	10.7	30.7	AGM 020, Sta. 93+91, ROW -- Han #3825	48.04257310	-103.87958950	1903.032
10000031	8,324.38	9,895.7	2,820	5.1	33.7	Casing Begin	48.04156216	-103.87919749	1902.968
10000032	8,593.47	10,607.4	2,990	22.3	10.8	Casing End	48.03967038	-103.87858825	1900.079
10000033	8,597.56	10,618.4	3,000	0.0	0.3	Bend right - 15 deg., 1.5D	48.03964096	-103.87857919	1900.672

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000034	10,325.91	15,042.7	4,120	0.1	1.5	Bend left - 45 deg., 3D	48.02872805	-103.87505530	1877.406
10000035	10,496.04	15,476.0	4,250	3.6	1.3	AGM 030, Sta. 153+57, ROW -- Han #8740	48.02819084	-103.87348760	1881.647
10000036	10,496.79	15,477.9	4,260	0.2	1.0	Tee at 90 deg.	48.02818853	-103.87348090	1881.682
10000037	11,237.94	17,392.7	4,760	0.1	1.5	Bend right - 45 deg., 3D	48.02935859	-103.86633095	1873.267
10000038	12,219.71	20,434.7	5,530	0.0	0.5	Bend left - 15 deg., 3D	48.02510491	-103.85577258	1858.710
10000039	12,671.74	22,132.7	5,960	20.7	21.5	AGM 040, Sta. 219+94, Drive Way -- Han #8740	48.02498494	-103.84887271	1852.490
10000040	13,124.66	23,803.3	6,370	1.2	8.3	Bend right - 90 deg., 6D	48.02491207	-103.84208300	1852.470
10000041	13,209.23	24,131.7	6,470	1.5	7.9	Bend left - 90 deg., 6D	48.02401923	-103.84207967	1850.244
10000042	13,881.15	26,606.4	7,110	0.2	5.9	Bend right - 65 deg., 5D	48.02393515	-103.83203183	1851.093
10000043	14,980.65	30,590.9	8,100	16.3	6.9	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	48.01877027	-103.81845672	1848.981
10000044	14,995.08	30,643.3	8,120	1.5	8.0	Bend left - 90 deg., 6D	48.01875924	-103.81824596	1848.673
10000045	15,403.34	32,125.8	8,510	0.1	1.2	Bend right - 35 deg., 3D	48.02265705	-103.81663056	1850.990
10000046	15,598.12	32,833.9	8,720	0.1	1.0	Bend right - 35 deg., 3D	48.02386464	-103.81437794	1852.723
10000047	16,333.33	35,503.6	9,390	0.1	1.5	Bend up - 45 deg., 3D	48.02379874	-103.80350841	1852.967
10000048	16,333.80	35,505.3	9,400	0.9	10.1	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	48.02379858	-103.80350292	1854.009
10000049	16,336.75	35,516.2	9,410	0.1	1.5	Bend down - 45 deg., 3D	48.02379725	-103.80346261	1863.156
10000050	16,337.12	35,517.6	9,420	0.5	1.5	Fitting on top of pipe	48.02379708	-103.80345561	1863.507
10000051	16,337.62	35,519.5	9,430	0.5	2.7	Flange	48.02379685	-103.80344617	1863.761
10000052	16,337.91	35,520.6	9,430	1.5	1.6	Valve, Sta. 354+24, 42nd St. NW	48.02379672	-103.80344062	1863.920
10000053	16,338.21	35,521.7	9,430	2.7	0.5	Flange	48.02379664	-103.80343600	1863.884
10000054	16,338.71	35,523.6	9,440	1.4	0.6	Fitting on top of pipe	48.02379651	-103.80342836	1863.877
10000055	16,339.06	35,525.0	9,450	0.1	1.6	Bend down - 45 deg., 3D	48.02379642	-103.80342298	1863.612
10000056	16,342.44	35,537.6	9,470	0.1	1.5	Bend up - 45 deg., 3D	48.02379565	-103.80338574	1854.942
10000057	16,650.01	36,575.9	9,770	0.1	1.5	Bend right - 45 deg., 3D	48.02401454	-103.79920634	1854.567
10000058	16,890.13	37,217.8	9,950	0.0	0.6	Bend right - 20 deg., 3D	48.02271067	-103.79746679	1855.140
10000059	17,042.84	37,624.4	10,080	0.0	0.4	Bend right - 12 deg., 1.5D	48.02167033	-103.79688642	1855.169
10000060	17,194.56	38,031.7	10,220	0.0	0.4	Bend left - 10 deg., 3D	48.02056613	-103.79670818	1854.452
10000061	17,344.71	38,441.1	10,340	0.0	0.3	Bend right - 12 deg., 1.5D	48.01950692	-103.79617030	1856.181
10000062	17,868.30	39,919.5	10,720	0.1	1.4	Bend left - 45 deg., 3D	48.01551241	-103.79530410	1857.620
10000063	18,574.32	42,069.3	11,250	0.2	1.8	Bend left - 60 deg., 3D	48.01309567	-103.78744722	1866.322
10000064	18,612.31	42,188.6	11,290	0.2	2.9	Bend right - 90 deg., 3D	48.01327815	-103.78704645	1867.842
10000065	18,975.34	43,267.3	11,570	0.1	1.4	Bend up - 45 deg., 1.5D	48.01052317	-103.78641944	2081.298
10000066	18,979.13	43,278.0	11,590	0.1	1.5	Bend down - 45 deg., 3D	48.01050392	-103.78642607	2088.938

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000067	18,979.84	43,280.0	11,600	1.2	1.8	Fitting on top of pipe	48.01049859	-103.78642781	2089.116
10000068	18,980.58	43,282.3	11,610	0.5	2.8	Flange	48.01049261	-103.78642969	2089.216
10000069	18,980.94	43,283.5	11,610	1.6	1.6	Valve	48.01048947	-103.78643063	2089.258
10000070	18,981.31	43,284.6	11,610	2.8	0.5	Flange	48.01048672	-103.78643156	2089.380
10000071	18,982.75	43,288.9	11,630	0.1	1.5	Bend down - 45 deg., 3D	48.01047641	-103.78643491	2089.339
10000072	18,986.22	43,299.6	11,650	0.1	1.5	Bend up - 45 deg., 3D	48.01045660	-103.78644048	2082.892
10000073	18,989.10	43,308.2	11,670	3.7	38.6	AGM 070, Sta. 431+85, ROW -- Han #8456	48.01043537	-103.78644713	2083.272
10000074	21,124.55	48,927.3	12,810	10.3	39.3	Bend right - 10 deg., 70D	47.99613647	-103.79344787	1996.698
10000075	21,382.61	49,581.6	12,950	0.1	5.8	Bend left - 60 deg., 8D	47.99505762	-103.79553854	1922.685
10000076	21,564.61	50,051.7	13,080	0.1	1.0	Bend right - 30 deg., 3D	47.99380947	-103.79540953	1911.834
10000077	21,580.06	50,090.1	13,100	6.2	43.2	AGM 080, Sta. 499+96, ROW -- Han #3713	47.99372506	-103.79550363	1911.338
10000078	21,703.32	50,397.9	13,160	10.3	39.3	Bend left - 11 deg., 71D	47.99303839	-103.79622011	1896.002
10000079	21,709.97	50,414.5	13,160	26.7	22.9	Bend left - 14 deg., 82D	47.99299542	-103.79624065	1894.854
10000080	21,723.66	50,448.7	13,170	13.0	13.6	Bend left - 15 deg., 43D	47.99290435	-103.79625790	1889.342
10000081	22,162.97	51,539.0	13,400	16.0	33.8	Bend right-up - 10 deg., 51D	47.99047095	-103.79388759	1902.659
10000082	22,403.27	52,152.1	13,550	13.0	36.7	Bend left - 10 deg., 44D	47.98882258	-103.79364160	1935.040
10000083	22,584.66	52,597.8	13,640	15.4	34.2	Bend right - 13 deg., 34D	47.98782859	-103.79264853	1994.513
10000084	22,666.57	52,797.4	13,680	15.2	34.6	Bend right - 13 deg., 51D	47.98729599	-103.79258521	2016.775
10000085	22,835.38	53,207.8	13,760	29.7	19.8	Bend left - 10 deg., 46D	47.98628138	-103.79320831	2076.542
10000086	22,848.37	53,239.0	13,770	10.9	38.6	Bend left - 15 deg., 26D	47.98619763	-103.79319646	2081.539
10000087	23,829.99	55,546.5	14,240	5.9	34.7	AGM 090, Sta. 553+29, ROW -- Han #8456	47.98007952	-103.79203074	2136.108
10000088	24,159.11	56,332.6	14,420	25.5	24.1	Bend left - 18 deg., 14D	47.97796648	-103.79230647	2125.707
10000089	24,173.23	56,365.7	14,430	12.7	36.9	Bend left - 14 deg., 67D	47.97787807	-103.79227857	2127.139
10000090	25,276.92	58,974.2	14,960	14.0	25.8	AGM 100, Sta. 587+47, ROW -- Han #3713	47.97129694	-103.78837454	2133.833
10000091	28,053.07	65,324.6	16,260	21.1	21.1	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	47.95432791	-103.78707714	2169.416
10000092	30,870.47	71,757.2	17,640	14.6	34.7	Reinforced Tee at 270 deg.	47.93695859	-103.78436510	2187.702
10000093	31,123.15	72,340.8	17,770	0.4	41.9	AGM 120, Sta. 722+63, Gravel Rd. -- Han #100	47.93536790	-103.78431805	2175.969
10000094	32,829.06	76,317.0	18,610	0.1	2.0	Bend right - 65 deg., 3D	47.92463486	-103.78192188	2232.843
10000095	32,838.66	76,339.5	18,640	0.1	6.1	Bend right - 45 deg., 11D	47.92459357	-103.78199075	2232.584
10000096	33,032.14	76,786.5	18,750	0.6	11.9	Bend left - 90 deg., 10D	47.92460366	-103.78379974	2220.193
10000097	33,101.32	76,946.6	18,810	0.1	1.4	Bend up - 45 deg., 3D	47.92416653	-103.78379900	2219.922
10000098	33,109.11	76,962.9	18,840	0.3	4.6	Pipe Exiting Ground -- Han #8404	47.92413500	-103.78379835	2231.445
10000099	33,111.44	76,968.3	18,850	0.1	1.6	Bend down - 45 deg., 3D	47.92412440	-103.78379991	2229.871

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000100	33,111.96	76,969.6	18,860	0.5	0.4	Flange	47.92412108	-103.78380033	2228.745
10000101	33,112.39	76,970.7	18,870	0.2	1.0	Tee at 90 deg.	47.92411841	-103.78380072	2227.814
10000102	33,112.90	76,971.9	18,880	0.5	0.7	Pipe Support	47.92411527	-103.78380118	2226.718
10000103	33,113.00	76,972.2	18,880	0.9	0.4	Fitting on top of pipe	47.92411464	-103.78380125	2226.498
10000104	33,113.32	76,973.0	18,890	0.5	2.7	Flange	47.92411264	-103.78380158	2225.803
10000105	33,113.76	76,974.1	18,890	1.6	1.6	Valve (Receiver), Sta. 763+72, Dore Junction	47.92410990	-103.78380205	2224.834

Locations	Number
Bend	50
Casing	1
Flange	15
Fitting	5
Marker	14
Repair	0
Tee	7
Valve	6
Pipe Support	8

Casings Summary

DEFINITIONS

A casing is a section of larger diameter pipe through which the pipeline passes. Usually installed to protect a pipeline from excessive external loading, casings can also shield pipelines from protective cathodic protection currents. Therefore, the condition of a pipeline inside a casing can provide valuable information.

TDW MFL tools detect when a casing is not centered around the pipeline. These casings are referred to as being eccentric. The closer the casing is to the pipeline, the stronger the signal seen by the inspection tool. The tool will not detect if the casing is shorted to the pipe wall. The tool might see evidence of a short, such as metal loss.

This information may be useful in updating pipeline databases and alignment sheets.

Sometimes spacers are identified inside casings. These are mechanical devices used to center the pipeline inside the casing and are not considered harmful.

ID#	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Time	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
Distance Start, End	Given in either feet or meters, this is the absolute distance measured by the tool from launch to the beginning and ending of the casing.
Casing Length	The total predicted casing length (in feet or meters).
Eccentric (side)	Identifies one of four conditions associated with the casing: 1- no eccentricity (blank); 2- eccentric on upstream side (upstream); 3- eccentric on downstream side (downstream); 4- eccentric on both ends (both)
# of Metal Loss in Casing	Provides the number of metal loss groups identified inside the casing.
Max. Depth of Metal Loss	If metal loss is identified inside the casing, this column provides the maximum predicted depth of all metal loss features.
Above Ground References	The name of the closest upstream and downstream references, usually an Aboveground Marker or a Valve.
Distance from Start/Upstream Side of Casing	The distance from the Aboveground Reference (AGM or Valve) to the start (upstream) side of the casing.

Casings Summary

ID#	Time	Distance (ft) Start	Distance (ft) End	Casing Length (ft)	Eccentric (side)	# of Metal Loss in Casing	Max. Depth of Metal Loss	Above Ground References		Distance from Start/Upstream Side of Casing
10000032	8593.47	9895.70	10607.42	711.72		0	0%	U/S:	AGM 020, Sta. 93+91, ROW -- Han #3825	384.74
								D/S:	AGM 030, Sta. 153+57, ROW -- Han #8740	5580.26

Total	Number with metal loss	Number eccentric	Total footage
1	0	0	711.72

Deformation Summary

DEFINITIONS

The Deformation Summary Report lists all the deformations and dents detected during the inspection, sorted by depth of deformation (descending)

Dents may affect the integrity of the pipeline and are considered harmful. A dent with associated metal loss is potentially more significant than a dent alone.

ID#	Each Deformation is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Depth	Depth of the indication in inches or mm.
Orientation	The orientation of the deformation indication in degrees (top of pipe = 0) and clock position, as viewed facing downstream.
Sub Type	The sub type of deformation if other than dent (i.e. Heavy Weld, Ovality, Buckle, Expansion).
Min X Sec Dia	The minimum measured Cross-Section (ID) measured within the scope of the deformation.
Description	Text describing a deformation in greater detail. Any special conditions are noted.
On Weld	Determination whether the indication crosses a girth (or seam) weld.
Metal Loss	"Yes" is listed if there is any metal loss associated with a dent.
Above-Ground References	The name of the closest upstream and downstream references, usually either an AGM or a valve.
Distance from Defect	The distance to the upstream and downstream reference listed in the previous column. Used for locating defects in the field.

Deformation Summary

ID#	Distance (ft)	Depth (in)	Depth %	Orientation (Deg / O'Clock)	Sub Type	Min X Sec Dia	Description	On Weld	Metal Loss	Above-Ground References	Distance from Defect
No Dents have been detected on this pipeline inspection											

Gains (Metal in Close Proximity)

DEFINITIONS

The inspection tool may detect ferrous metal objects located close to or touching the pipeline. They appear as additional metal added to the pipe, and are referred to as gains. This table identifies gains detected during the inspection.

Clamps or anchors around the pipeline are considered gains. Some metal objects can be potentially harmful to the pipeline. They can damage the pipeline's protective coating, or over time may dent or cause damage to the pipeline.

ID#	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Length	The measured length of the gain measured in feet or meters.
Width	The measured width of the gain measured in inches or millimeters. When full circumference , this is usually typical of a clamp or banding around the circumference of the pipeline.
Depth in Gauss	The difference in gauss reading (magnetic strength) at the gain. The greater the number, the greater the mass of the object, or the closer the proximity to the pipeline, or both. This table is sorted with highest depth in gauss listed in a descending order.
Orientation: Degrees / O'Clock	The distance from launch is plotted against the orientation of the defect. Orientation is based on 360 degrees in a circle, with 0 / 360 degrees marking the top of the pipe (180 degrees the bottom).
Joint #	This unique number identifies the girth weld number.
U/S Weld Dist.	The distance to the upstream (U/S) weld (in feet or meters).
D/S Weld Dist.	The distance to the downstream (D/S) weld (in feet or meters).

Gains (Metal in Close Proximity)

ID#	Distance (ft)	Length (in)	Width (in)	Depth in Gauss	Orientation Degrees	/ O'Clock	Joint #	U/S Weld Dist.	D/S Weld Dist.
13000001	6425.61	1.16	1.40	61	180 to 200	5:45 to 6:30	1900	7.7	33.6
13000005	56696.84	1.09	1.75	55	55 to 80	1:45 to 2:30	14500	3.5	46.1
13000009	76892.75	0.67	3.14	47	130 to 170	4:15 to 5:30	18790	9.2	22.1
13000007	59890.17	0.81	2.44	41	155 to 190	5:00 to 6:15	15150	3.2	46.1
13000003	38291.61	1.16	2.44	39	20 to 55	12:30 to 1:45	10300	15.2	29.1
13000002	30635.87	1.58	3.14	38	235 to 280	7:45 to 9:15	8110	38.0	2.8
13000000	3020.91	1.56	2.79	38	170 to 210	5:30 to 7:00	1060	37.4	3.9
13000006	56728.63	3.01	1.40	33	40 to 60	1:15 to 1:45	14500	35.2	14.4
13000004	42562.99	1.16	2.79	24	35 to 75	1:00 to 2:30	11390	18.8	23.5
13000008	66162.06	2.73	3.14	23	20 to 65	12:30 to 2:00	16440	38.7	10.8

Total Number of Gains

10

Nominal Wall Thickness

The following list provides locations along the pipeline where changes in wall thickness or pipe type occur. While the TDW inspection tool can easily detect changes in wall thickness, it cannot take direct thickness measurements. Therefore, where wall thicknesses are known, the tool can identify the locations where the thickness changes. Where wall thicknesses are not known, best efforts will be made to estimate thicknesses based on best available data.

ID#	Each wall thickness change ID is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Wall Thickness	The predicted wall thickness in inches or millimeters.
Pipetype	Type of pipe construction. Electric Resistance Weld (ERW), Seamless (SMLS), Lap Weld (LW), etc.
Yield Strength (SMYS)	Specified Minimum Yield Strength – A required strength level that measured yield stress of a pipe material must exceed, which is a function of pipe grade. The measured yield stress is the tensile stress required to produce a total elongation of 0.5 percent of a gage length as determined by an extensometer during a tensile test.
Safety Factor	(or design factor) Typically 0.72 per ASME B31.4 In setting the safety factor, due consideration has been given to and allowances made for the manufacturing tolerance and maximum allowable depth of imperfections provided for in the specifications.
Length of Segment	The length of the pipe for the specified wall thickness, measured in feet or meters.

Nominal Wall Thickness

ID#	Distance (ft)	Wall Thickness (in)	Pipetype	Yield Strength (SMYS)	Safety Factor	Length of Segment (ft)
11000000	-1.55	0.322	ERW	52000	0.72	70.97
11000001	69.42	0.188	ERW	52000	0.72	5007.03
11000002	5076.45	0.322	ERW	52000	0.72	211
11000003	5287.45	0.188	ERW	52000	0.72	4603.1
11000004	9890.55	0.322	ERW	52000	0.72	747.26
11000005	10637.81	0.188	ERW	52000	0.72	4398.04
11000006	15035.85	0.322	ERW	52000	0.72	14.51
11000007	15050.36	0.188	ERW	52000	0.72	421.95
11000008	15472.30	0.322	ERW	52000	0.72	6.03
11000009	15478.33	0.188	ERW	52000	0.72	1951.47
11000010	17429.80	0.322	ERW	52000	0.72	548.65
11000011	17978.45	0.188	ERW	52000	0.72	116.78
11000012	18095.23	0.322	ERW	52000	0.72	461.76
11000013	18556.99	0.188	ERW	52000	0.72	1305.21
11000014	19862.20	0.322	ERW	52000	0.72	582.66
11000015	20444.86	0.188	ERW	52000	0.72	817.5
11000016	21262.36	0.322	ERW	52000	0.72	84.36
11000017	21346.72	0.188	ERW	52000	0.72	680.83
11000018	22027.55	0.322	ERW	52000	0.72	126.65
11000019	22154.20	0.188	ERW	52000	0.72	1644.67
11000020	23798.87	0.322	ERW	52000	0.72	337.41
11000021	24136.28	0.188	ERW	52000	0.72	21.39
11000022	24157.67	0.322	ERW	52000	0.72	210.88
11000023	24368.55	0.188	ERW	52000	0.72	819.62
11000024	25188.17	0.322	ERW	52000	0.72	283.36
11000025	25471.53	0.188	ERW	52000	0.72	1126.51
11000026	26598.04	0.322	ERW	52000	0.72	22.36
11000027	26620.40	0.188	ERW	52000	0.72	2119.57
11000028	28739.98	0.322	ERW	52000	0.72	126.65
11000029	28866.62	0.188	ERW	52000	0.72	1539.13
11000030	30405.76	0.322	ERW	52000	0.72	168.81
11000031	30574.57	0.188	ERW	52000	0.72	1544.39
11000032	32118.96	0.322	ERW	52000	0.72	13.76
11000033	32132.72	0.188	ERW	52000	0.72	694.39
11000034	32827.11	0.322	ERW	52000	0.72	132.07
11000035	32959.18	0.188	ERW	52000	0.72	1392.24
11000036	34351.42	0.322	ERW	52000	0.72	124.82
11000037	34476.24	0.188	ERW	52000	0.72	940.51
11000038	35416.75	0.322	ERW	52000	0.72	212.57
11000039	35629.32	0.188	ERW	52000	0.72	394.4

Nominal Wall Thickness

ID#	Distance (ft)	Wall Thickness (in)	Pipetype	Yield Strength (SMYS)	Safety Factor	Length of Segment (ft)
11000040	36023.72	0.322	ERW	52000	0.72	210.71
11000041	36234.43	0.188	ERW	52000	0.72	334.47
11000042	36568.90	0.322	ERW	52000	0.72	14.16
11000043	36583.06	0.188	ERW	52000	0.72	246.59
11000044	36829.65	0.322	ERW	52000	0.72	395.28
11000045	37224.93	0.188	ERW	52000	0.72	393.22
11000046	37618.15	0.322	ERW	52000	0.72	370.22
11000047	37988.36	0.188	ERW	52000	0.72	37.11
11000048	38025.47	0.322	ERW	52000	0.72	12.44
11000049	38037.91	0.188	ERW	52000	0.72	360.74
11000050	38398.66	0.322	ERW	52000	0.72	402.85
11000051	38801.51	0.188	ERW	52000	0.72	1117.12
11000052	39918.63	0.322	ERW	52000	0.72	24.63
11000053	39943.26	0.500	ERW	52000	0.72	2110.62
11000054	42053.88	0.322	ERW	52000	0.72	1250.54
11000055	43304.42	0.188	ERW	52000	0.72	6458.6
11000056	49763.02	0.322	ERW	52000	0.72	289.13
11000057	50052.16	0.188	ERW	52000	0.72	1580.79
11000058	51632.95	0.322	ERW	52000	0.72	379.96
11000059	52012.91	0.188	ERW	52000	0.72	3806.66
11000060	55819.56	0.322	ERW	52000	0.72	274.42
11000061	56093.98	0.188	ERW	52000	0.72	9126.32
11000062	65220.30	0.322	ERW	52000	0.72	167.47
11000063	65387.76	0.188	ERW	52000	0.72	784.89
11000064	66172.65	0.322	ERW	52000	0.72	1269.55
11000065	67442.20	0.188	ERW	52000	0.72	4787.78
11000066	72229.98	0.322	ERW	52000	0.72	490.13
11000067	72720.10	0.188	ERW	52000	0.72	4225.72
11000068	76945.82	0.322	ERW	52000	0.72	28.29

Wall Thickness	Pipetype	Total Length (ft)	Total Length (miles)	Percent of Total Distance
0.188	ERW	64,799	12.272	84.2%
0.322	ERW	10,066	1.906	13.1%
0.500	ERW	2,111	0.400	2.7%

Repair Report

DEFINITIONS

This table lists all the repairs to the pipeline detected during the inspection.

Pipeline repairs that are typically detected include:

- Sleeves
- Half sole
- Patches
- Stopples
- Clamps
- Weld + End
- Clock Spring

ID#	Each repair is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Length	Gives the linear length of the repair.
Type of Repair	Describes the type of repair detected during the inspection.

Repair Report

ID#	Distance (ft)	Length (ft)	Type of Repair

No Repairs have been detected on this pipeline inspection

AGM Information Summary

This table includes all values and above ground marker sites in the inspection run.

ID#	Each location is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Time	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Description	Describes the AGM in greater detail. Generally includes only valves and markers.
Latitude	This shows the north/south position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
Longitude	This shows the east/west position of the Location as supplied by the customer or recorded by an AGM box. For XYZ mapping runs, these values are the supplied survey points or were calculated by the tool.
Altitude	For XYZ mapping runs, this shows the elevation above sea level of the location as supplied by the customer or calculated by the tool.

Zeroes in Latitude and Longitude mean that no data was supplied by the customer. Calculated or estimated values can be viewed in the Pipe Listing report.

AGM Information Summary

ID#	Time	Distance(ft)	Description	Latitude	Longitude	Altitude
10000001	4385.11	0.00	Valve (Launcher), Sta. 0+00, Bainville Injection	48.06736954	-103.88522349	2103.754
10000011	4394.45	18.95	Valve	48.06732626	-103.88518818	2104.693
10000018	4401.97	39.04	Valve	48.06728076	-103.88515042	2105.611
10000024	4408.59	56.62	Pipe Entering Ground -- Han #8404	48.06724620	-103.88512169	2100.536
10000027	6543.41	5228.77	AGM 010, Sta. 51+80, CR 2 -- Han #8740	48.05331498	-103.88411899	1949.291
10000030	8174.40	9510.97	AGM 020, Sta. 93+91, ROW -- Han #3825	48.04257310	-103.87958950	1903.032
10000035	10496.04	15475.97	AGM 030, Sta. 153+57, ROW -- Han #8740	48.02819084	-103.87348760	1881.647
10000039	12671.74	22132.75	AGM 040, Sta. 219+94, Drive Way -- Han #8740	48.02498494	-103.84887271	1852.490
10000043	14980.65	30590.94	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	48.01877027	-103.81845672	1848.981
10000048	16333.80	35505.35	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	48.02379858	-103.80350292	1854.009
10000052	16337.91	35520.59	Valve, Sta. 354+24, 42nd St. NW	48.02379672	-103.80344062	1863.920
10000069	18980.94	43283.46	Valve	48.01048947	-103.78643063	2089.258
10000073	18989.10	43308.18	AGM 070, Sta. 431+85, ROW -- Han #8456	48.01043537	-103.78644713	2083.272
10000077	21580.06	50090.11	AGM 080, Sta. 499+96, ROW -- Han #3713	47.99372506	-103.79550363	1911.338
10000087	23829.99	55546.53	AGM 090, Sta. 553+29, ROW -- Han #8456	47.98007952	-103.79203074	2136.108
10000090	25276.92	58974.24	AGM 100, Sta. 587+47, ROW -- Han #3713	47.97129694	-103.78837454	2133.833
10000091	28053.07	65324.65	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	47.95432791	-103.78707714	2169.416
10000093	31123.15	72340.77	AGM 120, Sta. 722+63, Gravel Rd. -- Han #100	47.93536790	-103.78431805	2175.969
10000098	33109.11	76962.87	Pipe Exiting Ground -- Han #8404	47.92413500	-103.78379835	2231.445
10000105	33113.76	76974.12	Valve (Receiver), Sta. 763+72, Dore Junction	47.92410990	-103.78380205	2224.834

TYPE	NUMBER
Valves	6
Markers	14

Miscellaneous

DEFINITIONS

There are occasions when special notations or circumstances require the addition of a note. These notes are included in this table for your reference.

ID#	Each miscellaneous note is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Time	A reference time from the inspection tool. May also be used to locate features in the PIGTRAP software.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance measured by the tool from launch.
Memo	A description of the entry.

MEMO EXAMPLES

Gap or dent in casing	When the casing is not welded, or when a gap occurs in the weld, this signature is detected by the tool, and identified with a Misc. remark.
Inclusion	An anomaly in the cross section of the pipeline. Inclusions may be detrimental if they protrude through the pipe wall.
Mill anomaly	The process of manufacturing pipe can often leave indications in the pipe wall. Typically these anomalies are not detrimental, and are identified for the benefit of the client.
Sensor problems	Noting locations where anomalous sensor readings occurred.
Tool stops/starts	All tools are setup on a time-based system. When the tool stops, it continues to record, although not moving. When the tool moves very slowly, it is possible that its movement is not detected, and therefore, reported distances may appear shorter than actual. Many stops and starts may affect the overall distance accuracy of the tool.

Miscellaneous

ID#	Time	Distance (ft)	Memo
12000000	198.96	-18.27	Begin Run Tickle
12000002	32,930.45	76,550.58	Debris @ 11:00
12000003	34,639.25	77,018.31	End Run Tickle

Total	Number
Misc listings	3

Other Anomalies

DEFINITIONS

This Report lists anomalies that appear in the data which do not fall into typical metal loss categories. Examples range from manufacturing/mill anomalies in the pipe body and seam weld to construction-related and girth weld anomalies. Predicted wall loss depth estimations as well as pressure calculations are not generally applicable to these features and therefore these values do not appear in this table.

ID#	Each item is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Feature Description / Comments	Classification of the feature along with any additional comments if applicable.
Dist (ft)	Given in either feet or meters, based on contractual agreements, this is the absolute distance from launch.
Length (in)	Predicted length of the defect, reported in either inches or millimeters.
Width (in)	Predicted width of the defect, reported in either inches or millimeters.
Gauss Delta	The difference between high and low gauss readings (magnetic strength) at the feature. This table is sorted with the highest gauss listed in a descending order. Gauss delta indicates relative disturbance of the magnetic field at that location and does not necessarily represent relative severety when comparing one feature to another.
ID/OD	Determination whether the defect exists on the inside (INT) or outside (EXT) surface of the pipe.
Anomaly / Seam Orientation	Orientation of both the feature and the seam weld in the joint of pipe is reported in o'clock (12:00 at top of pipe) as viewed looking downstream. If the pipe is determined to be seamless construction and therefore has no seam, "SMLS" will appear. "N/D" will be populated for joints where the seam is not detected.
Aboveground References	The name of the closest upstream and downstream references, usually either an AGM or a Valve.
Distance from Defect	The distance to the upstream and downstream reference listed in the previous column. Used for locating defects in the field.

Other Anomalies

ID#	Feature Description/Comments	Dist (ft)	Length	Width	Gauss Delta	ID/OD	Anomaly/Seam Orientation O'clock		Above-Ground References	Distance from Defect
20000015	Seam Variation	54,911.2	1.18	0.45	39	INT	8:15 / N/D	U/S:	AGM 080, Sta. 499+96, ROW -- Han #3713	4821.08
								D/S:	AGM 090, Sta. 553+29, ROW -- Han #8456	635.34
20000021	Girth Weld Anomaly	37,630.7	0.55	17.98	179	EXT	8:15 / N/D	U/S:	Valve, Sta. 354+24, 42nd St. NW	2110.05
								D/S:	Valve	5652.81
20000018	Seam Variation	64,618.9	0.82	0.54	29	INT	1:45 / N/D	U/S:	AGM 100, Sta. 587+47, ROW -- Han #3713	5644.60
								D/S:	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	705.81
20000016	Seam Variation	62,537.4	1.18	0.75	37	INT	9:00 / N/D	U/S:	AGM 100, Sta. 587+47, ROW -- Han #3713	3563.11
								D/S:	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	2787.30
20000019	Seam Variation	75,662.6	0.71	0.49	23	EXT	1:15 / N/D	U/S:	AGM 120, Sta. 722+63, Gravel Rd. -- Han #100	3321.78
								D/S:	Pipe Exiting Ground -- Han #8404	1300.32
20000014	Seam Variation	54,670.8	0.47	0.33	22	INT	3:15 / N/D	U/S:	AGM 080, Sta. 499+96, ROW -- Han #3713	4580.65
								D/S:	AGM 090, Sta. 553+29, ROW -- Han #8456	875.77
20000020	Seam Variation	75,663.1	0.82	0.53	22	EXT	1:30 / N/D	U/S:	AGM 120, Sta. 722+63, Gravel Rd. -- Han #100	3322.32
								D/S:	Pipe Exiting Ground -- Han #8404	1299.78
20000017	Seam Variation	63,852.9	1.30	1.05	26	EXT	2:45 / N/D	U/S:	AGM 100, Sta. 587+47, ROW -- Han #3713	4878.58
								D/S:	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	1471.83

Other Anomalies Type	Number
Girth Weld Anomaly	1
Mill Anomaly	
Seam Variation	7

Pipeline Listing

The Pipeline Listing Report presents all detected pipeline data in sequential order, beginning at launcher and ending at the receiver. The table includes welds, locations, metal loss defects, AGMs, wall thickness changes, etc.

ID#	Each item is automatically assigned a number in the software. This number is provided to assist the user of PIGTRAP software to more easily find any given defect.
Description	Describes the event at the particular location. Identifies the type of the descriptive, being a weld, location, pipe thickness change, etc.
Distance	Given in either feet or meters, based on contractual agreements, this is the absolute distance from launch.
Joint #	This unique number identifies the girth weld number.
U/S Weld	The distance to the upstream (U/S) weld (in feet or meters).
D/S Weld	The distance to the downstream (D/S) weld (in feet or meters).
Latitude	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Latitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
Longitude	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Longitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
Altitude	If GPS coordinates were provided for launch, receive and AGMs, this provides the predicted Altitude reading of the location from the first GPS reading based on INS readings obtained by the tool during the inspection.
Orientation: Deg. / O'Clock	Orientation is reported in degrees or o'clock (0 degrees/12:00 at top of pipe) as viewed looking downstream.
% Depth	Predicted depth of the defect as a percentage of nominal wall.
Length or WT (Pipe Thickness)	Predicted length of the defect, reported in either inches or millimeters – or if a wall thickness change, the new wall thickness begins at this point.
Width or YS (Yield Strength)	Predicted width of the defect, reported in either inches or millimeters – or if a wall thickness change, the new SMYS begins at this point.
P' (Calc. Safe Max. Operating Pressure) or SF (Safety Factor)	Calculated safe maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses either ASME B31G, MODIFIED ASME B31G or Z662-99 to calculate the calculated safe maximum allowable operating pressure (P') of the pipeline at a metal loss area.
(P'/P)	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure reducing.

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12000000	Begin Run Tickle	-18.3	0	-	16.8	48.06736947	-103.88522340	2103.740							
11000000	WT CHANGE	-1.6	0	0.0	0.1	48.06736947	-103.88522340	2103.740				0.322	52000	0.72	
110	WELD	-1.5	110	0.0	3.0	48.06736947	-103.88522340	2103.740							
10000000	Flange	-1.1	110	0.4	2.6	48.06736947	-103.88522340	2103.740	0	12:00					
10000001	Valve (Launcher), Sta. 0+00, Bainville Injection	0.0	110	1.5	1.6	48.06736954	-103.88522349	2103.754							
10000002	Flange	1.1	110	2.6	0.5	48.06736698	-103.88522141	2103.795	0	12:00					
120	WELD	1.6	120	0.0	3.8	48.06736590	-103.88522051	2103.821							
10000003	Pipe Support	3.3	120	1.6	2.2	48.06736196	-103.88521738	2103.911							
130	WELD	5.4	130	0.0	1.2	48.06735717	-103.88521342	2104.021							
10000004	Tee at 270 deg.	5.9	130	0.2	1.0	48.06735585	-103.88521234	2104.054	257	8:30					
140	WELD	6.5	140	0.0	2.5	48.06735452	-103.88521130	2104.084							
10000005	Pipe Support	8.2	140	1.6	1.0	48.06735062	-103.88520814	2104.165							
150	WELD	9.0	150	0.0	0.9	48.06734877	-103.88520669	2104.203							
10000006	Flange	9.5	150	0.5	0.5	48.06734775	-103.88520580	2104.223	0	12:00					
160	WELD	10.0	160	0.0	5.0	48.06734668	-103.88520496	2104.244							
10000007	Pipe Support	12.6	160	2.5	2.5	48.06734073	-103.88520009	2104.374							
170	WELD	15.0	170	0.0	1.2	48.06733529	-103.88519562	2104.494							
10000008	Tee at 270 deg.	15.5	170	0.1	1.1	48.06733402	-103.88519454	2104.523	255	8:30					
180	WELD	16.1	180	0.0	1.2	48.06733265	-103.88519341	2104.555							
10000009	Pipe Support	16.8	180	0.5	0.7	48.06733120	-103.88519225	2104.587							
190	WELD	17.4	190	0.0	3.1	48.06732981	-103.88519109	2104.617							
10000010	Flange	17.9	190	0.5	2.6	48.06732871	-103.88519019	2104.639	0	12:00					
10000011	Valve	18.9	190	1.6	1.6	48.06732626	-103.88518818	2104.693							
10000012	Flange	20.0	190	2.7	0.5	48.06732379	-103.88518610	2104.750	0	12:00					
200	WELD	20.5	200	0.0	11.4	48.06732273	-103.88518522	2104.775							
10000013	Pipe Support	20.8	200	0.2	11.3	48.06732213	-103.88518473	2104.790							
10000014	Fitting on top of pipe	27.5	200	6.9	4.5	48.06730682	-103.88517201	2105.096	347	11:30					
210	WELD	32.0	210	0.0	1.2	48.06729674	-103.88516365	2105.300							
10000015	Tee on bottom of pipe	32.6	210	0.2	1.0	48.06729541	-103.88516255	2105.328	169	5:30					
220	WELD	33.2	220	0.0	4.3	48.06729407	-103.88516149	2105.354							
10000016	Pipe Support	37.0	220	3.7	0.7	48.06728544	-103.88515426	2105.520							
230	WELD	37.5	230	0.0	3.1	48.06728422	-103.88515323	2105.543							
10000017	Flange	38.0	230	0.4	2.7	48.06728323	-103.88515241	2105.563	0	12:00					
10000018	Valve	39.0	230	1.5	1.6	48.06728076	-103.88515042	2105.611							
10000019	Flange	40.2	230	2.6	0.5	48.06727823	-103.88514830	2105.669	0	12:00					
240	WELD	40.6	240	0.0	1.3	48.06727720	-103.88514749	2105.693							

Criteria: ASME B31G: Modified

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10000020	Pipe Support	41.0	240	0.2	1.0	48.06727635	-103.88514680	2105.711							
250	WELD	41.9	250	0.0	1.2	48.06727437	-103.88514517	2105.753							
10000021	Tee at 270 deg.	42.4	250	0.1	1.1	48.06727306	-103.88514409	2105.781	258	8:30					
260	WELD	43.0	260	0.0	0.9	48.06727169	-103.88514295	2105.810							
10000022	Flange	43.5	260	0.5	0.4	48.06727059	-103.88514203	2105.834	0	12:00					
270	WELD	43.9	270	0.0	3.0	48.06726958	-103.88514117	2105.856							
280	WELD	46.9	280	0.0	1.6	48.06726290	-103.88513567	2106.045							
10000023	Bend down - 45 deg., 3D	47.7	280	0.1	1.5	48.06726108	-103.88513415	2105.968	0	12:00					
290	WELD	48.5	290	0.0	9.8	48.06725947	-103.88513281	2105.661							
10000024	Pipe Entering Ground -- Han #8404	56.6	290	8.1	1.8	48.06724620	-103.88512169	2100.536							
300	WELD	58.4	300	0.0	0.9	48.06724307	-103.88511910	2099.341							
10000025	Bend up - 30 deg., 3D	58.9	300	0.1	0.9	48.06724220	-103.88511833	2099.082	0	12:00					
310	WELD	59.3	310	0.0	10.2	48.06724124	-103.88511751	2098.883							
11000001	WT CHANGE	69.4	310	0.0	0.1	48.06721791	-103.88509819	2096.374				0.188	52000	0.72	
320	WELD	69.5	320	0.0	38.5	48.06721775	-103.88509805	2096.357							
330	WELD	108.0	330	0.0	41.3	48.06712853	-103.88502429	2087.551							
340	WELD	149.3	340	0.0	41.3	48.06703268	-103.88494390	2079.023							
350	WELD	190.6	350	0.0	41.4	48.06693684	-103.88486353	2070.623							
360	WELD	232.0	360	0.0	41.4	48.06684090	-103.88478022	2064.342							
370	WELD	273.4	370	0.0	41.4	48.06674466	-103.88469572	2060.054							
380	WELD	314.8	380	0.0	41.4	48.06664719	-103.88461200	2057.257							
390	WELD	356.2	390	0.0	41.4	48.06654898	-103.88452907	2055.579							
400	WELD	397.5	400	0.0	41.3	48.06645079	-103.88444686	2053.043							
410	WELD	438.9	410	0.0	41.3	48.06635309	-103.88436424	2049.452							
420	WELD	480.2	420	0.0	38.9	48.06625654	-103.88427915	2044.820							
430	WELD	519.0	430	0.0	6.1	48.06616590	-103.88419735	2042.483							
440	WELD	525.2	440	0.0	1.0	48.06615165	-103.88418418	2042.293							
10000026	Bend right - 33 deg., 1.5D	525.7	440	0.1	0.9	48.06615042	-103.88418342	2042.277	0	12:00					
450	WELD	526.2	450	0.0	6.2	48.06614910	-103.88418288	2042.263							
460	WELD	532.3	460	0.0	31.2	48.06613216	-103.88418220	2042.153							
470	WELD	563.6	470	0.0	41.3	48.06604676	-103.88417984	2041.368							
480	WELD	604.9	480	0.0	41.3	48.06593395	-103.88417711	2040.602							
490	WELD	646.2	490	0.0	41.3	48.06582111	-103.88417470	2040.469							
500	WELD	687.5	500	0.0	41.3	48.06570835	-103.88417224	2042.438							
510	WELD	728.9	510	0.0	41.3	48.06559535	-103.88417180	2042.861							
520	WELD	770.2	520	0.0	41.3	48.06548235	-103.88417240	2044.106							

Criteria: ASME B31G: Modified

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
530	WELD	811.5	530	0.0	41.3	48.06536957	-103.88417140	2046.945						
540	WELD	852.8	540	0.0	41.4	48.06525718	-103.88417020	2050.924						
550	WELD	894.2	550	0.0	41.4	48.06514439	-103.88417020	2053.277						
560	WELD	935.6	560	0.0	41.4	48.06503158	-103.88417178	2055.193						
570	WELD	976.9	570	0.0	41.4	48.06491887	-103.88417310	2057.921						
580	WELD	1,018.3	580	0.0	41.4	48.06480600	-103.88417440	2057.382						
590	WELD	1,059.8	590	0.0	41.4	48.06469310	-103.88417500	2056.150						
600	WELD	1,101.1	600	0.0	41.4	48.06458035	-103.88417290	2053.511						
610	WELD	1,142.5	610	0.0	41.3	48.06446749	-103.88416950	2051.146						
620	WELD	1,183.8	620	0.0	41.3	48.06435488	-103.88416664	2049.169						
630	WELD	1,225.2	630	0.0	41.3	48.06424207	-103.88416460	2047.503						
640	WELD	1,266.5	640	0.0	41.3	48.06412943	-103.88416360	2046.323						
650	WELD	1,307.8	650	0.0	41.3	48.06401654	-103.88416387	2045.299						
660	WELD	1,349.1	660	0.0	41.4	48.06390361	-103.88416460	2044.084						
670	WELD	1,390.5	670	0.0	41.3	48.06379080	-103.88416530	2043.096						
680	WELD	1,431.8	680	0.0	41.3	48.06367798	-103.88416580	2041.394						
690	WELD	1,473.1	690	0.0	41.4	48.06356516	-103.88416490	2039.269						
700	WELD	1,514.4	700	0.0	41.4	48.06345220	-103.88416430	2038.072						
710	WELD	1,555.8	710	0.0	41.3	48.06333955	-103.88416420	2036.835						
720	WELD	1,597.1	720	0.0	41.3	48.06322668	-103.88416360	2036.033						
730	WELD	1,638.4	730	0.0	41.3	48.06311392	-103.88416310	2034.192						
740	WELD	1,679.8	740	0.0	41.4	48.06300147	-103.88416449	2030.393						
750	WELD	1,721.2	750	0.0	41.4	48.06288898	-103.88416830	2026.540						
760	WELD	1,762.6	760	0.0	41.4	48.06277640	-103.88417130	2023.831						
770	WELD	1,804.0	770	0.0	41.3	48.06266358	-103.88417290	2021.979						
780	WELD	1,845.3	780	0.0	41.4	48.06255061	-103.88417330	2020.630						
790	WELD	1,886.7	790	0.0	41.3	48.06243763	-103.88417394	2020.293						
800	WELD	1,928.0	800	0.0	41.3	48.06232465	-103.88417410	2020.774						
810	WELD	1,969.3	810	0.0	41.3	48.06221182	-103.88417420	2022.528						
820	WELD	2,010.7	820	0.0	41.3	48.06209893	-103.88417320	2023.359						
830	WELD	2,052.0	830	0.0	41.3	48.06198600	-103.88417109	2021.878						
840	WELD	2,093.3	840	0.0	41.4	48.06187321	-103.88416900	2019.661						
850	WELD	2,134.7	850	0.0	41.3	48.06176030	-103.88416750	2017.982						
860	WELD	2,176.0	860	0.0	41.3	48.06164734	-103.88416580	2016.171						
870	WELD	2,217.3	870	0.0	41.3	48.06153438	-103.88416490	2015.478						
880	WELD	2,258.6	880	0.0	41.4	48.06142162	-103.88416420	2016.585						
890	WELD	2,300.0	890	0.0	41.4	48.06130865	-103.88416370	2016.690						

Criteria: ASME B31G: Modified

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
900	WELD	2,341.4	900	0.0	41.4	48.06119589	-103.88416280	2014.229						
910	WELD	2,382.7	910	0.0	40.7	48.06108357	-103.88416240	2009.746						
920	WELD	2,423.5	920	0.0	40.0	48.06097290	-103.88416190	2005.225						
930	WELD	2,463.5	930	0.0	40.5	48.06086411	-103.88416020	2000.560						
940	WELD	2,504.0	940	0.0	28.5	48.06075393	-103.88415900	1996.887						
950	WELD	2,532.5	950	0.0	37.6	48.06067632	-103.88416010	1994.729						
960	WELD	2,570.1	960	0.0	41.4	48.06057374	-103.88415960	1992.102						
970	WELD	2,611.5	970	0.0	41.4	48.06046058	-103.88415920	1991.266						
980	WELD	2,652.8	980	0.0	41.3	48.06034780	-103.88415910	1992.639						
990	WELD	2,694.2	990	0.0	41.3	48.06023498	-103.88415920	1993.928						
1000	WELD	2,735.5	1000	0.0	41.4	48.06012232	-103.88415820	1991.753						
1010	WELD	2,776.9	1010	0.0	41.3	48.06000958	-103.88415750	1989.243						
1020	WELD	2,818.2	1020	0.0	41.3	48.05989660	-103.88415632	1988.294						
1030	WELD	2,859.5	1030	0.0	41.3	48.05978370	-103.88415467	1987.824						
1040	WELD	2,900.8	1040	0.0	41.3	48.05967075	-103.88415220	1986.362						
1050	WELD	2,942.2	1050	0.0	41.3	48.05955811	-103.88414970	1983.078						
1060	WELD	2,983.4	1060	0.0	41.3	48.05944594	-103.88414824	1978.495						
13000000	GAIN	3,020.9	1060	37.4	3.9	48.05934403	-103.88414790	1974.813	191	6:15				
1070	WELD	3,024.7	1070	0.0	41.3	48.05933358	-103.88414800	1974.458						
1080	WELD	3,066.0	1080	0.0	41.3	48.05922085	-103.88414910	1971.803						
1090	WELD	3,107.4	1090	0.0	41.3	48.05910782	-103.88415031	1972.594						
1100	WELD	3,148.7	1100	0.0	41.3	48.05899482	-103.88415130	1973.402						
1110	WELD	3,190.0	1110	0.0	41.3	48.05888208	-103.88415170	1971.490						
1120	WELD	3,231.3	1120	0.0	41.3	48.05876923	-103.88415150	1968.881						
1130	WELD	3,272.7	1130	0.0	41.4	48.05865661	-103.88415170	1965.363						
1140	WELD	3,314.0	1140	0.0	41.4	48.05854381	-103.88415260	1963.204						
1150	WELD	3,355.4	1150	0.0	41.4	48.05843090	-103.88415340	1961.351						
1160	WELD	3,396.8	1160	0.0	41.3	48.05831788	-103.88415390	1960.588						
1170	WELD	3,438.1	1170	0.0	41.3	48.05820494	-103.88415320	1959.293						
1180	WELD	3,479.4	1180	0.0	41.3	48.05809208	-103.88415190	1958.975						
1190	WELD	3,520.7	1190	0.0	41.4	48.05797919	-103.88415120	1958.367						
1200	WELD	3,562.0	1200	0.0	41.3	48.05786613	-103.88414970	1958.060						
1210	WELD	3,603.3	1210	0.0	41.4	48.05775351	-103.88414840	1957.402						
1220	WELD	3,644.7	1220	0.0	41.3	48.05764044	-103.88414780	1957.246						
1230	WELD	3,686.0	1230	0.0	41.4	48.05752746	-103.88414820	1956.517						
1240	WELD	3,727.4	1240	0.0	41.3	48.05741453	-103.88414770	1955.967						
1250	WELD	3,768.7	1250	0.0	41.3	48.05730205	-103.88414630	1955.399						

Criteria: ASME B31G: Modified

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
1260	WELD	3,810.0	1260	0.0	41.3	48.05718917	-103.88414421	1955.372						
1270	WELD	3,851.3	1270	0.0	41.3	48.05707628	-103.88414300	1954.441						
1280	WELD	3,892.6	1280	0.0	41.3	48.05696334	-103.88414270	1953.845						
1290	WELD	3,933.9	1290	0.0	41.3	48.05685039	-103.88414220	1952.930						
1300	WELD	3,975.2	1300	0.0	41.3	48.05673741	-103.88414080	1952.641						
1310	WELD	4,016.6	1310	0.0	41.3	48.05662463	-103.88413830	1952.079						
1320	WELD	4,057.9	1320	0.0	41.3	48.05651169	-103.88413650	1951.606						
1330	WELD	4,099.2	1330	0.0	41.4	48.05639863	-103.88413610	1951.531						
1340	WELD	4,140.6	1340	0.0	41.4	48.05628559	-103.88413650	1951.129						
1350	WELD	4,181.9	1350	0.0	41.4	48.05617263	-103.88413680	1950.907						
1360	WELD	4,223.3	1360	0.0	41.3	48.05605973	-103.88413680	1950.898						
1370	WELD	4,264.6	1370	0.0	41.3	48.05594679	-103.88413680	1950.707						
1380	WELD	4,305.9	1380	0.0	41.3	48.05583384	-103.88413720	1950.199						
1390	WELD	4,347.3	1390	0.0	41.4	48.05572080	-103.88413760	1950.298						
1400	WELD	4,388.6	1400	0.0	41.4	48.05560784	-103.88413830	1950.313						
1410	WELD	4,430.0	1410	0.0	41.3	48.05549484	-103.88413830	1949.626						
1420	WELD	4,471.3	1420	0.0	41.3	48.05538185	-103.88413830	1949.750						
1430	WELD	4,512.6	1430	0.0	41.3	48.05526898	-103.88413760	1950.456						
1440	WELD	4,553.9	1440	0.0	41.4	48.05515599	-103.88413680	1951.121						
1450	WELD	4,595.3	1450	0.0	41.4	48.05504311	-103.88413500	1950.986						
1460	WELD	4,636.6	1460	0.0	41.3	48.05493044	-103.88413430	1951.787						
1470	WELD	4,677.9	1470	0.0	41.3	48.05481768	-103.88413420	1953.183						
1480	WELD	4,719.2	1480	0.0	41.4	48.05470478	-103.88413440	1954.200						
1490	WELD	4,760.6	1490	0.0	41.4	48.05459191	-103.88413420	1954.969						
1500	WELD	4,801.9	1500	0.0	41.4	48.05447901	-103.88413340	1955.710						
1510	WELD	4,843.3	1510	0.0	41.3	48.05436634	-103.88413210	1956.188						
1520	WELD	4,884.6	1520	0.0	41.3	48.05425353	-103.88413100	1955.974						
1530	WELD	4,926.0	1530	0.0	41.3	48.05414112	-103.88413110	1954.683						
1540	WELD	4,967.3	1540	0.0	41.3	48.05402840	-103.88413060	1953.018						
1550	WELD	5,008.6	1550	0.0	27.2	48.05391555	-103.88413010	1952.776						
1560	WELD	5,035.8	1560	0.0	40.7	48.05384121	-103.88412949	1952.793						
11000002	WT CHANGE	5,076.5	1560	0.0	0.1	48.05373026	-103.88412681	1953.267			0.322	52000	0.72	
1570	WELD	5,076.5	1570	0.0	42.2	48.05373007	-103.88412680	1953.268						
1580	WELD	5,118.7	1580	0.0	42.2	48.05361526	-103.88412090	1950.517						
1590	WELD	5,160.9	1590	0.0	42.2	48.05350012	-103.88411584	1948.793						
1600	WELD	5,203.2	1600	0.0	42.2	48.05338484	-103.88411760	1948.866						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10000027	AGM 010, Sta. 51+80, CR 2 -- Han #8740	5,228.8	1600	25.6	16.6	48.05331498	-103.88411899	1949.291							
1610	WELD	5,245.4	1610	0.0	42.2	48.05326973	-103.88411765	1950.450							
11000003	WT CHANGE	5,287.4	1610	0.0	0.1	48.05315521	-103.88410669	1951.568				0.188	52000	0.72	
1620	WELD	5,287.5	1620	0.0	14.2	48.05315502	-103.88410667	1951.565							
1630	WELD	5,301.7	1630	0.0	41.3	48.05311642	-103.88410083	1951.124							
1640	WELD	5,343.0	1640	0.0	41.3	48.05300457	-103.88407821	1951.242							
1650	WELD	5,384.3	1650	0.0	41.4	48.05289321	-103.88405117	1952.045							
1660	WELD	5,425.6	1660	0.0	41.4	48.05278167	-103.88402385	1952.413							
1670	WELD	5,467.0	1670	0.0	41.4	48.05266967	-103.88399846	1953.044							
1680	WELD	5,508.4	1680	0.0	41.4	48.05255775	-103.88397607	1953.310							
1690	WELD	5,549.7	1690	0.0	41.3	48.05244571	-103.88395536	1952.862							
1700	WELD	5,591.1	1700	0.0	41.4	48.05233364	-103.88393445	1952.321							
1710	WELD	5,632.5	1710	0.0	41.4	48.05222170	-103.88391262	1952.073							
1720	WELD	5,673.9	1720	0.0	41.3	48.05210967	-103.88388967	1951.892							
1730	WELD	5,715.2	1730	0.0	41.4	48.05199777	-103.88386738	1951.158							
1740	WELD	5,756.5	1740	0.0	41.3	48.05188581	-103.88384460	1950.194							
1750	WELD	5,797.9	1750	0.0	41.3	48.05177407	-103.88382262	1949.689							
1760	WELD	5,839.2	1760	0.0	41.4	48.05166208	-103.88380226	1948.976							
1770	WELD	5,880.6	1770	0.0	41.4	48.05154998	-103.88378134	1948.906							
1780	WELD	5,921.9	1780	0.0	41.3	48.05143812	-103.88375868	1949.022							
1790	WELD	5,963.2	1790	0.0	41.3	48.05132618	-103.88373628	1949.964							
1800	WELD	6,004.5	1800	0.0	41.3	48.05121418	-103.88371470	1950.903							
1810	WELD	6,045.8	1810	0.0	41.3	48.05110197	-103.88369411	1950.938							
1820	WELD	6,087.1	1820	0.0	41.3	48.05099012	-103.88367309	1950.830							
1830	WELD	6,128.5	1830	0.0	41.3	48.05087798	-103.88365227	1951.163							
1840	WELD	6,169.8	1840	0.0	41.3	48.05076596	-103.88363093	1950.567							
1850	WELD	6,211.1	1850	0.0	41.3	48.05065395	-103.88360914	1950.066							
1860	WELD	6,252.4	1860	0.0	41.3	48.05054201	-103.88358717	1949.576							
1870	WELD	6,293.7	1870	0.0	41.4	48.05043010	-103.88356498	1949.514							
1880	WELD	6,335.1	1880	0.0	41.4	48.05031829	-103.88354195	1949.589							
1890	WELD	6,376.5	1890	0.0	41.4	48.05020644	-103.88351908	1950.034							
1900	WELD	6,417.9	1900	0.0	41.3	48.05009450	-103.88349564	1950.327							
13000001	GAIN	6,425.6	1900	7.7	33.6	48.05007356	-103.88349114	1950.346	189	6:15					
1910	WELD	6,459.2	1910	0.0	41.3	48.04998283	-103.88347114	1950.670							
1920	WELD	6,500.5	1920	0.0	41.4	48.04987115	-103.88344549	1951.168							
1930	WELD	6,541.9	1930	0.0	41.4	48.04975971	-103.88342065	1951.569							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
1940	WELD	6,583.2	1940	0.0	41.4	48.04964794	-103.88339588	1951.267							
1950	WELD	6,624.6	1950	0.0	41.4	48.04953622	-103.88337077	1950.619							
1960	WELD	6,666.0	1960	0.0	41.3	48.04942473	-103.88334477	1950.772							
1970	WELD	6,707.3	1970	0.0	41.2	48.04931353	-103.88331791	1950.990							
1980	WELD	6,748.5	1980	0.0	41.3	48.04920228	-103.88329131	1951.791							
1990	WELD	6,789.8	1990	0.0	41.1	48.04909069	-103.88326448	1952.957							
2000	WELD	6,830.9	2000	0.0	41.3	48.04897970	-103.88323805	1954.342							
2010	WELD	6,872.3	2010	0.0	41.3	48.04886804	-103.88321296	1954.480							
2020	WELD	6,913.5	2020	0.0	41.3	48.04875648	-103.88318823	1954.590							
2030	WELD	6,954.8	2030	0.0	41.3	48.04864501	-103.88316264	1955.034							
2040	WELD	6,996.1	2040	0.0	41.3	48.04853391	-103.88313681	1955.418							
2050	WELD	7,037.4	2050	0.0	41.3	48.04842262	-103.88311128	1956.234							
2060	WELD	7,078.7	2060	0.0	41.2	48.04831127	-103.88308641	1957.344							
2070	WELD	7,119.9	2070	0.0	41.3	48.04820009	-103.88306133	1957.754							
2080	WELD	7,161.2	2080	0.0	41.3	48.04808880	-103.88303549	1958.521							
2090	WELD	7,202.4	2090	0.0	41.2	48.04797751	-103.88300929	1959.863							
2100	WELD	7,243.6	2100	0.0	41.2	48.04786646	-103.88298302	1961.862							
2110	WELD	7,284.8	2110	0.0	41.2	48.04775543	-103.88295611	1964.126							
2120	WELD	7,326.0	2120	0.0	41.2	48.04764423	-103.88292968	1965.113							
2130	WELD	7,367.2	2130	0.0	41.2	48.04753280	-103.88290365	1964.732							
2140	WELD	7,408.4	2140	0.0	40.4	48.04742141	-103.88287892	1964.324							
2150	WELD	7,448.7	2150	0.0	41.2	48.04731232	-103.88285387	1965.524							
2160	WELD	7,490.0	2160	0.0	41.3	48.04720150	-103.88282852	1969.948							
2170	WELD	7,531.2	2170	0.0	41.8	48.04709081	-103.88280192	1974.389							
2180	WELD	7,573.0	2180	0.0	41.2	48.04697807	-103.88277610	1977.341							
2190	WELD	7,614.2	2190	0.0	41.2	48.04686689	-103.88275070	1979.787							
2200	WELD	7,655.4	2200	0.0	41.4	48.04675563	-103.88272585	1982.568							
2210	WELD	7,696.8	2210	0.0	38.0	48.04664418	-103.88270108	1985.974							
2220	WELD	7,734.7	2220	0.0	6.1	48.04654179	-103.88267805	1989.047							
2230	WELD	7,740.9	2230	0.0	1.5	48.04652525	-103.88267444	1989.459							
10000028	Bend left - 45 deg., 3D	7,741.6	2230	0.1	1.5	48.04652333	-103.88267347	1989.498	0	12:00					
2240	WELD	7,742.4	2240	0.0	6.3	48.04652173	-103.88267161	1989.510							
2250	WELD	7,748.7	2250	0.0	34.8	48.04651119	-103.88265093	1989.403							
2260	WELD	7,783.5	2260	0.0	40.3	48.04645454	-103.88253685	1988.837							
2270	WELD	7,823.8	2270	0.0	41.2	48.04638799	-103.88240618	1986.195							
2280	WELD	7,865.0	2280	0.0	41.1	48.04632152	-103.88227562	1977.413							
2290	WELD	7,906.1	2290	0.0	41.2	48.04625462	-103.88214553	1969.203							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
2300	WELD	7,947.3	2300	0.0	41.3	48.04618661	-103.88201349	1964.283							
2310	WELD	7,988.7	2310	0.0	41.3	48.04611717	-103.88188099	1963.168							
2320	WELD	8,029.9	2320	0.0	41.2	48.04604807	-103.88174865	1965.345							
2330	WELD	8,071.1	2330	0.0	41.1	48.04597982	-103.88161565	1968.731							
2340	WELD	8,112.3	2340	0.0	41.3	48.04591164	-103.88148309	1973.450							
2350	WELD	8,153.6	2350	0.0	41.3	48.04584234	-103.88135080	1976.962							
2360	WELD	8,194.9	2360	0.0	41.2	48.04577277	-103.88121789	1978.346							
2370	WELD	8,236.1	2370	0.0	41.3	48.04570411	-103.88108437	1977.951							
2380	WELD	8,277.4	2380	0.0	41.1	48.04563529	-103.88095125	1977.999							
2390	WELD	8,318.5	2390	0.0	41.3	48.04556674	-103.88081834	1976.947							
2400	WELD	8,359.9	2400	0.0	41.3	48.04549865	-103.88068393	1975.807							
2410	WELD	8,401.2	2410	0.0	41.3	48.04543056	-103.88055035	1976.288							
2420	WELD	8,442.4	2420	0.0	41.3	48.04536176	-103.88041718	1976.296							
2430	WELD	8,483.7	2430	0.0	41.4	48.04529209	-103.88028529	1975.187							
2440	WELD	8,525.1	2440	0.0	6.7	48.04522369	-103.88015254	1971.548							
2450	WELD	8,531.7	2450	0.0	1.6	48.04521311	-103.88013091	1970.574							
10000029	Bend right - 45 deg., 3D	8,532.5	2450	0.1	1.4	48.04521161	-103.88012886	1970.459	0	12:00					
2460	WELD	8,533.3	2460	0.0	6.0	48.04520975	-103.88012750	1970.342							
2470	WELD	8,539.3	2470	0.0	35.6	48.04519302	-103.88012340	1969.461							
2480	WELD	8,574.9	2480	0.0	41.3	48.04509756	-103.88010043	1965.489							
2490	WELD	8,616.2	2490	0.0	41.3	48.04498658	-103.88007281	1962.350							
2500	WELD	8,657.5	2500	0.0	40.7	48.04487512	-103.88004674	1960.170							
2510	WELD	8,698.2	2510	0.0	40.9	48.04476588	-103.88001956	1957.621							
2520	WELD	8,739.0	2520	0.0	41.3	48.04465660	-103.87999591	1951.989							
2530	WELD	8,780.3	2530	0.0	39.0	48.04454530	-103.87997376	1947.789							
2540	WELD	8,819.4	2540	0.0	40.8	48.04443983	-103.87995281	1946.355							
2550	WELD	8,860.2	2550	0.0	41.4	48.04432980	-103.87993008	1943.920							
2560	WELD	8,901.6	2560	0.0	41.3	48.04421881	-103.87990676	1939.197							
2570	WELD	8,942.9	2570	0.0	37.9	48.04410915	-103.87988369	1931.608							
2580	WELD	8,980.8	2580	0.0	40.1	48.04400814	-103.87986304	1925.207							
2590	WELD	9,020.9	2590	0.0	41.3	48.04389995	-103.87984085	1921.924							
2600	WELD	9,062.2	2600	0.0	41.3	48.04378839	-103.87981716	1919.754							
2610	WELD	9,103.5	2610	0.0	38.9	48.04367666	-103.87979442	1917.472							
2620	WELD	9,142.5	2620	0.0	39.9	48.04357137	-103.87977274	1915.645							
2630	WELD	9,182.4	2630	0.0	41.4	48.04346367	-103.87975055	1913.095							
2640	WELD	9,223.7	2640	0.0	41.3	48.04335169	-103.87972945	1911.534							
2650	WELD	9,265.0	2650	0.0	38.2	48.04323974	-103.87971023	1909.405							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
2660	WELD	9,303.1	2660	0.0	21.3	48.04313635	-103.87969207	1907.506						
2670	WELD	9,324.5	2670	0.0	38.2	48.04307848	-103.87968183	1906.665						
2680	WELD	9,362.7	2680	0.0	22.6	48.04297480	-103.87966380	1905.520						
2690	WELD	9,385.3	2690	0.0	41.3	48.04291342	-103.87965263	1904.961						
2700	WELD	9,426.7	2700	0.0	39.2	48.04280143	-103.87963208	1904.205						
2710	WELD	9,465.9	2710	0.0	34.4	48.04269515	-103.87961339	1903.832						
2720	WELD	9,500.3	2720	0.0	41.3	48.04260197	-103.87959512	1903.357						
10000030	AGM 020, Sta. 93+91, ROW -- Han #3825	9,511.0	2720	10.7	30.7	48.04257310	-103.87958950	1903.032						
2730	WELD	9,541.6	2730	0.0	41.3	48.04249005	-103.87957301	1902.598						
2740	WELD	9,582.9	2740	0.0	39.5	48.04237806	-103.87955000	1902.470						
2750	WELD	9,622.4	2750	0.0	40.3	48.04227132	-103.87952804	1902.098						
2760	WELD	9,662.7	2760	0.0	40.3	48.04216244	-103.87950327	1902.072						
2770	WELD	9,703.0	2770	0.0	40.5	48.04205489	-103.87946847	1902.251						
2780	WELD	9,743.6	2780	0.0	40.4	48.04194894	-103.87942104	1901.280						
2790	WELD	9,784.0	2790	0.0	40.6	48.04184648	-103.87936036	1900.266						
2800	WELD	9,824.6	2800	0.0	40.3	48.04174427	-103.87929652	1900.938						
2810	WELD	9,864.9	2810	0.0	25.7	48.04164237	-103.87923480	1903.067						
11000004	WT CHANGE	9,890.5	2810	0.0	0.1	48.04157578	-103.87920300	1902.995			0.322	52000	0.72	
2820	WELD	9,890.6	2820	0.0	38.8	48.04157557	-103.87920291	1902.995						
10000031	Casing Begin	9,895.7	2820	5.1	33.7	48.04156216	-103.87919749	1902.968	0 12:00					
2830	WELD	9,929.4	2830	0.0	42.3	48.04147274	-103.87916460	1901.545						
2840	WELD	9,971.7	2840	0.0	42.2	48.04136042	-103.87913087	1896.697						
2850	WELD	10,013.9	2850	0.0	42.3	48.04124927	-103.87910041	1888.302						
2860	WELD	10,056.2	2860	0.0	42.2	48.04113810	-103.87906317	1881.214						
2870	WELD	10,098.4	2870	0.0	42.2	48.04102644	-103.87902687	1875.333						
2880	WELD	10,140.7	2880	0.0	42.3	48.04091340	-103.87899355	1872.812						
2890	WELD	10,182.9	2890	0.0	42.3	48.04080028	-103.87895967	1874.655						
2900	WELD	10,225.2	2900	0.0	42.2	48.04068804	-103.87892444	1879.669						
2910	WELD	10,267.4	2910	0.0	42.3	48.04057684	-103.87888316	1884.642						
2920	WELD	10,309.7	2920	0.0	42.2	48.04046590	-103.87883887	1889.165						
2930	WELD	10,351.9	2930	0.0	42.2	48.04035337	-103.87880209	1892.148						
2940	WELD	10,394.1	2940	0.0	42.3	48.04024021	-103.87876710	1892.467						
2950	WELD	10,436.4	2950	0.0	22.0	48.04012745	-103.87873027	1892.086						
2960	WELD	10,458.4	2960	0.0	42.3	48.04006893	-103.87871028	1892.472						
2970	WELD	10,500.6	2970	0.0	42.2	48.03995631	-103.87867271	1894.171						
2980	WELD	10,542.9	2980	0.0	42.2	48.03984301	-103.87863956	1895.984						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
2990	WELD	10,585.1	2990	0.0	33.1	48.03972985	-103.87860684	1898.516							
10000032	Casing End	10,607.4	2990	22.3	10.8	48.03967038	-103.87858825	1900.079	0	12:00					
3000	WELD	10,618.3	3000	0.0	0.3	48.03964143	-103.87857928	1900.665							
10000033	Bend right - 15 deg., 1.5D	10,618.4	3000	0.0	0.3	48.03964096	-103.87857919	1900.672	0	12:00					
3010	WELD	10,618.6	3010	0.0	10.3	48.03964049	-103.87857910	1900.679							
3020	WELD	10,628.9	3020	0.0	9.0	48.03961232	-103.87858110	1901.027							
11000005	WT CHANGE	10,637.8	3020	0.0	0.1	48.03958791	-103.87858302	1901.319				0.188	52000	0.72	
3030	WELD	10,637.9	3030	0.0	40.9	48.03958770	-103.87858304	1901.321							
3040	WELD	10,678.8	3040	0.0	41.2	48.03947597	-103.87859203	1902.413							
3050	WELD	10,720.0	3050	0.0	41.5	48.03936330	-103.87860039	1901.762							
3060	WELD	10,761.5	3060	0.0	41.1	48.03924982	-103.87860544	1901.485							
3070	WELD	10,802.5	3070	0.0	41.3	48.03913745	-103.87861138	1901.566							
3080	WELD	10,843.8	3080	0.0	41.3	48.03902465	-103.87861555	1901.547							
3090	WELD	10,885.1	3090	0.0	41.3	48.03891158	-103.87861953	1901.282							
3100	WELD	10,926.4	3100	0.0	40.4	48.03879916	-103.87862344	1901.092							
3110	WELD	10,966.9	3110	0.0	41.4	48.03868884	-103.87862690	1901.292							
3120	WELD	11,008.2	3120	0.0	41.4	48.03857609	-103.87862850	1901.114							
3130	WELD	11,049.7	3130	0.0	42.2	48.03846314	-103.87863070	1901.017							
3140	WELD	11,091.8	3140	0.0	41.1	48.03834810	-103.87863440	1900.640							
3150	WELD	11,132.9	3150	0.0	41.4	48.03823628	-103.87863820	1900.185							
3160	WELD	11,174.3	3160	0.0	41.2	48.03812341	-103.87864160	1899.860							
3170	WELD	11,215.5	3170	0.0	41.0	48.03801116	-103.87864657	1899.755							
3180	WELD	11,256.5	3180	0.0	41.3	48.03789926	-103.87865113	1899.501							
3190	WELD	11,297.8	3190	0.0	41.3	48.03778639	-103.87865485	1899.355							
3200	WELD	11,339.1	3200	0.0	41.3	48.03767345	-103.87865860	1899.022							
3210	WELD	11,380.4	3210	0.0	41.5	48.03756072	-103.87866241	1898.951							
3220	WELD	11,421.9	3220	0.0	41.3	48.03744734	-103.87866620	1898.439							
40000000	Metal Loss - INTERNAL	11,435.9	3220	14.0	27.3	48.03740900	-103.87866720	1898.262	226	7:30	35%	0.67	0.43	1760	100%
3230	WELD	11,463.2	3230	0.0	41.2	48.03733445	-103.87866980	1898.376							
3240	WELD	11,504.4	3240	0.0	41.2	48.03722177	-103.87867290	1898.238							
3250	WELD	11,545.5	3250	0.0	41.1	48.03710895	-103.87867588	1897.985							
3260	WELD	11,586.6	3260	0.0	41.3	48.03699647	-103.87867962	1898.003							
3270	WELD	11,627.9	3270	0.0	41.3	48.03688366	-103.87868277	1897.564							
3280	WELD	11,669.2	3280	0.0	41.3	48.03677108	-103.87868639	1897.067							
3290	WELD	11,710.5	3290	0.0	41.6	48.03665857	-103.87868995	1896.752							
3300	WELD	11,752.1	3300	0.0	41.3	48.03654528	-103.87869392	1896.407							
3310	WELD	11,793.4	3310	0.0	41.2	48.03643298	-103.87869821	1895.967							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
3320	WELD	11,834.5	3320	0.0	41.3	48.03632088	-103.87870272	1895.769						
3330	WELD	11,875.8	3330	0.0	41.4	48.03620857	-103.87870712	1895.595						
3340	WELD	11,917.2	3340	0.0	41.9	48.03609583	-103.87870976	1895.310						
3350	WELD	11,959.2	3350	0.0	41.4	48.03598145	-103.87871246	1895.223						
3360	WELD	12,000.5	3360	0.0	41.4	48.03586862	-103.87871471	1894.805						
3370	WELD	12,041.9	3370	0.0	41.3	48.03575562	-103.87871790	1894.374						
3380	WELD	12,083.2	3380	0.0	41.6	48.03564302	-103.87872103	1894.281						
3390	WELD	12,124.8	3390	0.0	41.2	48.03552924	-103.87872452	1894.104						
3400	WELD	12,166.0	3400	0.0	41.2	48.03541662	-103.87872813	1893.868						
3410	WELD	12,207.2	3410	0.0	41.3	48.03530414	-103.87873210	1893.505						
3420	WELD	12,248.5	3420	0.0	41.2	48.03519152	-103.87873568	1893.322						
3430	WELD	12,289.7	3430	0.0	41.1	48.03507906	-103.87873970	1893.359						
3440	WELD	12,330.8	3440	0.0	41.1	48.03496672	-103.87874483	1893.046						
3450	WELD	12,371.9	3450	0.0	41.5	48.03485411	-103.87874962	1892.966						
3460	WELD	12,413.4	3460	0.0	41.1	48.03474053	-103.87875392	1892.894						
3470	WELD	12,454.5	3470	0.0	41.1	48.03462803	-103.87875796	1892.741						
3480	WELD	12,495.7	3480	0.0	41.1	48.03451540	-103.87876170	1892.831						
3490	WELD	12,536.8	3490	0.0	40.4	48.03440272	-103.87876491	1892.513						
3500	WELD	12,577.2	3500	0.0	41.3	48.03429234	-103.87876860	1892.382						
3510	WELD	12,618.5	3510	0.0	41.1	48.03417951	-103.87877134	1892.411						
3520	WELD	12,659.6	3520	0.0	41.3	48.03406714	-103.87877320	1892.044						
3530	WELD	12,700.9	3530	0.0	41.3	48.03395437	-103.87877540	1891.919						
3540	WELD	12,742.1	3540	0.0	41.1	48.03384174	-103.87877817	1891.681						
3550	WELD	12,783.2	3550	0.0	41.2	48.03372948	-103.87878215	1891.618						
3560	WELD	12,824.4	3560	0.0	41.3	48.03361709	-103.87878620	1891.619						
3570	WELD	12,865.7	3570	0.0	41.3	48.03350451	-103.87879020	1891.422						
3580	WELD	12,907.1	3580	0.0	40.5	48.03339171	-103.87879358	1890.788						
3590	WELD	12,947.6	3590	0.0	41.4	48.03328130	-103.87879719	1890.397						
3600	WELD	12,989.0	3600	0.0	41.5	48.03316856	-103.87880110	1889.895						
3610	WELD	13,030.5	3610	0.0	41.6	48.03305528	-103.87880460	1889.455						
3620	WELD	13,072.1	3620	0.0	41.5	48.03294160	-103.87880725	1889.182						
3630	WELD	13,113.6	3630	0.0	41.3	48.03282805	-103.87880960	1888.888						
3640	WELD	13,154.9	3640	0.0	41.3	48.03271526	-103.87881191	1888.513						
3650	WELD	13,196.2	3650	0.0	41.2	48.03260240	-103.87881459	1887.932						
3660	WELD	13,237.5	3660	0.0	41.3	48.03248982	-103.87881690	1887.708						
3670	WELD	13,278.7	3670	0.0	41.2	48.03237707	-103.87882001	1887.544						
3680	WELD	13,319.9	3680	0.0	41.4	48.03226460	-103.87882449	1887.313						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
3690	WELD	13,361.3	3690	0.0	41.1	48.03215154	-103.87883067	1887.322						
3700	WELD	13,402.4	3700	0.0	41.1	48.03203921	-103.87883567	1887.158						
3710	WELD	13,443.5	3710	0.0	41.2	48.03192679	-103.87883730	1886.726						
3720	WELD	13,484.7	3720	0.0	41.2	48.03181420	-103.87883257	1886.722						
3730	WELD	13,525.9	3730	0.0	41.2	48.03170222	-103.87881811	1886.707						
3740	WELD	13,567.0	3740	0.0	41.3	48.03159110	-103.87879410	1886.507						
3750	WELD	13,608.3	3750	0.0	41.2	48.03148088	-103.87875962	1886.479						
3760	WELD	13,649.5	3760	0.0	41.1	48.03137598	-103.87870060	1886.582						
3770	WELD	13,690.6	3770	0.0	41.3	48.03128632	-103.87860093	1886.696						
3780	WELD	13,732.0	3780	0.0	41.3	48.03121175	-103.87847533	1886.093						
3790	WELD	13,773.3	3790	0.0	41.1	48.03114920	-103.87833570	1885.636						
3800	WELD	13,814.4	3800	0.0	41.4	48.03109253	-103.87819145	1885.360						
3810	WELD	13,855.7	3810	0.0	41.4	48.03103787	-103.87804408	1885.276						
3820	WELD	13,897.1	3820	0.0	41.3	48.03098468	-103.87789576	1885.002						
3830	WELD	13,938.5	3830	0.0	41.2	48.03093130	-103.87774730	1884.967						
3840	WELD	13,979.7	3840	0.0	41.8	48.03087759	-103.87759981	1884.177						
3850	WELD	14,021.4	3850	0.0	41.3	48.03082313	-103.87744998	1883.518						
3860	WELD	14,062.8	3860	0.0	41.2	48.03076914	-103.87730230	1883.411						
3870	WELD	14,104.0	3870	0.0	41.5	48.03071544	-103.87715466	1883.287						
3880	WELD	14,145.5	3880	0.0	41.3	48.03066147	-103.87700598	1883.098						
3890	WELD	14,186.8	3890	0.0	41.3	48.03060731	-103.87685872	1882.807						
3900	WELD	14,228.1	3900	0.0	41.2	48.03055217	-103.87671189	1882.807						
3910	WELD	14,269.3	3910	0.0	41.2	48.03049506	-103.87656716	1882.389						
3920	WELD	14,310.5	3920	0.0	41.3	48.03043220	-103.87642756	1882.425						
3930	WELD	14,351.8	3930	0.0	41.2	48.03036185	-103.87629574	1882.280						
3940	WELD	14,393.0	3940	0.0	41.1	48.03028618	-103.87617055	1881.870						
3950	WELD	14,434.1	3950	0.0	41.1	48.03020812	-103.87604916	1882.317						
3960	WELD	14,475.3	3960	0.0	40.4	48.03012843	-103.87593013	1882.080						
3970	WELD	14,515.7	3970	0.0	41.2	48.03004851	-103.87581584	1881.902						
3980	WELD	14,556.8	3980	0.0	41.1	48.02996562	-103.87570209	1881.706						
3990	WELD	14,598.0	3990	0.0	41.2	48.02987932	-103.87559437	1881.867						
4000	WELD	14,639.2	4000	0.0	41.3	48.02978535	-103.87550227	1882.348						
4010	WELD	14,680.5	4010	0.0	41.4	48.02968322	-103.87543257	1882.052						
4020	WELD	14,721.9	4020	0.0	41.4	48.02957639	-103.87537956	1881.939						
4030	WELD	14,763.3	4030	0.0	41.3	48.02946791	-103.87533518	1882.133						
4040	WELD	14,804.6	4040	0.0	41.3	48.02935878	-103.87529290	1882.354						
4050	WELD	14,845.9	4050	0.0	41.2	48.02924968	-103.87525092	1882.033						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
4060	WELD	14,887.0	4060	0.0	41.1	48.02914045	-103.87520989	1881.836							
4070	WELD	14,928.2	4070	0.0	30.2	48.02903136	-103.87516941	1881.324							
4080	WELD	14,958.4	4080	0.0	13.6	48.02895097	-103.87514021	1880.751							
4090	WELD	14,972.0	4090	0.0	38.8	48.02891471	-103.87512718	1880.656							
4100	WELD	15,010.8	4100	0.0	25.1	48.02881170	-103.87508900	1880.031							
11000006	WT CHANGE	15,035.8	4100	0.0	0.1	48.02874596	-103.87506314	1878.042				0.322	52000	0.72	
4110	WELD	15,035.9	4110	0.0	6.0	48.02874575	-103.87506305	1878.035							
4120	WELD	15,041.9	4120	0.0	1.6	48.02872994	-103.87505665	1877.512							
10000034	Bend left - 45 deg., 3D	15,042.7	4120	0.1	1.5	48.02872805	-103.87505530	1877.406	0	12:00					
4130	WELD	15,043.5	4130	0.0	6.9	48.02872653	-103.87505317	1877.236							
11000007	WT CHANGE	15,050.4	4130	0.0	0.1	48.02871699	-103.87502893	1875.369				0.188	52000	0.72	
4140	WELD	15,050.4	4140	0.0	40.6	48.02871688	-103.87502864	1875.347							
4150	WELD	15,091.0	4150	0.0	40.8	48.02866388	-103.87488533	1871.733							
4160	WELD	15,131.8	4160	0.0	40.4	48.02861255	-103.87473914	1876.979							
4170	WELD	15,172.2	4170	0.0	40.4	48.02856384	-103.87459220	1880.407							
4180	WELD	15,212.6	4180	0.0	40.1	48.02851578	-103.87444427	1880.881							
4190	WELD	15,252.7	4190	0.0	41.5	48.02846775	-103.87429766	1880.569							
4200	WELD	15,294.2	4200	0.0	41.3	48.02841766	-103.87414609	1881.020							
4210	WELD	15,335.5	4210	0.0	41.2	48.02836634	-103.87399631	1881.136							
4220	WELD	15,376.7	4220	0.0	41.2	48.02831510	-103.87384698	1881.375							
4230	WELD	15,417.9	4230	0.0	41.2	48.02826360	-103.87369765	1881.618							
4240	WELD	15,459.1	4240	0.0	13.3	48.02821174	-103.87354921	1881.751							
11000008	WT CHANGE	15,472.3	4240	0.0	0.1	48.02819558	-103.87350132	1881.628				0.322	52000	0.72	
4250	WELD	15,472.4	4250	0.0	4.9	48.02819548	-103.87350104	1881.629							
10000035	AGM 030, Sta. 153+57, ROW -- Han #8740	15,476.0	4250	3.6	1.3	48.02819084	-103.87348760	1881.647							
4260	WELD	15,477.3	4260	0.0	1.2	48.02818927	-103.87348304	1881.677							
10000036	Tee at 90 deg.	15,477.9	4260	0.2	1.0	48.02818853	-103.87348090	1881.682	61	2:00					
11000009	WT CHANGE	15,478.3	4260	0.0	0.1	48.02818795	-103.87347922	1881.682				0.188	52000	0.72	
4270	WELD	15,478.4	4270	0.0	7.3	48.02818786	-103.87347894	1881.682							
4280	WELD	15,485.7	4280	0.0	14.9	48.02817913	-103.87345285	1881.620							
4290	WELD	15,500.6	4290	0.0	41.3	48.02816127	-103.87339833	1882.034							
4300	WELD	15,541.8	4300	0.0	41.2	48.02811647	-103.87324508	1882.700							
4310	WELD	15,583.0	4310	0.0	41.3	48.02808393	-103.87308478	1882.844							
4320	WELD	15,624.3	4320	0.0	41.4	48.02806726	-103.87291918	1882.871							
4330	WELD	15,665.6	4330	0.0	41.4	48.02806287	-103.87275146	1882.407							
4340	WELD	15,707.1	4340	0.0	41.4	48.02806397	-103.87258302	1881.950							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
4350	WELD	15,748.5	4350	0.0	40.6	48.02806569	-103.87241476	1881.909						
4360	WELD	15,789.0	4360	0.0	40.4	48.02806742	-103.87224953	1881.562						
4370	WELD	15,829.5	4370	0.0	41.1	48.02806791	-103.87208469	1880.974						
4380	WELD	15,870.6	4380	0.0	41.2	48.02806748	-103.87191709	1880.243						
4390	WELD	15,911.8	4390	0.0	41.3	48.02806816	-103.87174922	1880.107						
4400	WELD	15,953.1	4400	0.0	41.2	48.02807027	-103.87158072	1879.448						
4410	WELD	15,994.3	4410	0.0	41.3	48.02807299	-103.87141295	1876.914						
4420	WELD	16,035.5	4420	0.0	41.3	48.02807511	-103.87124562	1871.785						
4430	WELD	16,076.8	4430	0.0	41.2	48.02807724	-103.87107806	1867.879						
4440	WELD	16,118.0	4440	0.0	41.1	48.02807812	-103.87091000	1868.261						
4450	WELD	16,159.1	4450	0.0	41.4	48.02807935	-103.87074334	1873.204						
4460	WELD	16,200.5	4460	0.0	41.2	48.02808110	-103.87057549	1877.083						
4470	WELD	16,241.7	4470	0.0	41.2	48.02808267	-103.87040784	1878.902						
4480	WELD	16,282.9	4480	0.0	41.3	48.02808373	-103.87024002	1878.913						
4490	WELD	16,324.2	4490	0.0	41.2	48.02808451	-103.87007132	1878.666						
4500	WELD	16,365.4	4500	0.0	41.3	48.02808452	-103.86990327	1877.840						
4510	WELD	16,406.6	4510	0.0	41.2	48.02808377	-103.86973480	1877.277						
4520	WELD	16,447.8	4520	0.0	41.4	48.02808117	-103.86956657	1878.298						
4530	WELD	16,489.3	4530	0.0	41.3	48.02807933	-103.86939774	1878.392						
4540	WELD	16,530.6	4540	0.0	41.5	48.02808110	-103.86922979	1878.298						
4550	WELD	16,572.1	4550	0.0	41.2	48.02809332	-103.86906198	1877.572						
4560	WELD	16,613.4	4560	0.0	41.3	48.02811892	-103.86889891	1876.883						
4570	WELD	16,654.6	4570	0.0	41.2	48.02816154	-103.86874399	1876.713						
4580	WELD	16,695.8	4580	0.0	41.3	48.02821730	-103.86859897	1876.642						
4590	WELD	16,737.1	4590	0.0	41.1	48.02828250	-103.86846253	1876.526						
4600	WELD	16,778.2	4600	0.0	41.2	48.02835141	-103.86833093	1875.532						
4610	WELD	16,819.4	4610	0.0	41.3	48.02841951	-103.86819859	1871.283						
4620	WELD	16,860.7	4620	0.0	41.3	48.02848689	-103.86806396	1868.932						
4630	WELD	16,902.1	4630	0.0	41.3	48.02855449	-103.86792935	1868.051						
4640	WELD	16,943.4	4640	0.0	41.3	48.02862235	-103.86779514	1865.410						
4650	WELD	16,984.7	4650	0.0	41.3	48.02868990	-103.86766015	1865.184						
4660	WELD	17,026.0	4660	0.0	41.3	48.02875700	-103.86752453	1866.073						
4670	WELD	17,067.4	4670	0.0	41.3	48.02882527	-103.86739055	1864.442						
4680	WELD	17,108.7	4680	0.0	41.3	48.02889360	-103.86725629	1864.825						
4690	WELD	17,150.0	4690	0.0	41.3	48.02896173	-103.86712208	1866.309						
4700	WELD	17,191.2	4700	0.0	41.3	48.02903004	-103.86698819	1867.579						
4710	WELD	17,232.5	4710	0.0	41.3	48.02909827	-103.86685432	1869.516						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
4720	WELD	17,273.8	4720	0.0	41.0	48.02916662	-103.86672034	1871.950							
4730	WELD	17,314.9	4730	0.0	40.8	48.02923494	-103.86658811	1873.196							
4740	WELD	17,355.6	4740	0.0	30.4	48.02930209	-103.86645593	1873.458							
4750	WELD	17,386.0	4750	0.0	5.9	48.02934892	-103.86635397	1873.075							
4760	WELD	17,392.0	4760	0.0	1.5	48.02935779	-103.86633382	1873.247							
10000037	Bend right - 45 deg., 3D	17,392.7	4760	0.1	1.5	48.02935859	-103.86633095	1873.267	0	12:00					
4770	WELD	17,393.5	4770	0.0	36.4	48.02935885	-103.86632783	1873.276							
11000010	WT CHANGE	17,429.8	4770	0.0	0.1	48.02933811	-103.86618352	1872.500				0.322	52000	0.72	
4780	WELD	17,429.9	4780	0.0	42.1	48.02933806	-103.86618322	1872.500							
4790	WELD	17,472.0	4790	0.0	42.2	48.02931075	-103.86601579	1872.766							
4800	WELD	17,514.2	4800	0.0	42.2	48.02927890	-103.86585033	1871.597							
4810	WELD	17,556.4	4810	0.0	42.2	48.02924309	-103.86568718	1868.741							
4820	WELD	17,598.6	4820	0.0	42.2	48.02920712	-103.86552394	1865.921							
4830	WELD	17,640.8	4830	0.0	42.2	48.02916734	-103.86536294	1862.541							
4840	WELD	17,683.1	4840	0.0	42.2	48.02911291	-103.86521166	1860.409							
4850	WELD	17,725.3	4850	0.0	42.3	48.02904915	-103.86506818	1860.041							
4860	WELD	17,767.5	4860	0.0	42.2	48.02898622	-103.86492399	1860.752							
4870	WELD	17,809.8	4870	0.0	42.2	48.02892830	-103.86477540	1862.570							
4880	WELD	17,852.0	4880	0.0	42.2	48.02887383	-103.86462358	1863.694							
4890	WELD	17,894.2	4890	0.0	42.2	48.02882363	-103.86446877	1863.055							
4900	WELD	17,936.4	4900	0.0	42.1	48.02877480	-103.86431284	1862.477							
11000011	WT CHANGE	17,978.5	4900	0.0	0.1	48.02872592	-103.86415778	1861.796				0.188	52000	0.72	
4910	WELD	17,978.5	4910	0.0	36.0	48.02872583	-103.86415749	1861.794							
4920	WELD	18,014.5	4920	0.0	40.2	48.02868373	-103.86402442	1861.565							
4930	WELD	18,054.8	4930	0.0	40.5	48.02863836	-103.86387464	1860.329							
11000012	WT CHANGE	18,095.2	4930	0.0	0.1	48.02859505	-103.86372328	1858.900				0.322	52000	0.72	
4940	WELD	18,095.3	4940	0.0	42.1	48.02859496	-103.86372299	1858.897							
4950	WELD	18,137.4	4950	0.0	42.2	48.02854887	-103.86356558	1856.573							
4960	WELD	18,179.6	4960	0.0	42.2	48.02850317	-103.86340821	1853.137							
4970	WELD	18,221.7	4970	0.0	42.2	48.02845412	-103.86325273	1851.072							
4980	WELD	18,264.0	4980	0.0	42.3	48.02840013	-103.86310100	1849.660							
4990	WELD	18,306.3	4990	0.0	42.3	48.02834164	-103.86295277	1848.295							
5000	WELD	18,348.6	5000	0.0	42.3	48.02827975	-103.86280767	1846.220							
5010	WELD	18,390.9	5010	0.0	42.3	48.02821485	-103.86266607	1843.230							
5020	WELD	18,433.2	5020	0.0	42.3	48.02814851	-103.86252525	1842.859							
5030	WELD	18,475.4	5030	0.0	42.3	48.02808365	-103.86238367	1846.766							
5040	WELD	18,517.7	5040	0.0	39.4	48.02801909	-103.86224209	1850.741							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11000013	WT CHANGE	18,557.0	5040	0.0	0.1	48.02795659	-103.86211293	1855.138			0.188	52000	0.72	
5050	WELD	18,557.1	5050	0.0	4.7	48.02795646	-103.86211268	1855.143						
5060	WELD	18,561.7	5060	0.0	41.3	48.02794881	-103.86209751	1855.412						
5070	WELD	18,603.0	5070	0.0	41.4	48.02788281	-103.86196091	1856.239						
5080	WELD	18,644.5	5080	0.0	41.3	48.02782705	-103.86181405	1855.990						
5090	WELD	18,685.8	5090	0.0	41.2	48.02777801	-103.86166229	1855.707						
5100	WELD	18,726.9	5100	0.0	41.2	48.02771579	-103.86152229	1856.052						
5110	WELD	18,768.1	5110	0.0	41.4	48.02765110	-103.86138445	1856.074						
5120	WELD	18,809.5	5120	0.0	41.2	48.02758566	-103.86124638	1856.262						
5130	WELD	18,850.7	5130	0.0	41.2	48.02752047	-103.86110892	1856.204						
5140	WELD	18,891.9	5140	0.0	41.1	48.02745461	-103.86097254	1855.974						
5150	WELD	18,933.0	5150	0.0	40.8	48.02738977	-103.86083543	1855.870						
5160	WELD	18,973.8	5160	0.0	41.4	48.02732619	-103.86069897	1855.868						
5170	WELD	19,015.2	5170	0.0	41.4	48.02726170	-103.86056045	1855.814						
5180	WELD	19,056.5	5180	0.0	41.4	48.02719688	-103.86042278	1855.202						
5190	WELD	19,097.9	5190	0.0	41.3	48.02713181	-103.86028490	1854.947						
5200	WELD	19,139.2	5200	0.0	41.3	48.02706695	-103.86014773	1855.288						
5210	WELD	19,180.5	5210	0.0	41.4	48.02700239	-103.86000986	1855.228						
5220	WELD	19,221.9	5220	0.0	41.3	48.02693804	-103.85987172	1855.190						
5230	WELD	19,263.2	5230	0.0	41.4	48.02687334	-103.85973414	1855.032						
5240	WELD	19,304.6	5240	0.0	41.4	48.02680763	-103.85959711	1855.324						
5250	WELD	19,346.0	5250	0.0	41.2	48.02674200	-103.85946024	1855.614						
5260	WELD	19,387.2	5260	0.0	41.1	48.02667687	-103.85932294	1855.564						
5270	WELD	19,428.3	5270	0.0	41.1	48.02661199	-103.85918605	1855.780						
5280	WELD	19,469.4	5280	0.0	42.0	48.02654722	-103.85904906	1855.925						
5290	WELD	19,511.4	5290	0.0	41.6	48.02648114	-103.85890923	1856.023						
5300	WELD	19,553.0	5300	0.0	41.3	48.02641505	-103.85877200	1856.204						
5310	WELD	19,594.3	5310	0.0	41.2	48.02634952	-103.85863543	1856.241						
5320	WELD	19,635.5	5320	0.0	41.3	48.02628346	-103.85849930	1856.161						
5330	WELD	19,676.8	5330	0.0	41.3	48.02621684	-103.85836329	1856.183						
5340	WELD	19,718.1	5340	0.0	41.2	48.02614988	-103.85822782	1856.563						
5350	WELD	19,759.3	5350	0.0	41.2	48.02608212	-103.85809355	1856.424						
5360	WELD	19,800.5	5360	0.0	41.2	48.02601421	-103.85795948	1857.091						
5370	WELD	19,841.7	5370	0.0	20.6	48.02594882	-103.85782259	1857.237						
11000014	WT CHANGE	19,862.2	5370	0.0	0.1	48.02591718	-103.85775384	1857.187			0.322	52000	0.72	
5380	WELD	19,862.3	5380	0.0	42.0	48.02591707	-103.85775358	1857.188						
5390	WELD	19,904.3	5390	0.0	42.3	48.02585356	-103.85761056	1857.205						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
5400	WELD	19,946.5	5400	0.0	42.3	48.02578877	-103.85746826	1854.681							
5410	WELD	19,988.8	5410	0.0	42.3	48.02572316	-103.85732669	1852.088							
5420	WELD	20,031.1	5420	0.0	42.3	48.02565712	-103.85718584	1849.554							
5430	WELD	20,073.3	5430	0.0	42.3	48.02559112	-103.85704478	1847.924							
5440	WELD	20,115.6	5440	0.0	42.3	48.02552589	-103.85690294	1847.836							
5450	WELD	20,157.9	5450	0.0	42.3	48.02546049	-103.85676115	1848.863							
5460	WELD	20,200.2	5460	0.0	42.3	48.02539463	-103.85662003	1851.274							
5470	WELD	20,242.5	5470	0.0	42.3	48.02533028	-103.85647788	1854.167							
5480	WELD	20,284.8	5480	0.0	42.3	48.02527184	-103.85632989	1856.494							
5490	WELD	20,327.1	5490	0.0	42.2	48.02522093	-103.85617557	1857.329							
5500	WELD	20,369.3	5500	0.0	42.3	48.02517440	-103.85601808	1857.663							
5510	WELD	20,411.6	5510	0.0	16.6	48.02512916	-103.85585962	1858.318							
5520	WELD	20,428.2	5520	0.0	6.2	48.02511173	-103.85579698	1858.568							
5530	WELD	20,434.4	5530	0.0	0.6	48.02510518	-103.85577370	1858.705							
10000038	Bend left - 15 deg., 3D	20,434.7	5530	0.0	0.5	48.02510491	-103.85577258	1858.710	0	12:00					
5540	WELD	20,435.0	5540	0.0	9.9	48.02510472	-103.85577142	1858.708							
11000015	WT CHANGE	20,444.9	5540	0.0	0.1	48.02510079	-103.85573114	1858.537				0.188	52000	0.72	
5550	WELD	20,444.9	5550	0.0	38.7	48.02510077	-103.85573082	1858.535							
5560	WELD	20,483.7	5560	0.0	41.2	48.02508792	-103.85557359	1858.416							
5570	WELD	20,524.8	5570	0.0	41.5	48.02507495	-103.85540622	1858.234							
5580	WELD	20,566.4	5580	0.0	41.3	48.02506261	-103.85523786	1858.156							
5590	WELD	20,607.7	5590	0.0	41.2	48.02505128	-103.85507031	1858.073							
5600	WELD	20,648.9	5600	0.0	41.3	48.02504304	-103.85490326	1857.689							
5610	WELD	20,690.1	5610	0.0	41.2	48.02503715	-103.85473554	1857.284							
5620	WELD	20,731.3	5620	0.0	41.4	48.02503257	-103.85456808	1856.819							
5630	WELD	20,772.7	5630	0.0	41.2	48.02502936	-103.85439956	1856.657							
5640	WELD	20,813.8	5640	0.0	41.3	48.02502760	-103.85423186	1856.381							
5650	WELD	20,855.1	5650	0.0	41.3	48.02502688	-103.85406387	1856.054							
5660	WELD	20,896.4	5660	0.0	41.3	48.02502619	-103.85389584	1855.592							
5670	WELD	20,937.7	5670	0.0	41.2	48.02502511	-103.85372795	1855.285							
5680	WELD	20,978.9	5680	0.0	41.2	48.02502337	-103.85356072	1854.892							
5690	WELD	21,020.1	5690	0.0	41.2	48.02502143	-103.85339305	1854.603							
5700	WELD	21,061.3	5700	0.0	41.2	48.02501911	-103.85322528	1854.427							
5710	WELD	21,102.5	5710	0.0	41.2	48.02501840	-103.85305776	1854.170							
5720	WELD	21,143.7	5720	0.0	41.4	48.02501922	-103.85289048	1853.750							
5730	WELD	21,185.1	5730	0.0	41.4	48.02502084	-103.85272238	1853.593							
5740	WELD	21,226.5	5740	0.0	36.0	48.02501908	-103.85255456	1853.500							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11000016	WT CHANGE	21,262.4	5740	0.0	0.1	48.02501201	-103.85241034	1850.825			0.322	52000	0.72	
5750	WELD	21,262.4	5750	0.0	42.0	48.02501198	-103.85240998	1850.816						
5760	WELD	21,304.5	5760	0.0	42.3	48.02500668	-103.85223966	1848.626						
11000017	WT CHANGE	21,346.7	5760	0.0	0.1	48.02500438	-103.85206858	1851.477			0.188	52000	0.72	
5770	WELD	21,346.8	5770	0.0	36.6	48.02500437	-103.85206827	1851.481						
5780	WELD	21,383.4	5780	0.0	41.4	48.02500266	-103.85192000	1852.213						
5790	WELD	21,424.8	5790	0.0	41.2	48.02500284	-103.85175198	1851.742						
5800	WELD	21,466.0	5800	0.0	41.5	48.02500340	-103.85158461	1851.686						
5810	WELD	21,507.4	5810	0.0	41.3	48.02500172	-103.85141594	1852.047						
5820	WELD	21,548.8	5820	0.0	41.5	48.02499970	-103.85124797	1852.058						
5830	WELD	21,590.3	5830	0.0	41.3	48.02499790	-103.85107927	1852.148						
5840	WELD	21,631.5	5840	0.0	40.1	48.02499652	-103.85091128	1851.987						
5850	WELD	21,671.6	5850	0.0	35.8	48.02499648	-103.85074816	1851.638						
5860	WELD	21,707.4	5860	0.0	41.3	48.02499621	-103.85060254	1851.945						
5870	WELD	21,748.7	5870	0.0	41.3	48.02499447	-103.85043443	1852.267						
5880	WELD	21,790.0	5880	0.0	41.5	48.02499236	-103.85026641	1851.903						
5890	WELD	21,831.5	5890	0.0	41.2	48.02499077	-103.85009749	1852.029						
5900	WELD	21,872.8	5900	0.0	41.3	48.02498951	-103.84992995	1852.335						
5910	WELD	21,914.1	5910	0.0	41.2	48.02498872	-103.84976177	1852.490						
5920	WELD	21,955.3	5920	0.0	41.3	48.02498919	-103.84959404	1852.443						
5930	WELD	21,996.5	5930	0.0	31.1	48.02499016	-103.84942617	1852.176						
11000018	WT CHANGE	22,027.6	5930	0.0	0.1	48.02498975	-103.84930023	1851.555			0.322	52000	0.72	
5940	WELD	22,027.6	5940	0.0	42.2	48.02498975	-103.84929986	1851.556						
5950	WELD	22,069.8	5950	0.0	42.3	48.02498805	-103.84912821	1851.289						
5960	WELD	22,112.1	5960	0.0	42.2	48.02498602	-103.84895640	1851.748						
10000039	AGM 040, Sta. 219+94, Drive Way -- Han #8740	22,132.7	5960	20.7	21.5	48.02498494	-103.84887271	1852.490						
11000019	WT CHANGE	22,154.2	5960	0.0	0.1	48.02498391	-103.84878561	1853.032			0.188	52000	0.72	
5970	WELD	22,154.3	5970	0.0	38.5	48.02498390	-103.84878525	1853.034						
5980	WELD	22,192.8	5980	0.0	41.4	48.02498135	-103.84862893	1853.111						
5990	WELD	22,234.1	5990	0.0	41.6	48.02497705	-103.84846109	1852.205						
6000	WELD	22,275.7	6000	0.0	41.3	48.02497439	-103.84829231	1852.220						
6010	WELD	22,317.1	6010	0.0	41.3	48.02497197	-103.84812461	1852.333						
6020	WELD	22,358.4	6020	0.0	41.3	48.02497065	-103.84795672	1852.593						
6030	WELD	22,399.7	6030	0.0	41.4	48.02496905	-103.84778910	1852.728						
6040	WELD	22,441.0	6040	0.0	41.3	48.02496690	-103.84762129	1852.216						
6050	WELD	22,482.3	6050	0.0	41.4	48.02496495	-103.84745373	1852.250						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
6060	WELD	22,523.7	6060	0.0	41.3	48.02496286	-103.84728537	1852.647							
6070	WELD	22,565.0	6070	0.0	39.9	48.02496172	-103.84711732	1852.410							
6080	WELD	22,604.9	6080	0.0	41.3	48.02496127	-103.84695512	1852.124							
6090	WELD	22,646.2	6090	0.0	41.3	48.02495988	-103.84678695	1852.069							
6100	WELD	22,687.5	6100	0.0	40.4	48.02495863	-103.84661886	1852.175							
6110	WELD	22,727.9	6110	0.0	41.2	48.02495794	-103.84645434	1852.104							
6120	WELD	22,769.2	6120	0.0	41.3	48.02495725	-103.84628609	1852.084							
6130	WELD	22,810.5	6130	0.0	41.3	48.02495691	-103.84611815	1851.999							
6140	WELD	22,851.8	6140	0.0	41.1	48.02495303	-103.84595016	1852.529							
6150	WELD	22,892.9	6150	0.0	41.2	48.02494795	-103.84578289	1851.836							
6160	WELD	22,934.0	6160	0.0	41.1	48.02494482	-103.84561531	1851.498							
6170	WELD	22,975.1	6170	0.0	41.0	48.02494296	-103.84544781	1851.356							
6180	WELD	23,016.2	6180	0.0	41.3	48.02494273	-103.84528033	1851.387							
6190	WELD	23,057.5	6190	0.0	41.3	48.02494293	-103.84511249	1851.121							
6200	WELD	23,098.8	6200	0.0	41.3	48.02494325	-103.84494430	1850.392							
6210	WELD	23,140.1	6210	0.0	41.1	48.02494195	-103.84477615	1850.413							
6220	WELD	23,181.2	6220	0.0	41.6	48.02494025	-103.84460880	1850.560							
6230	WELD	23,222.8	6230	0.0	41.3	48.02493876	-103.84444001	1850.521							
6240	WELD	23,264.1	6240	0.0	41.8	48.02493693	-103.84427217	1850.251							
6250	WELD	23,305.9	6250	0.0	41.4	48.02493615	-103.84410262	1850.650							
6260	WELD	23,347.3	6260	0.0	41.3	48.02493558	-103.84393430	1850.670							
6270	WELD	23,388.7	6270	0.0	41.4	48.02493626	-103.84376632	1851.069							
6280	WELD	23,430.0	6280	0.0	41.4	48.02493567	-103.84359836	1851.138							
6290	WELD	23,471.4	6290	0.0	41.4	48.02493307	-103.84343035	1850.902							
6300	WELD	23,512.8	6300	0.0	41.4	48.02493052	-103.84326236	1851.046							
6310	WELD	23,554.2	6310	0.0	41.4	48.02492851	-103.84309416	1851.285							
6320	WELD	23,595.6	6320	0.0	41.2	48.02492801	-103.84292584	1851.613							
6330	WELD	23,636.9	6330	0.0	41.1	48.02492990	-103.84275827	1851.486							
6340	WELD	23,678.0	6340	0.0	41.5	48.02493081	-103.84259079	1851.772							
6350	WELD	23,719.5	6350	0.0	41.5	48.02492760	-103.84242194	1851.669							
6360	WELD	23,761.0	6360	0.0	37.8	48.02492120	-103.84225316	1851.583							
6370	WELD	23,798.8	6370	0.0	9.5	48.02491553	-103.84209992	1852.326							
11000020	WT CHANGE	23,798.9	6370	0.0	9.4	48.02491552	-103.84209965	1852.330				0.322	52000	0.72	
10000040	Bend right - 90 deg., 6D	23,803.3	6370	1.2	8.3	48.02491207	-103.84208300	1852.470	0	12:00					
6380	WELD	23,808.3	6380	0.0	20.4	48.02489965	-103.84207829	1852.314							
6390	WELD	23,828.7	6390	0.0	42.2	48.02484444	-103.84208195	1850.825							
6400	WELD	23,870.9	6400	0.0	42.2	48.02472982	-103.84208918	1846.839							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
6410	WELD	23,913.0	6410	0.0	42.2	48.02461487	-103.84209156	1843.962							
6420	WELD	23,955.2	6420	0.0	42.2	48.02449983	-103.84208428	1841.986							
6430	WELD	23,997.4	6430	0.0	42.2	48.02438460	-103.84207798	1840.843							
6440	WELD	24,039.6	6440	0.0	42.1	48.02426932	-103.84207660	1841.660							
6450	WELD	24,081.7	6450	0.0	42.2	48.02415432	-103.84207850	1844.695							
6460	WELD	24,123.9	6460	0.0	3.1	48.02403971	-103.84208372	1849.293							
6470	WELD	24,127.0	6470	0.0	9.3	48.02403119	-103.84208407	1849.658							
10000041	Bend left - 90 deg., 6D	24,131.7	6470	1.5	7.9	48.02401923	-103.84207967	1850.244	0	12:00					
11000021	WT CHANGE	24,136.3	6470	0.0	0.1	48.02401548	-103.84206246	1850.548				0.188	52000	0.72	
6480	WELD	24,136.4	6480	0.0	21.4	48.02401548	-103.84206211	1850.551							
11000022	WT CHANGE	24,157.7	6480	0.0	0.1	48.02401386	-103.84197492	1851.305				0.322	52000	0.72	
6490	WELD	24,157.7	6490	0.0	42.1	48.02401386	-103.84197460	1851.306							
40000001	Metal Loss - EXTERNAL	24,171.1	6490	13.3	28.8	48.02401258	-103.84192018	1851.282	355	11:45	16%	0.63	0.50	3014	100%
40000002	Metal Loss - EXTERNAL	24,171.8	6490	14.1	28.0	48.02401251	-103.84191710	1851.275	350	11:30	12%	0.70	0.38	3014	100%
6500	WELD	24,199.9	6500	0.0	42.2	48.02400987	-103.84180295	1850.357							
6510	WELD	24,242.1	6510	0.0	42.2	48.02400219	-103.84163257	1845.581							
6520	WELD	24,284.3	6520	0.0	42.2	48.02399929	-103.84146091	1846.032							
6530	WELD	24,326.5	6530	0.0	42.1	48.02399828	-103.84128945	1848.787							
11000023	WT CHANGE	24,368.5	6530	0.0	0.1	48.02399270	-103.84111911	1851.274				0.188	52000	0.72	
6540	WELD	24,368.6	6540	0.0	19.8	48.02399269	-103.84111875	1851.275							
6550	WELD	24,388.5	6550	0.0	41.2	48.02398889	-103.84103821	1851.646							
6560	WELD	24,429.7	6560	0.0	41.4	48.02398462	-103.84087105	1853.313							
6570	WELD	24,471.1	6570	0.0	41.3	48.02398640	-103.84070315	1852.558							
6580	WELD	24,512.4	6580	0.0	41.4	48.02399147	-103.84053555	1851.974							
6590	WELD	24,553.8	6590	0.0	41.4	48.02399443	-103.84036744	1852.289							
6600	WELD	24,595.2	6600	0.0	41.4	48.02399338	-103.84019965	1852.569							
6610	WELD	24,636.6	6610	0.0	41.4	48.02399120	-103.84003166	1852.091							
6620	WELD	24,678.0	6620	0.0	41.3	48.02398821	-103.83986368	1852.099							
6630	WELD	24,719.3	6630	0.0	41.4	48.02398517	-103.83969582	1852.107							
6640	WELD	24,760.7	6640	0.0	41.3	48.02398272	-103.83952780	1852.190							
6650	WELD	24,802.0	6650	0.0	40.5	48.02398006	-103.83935996	1852.633							
6660	WELD	24,842.4	6660	0.0	41.5	48.02397769	-103.83919525	1853.072							
6670	WELD	24,883.9	6670	0.0	41.3	48.02397402	-103.83902624	1852.529							
6680	WELD	24,925.2	6680	0.0	41.3	48.02397009	-103.83885839	1852.677							
6690	WELD	24,966.5	6690	0.0	41.4	48.02396760	-103.83869043	1851.979							
6700	WELD	25,007.9	6700	0.0	41.2	48.02396725	-103.83852228	1851.916							
6710	WELD	25,049.1	6710	0.0	41.2	48.02396776	-103.83835463	1852.040							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
6720	WELD	25,090.3	6720	0.0	41.2	48.02396689	-103.83818705	1852.406						
6730	WELD	25,131.5	6730	0.0	41.2	48.02397148	-103.83801962	1852.551						
6740	WELD	25,172.6	6740	0.0	15.6	48.02398067	-103.83785267	1852.689						
11000024	WT CHANGE	25,188.2	6740	0.0	0.1	48.02398424	-103.83778993	1852.531			0.322	52000	0.72	
6750	WELD	25,188.3	6750	0.0	30.6	48.02398426	-103.83778958	1852.531						
6760	WELD	25,218.8	6760	0.0	42.2	48.02399000	-103.83766531	1850.972						
6770	WELD	25,261.1	6770	0.0	42.2	48.02399603	-103.83749592	1844.464						
6780	WELD	25,303.2	6780	0.0	42.2	48.02399439	-103.83732509	1840.111						
6790	WELD	25,345.4	6790	0.0	42.2	48.02398505	-103.83715371	1840.034						
6800	WELD	25,387.7	6800	0.0	42.0	48.02397762	-103.83698312	1844.693						
6810	WELD	25,429.7	6810	0.0	41.9	48.02397231	-103.83681397	1850.824						
11000025	WT CHANGE	25,471.5	6810	0.0	0.1	48.02397201	-103.83664418	1853.309			0.188	52000	0.72	
6820	WELD	25,471.6	6820	0.0	21.9	48.02397201	-103.83664383	1853.310						
6830	WELD	25,493.5	6830	0.0	41.0	48.02397104	-103.83655495	1853.410						
6840	WELD	25,534.5	6840	0.0	41.4	48.02396712	-103.83638870	1853.023						
6850	WELD	25,576.0	6850	0.0	41.4	48.02395815	-103.83622109	1853.186						
6860	WELD	25,617.4	6860	0.0	41.3	48.02395216	-103.83605323	1853.449						
6870	WELD	25,658.6	6870	0.0	41.3	48.02395120	-103.83588568	1853.563						
6880	WELD	25,699.9	6880	0.0	41.2	48.02395187	-103.83571832	1853.039						
6890	WELD	25,741.1	6890	0.0	41.4	48.02395322	-103.83555134	1852.684						
6900	WELD	25,782.5	6900	0.0	41.4	48.02395546	-103.83538363	1852.445						
6910	WELD	25,824.0	6910	0.0	41.3	48.02395711	-103.83521533	1852.405						
6920	WELD	25,865.3	6920	0.0	41.3	48.02395808	-103.83504772	1852.610						
6930	WELD	25,906.6	6930	0.0	41.3	48.02395776	-103.83487998	1852.655						
6940	WELD	25,947.8	6940	0.0	41.1	48.02395614	-103.83471206	1852.362						
6950	WELD	25,989.0	6950	0.0	41.2	48.02395442	-103.83454429	1852.339						
6960	WELD	26,030.2	6960	0.0	41.2	48.02395318	-103.83437675	1852.210						
6970	WELD	26,071.4	6970	0.0	41.2	48.02395281	-103.83420917	1852.134						
6980	WELD	26,112.7	6980	0.0	41.1	48.02395171	-103.83404102	1851.545						
6990	WELD	26,153.8	6990	0.0	41.1	48.02395089	-103.83387336	1851.843						
7000	WELD	26,194.9	7000	0.0	41.1	48.02394788	-103.83370626	1851.746						
7010	WELD	26,236.0	7010	0.0	41.1	48.02394627	-103.83353898	1851.369						
7020	WELD	26,277.1	7020	0.0	41.3	48.02394535	-103.83337169	1851.432						
7030	WELD	26,318.4	7030	0.0	41.1	48.02394544	-103.83320332	1851.424						
7040	WELD	26,359.5	7040	0.0	41.2	48.02394463	-103.83303601	1851.329						
7050	WELD	26,400.7	7050	0.0	41.1	48.02394540	-103.83286823	1851.019						
7060	WELD	26,441.8	7060	0.0	41.4	48.02394615	-103.83270070	1851.055						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7070	WELD	26,483.2	7070	0.0	41.2	48.02394625	-103.83253198	1850.928							
7080	WELD	26,524.4	7080	0.0	41.3	48.02394555	-103.83236417	1850.865							
7090	WELD	26,565.7	7090	0.0	32.2	48.02394194	-103.83219649	1851.022							
7100	WELD	26,598.0	7100	0.0	6.2	48.02393780	-103.83206574	1851.188							
11000026	WT CHANGE	26,598.0	7100	0.0	6.1	48.02393779	-103.83206541	1851.188				0.322	52000	0.72	
7110	WELD	26,604.1	7110	0.0	6.1	48.02393709	-103.83204046	1851.145							
10000042	Bend right - 65 deg., 5D	26,606.4	7110	0.2	5.9	48.02393515	-103.83203183	1851.093	0	12:00					
7120	WELD	26,610.2	7120	0.0	10.3	48.02392677	-103.83202320	1851.069							
11000027	WT CHANGE	26,620.4	7120	0.0	0.1	48.02390157	-103.83200536	1850.983				0.188	52000	0.72	
7130	WELD	26,620.5	7130	0.0	35.7	48.02390133	-103.83200520	1850.981							
7140	WELD	26,656.2	7140	0.0	41.3	48.02381282	-103.83194392	1850.636							
7150	WELD	26,697.5	7150	0.0	41.4	48.02371003	-103.83187566	1850.217							
7160	WELD	26,738.9	7160	0.0	41.4	48.02360601	-103.83181100	1850.535							
7170	WELD	26,780.3	7170	0.0	41.7	48.02350195	-103.83174702	1850.453							
7180	WELD	26,822.0	7180	0.0	41.4	48.02339698	-103.83168256	1850.275							
7190	WELD	26,863.3	7190	0.0	41.4	48.02329238	-103.83162041	1850.335							
7200	WELD	26,904.7	7200	0.0	41.4	48.02318797	-103.83155706	1850.478							
7210	WELD	26,946.1	7210	0.0	41.4	48.02308421	-103.83149133	1850.282							
7220	WELD	26,987.4	7220	0.0	41.4	48.02297997	-103.83142700	1850.039							
7230	WELD	27,028.8	7230	0.0	41.3	48.02287663	-103.83135962	1849.899							
7240	WELD	27,070.1	7240	0.0	41.2	48.02277536	-103.83128602	1850.655							
7250	WELD	27,111.2	7250	0.0	41.3	48.02267728	-103.83120421	1850.422							
7260	WELD	27,152.6	7260	0.0	41.3	48.02258526	-103.83110723	1850.033							
7270	WELD	27,193.9	7270	0.0	41.4	48.02250621	-103.83098782	1849.399							
7280	WELD	27,235.3	7280	0.0	41.3	48.02244190	-103.83084986	1849.364							
7290	WELD	27,276.6	7290	0.0	41.1	48.02239009	-103.83070045	1849.380							
7300	WELD	27,317.7	7300	0.0	41.2	48.02234828	-103.83054493	1849.489							
7310	WELD	27,358.9	7310	0.0	41.2	48.02231206	-103.83038637	1849.408							
7320	WELD	27,400.1	7320	0.0	41.2	48.02227871	-103.83022605	1849.622							
7330	WELD	27,441.4	7330	0.0	41.1	48.02224654	-103.83006503	1849.435							
7340	WELD	27,482.4	7340	0.0	41.1	48.02221395	-103.82990512	1849.573							
7350	WELD	27,523.5	7350	0.0	41.3	48.02218219	-103.82974501	1849.851							
7360	WELD	27,564.8	7360	0.0	41.1	48.02215135	-103.82958346	1850.011							
7370	WELD	27,605.9	7370	0.0	41.3	48.02212173	-103.82942218	1849.918							
7380	WELD	27,647.2	7380	0.0	41.2	48.02209140	-103.82926048	1850.113							
7390	WELD	27,688.4	7390	0.0	41.3	48.02206001	-103.82909983	1849.824							
7400	WELD	27,729.7	7400	0.0	41.3	48.02202646	-103.82893957	1849.308							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7410	WELD	27,771.0	7410	0.0	41.3	48.02198621	-103.82878323	1849.301							
7420	WELD	27,812.3	7420	0.0	41.3	48.02193590	-103.82863311	1849.399							
7430	WELD	27,853.6	7430	0.0	41.3	48.02187809	-103.82848962	1849.331							
7440	WELD	27,894.9	7440	0.0	41.3	48.02181594	-103.82835008	1849.198							
7450	WELD	27,936.2	7450	0.0	41.5	48.02175141	-103.82821291	1849.568							
7460	WELD	27,977.6	7460	0.0	41.4	48.02168606	-103.82807564	1849.619							
7470	WELD	28,019.0	7470	0.0	41.2	48.02162192	-103.82793767	1849.483							
40000003	Metal Loss - INTERNAL	28,035.9	7470	16.9	24.3	48.02159609	-103.82788087	1849.398	220	7:15	18%	1.10	1.78	1760	100%
40000004	Metal Loss - INTERNAL	28,036.1	7470	17.0	24.2	48.02159588	-103.82788040	1849.397	140	4:30	20%	1.02	1.06	1760	100%
40000005	Metal Loss - INTERNAL	28,036.3	7470	17.2	23.9	48.02159556	-103.82787968	1849.396	170	5:30	22%	0.62	0.88	1760	100%
40000006	Metal Loss - EXTERNAL	28,036.3	7470	17.2	23.9	48.02159553	-103.82787962	1849.396	205	6:45	12%	0.51	0.33	1760	100%
40000007	Metal Loss - INTERNAL	28,039.0	7470	20.0	21.2	48.02159136	-103.82787051	1849.377	204	6:45	27%	0.74	0.70	1760	100%
40000008	Metal Loss - INTERNAL	28,054.7	7470	35.6	5.5	48.02156727	-103.82781798	1849.189	359	11:45	49%	0.88	0.69	1760	100%
7480	WELD	28,060.2	7480	0.0	41.3	48.02155887	-103.82779951	1849.139							
7490	WELD	28,101.4	7490	0.0	41.2	48.02149617	-103.82766026	1848.873							
7500	WELD	28,142.7	7500	0.0	41.3	48.02143408	-103.82752026	1848.609							
7510	WELD	28,184.0	7510	0.0	41.1	48.02137250	-103.82737942	1848.686							
7520	WELD	28,225.1	7520	0.0	41.5	48.02131217	-103.82723811	1848.834							
7530	WELD	28,266.6	7530	0.0	41.3	48.02125257	-103.82709454	1848.913							
7540	WELD	28,307.9	7540	0.0	41.2	48.02119363	-103.82695144	1848.872							
7550	WELD	28,349.1	7550	0.0	41.3	48.02113425	-103.82680936	1848.897							
7560	WELD	28,390.4	7560	0.0	41.2	48.02107364	-103.82666732	1849.094							
7570	WELD	28,431.6	7570	0.0	41.2	48.02101226	-103.82652619	1849.105							
7580	WELD	28,472.8	7580	0.0	41.8	48.02095134	-103.82638464	1849.334							
7590	WELD	28,514.6	7590	0.0	41.2	48.02088878	-103.82624207	1849.259							
7600	WELD	28,555.8	7600	0.0	40.4	48.02082613	-103.82610267	1849.229							
7610	WELD	28,596.1	7610	0.0	41.4	48.02076449	-103.82596629	1849.190							
7620	WELD	28,637.5	7620	0.0	41.2	48.02070096	-103.82582663	1849.416							
7630	WELD	28,678.7	7630	0.0	38.1	48.02063799	-103.82568785	1849.280							
7640	WELD	28,716.8	7640	0.0	23.2	48.02058095	-103.82555819	1849.492							
11000028	WT CHANGE	28,740.0	7640	0.0	0.1	48.02054940	-103.82547672	1849.861				0.322	52000	0.72	
7650	WELD	28,740.1	7650	0.0	42.1	48.02054928	-103.82547640	1849.862							
7660	WELD	28,782.2	7660	0.0	42.3	48.02050212	-103.82532093	1846.512							
7670	WELD	28,824.4	7670	0.0	42.3	48.02045886	-103.82516178	1846.271							
11000029	WT CHANGE	28,866.6	7670	0.0	0.1	48.02041861	-103.82500141	1848.912				0.188	52000	0.72	
7680	WELD	28,866.7	7680	0.0	11.8	48.02041852	-103.82500104	1848.913							
7690	WELD	28,878.5	7690	0.0	41.1	48.02040767	-103.82495588	1849.024							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
7700	WELD	28,919.6	7700	0.0	41.2	48.02036913	-103.82479952	1849.007							
7710	WELD	28,960.9	7710	0.0	41.3	48.02032698	-103.82464461	1848.945							
7720	WELD	29,002.1	7720	0.0	41.3	48.02028183	-103.82449133	1848.718							
7730	WELD	29,043.4	7730	0.0	41.2	48.02023745	-103.82433723	1848.962							
7740	WELD	29,084.6	7740	0.0	41.3	48.02019558	-103.82418203	1848.857							
7750	WELD	29,125.9	7750	0.0	41.2	48.02015390	-103.82402648	1849.028							
7760	WELD	29,167.1	7760	0.0	41.3	48.02011166	-103.82387116	1848.982							
7770	WELD	29,208.4	7770	0.0	41.2	48.02006894	-103.82371605	1848.819							
7780	WELD	29,249.6	7780	0.0	41.2	48.02002569	-103.82356145	1849.209							
7790	WELD	29,290.8	7790	0.0	41.2	48.01998218	-103.82340703	1848.717							
7800	WELD	29,332.0	7800	0.0	41.3	48.01993871	-103.82325251	1849.017							
7810	WELD	29,373.3	7810	0.0	41.4	48.01989451	-103.82309799	1848.762							
7820	WELD	29,414.7	7820	0.0	41.3	48.01985040	-103.82294242	1848.704							
7830	WELD	29,456.0	7830	0.0	41.2	48.01980735	-103.82278704	1848.730							
7840	WELD	29,497.2	7840	0.0	41.3	48.01976571	-103.82263146	1848.590							
7850	WELD	29,538.6	7850	0.0	42.1	48.01972341	-103.82247521	1848.996							
7860	WELD	29,580.7	7860	0.0	41.3	48.01968058	-103.82231581	1848.783							
7870	WELD	29,621.9	7870	0.0	41.3	48.01963836	-103.82215963	1848.879							
7880	WELD	29,663.2	7880	0.0	41.3	48.01959613	-103.82200371	1848.826							
7890	WELD	29,704.5	7890	0.0	41.7	48.01955302	-103.82184817	1848.636							
7900	WELD	29,746.2	7900	0.0	44.2	48.01950977	-103.82169137	1848.927							
7910	WELD	29,790.4	7910	0.0	41.1	48.01946401	-103.82152454	1848.804							
7920	WELD	29,831.5	7920	0.0	41.4	48.01942160	-103.82136925	1849.154							
7930	WELD	29,872.9	7930	0.0	41.2	48.01937977	-103.82121263	1849.371							
7940	WELD	29,914.1	7940	0.0	41.3	48.01933909	-103.82105597	1849.410							
7950	WELD	29,955.4	7950	0.0	41.3	48.01929777	-103.82089947	1849.469							
7960	WELD	29,996.7	7960	0.0	41.2	48.01925562	-103.82074337	1849.301							
7970	WELD	30,037.9	7970	0.0	41.2	48.01921214	-103.82058824	1849.550							
7980	WELD	30,079.1	7980	0.0	41.3	48.01916995	-103.82043261	1849.829							
7990	WELD	30,120.4	7990	0.0	40.4	48.01912948	-103.82027575	1849.634							
40000009	Metal Loss - EXTERNAL	30,137.0	7990	16.7	23.7	48.01911380	-103.82021209	1849.606	13	12:15	13%	0.69	0.40	1760	100%
40000010	Metal Loss - EXTERNAL	30,142.0	7990	21.6	18.8	48.01910923	-103.82019321	1849.603	47	1:30	11%	0.69	0.59	1760	100%
8000	WELD	30,160.7	8000	0.0	41.6	48.01909179	-103.82012135	1849.587							
8010	WELD	30,202.3	8010	0.0	44.4	48.01905380	-103.81996192	1849.153							
8020	WELD	30,246.7	8020	0.0	41.4	48.01901322	-103.81979214	1849.495							
8030	WELD	30,288.0	8030	0.0	41.3	48.01896679	-103.81963906	1849.528							
8040	WELD	30,329.4	8040	0.0	41.3	48.01891836	-103.81948748	1849.802							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
8050	WELD	30,370.7	8050	0.0	35.1	48.01887653	-103.81933156	1849.302							
11000030	WT CHANGE	30,405.8	8050	0.0	0.1	48.01884445	-103.81919768	1847.971				0.322	52000	0.72	
8060	WELD	30,405.9	8060	0.0	42.2	48.01884435	-103.81919727	1847.965							
8070	WELD	30,448.1	8070	0.0	42.3	48.01880856	-103.81903453	1844.281							
8080	WELD	30,490.4	8080	0.0	42.3	48.01879523	-103.81886385	1843.663							
8090	WELD	30,532.6	8090	0.0	42.0	48.01878579	-103.81869268	1846.442							
11000031	WT CHANGE	30,574.6	8090	0.0	0.1	48.01877472	-103.81852319	1848.967				0.188	52000	0.72	
8100	WELD	30,574.6	8100	0.0	23.2	48.01877470	-103.81852287	1848.967							
10000043	AGM 050, Sta. 304+14, 145th Ave NW -- Survey Point	30,590.9	8100	16.3	6.9	48.01877027	-103.81845672	1848.981							
8110	WELD	30,597.8	8110	0.0	40.8	48.01876841	-103.81842882	1848.970							
13000002	GAIN	30,635.9	8110	38.0	2.8	48.01875781	-103.81827506	1848.697	256	8:30					
8120	WELD	30,638.6	8120	0.0	9.5	48.01875704	-103.81826388	1848.681							
10000044	Bend left - 90 deg., 6D	30,643.3	8120	1.5	8.0	48.01875924	-103.81824596	1848.673	0	12:00					
8130	WELD	30,648.1	8130	0.0	18.9	48.01877092	-103.81823900	1848.901							
8140	WELD	30,667.0	8140	0.0	40.7	48.01882249	-103.81823090	1849.906							
8150	WELD	30,707.8	8150	0.0	40.7	48.01893275	-103.81821024	1850.323							
8160	WELD	30,748.4	8160	0.0	41.3	48.01904193	-103.81818165	1850.420							
8170	WELD	30,789.8	8170	0.0	41.3	48.01915156	-103.81814178	1850.003							
8180	WELD	30,831.0	8180	0.0	41.2	48.01925996	-103.81809635	1849.852							
8190	WELD	30,872.3	8190	0.0	41.5	48.01936835	-103.81805037	1849.947							
8200	WELD	30,913.7	8200	0.0	40.3	48.01947780	-103.81800572	1850.190							
8210	WELD	30,954.1	8210	0.0	41.5	48.01958431	-103.81796218	1850.189							
8220	WELD	30,995.6	8220	0.0	41.3	48.01969372	-103.81791674	1849.779							
8230	WELD	31,036.8	8230	0.0	41.5	48.01980252	-103.81787188	1849.948							
8240	WELD	31,078.3	8240	0.0	40.1	48.01991192	-103.81782671	1850.187							
8250	WELD	31,118.5	8250	0.0	41.4	48.02001756	-103.81778189	1850.117							
8260	WELD	31,159.8	8260	0.0	41.2	48.02012609	-103.81773498	1850.279							
8270	WELD	31,201.0	8270	0.0	41.3	48.02023416	-103.81768805	1850.406							
8280	WELD	31,242.3	8280	0.0	41.2	48.02034226	-103.81764099	1850.403							
8290	WELD	31,283.5	8290	0.0	41.3	48.02045034	-103.81759368	1850.569							
8300	WELD	31,324.8	8300	0.0	41.2	48.02055820	-103.81754533	1850.535							
8310	WELD	31,366.0	8310	0.0	41.4	48.02066570	-103.81749671	1850.453							
8320	WELD	31,407.4	8320	0.0	41.3	48.02077370	-103.81744818	1850.161							
8330	WELD	31,448.7	8330	0.0	41.4	48.02088180	-103.81740026	1850.351							
8340	WELD	31,490.1	8340	0.0	41.5	48.02099001	-103.81735331	1850.499							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
8350	WELD	31,531.6	8350	0.0	41.3	48.02109804	-103.81730564	1850.340							
8360	WELD	31,572.9	8360	0.0	41.4	48.02120573	-103.81725745	1850.046							
8370	WELD	31,614.2	8370	0.0	41.3	48.02131389	-103.81721057	1850.224							
8380	WELD	31,655.6	8380	0.0	41.3	48.02142181	-103.81716305	1850.309							
8390	WELD	31,696.9	8390	0.0	41.4	48.02152987	-103.81711557	1850.402							
8400	WELD	31,738.2	8400	0.0	41.3	48.02163832	-103.81706832	1850.210							
8410	WELD	31,779.5	8410	0.0	41.2	48.02174672	-103.81702145	1850.217							
8420	WELD	31,820.7	8420	0.0	41.2	48.02185528	-103.81697645	1850.711							
8430	WELD	31,861.9	8430	0.0	41.2	48.02196378	-103.81693116	1850.384							
8440	WELD	31,903.1	8440	0.0	40.2	48.02207216	-103.81688508	1850.310							
8450	WELD	31,943.3	8450	0.0	40.0	48.02217775	-103.81683821	1850.376							
8460	WELD	31,983.3	8460	0.0	40.3	48.02228267	-103.81679199	1850.872							
8470	WELD	32,023.6	8470	0.0	41.3	48.02238873	-103.81674722	1850.758							
8480	WELD	32,064.9	8480	0.0	41.3	48.02249737	-103.81670089	1850.908							
8490	WELD	32,106.2	8490	0.0	12.8	48.02260583	-103.81665334	1851.154							
11000032	WT CHANGE	32,119.0	8490	0.0	0.1	48.02263912	-103.81663881	1851.040				0.322	52000	0.72	
8500	WELD	32,119.0	8500	0.0	6.1	48.02263936	-103.81663873	1851.040							
8510	WELD	32,125.2	8510	0.0	1.3	48.02265556	-103.81663186	1851.004							
10000045	Bend right - 35 deg., 3D	32,125.8	8510	0.1	1.2	48.02265705	-103.81663056	1850.990	0	12:00					
8520	WELD	32,126.4	8520	0.0	6.4	48.02265830	-103.81662876	1850.970							
11000033	WT CHANGE	32,132.7	8520	0.0	0.1	48.02266863	-103.81660803	1850.728				0.188	52000	0.72	
8530	WELD	32,132.8	8530	0.0	13.0	48.02266877	-103.81660773	1850.724							
8540	WELD	32,145.8	8540	0.0	40.7	48.02268999	-103.81656499	1850.356							
8550	WELD	32,186.5	8550	0.0	41.0	48.02275673	-103.81643185	1850.179							
8560	WELD	32,227.6	8560	0.0	44.2	48.02282445	-103.81629830	1850.484							
8570	WELD	32,271.8	8570	0.0	44.2	48.02289676	-103.81615406	1850.715							
8580	WELD	32,315.9	8580	0.0	44.2	48.02296888	-103.81600967	1850.944							
8590	WELD	32,360.1	8590	0.0	44.3	48.02304312	-103.81586721	1851.277							
8600	WELD	32,404.4	8600	0.0	44.3	48.02311760	-103.81572482	1851.190							
8610	WELD	32,448.6	8610	0.0	41.3	48.02319282	-103.81558334	1851.162							
8620	WELD	32,489.9	8620	0.0	41.2	48.02326380	-103.81545276	1851.535							
8630	WELD	32,531.2	8630	0.0	41.2	48.02333541	-103.81532274	1851.593							
8640	WELD	32,572.4	8640	0.0	41.2	48.02340721	-103.81519365	1851.791							
8650	WELD	32,613.6	8650	0.0	41.3	48.02348009	-103.81506550	1851.610							
8660	WELD	32,654.9	8660	0.0	41.2	48.02355249	-103.81493684	1851.565							
8670	WELD	32,696.1	8670	0.0	41.6	48.02362447	-103.81480822	1851.497							
8680	WELD	32,737.7	8680	0.0	41.3	48.02369703	-103.81467811	1851.379							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
8690	WELD	32,779.0	8690	0.0	41.4	48.02376918	-103.81454929	1852.156							
8700	WELD	32,820.3	8700	0.0	6.9	48.02384122	-103.81442031	1852.291							
11000034	WT CHANGE	32,827.1	8700	0.0	0.1	48.02385306	-103.81439935	1852.492				0.322	52000	0.72	
8710	WELD	32,827.2	8710	0.0	6.1	48.02385321	-103.81439908	1852.496							
8720	WELD	32,833.3	8720	0.0	1.1	48.02386398	-103.81437991	1852.718							
10000046	Bend right - 35 deg., 3D	32,833.9	8720	0.1	1.0	48.02386464	-103.81437794	1852.723	0	12:00					
8730	WELD	32,834.5	8730	0.0	40.2	48.02386507	-103.81437573	1852.711							
40000011	Metal Loss - EXTERNAL	32,844.9	8730	10.4	29.8	48.02386894	-103.81433388	1852.149	351	11:30	17%	0.74	0.41	3014	100%
8740	WELD	32,874.7	8740	0.0	42.3	48.02387949	-103.81421424	1850.350							
8750	WELD	32,917.0	8750	0.0	42.2	48.02388634	-103.81404257	1850.953							
11000035	WT CHANGE	32,959.2	8750	0.0	0.1	48.02388813	-103.81387117	1850.626				0.188	52000	0.72	
8760	WELD	32,959.3	8760	0.0	22.7	48.02388813	-103.81387085	1850.623							
8770	WELD	32,981.9	8770	0.0	41.5	48.02388786	-103.81377842	1850.788							
8780	WELD	33,023.5	8780	0.0	41.3	48.02388842	-103.81360900	1850.831							
8790	WELD	33,064.7	8790	0.0	41.4	48.02388769	-103.81344082	1850.676							
40000012	Metal Loss - INTERNAL	33,079.2	8790	14.4	27.1	48.02388699	-103.81338193	1850.635	80	2:30	30%	1.01	1.30	1760	100%
8800	WELD	33,106.2	8800	0.0	40.9	48.02388538	-103.81327152	1850.409							
8810	WELD	33,147.1	8810	0.0	41.2	48.02388389	-103.81310456	1849.939							
8820	WELD	33,188.3	8820	0.0	41.4	48.02388252	-103.81293638	1850.478							
8830	WELD	33,229.8	8830	0.0	41.3	48.02388150	-103.81276793	1850.665							
8840	WELD	33,271.0	8840	0.0	41.3	48.02388225	-103.81259988	1851.408							
8850	WELD	33,312.3	8850	0.0	41.8	48.02388397	-103.81243192	1851.237							
8860	WELD	33,354.1	8860	0.0	41.1	48.02388295	-103.81226167	1851.050							
8870	WELD	33,395.1	8870	0.0	41.2	48.02388006	-103.81209436	1851.263							
8880	WELD	33,436.4	8880	0.0	41.1	48.02387816	-103.81192610	1851.171							
8890	WELD	33,477.4	8890	0.0	41.2	48.02387571	-103.81175855	1851.340							
8900	WELD	33,518.6	8900	0.0	41.1	48.02387292	-103.81159063	1851.265							
8910	WELD	33,559.7	8910	0.0	41.2	48.02387047	-103.81142326	1851.554							
8920	WELD	33,600.9	8920	0.0	41.5	48.02386857	-103.81125537	1851.400							
40000013	Metal Loss - INTERNAL	33,628.0	8920	27.1	14.4	48.02386744	-103.81114471	1851.171	150	5:00	11%	1.19	0.79	1760	100%
8930	WELD	33,642.4	8930	0.0	41.3	48.02386674	-103.81108601	1851.228							
8940	WELD	33,683.7	8940	0.0	41.4	48.02386446	-103.81091777	1851.528							
8950	WELD	33,725.1	8950	0.0	41.2	48.02386211	-103.81074898	1851.434							
8960	WELD	33,766.3	8960	0.0	41.3	48.02385907	-103.81058103	1851.276							
8970	WELD	33,807.6	8970	0.0	41.3	48.02385692	-103.81041285	1851.487							
8980	WELD	33,848.9	8980	0.0	41.3	48.02385480	-103.81024459	1851.093							
8990	WELD	33,890.2	8990	0.0	41.1	48.02385221	-103.81007644	1850.587							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9000	WELD	33,931.3	9000	0.0	41.1	48.02384967	-103.80990926	1850.735						
9010	WELD	33,972.5	9010	0.0	41.3	48.02384708	-103.80974194	1851.128						
9020	WELD	34,013.8	9020	0.0	41.4	48.02384555	-103.80957378	1851.204						
9030	WELD	34,055.1	9030	0.0	41.4	48.02384432	-103.80940571	1851.685						
9040	WELD	34,096.6	9040	0.0	41.4	48.02384328	-103.80923742	1852.061						
9050	WELD	34,137.9	9050	0.0	41.4	48.02384248	-103.80906965	1851.703						
9060	WELD	34,179.3	9060	0.0	41.3	48.02384204	-103.80890124	1851.640						
9070	WELD	34,220.7	9070	0.0	41.2	48.02384197	-103.80873332	1851.583						
9080	WELD	34,261.9	9080	0.0	40.5	48.02384453	-103.80856587	1851.944						
9090	WELD	34,302.3	9090	0.0	41.2	48.02384506	-103.80840119	1853.067						
9100	WELD	34,343.6	9100	0.0	8.0	48.02384079	-103.80823367	1852.841						
11000036	WT CHANGE	34,351.4	9100	0.0	0.1	48.02383961	-103.80820201	1852.537			0.322	52000	0.72	
9110	WELD	34,351.5	9110	0.0	40.2	48.02383959	-103.80820161	1852.532						
9120	WELD	34,391.7	9120	0.0	42.3	48.02383459	-103.80803843	1849.051						
9130	WELD	34,434.1	9130	0.0	42.3	48.02383092	-103.80786659	1849.151						
11000037	WT CHANGE	34,476.2	9130	0.0	0.1	48.02383109	-103.80769536	1852.278			0.188	52000	0.72	
9140	WELD	34,476.3	9140	0.0	34.2	48.02383109	-103.80769505	1852.280						
9150	WELD	34,510.5	9150	0.0	41.4	48.02383039	-103.80755569	1852.373						
9160	WELD	34,551.9	9160	0.0	41.3	48.02382868	-103.80738733	1852.475						
9170	WELD	34,593.1	9170	0.0	41.2	48.02382769	-103.80721890	1852.408						
9180	WELD	34,634.4	9180	0.0	41.2	48.02382630	-103.80705080	1852.386						
9190	WELD	34,675.6	9190	0.0	44.3	48.02382585	-103.80688274	1852.592						
9200	WELD	34,719.9	9200	0.0	44.2	48.02382496	-103.80670179	1852.792						
9210	WELD	34,764.1	9210	0.0	44.2	48.02382410	-103.80652121	1852.875						
9220	WELD	34,808.4	9220	0.0	44.2	48.02382226	-103.80634098	1853.279						
9230	WELD	34,852.6	9230	0.0	44.2	48.02382032	-103.80616059	1853.251						
9240	WELD	34,896.8	9240	0.0	44.2	48.02381898	-103.80598022	1852.963						
9250	WELD	34,941.0	9250	0.0	44.2	48.02381768	-103.80579974	1853.140						
9260	WELD	34,985.2	9260	0.0	44.3	48.02381570	-103.80561931	1853.255						
9270	WELD	35,029.5	9270	0.0	44.2	48.02381363	-103.80543868	1853.112						
9280	WELD	35,073.7	9280	0.0	44.3	48.02381162	-103.80525840	1853.123						
9290	WELD	35,117.9	9290	0.0	44.3	48.02381037	-103.80507802	1852.995						
9300	WELD	35,162.3	9300	0.0	44.3	48.02380954	-103.80489779	1852.941						
9310	WELD	35,206.5	9310	0.0	44.3	48.02380834	-103.80471747	1853.041						
9320	WELD	35,250.8	9320	0.0	44.3	48.02380804	-103.80453682	1852.958						
9330	WELD	35,295.1	9330	0.0	44.3	48.02380715	-103.80435630	1852.879						
9340	WELD	35,339.5	9340	0.0	44.3	48.02380514	-103.80417591	1853.332						

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9350	WELD	35,383.8	9350	0.0	33.1	48.02380367	-103.80399547	1853.789							
11000038	WT CHANGE	35,416.8	9350	0.0	0.1	48.02380309	-103.80386165	1853.270				0.322	52000	0.72	
9360	WELD	35,416.9	9360	0.0	42.2	48.02380309	-103.80386125	1853.269							
9370	WELD	35,459.0	9370	0.0	37.8	48.02380113	-103.80368942	1853.264							
9380	WELD	35,496.8	9380	0.0	6.0	48.02379928	-103.80353572	1852.762							
9390	WELD	35,502.9	9390	0.0	1.5	48.02379880	-103.80351134	1852.759							
10000047	Bend up - 45 deg., 3D	35,503.6	9390	0.1	1.5	48.02379874	-103.80350841	1852.967	0	12:00					
9400	WELD	35,504.4	9400	0.0	11.0	48.02379868	-103.80350579	1853.373							
10000048	AGM 060, Sta. 354+24, 42nd St. NW -- Han #8745	35,505.3	9400	0.9	10.1	48.02379858	-103.80350292	1854.009							
9410	WELD	35,515.4	9410	0.0	1.6	48.02379735	-103.80346614	1862.657							
10000049	Bend down - 45 deg., 3D	35,516.2	9410	0.1	1.5	48.02379725	-103.80346261	1863.156	0	12:00					
9420	WELD	35,517.1	9420	0.0	2.0	48.02379715	-103.80345849	1863.415							
10000050	Fitting on top of pipe	35,517.6	9420	0.5	1.5	48.02379708	-103.80345561	1863.507	344	11:15					
9430	WELD	35,519.1	9430	0.0	3.1	48.02379690	-103.80344849	1863.697							
10000051	Flange	35,519.5	9430	0.5	2.7	48.02379685	-103.80344617	1863.761	0	12:00					
10000052	Valve, Sta. 354+24, 42nd St. NW	35,520.6	9430	1.5	1.6	48.02379672	-103.80344062	1863.920							
10000053	Flange	35,521.7	9430	2.7	0.5	48.02379664	-103.80343600	1863.884	0	12:00					
9440	WELD	35,522.2	9440	0.0	2.0	48.02379661	-103.80343412	1863.875							
10000054	Fitting on top of pipe	35,523.6	9440	1.4	0.6	48.02379651	-103.80342836	1863.877	342	11:15					
9450	WELD	35,524.2	9450	0.0	1.6	48.02379647	-103.80342611	1863.832							
10000055	Bend down - 45 deg., 3D	35,525.0	9450	0.1	1.6	48.02379642	-103.80342298	1863.612	0	12:00					
9460	WELD	35,525.8	9460	0.0	11.0	48.02379636	-103.80342033	1863.136							
9470	WELD	35,536.8	9470	0.0	1.6	48.02379570	-103.80338846	1855.296							
10000056	Bend up - 45 deg., 3D	35,537.6	9470	0.1	1.5	48.02379565	-103.80338574	1854.942	0	12:00					
9480	WELD	35,538.4	9480	0.0	6.0	48.02379559	-103.80338278	1854.811							
9490	WELD	35,544.4	9490	0.0	4.5	48.02379528	-103.80335817	1854.860							
9500	WELD	35,548.9	9500	0.0	40.4	48.02379520	-103.80333997	1854.951							
9510	WELD	35,589.3	9510	0.0	23.3	48.02379529	-103.80317545	1855.303							
9520	WELD	35,612.6	9520	0.0	16.8	48.02379622	-103.80308052	1855.580							
11000039	WT CHANGE	35,629.3	9520	0.0	0.1	48.02379771	-103.80301283	1856.261				0.188	52000	0.72	
9530	WELD	35,629.4	9530	0.0	32.3	48.02379772	-103.80301238	1856.264							
9540	WELD	35,661.7	9540	0.0	41.3	48.02380013	-103.80288106	1856.021							
9550	WELD	35,703.0	9550	0.0	41.2	48.02379444	-103.80271346	1855.737							
9560	WELD	35,744.2	9560	0.0	44.3	48.02378942	-103.80254599	1855.535							
9570	WELD	35,788.5	9570	0.0	44.2	48.02378751	-103.80236575	1855.925							

Criteria: ASME B31G: Modified

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9580	WELD	35,832.8	9580	0.0	44.3	48.02378653	-103.80218552	1856.052							
9590	WELD	35,877.0	9590	0.0	44.2	48.02378687	-103.80200542	1856.484							
9600	WELD	35,921.3	9600	0.0	41.2	48.02379563	-103.80182599	1857.904							
9610	WELD	35,962.4	9610	0.0	41.3	48.02381794	-103.80166158	1857.661							
9620	WELD	36,003.7	9620	0.0	20.1	48.02385215	-103.80150163	1857.598							
11000040	WT CHANGE	36,023.7	9620	0.0	0.1	48.02386964	-103.80142459	1857.525				0.322	52000	0.72	
9630	WELD	36,023.8	9630	0.0	41.9	48.02386972	-103.80142426	1857.523							
9640	WELD	36,065.7	9640	0.0	42.2	48.02390433	-103.80126231	1854.066							
9650	WELD	36,107.9	9650	0.0	42.2	48.02393841	-103.80109873	1851.010							
9660	WELD	36,150.1	9660	0.0	42.2	48.02396904	-103.80093289	1850.418							
9670	WELD	36,192.3	9670	0.0	42.2	48.02399093	-103.80076411	1852.594							
11000041	WT CHANGE	36,234.4	9670	0.0	0.1	48.02400873	-103.80059459	1854.005				0.188	52000	0.72	
9680	WELD	36,234.5	9680	0.0	39.7	48.02400876	-103.80059428	1854.006							
9690	WELD	36,274.2	9690	0.0	44.2	48.02402286	-103.80043365	1855.119							
9700	WELD	36,318.4	9700	0.0	44.2	48.02403268	-103.80025396	1855.253							
9710	WELD	36,362.6	9710	0.0	44.2	48.02403566	-103.80007364	1855.338							
9720	WELD	36,406.8	9720	0.0	44.3	48.02403398	-103.79989331	1855.498							
9730	WELD	36,451.1	9730	0.0	44.3	48.02402934	-103.79971331	1855.950							
9740	WELD	36,495.4	9740	0.0	44.4	48.02402498	-103.79953296	1855.338							
9750	WELD	36,539.8	9750	0.0	29.2	48.02401995	-103.79935282	1854.635							
11000042	WT CHANGE	36,568.9	9750	0.0	0.1	48.02401592	-103.79923492	1854.619				0.322	52000	0.72	
9760	WELD	36,569.0	9760	0.0	6.1	48.02401591	-103.79923456	1854.619							
9770	WELD	36,575.1	9770	0.0	1.6	48.02401522	-103.79920932	1854.580							
10000057	Bend right - 45 deg., 3D	36,575.9	9770	0.1	1.5	48.02401454	-103.79920634	1854.567	0	12:00					
9780	WELD	36,576.7	9780	0.0	6.5	48.02401323	-103.79920377	1854.553							
11000043	WT CHANGE	36,583.1	9780	0.0	0.1	48.02400050	-103.79918626	1854.433				0.188	52000	0.72	
9790	WELD	36,583.1	9790	0.0	38.6	48.02400033	-103.79918601	1854.430							
9800	WELD	36,621.7	9800	0.0	44.4	48.02392253	-103.79908032	1854.231							
9810	WELD	36,666.1	9810	0.0	44.3	48.02383249	-103.79896003	1854.451							
9820	WELD	36,710.4	9820	0.0	44.4	48.02374116	-103.79884211	1854.277							
9830	WELD	36,754.8	9830	0.0	44.3	48.02364940	-103.79872464	1854.297							
9840	WELD	36,799.1	9840	0.0	30.6	48.02355812	-103.79860647	1854.067							
11000044	WT CHANGE	36,829.6	9840	0.0	0.1	48.02349577	-103.79852457	1854.109				0.322	52000	0.72	
9850	WELD	36,829.7	9850	0.0	42.2	48.02349559	-103.79852433	1854.111							
9860	WELD	36,871.9	9860	0.0	42.3	48.02340904	-103.79841077	1854.376							
9870	WELD	36,914.2	9870	0.0	42.3	48.02332286	-103.79829710	1851.648							
9880	WELD	36,956.5	9880	0.0	42.2	48.02323696	-103.79818264	1850.953							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
9890	WELD	36,998.7	9890	0.0	42.3	48.02315135	-103.79806737	1852.028							
9900	WELD	37,041.0	9900	0.0	42.2	48.02306612	-103.79795153	1851.662							
9910	WELD	37,083.2	9910	0.0	42.2	48.02298252	-103.79783301	1850.785							
9920	WELD	37,125.5	9920	0.0	42.3	48.02289917	-103.79771440	1848.891							
9930	WELD	37,167.8	9930	0.0	37.9	48.02281305	-103.79760004	1850.349							
9940	WELD	37,205.6	9940	0.0	11.8	48.02273563	-103.79749919	1854.314							
9950	WELD	37,217.4	9950	0.0	0.7	48.02271148	-103.79746745	1855.128							
10000058	Bend right - 20 deg., 3D	37,217.8	9950	0.0	0.6	48.02271067	-103.79746679	1855.140	0	12:00					
9960	WELD	37,218.1	9960	0.0	6.9	48.02270984	-103.79746618	1855.150							
11000045	WT CHANGE	37,224.9	9960	0.0	0.1	48.02269234	-103.79745644	1855.252				0.188	52000	0.72	
9970	WELD	37,225.0	9970	0.0	22.8	48.02269212	-103.79745632	1855.252							
9980	WELD	37,247.8	9980	0.0	44.2	48.02263330	-103.79742562	1855.369							
9990	WELD	37,292.1	9990	0.0	44.2	48.02251911	-103.79736621	1855.159							
10000	WELD	37,336.3	10000	0.0	44.2	48.02240523	-103.79730558	1855.007							
10010	WELD	37,380.5	10010	0.0	41.3	48.02229134	-103.79724507	1854.810							
10020	WELD	37,421.8	10020	0.0	41.4	48.02218515	-103.79718822	1854.591							
10030	WELD	37,463.2	10030	0.0	41.3	48.02207953	-103.79712890	1854.542							
10040	WELD	37,504.5	10040	0.0	41.3	48.02197470	-103.79706640	1854.602							
10050	WELD	37,545.8	10050	0.0	41.3	48.02187002	-103.79700357	1854.781							
10060	WELD	37,587.1	10060	0.0	31.2	48.02176538	-103.79694103	1854.680							
11000046	WT CHANGE	37,618.1	10060	0.0	0.1	48.02168659	-103.79689520	1855.055				0.322	52000	0.72	
10070	WELD	37,618.2	10070	0.0	5.9	48.02168634	-103.79689505	1855.057							
10080	WELD	37,624.2	10080	0.0	0.4	48.02167086	-103.79688663	1855.170							
10000059	Bend right - 12 deg., 1.5D	37,624.4	10080	0.0	0.4	48.02167033	-103.79688642	1855.169	0	12:00					
10090	WELD	37,624.6	10090	0.0	6.1	48.02166977	-103.79688625	1855.164							
20000021	Girth Weld Anomaly	37,630.7	10090	6.1	0.1	48.02165336	-103.79688180	1855.031	248	8:15	-	0.55	17.98		
10100	WELD	37,630.7	10100	0.0	19.9	48.02165328	-103.79688178	1855.031							
10110	WELD	37,650.6	10110	0.0	42.2	48.02159967	-103.79686760	1854.844							
10120	WELD	37,692.8	10120	0.0	42.3	48.02148531	-103.79684633	1854.465							
10130	WELD	37,735.1	10130	0.0	42.2	48.02136992	-103.79683868	1854.230							
10140	WELD	37,777.3	10140	0.0	42.2	48.02125462	-103.79683324	1853.564							
10150	WELD	37,819.6	10150	0.0	42.2	48.02113951	-103.79682239	1853.488							
10160	WELD	37,861.8	10160	0.0	42.3	48.02102560	-103.79679546	1853.534							
10170	WELD	37,904.1	10170	0.0	42.3	48.02091185	-103.79676687	1852.384							
10180	WELD	37,946.4	10180	0.0	42.1	48.02079723	-103.79674767	1852.311							
11000047	WT CHANGE	37,988.4	10180	0.0	0.1	48.02068347	-103.79673159	1854.246				0.188	52000	0.72	
10190	WELD	37,988.5	10190	0.0	20.9	48.02068323	-103.79673155	1854.247							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10200	WELD	38,009.3	10200	0.0	16.3	48.02062663	-103.79672128	1854.474							
11000048	WT CHANGE	38,025.5	10200	0.0	0.1	48.02058324	-103.79671213	1854.432				0.322	52000	0.72	
10210	WELD	38,025.6	10210	0.0	6.0	48.02058297	-103.79671207	1854.433							
10220	WELD	38,031.5	10220	0.0	0.4	48.02056667	-103.79670837	1854.448							
10000060	Bend left - 10 deg., 3D	38,031.7	10220	0.0	0.4	48.02056613	-103.79670818	1854.452	0	12:00					
10230	WELD	38,031.9	10230	0.0	6.1	48.02056560	-103.79670799	1854.456							
11000049	WT CHANGE	38,037.9	10230	0.0	0.1	48.02055009	-103.79669999	1854.609				0.188	52000	0.72	
10240	WELD	38,038.0	10240	0.0	18.8	48.02054986	-103.79669988	1854.611							
10250	WELD	38,056.8	10250	0.0	44.2	48.02050118	-103.79667479	1854.954							
10260	WELD	38,101.1	10260	0.0	44.3	48.02038785	-103.79661188	1854.819							
10270	WELD	38,145.3	10270	0.0	44.2	48.02027507	-103.79654714	1854.868							
10280	WELD	38,189.6	10280	0.0	43.9	48.02016192	-103.79648288	1854.785							
10290	WELD	38,233.4	10290	0.0	43.0	48.02004883	-103.79642295	1854.974							
10300	WELD	38,276.4	10300	0.0	44.3	48.01993779	-103.79636563	1855.058							
13000003	GAIN	38,291.6	10300	15.2	29.1	48.01989826	-103.79634601	1855.167	36	1:00					
10310	WELD	38,320.6	10310	0.0	44.3	48.01982265	-103.79631014	1855.309							
10320	WELD	38,364.9	10320	0.0	33.9	48.01970681	-103.79625863	1856.523							
11000050	WT CHANGE	38,398.7	10320	0.0	0.1	48.01961820	-103.79622030	1856.954				0.322	52000	0.72	
10330	WELD	38,398.7	10330	0.0	42.1	48.01961797	-103.79622020	1856.953							
10340	WELD	38,440.9	10340	0.0	0.4	48.01950744	-103.79617048	1856.185							
10000061	Bend right - 12 deg., 1.5D	38,441.1	10340	0.0	0.3	48.01950692	-103.79617030	1856.181	0	12:00					
10350	WELD	38,441.3	10350	0.0	23.0	48.01950641	-103.79617019	1856.169							
10360	WELD	38,464.2	10360	0.0	42.1	48.01944370	-103.79616140	1855.180							
10370	WELD	38,506.4	10370	0.0	42.2	48.01932935	-103.79614187	1852.845							
10380	WELD	38,548.5	10380	0.0	42.1	48.01921513	-103.79611767	1851.499							
10390	WELD	38,590.7	10390	0.0	42.1	48.01909996	-103.79610573	1850.823							
10400	WELD	38,632.8	10400	0.0	42.1	48.01898481	-103.79609721	1850.838							
10410	WELD	38,675.0	10410	0.0	42.2	48.01886984	-103.79608410	1852.497							
10420	WELD	38,717.2	10420	0.0	42.2	48.01875462	-103.79607058	1853.447							
10430	WELD	38,759.4	10430	0.0	42.2	48.01863948	-103.79605906	1853.684							
11000051	WT CHANGE	38,801.5	10430	0.0	0.1	48.01852535	-103.79603822	1855.760				0.188	52000	0.72	
10440	WELD	38,801.6	10440	0.0	43.4	48.01852511	-103.79603818	1855.761							
10450	WELD	38,845.0	10450	0.0	44.3	48.01840765	-103.79601222	1856.284							
10460	WELD	38,889.3	10460	0.0	41.3	48.01828893	-103.79597783	1855.589							
10470	WELD	38,930.6	10470	0.0	41.3	48.01817771	-103.79595184	1855.695							
10480	WELD	38,971.9	10480	0.0	41.3	48.01806589	-103.79593073	1855.649							
10490	WELD	39,013.2	10490	0.0	41.4	48.01795445	-103.79590473	1855.439							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10500	WELD	39,054.6	10500	0.0	41.4	48.01784342	-103.79587584	1855.175							
10510	WELD	39,096.0	10510	0.0	41.4	48.01773217	-103.79584830	1855.274							
10520	WELD	39,137.3	10520	0.0	41.3	48.01762081	-103.79582153	1855.396							
10530	WELD	39,178.6	10530	0.0	41.6	48.01750942	-103.79579606	1855.233							
10540	WELD	39,220.3	10540	0.0	41.4	48.01739717	-103.79576968	1855.392							
10550	WELD	39,261.6	10550	0.0	41.3	48.01728560	-103.79574497	1855.578							
10560	WELD	39,302.9	10560	0.0	41.3	48.01717440	-103.79571820	1855.669							
10570	WELD	39,344.2	10570	0.0	37.6	48.01706305	-103.79569030	1855.734							
10580	WELD	39,381.8	10580	0.0	41.3	48.01696155	-103.79566687	1855.880							
10590	WELD	39,423.1	10590	0.0	41.0	48.01685000	-103.79563974	1856.637							
10600	WELD	39,464.1	10600	0.0	41.3	48.01673930	-103.79561299	1856.483							
10610	WELD	39,505.4	10610	0.0	41.3	48.01662787	-103.79558582	1856.265							
10620	WELD	39,546.8	10620	0.0	41.3	48.01651630	-103.79555903	1856.736							
10630	WELD	39,588.1	10630	0.0	41.3	48.01640493	-103.79553165	1856.667							
10640	WELD	39,629.4	10640	0.0	41.3	48.01629344	-103.79550410	1856.346							
10650	WELD	39,670.7	10650	0.0	41.3	48.01618208	-103.79547679	1856.201							
10660	WELD	39,712.1	10660	0.0	41.4	48.01607068	-103.79544932	1856.391							
10670	WELD	39,753.4	10670	0.0	41.3	48.01595906	-103.79542230	1856.405							
10680	WELD	39,794.8	10680	0.0	41.0	48.01584748	-103.79539469	1856.391							
10690	WELD	39,835.8	10690	0.0	40.9	48.01573728	-103.79536470	1856.406							
10700	WELD	39,876.8	10700	0.0	34.9	48.01562717	-103.79533475	1857.083							
10710	WELD	39,911.6	10710	0.0	7.1	48.01553314	-103.79531063	1857.638							
11000052	WT CHANGE	39,918.6	10710	0.0	0.1	48.01551443	-103.79530554	1857.628				0.322	52000	0.72	
10720	WELD	39,918.7	10720	0.0	1.5	48.01551420	-103.79530544	1857.628							
10000062	Bend left - 45 deg., 3D	39,919.5	10720	0.1	1.4	48.01551241	-103.79530410	1857.620	0	12:00					
10730	WELD	39,920.2	10730	0.0	23.1	48.01551092	-103.79530189	1857.602							
11000053	WT CHANGE	39,943.3	10730	0.0	0.1	48.01547529	-103.79522389	1857.039				0.500	52000	0.72	
10740	WELD	39,943.4	10740	0.0	42.1	48.01547514	-103.79522356	1857.038							
10750	WELD	39,985.5	10750	0.0	42.3	48.01541267	-103.79508006	1856.906							
10760	WELD	40,027.8	10760	0.0	42.3	48.01535046	-103.79493545	1855.957							
10770	WELD	40,070.1	10770	0.0	42.3	48.01528925	-103.79479141	1851.372							
10780	WELD	40,112.4	10780	0.0	42.3	48.01522937	-103.79465050	1841.562							
10790	WELD	40,154.8	10790	0.0	42.3	48.01517016	-103.79450983	1830.962							
10800	WELD	40,197.1	10800	0.0	42.3	48.01511276	-103.79436689	1820.711							
10810	WELD	40,239.4	10810	0.0	42.2	48.01505699	-103.79422226	1811.008							
10820	WELD	40,281.6	10820	0.0	42.2	48.01500305	-103.79407530	1802.224							
10830	WELD	40,323.8	10830	0.0	42.3	48.01494999	-103.79392645	1794.631							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10840	WELD	40,366.1	10840	0.0	42.3	48.01489738	-103.79377602	1788.453						
10850	WELD	40,408.4	10850	0.0	42.2	48.01484508	-103.79362426	1784.143						
10860	WELD	40,450.6	10860	0.0	42.3	48.01479383	-103.79347124	1781.280						
10870	WELD	40,492.8	10870	0.0	42.2	48.01474352	-103.79331725	1779.029						
10880	WELD	40,535.1	10880	0.0	42.3	48.01469352	-103.79316283	1777.639						
10890	WELD	40,577.3	10890	0.0	42.2	48.01464409	-103.79300772	1777.218						
10900	WELD	40,619.6	10900	0.0	42.2	48.01459504	-103.79285250	1777.269						
10910	WELD	40,661.8	10910	0.0	42.3	48.01454654	-103.79269689	1777.316						
10920	WELD	40,704.1	10920	0.0	42.3	48.01449868	-103.79254049	1777.293						
10930	WELD	40,746.4	10930	0.0	42.3	48.01445101	-103.79238413	1776.944						
10940	WELD	40,788.8	10940	0.0	42.3	48.01440452	-103.79222693	1775.950						
10950	WELD	40,831.1	10950	0.0	42.3	48.01435883	-103.79206947	1774.612						
10960	WELD	40,873.3	10960	0.0	42.3	48.01431402	-103.79191152	1773.865						
10970	WELD	40,915.6	10970	0.0	42.3	48.01426933	-103.79175333	1773.577						
10980	WELD	40,957.9	10980	0.0	42.3	48.01422491	-103.79159498	1773.042						
10990	WELD	41,000.2	10990	0.0	42.3	48.01418110	-103.79143598	1772.256						
11000	WELD	41,042.5	11000	0.0	42.2	48.01413689	-103.79127753	1772.096						
11010	WELD	41,084.7	11010	0.0	42.3	48.01409284	-103.79111914	1772.722						
11020	WELD	41,127.0	11020	0.0	42.3	48.01404753	-103.79096097	1773.568						
11030	WELD	41,169.3	11030	0.0	42.3	48.01400279	-103.79080271	1774.147						
11040	WELD	41,211.6	11040	0.0	42.3	48.01395948	-103.79064361	1774.177						
11050	WELD	41,254.0	11050	0.0	42.3	48.01391699	-103.79048388	1774.161						
11060	WELD	41,296.3	11060	0.0	42.3	48.01387473	-103.79032430	1774.683						
11070	WELD	41,338.6	11070	0.0	42.3	48.01383184	-103.79016506	1775.263						
11080	WELD	41,380.9	11080	0.0	42.3	48.01378875	-103.79000549	1775.279						
11090	WELD	41,423.3	11090	0.0	42.3	48.01374610	-103.78984568	1775.306						
11100	WELD	41,465.6	11100	0.0	42.3	48.01370490	-103.78968533	1775.619						
11110	WELD	41,507.9	11110	0.0	42.4	48.01366426	-103.78952453	1775.823						
11120	WELD	41,550.2	11120	0.0	42.3	48.01362379	-103.78936363	1776.657						
11130	WELD	41,592.5	11130	0.0	42.3	48.01358322	-103.78920340	1778.696						
11140	WELD	41,634.7	11140	0.0	42.3	48.01354256	-103.78904324	1782.266						
11150	WELD	41,677.1	11150	0.0	42.3	48.01350090	-103.78888444	1787.558						
11160	WELD	41,719.3	11160	0.0	42.2	48.01345853	-103.78872659	1793.645						
11170	WELD	41,761.6	11170	0.0	42.3	48.01341648	-103.78856875	1799.838						
11180	WELD	41,803.8	11180	0.0	42.3	48.01337284	-103.78841265	1807.217						
11190	WELD	41,846.1	11190	0.0	42.4	48.01332975	-103.78825766	1816.270						
11200	WELD	41,888.5	11200	0.0	42.3	48.01328698	-103.78810313	1826.368						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11210	WELD	41,930.8	11210	0.0	42.3	48.01324433	-103.78794956	1837.206							
11220	WELD	41,973.1	11220	0.0	42.3	48.01320133	-103.78779692	1848.793							
11230	WELD	42,015.4	11230	0.0	38.6	48.01315500	-103.78764423	1858.336							
11000054	WT CHANGE	42,053.9	11230	0.0	0.1	48.01311116	-103.78750478	1864.617				0.322	52000	0.72	
11240	WELD	42,054.0	11240	0.0	14.3	48.01311106	-103.78750446	1864.627							
11250	WELD	42,068.3	11250	0.0	2.0	48.01309545	-103.78745117	1866.243							
10000063	Bend left - 60 deg., 3D	42,069.3	11250	0.2	1.8	48.01309567	-103.78744722	1866.322	0	12:00					
11260	WELD	42,070.3	11260	0.0	41.7	48.01309696	-103.78744366	1866.359							
11270	WELD	42,111.9	11270	0.0	42.1	48.01316409	-103.78730577	1867.668							
11280	WELD	42,154.0	11280	0.0	33.0	48.01322899	-103.78716469	1867.911							
11290	WELD	42,187.0	11290	0.0	3.2	48.01327836	-103.78705265	1867.922							
10000064	Bend right - 90 deg., 3D	42,188.6	11290	0.2	2.9	48.01327815	-103.78704645	1867.842	0	12:00					
11300	WELD	42,190.1	11300	0.0	15.7	48.01327530	-103.78704203	1867.706							
11310	WELD	42,205.8	11310	0.0	42.2	48.01323753	-103.78700808	1866.155							
11320	WELD	42,248.0	11320	0.0	42.3	48.01313790	-103.78692218	1863.351							
11330	WELD	42,290.3	11330	0.0	42.2	48.01303612	-103.78684018	1863.583							
11340	WELD	42,332.6	11340	0.0	42.3	48.01293363	-103.78676171	1865.814							
11350	WELD	42,374.9	11350	0.0	42.3	48.01283042	-103.78668643	1870.128							
11360	WELD	42,417.2	11360	0.0	42.3	48.01272668	-103.78661457	1875.764							
11370	WELD	42,459.5	11370	0.0	42.3	48.01262146	-103.78654728	1881.352							
11380	WELD	42,501.8	11380	0.0	42.3	48.01251437	-103.78648797	1887.408							
11390	WELD	42,544.1	11390	0.0	42.3	48.01240562	-103.78643737	1894.383							
13000004	GAIN	42,563.0	11390	18.8	23.5	48.01235704	-103.78641726	1898.166	56	1:45					
11400	WELD	42,586.4	11400	0.0	42.3	48.01229657	-103.78639373	1903.285							
11410	WELD	42,628.8	11410	0.0	42.3	48.01218810	-103.78635463	1914.200							
11420	WELD	42,671.1	11420	0.0	42.3	48.01208049	-103.78631755	1926.578							
11430	WELD	42,713.4	11430	0.0	42.3	48.01197252	-103.78628703	1939.713							
11440	WELD	42,755.7	11440	0.0	42.3	48.01186388	-103.78626470	1953.090							
11450	WELD	42,798.0	11450	0.0	42.3	48.01175506	-103.78624911	1966.863							
11460	WELD	42,840.2	11460	0.0	42.3	48.01164644	-103.78624152	1981.243							
11470	WELD	42,882.5	11470	0.0	42.2	48.01153773	-103.78624080	1995.638							
11480	WELD	42,924.7	11480	0.0	42.2	48.01142759	-103.78624941	2008.336							
11490	WELD	42,967.0	11490	0.0	42.2	48.01131719	-103.78626613	2020.140							
11500	WELD	43,009.2	11500	0.0	42.2	48.01120603	-103.78628117	2030.957							
11510	WELD	43,051.4	11510	0.0	42.2	48.01109418	-103.78628840	2041.204							
11520	WELD	43,093.6	11520	0.0	42.2	48.01098211	-103.78629312	2051.346							
11530	WELD	43,135.9	11530	0.0	42.2	48.01086955	-103.78631068	2059.890							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11540	WELD	43,178.1	11540	0.0	42.2	48.01075706	-103.78634478	2064.486							
11550	WELD	43,220.3	11550	0.0	42.2	48.01064636	-103.78637954	2073.029							
11560	WELD	43,262.5	11560	0.0	4.0	48.01053542	-103.78641536	2080.396							
11570	WELD	43,266.5	11570	0.0	1.5	48.01052486	-103.78641883	2080.929							
10000065	Bend up - 45 deg., 1.5D	43,267.3	11570	0.1	1.4	48.01052317	-103.78641944	2081.298	0	12:00					
11580	WELD	43,268.1	11580	0.0	9.1	48.01052177	-103.78641994	2081.810							
11590	WELD	43,277.2	11590	0.0	1.6	48.01050589	-103.78642542	2088.622							
10000066	Bend down - 45 deg., 3D	43,278.0	11590	0.1	1.5	48.01050392	-103.78642607	2088.938	0	12:00					
11600	WELD	43,278.8	11600	0.0	3.0	48.01050183	-103.78642677	2089.049							
10000067	Fitting on top of pipe	43,280.0	11600	1.2	1.8	48.01049859	-103.78642781	2089.116	346	11:30					
11610	WELD	43,281.8	11610	0.0	3.2	48.01049385	-103.78642930	2089.198							
10000068	Flange	43,282.3	11610	0.5	2.8	48.01049261	-103.78642969	2089.216	0	12:00					
10000069	Valve	43,283.5	11610	1.6	1.6	48.01048947	-103.78643063	2089.258							
10000070	Flange	43,284.6	11610	2.8	0.5	48.01048672	-103.78643156	2089.380	0	12:00					
11620	WELD	43,285.1	11620	0.0	3.0	48.01048558	-103.78643196	2089.418							
11630	WELD	43,288.0	11630	0.0	1.6	48.01047823	-103.78643437	2089.612							
10000071	Bend down - 45 deg., 3D	43,288.9	11630	0.1	1.5	48.01047641	-103.78643491	2089.339	0	12:00					
11640	WELD	43,289.7	11640	0.0	9.2	48.01047484	-103.78643534	2088.884							
11650	WELD	43,298.8	11650	0.0	1.6	48.01045833	-103.78643997	2083.089							
10000072	Bend up - 45 deg., 3D	43,299.6	11650	0.1	1.5	48.01045660	-103.78644048	2082.892	0	12:00					
11660	WELD	43,300.4	11660	0.0	4.1	48.01045472	-103.78644104	2082.871							
11000055	WT CHANGE	43,304.4	11660	0.0	0.1	48.01044476	-103.78644412	2083.092				0.188	52000	0.72	
11670	WELD	43,304.5	11670	0.0	42.3	48.01044454	-103.78644419	2083.097							
10000073	AGM 070, Sta. 431+85, ROW -- Han #8456	43,308.2	11670	3.7	38.6	48.01043537	-103.78644713	2083.272							
11680	WELD	43,346.8	11680	0.0	49.6	48.01033233	-103.78647880	2082.471							
11690	WELD	43,396.4	11690	0.0	49.3	48.01019923	-103.78651425	2079.732							
11700	WELD	43,445.7	11700	0.0	49.1	48.01006548	-103.78653851	2079.261							
11710	WELD	43,494.8	11710	0.0	49.5	48.00993168	-103.78654428	2080.938							
11720	WELD	43,544.3	11720	0.0	49.4	48.00979763	-103.78652683	2084.436							
11730	WELD	43,593.7	11730	0.0	49.6	48.00966612	-103.78648452	2088.002							
11740	WELD	43,643.3	11740	0.0	49.5	48.00953572	-103.78643157	2090.013							
11750	WELD	43,692.8	11750	0.0	49.5	48.00940465	-103.78638269	2089.865							
11760	WELD	43,742.3	11760	0.0	49.7	48.00927108	-103.78634952	2088.286							
11770	WELD	43,792.0	11770	0.0	44.9	48.00913616	-103.78633500	2085.255							
11780	WELD	43,836.9	11780	0.0	49.5	48.00901375	-103.78633786	2083.908							
11790	WELD	43,886.4	11790	0.0	49.4	48.00887933	-103.78635825	2086.226							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11800	WELD	43,935.8	11800	0.0	49.6	48.00874800	-103.78640185	2088.905						
11810	WELD	43,985.4	11810	0.0	49.7	48.00862022	-103.78646903	2090.424						
11820	WELD	44,035.1	11820	0.0	49.6	48.00849578	-103.78654976	2091.381						
11830	WELD	44,084.8	11830	0.0	49.5	48.00837336	-103.78663630	2091.424						
11840	WELD	44,134.3	11840	0.0	49.5	48.00825086	-103.78672193	2091.343						
11850	WELD	44,183.8	11850	0.0	49.5	48.00812851	-103.78680750	2093.222						
11860	WELD	44,233.4	11860	0.0	49.5	48.00800668	-103.78689450	2095.957						
11870	WELD	44,282.8	11870	0.0	49.6	48.00788450	-103.78698025	2098.088						
11880	WELD	44,332.5	11880	0.0	49.2	48.00776135	-103.78706452	2099.724						
11890	WELD	44,381.7	11890	0.0	49.5	48.00763871	-103.78714783	2098.997						
11900	WELD	44,431.2	11900	0.0	49.4	48.00751591	-103.78723191	2096.838						
11910	WELD	44,480.6	11910	0.0	49.2	48.00739297	-103.78731577	2095.496						
11920	WELD	44,529.8	11920	0.0	49.5	48.00727046	-103.78739941	2095.366						
11930	WELD	44,579.3	11930	0.0	49.5	48.00714740	-103.78748341	2096.752						
11940	WELD	44,628.7	11940	0.0	49.4	48.00702429	-103.78756788	2099.178						
11950	WELD	44,678.2	11950	0.0	49.5	48.00690169	-103.78765235	2102.809						
11960	WELD	44,727.6	11960	0.0	49.2	48.00677859	-103.78773620	2106.607						
11970	WELD	44,776.8	11970	0.0	49.2	48.00665635	-103.78781948	2111.089						
11980	WELD	44,826.0	11980	0.0	49.6	48.00653463	-103.78790491	2114.682						
11990	WELD	44,875.7	11990	0.0	49.6	48.00641629	-103.78800373	2115.751						
12000	WELD	44,925.3	12000	0.0	49.6	48.00630264	-103.78811429	2115.276						
12010	WELD	44,974.9	12010	0.0	49.6	48.00619182	-103.78823094	2115.019						
12020	WELD	45,024.6	12020	0.0	49.5	48.00608243	-103.78835025	2114.776						
12030	WELD	45,074.1	12030	0.0	49.7	48.00597247	-103.78846786	2114.486						
12040	WELD	45,123.8	12040	0.0	49.7	48.00585833	-103.78857674	2113.590						
12050	WELD	45,173.5	12050	0.0	49.7	48.00573806	-103.78866967	2111.272						
12060	WELD	45,223.2	12060	0.0	49.7	48.00561494	-103.78875452	2111.484						
12070	WELD	45,272.9	12070	0.0	49.7	48.00548922	-103.78882955	2113.300						
12080	WELD	45,322.6	12080	0.0	49.7	48.00536030	-103.78889190	2112.469						
12090	WELD	45,372.3	12090	0.0	49.6	48.00523063	-103.78894958	2108.606						
12100	WELD	45,421.9	12100	0.0	49.3	48.00510105	-103.78900425	2103.606						
12110	WELD	45,471.3	12110	0.0	49.6	48.00497143	-103.78905861	2101.893						
12120	WELD	45,520.9	12120	0.0	49.7	48.00484135	-103.78911317	2103.212						
12130	WELD	45,570.6	12130	0.0	49.4	48.00471140	-103.78916876	2107.723						
12140	WELD	45,620.0	12140	0.0	49.6	48.00458207	-103.78922457	2111.584						
12150	WELD	45,669.6	12150	0.0	49.5	48.00445235	-103.78928206	2114.025						
12160	WELD	45,719.1	12160	0.0	49.6	48.00432250	-103.78933868	2115.221						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12170	WELD	45,768.7	12170	0.0	49.5	48.00419181	-103.78939272	2116.304						
12180	WELD	45,818.2	12180	0.0	49.5	48.00406135	-103.78944652	2116.690						
12190	WELD	45,867.8	12190	0.0	49.5	48.00393098	-103.78950121	2116.762						
12200	WELD	45,917.3	12200	0.0	49.3	48.00380044	-103.78955578	2116.823						
12210	WELD	45,966.6	12210	0.0	49.6	48.00367016	-103.78960748	2117.280						
12220	WELD	46,016.2	12220	0.0	49.5	48.00353802	-103.78965292	2117.040						
12230	WELD	46,065.7	12230	0.0	49.6	48.00340525	-103.78969448	2117.159						
12240	WELD	46,115.3	12240	0.0	49.6	48.00327193	-103.78973334	2117.346						
12250	WELD	46,164.9	12250	0.0	49.4	48.00313866	-103.78977078	2117.759						
12260	WELD	46,214.3	12260	0.0	49.0	48.00300540	-103.78980703	2117.327						
12270	WELD	46,263.3	12270	0.0	49.5	48.00287316	-103.78984187	2116.668						
12280	WELD	46,312.8	12280	0.0	49.6	48.00273965	-103.78987626	2116.029						
12290	WELD	46,362.4	12290	0.0	49.6	48.00260603	-103.78990975	2115.538						
12300	WELD	46,412.0	12300	0.0	49.2	48.00247239	-103.78994237	2115.004						
12310	WELD	46,461.2	12310	0.0	49.5	48.00233990	-103.78997525	2114.388						
12320	WELD	46,510.6	12320	0.0	42.5	48.00220681	-103.79000965	2113.758						
12330	WELD	46,553.2	12330	0.0	49.7	48.00209236	-103.79003899	2113.465						
12340	WELD	46,602.9	12340	0.0	47.8	48.00195848	-103.79007274	2113.596						
12350	WELD	46,650.7	12350	0.0	49.7	48.00182999	-103.79010610	2113.086						
12360	WELD	46,700.4	12360	0.0	49.5	48.00169632	-103.79013959	2112.188						
12370	WELD	46,749.9	12370	0.0	51.3	48.00156314	-103.79017276	2111.157						
12380	WELD	46,801.3	12380	0.0	49.5	48.00142547	-103.79020870	2109.141						
12390	WELD	46,850.7	12390	0.0	49.6	48.00129257	-103.79024277	2107.645						
12400	WELD	46,900.4	12400	0.0	49.1	48.00115931	-103.79027817	2106.285						
12410	WELD	46,949.5	12410	0.0	49.5	48.00102758	-103.79031297	2104.454						
12420	WELD	46,999.0	12420	0.0	49.4	48.00089472	-103.79034917	2102.253						
12430	WELD	47,048.4	12430	0.0	49.5	48.00076187	-103.79038321	2100.175						
12440	WELD	47,097.9	12440	0.0	49.6	48.00062863	-103.79041529	2100.107						
12450	WELD	47,147.5	12450	0.0	49.5	48.00049462	-103.79044522	2102.366						
12460	WELD	47,197.0	12460	0.0	49.6	48.00036102	-103.79047720	2103.479						
12470	WELD	47,246.6	12470	0.0	49.6	48.00022875	-103.79052103	2103.959						
12480	WELD	47,296.2	12480	0.0	49.2	48.00009870	-103.79057818	2103.764						
12490	WELD	47,345.4	12490	0.0	49.3	47.99997344	-103.79065186	2101.703						
12500	WELD	47,394.7	12500	0.0	49.5	47.99985018	-103.79073273	2100.641						
12510	WELD	47,444.1	12510	0.0	44.0	47.99972627	-103.79081418	2100.109						
12520	WELD	47,488.1	12520	0.0	49.6	47.99961555	-103.79088454	2099.833						
12530	WELD	47,537.7	12530	0.0	49.5	47.99949061	-103.79096307	2099.041						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12540	WELD	47,587.2	12540	0.0	49.5	47.99936512	-103.79103888	2097.394							
12550	WELD	47,636.7	12550	0.0	49.5	47.99923912	-103.79111202	2095.250							
12560	WELD	47,686.2	12560	0.0	49.5	47.99911327	-103.79118561	2093.032							
12570	WELD	47,735.7	12570	0.0	49.6	47.99898772	-103.79125993	2091.394							
12580	WELD	47,785.3	12580	0.0	49.1	47.99886187	-103.79133532	2090.055							
12590	WELD	47,834.4	12590	0.0	49.5	47.99873773	-103.79141107	2088.547							
12600	WELD	47,883.9	12600	0.0	49.3	47.99861324	-103.79148858	2087.212							
12610	WELD	47,933.1	12610	0.0	49.4	47.99848867	-103.79156408	2086.245							
12620	WELD	47,982.5	12620	0.0	48.9	47.99836403	-103.79163961	2085.458							
12630	WELD	48,031.3	12630	0.0	39.4	47.99824081	-103.79171552	2084.343							
12640	WELD	48,070.8	12640	0.0	49.6	47.99814112	-103.79177599	2083.194							
12650	WELD	48,120.4	12650	0.0	49.7	47.99801562	-103.79185082	2081.379							
12660	WELD	48,170.1	12660	0.0	49.5	47.99788974	-103.79192511	2080.050							
12670	WELD	48,219.5	12670	0.0	49.5	47.99776484	-103.79199904	2076.785							
12680	WELD	48,269.0	12680	0.0	49.6	47.99764207	-103.79208106	2074.044							
12690	WELD	48,318.6	12690	0.0	49.5	47.99752541	-103.79218265	2074.340							
12700	WELD	48,368.0	12700	0.0	49.7	47.99741849	-103.79230419	2071.791							
12710	WELD	48,417.7	12710	0.0	49.4	47.99731641	-103.79243604	2067.572							
12720	WELD	48,467.2	12720	0.0	49.5	47.99721326	-103.79256424	2063.576							
12730	WELD	48,516.7	12730	0.0	49.3	47.99710467	-103.79267853	2055.981							
12740	WELD	48,566.0	12740	0.0	49.6	47.99699179	-103.79277490	2043.720							
12750	WELD	48,615.6	12750	0.0	49.7	47.99687691	-103.79286292	2029.249							
12760	WELD	48,665.3	12760	0.0	49.6	47.99676058	-103.79295170	2016.203							
12770	WELD	48,715.0	12770	0.0	49.6	47.99664326	-103.79304098	2004.730							
12780	WELD	48,764.6	12780	0.0	49.4	47.99652413	-103.79313036	1996.272							
12790	WELD	48,814.0	12790	0.0	49.4	47.99640368	-103.79321851	1991.506							
12800	WELD	48,863.3	12800	0.0	49.6	47.99628419	-103.79331054	1990.871							
12810	WELD	48,912.9	12810	0.0	49.6	47.99616832	-103.79341430	1994.961							
10000074	Bend right - 10 deg., 70D	48,927.3	12810	10.3	39.3	47.99613647	-103.79344787	1996.698	0	12:00					
12820	WELD	48,962.5	12820	0.0	49.7	47.99606938	-103.79355043	1999.415							
12830	WELD	49,012.2	12830	0.0	49.6	47.99598559	-103.79370884	1996.764							
12840	WELD	49,061.8	12840	0.0	49.6	47.99590734	-103.79387111	1990.026							
12850	WELD	49,111.4	12850	0.0	49.0	47.99582749	-103.79403187	1983.003							
12860	WELD	49,160.5	12860	0.0	48.9	47.99574709	-103.79418835	1975.548							
12870	WELD	49,209.4	12870	0.0	49.6	47.99566645	-103.79434472	1968.697							
12880	WELD	49,258.9	12880	0.0	49.2	47.99558470	-103.79450369	1962.367							
12890	WELD	49,308.1	12890	0.0	49.3	47.99550500	-103.79466203	1955.615							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
12900	WELD	49,357.4	12900	0.0	49.3	47.99542557	-103.79482150	1948.416							
12910	WELD	49,406.7	12910	0.0	49.4	47.99534654	-103.79498078	1941.108							
12920	WELD	49,456.1	12920	0.0	49.6	47.99526585	-103.79513947	1934.514							
12930	WELD	49,505.8	12930	0.0	49.7	47.99518491	-103.79529963	1929.258							
12940	WELD	49,555.5	12940	0.0	23.1	47.99510336	-103.79545992	1924.670							
12950	WELD	49,578.6	12950	0.0	5.9	47.99506472	-103.79553409	1922.958							
10000075	Bend left - 60 deg., 8D	49,581.6	12950	0.1	5.8	47.99505762	-103.79553854	1922.685	0	12:00					
12960	WELD	49,584.6	12960	0.0	9.7	47.99504964	-103.79553743	1922.420							
12970	WELD	49,594.3	12970	0.0	49.6	47.99502325	-103.79553208	1921.508							
12980	WELD	49,643.9	12980	0.0	49.6	47.99489088	-103.79550198	1914.088							
12990	WELD	49,693.4	12990	0.0	49.7	47.99475897	-103.79547004	1905.959							
13000	WELD	49,743.1	13000	0.0	20.0	47.99462756	-103.79543989	1895.628							
11000056	WT CHANGE	49,763.0	13000	0.0	0.1	47.99457590	-103.79542998	1891.290				0.322	52000	0.72	
13010	WELD	49,763.1	13010	0.0	42.1	47.99457565	-103.79542992	1891.268							
13020	WELD	49,805.2	13020	0.0	42.2	47.99446531	-103.79540752	1881.377							
13030	WELD	49,847.4	13030	0.0	42.3	47.99435239	-103.79538602	1875.496							
13040	WELD	49,889.7	13040	0.0	42.3	47.99423772	-103.79537409	1877.162							
13050	WELD	49,932.0	13050	0.0	42.3	47.99412588	-103.79537140	1887.187							
13060	WELD	49,974.3	13060	0.0	42.2	47.99401559	-103.79537259	1899.532							
13070	WELD	50,016.6	13070	0.0	34.6	47.99390336	-103.79538775	1908.160							
13080	WELD	50,051.2	13080	0.0	1.1	47.99381059	-103.79540870	1911.816							
10000076	Bend right - 30 deg., 3D	50,051.7	13080	0.1	1.0	47.99380947	-103.79540953	1911.834	0	12:00					
11000057	WT CHANGE	50,052.2	13080	0.0	0.1	47.99380843	-103.79541052	1911.834				0.188	52000	0.72	
13090	WELD	50,052.2	13090	0.0	31.7	47.99380829	-103.79541066	1911.834							
13100	WELD	50,083.9	13100	0.0	49.4	47.99373853	-103.79548838	1911.675							
10000077	AGM 080, Sta. 499+96, ROW -- Han #3713	50,090.1	13100	6.2	43.2	47.99372506	-103.79550363	1911.338							
13110	WELD	50,133.3	13110	0.0	49.6	47.99363149	-103.79560998	1908.218							
13120	WELD	50,182.9	13120	0.0	49.6	47.99352380	-103.79573219	1905.565							
13130	WELD	50,232.5	13130	0.0	49.7	47.99341592	-103.79585407	1902.749							
13140	WELD	50,282.2	13140	0.0	49.3	47.99330713	-103.79597406	1899.655							
13150	WELD	50,331.5	13150	0.0	49.5	47.99319559	-103.79608664	1897.894							
13160	WELD	50,381.0	13160	0.0	49.7	47.99307946	-103.79618955	1896.335							
10000078	Bend left - 11 deg., 71D	50,397.9	13160	10.3	39.3	47.99303839	-103.79622011	1896.002	0	12:00					
10000079	Bend left - 14 deg., 82D	50,414.5	13160	26.7	22.9	47.99299542	-103.79624065	1894.854	0	12:00					
13170	WELD	50,430.7	13170	0.0	26.6	47.99295235	-103.79625081	1892.547							
10000080	Bend left - 15 deg., 43D	50,448.7	13170	13.0	13.6	47.99290435	-103.79625790	1889.342	0	12:00					

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
13180	WELD	50,457.3	13180	0.0	23.1	47.99288155	-103.79625425	1887.780							
13190	WELD	50,480.4	13190	0.0	49.6	47.99281997	-103.79623952	1884.328							
13200	WELD	50,530.0	13200	0.0	49.4	47.99268827	-103.79619386	1882.533							
13210	WELD	50,579.5	13210	0.0	49.4	47.99255992	-103.79613225	1882.832							
13220	WELD	50,628.9	13220	0.0	49.6	47.99243406	-103.79605969	1883.143							
13230	WELD	50,678.5	13230	0.0	49.2	47.99231027	-103.79597670	1883.335							
13240	WELD	50,727.7	13240	0.0	49.4	47.99218863	-103.79589073	1884.511							
13250	WELD	50,777.1	13250	0.0	49.5	47.99206684	-103.79580278	1885.122							
13260	WELD	50,826.6	13260	0.0	49.5	47.99194589	-103.79571224	1886.356							
13270	WELD	50,876.2	13270	0.0	49.4	47.99182689	-103.79561589	1889.499							
13280	WELD	50,925.6	13280	0.0	49.7	47.99171318	-103.79550869	1894.016							
13290	WELD	50,975.3	13290	0.0	49.5	47.99160669	-103.79538550	1899.000							
13300	WELD	51,024.8	13300	0.0	49.5	47.99150499	-103.79525343	1902.710							
13310	WELD	51,074.3	13310	0.0	49.6	47.99140595	-103.79511699	1907.368							
13320	WELD	51,123.9	13320	0.0	47.8	47.99131057	-103.79497515	1911.947							
13330	WELD	51,171.7	13330	0.0	49.6	47.99122182	-103.79483327	1914.997							
13340	WELD	51,221.3	13340	0.0	49.7	47.99113175	-103.79468328	1918.384							
13350	WELD	51,271.1	13350	0.0	49.7	47.99104138	-103.79453315	1921.873							
13360	WELD	51,320.7	13360	0.0	49.7	47.99094904	-103.79438563	1922.750							
13370	WELD	51,370.4	13370	0.0	49.7	47.99085321	-103.79424338	1921.812							
13380	WELD	51,420.1	13380	0.0	49.4	47.99075211	-103.79410972	1917.686							
13390	WELD	51,469.5	13390	0.0	49.8	47.99064424	-103.79399294	1911.788							
13400	WELD	51,519.3	13400	0.0	49.8	47.99052196	-103.79391002	1905.643							
10000081	Bend right-up - 10 deg., 51D	51,539.0	13400	16.0	33.8	47.99047095	-103.79388759	1902.659	0	12:00					
13410	WELD	51,569.1	13410	0.0	49.8	47.99039012	-103.79387198	1899.645							
13420	WELD	51,618.9	13420	0.0	14.2	47.99025524	-103.79385219	1896.559							
11000058	WT CHANGE	51,632.9	13420	0.0	0.1	47.99021739	-103.79384692	1895.634				0.322	52000	0.72	
13430	WELD	51,633.1	13430	0.0	42.1	47.99021705	-103.79384687	1895.622							
13440	WELD	51,675.2	13440	0.0	42.2	47.99010291	-103.79383151	1891.558							
13450	WELD	51,717.5	13450	0.0	42.2	47.98998987	-103.79381534	1885.195							
13460	WELD	51,759.7	13460	0.0	42.3	47.98987599	-103.79380240	1880.629							
13470	WELD	51,802.0	13470	0.0	42.2	47.98976165	-103.79378665	1882.969							
13480	WELD	51,844.2	13480	0.0	42.3	47.98964889	-103.79376618	1889.908							
13490	WELD	51,886.5	13490	0.0	42.2	47.98953814	-103.79374410	1900.376							
13500	WELD	51,928.7	13500	0.0	42.2	47.98942658	-103.79372584	1909.687							
13510	WELD	51,970.9	13510	0.0	42.1	47.98931287	-103.79370927	1915.022							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
11000059	WT CHANGE	52,012.9	13510	0.0	0.1	47.98919921	-103.79369263	1918.816				0.188	52000	0.72	
13520	WELD	52,013.0	13520	0.0	21.7	47.98919894	-103.79369259	1918.825							
13530	WELD	52,034.7	13530	0.0	49.7	47.98914019	-103.79368481	1921.361							
13540	WELD	52,084.4	13540	0.0	49.6	47.98900592	-103.79366803	1927.730							
13550	WELD	52,133.9	13550	0.0	49.7	47.98887159	-103.79365080	1933.300							
10000082	Bend left - 10 deg., 44D	52,152.1	13550	13.0	36.7	47.98882258	-103.79364160	1935.040	0	12:00					
13560	WELD	52,183.7	13560	0.0	49.5	47.98874052	-103.79360471	1938.002							
13570	WELD	52,233.2	13570	0.0	49.5	47.98861739	-103.79352251	1939.394							
13580	WELD	52,282.7	13580	0.0	49.5	47.98850808	-103.79341246	1950.797							
13590	WELD	52,332.3	13590	0.0	49.1	47.98840365	-103.79329144	1961.562							
13600	WELD	52,381.4	13600	0.0	49.5	47.98830046	-103.79316802	1969.676							
13610	WELD	52,430.8	13610	0.0	49.6	47.98819655	-103.79304140	1976.682							
13620	WELD	52,480.5	13620	0.0	49.5	47.98809251	-103.79291448	1983.540							
13630	WELD	52,530.0	13630	0.0	49.6	47.98798611	-103.79279232	1990.369							
13640	WELD	52,579.6	13640	0.0	49.6	47.98787303	-103.79268176	1993.477							
10000083	Bend right - 13 deg., 34D	52,597.8	13640	15.4	34.2	47.98782859	-103.79264853	1994.513	0	12:00					
13650	WELD	52,629.2	13650	0.0	49.7	47.98774607	-103.79261522	1998.301							
13660	WELD	52,678.9	13660	0.0	49.7	47.98761366	-103.79257476	2003.650							
13670	WELD	52,728.6	13670	0.0	49.7	47.98747957	-103.79255104	2006.940							
13680	WELD	52,778.3	13680	0.0	49.7	47.98734559	-103.79256596	2013.377							
10000084	Bend right - 13 deg., 51D	52,797.4	13680	15.2	34.6	47.98729599	-103.79258521	2016.775	0	12:00					
13690	WELD	52,828.1	13690	0.0	49.4	47.98722067	-103.79263745	2021.148							
13700	WELD	52,877.4	13700	0.0	49.7	47.98710343	-103.79273420	2026.557							
13710	WELD	52,927.2	13710	0.0	49.4	47.98698783	-103.79283770	2032.229							
13720	WELD	52,976.5	13720	0.0	49.6	47.98687115	-103.79293613	2037.599							
13730	WELD	53,026.1	13730	0.0	49.6	47.98675134	-103.79302675	2043.844							
13740	WELD	53,075.8	13740	0.0	49.6	47.98662781	-103.79310136	2052.051							
13750	WELD	53,125.4	13750	0.0	49.6	47.98649905	-103.79315353	2060.803							
13760	WELD	53,175.0	13760	0.0	49.5	47.98636867	-103.79319183	2070.512							
10000085	Bend left - 10 deg., 46D	53,207.8	13760	29.7	19.8	47.98628138	-103.79320831	2076.542	0	12:00					
13770	WELD	53,224.6	13770	0.0	49.6	47.98623623	-103.79320418	2079.426							
10000086	Bend left - 15 deg., 26D	53,239.0	13770	10.9	38.6	47.98619763	-103.79319646	2081.539	0	12:00					
13780	WELD	53,274.1	13780	0.0	49.3	47.98610857	-103.79314608	2086.445							
13790	WELD	53,323.4	13790	0.0	49.6	47.98598743	-103.79306208	2092.659							
13800	WELD	53,373.0	13800	0.0	49.6	47.98586653	-103.79297389	2098.354							
13810	WELD	53,422.6	13810	0.0	49.6	47.98574445	-103.79288903	2103.899							
13820	WELD	53,472.1	13820	0.0	49.6	47.98562128	-103.79280825	2109.653							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
13830	WELD	53,521.7	13830	0.0	49.5	47.98549505	-103.79273676	2115.060							
13840	WELD	53,571.2	13840	0.0	49.3	47.98536516	-103.79267963	2117.278							
13850	WELD	53,620.5	13850	0.0	49.3	47.98523379	-103.79263344	2116.552							
13860	WELD	53,669.8	13860	0.0	47.3	47.98510394	-103.79257899	2114.811							
13870	WELD	53,717.2	13870	0.0	42.1	47.98498021	-103.79252313	2113.550							
13880	WELD	53,759.3	13880	0.0	49.0	47.98487068	-103.79247122	2117.137							
13890	WELD	53,808.3	13890	0.0	49.5	47.98474423	-103.79241089	2124.819							
13900	WELD	53,857.9	13900	0.0	49.6	47.98461574	-103.79235341	2132.597							
13910	WELD	53,907.4	13910	0.0	49.3	47.98448488	-103.79230106	2134.451							
13920	WELD	53,956.7	13920	0.0	49.5	47.98435367	-103.79225410	2134.308							
13930	WELD	54,006.3	13930	0.0	49.3	47.98422138	-103.79221018	2134.269							
13940	WELD	54,055.5	13940	0.0	49.4	47.98409017	-103.79216487	2132.498							
13950	WELD	54,104.9	13950	0.0	49.6	47.98395978	-103.79211564	2128.761							
13960	WELD	54,154.5	13960	0.0	49.7	47.98382928	-103.79206499	2124.125							
13970	WELD	54,204.2	13970	0.0	49.7	47.98369784	-103.79201723	2120.039							
13980	WELD	54,253.9	13980	0.0	49.3	47.98356645	-103.79196914	2117.068							
13990	WELD	54,303.2	13990	0.0	49.7	47.98343655	-103.79191681	2118.667							
14000	WELD	54,352.9	14000	0.0	49.7	47.98330694	-103.79186270	2124.129							
14010	WELD	54,402.5	14010	0.0	49.6	47.98317775	-103.79180742	2130.906							
14020	WELD	54,452.1	14020	0.0	49.7	47.98304868	-103.79175271	2137.884							
14030	WELD	54,501.8	14030	0.0	49.7	47.98291853	-103.79170226	2145.051							
14040	WELD	54,551.5	14040	0.0	49.8	47.98278564	-103.79166741	2147.179							
14050	WELD	54,601.3	14050	0.0	47.5	47.98265007	-103.79166951	2144.868							
14060	WELD	54,648.8	14060	0.0	49.0	47.98252088	-103.79168755	2144.293							
20000014	Seam Variation	54,670.8	14060	21.9	27.1	47.98246132	-103.79169692	2144.080	103	3:15	-	0.47	0.33		
14070	WELD	54,697.8	14070	0.0	49.5	47.98238792	-103.79170916	2144.379							
14080	WELD	54,747.3	14080	0.0	49.6	47.98225351	-103.79173241	2144.333							
14090	WELD	54,797.0	14090	0.0	49.7	47.98211920	-103.79175470	2140.525							
14100	WELD	54,846.7	14100	0.0	49.6	47.98198462	-103.79177398	2136.104							
14110	WELD	54,896.3	14110	0.0	49.7	47.98184973	-103.79179274	2133.604							
20000015	Seam Variation	54,911.2	14110	14.9	34.8	47.98180912	-103.79179842	2133.435	254	8:15	-	1.18	0.45		
14120	WELD	54,946.0	14120	0.0	49.5	47.98171459	-103.79181117	2133.110							
14130	WELD	54,995.5	14130	0.0	49.6	47.98157978	-103.79182836	2131.459							
14140	WELD	55,045.1	14140	0.0	49.5	47.98144464	-103.79184595	2130.292							
14150	WELD	55,094.6	14150	0.0	49.6	47.98130984	-103.79186601	2130.201							
14160	WELD	55,144.2	14160	0.0	49.5	47.98117497	-103.79188650	2132.349							
14170	WELD	55,193.7	14170	0.0	49.6	47.98103997	-103.79190575	2135.794							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14180	WELD	55,243.3	14180	0.0	49.5	47.98090521	-103.79192615	2138.872							
14190	WELD	55,292.8	14190	0.0	49.3	47.98077020	-103.79194692	2140.427							
14200	WELD	55,342.2	14200	0.0	49.5	47.98063585	-103.79196726	2141.624							
14210	WELD	55,391.7	14210	0.0	49.6	47.98050077	-103.79198583	2143.463							
14220	WELD	55,441.4	14220	0.0	49.6	47.98036569	-103.79200108	2141.642							
14230	WELD	55,490.9	14230	0.0	49.7	47.98023098	-103.79201434	2138.052							
14240	WELD	55,540.6	14240	0.0	40.6	47.98009572	-103.79202884	2136.318							
10000087	AGM 090, Sta. 553+29, ROW -- Han #8456	55,546.5	14240	5.9	34.7	47.98007952	-103.79203074	2136.108							
14250	WELD	55,581.2	14250	0.0	49.7	47.97998570	-103.79204157	2133.836							
14260	WELD	55,630.9	14260	0.0	49.7	47.97985087	-103.79205831	2130.286							
14270	WELD	55,680.6	14270	0.0	49.7	47.97971641	-103.79207622	2126.268							
14280	WELD	55,730.4	14280	0.0	49.6	47.97958298	-103.79209719	2119.542							
14290	WELD	55,780.0	14290	0.0	39.7	47.97944965	-103.79211870	2113.619							
11000060	WT CHANGE	55,819.6	14290	0.0	0.1	47.97934408	-103.79213788	2107.581				0.322	52000	0.72	
14300	WELD	55,819.7	14300	0.0	20.9	47.97934380	-103.79213794	2107.558							
14310	WELD	55,840.6	14310	0.0	42.2	47.97928839	-103.79214797	2102.914							
14320	WELD	55,882.8	14320	0.0	42.2	47.97917812	-103.79216625	2092.084							
14330	WELD	55,925.1	14330	0.0	42.3	47.97906584	-103.79218449	2084.238							
14340	WELD	55,967.4	14340	0.0	42.3	47.97895155	-103.79220029	2085.228							
14350	WELD	56,009.6	14350	0.0	42.2	47.97884006	-103.79222268	2094.309							
14360	WELD	56,051.8	14360	0.0	42.2	47.97872876	-103.79224461	2103.635							
11000061	WT CHANGE	56,094.0	14360	0.0	0.1	47.97861605	-103.79226362	2110.452				0.188	52000	0.72	
14370	WELD	56,094.1	14370	0.0	13.1	47.97861579	-103.79226367	2110.466							
14380	WELD	56,107.2	14380	0.0	49.6	47.97858055	-103.79226854	2112.248							
14390	WELD	56,156.7	14390	0.0	49.3	47.97844590	-103.79227993	2116.422							
14400	WELD	56,206.0	14400	0.0	49.2	47.97831163	-103.79228406	2120.022							
14410	WELD	56,255.2	14410	0.0	42.4	47.97817731	-103.79229319	2122.109							
14420	WELD	56,297.6	14420	0.0	49.6	47.97806186	-103.79230306	2124.216							
10000088	Bend left - 18 deg., 14D	56,332.6	14420	25.5	24.1	47.97796648	-103.79230647	2125.707	0	12:00					
14430	WELD	56,347.2	14430	0.0	49.6	47.97792735	-103.79229481	2126.359							
10000089	Bend left - 14 deg., 67D	56,365.7	14430	12.7	36.9	47.97787807	-103.79227857	2127.139	0	12:00					
14440	WELD	56,396.8	14440	0.0	49.6	47.97779933	-103.79223186	2129.242							
14450	WELD	56,446.4	14450	0.0	49.5	47.97767592	-103.79214981	2133.162							
14460	WELD	56,495.9	14460	0.0	49.4	47.97755402	-103.79206278	2136.869							
14470	WELD	56,545.2	14470	0.0	49.3	47.97743299	-103.79197575	2141.283							
14480	WELD	56,594.5	14480	0.0	49.5	47.97731136	-103.79189130	2146.412							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14490	WELD	56,644.0	14490	0.0	49.3	47.97718890	-103.79180777	2152.041							
14500	WELD	56,693.3	14500	0.0	49.6	47.97706659	-103.79172341	2154.636							
13000005	GAIN	56,696.8	14500	3.5	46.1	47.97705787	-103.79171724	2154.667	67	2:00					
13000006	GAIN	56,728.6	14500	35.2	14.4	47.97697922	-103.79166173	2154.582	49	1:30					
14510	WELD	56,742.9	14510	0.0	49.5	47.97694393	-103.79163714	2154.209							
14520	WELD	56,792.3	14520	0.0	49.5	47.97682185	-103.79155037	2152.220							
14530	WELD	56,841.8	14530	0.0	49.5	47.97669903	-103.79146550	2151.008							
14540	WELD	56,891.3	14540	0.0	49.6	47.97657576	-103.79138242	2150.021							
14550	WELD	56,940.9	14550	0.0	49.5	47.97645264	-103.79129875	2149.541							
14560	WELD	56,990.3	14560	0.0	49.6	47.97632963	-103.79121471	2148.313							
14570	WELD	57,039.9	14570	0.0	49.6	47.97620643	-103.79113104	2147.076							
14580	WELD	57,089.5	14580	0.0	49.5	47.97608314	-103.79104782	2145.296							
14590	WELD	57,139.0	14590	0.0	49.6	47.97595999	-103.79096545	2143.255							
14600	WELD	57,188.6	14600	0.0	48.2	47.97583647	-103.79088268	2142.841							
14610	WELD	57,236.8	14610	0.0	49.6	47.97571663	-103.79080195	2142.952							
14620	WELD	57,286.4	14620	0.0	49.7	47.97559401	-103.79071682	2140.731							
14630	WELD	57,336.1	14630	0.0	49.7	47.97547200	-103.79063057	2137.187							
14640	WELD	57,385.9	14640	0.0	49.4	47.97534904	-103.79054552	2135.817							
14650	WELD	57,435.2	14650	0.0	49.6	47.97522722	-103.79046175	2139.063							
14660	WELD	57,484.8	14660	0.0	47.6	47.97510382	-103.79037940	2141.582							
14670	WELD	57,532.5	14670	0.0	49.4	47.97498477	-103.79030191	2141.737							
14680	WELD	57,581.9	14680	0.0	49.7	47.97486182	-103.79021915	2141.611							
14690	WELD	57,631.5	14690	0.0	49.5	47.97473905	-103.79013300	2141.816							
14700	WELD	57,681.0	14700	0.0	49.4	47.97461720	-103.79004654	2143.313							
14710	WELD	57,730.4	14710	0.0	43.7	47.97449481	-103.78996151	2144.261							
14720	WELD	57,774.1	14720	0.0	49.5	47.97438637	-103.78988726	2144.559							
14730	WELD	57,823.6	14730	0.0	49.4	47.97426299	-103.78980343	2143.841							
14740	WELD	57,873.0	14740	0.0	49.0	47.97413976	-103.78972077	2143.112							
14750	WELD	57,922.0	14750	0.0	49.2	47.97401820	-103.78963764	2141.181							
14760	WELD	57,971.2	14760	0.0	49.4	47.97389735	-103.78955178	2137.061							
14770	WELD	58,020.6	14770	0.0	49.3	47.97377543	-103.78946490	2136.989							
14780	WELD	58,069.8	14780	0.0	49.4	47.97365432	-103.78937842	2140.683							
14790	WELD	58,119.3	14790	0.0	49.2	47.97353222	-103.78929231	2143.122							
14800	WELD	58,168.5	14800	0.0	49.2	47.97340970	-103.78920879	2144.196							
14810	WELD	58,217.7	14810	0.0	49.5	47.97328608	-103.78912927	2144.155							
14820	WELD	58,267.1	14820	0.0	49.5	47.97316001	-103.78905543	2143.442							
14830	WELD	58,316.7	14830	0.0	49.3	47.97303234	-103.78899181	2139.101							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
14840	WELD	58,366.0	14840	0.0	49.6	47.97290363	-103.78894129	2131.886							
14850	WELD	58,415.6	14850	0.0	49.6	47.97277273	-103.78889629	2125.184							
14860	WELD	58,465.2	14860	0.0	49.4	47.97264202	-103.78885226	2118.268							
14870	WELD	58,514.5	14870	0.0	49.7	47.97251123	-103.78880641	2116.584							
14880	WELD	58,564.2	14880	0.0	49.5	47.97238169	-103.78876106	2126.217							
14890	WELD	58,613.7	14890	0.0	49.7	47.97225209	-103.78871670	2134.626							
14900	WELD	58,663.4	14900	0.0	49.6	47.97212067	-103.78867019	2138.696							
14910	WELD	58,713.0	14910	0.0	49.4	47.97198943	-103.78862213	2139.610							
14920	WELD	58,762.4	14920	0.0	49.7	47.97185879	-103.78857244	2138.860							
14930	WELD	58,812.1	14930	0.0	49.7	47.97172763	-103.78852251	2138.248							
14940	WELD	58,861.8	14940	0.0	49.6	47.97159610	-103.78847620	2136.160							
14950	WELD	58,911.4	14950	0.0	48.9	47.97146457	-103.78843010	2135.240							
14960	WELD	58,960.2	14960	0.0	39.8	47.97133453	-103.78838546	2134.392							
10000090	AGM 100, Sta. 587+47, ROW -- Han #3713	58,974.2	14960	14.0	25.8	47.97129694	-103.78837454	2133.833							
14970	WELD	59,000.1	14970	0.0	48.7	47.97122694	-103.78836001	2133.271							
14980	WELD	59,048.8	14980	0.0	49.5	47.97109396	-103.78834743	2131.609							
14990	WELD	59,098.3	14990	0.0	49.1	47.97095873	-103.78833982	2130.154							
15000	WELD	59,147.5	15000	0.0	49.4	47.97082465	-103.78833040	2128.871							
15010	WELD	59,196.8	15010	0.0	48.8	47.97069006	-103.78832056	2127.494							
15020	WELD	59,245.6	15020	0.0	49.5	47.97055691	-103.78831210	2126.795							
15030	WELD	59,295.2	15030	0.0	49.5	47.97042157	-103.78830292	2126.800							
15040	WELD	59,344.7	15040	0.0	49.5	47.97028630	-103.78829440	2126.444							
15050	WELD	59,394.1	15050	0.0	49.5	47.97015133	-103.78828642	2124.937							
15060	WELD	59,443.6	15060	0.0	49.5	47.97001633	-103.78827792	2122.424							
15070	WELD	59,493.1	15070	0.0	49.1	47.96988103	-103.78826771	2120.595							
15080	WELD	59,542.2	15080	0.0	49.4	47.96974685	-103.78825810	2118.462							
15090	WELD	59,591.7	15090	0.0	49.5	47.96961192	-103.78824956	2116.291							
15100	WELD	59,641.1	15100	0.0	49.6	47.96947650	-103.78824251	2115.394							
15110	WELD	59,690.7	15110	0.0	49.5	47.96934115	-103.78823874	2114.851							
15120	WELD	59,740.3	15120	0.0	49.6	47.96920612	-103.78823455	2112.386							
15130	WELD	59,789.9	15130	0.0	49.6	47.96907545	-103.78822273	2100.778							
15140	WELD	59,839.5	15140	0.0	47.4	47.96894755	-103.78820657	2085.512							
15150	WELD	59,886.9	15150	0.0	49.4	47.96882110	-103.78819103	2076.368							
13000007	GAIN	59,890.2	15150	3.2	46.1	47.96881228	-103.78819003	2075.901	174	5:45					
15160	WELD	59,936.3	15160	0.0	49.6	47.96868785	-103.78817806	2070.108							
15170	WELD	59,985.8	15170	0.0	49.6	47.96855391	-103.78818381	2063.639							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15180	WELD	60,035.5	15180	0.0	49.6	47.96842071	-103.78820530	2056.853						
15190	WELD	60,085.0	15190	0.0	49.7	47.96828863	-103.78823622	2049.450						
15200	WELD	60,134.7	15200	0.0	49.2	47.96815701	-103.78827350	2042.087						
15210	WELD	60,183.9	15210	0.0	49.7	47.96802701	-103.78831485	2035.746						
15220	WELD	60,233.6	15220	0.0	49.4	47.96789550	-103.78835744	2030.279						
15230	WELD	60,283.0	15230	0.0	49.5	47.96776425	-103.78839924	2026.211						
15240	WELD	60,332.5	15240	0.0	49.6	47.96763231	-103.78844016	2021.922						
15250	WELD	60,382.1	15250	0.0	49.6	47.96750052	-103.78848098	2017.569						
15260	WELD	60,431.7	15260	0.0	49.7	47.96736878	-103.78852263	2011.981						
15270	WELD	60,481.4	15270	0.0	49.6	47.96723719	-103.78856531	2006.107						
15280	WELD	60,531.0	15280	0.0	49.5	47.96710617	-103.78861057	2000.224						
15290	WELD	60,580.6	15290	0.0	49.6	47.96697470	-103.78865596	1995.627						
15300	WELD	60,630.1	15300	0.0	49.6	47.96684364	-103.78870266	1990.211						
15310	WELD	60,679.8	15310	0.0	49.5	47.96671204	-103.78875069	1987.360						
15320	WELD	60,729.2	15320	0.0	49.6	47.96658126	-103.78880109	1991.065						
15330	WELD	60,778.8	15330	0.0	49.5	47.96645056	-103.78885389	1994.236						
15340	WELD	60,828.3	15340	0.0	49.6	47.96631959	-103.78890595	1995.630						
15350	WELD	60,877.9	15350	0.0	49.5	47.96618831	-103.78895609	1995.806						
15360	WELD	60,927.4	15360	0.0	49.6	47.96605594	-103.78899760	1993.281						
15370	WELD	60,977.0	15370	0.0	49.6	47.96592202	-103.78902449	1991.258						
15380	WELD	61,026.6	15380	0.0	49.5	47.96578721	-103.78901478	1988.307						
15390	WELD	61,076.0	15390	0.0	49.6	47.96565405	-103.78897909	1987.799						
15400	WELD	61,125.7	15400	0.0	49.4	47.96552171	-103.78893554	1988.845						
15410	WELD	61,175.1	15410	0.0	49.7	47.96539028	-103.78889068	1989.499						
15420	WELD	61,224.8	15420	0.0	49.3	47.96525746	-103.78884934	1989.993						
15430	WELD	61,274.1	15430	0.0	49.7	47.96512616	-103.78880497	1990.080						
15440	WELD	61,323.8	15440	0.0	49.7	47.96499349	-103.78876212	1990.227						
15450	WELD	61,373.5	15450	0.0	49.7	47.96486054	-103.78872223	1991.181						
15460	WELD	61,423.2	15460	0.0	49.7	47.96472807	-103.78867934	1992.079						
15470	WELD	61,472.9	15470	0.0	49.6	47.96459568	-103.78863548	1993.584						
15480	WELD	61,522.4	15480	0.0	49.7	47.96446370	-103.78859391	1996.973						
15490	WELD	61,572.2	15490	0.0	49.7	47.96433058	-103.78855688	1999.725						
15500	WELD	61,621.8	15500	0.0	49.6	47.96419719	-103.78852525	2003.594						
15510	WELD	61,671.5	15510	0.0	49.6	47.96406295	-103.78849937	2005.855						
15520	WELD	61,721.1	15520	0.0	49.6	47.96392838	-103.78847670	2006.765						
15530	WELD	61,770.7	15530	0.0	49.6	47.96379375	-103.78845380	2006.815						
15540	WELD	61,820.3	15540	0.0	49.6	47.96365910	-103.78842923	2007.678						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15550	WELD	61,869.8	15550	0.0	49.3	47.96352475	-103.78840423	2008.810							
15560	WELD	61,919.2	15560	0.0	49.6	47.96339118	-103.78837928	2011.708							
15570	WELD	61,968.8	15570	0.0	48.8	47.96325718	-103.78835180	2014.680							
15580	WELD	62,017.6	15580	0.0	49.5	47.96312586	-103.78831823	2017.799							
15590	WELD	62,067.2	15590	0.0	49.5	47.96299393	-103.78827624	2020.876							
15600	WELD	62,116.7	15600	0.0	49.5	47.96286305	-103.78822622	2024.680							
15610	WELD	62,166.2	15610	0.0	49.5	47.96273300	-103.78817224	2028.785							
15620	WELD	62,215.7	15620	0.0	48.8	47.96260366	-103.78811504	2032.916							
15630	WELD	62,264.4	15630	0.0	49.5	47.96247629	-103.78805613	2035.958							
15640	WELD	62,314.0	15640	0.0	49.6	47.96234729	-103.78799433	2037.447							
15650	WELD	62,363.6	15650	0.0	45.2	47.96221795	-103.78793170	2037.765							
15660	WELD	62,408.8	15660	0.0	49.0	47.96210014	-103.78787629	2035.770							
15670	WELD	62,457.7	15670	0.0	49.7	47.96197259	-103.78781795	2033.671							
15680	WELD	62,507.4	15680	0.0	49.7	47.96184310	-103.78776004	2036.993							
20000016	Seam Variation	62,537.4	15680	29.9	19.7	47.96176527	-103.78772636	2041.047	276	9:00	-	1.18	0.75		
15690	WELD	62,557.1	15690	0.0	49.6	47.96171382	-103.78770507	2043.286							
15700	WELD	62,606.7	15700	0.0	49.6	47.96158388	-103.78765251	2049.235							
15710	WELD	62,656.4	15710	0.0	49.6	47.96145292	-103.78760310	2053.694							
15720	WELD	62,705.9	15720	0.0	48.6	47.96132153	-103.78755755	2057.675							
15730	WELD	62,754.6	15730	0.0	6.9	47.96119207	-103.78751785	2061.969							
15740	WELD	62,761.5	15740	0.0	41.2	47.96117365	-103.78751280	2062.527							
15750	WELD	62,802.7	15750	0.0	49.7	47.96106306	-103.78748500	2066.146							
15760	WELD	62,852.4	15760	0.0	49.8	47.96092969	-103.78745432	2071.596							
15770	WELD	62,902.2	15770	0.0	49.8	47.96079516	-103.78745093	2077.701							
15780	WELD	62,952.0	15780	0.0	49.7	47.96066073	-103.78746652	2083.928							
15790	WELD	63,001.7	15790	0.0	49.5	47.96052694	-103.78749147	2089.696							
15800	WELD	63,051.3	15800	0.0	49.7	47.96039416	-103.78751571	2097.012							
15810	WELD	63,101.0	15810	0.0	49.7	47.96026288	-103.78753837	2108.039							
15820	WELD	63,150.7	15820	0.0	49.6	47.96013445	-103.78756163	2123.071							
15830	WELD	63,200.3	15830	0.0	49.6	47.96000599	-103.78758865	2137.422							
15840	WELD	63,249.9	15840	0.0	49.6	47.95987594	-103.78762150	2148.949							
15850	WELD	63,299.5	15850	0.0	49.6	47.95974435	-103.78766014	2155.987							
15860	WELD	63,349.0	15860	0.0	49.3	47.95961236	-103.78770459	2159.358							
15870	WELD	63,398.4	15870	0.0	49.7	47.95948205	-103.78775412	2162.077							
15880	WELD	63,448.0	15880	0.0	49.7	47.95935163	-103.78780879	2164.636							
15890	WELD	63,497.7	15890	0.0	49.7	47.95922085	-103.78786169	2167.748							
15900	WELD	63,547.4	15900	0.0	49.6	47.95908923	-103.78790970	2170.290							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
15910	WELD	63,596.9	15910	0.0	49.6	47.95895683	-103.78795131	2171.144							
15920	WELD	63,646.5	15920	0.0	49.5	47.95882382	-103.78799029	2172.448							
15930	WELD	63,696.0	15930	0.0	49.6	47.95869086	-103.78802814	2173.957							
15940	WELD	63,745.6	15940	0.0	49.5	47.95855730	-103.78806370	2174.803							
15950	WELD	63,795.0	15950	0.0	49.6	47.95842247	-103.78807731	2174.820							
15960	WELD	63,844.6	15960	0.0	49.7	47.95828676	-103.78807760	2174.886							
20000017	Seam Variation	63,852.9	15960	8.2	41.4	47.95826418	-103.78807700	2174.813	84	2:45	-	1.30	1.05		
15970	WELD	63,894.3	15970	0.0	49.6	47.95815115	-103.78807385	2174.668							
15980	WELD	63,943.9	15980	0.0	49.5	47.95801551	-103.78807070	2174.171							
15990	WELD	63,993.4	15990	0.0	49.5	47.95788055	-103.78806840	2172.718							
16000	WELD	64,042.9	16000	0.0	49.7	47.95774513	-103.78806670	2172.958							
16010	WELD	64,092.7	16010	0.0	49.6	47.95760931	-103.78806430	2174.143							
16020	WELD	64,142.2	16020	0.0	49.6	47.95747391	-103.78805993	2175.213							
16030	WELD	64,191.9	16030	0.0	49.6	47.95733867	-103.78805132	2175.493							
16040	WELD	64,241.5	16040	0.0	49.4	47.95720406	-103.78803846	2172.384							
16050	WELD	64,290.9	16050	0.0	49.6	47.95706969	-103.78802271	2172.653							
16060	WELD	64,340.5	16060	0.0	49.6	47.95693521	-103.78800200	2175.320							
16070	WELD	64,390.1	16070	0.0	49.5	47.95680119	-103.78797709	2176.832							
16080	WELD	64,439.6	16080	0.0	46.3	47.95666741	-103.78795114	2177.512							
16090	WELD	64,485.9	16090	0.0	49.6	47.95654220	-103.78792739	2176.922							
16100	WELD	64,535.5	16100	0.0	49.3	47.95640817	-103.78790039	2177.215							
16110	WELD	64,584.8	16110	0.0	49.6	47.95627534	-103.78786769	2178.987							
20000018	Seam Variation	64,618.9	16110	34.0	15.6	47.95618440	-103.78783960	2180.069	56	1:45	-	0.82	0.54		
16120	WELD	64,634.4	16120	0.0	49.6	47.95614293	-103.78782611	2180.238							
16130	WELD	64,684.0	16130	0.0	49.6	47.95601121	-103.78778075	2180.296							
16140	WELD	64,733.6	16140	0.0	49.4	47.95588019	-103.78773110	2180.729							
16150	WELD	64,783.0	16150	0.0	49.7	47.95575008	-103.78767845	2180.682							
16160	WELD	64,832.8	16160	0.0	49.6	47.95561939	-103.78762423	2180.486							
16170	WELD	64,882.4	16170	0.0	49.5	47.95548912	-103.78756916	2180.080							
16180	WELD	64,931.9	16180	0.0	49.5	47.95535909	-103.78751305	2179.596							
16190	WELD	64,981.4	16190	0.0	49.2	47.95522927	-103.78745719	2178.443							
16200	WELD	65,030.7	16200	0.0	49.6	47.95509956	-103.78740398	2177.818							
16210	WELD	65,080.2	16210	0.0	49.3	47.95496975	-103.78734762	2176.607							
16220	WELD	65,129.6	16220	0.0	49.5	47.95484095	-103.78728891	2175.678							
16230	WELD	65,179.0	16230	0.0	41.4	47.95471142	-103.78723139	2174.073							
11000062	WT CHANGE	65,220.3	16230	0.0	0.1	47.95460281	-103.78718662	2172.487				0.322	52000	0.72	
16240	WELD	65,220.4	16240	0.0	40.9	47.95460253	-103.78718651	2172.481							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
16250	WELD	65,261.3	16250	0.0	42.2	47.95449485	-103.78714305	2169.436							
16260	WELD	65,303.5	16260	0.0	42.2	47.95438390	-103.78709802	2169.148							
10000091	AGM 110, Sta. 652+58, Gravel Rd. -- Survey Point	65,324.6	16260	21.1	21.1	47.95432791	-103.78707714	2169.416							
16270	WELD	65,345.7	16270	0.0	42.1	47.95427195	-103.78705769	2169.573							
11000063	WT CHANGE	65,387.8	16270	0.0	0.1	47.95415962	-103.78702119	2170.329				0.188	52000	0.72	
16280	WELD	65,387.9	16280	0.0	48.1	47.95415938	-103.78702112	2170.329							
16290	WELD	65,436.0	16290	0.0	49.4	47.95403156	-103.78697706	2169.797							
16300	WELD	65,485.4	16300	0.0	49.5	47.95390181	-103.78692164	2169.229							
16310	WELD	65,534.9	16310	0.0	49.5	47.95377058	-103.78687210	2168.464							
16320	WELD	65,584.4	16320	0.0	49.5	47.95363930	-103.78682140	2167.661							
16330	WELD	65,633.9	16330	0.0	49.5	47.95350782	-103.78677188	2167.559							
16340	WELD	65,683.5	16340	0.0	49.5	47.95337731	-103.78672005	2166.938							
16350	WELD	65,733.0	16350	0.0	49.5	47.95324670	-103.78666848	2166.619							
16360	WELD	65,782.5	16360	0.0	49.6	47.95311566	-103.78661675	2166.270							
16370	WELD	65,832.1	16370	0.0	49.5	47.95298463	-103.78656476	2166.009							
16380	WELD	65,881.6	16380	0.0	49.5	47.95285355	-103.78651558	2165.193							
16390	WELD	65,931.0	16390	0.0	49.5	47.95272222	-103.78646878	2163.952							
16400	WELD	65,980.5	16400	0.0	49.5	47.95259090	-103.78642192	2161.708							
16410	WELD	66,030.0	16410	0.0	49.1	47.95245944	-103.78637600	2160.007							
16420	WELD	66,079.1	16420	0.0	7.9	47.95232864	-103.78633145	2158.750							
16430	WELD	66,087.0	16430	0.0	36.2	47.95230762	-103.78632453	2158.549							
16440	WELD	66,123.3	16440	0.0	49.5	47.95221058	-103.78629668	2158.115							
13000008	GAIN	66,162.1	16440	38.7	10.8	47.95210625	-103.78627271	2156.396	42	1:15					
11000064	WT CHANGE	66,172.7	16440	0.0	0.1	47.95207788	-103.78626733	2155.064				0.322	52000	0.72	
16450	WELD	66,172.8	16450	0.0	14.8	47.95207761	-103.78626728	2155.050							
16460	WELD	66,187.6	16460	0.0	41.6	47.95203777	-103.78626112	2152.472							
16470	WELD	66,229.2	16470	0.0	42.2	47.95192773	-103.78624744	2143.373							
16480	WELD	66,271.4	16480	0.0	42.3	47.95181533	-103.78623476	2134.999							
16490	WELD	66,313.7	16490	0.0	42.3	47.95170292	-103.78622128	2126.546							
16500	WELD	66,356.0	16500	0.0	42.2	47.95159006	-103.78620684	2118.922							
16510	WELD	66,398.2	16510	0.0	42.3	47.95147718	-103.78619305	2111.473							
16520	WELD	66,440.5	16520	0.0	42.3	47.95136488	-103.78617947	2102.908							
16530	WELD	66,482.8	16530	0.0	42.2	47.95125275	-103.78616780	2093.776							
16540	WELD	66,525.0	16540	0.0	42.3	47.95114033	-103.78615849	2085.164							
16550	WELD	66,567.3	16550	0.0	42.2	47.95102744	-103.78615034	2077.030							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
16560	WELD	66,609.5	16560	0.0	42.2	47.95091441	-103.78614209	2069.374						
16570	WELD	66,651.7	16570	0.0	42.2	47.95080092	-103.78613371	2062.646						
16580	WELD	66,693.9	16580	0.0	42.2	47.95068676	-103.78612630	2057.656						
16590	WELD	66,736.1	16590	0.0	42.2	47.95057204	-103.78611811	2054.894						
16600	WELD	66,778.3	16600	0.0	42.2	47.95045686	-103.78611043	2054.500						
16610	WELD	66,820.5	16610	0.0	42.2	47.95034175	-103.78610146	2055.376						
16620	WELD	66,862.8	16620	0.0	42.2	47.95022686	-103.78608901	2056.738						
16630	WELD	66,904.9	16630	0.0	42.2	47.95011200	-103.78607625	2058.699						
16640	WELD	66,947.1	16640	0.0	42.2	47.94999751	-103.78606410	2061.858						
16650	WELD	66,989.4	16650	0.0	42.2	47.94988354	-103.78605141	2067.225						
16660	WELD	67,031.6	16660	0.0	42.2	47.94977078	-103.78603433	2074.937						
16670	WELD	67,073.8	16670	0.0	42.2	47.94966018	-103.78600978	2085.243						
16680	WELD	67,116.0	16680	0.0	42.2	47.94955112	-103.78598034	2096.730						
16690	WELD	67,158.2	16690	0.0	42.2	47.94944229	-103.78595102	2108.793						
16700	WELD	67,200.4	16700	0.0	42.2	47.94933419	-103.78592227	2121.698						
16710	WELD	67,242.6	16710	0.0	42.2	47.94922602	-103.78589542	2134.748						
16720	WELD	67,284.8	16720	0.0	42.2	47.94911475	-103.78587535	2144.562						
16730	WELD	67,327.0	16730	0.0	42.2	47.94900194	-103.78585523	2151.380						
16740	WELD	67,369.2	16740	0.0	42.2	47.94888879	-103.78583394	2157.706						
16750	WELD	67,411.4	16750	0.0	30.9	47.94877492	-103.78581221	2161.176						
11000065	WT CHANGE	67,442.2	16750	0.0	0.1	47.94869165	-103.78579607	2163.020			0.188	52000	0.72	
16760	WELD	67,442.3	16760	0.0	18.6	47.94869139	-103.78579602	2163.026						
16770	WELD	67,460.9	16770	0.0	49.4	47.94864115	-103.78578667	2164.256						
16780	WELD	67,510.3	16780	0.0	49.5	47.94850764	-103.78575946	2165.138						
16790	WELD	67,559.8	16790	0.0	49.3	47.94837356	-103.78573508	2165.983						
16800	WELD	67,609.2	16800	0.0	49.5	47.94823961	-103.78571492	2166.703						
16810	WELD	67,658.7	16810	0.0	49.8	47.94810526	-103.78569400	2166.535						
16820	WELD	67,708.5	16820	0.0	49.6	47.94797042	-103.78567137	2166.562						
16830	WELD	67,758.1	16830	0.0	49.5	47.94783607	-103.78564845	2167.021						
16840	WELD	67,807.6	16840	0.0	49.4	47.94770207	-103.78562509	2167.599						
16850	WELD	67,857.0	16850	0.0	49.7	47.94756838	-103.78560144	2168.457						
16860	WELD	67,906.6	16860	0.0	49.7	47.94743376	-103.78557897	2170.310						
16870	WELD	67,956.3	16870	0.0	44.0	47.94729915	-103.78555679	2171.110						
16880	WELD	68,000.3	16880	0.0	51.0	47.94717985	-103.78553709	2172.018						
16890	WELD	68,051.3	16890	0.0	49.5	47.94704129	-103.78551529	2172.557						
16900	WELD	68,100.7	16900	0.0	49.5	47.94690682	-103.78549396	2173.193						
16910	WELD	68,150.2	16910	0.0	49.4	47.94677246	-103.78547102	2174.318						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
16920	WELD	68,199.6	16920	0.0	49.0	47.94663870	-103.78544664	2174.883						
16930	WELD	68,248.6	16930	0.0	49.4	47.94650593	-103.78542128	2174.865						
16940	WELD	68,298.0	16940	0.0	49.2	47.94637161	-103.78539854	2174.083						
16950	WELD	68,347.2	16950	0.0	49.5	47.94623794	-103.78537714	2173.532						
16960	WELD	68,396.6	16960	0.0	49.5	47.94610371	-103.78535540	2173.392						
16970	WELD	68,446.2	16970	0.0	49.4	47.94596938	-103.78533114	2171.714						
16980	WELD	68,495.5	16980	0.0	49.3	47.94583560	-103.78530561	2168.458						
16990	WELD	68,544.9	16990	0.0	49.5	47.94570180	-103.78527992	2166.203						
17000	WELD	68,594.4	17000	0.0	49.5	47.94556768	-103.78525381	2166.516						
17010	WELD	68,643.8	17010	0.0	49.6	47.94543345	-103.78522868	2168.458						
17020	WELD	68,693.4	17020	0.0	49.6	47.94529866	-103.78520680	2170.777						
17030	WELD	68,743.0	17030	0.0	49.5	47.94516365	-103.78518583	2172.227						
17040	WELD	68,792.5	17040	0.0	49.4	47.94502896	-103.78516186	2173.148						
17050	WELD	68,841.9	17050	0.0	49.3	47.94489512	-103.78513573	2175.596						
17060	WELD	68,891.2	17060	0.0	49.7	47.94476128	-103.78511110	2176.780						
17070	WELD	68,940.9	17070	0.0	49.3	47.94462649	-103.78508801	2175.775						
17080	WELD	68,990.2	17080	0.0	49.6	47.94449308	-103.78506522	2177.683						
17090	WELD	69,039.8	17090	0.0	49.6	47.94435915	-103.78504084	2181.339						
17100	WELD	69,089.4	17100	0.0	49.5	47.94422493	-103.78501625	2185.008						
17110	WELD	69,139.0	17110	0.0	49.3	47.94409091	-103.78499348	2187.402						
17120	WELD	69,188.3	17120	0.0	49.7	47.94395724	-103.78496942	2187.546						
17130	WELD	69,238.0	17130	0.0	49.5	47.94382281	-103.78494333	2187.681						
17140	WELD	69,287.5	17140	0.0	48.4	47.94368895	-103.78491602	2188.347						
17150	WELD	69,335.8	17150	0.0	49.7	47.94355794	-103.78488994	2188.556						
17160	WELD	69,385.6	17160	0.0	49.5	47.94342331	-103.78486604	2189.213						
17170	WELD	69,435.0	17170	0.0	49.5	47.94328899	-103.78484350	2188.284						
17180	WELD	69,484.5	17180	0.0	49.5	47.94315477	-103.78482046	2188.005						
17190	WELD	69,534.0	17190	0.0	49.5	47.94302035	-103.78479675	2188.536						
17200	WELD	69,583.5	17200	0.0	49.2	47.94288605	-103.78477282	2188.964						
17210	WELD	69,632.7	17210	0.0	49.3	47.94275263	-103.78474776	2189.856						
17220	WELD	69,682.0	17220	0.0	45.5	47.94261908	-103.78472447	2191.222						
17230	WELD	69,727.5	17230	0.0	48.0	47.94249550	-103.78470466	2193.677						
17240	WELD	69,775.5	17240	0.0	49.6	47.94236503	-103.78468685	2196.264						
17250	WELD	69,825.1	17250	0.0	49.4	47.94222980	-103.78467165	2197.644						
17260	WELD	69,874.5	17260	0.0	49.5	47.94209498	-103.78465537	2198.270						
17270	WELD	69,924.0	17270	0.0	49.4	47.94196052	-103.78463276	2198.372						
17280	WELD	69,973.4	17280	0.0	49.3	47.94182652	-103.78460745	2198.583						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
17290	WELD	70,022.7	17290	0.0	49.3	47.94169261	-103.78458177	2198.465						
17300	WELD	70,071.9	17300	0.0	49.2	47.94155859	-103.78455697	2198.797						
17310	WELD	70,121.1	17310	0.0	49.3	47.94142514	-103.78453185	2199.714						
17320	WELD	70,170.4	17320	0.0	49.4	47.94129119	-103.78450759	2200.272						
17330	WELD	70,219.8	17330	0.0	49.4	47.94115694	-103.78448471	2201.109						
17340	WELD	70,269.3	17340	0.0	49.4	47.94102247	-103.78446677	2200.756						
17350	WELD	70,318.7	17350	0.0	49.6	47.94088792	-103.78445513	2199.241						
17360	WELD	70,368.3	17360	0.0	49.5	47.94075267	-103.78444883	2198.175						
17370	WELD	70,417.7	17370	0.0	49.6	47.94061763	-103.78444710	2198.002						
17380	WELD	70,467.3	17380	0.0	49.5	47.94048232	-103.78444650	2198.605						
17390	WELD	70,516.9	17390	0.0	49.7	47.94034713	-103.78444530	2197.663						
17400	WELD	70,566.6	17400	0.0	49.4	47.94021156	-103.78444217	2196.880						
17410	WELD	70,616.0	17410	0.0	48.3	47.94007682	-103.78443740	2195.715						
17420	WELD	70,664.3	17420	0.0	49.7	47.93994516	-103.78443281	2194.603						
17430	WELD	70,714.0	17430	0.0	49.2	47.93980978	-103.78442697	2194.315						
17440	WELD	70,763.2	17440	0.0	49.5	47.93967549	-103.78442286	2194.200						
17450	WELD	70,812.7	17450	0.0	49.6	47.93954026	-103.78442070	2194.585						
17460	WELD	70,862.3	17460	0.0	49.7	47.93940504	-103.78441830	2194.519						
17470	WELD	70,912.0	17470	0.0	49.6	47.93926944	-103.78441530	2194.411						
17480	WELD	70,961.6	17480	0.0	49.5	47.93913378	-103.78441252	2194.308						
17490	WELD	71,011.1	17490	0.0	49.6	47.93899859	-103.78440989	2194.617						
17500	WELD	71,060.7	17500	0.0	49.4	47.93886297	-103.78440670	2194.923						
17510	WELD	71,110.1	17510	0.0	47.5	47.93872794	-103.78440320	2195.212						
17520	WELD	71,157.6	17520	0.0	49.6	47.93859782	-103.78440070	2194.860						
17530	WELD	71,207.2	17530	0.0	44.4	47.93846211	-103.78439880	2194.480						
17540	WELD	71,251.6	17540	0.0	49.5	47.93834076	-103.78439720	2193.470						
17550	WELD	71,301.1	17550	0.0	49.4	47.93820516	-103.78439490	2193.048						
17560	WELD	71,350.4	17560	0.0	47.5	47.93807012	-103.78439310	2192.226						
17570	WELD	71,397.9	17570	0.0	49.6	47.93794018	-103.78439071	2191.149						
17580	WELD	71,447.5	17580	0.0	49.5	47.93780468	-103.78438694	2190.202						
17590	WELD	71,497.0	17590	0.0	49.6	47.93766919	-103.78438290	2189.915						
17600	WELD	71,546.7	17600	0.0	49.6	47.93753377	-103.78438030	2190.144						
17610	WELD	71,596.3	17610	0.0	48.4	47.93739839	-103.78437760	2190.837						
17620	WELD	71,644.7	17620	0.0	49.2	47.93726611	-103.78437298	2190.525						
17630	WELD	71,693.9	17630	0.0	48.5	47.93713156	-103.78436882	2189.613						
17640	WELD	71,742.4	17640	0.0	49.3	47.93699907	-103.78436580	2188.194						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10000092	Reinforced Tee at 270 deg.	71,757.2	17640	14.6	34.7	47.93695859	-103.78436510	2187.702	260 8:30					
17650	WELD	71,791.7	17650	0.0	49.6	47.93686439	-103.78436290	2186.883						
17660	WELD	71,841.4	17660	0.0	49.6	47.93672912	-103.78435950	2185.338						
17670	WELD	71,890.9	17670	0.0	49.2	47.93659384	-103.78435540	2183.768						
17680	WELD	71,940.2	17680	0.0	49.6	47.93645951	-103.78435190	2185.037						
17690	WELD	71,989.8	17690	0.0	49.6	47.93632398	-103.78434770	2185.276						
17700	WELD	72,039.4	17700	0.0	49.6	47.93618880	-103.78434420	2184.785						
17710	WELD	72,089.0	17710	0.0	49.6	47.93605345	-103.78434220	2184.852						
17720	WELD	72,138.6	17720	0.0	49.6	47.93591797	-103.78433567	2184.880						
17730	WELD	72,188.2	17730	0.0	41.9	47.93578277	-103.78433000	2184.065						
11000066	WT CHANGE	72,230.0	17730	0.0	0.1	47.93566909	-103.78432885	2182.951			0.322	52000	0.72	
17740	WELD	72,230.1	17740	0.0	25.7	47.93566883	-103.78432883	2182.948						
17750	WELD	72,255.8	17750	0.0	42.3	47.93559852	-103.78432680	2182.719						
17760	WELD	72,298.1	17760	0.0	42.3	47.93548382	-103.78432251	2179.092						
17770	WELD	72,340.4	17770	0.0	42.3	47.93536903	-103.78431810	2176.000						
10000093	AGM 120, Sta. 722+63, Gravel Rd. -- Han #100	72,340.8	17770	0.4	41.9	47.93536790	-103.78431805	2175.969						
17780	WELD	72,382.6	17780	0.0	42.2	47.93525392	-103.78431179	2175.690						
17790	WELD	72,424.9	17790	0.0	42.2	47.93513922	-103.78429609	2176.657						
17800	WELD	72,467.1	17800	0.0	42.2	47.93502468	-103.78427919	2177.714						
17810	WELD	72,509.3	17810	0.0	42.2	47.93491040	-103.78426093	2176.861						
17820	WELD	72,551.5	17820	0.0	42.2	47.93479663	-103.78423476	2175.999						
17830	WELD	72,593.7	17830	0.0	42.2	47.93468317	-103.78420811	2178.846						
17840	WELD	72,635.9	17840	0.0	42.2	47.93456991	-103.78418217	2183.275						
17850	WELD	72,678.1	17850	0.0	42.1	47.93445655	-103.78415275	2184.786						
11000067	WT CHANGE	72,720.1	17850	0.0	0.1	47.93434325	-103.78412653	2184.842			0.188	52000	0.72	
17860	WELD	72,720.2	17860	0.0	39.0	47.93434299	-103.78412648	2184.840						
17870	WELD	72,759.2	17870	0.0	49.5	47.93423766	-103.78410376	2184.057						
17880	WELD	72,808.7	17880	0.0	49.5	47.93410418	-103.78407274	2183.513						
17890	WELD	72,858.2	17890	0.0	49.3	47.93397062	-103.78403838	2184.173						
17900	WELD	72,907.5	17900	0.0	49.5	47.93383774	-103.78400532	2184.067						
17910	WELD	72,957.0	17910	0.0	49.3	47.93370408	-103.78397380	2184.764						
17920	WELD	73,006.2	17920	0.0	45.7	47.93357058	-103.78394413	2184.574						
17930	WELD	73,052.0	17930	0.0	49.4	47.93344669	-103.78391699	2184.406						
17940	WELD	73,101.4	17940	0.0	49.3	47.93331321	-103.78388948	2184.084						
17950	WELD	73,150.7	17950	0.0	49.5	47.93318002	-103.78385972	2184.029						
17960	WELD	73,200.1	17960	0.0	49.5	47.93304644	-103.78382962	2183.857						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
17970	WELD	73,249.6	17970	0.0	49.2	47.93291282	-103.78380014	2183.512						
17980	WELD	73,298.8	17980	0.0	49.6	47.93277997	-103.78377098	2183.074						
17990	WELD	73,348.4	17990	0.0	49.2	47.93264584	-103.78374156	2182.546						
18000	WELD	73,397.7	18000	0.0	49.4	47.93251302	-103.78371113	2182.561						
18010	WELD	73,447.0	18010	0.0	49.5	47.93237940	-103.78368065	2181.606						
18020	WELD	73,496.6	18020	0.0	49.7	47.93224568	-103.78364905	2180.878						
18030	WELD	73,546.3	18030	0.0	49.4	47.93211181	-103.78361724	2180.189						
18040	WELD	73,595.6	18040	0.0	42.3	47.93197866	-103.78358548	2179.796						
18050	WELD	73,637.9	18050	0.0	49.3	47.93186452	-103.78356089	2180.093						
18060	WELD	73,687.3	18060	0.0	49.4	47.93173130	-103.78353294	2179.793						
18070	WELD	73,736.6	18070	0.0	49.7	47.93159795	-103.78350379	2178.979						
18080	WELD	73,786.3	18080	0.0	49.6	47.93146394	-103.78347365	2177.010						
18090	WELD	73,835.9	18090	0.0	49.6	47.93133008	-103.78344624	2174.081						
18100	WELD	73,885.5	18100	0.0	49.8	47.93119618	-103.78341630	2175.150						
18110	WELD	73,935.3	18110	0.0	49.7	47.93106295	-103.78338599	2181.255						
18120	WELD	73,985.0	18120	0.0	49.7	47.93092892	-103.78335531	2182.954						
18130	WELD	74,034.7	18130	0.0	49.6	47.93079492	-103.78332533	2182.817						
18140	WELD	74,084.3	18140	0.0	49.3	47.93066104	-103.78329526	2182.048						
18150	WELD	74,133.6	18150	0.0	49.4	47.93052822	-103.78326444	2182.016						
18160	WELD	74,183.0	18160	0.0	49.7	47.93039473	-103.78323353	2183.639						
18170	WELD	74,232.7	18170	0.0	49.3	47.93026051	-103.78320225	2184.474						
18180	WELD	74,282.0	18180	0.0	49.6	47.93012746	-103.78317065	2184.780						
18190	WELD	74,331.6	18190	0.0	49.6	47.92999371	-103.78313886	2185.394						
18200	WELD	74,381.2	18200	0.0	49.3	47.92985981	-103.78310787	2186.476						
18210	WELD	74,430.5	18210	0.0	49.6	47.92972662	-103.78307784	2187.526						
18220	WELD	74,480.1	18220	0.0	49.6	47.92959245	-103.78304922	2188.277						
18230	WELD	74,529.7	18230	0.0	49.5	47.92945829	-103.78301986	2188.747						
18240	WELD	74,579.2	18240	0.0	49.7	47.92932450	-103.78298929	2188.785						
18250	WELD	74,628.8	18250	0.0	49.6	47.92919052	-103.78295929	2188.357						
18260	WELD	74,678.4	18260	0.0	49.5	47.92905609	-103.78293077	2188.662						
18270	WELD	74,728.0	18270	0.0	49.5	47.92892190	-103.78290238	2190.561						
18280	WELD	74,777.5	18280	0.0	49.5	47.92878792	-103.78287229	2191.963						
18290	WELD	74,827.0	18290	0.0	49.6	47.92865397	-103.78284122	2193.142						
18300	WELD	74,876.6	18300	0.0	49.6	47.92852015	-103.78280928	2195.310						
18310	WELD	74,926.2	18310	0.0	49.6	47.92838651	-103.78277675	2197.580						
18320	WELD	74,975.7	18320	0.0	49.8	47.92825269	-103.78274512	2199.548						
18330	WELD	75,025.5	18330	0.0	49.7	47.92811829	-103.78271539	2200.980						

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
18340	WELD	75,075.2	18340	0.0	49.5	47.92798400	-103.78268709	2201.765							
18350	WELD	75,124.7	18350	0.0	49.6	47.92785034	-103.78265991	2202.894							
18360	WELD	75,174.3	18360	0.0	49.4	47.92771619	-103.78263233	2203.922							
18370	WELD	75,223.7	18370	0.0	49.7	47.92758306	-103.78260275	2206.066							
18380	WELD	75,273.5	18380	0.0	49.6	47.92744893	-103.78257302	2208.849							
18390	WELD	75,323.1	18390	0.0	49.7	47.92731535	-103.78254205	2211.814							
18400	WELD	75,372.8	18400	0.0	49.6	47.92718173	-103.78250983	2214.343							
18410	WELD	75,422.5	18410	0.0	48.9	47.92704816	-103.78247704	2216.947							
18420	WELD	75,471.4	18420	0.0	49.9	47.92691633	-103.78244532	2219.818							
18430	WELD	75,521.3	18430	0.0	48.6	47.92678184	-103.78241319	2221.018							
18440	WELD	75,569.9	18440	0.0	49.1	47.92665075	-103.78238288	2220.738							
18450	WELD	75,619.0	18450	0.0	49.2	47.92651799	-103.78235391	2220.390							
20000019	Seam Variation	75,662.6	18450	43.6	5.6	47.92639997	-103.78232804	2220.125	42	1:15	-	0.71	0.49		
20000020	Seam Variation	75,663.1	18450	44.1	5.1	47.92639850	-103.78232770	2220.125	47	1:30	-	0.82	0.53		
18460	WELD	75,668.2	18460	0.0	49.5	47.92638479	-103.78232462	2220.151							
18470	WELD	75,717.7	18470	0.0	49.3	47.92625076	-103.78229440	2220.260							
18480	WELD	75,767.0	18480	0.0	49.6	47.92611743	-103.78226473	2220.039							
18490	WELD	75,816.6	18490	0.0	49.1	47.92598316	-103.78223469	2219.599							
18500	WELD	75,865.8	18500	0.0	10.0	47.92585053	-103.78220384	2217.011							
18510	WELD	75,875.8	18510	0.0	37.4	47.92582354	-103.78219772	2216.837							
18520	WELD	75,913.2	18520	0.0	49.0	47.92572264	-103.78217550	2219.550							
18530	WELD	75,962.1	18530	0.0	49.6	47.92559082	-103.78214473	2224.076							
18540	WELD	76,011.7	18540	0.0	49.3	47.92545705	-103.78211305	2226.895							
18550	WELD	76,061.0	18550	0.0	49.7	47.92532363	-103.78208589	2228.973							
18560	WELD	76,110.7	18560	0.0	49.4	47.92518940	-103.78205624	2228.130							
18570	WELD	76,160.0	18570	0.0	49.7	47.92505643	-103.78202587	2224.869							
18580	WELD	76,209.7	18580	0.0	43.3	47.92492225	-103.78199438	2224.194							
18590	WELD	76,253.0	18590	0.0	14.5	47.92480578	-103.78196623	2226.768							
18600	WELD	76,267.6	18600	0.0	48.4	47.92476660	-103.78195639	2227.887							
18610	WELD	76,316.0	18610	0.0	2.1	47.92463739	-103.78192033	2232.798							
10000094	Bend right - 65 deg., 3D	76,317.0	18610	0.1	2.0	47.92463486	-103.78192188	2232.843	0	12:00					
18620	WELD	76,318.0	18620	0.0	16.0	47.92463277	-103.78192479	2232.823							
18630	WELD	76,334.0	18630	0.0	2.4	47.92460283	-103.78197345	2232.612							
18640	WELD	76,336.4	18640	0.0	6.2	47.92459844	-103.78198040	2232.605							
10000095	Bend right - 45 deg., 11D	76,339.5	18640	0.1	6.1	47.92459357	-103.78199075	2232.584	0	12:00					
18650	WELD	76,342.6	18650	0.0	25.1	47.92459227	-103.78200318	2232.517							
18660	WELD	76,367.7	18660	0.0	41.2	47.92459334	-103.78210589	2232.093							

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)		Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
18670	WELD	76,409.0	18670	0.0	41.4	47.92459344	-103.78227325	2231.527							
18680	WELD	76,450.4	18680	0.0	49.6	47.92459335	-103.78244089	2229.634							
18690	WELD	76,500.0	18690	0.0	49.6	47.92459242	-103.78264121	2226.643							
18700	WELD	76,549.6	18700	0.0	49.8	47.92459284	-103.78284128	2222.873							
12000002	Debris @ 11:00	76,550.6	18700	1.0	48.8	47.92459284	-103.78284528	2222.789							
18710	WELD	76,599.4	18710	0.0	49.6	47.92459427	-103.78304283	2220.367							
18720	WELD	76,649.0	18720	0.0	49.7	47.92459795	-103.78324401	2220.635							
18730	WELD	76,698.6	18730	0.0	49.6	47.92460274	-103.78344549	2221.457							
18740	WELD	76,748.3	18740	0.0	32.3	47.92460797	-103.78364678	2220.481							
18750	WELD	76,780.5	18750	0.0	12.5	47.92460966	-103.78377749	2220.049							
10000096	Bend left - 90 deg., 10D	76,786.5	18750	0.6	11.9	47.92460366	-103.78379974	2220.193	0	12:00					
18760	WELD	76,793.0	18760	0.0	32.2	47.92458640	-103.78380620	2220.321							
18770	WELD	76,825.2	18770	0.0	29.9	47.92449788	-103.78380750	2220.245							
18780	WELD	76,855.1	18780	0.0	28.5	47.92441607	-103.78380690	2218.700							
18790	WELD	76,883.6	18790	0.0	31.2	47.92433810	-103.78380520	2218.146							
13000009	GAIN	76,892.7	18790	9.2	22.1	47.92431301	-103.78380432	2218.203	150	5:00					
18800	WELD	76,914.8	18800	0.0	31.1	47.92425283	-103.78380200	2218.247							
11000068	WT CHANGE	76,945.8	18800	0.0	0.1	47.92416834	-103.78379900	2219.496				0.322	52000	0.72	
18810	WELD	76,945.9	18810	0.0	1.5	47.92416818	-103.78379900	2219.531							
10000097	Bend up - 45 deg., 3D	76,946.6	18810	0.1	1.4	47.92416653	-103.78379900	2219.922	0	12:00					
18820	WELD	76,947.4	18820	0.0	5.0	47.92416501	-103.78379897	2220.431							
18830	WELD	76,952.4	18830	0.0	10.2	47.92415518	-103.78379877	2224.036							
18840	WELD	76,962.6	18840	0.0	4.9	47.92413550	-103.78379840	2231.191							
10000098	Pipe Exiting Ground -- Han #8404	76,962.9	18840	0.3	4.6	47.92413500	-103.78379835	2231.445							
18850	WELD	76,967.5	18850	0.0	1.6	47.92412641	-103.78379964	2230.409							
10000099	Bend down - 45 deg., 3D	76,968.3	18850	0.1	1.6	47.92412440	-103.78379991	2229.871	0	12:00					
18860	WELD	76,969.1	18860	0.0	0.9	47.92412232	-103.78380019	2229.179							
10000100	Flange	76,969.6	18860	0.5	0.4	47.92412108	-103.78380033	2228.745	0	12:00					
18870	WELD	76,970.0	18870	0.0	1.2	47.92411997	-103.78380051	2228.360							
10000101	Tee at 90 deg.	76,970.7	18870	0.2	1.0	47.92411841	-103.78380072	2227.814	72	2:15					
18880	WELD	76,971.2	18880	0.0	1.3	47.92411699	-103.78380092	2227.318							
10000102	Pipe Support	76,971.9	18880	0.5	0.7	47.92411527	-103.78380118	2226.718							
10000103	Fitting on top of pipe	76,972.2	18880	0.9	0.4	47.92411464	-103.78380125	2226.498	342	11:15					
18890	WELD	76,972.5	18890	0.0	3.2	47.92411381	-103.78380137	2226.210							
10000104	Flange	76,973.0	18890	0.5	2.7	47.92411264	-103.78380158	2225.803	0	12:00					
10000105	Valve (Receiver), Sta. 763+72, Dore Junction	76,974.1	18890	1.6	1.6	47.92410990	-103.78380205	2224.834							

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Bainville to Dore Junction

ID#	Description	Distance (ft)	Joint #	U/S Weld	D/S Weld	Latitude	Longitude	Altitude	Orientation (Deg / O'Clock)	Depth (%)	Length or WT	Width or YS	P' or SF	(P'/P)
10000106	Flange	76,975.2	18890	2.7	0.5	47.92410994	-103.78380203	2224.861	0 12:00					
18900	WELD	76,975.7	18900	0.0	-	47.92410994	-103.78380203	2224.861						
12000003	End Run Tickle	77,018.3	18900	42.6	-	47.92410994	-103.78380203	2224.861						

Type	Number
DEFORMATION	0
GAINS	10
GIRTH WELD ANOMALY	1
GROUPED PITS	14
LOCATIONS	107
MISC	3
SEAM VARIATION	7
WT CHANGES	69
WELDS	1880

General Inline Inspection Terms

GLOSSARY

AGM (Aboveground Marker)	A portable device placed at an above ground reference point that both detects and records the passage of an in-line inspection tool. AGMs are typically reported using a marker number followed by the aboveground reference point description of the location device (box) placement.
ABOVE-GROUND REFERENCE POINTS	The above ground reference point is a permanent reference on or above the pipeline, which can be used to locate features in the pipeline. Reference points can be valves, fences, test stations, markers posts, or other permanent features.
ACCELEROMETERS	Part of the INS package of the in-line inspection tool. Each TDW tool contains 3 axis-aligned accelerometers measuring orientation and shock.
ANCHOR, WEIGHT OR HANGAR	Non-welded full encirclement pipeline features typically evenly spaced across water crossings. These are usually not detrimental unless associated metal loss is detected.
ANOMALY	Any kind of imperfection or defect that may be present in the wall of the pipe. This includes coating or welding.
APPURTENANCE	A component that is attached to the pipeline; e.g., valve, tee, casing, instrument connection.
ASME B31G, MODIFIED ASME B31G, or DNV RP-F101	Commonly used analysis criterion for metal loss anomalies in a pipeline. TDW software may use ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the safe maximum allowable operating pressure or failure pressure at an area of metal loss. These formulas utilize only length and depth - they do not take into consideration the width of the anomaly. The MODIFIED ASME B31G more closely approximates the values obtained via the RSTRENG calculations, which is less conservative than the standard ASME B31G calculation. See also DNV RP-F101.
BEND	A physical pipe configuration that changes pipeline direction.
BEND RADIUS	The radius of the bend in the pipe as related to the pipe diameter (D). Example: A 3-D bend would have a radius of 3 times the diameter of the pipe measured to the centerline of the pipe.
BORE RESTRICTION	Any reduction of the cross-section of the pipe that may restrict the passage of an ILI pig.
BUCKLE	A condition where the pipeline has undergone sufficient plastic deformation to cause permanent wrinkling or deformation of the pipe wall or the pipe's cross section.
BURST PRESSURE	The pressure at which the nominal hoop stress in the wall of a pipe equals the specified minimum yield stress of the pipe grade. It is calculated by 2st/D where s = SMYS, t = nominal wall thickness, D = nominal outside diameter of pipe.
CALIBRATION DIG	An exploratory excavation to compare findings of an in-line inspection system to actual conditions with the purpose of improving data analysis.
CASING ANOMALY	When the casing is not welded, or when a gap occurs in the weld, this signature is detected by the tool, and identified with a miscellaneous remark.
CHARACTERIZATION	The process of quantifying the size, shape, orientation, and location of an anomaly, defect, or critical defect after it has been detected.
CHECK VALVE	A valve that prevents reverse flow.
CLAMP	Non-welded full encirclement pipeline feature not located at a bridge or water crossing, in some cases a type of temporary repair.
COMPONENT	Any physical part of the pipeline , other than line pipe, including but not limited to valves, welds, tees, flanges, fitting, taps, branch connections, outlets, supports and anchors.

General Inline Inspection Terms

CONTROL POINT	Control points are know locations used to provide coordinate updates to aid the final processing of the inertial data gathered from the instruments onboard the inspection vehicle.
CORROSION (External)	Metal loss due to electrochemical, galvanic, microbiological, or other attack on the pipe due to environmental conditions surrounding the pipe.
CORROSION (Internal)	Metal loss due to chemical or other attack on the steel from liquids on the inside of the pipe. Electrochemical attack can also occur in local cells, but this is less frequent.
DATA ANALYSIS	The process through which indications are evaluated to classify, characterize and size them as non-relevant conditions, pipeline components, anomalies, imperfections, or defects.
DATUM	A datum is a set of reference points on the earth's surface against which position measurements are made. Horizontal datums are used for describing a point on the earth's surface, in latitude and longitude or another coordinate system. While hundreds of reference datums exists some examples of horizontal datums include, NAD27, NAD83, and WGS84. Vertical datums are tidal, based on sea levels referencing geodetic datums such as NAVD88, or geodetic, based on the same ellipsoid models of the earth used for computing horizontal datums.
DNV RP-F101	An analysis procedure that differs from the commonly used ASME B31G criterion. Developed by the Norwegian company Det Norske Veritas, this method is employed for European and Asian pipelines. The DNV algorithm is generally considered to be more conservative than ASME B31G.
DEFECT	An anomaly for which an analysis, such as ASME B31G, would indicate that the pipe is approaching failure as the nominal hoop stress approaches the specified minimum yield stress (SMYS).
DEFORMATION PIG	A pig designed to record conditions such as dents, wrinkles, ovalities, bend radius and angle by making measurements of the inside surface of the pipeline.
DENTS	Dents are depressions in the pipeline that may be detected by the inline inspection tool. MFL tools may be able to detect dents, but may not be able to accurately size them.
DETECTION THRESHOLD	A characteristic dimension or dimensions of an anomaly that must be exceeded to achieve a stated probability of detection.
DOT192	Part 192 of the Code for Federal Regulations (CFR) Title 49 that addresses Gas Transmission Pipelines.
DOT195	Part 195 of the Code for Federal Regulations (CFR) Title 49 that addresses Transportation of Hazardous Liquids by Pipeline.
ECCENTRIC CASINGS	TDW tools detect when a casing is not centered on the pipeline. These casings are referred to as being eccentric. The closer the casing is to the pipeline, the stronger the signal seen by the inspection tool. The tool may not detect if the casing is shorted to the pipe wall. The tool might see evidence of a short, such as metal loss.
ESTIMATED REPAIR FACTOR (ERF)	The ratio of pipeline design pressure or in some cases MOP to the safe maximum operating pressure (P').
ERW (Electric Resistance Weld)	Describes a process used to form steel from a sheet into tubular form (pipe). Welds are formed by resistance heating of two edges of a metal sheet and then forcing them together to create a solid-state weld.
EXPANSION	Local increase of pipe diameter during service which indicates the yield stress of the pipe at that location has been surpassed.

General Inline Inspection Terms

FAILURE PRESSURE RATIO (FPR)	The ratio of the predicted failure pressure calculated by an analysis criterion (e.g. ASME B31G, RSTRENG, etc.) to the MAOP
FEATURE	Any physical object detected by an in-line inspection system. Features may be anomalies, components, or some other item.
FITTING	A branch connection attached to the pipeline which is smaller than the nominal pipe size that alters flow or diverts product (e.g. tap, offtake, split-tee, weld-o-let, thread-o-let).
GAIN (Metal in Close Proximity)	The inspection tool may detect ferrous metal objects located close to or touching the pipeline. They appear as additional metal added to the pipe and are referred to as gains. Clamps or anchors are considered gains as well as features such as puddle welds or CP connections. Generally, repairs such as patches or sleeves are called out as repairs even though they show appear in the data as gains.
GIRTH WELD	A circumferential weld joining two joints of pipe.
GIS	Geographic Information System is any system that captures, stores, analyzes, manages, and presents data that are linked to location. GIS is the merging of cartography and database technology.
GOUGE	Elongated grooves or cavities caused by mechanical removal of metal.
GPS (Global Positioning System)	The navigational system utilizing satellite technology to provide a user an exact position on the earth's surface. When coupled with known surface locations such as valves and AGMs, an ILI tool's INS or IMU can approximate or calculate the centerline of a pipeline.
GYROSCOPES (Gyros)	Electronic sensors used to measure change in direction of in-line inspection tool during inspection process. Displayed as pitch and yaw in PIGTRAP.
GROUP	A group is several pits that are grouped together using specific interaction rules. If a pit is a mountain peak, then a group is a mountain range. The reason for groups is so that the overall extent of the metal loss area can be evaluated. Most formulas for calculating the strength of the pipe wall around metal loss look at the overall length of metal loss after interaction rules have been applied to pits.
HALF SOLE	A device used to repair a pipeline by welding a small section over half the circumference of the pipe over the defect, literally half of a sleeve.
HALL SENSORS	A sensor that directly measures the remaining magnetic field strength not absorbed by the pipe.
HCA (High Consequence Area)	A criterion for pipelines designed by the Code of Federal Regulations which define what program and practices operators must use to manage pipeline integrity if the pipeline is located near a commercially navigable waterway, a high population area, or an unusually sensitive area.
HEAT AFFECTED ZONE (HAZ)	The region around a weld which has been metallurgically affected during the welding process.
HEAVY WELD	A girth weld in which the root pass or a portion of the root pass intrudes further than normal into the ID of the pipe. Not usually considered detrimental.
HIGH RESOLUTION	A term used to describe the function of TDW tools for use in MFL or Deformation analysis schemes. Both MFL and Deformation tools are considered high resolution.
IMPERFECTION	An anomaly with dimension and characteristics that do not exceed acceptable limits.

General Inline Inspection Terms

IMU (Inertial Measurement Unit)	Inertial measurement unit, or IMU, is the main component of inertial guidance systems. An IMU works by sensing motion including the type, rate, and direction of that motion using a combination of accelerometers and gyroscopes.
INCLUSION	An anomaly in the cross section of the pipeline caused by manufacturing processes. Inclusions may be detrimental if they protrude through the pipe wall. Refer to mill anomaly.
INDICATION	Any measured signal or response from an inspection of a pipe different than the normal baseline signal.
INS (Inertial Navigation System)	Refers to a system of accelerometers and gyroscopes to track the movement and orientation of the inspection tool through bends, turns, etc.
INTERACTION RULES	Specifications that establish spacing criteria between anomalies or defects (pits). If the indications or defects are proximate to one another within the criteria , the anomaly or defect is treated as a single larger unit or group for engineering analysis purposes.
INSPECTION	The use of a non-destructive inspection technique.
JOINT	A single section of pipe that is welded to others to make up a pipeline.
LACK OF FUSION (LOF)	In a weld, any area or zone that lacks complete melting and coalescence of a portion of the weld.
LAUNCHER	Refers to the beginning of the inspection; an oversize section of pipe equipped with sealing door through which the inspection tool is loaded into the pipeline.
LOCATION	A location is a feature in the pipeline that can be used to correlate the inspection tool data to above ground references. Common location features include valves, fitting, flanges, tees, casings, repairs and AGMs. For example, a metal loss area could be referenced as being 200 feet downstream from a valve. Not all locations can be easily found from aboveground.
LATITUDE & LONGITUDE	Latitude is the angular distance north or south from the earth's equator measured through 90 degrees. Longitude is the arc or portion of the earth's equator intersected between the meridian of a given place and the prime meridian and is expressed either in degrees or in time. Latitude and longitude are reported as GPS coordinates. Predicted GPS for features are provided in the Pipeline Listing section.
MAOP (Maximum Allowable Operating Pressure)	(or Design Pressure) The maximum internal pressure permitted in the operation of a pipeline as defined by the Code of Federal Regulations.
MAPPING PIG	An ILI tool that uses an IMU to collect data that can be analyzed to produce an elevation and plan view of the pipeline route.
MEASUREMENT THRESHOLD	A characteristic's dimension or dimensions above which anomaly measurements can be made.
MECHANICAL DAMAGE	A generic term used to describe combinations of dents gouges, and/or cold work caused by the application of external force. Damage includes coating, movement of metal and high residual stress.
METAL LOSS	Any of a number of types of anomalies in pipe in which metal has been removed from the pipe surface, usually due to corrosion or gouging.
MFL (Magnetic Flux Leakage)	An inspection technique in which a magnetic field is applied to a pipe section and measurements are taken of a magnetic flux density at the pipe surface. Changes in measured flux density indicate the presence of a possible defect.

General Inline Inspection Terms

MILL ANOMALY	The process of manufacturing pipe can often leave indications in the pipe wall. Typically these anomalies are not detrimental, and are identified for the benefit of the client.
MINIMUM BORE	The minimum measured Internal Diameter of the pipe at any particular point. Also referred to as minimum cross-section.
MISALIGNMENT	A girth weld anomaly where the two joints of pipe were not aligned properly prior to welding. Sometimes referred to as a hi-lo.
MOP (Maximum Operating Pressure)	The established maximum internal pressure expected during the operation of a pipeline, which cannot normally exceed the maximum allowable operating pressure (MAOP).
ODOMETER	Wheels on in-line inspection tool, which rotate along the pipe to measure the distance the tool has traveled.
ORIENTATION	The location of the reference around the circumference of the pipe, as viewed in the direction of flow (downstream). The value is represented in degrees 0-360° rotating clockwise around pipe. (0° = top of pipe, 90° = 3:00)
OVALITY	A condition in which a circular pipe forms into an ellipse, usually as the result of external forces.
P	Calculated pressure rating for the pipe. Per ASME B31G, it is the greater of either the established MOP for liquid lines (MAOP for gas lines), or 2stFT/D, where S = SMYS, F = appropriate design factor from ASME B31G, T = Temperature derating factor, D = nominal outside diameter of pipe, and t = nominal wall thickness. See ASME B31G. In application, this variable is identical per DNV RP-F101, however it is calculated using different formulas and factors.
P' (Calculated safe maximum operating pressure)	Calculated safe maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the safe maximum allowable operating pressure (P') of the pipeline at a metal loss area for liquid lines. The calculation also takes into consideration a temperature factor, for use when the line is at elevated temperature, and a safety factor. The default values used in calculations are a temperature factor of 1, and a safety factor of 72% (80% for Canada).
Pfail (Calculated failure pressure)	Calculated maximum operating pressure for the pipeline segment as calculated based on information provided by the Customer. TDW software uses ASME B31G, MODIFIED ASME B31G, or DNV RP-F101 to calculate the failure pressure (Pfail) of the pipeline at a metal loss area for gas lines. The calculation also takes into consideration a temperature factor, for use when the line is at elevated temperature, and a safety factor. The default values used in calculations are a temperature factor of 1, and a safety factor of 100%.
P'/P	Percent of maximum established pressure, this is calculated by dividing the calculated safe pressure of the defect (P') by the current established maximum operating pressure of the pipeline (P). For TDW reporting, P is either established MOP provided by the customer or the calculated pressure rating for the pipe (P). Percentages less than 100% are considered pressure-reducing.
Pfail/MAOP	Percent of MAOP, this is calculated by dividing the calculated failure pressure of the defect (Pfail) by the current MAOP of the pipeline (P). For TDW reporting, P is either established MAOP provided by the customer or the calculated pressure rating for the pipe (P).
PATCH	A device used to repair a pipeline by welding a small section of pipe on top of the defect.
PIG	A generic term signifying any independent, self-contained device, tool or vehicle that moves through the interior of the pipeline for purposes of inspecting, batching, dimensioning, or cleaning.

General Inline Inspection Terms

PIGTRAP	Pipeline Inspection Graphical Test Reporting and Analysis Program (PIGTRAP). Proprietary software developed by TDW Inc. for viewing data collected by the inspection tool.
PIPE SUPPORT	Any device used to support an aboveground pipeline.
PIT	Localized concentrated-cell corrosion on the external or internal surfaces that results from generation of a potential (voltage) difference set up by variations in oxygen concentrations within and outside the pit. The oxygen-starved pit acts as anode and the pipe surface acts as the cathode. If several pits are in close proximity to each other, they may be grouped together using interaction rules as one group.
PLANAR	An NDT term indicating a feature has two-dimensional characteristics like a fissure. Sometimes referred to as crack-like.
RSTRENG	A computer program designed to calculate the calculated safe maximum operating pressure (P') of corroded pipe. RSTRENG results are approximated when Modified B31G criteria is used.
REBOUNDING	The process of changing the dent depth and shape by internal pressure in the pipe. Generally, dents due to third-party contact will re-round, while dents due to rocks will not unless the rock causing the dent is removed.
RECEIVER	Refers to the ending of the inspection; an oversize section of pipe equipped with sealing door through which the inspection tool is retrieved from the pipeline.
REPORTING THRESHOLD	A parameter that defines whether or not an anomaly will be reported. The parameter may be a limiting value on the depth, width, or length of the anomaly or feature.
RESIDUAL DENT DEPTH	The dent depth measured under a particular set of conditions, e.g., in pressurized or un-pressurized pipeline. While maximum dent depth does not change, the residual or measured dent depth changes with pressure and loading. Also referred to as the measured dent depth.
RUPTURE PRESSURE RATIO (RPR)	The ratio of the predicted failure pressure calculated by an analysis criterion (e.g. ASME B31G, RSTRENG, etc.) to the pressure at specified minimum yield strength (SMYS)
SAFETY FACTOR	(or Design Factor) Typically 0.72 for liquid lines per ASME B31G (0.80 in Canada) . In setting the safety factor, due consideration has been given to and allowances made for the manufacturing tolerance and maximum allowable depth of imperfections provided for in the specifications. DNV RP-F101 uses a slightly different Total Usage Factor, which is entered as the Safety Factor in PIGTRAP. The typical 0.72 factor becomes 0.648 when applying the DNV modeling factor of 0.9.
SEAMLESS	Pipe that is manufactured by means of extrusion. This process typically creates significantly more variation in pipe wall thickness than ERW pipe.
SEAM VARIATION	Non-detrimental irregularity due to the manufacturing of the seam weld. An example is excess or variance in trim.
SEAM WELD (or SEAM)	The longitudinal or spirally-oriented weld in pipe connecting two edges of a formed plate which was created at the pipe mill.
SLEEVE	A device used to repair a pipeline by welding a small section of pipe over the full circumference of the pipe over the top of the defect.
SpirALL™ Magnetic Flux Leakage	A tool system that unites a conventional axial MFL and a unique spiral MFL tool section into one tool combining the benefits of each for enhanced defect characterization and sizing.

General Inline Inspection Terms

Spiral MFL (SMFL)	A unique type of MFL tool section that creates an oblique, near-45 degree magnetic field within the pipe wall. This allows detection and characterization of long and narrow metal loss or seam features on par with circumferential or transverse MFL tools.
SPACER	A device used to maintain space between a casing and a pipeline.
SMYS (Specified Minimum Yield Strength)	A required strength level that measured yield stress of a pipe material must exceed, which is reported as pipe grade. The measured yield stress is the tensile stress required to produce a total elongation of 0.5 percent of a gage length as determined by an extensometer during a tensile test.
STITCHING	Intermittent or repeating lack of fusion in a seam weld.
TEMPERATURE FACTOR	Typically 1.0 unless the metal temperature is expected to exceed a normal temperature range of -20°F (-30°C) to 250°F (120°C).
THIRD PARTY DAMAGE	Damage to a pipeline system by an outside party. See mechanical damage.
TRACKING	The process used to monitor the progress of the inspection tool through the pipeline. AGM boxes are placed at aboveground marker reference locations to record the passage of the inspection tool.
TRAP	Pipeline facility for launching and receiving tools and pigs.
VOLUMETRIC	A term indicating a feature has three-dimensional characteristic similar to a typical corrosion pit.
WELD ANOMALY	Any area or zone in a weld that lacks complete melting and fusion of a portion of the weld which could have occurred during the welding process or caused by corrosion.
WRINKLE	A smooth and localized bulge visible on the outside wall of the pipe.
WRINKLE BEND	A field bend that contains smooth and localized bulges on the inner radius of the bend, sometimes formed when pipe is cold bent.

Appendix A

1. The Graphs, Dig Sheets, and Tables used in this report were generated using a standalone reporting engine from data contained in a Microsoft Access™ database.

2. If the end user has Microsoft™Access on their computer, they have complete access to the inspection database. The database file which has an extension of *.mdb (Microsoft™ database) is stored in the same directory as the tool data. Although the printed reports and report spreadsheet were generated by a standalone reporting engine, using Access the user can customize some basic graphs or tables contained in the database. Alternatively, the data can be exported to a spreadsheet if preferred.

3. The PigTrap™ software, included with this report, provides the user with an easy way to view the data collected by the TDW in-line inspection tool and can also be helpful when trying to locate certain features or specific sections of pipe. The software can be run off various media or installed onto a network or hard drive. Please refer to Appendix B for installation requirements and instructions.

4. For dig sheet creation, please refer to Appendix C.

5. TDW inspection tools are designed to detect various features and anomalies within a pipeline. These various features and anomalies are added to the database using PigTrap™ software by qualified Data Analysts.

6. Database Numbering System: All entries in the database have a unique number assigned to them. The table below lists the number range of each category of database records.

7. All records are numbered sequentially from the beginning of the pipeline section to the end of the pipeline section. By default Welds begin at 110 and are incremented by 10 from one weld to the next. This can be altered to match customer weld or joint numbering by request.

Welds	110	to	9,999,999
Locations	10,000,000	to	10,999,999
Pipe	11,000,000	to	11,999,999
Misc	12,000,000	to	12,999,999
Gains	13,000,000	to	13,999,999
Deformations	14,000,000	to	14,999,999
Bore Restrictions	15,000,000	to	15,999,999
Pits or Other Defects	20,000,000	to	39,999,999
Groups (of Pits)	40,000,000	to	49,999,999
Seam Welds	51,000,000	to	51,999,999

8. All other records are incremented by 1 from one record to the next. For example, the first Location record would be numbered 10,000,000, the second record would be 10,000,001, and the third record would be 10,000,002, etc. Depending on information sent out previous to the final report, numbering may change during analysis of the run.

Appendix B

The PigTrap™ software allows the user to view all of the data collected during the Magpie/TDW inline inspection survey. Installation requires the disk(s) or external drive that accompany the inspection report.

System Requirements

Before you install and run PigTrap™ please verify that the computer you are installing to meets the minimum requirements needed to successfully open and operate PigTrap™.

Windows OS

- Microsoft® Windows 7, Vista®; Windows® XP Professional, Home Edition
  - o Administrator rights required
- 2.0 GHz Intel® Core™ 2 Duo Processor or higher
- 2 GB RAM or more
- 1 GB available hard drive space plus additional necessary for the run size.
- Qualified hardware-accelerated OpenGL graphics card, 32-bit color, and 256MB of VRAM (latest manufacturer drivers strongly recommended also).
- Microsoft® Access 2003 or higher
- Microsoft® .NET Framework 3.5 Service pack 1
- Microsoft® Visual C++ 2008 SP1 Redistributable Package (x86)
- Microsoft® Report Viewer 2008 SP1

What electronic data accompanied the inspection report

The CD, DVD, or external drive supplied by T.D. Williamson, Inc. for this PigTrap™ inspection of your pipeline contains the following types of files. For CD or DVDs the first disk will contain these files while accompanying disks (if any) contain raw tool data only. External drives will contain this information in the Final Report folder on the external drive under the run name folder.

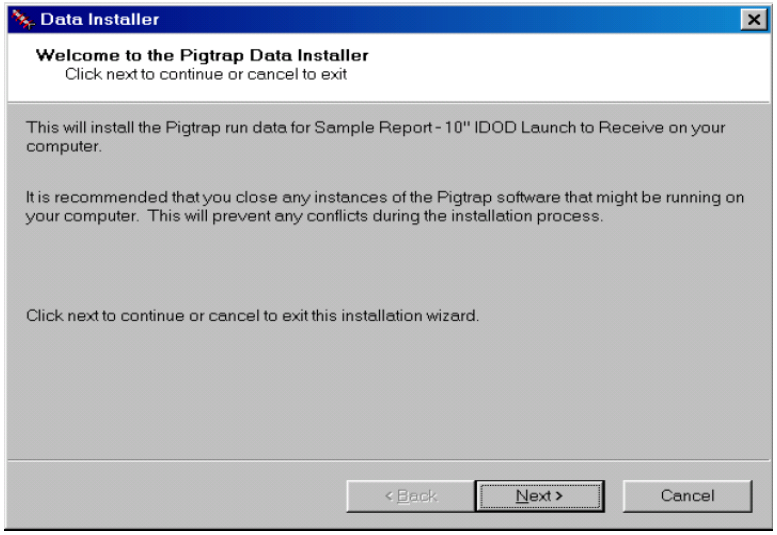
- Database – .MBD (Microsoft Data Base) Files of this type may be viewed through Microsoft Access. This file contains the analysis of the inspection.
- .rsf – This is a PigTrap™ reference file which holds specific settings for the run to be viewed.
- Spreadsheet – .XLS (Microsoft Excel) A Pipeline Listing is generated for your run in an Excel spreadsheet format. Each event at a particular location is identified and described. You may use Copy and Paste techniques to build your own custom formatted report.
- Setup.exe file – This file executes the installation of the data for the specific run contained on the disk(s) or external drive.
- h*.nnn, c*.nnn, i*.nnn, p*.nnn, t*.nnn, l*.nnn & o*.nnn – The raw tool data created on-board the inspection tool. These files are necessary for PigTrap™ to function properly. CD and DVDs have the option to install these files onto your computer, if chosen not to install them to your computer the disks must be used to view the run.

Run Data and PigTrap™ Installation

The inspection report will be accompanied by either CDs, DVDs, or an external drive containing all files necessary for installation. Installation for CDs and DVDs differs from external drives, if an external drive accompanied your final report please skip to PigTrap™ Installation.

CDs and DVDs

1. Insert Disk 1 from the report binder into your computer's CD/DVD drive.
2. Access the Setup.exe program located on the CD or DVD. This can be done by browsing to your computer's CD/DVD drive and double clicking Setup.exe. This will launch the Data Installer program.

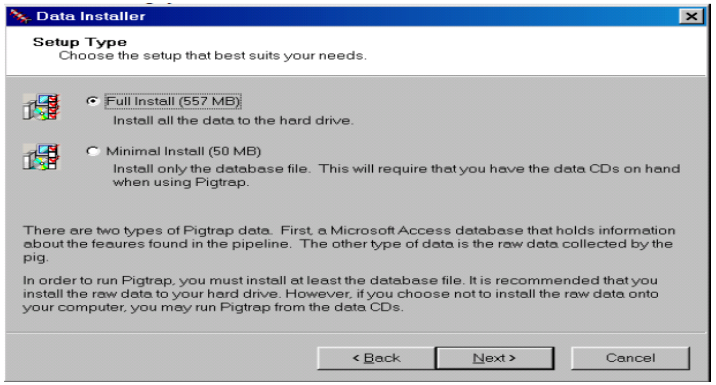


Note: If you want to install only the Pigtrap™ software and not the run data (advanced users only), choose Cancel and go to the Pigtrap™ Installation steps on page 3.

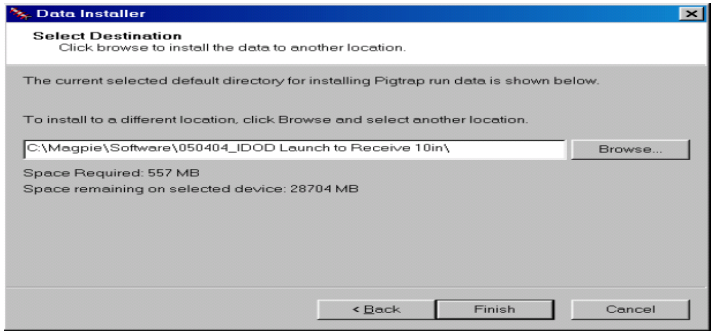
3. Click Next to continue installing the run data.

Appendix B

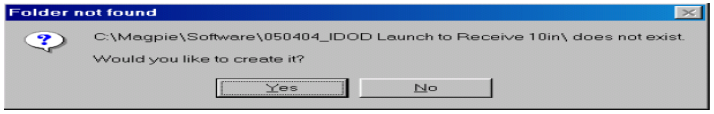
4. Choose the type of install you would like to perform: Full Install (recommended) or Minimal Install. The size of the installation is shown next to each type of installation. The database file must be installed for PigTrap™ to operate properly, but you may choose to not install the raw data. If you choose to not install all the data, you may need to change disks while viewing the data in PigTrap™. Click Next to continue after making your choice.



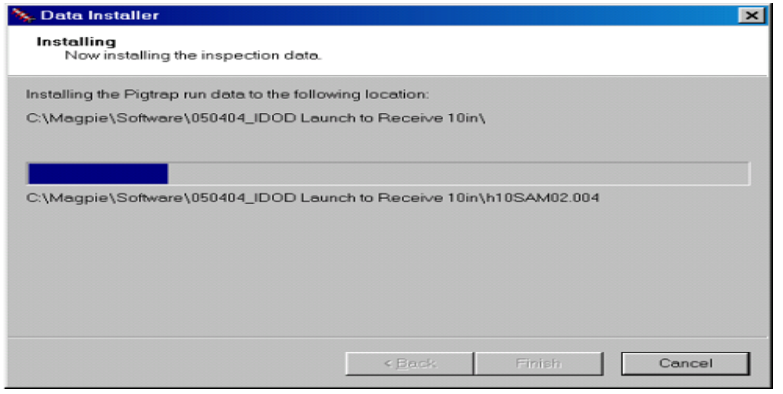
5. Choose the installation location on your computer for the data files. The default and recommended location is C:\Magpie\Software. The location inside this folder is based on the trap date, name, and size of the run. If you would like to specify another location, click the Browse... button. Click Finish to continue.



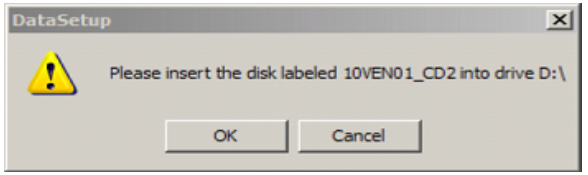
6. If the installation folder does not already exist, then you will be prompted to create it. Click Yes to create the new folder.



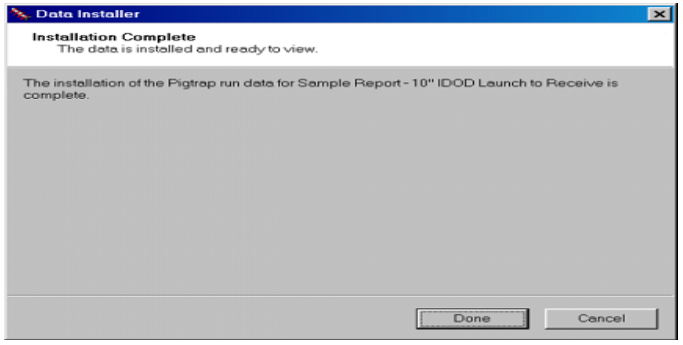
7. The following progress bar will appear. There may be a short delay while the database is being copied. Be patient, this is normal.



8. You may be prompted to insert other disks from the run distribution if data was supplied on more than one disk. Insert the required disk and click OK to continue. Repeat until all disks have been copied.



9. Click Done to complete the run data installation.



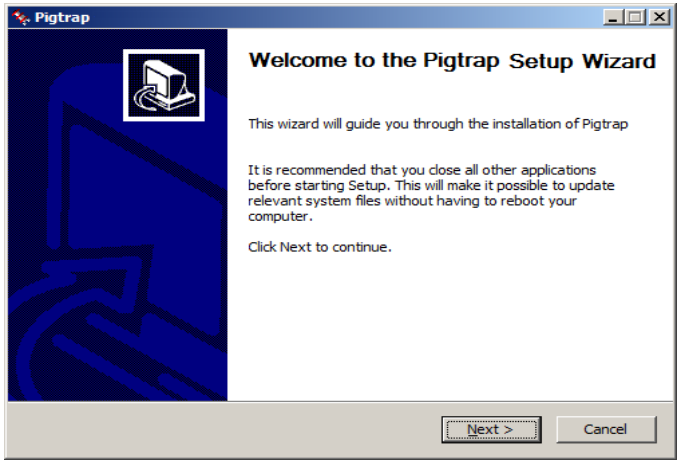
10. After clicking Done in the Data Installer PigTrap™ Installation will automatically launch.

Appendix B

PigTrap™ Installation

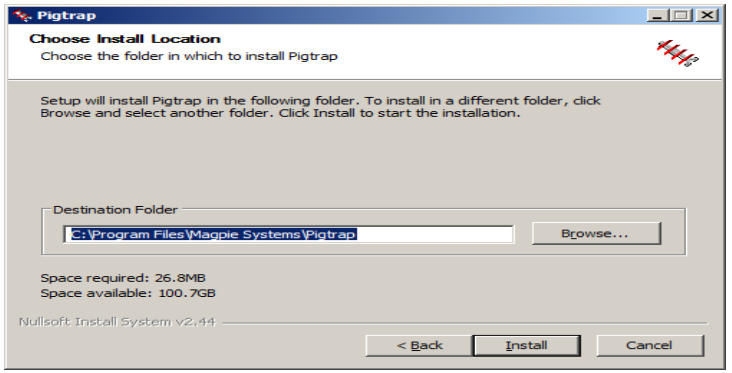
Note: CD and DVDs follow a slightly different installation process. Steps 1 and 2 are for external drives, if you are installing from CDs or DVDs please skip to step 3.

1. Plug the external drive into your computer.
2. Access the PigTrap™ setup.exe located on the external drive. This can be done by browsing to external drive and double clicking PigTrap™ setup.exe.
3. PigTrap™ Setup Wizard will launch. This will guide you through the installation of PigTrap™. Click Next to continue.

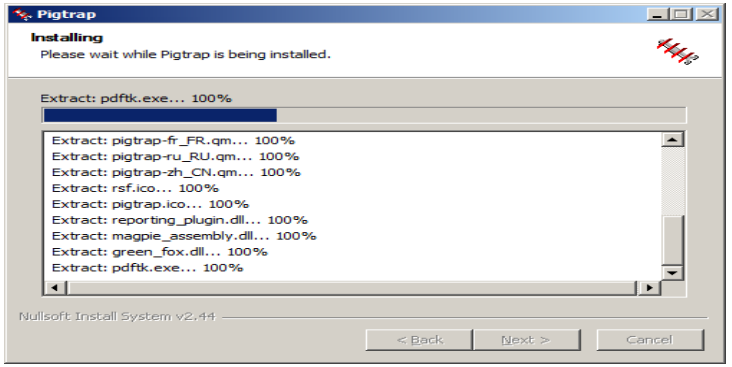


4. The Software License Agreement will appear. Read the agreement select I Agree to continue. You must accept the agreement to install PigTrap™.

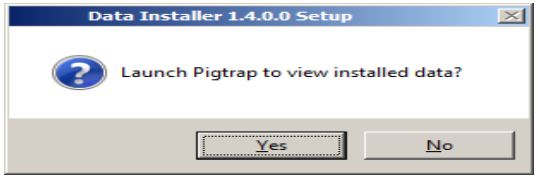
5. Choose the installation location on your computer for the PigTrap™ software. The default and recommended location is C:\Magpie\Software. Click Install to continue.



6. The following progress bar will appear while PigTrap™ installs all the necessary files. Once the installation has completed click Finish to close the wizard.



7. When prompted whether you would like to view the run data, click Yes to launch PigTrap™. Shortcuts are now on the desktop to the run and to PigTrap™. Once PigTrap™ opens with the data, choose save in the upper left of the data view.



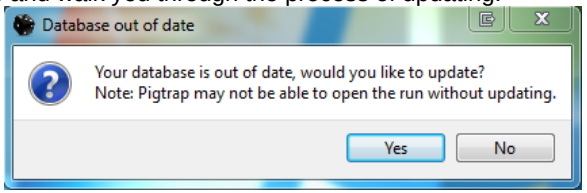
Appendix B

Opening and Viewing the Inspection Data

Viewing the inspection data in PigTrap™ can be done by using one of three different methods.

1. Double click on PigTrap™ .exe icon. Click on the Open Folder icon , then browse to the installed inspection data folder and select the desired .rsf or .mrsf file.
2. Double click on a run settings file (.rsf or .mrsf) that is associated with PigTrap™.
3. Drag and drop a run settings file (.rsf or .mrsf) on top of the PigTrap™ .exe file.

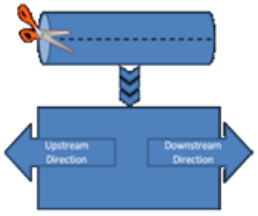
PigTrap™ was designed so you would have the ability to review previous TDW/Magpie inspection data when needed. However, you may need to acquire an updated Microsoft Access Data-base from one of our TDW representatives. When opening previous data in PigTrap™ you may encounter the message, "Your database is very old. You may need to update it." If this happens, don't panic. Chances are you will be able to view the data without any problems. If you can't, just contact your TDW representative and we can send you a newer database and walk you through the process of updating.

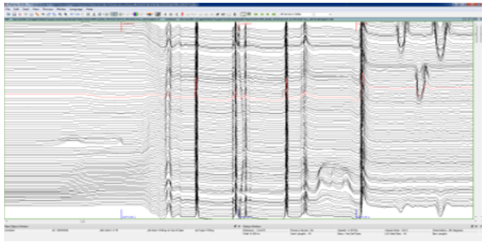


We packed so much into the new PigTrap™ the older reference files just couldn't hold it all so a new one may need to be created. Once the new reference file finishes, you will be able to freely navigate around in PigTrap™.

What am I looking at?

The data viewed in PigTrap™ is a 360 degree snapshot of the inside of the inspected pipe. This captured data is sliced down the middle and laid flat in the PigTrap™ main display. The horizontal lines represent sensor data collected from the pigging tool. Each line is one sensor. The left side of the screen is "upstream" while the right side of the screen is "downstream". So, as you scroll from left to right you are moving downstream from the launch valve.





Basic Navigation

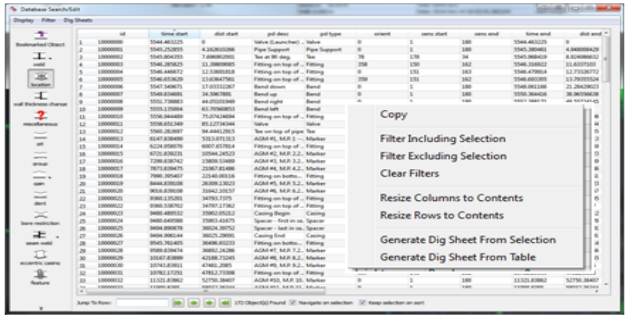
The horizontal scrollbar at the bottom of the main view moves the view upstream or downstream. Clicking on the left arrow moves upstream while clicking on the right arrow moves downstream.

The vertical scrollbar at the right side of the main view rolls the data vertically to a desired orientation of the view.

Zooming IN/OUT on the data is easily performed by clicking on the Zoom buttons.

Select the "Jump to Distance" icon from the run toolbar to enter a desired distance point to navigate in the inspection data. The option "View Width" sets how much viewable area to display (time based).

Click on the binoculars to open the Database/Search Edit (DSE). This displays a table of the pipe objects marked by the Data Analysis personnel. The buttons in the DSE allow for a high level filtering of specific types of marked pipe objects in the table. Right click on any pipe object to display a context menu of filtering, resize columns/rows and generate dig/feature sheets.



For example: Launch and Receive Valves can be found under "location" button, you'll also find Bends, Tees, Markers, etc.

For additional information regarding dig/feature sheet creation, see Appendix C.

Training

For detailed Pigtrap training, contact your TDW representative.

Appendix B

Trouble Shooting

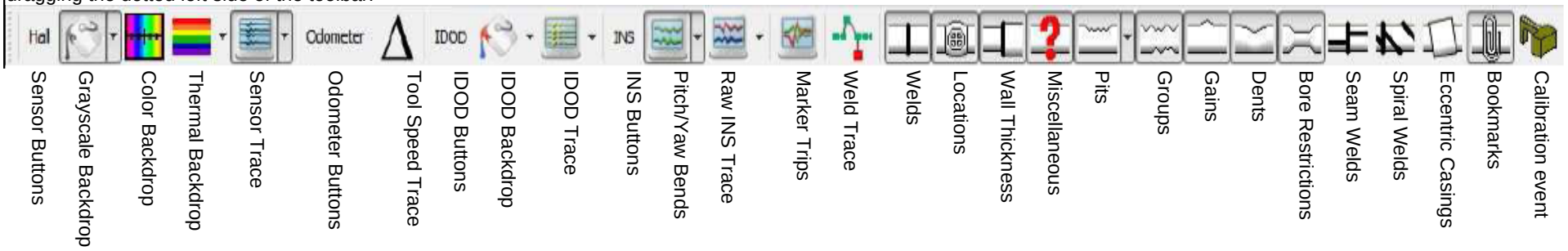
Issue	Possible Cause	Possible Solution
"Data files missing" message displayed on the Main view.	PigTrap™ is not able to load the necessary data file(s) because they are missing, not installed correctly, media/hardware damage (Dirty or scratched CD/DVD, drive failure).	Please reinstall the inspection data, check the run setting has the correct path to the files (Run Settings>Files>Data File Directory), clean the CD/DVD.
"Generate Dig Sheet" is not available from the DSE.	PigTrap™ is not installed correctly.	Please reinstall PigTrap™.
Main window title bar is not visible.	Full screen is enabled.	Press "F11" on the keyboard.
Not able to highlight pipe objects.	The color bit depth is not set correctly.	PigTrap™ requires a 32 bit color depth, please contact IT to assist in changing to the correct setting.
	One of the task specific modes is enabled.	Press the "Done" or "Cancel" buttons from the bottom left.
REF error message.	If this is the first time opening a run with PigTrap™ , it may attempt to create a reference file (.ref2). This message appears because a .ref2 file does not exist or it is corrupt.	Select OK to create a new ref2 file.
Can't see the sensor data.	Zoomed in very close.	Click on the Zoom OUT button.
	Sensors are not enabled.	Turn on the sensors from the Run Toolbar.
Can't find the Status/Database Window.	The Status/Database windows are not enabled	Go to View>Status Window and toggle the option ON
Crashes while opening.	The video card drivers are out of date.	Update the graphic card drivers. Note: Before installing the latest driver, you may need to uninstall the current drivers while in Windows safe mode. Can also turn off shaders.
	The .rsf is corrupt and needs replacing.	Reinstall the inspection data.
	Microsoft Visual C++2010 redistributable is corrupt or not installed.	This is typically installed the TDW Inspection data. It is possible to have a corrupt install and additional help may be required to correct the issue. Please contact your local IT department to assist with the prerequisite install.

Appendix B

Tool Bar Layouts and Functions

Run Toolbar

The run toolbar will contain button that will toggle different views, traces and features on and off. Some of the features will be technology specific, such as IDOD as proximity sensors are only present on MFL tools. The arrows next to some buttons will provide additional options related to the specific button. Each window can be undocked by clicking and dragging the dotted left side of the toolbar.



Main

The main toolbar contains navigation buttons that will aid in viewing run data and seeking to specific distances or locations.

Database Navigation

These buttons navigate to features listed in the DSE.

Sensor Visibility

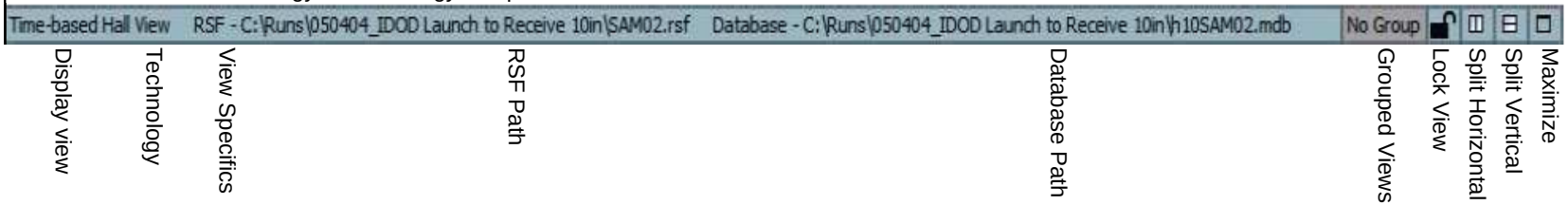
PigTrap™ allows user to zoom in on specific set of sensors, this dialog will display what sensors are currently being viewed. To return to viewing all sensors simply zoom out (-).

Quick Search

The quick search allows users to quickly search for features by typing in a certain criteria, such as '+valve' this will jump to the next downstream valve.

Run Details Status Bar

The run details status bar displays information regarding the view-type (time or distance), the location of the RSF and database and allows for the splitting of multiple views. Additional views can be split vertically or horizontally and even un-docked into a separate window using the button that appears after a view has been split. Locking a view will keep the current view in place. This feature will allow for multiple runs to be open in the same PigTrap™ for easier run to run or technology to technology comparison.



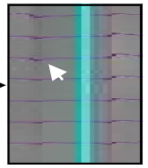
Appendix B

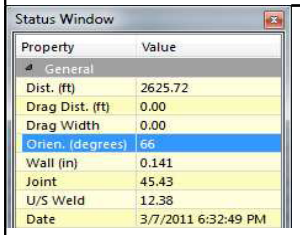
Displayed Information and Shortcuts

Pipe Object and Status Windows

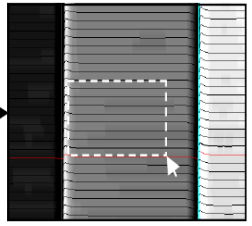
The Pipe Object and Status Windows will be defaulted to the right side of PigTrap™. Both windows can be docked and undocked by double clicking the title bar, left clicking and dragging or clicking the undock button located in the top right corner. As PigTrap™ has the ability to display multiple datasets the Status Window will update each section depending on which tool technology is selected (refer to the Run Details Status Bar on the Tool Bar Layout and Functions page). The information contained in each section of the Status Window can also be customized by right clicking on the desired section and selecting what data to display.

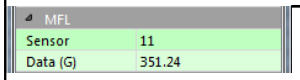
The pipe object window will display information about a highlighted feature, such as a weld, providing the weld ID and Distance. Features are highlighted when the cursor is placed upstream of an object and the object becomes highlighted with a teal color.



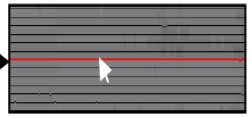


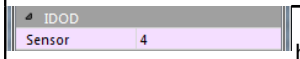
The General section of the Status Window will display information pertaining to all datasets. The information is dependent on the cursor location, displaying the current distance, orientation, wall thickness, joint length, up stream weld and date and time. The drag distance and drag width is populated when a box is drawn and can be useful when manually measuring lengths and widths.



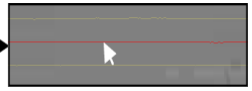


The MFL window will display information for the current highlighted sensor. The highlighted sensor will be a red line over the entire sensor. These sensors can be turned on and off using the Esc key.

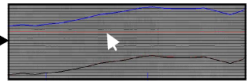




The IDOD window will display information for the current highlighted IDOD sensor. The IDOD sensors can be turned on by pressing the tilde (~) key.



The odometer section displays information about the speed for the current cursor location.



Status Bar

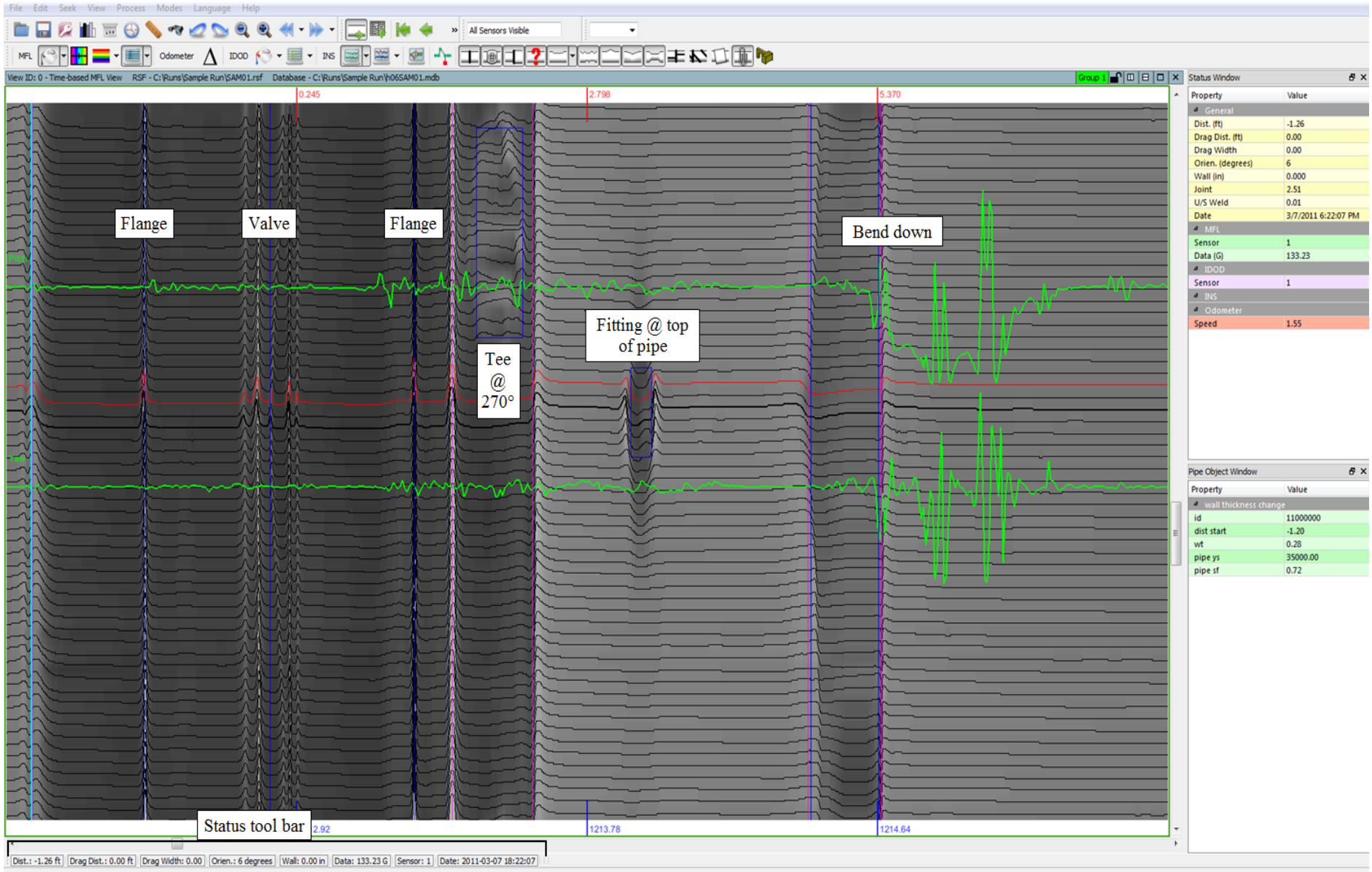
The Status Bar is located at the bottom left of PigTrap™ and contains much of the same information as the General section of the Status Window. It can also be customized by right clicking and selecting what information to display. The order can also be adjusted by clicking and dragging a section above or below other rows.

Keyboard Shortcuts

Ctrl + ŷ	Jump to Launch Valve
Ctrl + Ź	Jump to Receive Valve
Ÿ	Move Half Screen Downstream
Ŷ	Move Half Screen Upstream
Page Down	Move Full Screen Downstream
Page Up	Move Full Screen Upstream
ŷ	Rotate Orientation Up
Ź	Rotate Orientation Down
Mouse Wheel	Rotate Orientation
Ctrl + F	Open Database Search Edit (DSE)
Spacebar	Repeat Last DSE Find
Ctrl + Z	Undo Last View
Ctrl + Shift + Z	Redo Last View
Ctrl + D	Jump to Distance
Ctrl + T	Jump to Time
Ctrl + H	Open Deformation Cross Section
Ctrl + Ÿ	Jump to Downstream Marker Trip
Ctrl + Ŷ	Jump to Upstream Marker Trip
Alt + Double Click	Hide Status Windows
Esc	Turn Hall sensors on/off
Tilde (~)	Turn IDOD sensors on/off
M	Measure dragged box

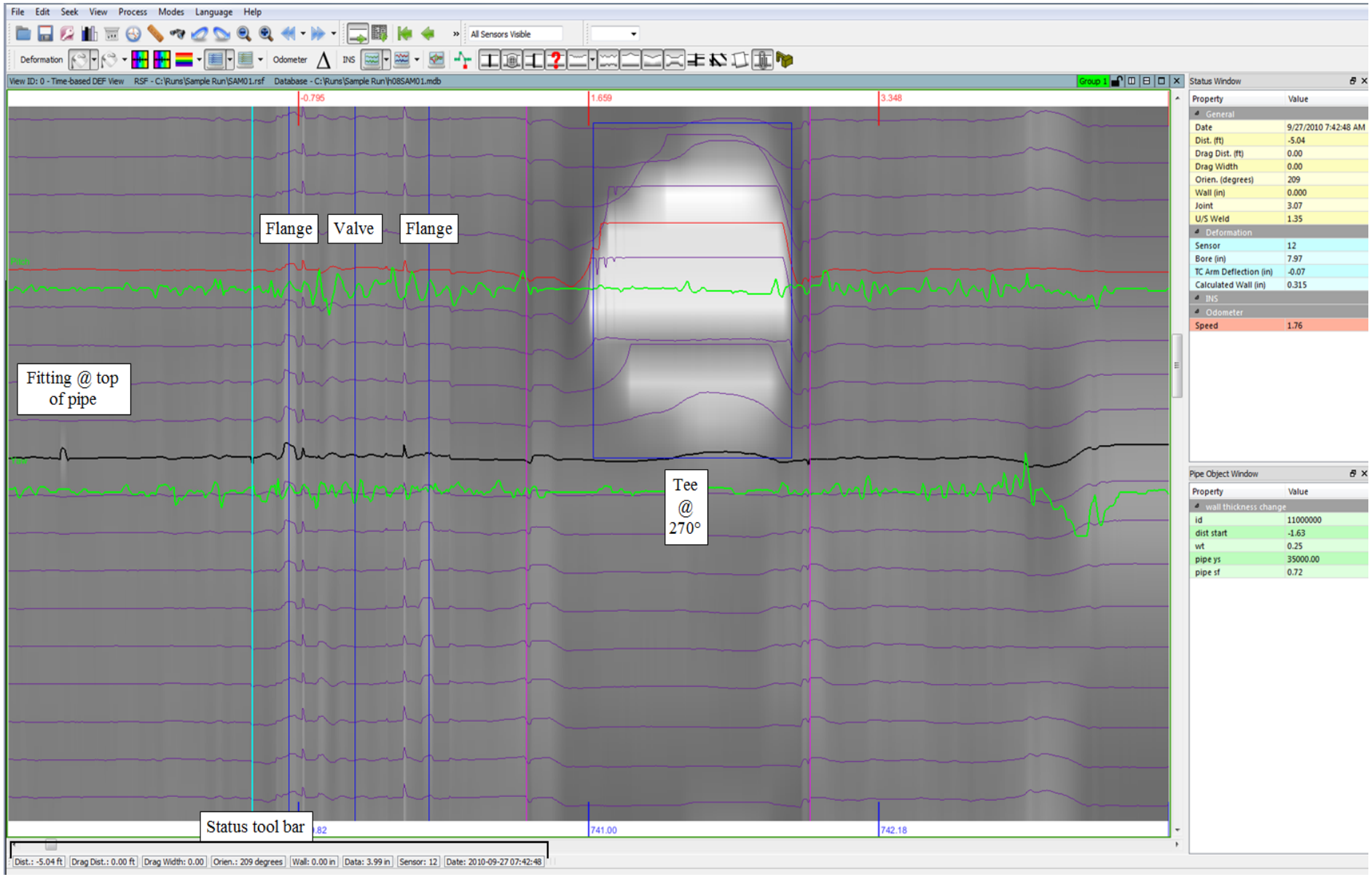
Appendix B

PigTrap™ MFL Runs



Appendix B

PigTrap™ DEF Runs

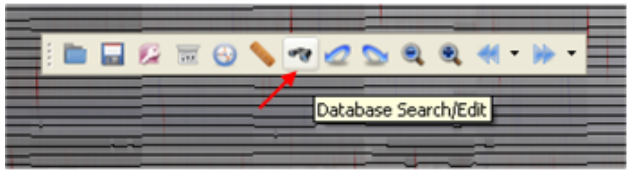


Appendix C

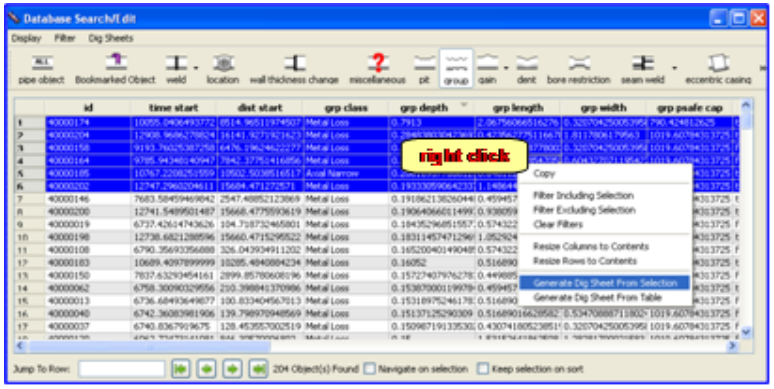
The user can view and print dig sheets for any anomaly or feature detected in the pipeline including Metal Loss (Groups or Pits), Dents, Locations, Gains, Wall Thickness changes, Welds, Miscellaneous notes, etc.

1. Open PigTrap™ to view the inspection data for the run. Please consult Appendix B if you need instructions on installing and viewing the raw data.

2. Click on the Database Search/Edit option either by clicking on the small binoculars icon in the toolbar or choosing the option under the Seek toolbar.



   a. This will bring up the Database Search/Edit (DSE) window.



3. You can choose what type of feature you want to list in the window by clicking on the icon in the margin.

4. Once the list populates with that type of object, you can filter or sort the data to find the object(s) for which you want to create dig sheets.

   a. Clicking on the header of the column will sort either ascending or descending. Click again to reverse the order.

   b. You may also use or create various filters by clicking on one of the two Filters buttons.

   c. There is also a Displayed Columns button which allows you to hide or show the various columns of data.

5. Right clicking in the table or choosing the Dig Sheets option in the top toolbar will allow you to create dig sheets one of two ways:

   a. Generate Dig Sheet From Selection – This will create a separate dig sheet for each of the highlighted rows in the list. Using the Ctrl key or the Shift key and clicking rows will allow for multiple row selection.

   b. Generate Dig Sheet From Table – This will create a separate dig sheet for every item in the list whether highlighted or not. Note that if the list contains a lot of features, this could lead to numerous dig sheets being created and may impact the short term performance of your computer while they are being generated.

6. The dig sheets you requested will automatically be previewed for easier printing as well as saved to a directory as a pdf file for printing later.

   a. To choose which directory the dig sheets are saved into, choose Report Creation Settings under the Dig Sheets option in the top toolbar.

7. Also under the Dig Sheets toolbar in the DSE window, you may change various dig sheet formatting preferences by clicking on Dig Sheet Settings option.