K360 DEF MFL GMFL SMFL XYZ LGT

2013

Pipeline Inspection Report

T.D. Williamson
Pipeline Performance™

Company Name

Hiland Crude, LLC

Project Name

Dore Junction to Dore Station

Pipe Size

8"

Inspection Date(s)

Sep 20, 2013

Report Date(s)

Nov 27, 2013

TDW Regional Office

TDW Services, Inc.

Executive Summary - GMFL Inspection

RUN INFORMATION

Hiland Crude, LLC — *Dore Junction to Dore Station*

Heber Briceno — *8" Crude*

	Launcher	Receiver
Location:	Dore Junction	Dore Station
Date/Time:	9/20/2013 1:18:28 PM	9/20/2013 5:18:16 PM
Stationing:	0+00	671+28
GPS - LAT:	47.92410819	47.920191384
GPS - LONG:	-103.783833066	-104.030236156

Duration of run - Hours: 4 **Average Velocity:** 4.75 ft/sec **Tool Tracking By:** Cherokee Pipeline Services

Pipeline Length: 68,301.00 ft **Maximum Velocity:** 6.1 ft/sec

On-site Representative: Eric Johnson **Data Analyst:** Ben Stehling

Contact: Heber Briceno

INSPECTION FINDINGS

Current Established Maximum **Criteria Used:** ASME B31G: Modified

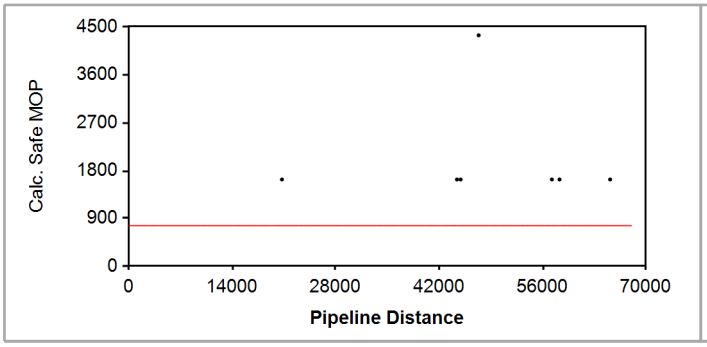
Operating Pressure of Pipeline: 750 psi **Defect Interaction Rule:** 1 inch between pits

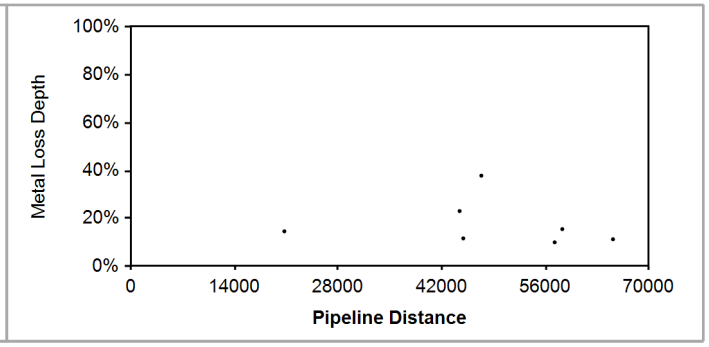
Welds Detected: 1,575 **Valves Detected:** 4 **Fittings Detected:** 6 **Markers Detected:** 14 **Gains Detected:** 0

Casings Detected: 0 **Tees Detected:** 2 **Flanges Detected:** 10 **Repairs Detected:** 0 **Deformations Detected:** 0

P'<P*: 0 **M/L pits:** 7 **M/L grouping:** 7

Internal groups: 2 **External groups:** 5





** 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 7 metal loss groups (2 Internal/5 External) were detected on the inspection survey, of which the deepest is reported at 38%. 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 (68,301 feet / 12.94 miles) of the survey. The quality of the inspection data is satisfactory for a comprehensive assessment of this pipeline segment.

GMFL sensor coverage, 94%, IDOD sensor coverage, 92%. Tool rotation is good through the affected areas. Client was notified of the incomplete sensor coverage and accepted the run. Tool speed is 100% within tolerance.

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
Heber Briceno

Dore Junction to Dore Station
8" Crude

	Launcher	Receiver
Location:	Dore Junction	Dore Station
Date/Time:	9/19/2013 6:13:35 PM	9/19/2013 10:31:47 PM
Stationing:	0+00	671+28
GPS - LAT:	47.92410819	47.920191384
GPS - LONG:	-103.783833066	-104.030236156

Duration of run - Hours: 4.3
Pipeline Length: 68,107.00 ft
On-site Representative: Eric Johnson

Average Velocity: 4.40 ft/sec
Maximum Velocity: 5.97 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:** 4

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

INSPECTION DETAILS

Inspection data was obtained for the full length (68,107 feet / 12.90 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.

Sorted by depth then distance

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.										

Sorted by depth then distance

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
40000001	44,418.4	23.1%	1.24	0.48	EXT	66	2:00	1632.2	100.0	U/S:	AGM 090, Sta. 442+88, Route 7 -- Han #102	289.00
										D/S:	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	5100.58
40000005	58,294.2	15.5%	0.64	0.41	EXT	342	11:15	1632.2	100.0	U/S:	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	4173.88
										D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	2760.10
40000000	20,733.0	14.6%	1.22	0.46	EXT	349	11:30	1632.2	100.0	U/S:	AGM 040, Sta. 204+86, Gravel Rd. -- Han #116	638.53
										D/S:	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	4795.76
40000002	44,915.7	11.7%	0.39	0.43	INT	225	7:30	1632.2	100.0	U/S:	AGM 090, Sta. 442+88, Route 7 -- Han #102	786.34
										D/S:	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	4603.24
40000006	65,144.6	11.3%	0.48	0.43	EXT	346	11:30	1632.2	100.0	U/S:	AGM 120, Sta. 601+58, ROW -- Han #116	4090.34
										D/S:	Pipe Exiting the Ground, Dore Station -- Han #257	3143.21
40000004	57,261.9	10.0%	1.12	0.93	EXT	232	7:30	1632.2	100.0	U/S:	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	3141.58
										D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	3792.40
40000003	47,354.7	37.9%	0.99	0.44	INT	291	9:30	4340.9	100.0	U/S:	AGM 090, Sta. 442+88, Route 7 -- Han #102	3225.28
										D/S:	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	2164.30

This report shows a maximum of 100 metal loss groups.

Type	Number
Metal Loss	7

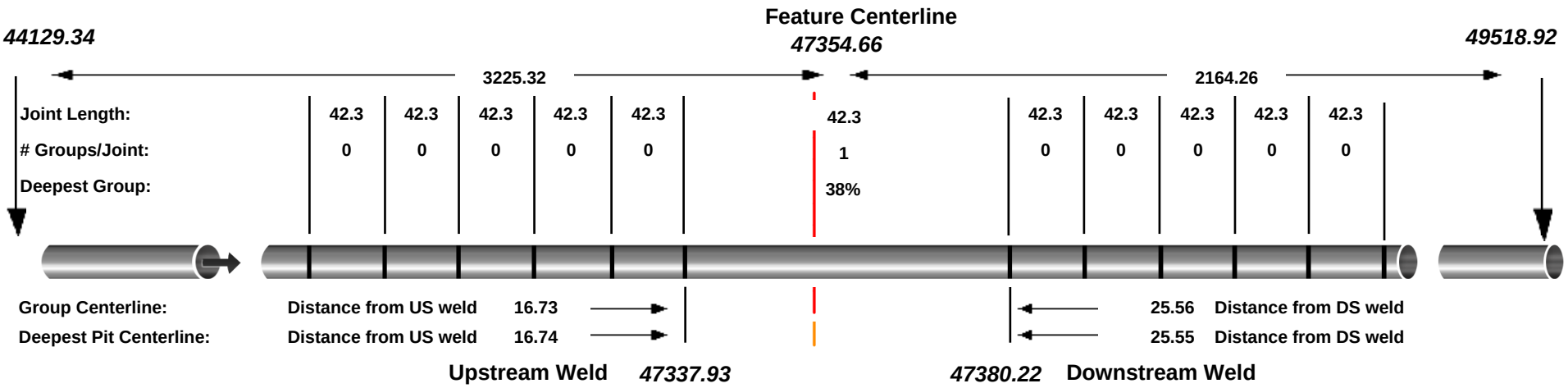
Sorted by pressure (P'), then depth

Criteria: ASME B31G: Modified

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 090, Sta. 442+88, Route 7 -- Han #102

DOWNSTREAM REFERENCE
AGM 100, Sta. 496+26, 158 Ave NW -- Han #142



Feature Information

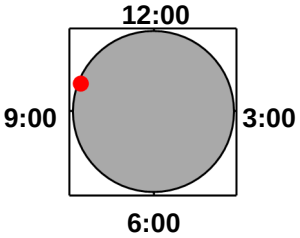
ID:	**40000003**	Distance from Launcher:	***47354.66***	***Feature Description***	
Time:	**12628.49**	Orientation on Pipe Wall:	**9:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.500**
Latitude:	**47.93541457**	Longitude:	**-103.96050340**	Altitude:	**1794.210**

Upstream Locations		Downstream Locations	
6066.55	Bend up - 45 deg., 1.5D	6727.92	Bend up - 45 deg., 8D
6077.51	Bend down - 45 deg., 3D	6744.38	Bend down - 45 deg., 3D
6079.25	Fitting on top of pipe	6747.12	Fitting on top of pipe
6081.11	Flange	6749.19	Flange
6082.24	Valve, AGM 080, Sta. 414+59, Gravel Rd.	6750.46	Valve, AGM 110, Sta. 541+92, ROW

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **38%**
Length: **0.987**
Width: **0.436**
ERF: **0.173**
Safe Operating Pressure: **4341 psi**

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

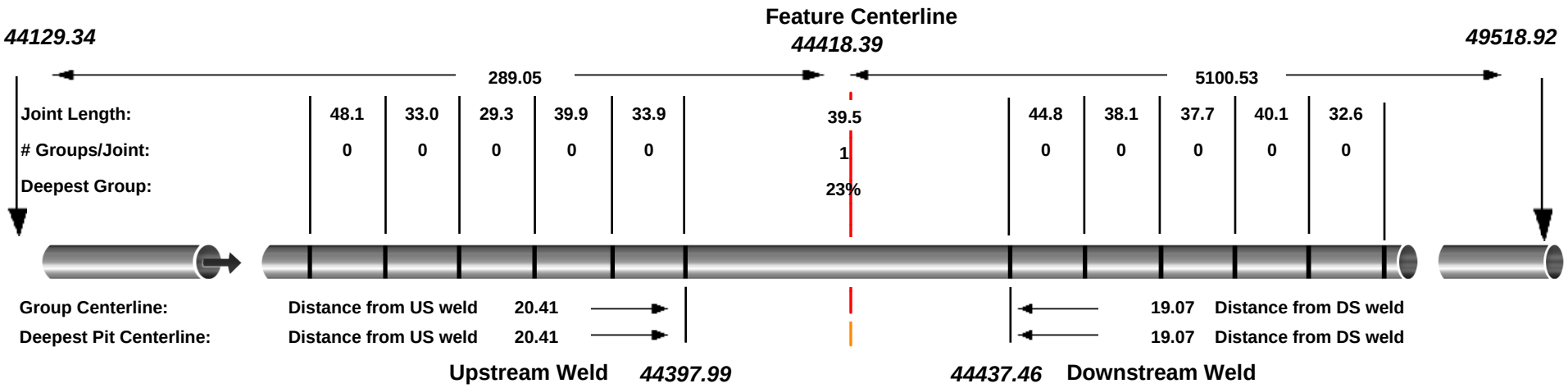
Generated: 11/27/2013

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

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 090, Sta. 442+88, Route 7 -- Han #102

DOWNSTREAM REFERENCE
AGM 100, Sta. 496+26, 158 Ave NW -- Han #142



Feature Information

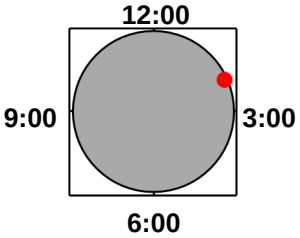
ID:	**40000001**	Distance from Launcher:	***44418.39***	***Feature Description***	
Time:	**12030.25**	Orientation on Pipe Wall:	**2:00**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.93525381**	Longitude:	**-103.94859128**	Altitude:	**1866.508**

Upstream Locations		Downstream Locations	
3130.28	Bend up - 45 deg., 1.5D	9664.19	Bend up - 45 deg., 8D
3141.24	Bend down - 45 deg., 3D	9680.65	Bend down - 45 deg., 3D
3142.98	Fitting on top of pipe	9683.39	Fitting on top of pipe
3144.84	Flange	9685.46	Flange
3145.97	Valve, AGM 080, Sta. 414+59, Gravel Rd.	9686.73	Valve, AGM 110, Sta. 541+92, ROW

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **23%**
Length: **1.241**
Width: **0.477**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

1. Measurements on this sheet are in ft / in
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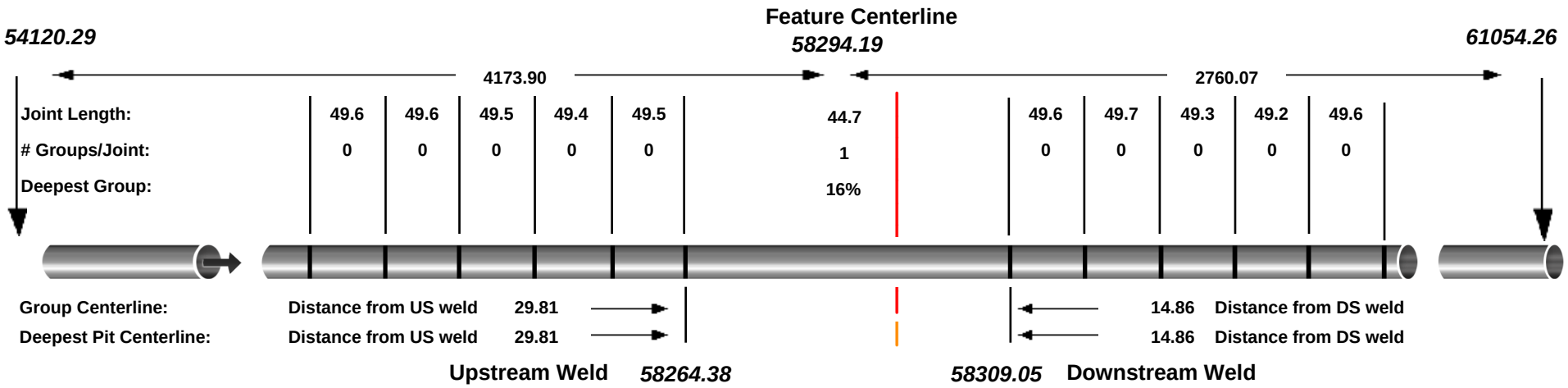
Generated: 11/27/2013

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

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142

DOWNSTREAM REFERENCE
AGM 120, Sta. 601+58, ROW -- Han #116



Feature Information

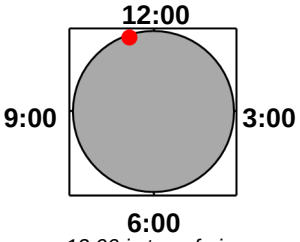
ID:	**40000005**	Distance from Launcher:	***58294.19***	***Feature Description***	
Time:	**14935.16**	Orientation on Pipe Wall:	**11:15**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.93249852**	Longitude:	**-104.00347619**	Altitude:	**1868.826**

Upstream Locations		Downstream Locations	
4167.63	Bend up - 45 deg., 1.5D	2941.63	Bend right - 45 deg., 3D
4184.17	Bend down - 45 deg., 6D	5184.53	Bend right - 45 deg., 3D
4186.02	Fitting on top of pipe	5249.80	Bend left - 45 deg., 3D
4187.91	Flange	7211.86	Bend left - 35 deg., 1.5D
4189.07	Valve, AGM 110, Sta. 541+92, ROW	7366.75	Bend left - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **16%**
Length: **0.640**
Width: **0.408**
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

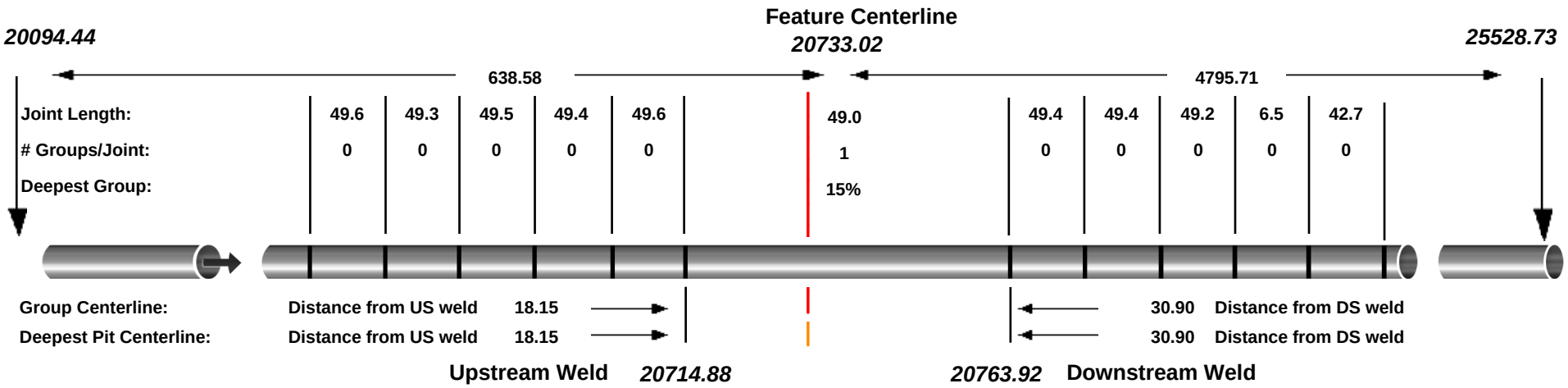
Generated: 11/27/2013

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

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 040, Sta. 204+86, Gravel Rd. -- Han #116

DOWNSTREAM REFERENCE
AGM 050, Sta. 258+70, 154 Ave NW -- Han #142



Feature Information

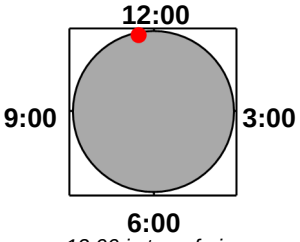
ID:	**40000000**	Distance from Launcher:	***20733.02***	***Feature Description***	
Time:	**7046.37**	Orientation on Pipe Wall:	**11:30**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.93472066**	Longitude:	**-103.86413482**	Altitude:	**2170.137**

Upstream Locations		Downstream Locations	
10726.30	Bend left - 27 deg., 1.5D	2601.65	Bend right - 35 deg., 3D
20673.85	Bend left - 85 deg., 17D	4292.23	Bend left - 60 deg., 1.5D
20711.41	Bend up - 45 deg., 3D	4416.71	Bend right - 45 deg., 1.5D
20727.87	Bend down - 45 deg., 3D	4901.64	Bend right - 30 deg., 1.5D
20728.60	Flange	7186.54	Bend right - 16 deg., 98D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **15%**
Length: **1.215**
Width: **0.462**
ERF: **0.460**
Safe Operating Pressure: **1632 psi**

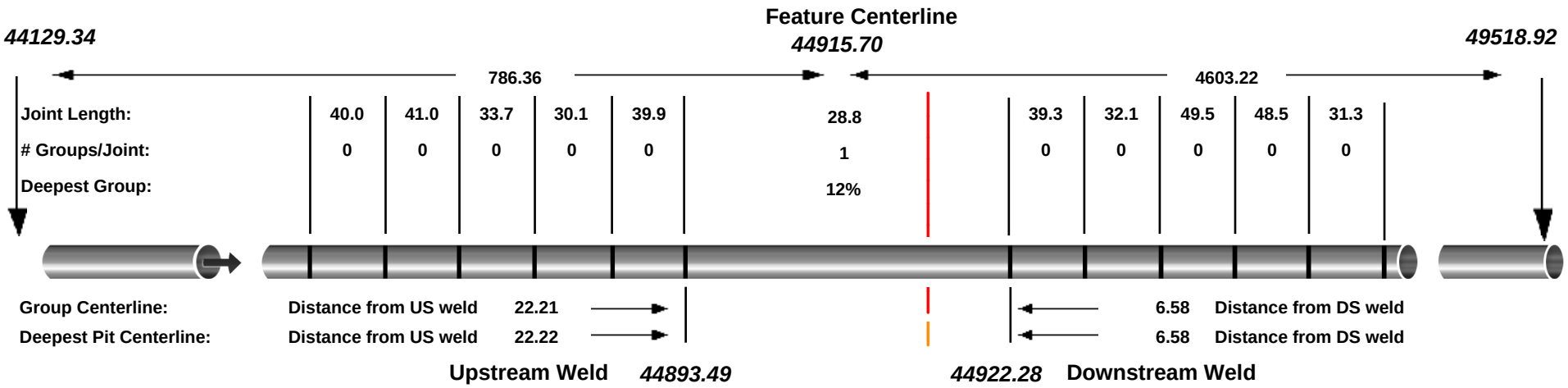
1. Measurements on this sheet are in ft / in
2. All numbers in italics are Distance from Launch

Generated: 11/27/2013

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 090, Sta. 442+88, Route 7 -- Han #102

DOWNSTREAM REFERENCE
AGM 100, Sta. 496+26, 158 Ave NW -- Han #142



Feature Information

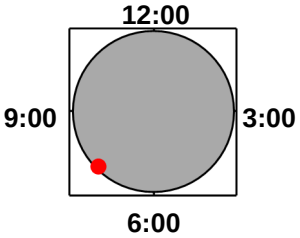
ID:	**40000002**	Distance from Launcher:	***44915.70***	***Feature Description***	
Time:	**12136.49**	Orientation on Pipe Wall:	**7:30**	**Metal Loss - INTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.93527636**	Longitude:	**-103.95061518**	Altitude:	**1867.606**

Upstream Locations		Downstream Locations	
3627.59	Bend up - 45 deg., 1.5D	9166.88	Bend up - 45 deg., 8D
3638.55	Bend down - 45 deg., 3D	9183.34	Bend down - 45 deg., 3D
3640.29	Fitting on top of pipe	9186.08	Fitting on top of pipe
3642.15	Flange	9188.15	Flange
3643.28	Valve, AGM 080, Sta. 414+59, Gravel Rd.	9189.42	Valve, AGM 110, Sta. 541+92, ROW

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **12%**
Length: **0.391**
Width: **0.433**
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

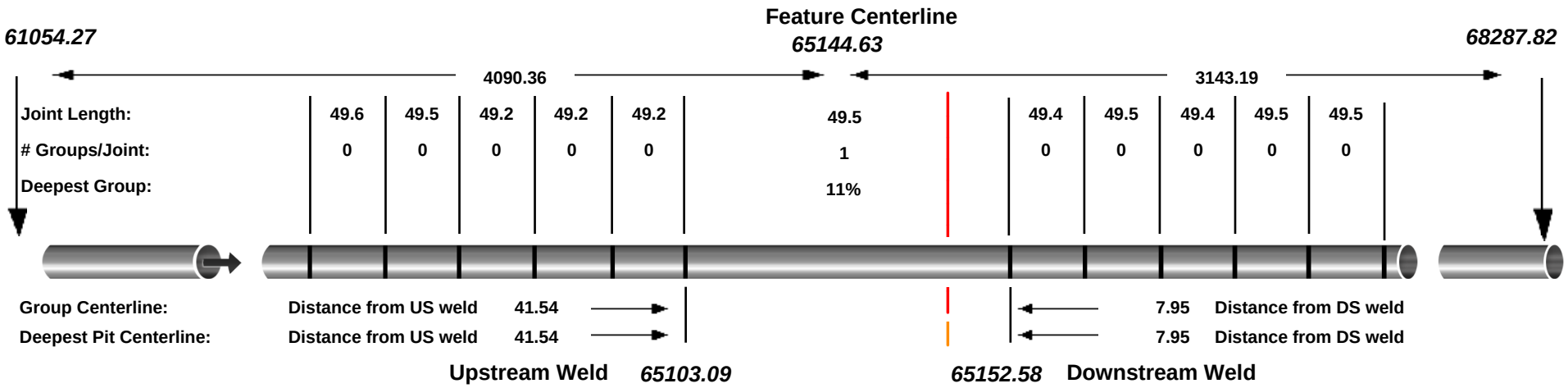
Generated: 11/27/2013

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

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
AGM 120, Sta. 601+58, ROW -- Han #116

DOWNSTREAM REFERENCE
Pipe Exiting the Ground, Dore Station -- Han #257



Feature Information

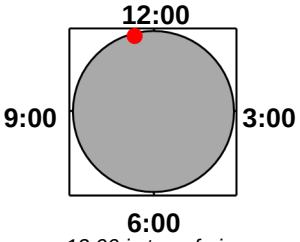
ID:	**40000006**	Distance from Launcher:	***65144.63***	***Feature Description***	
Time:	**16426.08**	Orientation on Pipe Wall:	**11:30**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.92766003**	Longitude:	**-104.02855699**	Altitude:	**1874.324**

Upstream Locations		Downstream Locations	
1600.64	Bend left - 45 deg., 3D	361.42	Bend left - 35 deg., 1.5D
1665.91	Bend right - 45 deg., 3D	516.31	Bend left - 45 deg., 3D
3908.81	Bend right - 45 deg., 3D	3129.80	Bend right - 24 deg., 3D
11018.07	Bend up - 45 deg., 1.5D	3134.68	Bend up - 45 deg., 3D
11034.61	Bend down - 45 deg., 6D	3146.80	Bend down - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **11%**
Length: **0.480**
Width: **0.429**
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

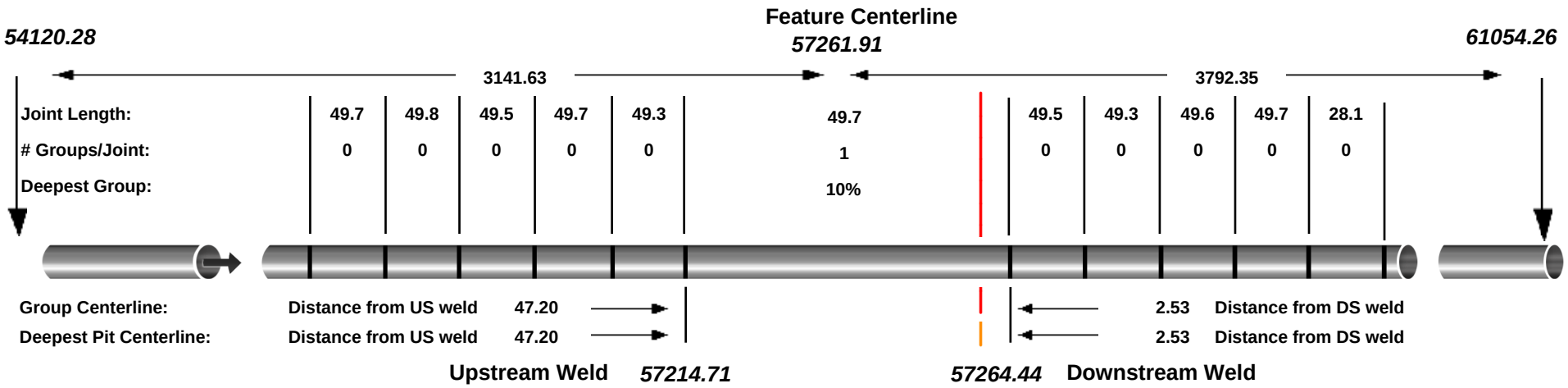
Generated: 11/27/2013

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

GROUP - Dig Site Information Report

UPSTREAM REFERENCE
Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142

DOWNSTREAM REFERENCE
AGM 120, Sta. 601+58, ROW -- Han #116



Feature Information

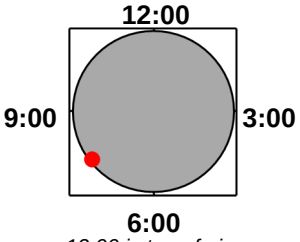
ID:	**40000004**	Distance from Launcher:	***57261.91***	***Feature Description***	
Time:	**14707.44**	Orientation on Pipe Wall:	**7:30**	**Metal Loss - EXTERNAL**	
				Wall Thickness:	**0.188**
Latitude:	**47.93420984**	Longitude:	**-104.00013680**	Altitude:	**1870.863**

Upstream Locations		Downstream Locations	
3135.35	Bend up - 45 deg., 1.5D	3973.91	Bend right - 45 deg., 3D
3151.89	Bend down - 45 deg., 6D	6216.81	Bend right - 45 deg., 3D
3153.74	Fitting on top of pipe	6282.08	Bend left - 45 deg., 3D
3155.63	Flange	8244.14	Bend left - 35 deg., 1.5D
3156.79	Valve, AGM 110, Sta. 541+92, ROW	8399.03	Bend left - 45 deg., 3D

(relative distance from Feature Centerline)

Feature Orientation

as looking downstream



12:00 is top of pipe

GROUP

Depth: **10%**
Length: **1.119**
Width: **0.928**
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: 11/27/2013

Charts

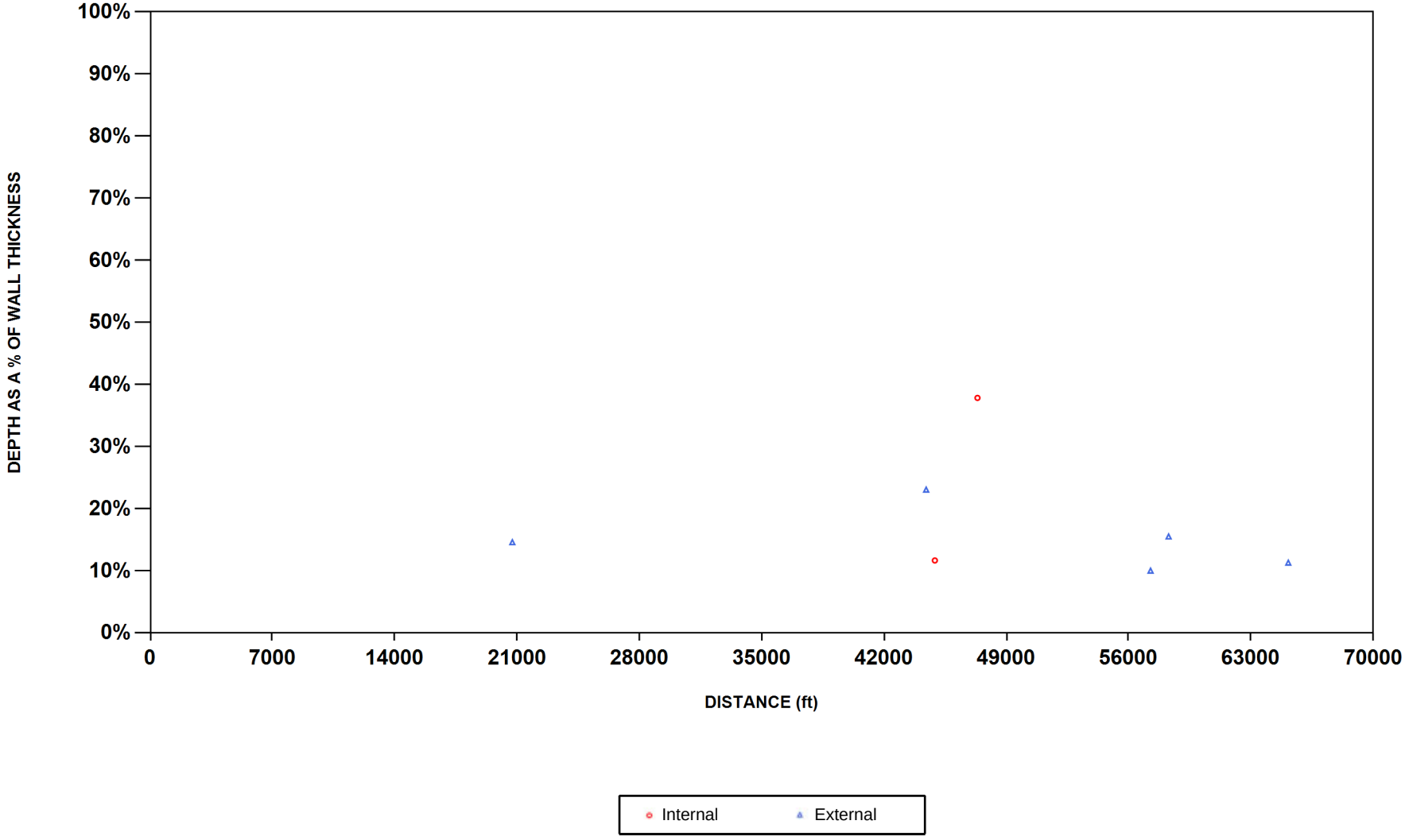
The Pipeline Summary report provides an overview of the pipeline condition.

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.

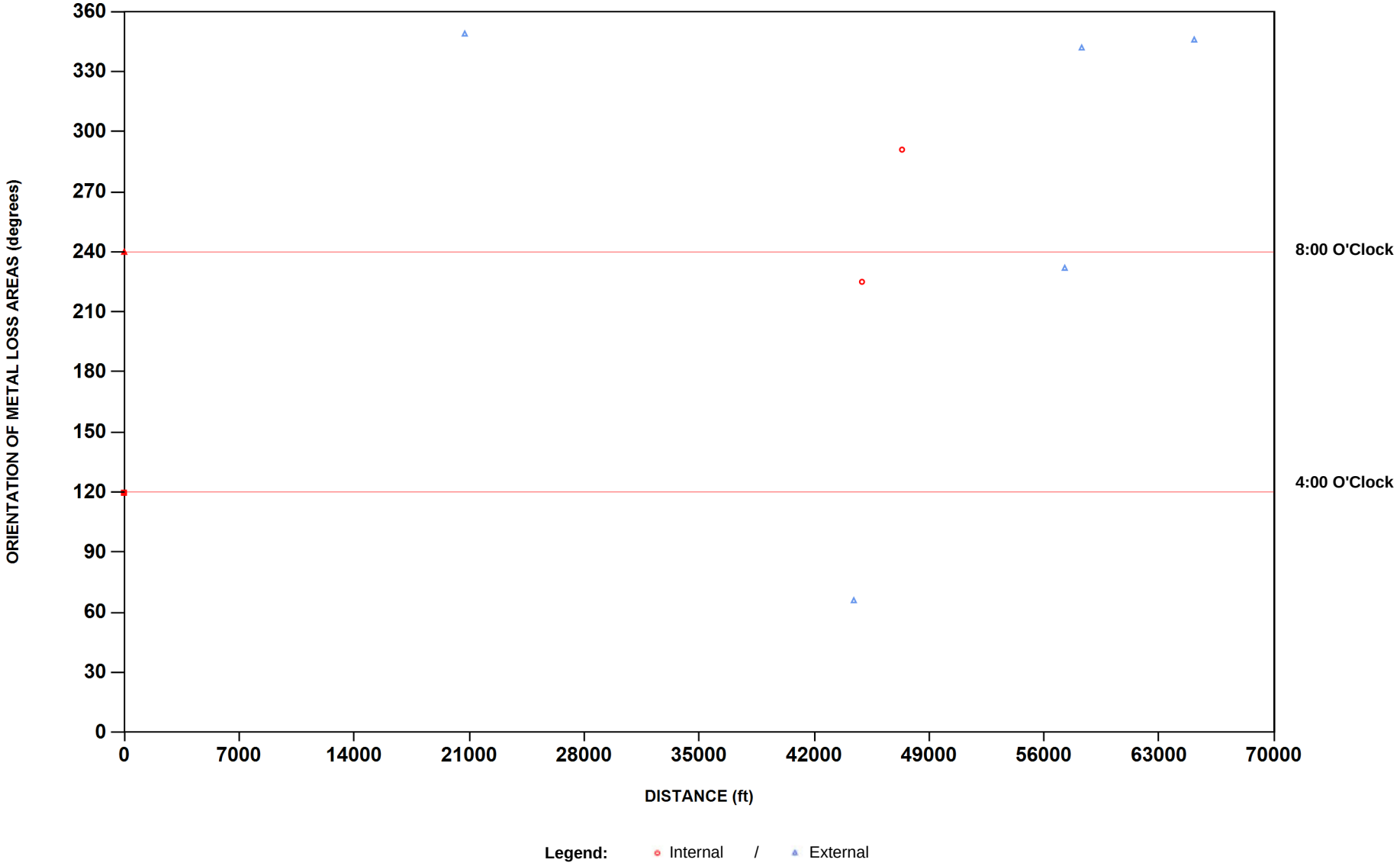
TDW Services, Inc.
Hiland Crude, LLC
Dore Junction to Dore Station

Metal Loss Depth Graph



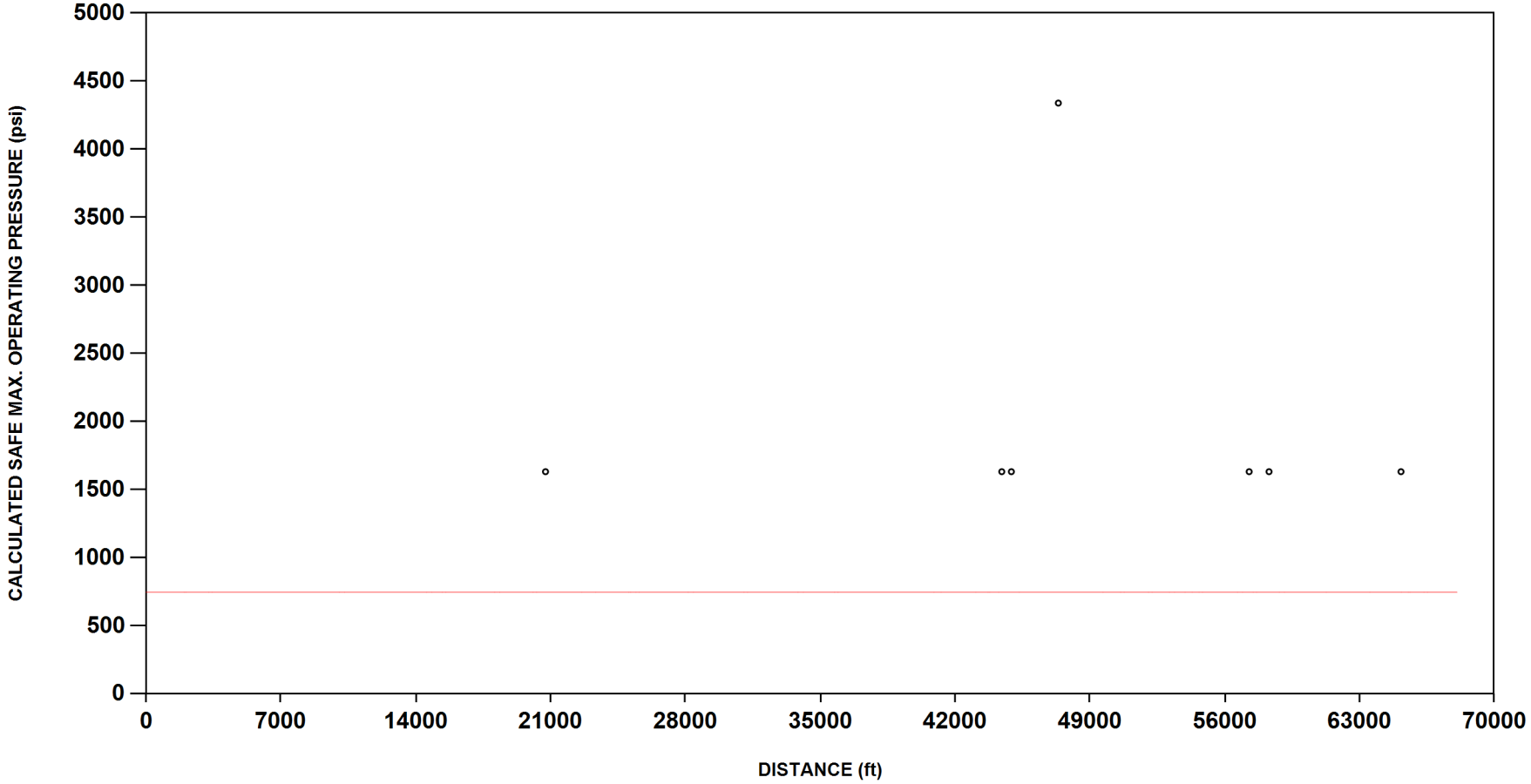
TDW Services, Inc.
Hiland Crude, LLC
Dore Junction to Dore Station

Metal Loss Orientation Graph



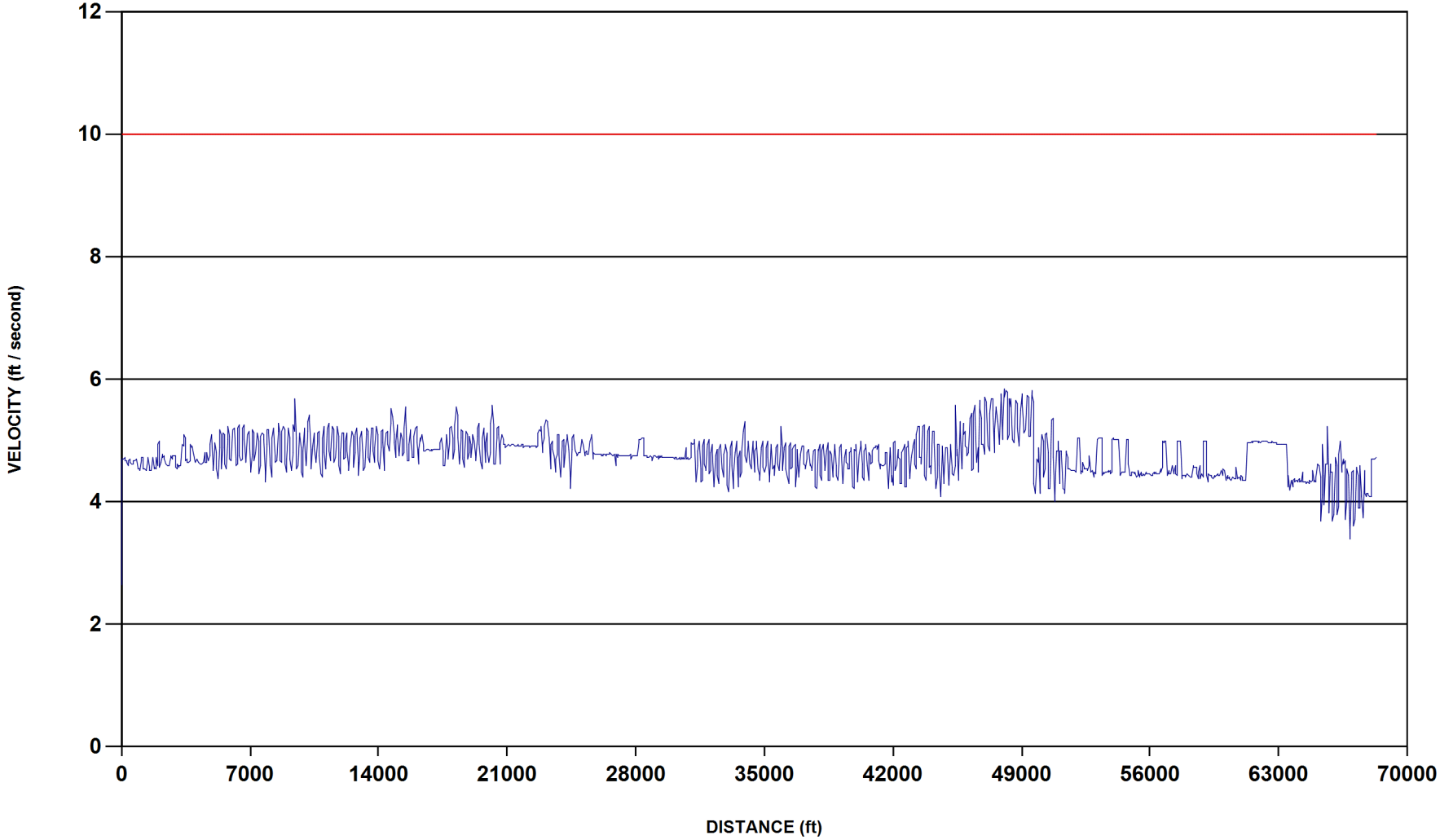
TDW Services, Inc.
Hiland Crude, LLC
Dore Junction to Dore Station

Metal Loss - Calculated Safe Max. Operating Pressure Graph



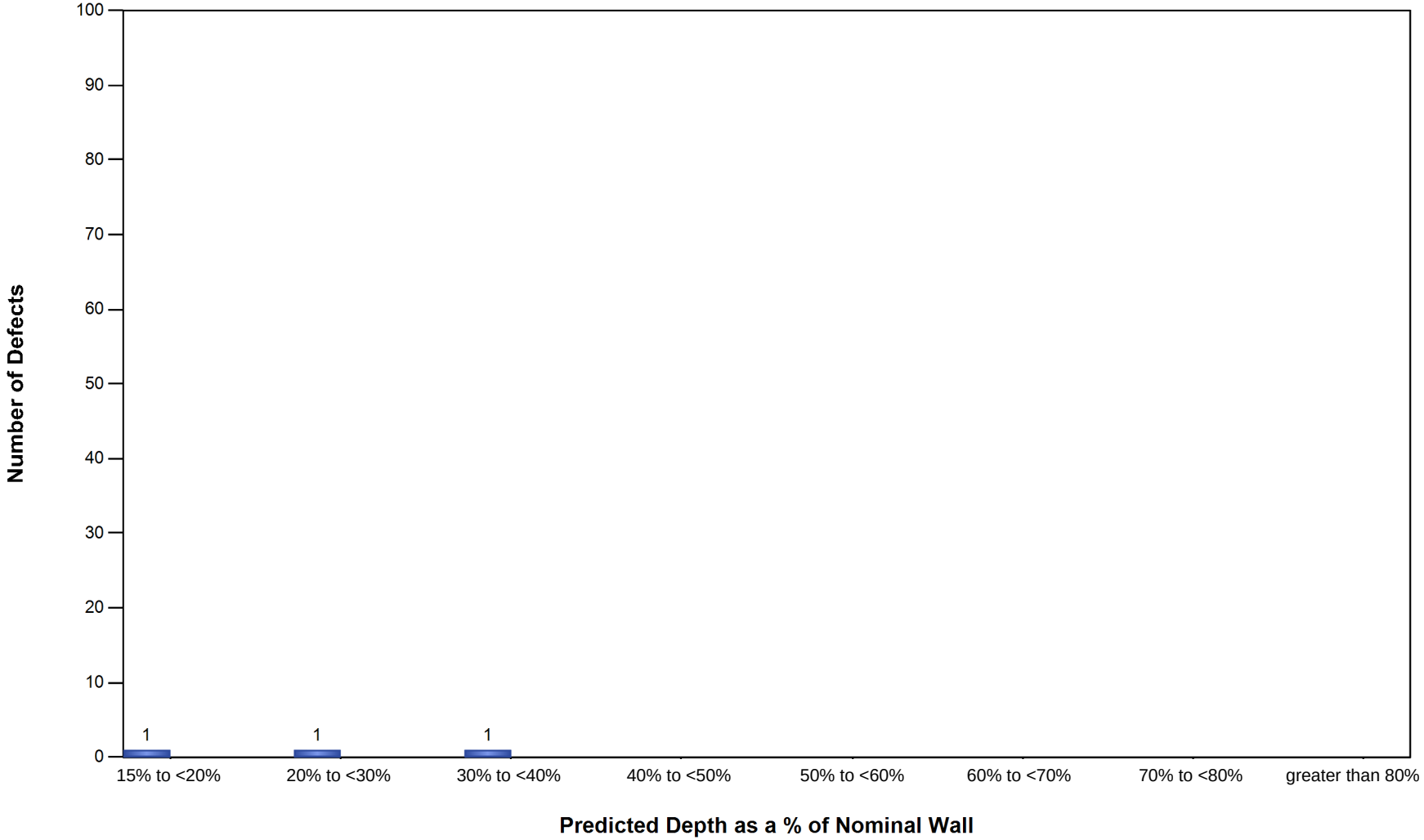
TDW Services, Inc.
Hiland Crude, LLC
Dore Junction to Dore Station

Velocity Graph - MFL



Velocity Graph - MFL

Defect Depth Histogram

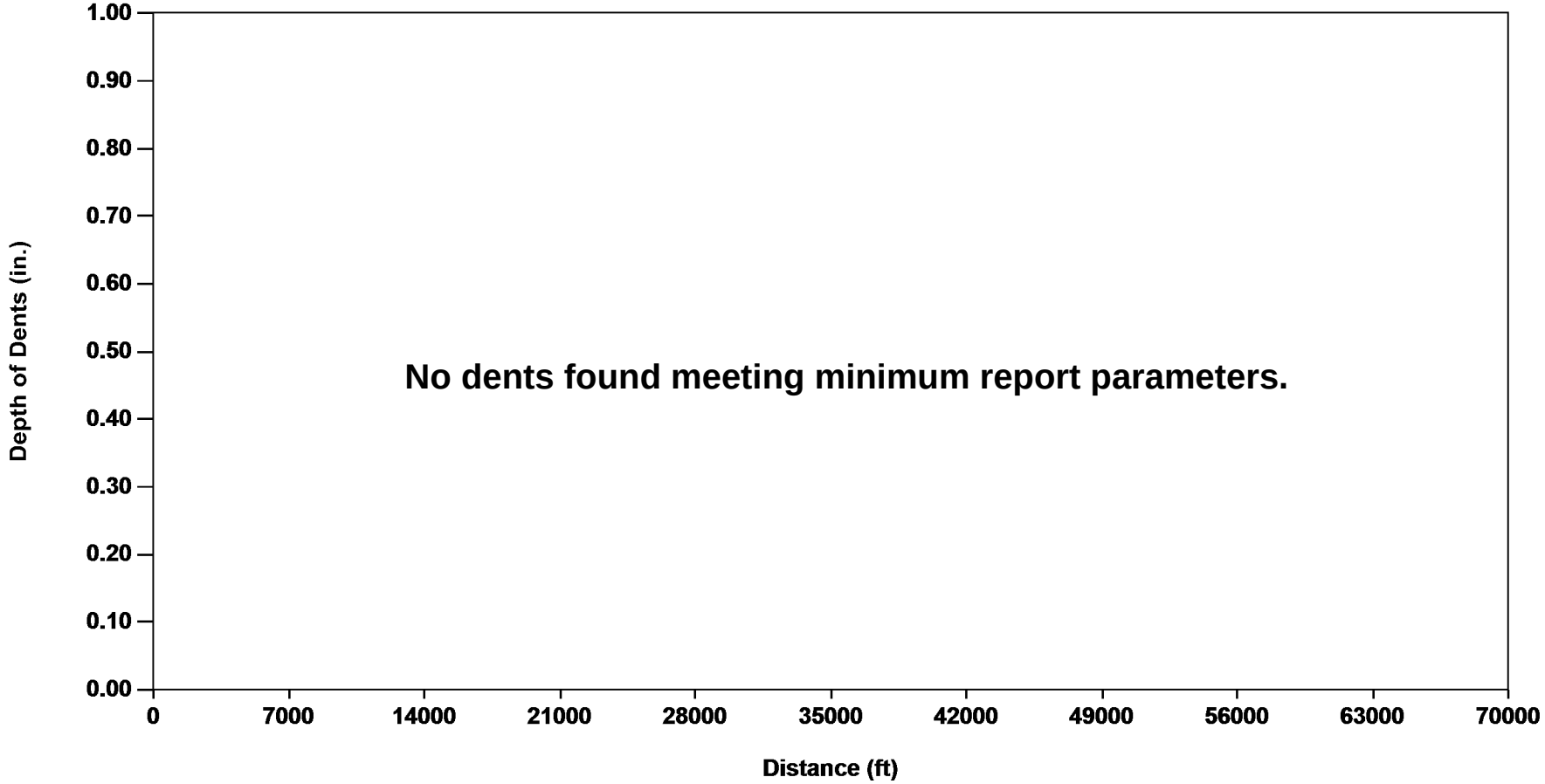


Total Defects: **7**

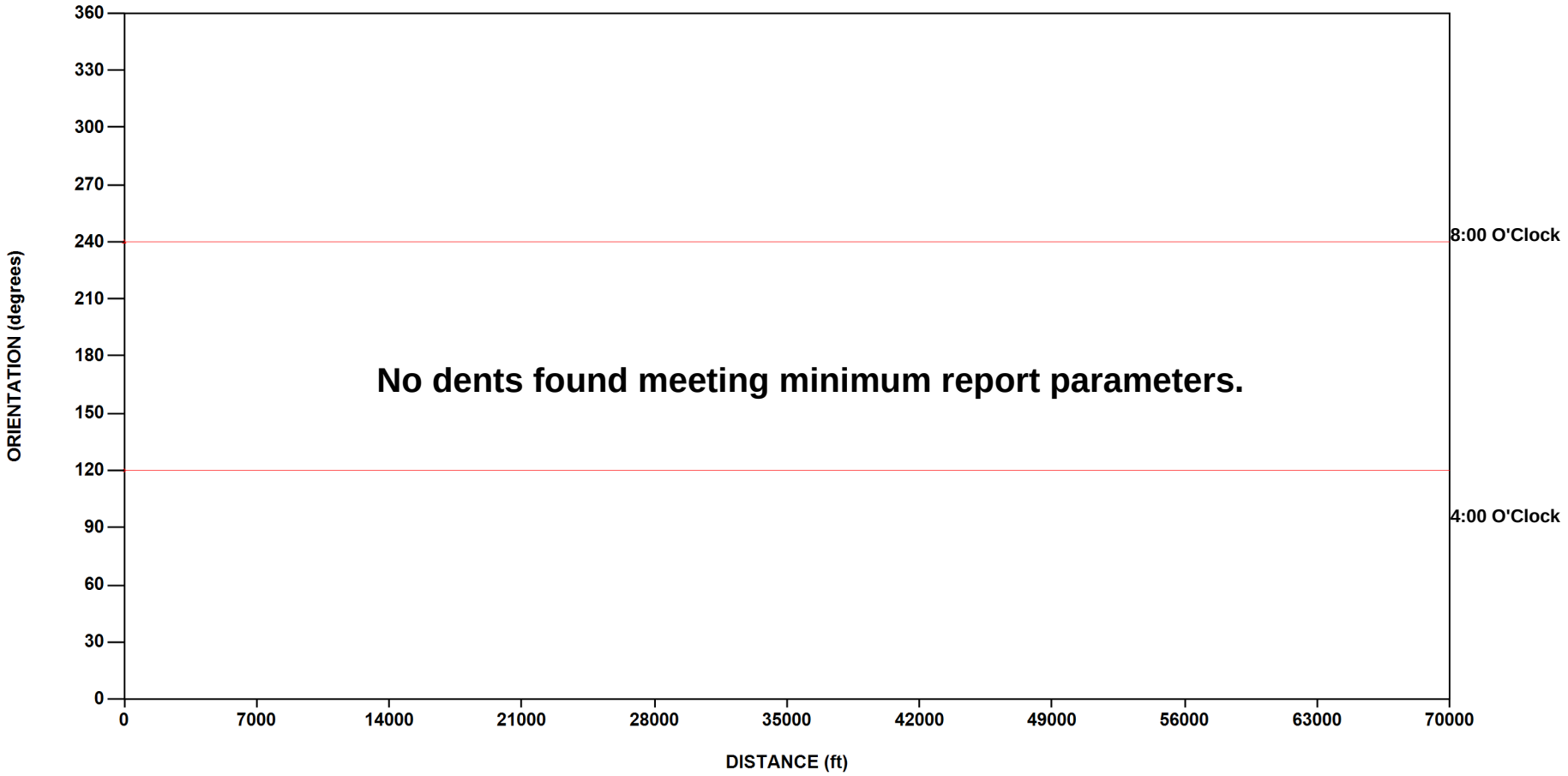
Non-Pressure-Reducing Groups

Pressure-Reducing Groups (where P' < P)

Dent Depth Graph

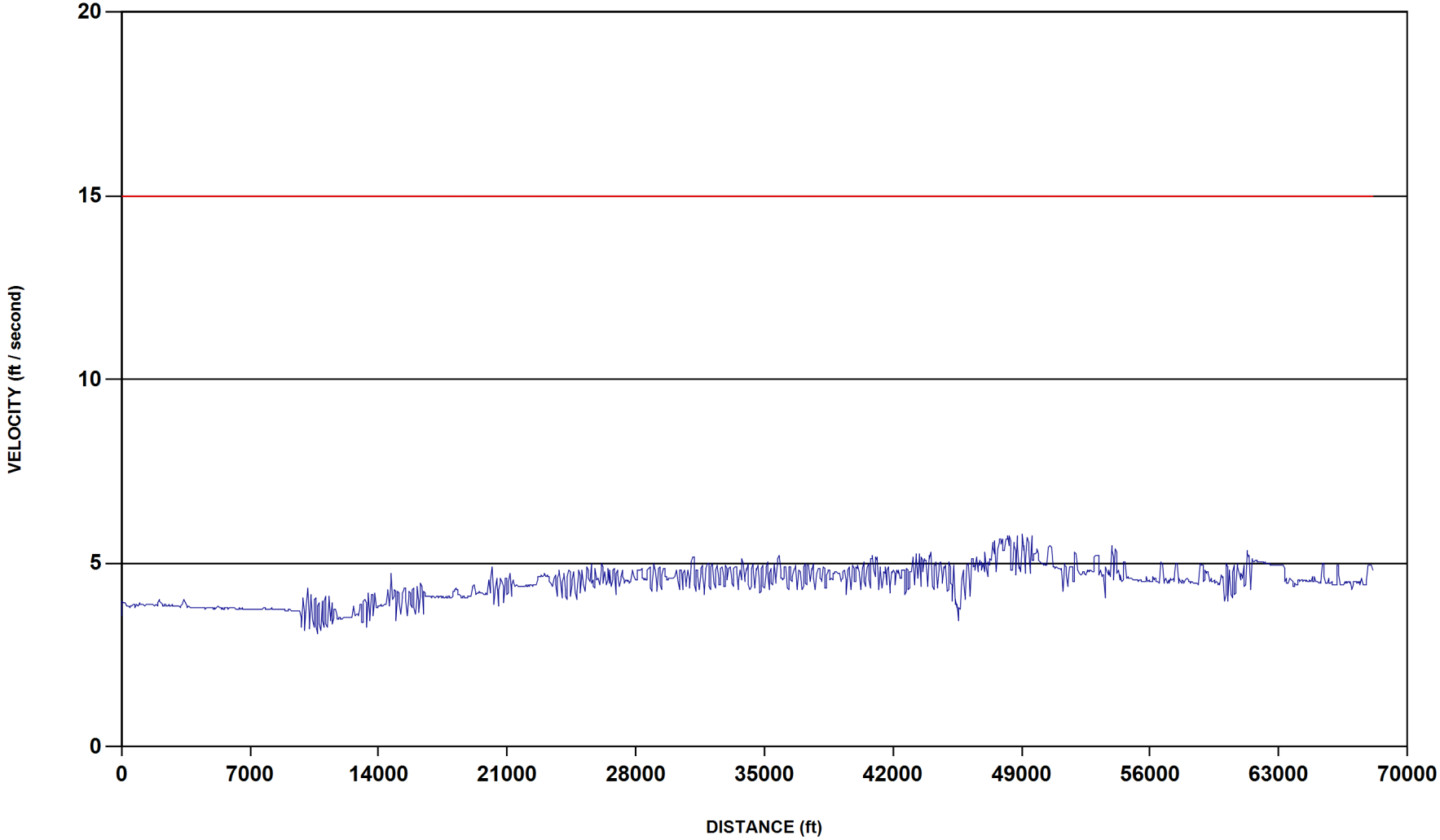


Dent Orientation Graph



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

Velocity Graph - DEF



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	2,777.29	0.0	110	1.5	1.6	Valve (Launcher), Sta. 0+00, Dore Junction	47.92410819	-103.78383307	2233.809
10000002	2,777.75	1.1	110	2.6	0.5	Flange	47.92411060	-103.78383310	2233.785
10000003	2,778.02	1.8	120	0.2	1.0	Fitting on top of pipe	47.92411239	-103.78383318	2233.768
10000004	2,778.11	2.2	120	0.5	0.7	Pipe Support	47.92411335	-103.78383320	2233.758
10000005	2,778.34	3.3	130	0.1	1.0	Tee at 270 deg.	47.92411657	-103.78383328	2233.735
10000006	2,778.56	4.4	140	0.5	0.4	Flange	47.92411958	-103.78383332	2233.714
10000007	2,778.82	5.7	150	0.3	1.3	Bend down - 45 deg., 3D	47.92412299	-103.78383340	2233.468
10000065	2,779.87	10.9	160	4.5	0.8	Pipe Entering Ground, Dore Junction -- Han #257	47.92413344	-103.78383347	2229.782
10000008	2,782.16	22.2	190	0.2	1.3	Bend up - 45 deg., 3D	47.92415484	-103.78383270	2221.764
10000009	2,790.93	63.5	210	0.3	8.9	Bend left - 85 deg., 17D	47.92426642	-103.78384044	2219.418
10000010	3,511.66	3,428.5	980	14.9	27.3	AGM 010, Sta. 38+65, Two track -- Han #140	47.92480243	-103.79747536	2197.922
10000011	4,869.85	10,007.0	2,340	0.0	0.7	Bend left - 27 deg., 1.5D	47.92678664	-103.82379522	2214.409
10000012	4,909.92	10,209.6	2,400	20.5	21.7	AGM 020, Sta. 105+48, Two track -- Han #114	47.92719930	-103.82433066	2211.461
10000013	5,824.74	14,685.8	3,330	33.0	9.2	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	47.93279021	-103.84047075	2236.558
10000014	6,919.76	20,094.4	4,500	6.4	35.8	AGM 040, Sta. 204+86, Gravel Rd. -- Han #116	47.93472118	-103.86153784	2188.147
10000015	7,569.83	23,335.3	5,220	0.1	1.4	Bend right - 35 deg., 3D	47.93433434	-103.87464236	2148.000
10000016	7,920.66	25,025.8	5,590	0.2	1.3	Bend left - 60 deg., 1.5D	47.93426616	-103.88142678	2101.252
10000017	7,945.42	25,150.4	5,630	0.2	1.4	Bend right - 45 deg., 1.5D	47.93399582	-103.88172850	2107.124
10000018	8,023.76	25,528.7	5,730	20.6	21.6	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	47.93400149	-103.88326014	2098.849
10000019	8,044.72	25,635.1	5,760	0.1	1.0	Bend right - 30 deg., 1.5D	47.93403022	-103.88369019	2101.475
10000020	8,526.20	27,928.7	6,250	5.7	40.1	Bend right - 16 deg., 98D	47.93453112	-103.89272283	2149.756
10000021	8,622.80	28,401.8	6,370	0.1	1.5	Bend left-up - 45 deg., 3D	47.93539349	-103.89414181	2159.028
10000022	9,035.64	30,356.0	6,850	0.1	1.4	Bend right - 45 deg., 3D	47.93536717	-103.90208358	2181.235
10000023	9,109.12	30,702.0	6,950	0.1	1.4	Bend left - 45 deg., 3D	47.93608713	-103.90299905	2180.283
10000024	9,183.61	31,053.5	7,060	9.2	21.8	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	47.93617004	-103.90442413	2170.838
10000066	10,138.62	35,534.3	8,040	18.9	30.7	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	47.94164996	-103.92049153	2124.145
10000025	10,184.18	35,750.2	8,100	0.1	1.5	Bend right - 45 deg., 1.5D	47.94200928	-103.92118782	2122.318
10000026	10,219.57	35,920.9	8,160	0.2	1.5	Bend left - 45 deg., 3D	47.94247442	-103.92117510	2122.588
10000027	10,724.65	38,281.4	8,650	0.1	1.1	Bend left - 35 deg., 3D	47.94369281	-103.92975987	2117.816
10000028	11,352.26	41,219.8	9,300	1.6	8.3	Bend right - 90 deg., 10D	47.93792158	-103.93665963	1958.090
10000029	11,360.02	41,256.2	9,340	0.1	1.4	Bend up - 45 deg., 7D	47.93789399	-103.93680021	1958.042
10000030	11,360.20	41,257.1	9,350	0.1	9.0	Fitting on top of pipe	47.93789355	-103.93680310	1958.478
10000067	11,360.52	41,258.6	9,350	1.6	7.5	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	47.93789292	-103.93680753	1959.493

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000031	11,362.21	41,266.9	9,360	0.3	1.3	Bend down - 45 deg., 1.5D	47.93788908	-103.93683367	1961.142
10000032	11,362.68	41,269.2	9,370	1.4	1.6	Fitting on top of pipe	47.93788741	-103.93684322	1960.268
10000033	11,363.08	41,271.2	9,380	0.5	2.8	Flange	47.93788598	-103.93685136	1959.345
10000034	11,363.31	41,272.4	9,380	1.7	1.6	Valve, AGM 080, Sta. 414+59, Gravel Rd.	47.93788521	-103.93685563	1958.859
10000035	11,363.53	41,273.5	9,380	2.8	0.5	Flange	47.93788431	-103.93686065	1958.843
10000036	11,363.93	41,275.5	9,390	1.4	1.6	Fitting on top of pipe	47.93788289	-103.93686851	1958.820
10000037	11,364.41	41,277.8	9,400	0.2	1.5	Bend down - 45 deg., 3D	47.93788126	-103.93687739	1958.649
10000038	11,366.57	41,288.6	9,420	0.3	1.2	Bend up - 45 deg., 1.5D	47.93787469	-103.93690761	1951.482
10000039	11,967.65	44,129.3	10,080	27.0	15.2	AGM 090, Sta. 442+88, Route 7 -- Han #102	47.93522499	-103.94741482	1866.778
10000040	13,032.60	49,518.9	11,400	24.3	17.9	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	47.93553318	-103.96925202	1864.660
10000041	14,011.00	54,083.1	12,440	0.3	1.3	Bend up - 45 deg., 8D	47.93544977	-103.98780765	1858.195
10000042	14,014.24	54,099.6	12,460	0.3	1.3	Bend down - 45 deg., 3D	47.93544588	-103.98785096	1870.360
10000043	14,014.69	54,101.8	12,470	1.4	1.6	Fitting on top of pipe	47.93544566	-103.98785965	1870.727
10000044	14,015.08	54,103.9	12,480	0.5	2.9	Flange	47.93544548	-103.98786743	1870.908
10000045	14,015.30	54,105.1	12,480	1.8	1.6	Valve, AGM 110, Sta. 541+92, ROW	47.93544541	-103.98787161	1870.997
10000046	14,015.52	54,106.3	12,480	2.9	0.4	Flange	47.93544553	-103.98787779	1871.607
10000047	14,015.90	54,108.2	12,490	1.5	1.5	Fitting on top of pipe	47.93544573	-103.98788758	1872.580
10000048	14,016.37	54,110.6	12,500	0.3	1.3	Bend down - 45 deg., 6D	47.93544600	-103.98789906	1873.461
10000068	14,018.23	54,120.3	12,510	9.0	6.0	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	47.93544719	-103.98793541	1871.281
10000049	14,019.56	54,127.1	12,520	0.3	1.3	Bend up - 45 deg., 1.5D	47.93544704	-103.98795691	1867.270
10000050	15,552.20	61,054.3	14,050	24.8	24.1	AGM 120, Sta. 601+58, ROW -- Han #116	47.92775718	-104.01220281	1864.924
10000051	15,593.76	61,236.5	14,100	0.1	1.4	Bend right - 45 deg., 3D	47.92741754	-104.01274389	1864.508
10000052	16,045.00	63,479.3	14,650	0.3	1.3	Bend right - 45 deg., 3D	47.92753888	-104.02185397	1871.170
10000053	16,059.58	63,544.7	14,680	0.1	1.4	Bend left - 45 deg., 3D	47.92765988	-104.02204857	1869.746
10000054	16,511.72	65,506.5	15,100	0.1	1.0	Bend left - 35 deg., 1.5D	47.92766125	-104.03003052	1876.467
10000055	16,544.08	65,661.6	15,160	0.1	1.5	Bend left - 45 deg., 3D	47.92737887	-104.03049085	1877.592
10000056	17,159.56	68,274.7	15,750	0.1	0.7	Bend right - 24 deg., 3D	47.92025341	-104.03022925	1884.913
10000057	17,160.68	68,279.9	15,770	0.1	1.4	Bend up - 45 deg., 3D	47.92023920	-104.03023047	1885.089
10000069	17,162.31	68,287.8	15,780	7.1	3.5	Pipe Exiting the Ground, Dore Station -- Han #257	47.92022385	-104.03023270	1890.430
10000058	17,163.24	68,292.1	15,790	0.1	1.5	Bend down - 45 deg., 3D	47.92021517	-104.03023385	1893.258
10000059	17,164.14	68,296.4	15,810	0.5	0.5	Flange	47.92020368	-104.03023495	1893.415
10000060	17,164.36	68,297.6	15,820	0.2	1.1	Tee at 90 deg.	47.92020059	-104.03023525	1893.415
10000061	17,164.65	68,299.0	15,830	0.7	0.6	Pipe Support	47.92019687	-104.03023561	1893.415

Locations Summary

ID#	Time	Dist (ft)	Joint #	U/S Weld Dist.	D/S Weld Dist.	Description	Latitude	Longitude	Altitude
10000062	17,164.84	68,299.9	15,840	0.4	2.5	Flange	47.92019437	-104.03023577	1893.415
10000063	17,165.07	68,301.0	15,840	1.5	1.5	Valve (Receiver), Sta. 671+28, Dore Station	47.92019138	-104.03023616	1893.413

Locations	Number
Bend	32
Casing	0
Flange	10
Fitting	6
Marker	14
Repair	0
Tee	2
Valve	4
Pipe Support	2

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
No Casings appear in this pipeline inspection									

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.
No Gains have been detected on this pipeline inspection								

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	-1.58	0.322	ERW	52000	0.72	24.49
11000001	22.91	0.188	ERW	52000	0.72	1949.76
11000002	1972.67	0.322	ERW	52000	0.72	126.61
11000003	2099.28	0.188	ERW	52000	0.72	1187.82
11000004	3287.10	0.322	ERW	52000	0.72	168.68
11000005	3455.78	0.188	ERW	52000	0.72	6606.97
11000006	10062.75	0.322	ERW	52000	0.72	210.7
11000007	10273.45	0.188	ERW	52000	0.72	4271.67
11000008	14545.12	0.322	ERW	52000	0.72	318.38
11000009	14863.50	0.188	ERW	52000	0.72	491.08
11000010	15354.58	0.322	ERW	52000	0.72	190.33
11000011	15544.91	0.188	ERW	52000	0.72	2531.69
11000012	18076.61	0.322	ERW	52000	0.72	294.83
11000013	18371.43	0.188	ERW	52000	0.72	1674.66
11000014	20046.09	0.322	ERW	52000	0.72	228.4
11000015	20274.49	0.188	ERW	52000	0.72	2385.95
11000016	22660.45	0.322	ERW	52000	0.72	675.56
11000017	23336.01	0.188	ERW	52000	0.72	1688.29
11000018	25024.30	0.322	ERW	52000	0.72	126.82
11000019	25151.12	0.188	ERW	52000	0.72	314.8
11000020	25465.92	0.322	ERW	52000	0.72	169.66
11000021	25635.57	0.188	ERW	52000	0.72	2508.98
11000022	28144.56	0.322	ERW	52000	0.72	258.09
11000023	28402.65	0.188	ERW	52000	0.72	2641.57
11000024	31044.22	0.322	ERW	52000	0.72	199.86
11000025	31244.08	0.188	ERW	52000	0.72	2576.89
11000026	33820.97	0.322	ERW	52000	0.72	252.99
11000027	34073.96	0.188	ERW	52000	0.72	1675.48
11000028	35749.44	0.322	ERW	52000	0.72	172.18
11000029	35921.62	0.188	ERW	52000	0.72	4954.32
11000030	40875.94	0.322	ERW	52000	0.72	348.99
11000031	41224.93	0.188	ERW	52000	0.72	26.43
11000032	41251.36	0.322	ERW	52000	0.72	42.03
11000033	41293.39	0.188	ERW	52000	0.72	1822.17
11000034	43115.56	0.322	ERW	52000	0.72	633.17
11000035	43748.73	0.188	ERW	52000	0.72	58.24
11000036	43806.97	0.322	ERW	52000	0.72	406.73
11000037	44213.70	0.188	ERW	52000	0.72	1124.35
11000038	45338.04	0.500	ERW	52000	0.72	4324.91
11000039	49662.95	0.188	ERW	52000	0.72	920.41

Nominal Wall Thickness

ID#	Distance (ft)	Wall Thickness (in)	Pipetype	Yield Strength (SMYS)	Safety Factor	Length of Segment (ft)
11000040	50583.36	0.322	ERW	52000	0.72	210.76
11000041	50794.12	0.188	ERW	52000	0.72	1215.67
11000042	52009.79	0.322	ERW	52000	0.72	174.72
11000043	52184.51	0.188	ERW	52000	0.72	908.21
11000044	53092.73	0.322	ERW	52000	0.72	294.38
11000045	53387.11	0.188	ERW	52000	0.72	534.68
11000046	53921.79	0.322	ERW	52000	0.72	386.23
11000047	54308.02	0.188	ERW	52000	0.72	379.77
11000048	54687.78	0.322	ERW	52000	0.72	123.18
11000049	54810.96	0.188	ERW	52000	0.72	1856.68
11000050	56667.65	0.322	ERW	52000	0.72	217.25
11000051	56884.90	0.188	ERW	52000	0.72	605.76
11000052	57490.65	0.322	ERW	52000	0.72	182.33
11000053	57672.98	0.188	ERW	52000	0.72	1179.8
11000054	58852.78	0.322	ERW	52000	0.72	204.92
11000055	59057.70	0.188	ERW	52000	0.72	2177.99
11000056	61235.69	0.322	ERW	52000	0.72	2260.99
11000057	63496.68	0.188	ERW	52000	0.72	2009.25
11000058	65505.94	0.322	ERW	52000	0.72	156.41
11000059	65662.35	0.188	ERW	52000	0.72	687.7
11000060	66350.05	0.322	ERW	52000	0.72	134.97
11000061	66485.02	0.188	ERW	52000	0.72	1554.72
11000062	68039.74	0.322	ERW	52000	0.72	261.27

Wall Thickness	Pipetype	Total Length (ft)	Total Length (miles)	Percent of Total Distance
0.188	ERW	54,522	10.326	79.8%
0.322	ERW	9,456	1.791	13.8%
0.500	ERW	4,325	0.819	6.3%

Repair Report

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

DEFINITIONS

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	2777.29	0.00	Valve (Launcher), Sta. 0+00, Dore Junction	47.92410819	-103.78383307	2233.809
10000065	2779.87	10.95	Pipe Entering Ground, Dore Junction -- Han #257	47.92413344	-103.78383347	2229.782
10000010	3511.66	3428.49	AGM 010, Sta. 38+65, Two track -- Han #140	47.92480243	-103.79747536	2197.922
10000012	4909.92	10209.61	AGM 020, Sta. 105+48, Two track -- Han #114	47.92719930	-103.82433066	2211.461
10000013	5824.74	14685.76	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	47.93279021	-103.84047075	2236.558
10000014	6919.76	20094.44	AGM 040, Sta. 204+86, Gravel Rd. -- Han #116	47.93472118	-103.86153784	2188.147
10000018	8023.76	25528.73	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	47.93400149	-103.88326014	2098.849
10000024	9183.61	31053.51	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	47.93617004	-103.90442413	2170.838
10000066	10138.62	35534.33	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	47.94164996	-103.92049153	2124.145
10000067	11360.52	41258.57	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	47.93789292	-103.93680753	1959.493
10000034	11363.31	41272.42	Valve, AGM 080, Sta. 414+59, Gravel Rd.	47.93788521	-103.93685563	1958.859
10000039	11967.65	44129.34	AGM 090, Sta. 442+88, Route 7 -- Han #102	47.93522499	-103.94741482	1866.778
10000040	13032.60	49518.92	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	47.93553318	-103.96925202	1864.660
10000045	14015.30	54105.12	Valve, AGM 110, Sta. 541+92, ROW	47.93544541	-103.98787161	1870.997
10000068	14018.23	54120.29	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	47.93544719	-103.98793541	1871.281
10000050	15552.20	61054.26	AGM 120, Sta. 601+58, ROW -- Han #116	47.92775718	-104.01220281	1864.924
10000069	17162.31	68287.82	Pipe Exiting the Ground, Dore Station -- Han #257	47.92022385	-104.03023270	1890.430
10000063	17165.07	68301.01	Valve (Receiver), Sta. 671+28, Dore Station	47.92019138	-104.03023616	1893.413

TYPE	NUMBER
Valves	4
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	320.49	-12.11	Begin Run Tickle
12000001	17,959.25	68,341.12	End Run Tickle

Total	Number
Misc listings	2

Other Anomalies

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
20000027	Seam Variation	65,688.1	0.47	0.34	33	EXT	2:00 / N/D	**U/S:**	AGM 120, Sta. 601+58, ROW -- Han #116	4633.82
								D/S:	Pipe Exiting the Ground, Dore Station -- Han #257	2599.74
20000007	Seam Variation	28,570.1	0.71	0.69	35	EXT	10:30 / N/D	**U/S:**	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	3041.30
								D/S:	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	2483.49
20000004	Seam Variation	13,272.5	0.71	0.48	31	EXT	3:30 / N/D	**U/S:**	AGM 020, Sta. 105+48, Two track -- Han #114	3062.87
								D/S:	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	1413.28
20000029	Seam Variation	67,505.6	0.35	0.35	29	INT	8:15 / N/D	**U/S:**	AGM 120, Sta. 601+58, ROW -- Han #116	6451.36
								D/S:	Pipe Exiting the Ground, Dore Station -- Han #257	782.20
20000017	Seam Variation	49,743.4	0.59	0.57	29	EXT	2:00 / N/D	**U/S:**	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	224.42
								D/S:	Valve, AGM 110, Sta. 541+92, ROW	4361.78
20000023	Seam Variation	58,829.7	0.35	0.40	31	INT	6:00 / N/D	**U/S:**	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	4709.38
								D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	2224.60
20000024	Seam Variation	58,839.1	0.59	0.52	30	EXT	6:00 / N/D	**U/S:**	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	4718.81
								D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	2215.17
20000006	Seam Variation	27,588.2	0.71	0.60	29	INT	3:15 / N/D	**U/S:**	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	2059.42
								D/S:	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	3465.36
20000021	Seam Variation	58,101.0	0.47	0.48	25	INT	8:45 / N/D	**U/S:**	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	3980.74
								D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	2953.23
20000019	Seam Variation	52,278.3	0.47	0.50	27	INT	11:45 / N/D	**U/S:**	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	2759.31
								D/S:	Valve, AGM 110, Sta. 541+92, ROW	1826.89

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
20000010	Seam Variation	39,376.3	0.35	0.33	23	EXT	8:45 / N/D	**U/S:**	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	3841.99
								D/S:	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	1882.25
20000009	Seam Variation	34,083.2	0.59	0.56	29	INT	2:15 / N/D	**U/S:**	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	3029.70
								D/S:	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	1451.11
20000015	Seam Variation	44,978.7	0.47	0.52	26	INT	8:45 / N/D	**U/S:**	AGM 090, Sta. 442+88, Route 7 -- Han #102	849.34
								D/S:	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	4540.24
20000000	Seam Variation	9,344.9	0.71	0.63	28	INT	2:30 / N/D	**U/S:**	AGM 010, Sta. 38+65, Two track -- Han #140	5916.36
								D/S:	AGM 020, Sta. 105+48, Two track -- Han #114	864.76
20000012	Seam Variation	39,694.1	0.47	0.56	22	INT	7:45 / N/D	**U/S:**	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	4159.76
								D/S:	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	1564.47
20000002	Seam Variation	12,276.3	0.71	0.63	33	EXT	7:45 / N/D	**U/S:**	AGM 020, Sta. 105+48, Two track -- Han #114	2066.70
								D/S:	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	2409.45
20000011	Seam Variation	39,693.4	0.59	0.61	21	INT	7:45 / N/D	**U/S:**	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	4159.06
								D/S:	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	1565.18
20000008	Seam Variation	29,393.5	0.47	0.52	27	INT	9:45 / N/D	**U/S:**	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	3864.79
								D/S:	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	1660.00
20000001	Seam Variation	10,839.1	0.47	0.48	22	INT	5:45 / N/D	**U/S:**	AGM 020, Sta. 105+48, Two track -- Han #114	629.44
								D/S:	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	3846.71
20000028	Seam Variation	66,017.8	0.47	0.60	23	INT	4:00 / N/D	**U/S:**	AGM 120, Sta. 601+58, ROW -- Han #116	4963.50
								D/S:	Pipe Exiting the Ground, Dore Station -- Han #257	2270.06

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
20000003	Seam Variation	12,765.2	0.35	0.46	22	INT	1:15 / N/D	**U/S:**	AGM 020, Sta. 105+48, Two track -- Han #114	2555.57
								D/S:	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	1920.58
20000018	Seam Variation	50,300.6	1.18	1.12	17	EXT	12:15 / N/D	**U/S:**	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	781.61
								D/S:	Valve, AGM 110, Sta. 541+92, ROW	3804.59
20000025	Seam Variation	60,165.7	0.59	0.90	22	EXT	11:15 / N/D	**U/S:**	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	6045.39
								D/S:	AGM 120, Sta. 601+58, ROW -- Han #116	888.59

Other Anomalies Type	Number
Girth Weld Anomaly	0
Mill Anomaly	
Seam Variation	23

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

Dore Junction to Dore Station

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	-12.1	0	-	10.6	47.92410817	-103.78383308	2233.810							
11000000	WT CHANGE	-1.6	0	0.0	0.0	47.92410817	-103.78383308	2233.810				0.322	52000	0.72	
110	WELD	-1.5	110	0.0	3.1	47.92410817	-103.78383308	2233.810							
10000000	Flange	-1.1	110	0.5	2.6	47.92410817	-103.78383308	2233.810	0	12:00					
10000001	Valve (Launcher), Sta. 0+00, Dore Junction	0.0	110	1.5	1.6	47.92410819	-103.78383307	2233.809							
10000002	Flange	1.1	110	2.6	0.5	47.92411060	-103.78383310	2233.785	0	12:00					
120	WELD	1.6	120	0.0	1.2	47.92411163	-103.78383314	2233.775							
10000003	Fitting on top of pipe	1.8	120	0.2	1.0	47.92411239	-103.78383318	2233.768	1	12:00					
10000004	Pipe Support	2.2	120	0.5	0.7	47.92411335	-103.78383320	2233.758							
130	WELD	2.8	130	0.0	1.1	47.92411499	-103.78383320	2233.740							
10000005	Tee at 270 deg.	3.3	130	0.1	1.0	47.92411657	-103.78383328	2233.735	275	9:00					
140	WELD	3.9	140	0.0	0.9	47.92411829	-103.78383330	2233.730							
10000006	Flange	4.4	140	0.5	0.4	47.92411958	-103.78383332	2233.714	0	12:00					
150	WELD	4.9	150	0.0	1.6	47.92412078	-103.78383338	2233.681							
10000007	Bend down - 45 deg., 3D	5.7	150	0.3	1.3	47.92412299	-103.78383340	2233.468	0	12:00					
160	WELD	6.5	160	0.0	5.3	47.92412482	-103.78383340	2233.024							
10000065	Pipe Entering Ground, Dore Junction -- Han #257	10.9	160	4.5	0.8	47.92413344	-103.78383347	2229.782							
170	WELD	11.8	170	0.0	4.8	47.92413502	-103.78383340	2229.175							
180	WELD	16.6	180	0.0	4.8	47.92414421	-103.78383320	2225.653							
190	WELD	21.5	190	0.0	1.5	47.92415318	-103.78383270	2222.169							
10000008	Bend up - 45 deg., 3D	22.2	190	0.2	1.3	47.92415484	-103.78383270	2221.764	0	12:00					
11000001	WT CHANGE	22.9	190	0.0	0.0	47.92415670	-103.78383260	2221.568				0.188	52000	0.72	
200	WELD	22.9	200	0.0	36.0	47.92415678	-103.78383260	2221.563							
210	WELD	58.9	210	0.0	9.2	47.92425505	-103.78383339	2219.338							
10000009	Bend left - 85 deg., 17D	63.5	210	0.3	8.9	47.92426642	-103.78384044	2219.418	0	12:00					
220	WELD	68.1	220	0.0	3.1	47.92427170	-103.78385724	2219.705							
230	WELD	71.2	230	0.0	33.3	47.92427272	-103.78386987	2219.976							
240	WELD	104.5	240	0.0	49.5	47.92428326	-103.78400418	2222.503							
250	WELD	154.0	250	0.0	49.5	47.92429727	-103.78420460	2222.277							
260	WELD	203.5	260	0.0	49.5	47.92431319	-103.78440463	2222.356							
270	WELD	252.9	270	0.0	49.5	47.92432659	-103.78460507	2221.877							
280	WELD	302.4	280	0.0	49.6	47.92434032	-103.78480545	2220.897							
290	WELD	352.1	290	0.0	49.6	47.92435459	-103.78500601	2220.145							
300	WELD	401.7	300	0.0	49.6	47.92436902	-103.78520647	2219.207							
310	WELD	451.3	310	0.0	49.6	47.92438429	-103.78540693	2219.354							

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)
320	WELD	500.9	320	0.0	49.6	47.92439934	-103.78560726	2219.105						
330	WELD	550.5	330	0.0	49.6	47.92441389	-103.78580773	2218.995						
340	WELD	600.1	340	0.0	49.7	47.92442727	-103.78600836	2220.577						
350	WELD	649.8	350	0.0	49.6	47.92444145	-103.78620903	2222.657						
360	WELD	699.4	360	0.0	49.6	47.92445661	-103.78640918	2225.676						
370	WELD	749.0	370	0.0	49.6	47.92447204	-103.78660941	2226.818						
380	WELD	798.6	380	0.0	30.2	47.92448604	-103.78680996	2224.348						
390	WELD	828.8	390	0.0	46.9	47.92449355	-103.78693206	2223.209						
400	WELD	875.7	400	0.0	22.1	47.92450460	-103.78712198	2223.452						
410	WELD	897.8	410	0.0	49.6	47.92450911	-103.78721169	2224.523						
420	WELD	947.4	420	0.0	49.6	47.92451609	-103.78741301	2226.667						
430	WELD	997.0	430	0.0	49.6	47.92452138	-103.78761432	2229.009						
440	WELD	1,046.6	440	0.0	49.6	47.92452751	-103.78781544	2230.814						
450	WELD	1,096.2	450	0.0	49.6	47.92453536	-103.78801656	2232.588						
460	WELD	1,145.8	460	0.0	49.0	47.92454329	-103.78821810	2233.506						
470	WELD	1,194.8	470	0.0	49.5	47.92454853	-103.78841733	2231.593						
480	WELD	1,244.3	480	0.0	48.4	47.92455427	-103.78861701	2226.982						
490	WELD	1,292.6	490	0.0	8.7	47.92456249	-103.78881220	2221.445						
500	WELD	1,301.3	500	0.0	29.0	47.92456417	-103.78884722	2220.742						
510	WELD	1,330.3	510	0.0	49.3	47.92456957	-103.78896478	2218.771						
520	WELD	1,379.6	520	0.0	49.6	47.92457684	-103.78916506	2217.247						
530	WELD	1,429.2	530	0.0	49.6	47.92458337	-103.78936670	2217.616						
540	WELD	1,478.7	540	0.0	49.2	47.92458795	-103.78956824	2219.997						
550	WELD	1,527.9	550	0.0	49.6	47.92459252	-103.78976810	2222.619						
560	WELD	1,577.5	560	0.0	50.7	47.92459699	-103.78996889	2227.213						
570	WELD	1,628.2	570	0.0	49.5	47.92460118	-103.79017413	2232.056						
580	WELD	1,677.6	580	0.0	49.4	47.92460540	-103.79037469	2235.885						
590	WELD	1,727.1	590	0.0	49.4	47.92460955	-103.79057446	2240.202						
600	WELD	1,776.5	600	0.0	49.7	47.92461320	-103.79077443	2243.484						
610	WELD	1,826.2	610	0.0	18.1	47.92461895	-103.79097567	2244.794						
620	WELD	1,844.3	620	0.0	30.3	47.92462199	-103.79104873	2245.036						
630	WELD	1,874.5	630	0.0	49.3	47.92462767	-103.79117133	2246.019						
640	WELD	1,923.9	640	0.0	48.8	47.92463599	-103.79137099	2247.283						
11000002	WT CHANGE	1,972.7	640	0.0	0.0	47.92464175	-103.79156854	2246.795			0.322	52000	0.72	
650	WELD	1,972.7	650	0.0	42.2	47.92464176	-103.79156870	2246.794						
660	WELD	2,014.9	660	0.0	42.2	47.92464416	-103.79173950	2243.784						
670	WELD	2,057.1	670	0.0	42.2	47.92464465	-103.79191039	2240.693						

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Dore Junction to Dore Station

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)
11000003	WT CHANGE	2,099.3	670	0.0	0.0	47.92464882	-103.79207988	2237.597			0.188	52000	0.72	
680	WELD	2,099.3	680	0.0	44.2	47.92464882	-103.79208004	2237.594						
690	WELD	2,143.5	690	0.0	49.7	47.92465474	-103.79225963	2232.723						
700	WELD	2,193.1	700	0.0	23.1	47.92466094	-103.79245948	2227.467						
710	WELD	2,216.3	710	0.0	20.4	47.92466469	-103.79255287	2226.294						
720	WELD	2,236.7	720	0.0	49.5	47.92466730	-103.79263578	2225.856						
730	WELD	2,286.3	730	0.0	49.7	47.92467348	-103.79283688	2225.858						
740	WELD	2,335.9	740	0.0	49.5	47.92468023	-103.79303824	2226.931						
750	WELD	2,385.5	750	0.0	47.3	47.92468651	-103.79323945	2227.837						
760	WELD	2,432.8	760	0.0	46.8	47.92469231	-103.79343164	2226.991						
770	WELD	2,479.5	770	0.0	49.6	47.92469654	-103.79362124	2224.049						
780	WELD	2,529.1	780	0.0	49.6	47.92470268	-103.79382206	2220.680						
790	WELD	2,578.7	790	0.0	49.2	47.92470797	-103.79402286	2218.148						
800	WELD	2,627.9	800	0.0	49.5	47.92471417	-103.79422266	2215.981						
810	WELD	2,677.4	810	0.0	49.6	47.92472027	-103.79442349	2215.561						
820	WELD	2,727.0	820	0.0	49.6	47.92472583	-103.79462467	2216.833						
830	WELD	2,776.6	830	0.0	49.2	47.92473080	-103.79482572	2219.001						
840	WELD	2,825.8	840	0.0	32.0	47.92473914	-103.79502531	2216.350						
850	WELD	2,857.9	850	0.0	15.0	47.92474426	-103.79515451	2212.827						
860	WELD	2,872.9	860	0.0	48.8	47.92474590	-103.79521568	2211.808						
870	WELD	2,921.6	870	0.0	49.5	47.92474887	-103.79541420	2210.704						
880	WELD	2,971.2	880	0.0	49.2	47.92475238	-103.79561597	2207.718						
890	WELD	3,020.3	890	0.0	49.5	47.92475635	-103.79581591	2204.251						
900	WELD	3,069.9	900	0.0	49.5	47.92476138	-103.79601721	2201.445						
910	WELD	3,119.4	910	0.0	49.5	47.92476773	-103.79621845	2198.850						
920	WELD	3,168.9	920	0.0	49.6	47.92477569	-103.79641953	2198.005						
930	WELD	3,218.5	930	0.0	48.8	47.92478460	-103.79662117	2197.541						
940	WELD	3,267.3	940	0.0	19.9	47.92479118	-103.79681946	2196.790						
11000004	WT CHANGE	3,287.1	940	0.0	0.0	47.92479265	-103.79689992	2196.932			0.322	52000	0.72	
950	WELD	3,287.1	950	0.0	42.1	47.92479265	-103.79690008	2196.933						
960	WELD	3,329.2	960	0.0	42.2	47.92479430	-103.79707167	2195.784						
970	WELD	3,371.4	970	0.0	42.2	47.92479442	-103.79724343	2195.638						
980	WELD	3,413.6	980	0.0	42.2	47.92479925	-103.79741508	2197.524						
10000010	AGM 010, Sta. 38+65, Two track -- Han #140	3,428.5	980	14.9	27.3	47.92480243	-103.79747536	2197.922						
11000005	WT CHANGE	3,455.8	980	0.0	0.0	47.92480878	-103.79758590	2198.265			0.188	52000	0.72	
990	WELD	3,455.8	990	0.0	46.9	47.92480879	-103.79758610	2198.266						

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)
1000	WELD	3,502.8	1000	0.0	49.3	47.92481927	-103.79777609	2200.395						
1010	WELD	3,552.1	1010	0.0	49.7	47.92483032	-103.79797577	2203.172						
1020	WELD	3,601.8	1020	0.0	49.3	47.92484110	-103.79817683	2206.499						
1030	WELD	3,651.1	1030	0.0	49.1	47.92485241	-103.79837651	2210.356						
1040	WELD	3,700.2	1040	0.0	49.7	47.92486444	-103.79857474	2213.869						
1050	WELD	3,749.9	1050	0.0	49.6	47.92487491	-103.79877558	2217.104						
1060	WELD	3,799.5	1060	0.0	49.3	47.92488569	-103.79897624	2219.876						
1070	WELD	3,848.8	1070	0.0	49.7	47.92489599	-103.79917585	2222.869						
1080	WELD	3,898.5	1080	0.0	49.4	47.92490726	-103.79937706	2224.665						
1090	WELD	3,947.9	1090	0.0	49.5	47.92491926	-103.79957711	2226.077						
1100	WELD	3,997.4	1100	0.0	49.6	47.92493078	-103.79977727	2226.988						
1110	WELD	4,047.0	1110	0.0	49.6	47.92494213	-103.79997819	2227.424						
1120	WELD	4,096.6	1120	0.0	49.8	47.92495359	-103.80017901	2227.045						
1130	WELD	4,146.4	1130	0.0	49.6	47.92496607	-103.80037996	2226.688						
1140	WELD	4,196.0	1140	0.0	49.6	47.92497730	-103.80058073	2225.965						
1150	WELD	4,245.7	1150	0.0	49.4	47.92498725	-103.80078183	2224.740						
1160	WELD	4,295.1	1160	0.0	45.2	47.92499760	-103.80098180	2223.656						
1170	WELD	4,340.3	1170	0.0	49.7	47.92500763	-103.80116471	2221.996						
1180	WELD	4,390.0	1180	0.0	49.6	47.92501944	-103.80136576	2220.986						
1190	WELD	4,439.6	1190	0.0	49.7	47.92503003	-103.80156697	2219.742						
1200	WELD	4,489.3	1200	0.0	49.4	47.92504032	-103.80176786	2218.766						
1210	WELD	4,538.7	1210	0.0	49.8	47.92505096	-103.80196758	2217.571						
1220	WELD	4,588.5	1220	0.0	49.6	47.92506228	-103.80216885	2216.171						
1230	WELD	4,638.1	1230	0.0	49.4	47.92507290	-103.80236977	2214.139						
1240	WELD	4,687.5	1240	0.0	49.6	47.92508317	-103.80256971	2212.838						
1250	WELD	4,737.1	1250	0.0	49.5	47.92509449	-103.80277051	2211.091						
1260	WELD	4,786.6	1260	0.0	49.4	47.92510644	-103.80297093	2209.124						
1270	WELD	4,835.9	1270	0.0	49.6	47.92511788	-103.80317084	2207.484						
1280	WELD	4,885.5	1280	0.0	49.5	47.92512869	-103.80337197	2205.791						
1290	WELD	4,935.1	1290	0.0	49.7	47.92513903	-103.80357238	2203.751						
1300	WELD	4,984.7	1300	0.0	49.6	47.92514902	-103.80377338	2201.590						
1310	WELD	5,034.3	1310	0.0	49.3	47.92515905	-103.80397415	2199.165						
1320	WELD	5,083.7	1320	0.0	49.6	47.92517086	-103.80417388	2197.045						
1330	WELD	5,133.2	1330	0.0	49.4	47.92518217	-103.80437486	2194.809						
1340	WELD	5,182.6	1340	0.0	49.4	47.92519343	-103.80457519	2192.719						
1350	WELD	5,232.0	1350	0.0	49.2	47.92520432	-103.80477541	2191.023						
1360	WELD	5,281.2	1360	0.0	49.3	47.92521451	-103.80497535	2190.605						

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)
1370	WELD	5,330.5	1370	0.0	49.3	47.92522533	-103.80517533	2190.889						
1380	WELD	5,379.8	1380	0.0	49.4	47.92523707	-103.80537474	2190.260						
1390	WELD	5,429.2	1390	0.0	49.5	47.92524916	-103.80557442	2189.973						
1400	WELD	5,478.7	1400	0.0	49.5	47.92525918	-103.80577536	2188.574						
1410	WELD	5,528.2	1410	0.0	49.4	47.92526986	-103.80597634	2188.758						
1420	WELD	5,577.5	1420	0.0	49.3	47.92528203	-103.80617660	2188.443						
1430	WELD	5,626.9	1430	0.0	49.5	47.92529461	-103.80637658	2187.453						
1440	WELD	5,676.4	1440	0.0	49.5	47.92530581	-103.80657708	2185.526						
1450	WELD	5,725.9	1450	0.0	49.6	47.92531526	-103.80677793	2182.790						
1460	WELD	5,775.5	1460	0.0	49.5	47.92532486	-103.80697892	2180.046						
1470	WELD	5,825.0	1470	0.0	49.3	47.92533528	-103.80717925	2178.053						
1480	WELD	5,874.2	1480	0.0	49.3	47.92534637	-103.80737861	2176.535						
1490	WELD	5,923.5	1490	0.0	49.2	47.92535694	-103.80757843	2175.155						
1500	WELD	5,972.7	1500	0.0	49.6	47.92536761	-103.80777826	2174.544						
1510	WELD	6,022.3	1510	0.0	49.6	47.92537915	-103.80797918	2173.627						
1520	WELD	6,071.9	1520	0.0	49.5	47.92539199	-103.80817956	2173.362						
1530	WELD	6,121.3	1530	0.0	49.7	47.92540415	-103.80838008	2173.009						
1540	WELD	6,171.0	1540	0.0	49.6	47.92541697	-103.80858098	2172.339						
1550	WELD	6,220.5	1550	0.0	48.8	47.92542883	-103.80878170	2171.331						
1560	WELD	6,269.4	1560	0.0	49.6	47.92544002	-103.80897946	2170.810						
1570	WELD	6,319.0	1570	0.0	49.7	47.92545093	-103.80918039	2170.613						
1580	WELD	6,368.6	1580	0.0	49.4	47.92546200	-103.80938139	2169.761						
1590	WELD	6,418.0	1590	0.0	49.3	47.92547381	-103.80958175	2169.125						
1600	WELD	6,467.3	1600	0.0	49.3	47.92548543	-103.80978161	2168.245						
1610	WELD	6,516.6	1610	0.0	49.3	47.92549735	-103.80998106	2167.526						
1620	WELD	6,565.9	1620	0.0	49.6	47.92551044	-103.81018051	2167.668						
1630	WELD	6,615.5	1630	0.0	49.6	47.92552302	-103.81038107	2167.907						
1640	WELD	6,665.2	1640	0.0	49.5	47.92553520	-103.81058184	2167.478						
1650	WELD	6,714.7	1650	0.0	49.6	47.92554662	-103.81078190	2167.549						
1660	WELD	6,764.3	1660	0.0	49.6	47.92555762	-103.81098248	2167.804						
1670	WELD	6,813.9	1670	0.0	49.3	47.92556862	-103.81118311	2167.976						
1680	WELD	6,863.2	1680	0.0	49.2	47.92557977	-103.81138300	2169.014						
1690	WELD	6,912.4	1690	0.0	49.2	47.92559132	-103.81158216	2169.612						
1700	WELD	6,961.6	1700	0.0	49.1	47.92560258	-103.81178151	2169.397						
1710	WELD	7,010.7	1710	0.0	49.5	47.92561315	-103.81198039	2170.123						
1720	WELD	7,060.3	1720	0.0	49.5	47.92562376	-103.81218111	2171.153						
1730	WELD	7,109.8	1730	0.0	49.2	47.92563566	-103.81238164	2172.205						

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)
1740	WELD	7,159.0	1740	0.0	49.5	47.92564805	-103.81258107	2173.734						
1750	WELD	7,208.5	1750	0.0	49.5	47.92566124	-103.81278125	2175.453						
1760	WELD	7,258.0	1760	0.0	49.3	47.92567481	-103.81298154	2176.785						
1770	WELD	7,307.3	1770	0.0	44.6	47.92568630	-103.81318127	2178.691						
1780	WELD	7,351.9	1780	0.0	49.4	47.92569403	-103.81336145	2181.338						
1790	WELD	7,401.3	1790	0.0	49.4	47.92569947	-103.81356264	2183.354						
1800	WELD	7,450.7	1800	0.0	49.3	47.92570257	-103.81376306	2186.032						
1810	WELD	7,500.0	1810	0.0	49.5	47.92570547	-103.81396326	2189.824						
1820	WELD	7,549.6	1820	0.0	49.3	47.92570893	-103.81416466	2192.900						
1830	WELD	7,598.8	1830	0.0	49.5	47.92571260	-103.81436518	2193.844						
1840	WELD	7,648.4	1840	0.0	49.5	47.92571679	-103.81456659	2194.525						
1850	WELD	7,697.8	1850	0.0	49.3	47.92572051	-103.81476792	2195.905						
1860	WELD	7,747.1	1860	0.0	49.3	47.92572404	-103.81496863	2197.324						
1870	WELD	7,796.4	1870	0.0	49.2	47.92572781	-103.81516995	2198.047						
1880	WELD	7,845.7	1880	0.0	44.2	47.92573443	-103.81537044	2197.927						
1890	WELD	7,889.9	1890	0.0	49.5	47.92573909	-103.81555030	2197.522						
1900	WELD	7,939.4	1900	0.0	49.2	47.92574037	-103.81575161	2197.439						
1910	WELD	7,988.6	1910	0.0	49.7	47.92574260	-103.81595185	2197.140						
1920	WELD	8,038.3	1920	0.0	49.3	47.92574547	-103.81615381	2199.449						
1930	WELD	8,087.6	1930	0.0	49.4	47.92574878	-103.81635404	2199.962						
1940	WELD	8,136.9	1940	0.0	49.5	47.92575311	-103.81655468	2198.054						
1950	WELD	8,186.5	1950	0.0	49.6	47.92575767	-103.81675571	2199.381						
1960	WELD	8,236.0	1960	0.0	49.5	47.92576344	-103.81695676	2201.778						
1970	WELD	8,285.6	1970	0.0	49.6	47.92576769	-103.81715772	2200.373						
1980	WELD	8,335.1	1980	0.0	49.5	47.92577152	-103.81735819	2199.278						
1990	WELD	8,384.7	1990	0.0	49.6	47.92577544	-103.81756040	2199.154						
2000	WELD	8,434.2	2000	0.0	49.6	47.92577939	-103.81776103	2202.339						
2010	WELD	8,483.8	2010	0.0	49.5	47.92578267	-103.81796202	2205.506						
2020	WELD	8,533.3	2020	0.0	49.7	47.92578594	-103.81816276	2207.966						
2030	WELD	8,583.0	2030	0.0	49.5	47.92579027	-103.81836402	2210.946						
2040	WELD	8,632.5	2040	0.0	49.3	47.92579594	-103.81856478	2214.389						
2050	WELD	8,681.8	2050	0.0	47.6	47.92580317	-103.81876376	2219.706						
2060	WELD	8,729.4	2060	0.0	47.3	47.92581162	-103.81895576	2223.782						
2070	WELD	8,776.7	2070	0.0	49.4	47.92582216	-103.81914676	2222.900						
2080	WELD	8,826.1	2080	0.0	49.6	47.92583292	-103.81934656	2220.140						
2090	WELD	8,875.7	2090	0.0	49.7	47.92584401	-103.81954723	2218.955						
2100	WELD	8,925.4	2100	0.0	49.6	47.92585625	-103.81974823	2220.015						

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)
2110	WELD	8,975.0	2110	0.0	49.2	47.92586852	-103.81994872	2219.578							
2120	WELD	9,024.1	2120	0.0	49.7	47.92588089	-103.82014711	2215.714							
2130	WELD	9,073.8	2130	0.0	6.9	47.92589230	-103.82034688	2211.136							
2140	WELD	9,080.7	2140	0.0	42.6	47.92589376	-103.82037447	2210.921							
2150	WELD	9,123.3	2150	0.0	49.3	47.92590268	-103.82054693	2211.847							
2160	WELD	9,172.6	2160	0.0	22.6	47.92591207	-103.82074602	2215.731							
2170	WELD	9,195.2	2170	0.0	43.2	47.92591619	-103.82083668	2218.092							
2180	WELD	9,238.4	2180	0.0	35.6	47.92592315	-103.82101170	2220.006							
2190	WELD	9,274.0	2190	0.0	49.4	47.92592771	-103.82115668	2220.169							
2200	WELD	9,323.4	2200	0.0	49.5	47.92593494	-103.82135704	2216.830							
20000000	Seam Variation	9,344.9	2200	21.4	28.1	47.92593966	-103.82144381	2215.773	79	2:30	-	0.71	0.63		
2210	WELD	9,372.9	2210	0.0	49.5	47.92594835	-103.82155712	2215.066							
2220	WELD	9,422.5	2220	0.0	49.6	47.92597135	-103.82175567	2215.079							
2230	WELD	9,472.0	2230	0.0	49.4	47.92601823	-103.82194396	2215.233							
2240	WELD	9,521.4	2240	0.0	49.5	47.92608663	-103.82211719	2213.553							
2250	WELD	9,570.9	2250	0.0	48.6	47.92615932	-103.82228729	2212.019							
2260	WELD	9,619.5	2260	0.0	43.9	47.92623168	-103.82245264	2210.001							
2270	WELD	9,663.4	2270	0.0	49.6	47.92629568	-103.82260343	2207.057							
2280	WELD	9,713.0	2280	0.0	49.1	47.92636640	-103.82277543	2206.491							
2290	WELD	9,762.1	2290	0.0	49.5	47.92643669	-103.82294552	2206.763							
2300	WELD	9,811.6	2300	0.0	49.3	47.92650691	-103.82311776	2207.749							
2310	WELD	9,861.0	2310	0.0	49.1	47.92657688	-103.82328942	2208.456							
2320	WELD	9,910.0	2320	0.0	49.4	47.92664700	-103.82345990	2210.039							
2330	WELD	9,959.5	2330	0.0	47.2	47.92671839	-103.82363089	2211.611							
2340	WELD	10,006.7	2340	0.0	0.7	47.92678600	-103.82379397	2214.386							
10000011	Bend left - 27 deg., 1.5D	10,007.0	2340	0.0	0.7	47.92678664	-103.82379522	2214.409	0	12:00					
2350	WELD	10,007.4	2350	0.0	49.0	47.92678744	-103.82379637	2214.423							
2360	WELD	10,056.4	2360	0.0	6.4	47.92689966	-103.82390726	2214.234							
11000006	WT CHANGE	10,062.7	2360	0.0	0.0	47.92691386	-103.82392169	2213.816				0.322	52000	0.72	
2370	WELD	10,062.8	2370	0.0	42.0	47.92691393	-103.82392176	2213.814							
2380	WELD	10,104.8	2380	0.0	42.2	47.92700807	-103.82401926	2210.731							
2390	WELD	10,147.0	2390	0.0	42.2	47.92709772	-103.82412647	2209.661							
2400	WELD	10,189.1	2400	0.0	42.2	47.92716954	-103.82426021	2210.806							
10000012	AGM 020, Sta. 105+48, Two track -- Han #114	10,209.6	2400	20.5	21.7	47.92719930	-103.82433066	2211.461							
2410	WELD	10,231.3	2410	0.0	42.2	47.92722940	-103.82440650	2211.627							
11000007	WT CHANGE	10,273.4	2410	0.0	0.0	47.92728677	-103.82455487	2212.198				0.188	52000	0.72	

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)
2420	WELD	10,273.5	2420	0.0	48.8	47.92728681	-103.82455498	2212.199							
2430	WELD	10,322.3	2430	0.0	49.5	47.92735532	-103.82472479	2216.064							
2440	WELD	10,371.8	2440	0.0	49.5	47.92742449	-103.82489772	2218.041							
2450	WELD	10,421.3	2450	0.0	49.5	47.92749020	-103.82507372	2219.021							
2460	WELD	10,470.8	2460	0.0	49.3	47.92755421	-103.82525099	2219.051							
2470	WELD	10,520.0	2470	0.0	49.5	47.92761807	-103.82542744	2218.658							
2480	WELD	10,569.5	2480	0.0	49.4	47.92768376	-103.82560369	2217.686							
2490	WELD	10,618.9	2490	0.0	49.5	47.92775017	-103.82577804	2217.011							
2500	WELD	10,668.4	2500	0.0	49.6	47.92781739	-103.82595286	2216.242							
2510	WELD	10,718.0	2510	0.0	49.6	47.92788304	-103.82612932	2215.549							
2520	WELD	10,767.6	2520	0.0	49.5	47.92794892	-103.82630598	2216.629							
2530	WELD	10,817.1	2530	0.0	49.6	47.92801562	-103.82648081	2219.404							
20000001	Seam Variation	10,839.1	2530	21.9	27.6	47.92804475	-103.82655885	2220.177	174	5:45	-	0.47	0.48		
2540	WELD	10,866.7	2540	0.0	49.7	47.92808162	-103.82665673	2221.251							
2550	WELD	10,916.4	2550	0.0	49.5	47.92814839	-103.82683273	2222.500							
2560	WELD	10,965.9	2560	0.0	49.5	47.92821516	-103.82700784	2221.977							
2570	WELD	11,015.4	2570	0.0	49.2	47.92828242	-103.82718225	2220.761							
2580	WELD	11,064.6	2580	0.0	49.6	47.92834914	-103.82735607	2218.605							
2590	WELD	11,114.2	2590	0.0	49.3	47.92841558	-103.82753206	2218.225							
2600	WELD	11,163.6	2600	0.0	49.6	47.92848183	-103.82770618	2220.121							
2610	WELD	11,213.2	2610	0.0	49.3	47.92854943	-103.82788066	2222.578							
2620	WELD	11,262.4	2620	0.0	49.6	47.92861614	-103.82805457	2224.390							
2630	WELD	11,312.0	2630	0.0	49.4	47.92868280	-103.82822992	2225.747							
2640	WELD	11,361.5	2640	0.0	50.2	47.92874823	-103.82840517	2226.819							
2650	WELD	11,411.6	2650	0.0	48.9	47.92881450	-103.82858372	2227.451							
2660	WELD	11,460.6	2660	0.0	49.8	47.92887949	-103.82875698	2226.977							
2670	WELD	11,510.4	2670	0.0	49.3	47.92894644	-103.82893218	2225.246							
2680	WELD	11,559.7	2680	0.0	49.4	47.92901339	-103.82910593	2223.497							
2690	WELD	11,609.1	2690	0.0	49.6	47.92907935	-103.82928061	2222.179							
2700	WELD	11,658.7	2700	0.0	49.6	47.92914467	-103.82945687	2220.870							
2710	WELD	11,708.2	2710	0.0	49.6	47.92921134	-103.82963261	2220.302							
2720	WELD	11,757.9	2720	0.0	49.6	47.92927926	-103.82980700	2220.102							
2730	WELD	11,807.5	2730	0.0	49.4	47.92934674	-103.82998151	2221.395							
2740	WELD	11,856.9	2740	0.0	49.4	47.92941340	-103.83015587	2223.147							
2750	WELD	11,906.3	2750	0.0	49.5	47.92948034	-103.83033013	2224.727							
2760	WELD	11,955.8	2760	0.0	49.6	47.92954627	-103.83050598	2226.201							
2770	WELD	12,005.3	2770	0.0	49.5	47.92961149	-103.83068270	2228.064							

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)
2780	WELD	12,054.8	2780	0.0	49.5	47.92967642	-103.83085906	2231.134							
2790	WELD	12,104.4	2790	0.0	49.5	47.92974102	-103.83103595	2232.745							
2800	WELD	12,153.8	2800	0.0	49.4	47.92980569	-103.83121291	2234.012							
2810	WELD	12,203.2	2810	0.0	49.4	47.92986912	-103.83139084	2234.310							
2820	WELD	12,252.6	2820	0.0	49.2	47.92993091	-103.83156960	2233.504							
20000002	Seam Variation	12,276.3	2820	23.7	25.5	47.92996013	-103.83165583	2233.229	239	7:45	-	0.71	0.63		
2830	WELD	12,301.8	2830	0.0	49.6	47.92999156	-103.83174840	2233.327							
2840	WELD	12,351.4	2840	0.0	49.6	47.93005346	-103.83192783	2233.182							
2850	WELD	12,400.9	2850	0.0	49.5	47.93011640	-103.83210650	2233.735							
2860	WELD	12,450.5	2860	0.0	49.4	47.93017838	-103.83228569	2234.950							
2870	WELD	12,499.9	2870	0.0	48.5	47.93023948	-103.83246539	2235.912							
2880	WELD	12,548.4	2880	0.0	49.1	47.93029876	-103.83264201	2236.187							
2890	WELD	12,597.6	2890	0.0	29.6	47.93036070	-103.83281978	2233.920							
2900	WELD	12,627.2	2900	0.0	48.5	47.93039831	-103.83292621	2233.595							
2910	WELD	12,675.6	2910	0.0	49.4	47.93045844	-103.83310222	2232.380							
2920	WELD	12,725.0	2920	0.0	49.5	47.93051968	-103.83328082	2229.997							
20000003	Seam Variation	12,765.2	2920	40.2	9.3	47.93057087	-103.83342545	2230.046	43	1:15	-	0.35	0.46		
2930	WELD	12,774.5	2930	0.0	3.4	47.93058278	-103.83345879	2230.586							
2940	WELD	12,777.9	2940	0.0	45.5	47.93058712	-103.83347084	2230.772							
2950	WELD	12,823.4	2950	0.0	49.5	47.93064521	-103.83363455	2232.280							
2960	WELD	12,873.0	2960	0.0	49.5	47.93070734	-103.83381361	2231.173							
2970	WELD	12,922.4	2970	0.0	49.5	47.93077001	-103.83399200	2230.256							
2980	WELD	12,971.9	2980	0.0	49.5	47.93083452	-103.83416925	2230.015							
2990	WELD	13,021.4	2990	0.0	48.8	47.93089649	-103.83434817	2229.482							
3000	WELD	13,070.2	3000	0.0	47.4	47.93095675	-103.83452543	2230.216							
3010	WELD	13,117.6	3010	0.0	49.6	47.93101586	-103.83469668	2231.287							
3020	WELD	13,167.2	3020	0.0	49.6	47.93107917	-103.83487521	2232.623							
3030	WELD	13,216.8	3030	0.0	49.5	47.93114271	-103.83505324	2232.307							
3040	WELD	13,266.3	3040	0.0	49.5	47.93120626	-103.83523103	2231.971							
20000004	Seam Variation	13,272.5	3040	6.1	43.4	47.93121436	-103.83525300	2232.012	111	3:30	-	0.71	0.48		
3050	WELD	13,315.8	3050	0.0	49.7	47.93127185	-103.83540720	2231.857							
3060	WELD	13,365.5	3060	0.0	49.5	47.93133891	-103.83558291	2231.978							
3070	WELD	13,415.1	3070	0.0	49.5	47.93140639	-103.83575754	2232.284							
3080	WELD	13,464.5	3080	0.0	49.6	47.93147284	-103.83593249	2232.574							
3090	WELD	13,514.1	3090	0.0	49.5	47.93153989	-103.83610770	2233.017							
3100	WELD	13,563.6	3100	0.0	49.6	47.93160661	-103.83628228	2233.915							
3110	WELD	13,613.2	3110	0.0	49.6	47.93167243	-103.83645809	2234.956							

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)
3120	WELD	13,662.8	3120	0.0	45.0	47.93173758	-103.83663447	2235.782						
3130	WELD	13,707.8	3130	0.0	49.5	47.93179556	-103.83679463	2237.019						
3140	WELD	13,757.3	3140	0.0	49.6	47.93186073	-103.83697079	2238.316						
3150	WELD	13,806.9	3150	0.0	49.1	47.93192825	-103.83714562	2239.300						
3160	WELD	13,856.1	3160	0.0	49.2	47.93199248	-103.83732043	2240.426						
3170	WELD	13,905.3	3170	0.0	49.6	47.93205143	-103.83749958	2240.637						
3180	WELD	13,954.9	3180	0.0	49.3	47.93210453	-103.83768491	2239.801						
3190	WELD	14,004.2	3190	0.0	49.5	47.93215119	-103.83787286	2238.798						
3200	WELD	14,053.7	3200	0.0	49.2	47.93219422	-103.83806373	2238.327						
3210	WELD	14,102.9	3210	0.0	46.9	47.93223606	-103.83825389	2238.005						
3220	WELD	14,149.9	3220	0.0	49.3	47.93227651	-103.83843519	2237.665						
3230	WELD	14,199.1	3230	0.0	49.5	47.93231961	-103.83862519	2237.799						
3240	WELD	14,248.6	3240	0.0	49.2	47.93236354	-103.83881575	2237.098						
3250	WELD	14,297.8	3250	0.0	49.4	47.93240784	-103.83900490	2236.601						
3260	WELD	14,347.2	3260	0.0	49.5	47.93245207	-103.83919525	2236.575						
3270	WELD	14,396.7	3270	0.0	49.5	47.93249658	-103.83938555	2235.741						
3280	WELD	14,446.2	3280	0.0	49.5	47.93254083	-103.83957565	2235.563						
3290	WELD	14,495.7	3290	0.0	49.5	47.93258416	-103.83976636	2236.069						
11000008	WT CHANGE	14,545.1	3290	0.0	0.0	47.93262811	-103.83995660	2236.093			0.322	52000	0.72	
3300	WELD	14,545.2	3300	0.0	23.3	47.93262814	-103.83995671	2236.092						
3310	WELD	14,568.4	3310	0.0	42.2	47.93264820	-103.84004649	2235.856						
3320	WELD	14,610.6	3320	0.0	42.2	47.93268578	-103.84020854	2235.459						
3330	WELD	14,652.8	3330	0.0	42.2	47.93273802	-103.84036145	2236.223						
10000013	AGM 030, Sta. 150+13, 152 Ave. NW -- Han #140	14,685.8	3330	33.0	9.2	47.93279021	-103.84047075	2236.558						
3340	WELD	14,695.0	3340	0.0	42.2	47.93280534	-103.84050058	2236.511						
3350	WELD	14,737.1	3350	0.0	42.2	47.93287497	-103.84063713	2235.962						
3360	WELD	14,779.3	3360	0.0	42.2	47.93294264	-103.84077579	2234.765						
3370	WELD	14,821.5	3370	0.0	42.1	47.93300996	-103.84091455	2236.341						
11000009	WT CHANGE	14,863.5	3370	0.0	0.0	47.93307935	-103.84104966	2240.260			0.188	52000	0.72	
3380	WELD	14,863.5	3380	0.0	25.0	47.93307941	-103.84104979	2240.261						
3390	WELD	14,888.5	3390	0.0	49.4	47.93312082	-103.84113063	2240.920						
3400	WELD	14,937.9	3400	0.0	49.5	47.93320354	-103.84128978	2241.125						
3410	WELD	14,987.4	3410	0.0	49.6	47.93328591	-103.84144964	2241.964						
3420	WELD	15,037.0	3420	0.0	49.4	47.93336796	-103.84161038	2243.356						
3430	WELD	15,086.4	3430	0.0	49.6	47.93344981	-103.84177032	2244.251						
3440	WELD	15,136.0	3440	0.0	49.6	47.93353220	-103.84193054	2243.272						

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)
3450	WELD	15,185.7	3450	0.0	49.6	47.93361445	-103.84209095	2241.482						
3460	WELD	15,235.3	3460	0.0	49.3	47.93369615	-103.84225184	2239.120						
3470	WELD	15,284.6	3470	0.0	49.4	47.93377847	-103.84241017	2237.234						
3480	WELD	15,334.0	3480	0.0	20.6	47.93385915	-103.84257125	2235.425						
11000010	WT CHANGE	15,354.6	3480	0.0	0.0	47.93389148	-103.84263956	2235.166			0.322	52000	0.72	
3490	WELD	15,354.6	3490	0.0	42.1	47.93389154	-103.84263969	2235.165						
3500	WELD	15,396.7	3500	0.0	42.2	47.93395713	-103.84277997	2233.909						
3510	WELD	15,438.9	3510	0.0	42.2	47.93402262	-103.84292071	2233.185						
3520	WELD	15,481.1	3520	0.0	42.2	47.93409102	-103.84305849	2231.851						
3530	WELD	15,523.3	3530	0.0	21.6	47.93416018	-103.84319548	2231.417						
11000011	WT CHANGE	15,544.9	3530	0.0	0.0	47.93419597	-103.84326514	2231.498			0.188	52000	0.72	
3540	WELD	15,545.0	3540	0.0	43.0	47.93419603	-103.84326527	2231.499						
3550	WELD	15,587.9	3550	0.0	49.6	47.93426814	-103.84340318	2230.927						
3560	WELD	15,637.5	3560	0.0	49.7	47.93435149	-103.84356179	2230.360						
3570	WELD	15,687.2	3570	0.0	49.7	47.93443510	-103.84372050	2229.055						
3580	WELD	15,736.9	3580	0.0	49.6	47.93451449	-103.84388305	2228.429						
3590	WELD	15,786.6	3590	0.0	48.7	47.93457953	-103.84405939	2228.118						
3600	WELD	15,835.2	3600	0.0	49.0	47.93461962	-103.84424735	2227.732						
3610	WELD	15,884.2	3610	0.0	49.7	47.93464861	-103.84444136	2227.502						
3620	WELD	15,933.9	3620	0.0	49.6	47.93467248	-103.84464021	2226.853						
3630	WELD	15,983.6	3630	0.0	49.6	47.93469287	-103.84483939	2226.945						
3640	WELD	16,033.1	3640	0.0	49.4	47.93470745	-103.84504008	2226.795						
3650	WELD	16,082.5	3650	0.0	49.5	47.93471581	-103.84524095	2226.654						
3660	WELD	16,132.1	3660	0.0	47.7	47.93471958	-103.84544258	2226.953						
3670	WELD	16,179.8	3670	0.0	49.6	47.93472241	-103.84563658	2226.876						
3680	WELD	16,229.4	3680	0.0	48.8	47.93472485	-103.84583828	2226.916						
3690	WELD	16,278.2	3690	0.0	49.5	47.93472587	-103.84603694	2227.006						
3700	WELD	16,327.7	3700	0.0	49.5	47.93472571	-103.84623844	2226.965						
3710	WELD	16,377.1	3710	0.0	49.6	47.93472473	-103.84643964	2226.563						
3720	WELD	16,426.7	3720	0.0	49.6	47.93472441	-103.84664139	2225.128						
3730	WELD	16,476.3	3730	0.0	49.7	47.93472429	-103.84684359	2223.876						
3740	WELD	16,526.0	3740	0.0	49.5	47.93472361	-103.84704566	2222.302						
3750	WELD	16,575.5	3750	0.0	49.6	47.93472241	-103.84724756	2220.428						
3760	WELD	16,625.1	3760	0.0	49.4	47.93472125	-103.84744938	2218.880						
3770	WELD	16,674.5	3770	0.0	49.6	47.93472002	-103.84765065	2217.388						
3780	WELD	16,724.1	3780	0.0	46.0	47.93472023	-103.84785248	2216.958						
3790	WELD	16,770.0	3790	0.0	49.3	47.93472071	-103.84803985	2216.308						

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)
3800	WELD	16,819.4	3800	0.0	49.5	47.93472107	-103.84824074	2215.344						
3810	WELD	16,868.9	3810	0.0	49.1	47.93472020	-103.84844255	2214.711						
3820	WELD	16,918.0	3820	0.0	49.3	47.93471892	-103.84864272	2214.425						
3830	WELD	16,967.3	3830	0.0	49.5	47.93471825	-103.84884369	2213.807						
3840	WELD	17,016.8	3840	0.0	49.6	47.93471807	-103.84904550	2213.261						
3850	WELD	17,066.4	3850	0.0	49.6	47.93471831	-103.84924745	2213.292						
3860	WELD	17,115.9	3860	0.0	46.7	47.93471740	-103.84944927	2212.642						
3870	WELD	17,162.6	3870	0.0	48.8	47.93471499	-103.84963949	2212.185						
3880	WELD	17,211.4	3880	0.0	47.6	47.93471156	-103.84983761	2210.580						
3890	WELD	17,259.0	3890	0.0	49.2	47.93470978	-103.85003153	2209.471						
3900	WELD	17,308.2	3900	0.0	48.8	47.93470999	-103.85023188	2209.511						
3910	WELD	17,357.0	3910	0.0	37.9	47.93471095	-103.85043025	2208.872						
3920	WELD	17,394.8	3920	0.0	49.5	47.93471029	-103.85058439	2210.055						
3930	WELD	17,444.3	3930	0.0	49.4	47.93471112	-103.85078563	2210.475						
3940	WELD	17,493.7	3940	0.0	49.5	47.93471277	-103.85098686	2209.933						
3950	WELD	17,543.2	3950	0.0	43.6	47.93471264	-103.85118835	2209.330						
3960	WELD	17,586.7	3960	0.0	49.2	47.93471212	-103.85136570	2209.335						
3970	WELD	17,635.9	3970	0.0	49.6	47.93471282	-103.85156527	2209.350						
3980	WELD	17,685.5	3980	0.0	49.6	47.93471461	-103.85176702	2210.135						
3990	WELD	17,735.1	3990	0.0	49.5	47.93471462	-103.85196859	2210.475						
4000	WELD	17,784.6	4000	0.0	48.6	47.93471531	-103.85217023	2210.209						
4010	WELD	17,833.2	4010	0.0	48.6	47.93471573	-103.85236805	2210.359						
4020	WELD	17,881.8	4020	0.0	49.7	47.93471542	-103.85256551	2210.046						
4030	WELD	17,931.5	4030	0.0	48.8	47.93471469	-103.85276762	2210.222						
4040	WELD	17,980.3	4040	0.0	49.3	47.93471495	-103.85296601	2210.273						
4050	WELD	18,029.6	4050	0.0	47.0	47.93471583	-103.85316636	2210.444						
11000012	WT CHANGE	18,076.6	4050	0.0	0.0	47.93471548	-103.85335687	2208.963			0.322	52000	0.72	
4060	WELD	18,076.6	4060	0.0	41.3	47.93471548	-103.85335703	2208.964						
4070	WELD	18,118.0	4070	0.0	42.3	47.93471237	-103.85352447	2208.828						
4080	WELD	18,160.2	4080	0.0	42.2	47.93471041	-103.85369586	2209.056						
4090	WELD	18,202.4	4090	0.0	42.3	47.93471233	-103.85386722	2209.544						
4100	WELD	18,244.7	4100	0.0	42.3	47.93471512	-103.85403839	2210.424						
4110	WELD	18,287.0	4110	0.0	42.3	47.93471729	-103.85420974	2210.658						
4120	WELD	18,329.2	4120	0.0	42.2	47.93471855	-103.85438074	2213.769						
11000013	WT CHANGE	18,371.4	4120	0.0	0.0	47.93471950	-103.85455193	2214.917			0.188	52000	0.72	
4130	WELD	18,371.5	4130	0.0	35.8	47.93471949	-103.85455208	2214.917						
4140	WELD	18,407.3	4140	0.0	49.7	47.93471608	-103.85469758	2214.939						

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)
4150	WELD	18,457.0	4150	0.0	49.4	47.93471445	-103.85489935	2215.037						
4160	WELD	18,506.4	4160	0.0	49.5	47.93471492	-103.85509949	2215.727						
4170	WELD	18,555.9	4170	0.0	49.6	47.93471402	-103.85530049	2216.343						
4180	WELD	18,605.5	4180	0.0	49.7	47.93471553	-103.85550160	2217.051						
4190	WELD	18,655.2	4190	0.0	49.4	47.93471629	-103.85570292	2218.103						
4200	WELD	18,704.7	4200	0.0	49.7	47.93471638	-103.85590341	2219.367						
4210	WELD	18,754.4	4210	0.0	49.3	47.93471574	-103.85610508	2219.327						
4220	WELD	18,803.7	4220	0.0	49.7	47.93471584	-103.85630542	2218.838						
4230	WELD	18,853.3	4230	0.0	49.7	47.93471645	-103.85650663	2218.867						
4240	WELD	18,903.0	4240	0.0	49.7	47.93471815	-103.85670809	2218.221						
4250	WELD	18,952.7	4250	0.0	49.6	47.93472106	-103.85690976	2217.421						
4260	WELD	19,002.3	4260	0.0	49.6	47.93472196	-103.85711118	2216.568						
4270	WELD	19,051.9	4270	0.0	49.4	47.93472013	-103.85731213	2214.032						
4280	WELD	19,101.3	4280	0.0	49.4	47.93471864	-103.85751203	2209.841						
4290	WELD	19,150.6	4290	0.0	49.6	47.93471860	-103.85771107	2204.324						
4300	WELD	19,200.2	4300	0.0	49.2	47.93471957	-103.85791141	2199.621						
4310	WELD	19,249.4	4310	0.0	45.4	47.93472200	-103.85811040	2195.915						
4320	WELD	19,294.7	4320	0.0	7.1	47.93472446	-103.85829466	2196.309						
4330	WELD	19,301.8	4330	0.0	48.6	47.93472494	-103.85832348	2196.623						
4340	WELD	19,350.5	4340	0.0	49.7	47.93472726	-103.85852046	2200.071						
4350	WELD	19,400.2	4350	0.0	49.6	47.93472916	-103.85872152	2204.790						
4360	WELD	19,449.7	4360	0.0	49.6	47.93473126	-103.85892238	2209.116						
4370	WELD	19,499.3	4370	0.0	49.5	47.93472997	-103.85912310	2212.711						
4380	WELD	19,548.8	4380	0.0	49.4	47.93472433	-103.85932456	2213.150						
4390	WELD	19,598.3	4390	0.0	46.5	47.93472353	-103.85952495	2208.833						
4400	WELD	19,644.8	4400	0.0	49.5	47.93472389	-103.85971324	2203.947						
4410	WELD	19,694.3	4410	0.0	49.1	47.93472203	-103.85991476	2204.028						
4420	WELD	19,743.3	4420	0.0	49.6	47.93471994	-103.86011427	2207.685						
4430	WELD	19,793.0	4430	0.0	49.5	47.93471852	-103.86031578	2211.173						
4440	WELD	19,842.5	4440	0.0	49.6	47.93471914	-103.86051726	2211.108						
4450	WELD	19,892.1	4450	0.0	49.4	47.93472049	-103.86071798	2207.057						
4460	WELD	19,941.5	4460	0.0	49.5	47.93471961	-103.86091764	2200.868						
4470	WELD	19,991.0	4470	0.0	49.5	47.93471793	-103.86111750	2194.978						
4480	WELD	20,040.5	4480	0.0	5.6	47.93471817	-103.86131874	2191.931						
11000014	WT CHANGE	20,046.1	4480	0.0	0.0	47.93471840	-103.86134126	2191.643			0.322	52000	0.72	
4490	WELD	20,046.1	4490	0.0	42.0	47.93471840	-103.86134142	2191.641						
4500	WELD	20,088.1	4500	0.0	42.1	47.93472067	-103.86151202	2188.682						

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)
10000014	AGM 040, Sta. 204+86, Gravel Rd. -- Han #116	20,094.4	4500	6.4	35.8	47.93472118	-103.86153784	2188.147							
4510	WELD	20,130.2	4510	0.0	42.2	47.93472205	-103.86168311	2186.245							
4520	WELD	20,172.4	4520	0.0	42.2	47.93471948	-103.86185419	2183.709							
4530	WELD	20,214.6	4530	0.0	42.1	47.93471930	-103.86202502	2180.355							
4540	WELD	20,256.7	4540	0.0	17.8	47.93472143	-103.86219634	2178.271							
11000015	WT CHANGE	20,274.5	4540	0.0	0.0	47.93472185	-103.86226854	2177.677				0.188	52000	0.72	
4550	WELD	20,274.5	4550	0.0	48.6	47.93472185	-103.86226871	2177.676							
4560	WELD	20,323.1	4560	0.0	48.3	47.93472219	-103.86246670	2176.133							
4570	WELD	20,371.4	4570	0.0	49.5	47.93472117	-103.86266308	2175.214							
4580	WELD	20,420.9	4580	0.0	46.5	47.93471939	-103.86286491	2174.501							
4590	WELD	20,467.4	4590	0.0	49.6	47.93471884	-103.86305398	2173.736							
4600	WELD	20,517.0	4600	0.0	49.3	47.93471816	-103.86325561	2172.317							
4610	WELD	20,566.4	4610	0.0	49.5	47.93471836	-103.86345626	2170.842							
4620	WELD	20,615.9	4620	0.0	49.4	47.93471999	-103.86365816	2168.860							
4630	WELD	20,665.3	4630	0.0	49.6	47.93472028	-103.86385911	2168.481							
4640	WELD	20,714.9	4640	0.0	49.0	47.93472011	-103.86406106	2169.191							
40000000	Metal Loss - EXTERNAL	20,733.0	4640	18.1	31.0	47.93472066	-103.86413482	2170.137	349	11:30	15%	1.22	0.46	1760	100%
4650	WELD	20,763.9	4650	0.0	49.4	47.93472222	-103.86426043	2171.751							
4660	WELD	20,813.3	4660	0.0	49.4	47.93472270	-103.86446149	2172.252							
4670	WELD	20,862.6	4670	0.0	49.2	47.93472163	-103.86466187	2169.415							
4680	WELD	20,911.9	4680	0.0	6.5	47.93472020	-103.86486154	2165.895							
4690	WELD	20,918.4	4690	0.0	42.7	47.93471986	-103.86488776	2165.296							
4700	WELD	20,961.1	4700	0.0	49.4	47.93471691	-103.86506112	2162.518							
4710	WELD	21,010.5	4710	0.0	41.7	47.93471228	-103.86526139	2158.673							
4720	WELD	21,052.2	4720	0.0	49.7	47.93471020	-103.86543108	2156.076							
4730	WELD	21,101.9	4730	0.0	49.2	47.93470985	-103.86563298	2155.922							
4740	WELD	21,151.1	4740	0.0	48.7	47.93471128	-103.86583365	2155.774							
4750	WELD	21,199.7	4750	0.0	47.3	47.93471639	-103.86603105	2155.253							
4760	WELD	21,247.0	4760	0.0	9.0	47.93472046	-103.86622275	2152.846							
4770	WELD	21,256.0	4770	0.0	48.6	47.93472115	-103.86625929	2152.611							
4780	WELD	21,304.6	4780	0.0	49.8	47.93472236	-103.86645669	2152.325							
4790	WELD	21,354.4	4790	0.0	49.8	47.93472264	-103.86665841	2151.764							
4800	WELD	21,404.1	4800	0.0	49.6	47.93472292	-103.86686058	2151.303							
4810	WELD	21,453.7	4810	0.0	49.4	47.93472177	-103.86706235	2150.501							
4820	WELD	21,503.1	4820	0.0	49.5	47.93472207	-103.86726275	2149.757							
4830	WELD	21,552.6	4830	0.0	48.7	47.93472274	-103.86746357	2149.097							

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)
4840	WELD	21,601.3	4840	0.0	49.7	47.93472207	-103.86766122	2148.099						
4850	WELD	21,651.1	4850	0.0	40.7	47.93471971	-103.86786284	2147.294						
4860	WELD	21,691.8	4860	0.0	49.6	47.93471571	-103.86802801	2146.418						
4870	WELD	21,741.4	4870	0.0	49.3	47.93470956	-103.86822934	2146.467						
4880	WELD	21,790.7	4880	0.0	49.7	47.93470334	-103.86842948	2145.745						
4890	WELD	21,840.4	4890	0.0	49.7	47.93469878	-103.86863016	2141.558						
4900	WELD	21,890.1	4900	0.0	49.3	47.93469688	-103.86883140	2139.537						
4910	WELD	21,939.4	4910	0.0	49.6	47.93469591	-103.86903193	2141.312						
4920	WELD	21,989.0	4920	0.0	49.6	47.93469583	-103.86923353	2142.644						
4930	WELD	22,038.6	4930	0.0	43.2	47.93469052	-103.86943481	2143.034						
4940	WELD	22,081.8	4940	0.0	41.1	47.93468496	-103.86961015	2144.787						
4950	WELD	22,122.9	4950	0.0	49.1	47.93467845	-103.86977697	2147.476						
4960	WELD	22,172.1	4960	0.0	49.6	47.93467160	-103.86997653	2148.979						
4970	WELD	22,221.6	4970	0.0	49.6	47.93466783	-103.87017798	2149.110						
4980	WELD	22,271.2	4980	0.0	49.3	47.93466536	-103.87037963	2149.125						
4990	WELD	22,320.5	4990	0.0	49.2	47.93466212	-103.87058009	2150.436						
5000	WELD	22,369.7	5000	0.0	49.4	47.93465778	-103.87078018	2149.323						
5010	WELD	22,419.1	5010	0.0	49.5	47.93464906	-103.87098101	2146.801						
5020	WELD	22,468.6	5020	0.0	49.6	47.93463933	-103.87118175	2143.932						
5030	WELD	22,518.2	5030	0.0	49.5	47.93462895	-103.87138224	2144.864						
5040	WELD	22,567.7	5040	0.0	49.5	47.93461867	-103.87158296	2145.208						
5050	WELD	22,617.2	5050	0.0	43.3	47.93460836	-103.87178402	2144.727						
11000016	WT CHANGE	22,660.4	5050	0.0	0.0	47.93460122	-103.87195989	2145.483			0.322	52000	0.72	
5060	WELD	22,660.5	5060	0.0	41.3	47.93460121	-103.87196000	2145.483						
5070	WELD	22,701.8	5070	0.0	42.1	47.93459683	-103.87212806	2145.761						
5080	WELD	22,743.9	5080	0.0	42.2	47.93459596	-103.87229964	2145.924						
5090	WELD	22,786.1	5090	0.0	42.2	47.93459739	-103.87247132	2146.052						
5100	WELD	22,828.3	5100	0.0	42.2	47.93459717	-103.87264269	2145.147						
5110	WELD	22,870.5	5110	0.0	42.2	47.93459358	-103.87281410	2143.999						
5120	WELD	22,912.6	5120	0.0	42.2	47.93459138	-103.87298551	2143.086						
5130	WELD	22,954.8	5130	0.0	42.2	47.93458583	-103.87315684	2142.532						
5140	WELD	22,996.9	5140	0.0	42.2	47.93457080	-103.87332622	2139.296						
5150	WELD	23,039.1	5150	0.0	42.2	47.93454839	-103.87349366	2135.810						
5160	WELD	23,081.3	5160	0.0	42.2	47.93451829	-103.87365835	2132.092						
5170	WELD	23,123.6	5170	0.0	42.2	47.93448492	-103.87382165	2128.529						
5180	WELD	23,165.8	5180	0.0	42.2	47.93445109	-103.87398545	2129.517						
5190	WELD	23,208.0	5190	0.0	42.3	47.93441242	-103.87414421	2137.052						

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)
5200	WELD	23,250.3	5200	0.0	42.3	47.93438218	-103.87430619	2145.291							
5210	WELD	23,292.6	5210	0.0	42.0	47.93435871	-103.87447315	2149.093							
5220	WELD	23,334.6	5220	0.0	1.5	47.93433440	-103.87463942	2148.046							
10000015	Bend right - 35 deg., 3D	23,335.3	5220	0.1	1.4	47.93433434	-103.87464236	2148.000	0	12:00					
11000017	WT CHANGE	23,336.0	5220	0.0	0.0	47.93433479	-103.87464514	2147.965				0.188	52000	0.72	
5230	WELD	23,336.0	5230	0.0	27.6	47.93433483	-103.87464529	2147.964							
5240	WELD	23,363.6	5240	0.0	49.1	47.93436380	-103.87474941	2147.911							
5250	WELD	23,412.8	5250	0.0	42.7	47.93441412	-103.87493461	2145.883							
5260	WELD	23,455.5	5260	0.0	42.9	47.93445063	-103.87509916	2145.965							
5270	WELD	23,498.4	5270	0.0	49.3	47.93447230	-103.87527045	2145.075							
5280	WELD	23,547.7	5280	0.0	49.6	47.93448190	-103.87546948	2141.447							
5290	WELD	23,597.3	5290	0.0	49.6	47.93448257	-103.87567058	2142.160							
5300	WELD	23,646.9	5300	0.0	49.5	47.93448261	-103.87587232	2144.458							
5310	WELD	23,696.5	5310	0.0	49.6	47.93448017	-103.87607346	2143.776							
5320	WELD	23,746.1	5320	0.0	49.5	47.93447426	-103.87627413	2140.136							
5330	WELD	23,795.6	5330	0.0	49.6	47.93446231	-103.87647382	2136.116							
5340	WELD	23,845.2	5340	0.0	49.6	47.93444388	-103.87667195	2130.790							
5350	WELD	23,894.8	5350	0.0	49.5	47.93442153	-103.87686910	2124.930							
5360	WELD	23,944.4	5360	0.0	49.5	47.93439742	-103.87706565	2119.190							
5370	WELD	23,993.8	5370	0.0	49.7	47.93437292	-103.87726305	2116.179							
5380	WELD	24,043.5	5380	0.0	43.1	47.93435066	-103.87746205	2117.226							
5390	WELD	24,086.6	5390	0.0	49.7	47.93433525	-103.87763516	2117.812							
5400	WELD	24,136.3	5400	0.0	49.7	47.93431632	-103.87783445	2116.279							
5410	WELD	24,185.9	5410	0.0	49.6	47.93429751	-103.87803372	2114.972							
5420	WELD	24,235.5	5420	0.0	49.5	47.93428113	-103.87823390	2113.869							
5430	WELD	24,285.1	5430	0.0	49.3	47.93426555	-103.87843414	2113.781							
5440	WELD	24,334.4	5440	0.0	49.6	47.93424942	-103.87863312	2112.015							
5450	WELD	24,383.9	5450	0.0	49.6	47.93423217	-103.87883299	2111.668							
5460	WELD	24,433.6	5460	0.0	49.6	47.93421326	-103.87903279	2111.436							
5470	WELD	24,483.2	5470	0.0	49.4	47.93419420	-103.87923229	2111.833							
5480	WELD	24,532.6	5480	0.0	49.2	47.93417808	-103.87943161	2113.719							
5490	WELD	24,581.8	5490	0.0	49.4	47.93416648	-103.87963120	2111.675							
5500	WELD	24,631.2	5500	0.0	49.4	47.93415971	-103.87983184	2110.242							
5510	WELD	24,680.6	5510	0.0	49.5	47.93416005	-103.88003290	2112.137							
5520	WELD	24,730.1	5520	0.0	49.5	47.93416630	-103.88023402	2111.339							
5530	WELD	24,779.5	5530	0.0	49.5	47.93417766	-103.88043498	2109.675							
5540	WELD	24,829.0	5540	0.0	49.5	47.93419433	-103.88063517	2108.904							

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)
5550	WELD	24,878.5	5550	0.0	49.2	47.93421344	-103.88083445	2108.598							
5560	WELD	24,927.7	5560	0.0	49.6	47.93423277	-103.88103276	2108.007							
5570	WELD	24,977.3	5570	0.0	47.1	47.93425044	-103.88123261	2105.917							
11000018	WT CHANGE	25,024.3	5570	0.0	0.0	47.93426686	-103.88142083	2101.384				0.322	52000	0.72	
5580	WELD	25,024.3	5580	0.0	0.7	47.93426687	-103.88142102	2101.380							
5590	WELD	25,025.0	5590	0.0	1.6	47.93426679	-103.88142384	2101.316							
10000016	Bend left - 60 deg., 1.5D	25,025.8	5590	0.2	1.3	47.93426616	-103.88142678	2101.252	0	12:00					
5600	WELD	25,026.6	5600	0.0	42.3	47.93426479	-103.88142920	2101.194							
5610	WELD	25,068.9	5610	0.0	42.2	47.93416579	-103.88151903	2099.126							
5620	WELD	25,111.1	5620	0.0	38.5	47.93407139	-103.88161722	2101.829							
5630	WELD	25,149.6	5630	0.0	1.6	47.93399698	-103.88172592	2107.069							
10000017	Bend right - 45 deg., 1.5D	25,150.4	5630	0.2	1.4	47.93399582	-103.88172850	2107.124	0	12:00					
11000019	WT CHANGE	25,151.1	5630	0.0	0.0	47.93399525	-103.88173132	2107.128				0.188	52000	0.72	
5640	WELD	25,151.2	5640	0.0	6.3	47.93399523	-103.88173147	2107.128							
5650	WELD	25,157.5	5650	0.0	39.7	47.93399519	-103.88175725	2106.810							
5660	WELD	25,197.1	5660	0.0	49.5	47.93399450	-103.88191865	2105.713							
5670	WELD	25,246.6	5670	0.0	49.5	47.93398731	-103.88211941	2106.065							
5680	WELD	25,296.1	5680	0.0	49.5	47.93397174	-103.88231930	2107.162							
5690	WELD	25,345.6	5690	0.0	49.1	47.93395974	-103.88251989	2107.018							
5700	WELD	25,394.8	5700	0.0	48.5	47.93396296	-103.88271955	2106.123							
5710	WELD	25,443.3	5710	0.0	22.6	47.93397546	-103.88291584	2104.280							
11000020	WT CHANGE	25,465.9	5710	0.0	0.0	47.93398239	-103.88300708	2102.909				0.322	52000	0.72	
5720	WELD	25,466.0	5720	0.0	42.1	47.93398240	-103.88300724	2102.906							
5730	WELD	25,508.1	5730	0.0	42.2	47.93399422	-103.88317703	2099.582							
10000018	AGM 050, Sta. 258+70, 154 Ave NW -- Han #142	25,528.7	5730	20.6	21.6	47.93400149	-103.88326014	2098.849							
5740	WELD	25,550.3	5740	0.0	42.1	47.93400994	-103.88334692	2098.974							
5750	WELD	25,592.4	5750	0.0	42.1	47.93402094	-103.88351742	2099.808							
5760	WELD	25,634.5	5760	0.0	1.1	47.93402994	-103.88368808	2101.440							
10000019	Bend right - 30 deg., 1.5D	25,635.1	5760	0.1	1.0	47.93403022	-103.88369019	2101.475	0	12:00					
11000021	WT CHANGE	25,635.6	5760	0.0	0.0	47.93403082	-103.88369205	2101.496				0.188	52000	0.72	
5770	WELD	25,635.6	5770	0.0	37.5	47.93403087	-103.88369219	2101.498							
5780	WELD	25,673.1	5780	0.0	49.3	47.93409156	-103.88381678	2101.620							
5790	WELD	25,722.5	5790	0.0	49.5	47.93417339	-103.88397675	2102.976							
5800	WELD	25,772.0	5800	0.0	47.0	47.93425001	-103.88414269	2103.381							
5810	WELD	25,819.0	5810	0.0	49.5	47.93431425	-103.88430857	2103.126							
5820	WELD	25,868.5	5820	0.0	49.0	47.93437777	-103.88448623	2101.711							

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)
5830	WELD	25,917.5	5830	0.0	49.4	47.93443448	-103.88466615	2099.992							
5840	WELD	25,966.9	5840	0.0	49.4	47.93447858	-103.88485532	2098.157							
5850	WELD	26,016.3	5850	0.0	49.4	47.93450713	-103.88505183	2097.621							
5860	WELD	26,065.7	5860	0.0	48.6	47.93452681	-103.88525107	2097.418							
5870	WELD	26,114.3	5870	0.0	49.5	47.93454579	-103.88544673	2096.929							
5880	WELD	26,163.9	5880	0.0	49.4	47.93456578	-103.88564557	2096.095							
5890	WELD	26,213.3	5890	0.0	49.5	47.93458551	-103.88584451	2095.541							
5900	WELD	26,262.8	5900	0.0	49.4	47.93460680	-103.88604305	2094.204							
5910	WELD	26,312.2	5910	0.0	48.1	47.93462680	-103.88624189	2093.501							
5920	WELD	26,360.3	5920	0.0	48.5	47.93464044	-103.88643624	2093.786							
5930	WELD	26,408.8	5930	0.0	49.5	47.93464648	-103.88663308	2093.224							
5940	WELD	26,458.3	5940	0.0	48.4	47.93464711	-103.88683435	2092.664							
5950	WELD	26,506.6	5950	0.0	48.6	47.93464463	-103.88703028	2096.128							
5960	WELD	26,555.2	5960	0.0	48.4	47.93464236	-103.88722642	2101.432							
5970	WELD	26,603.5	5970	0.0	48.4	47.93464089	-103.88742150	2106.964							
5980	WELD	26,652.0	5980	0.0	48.5	47.93464221	-103.88761641	2112.915							
5990	WELD	26,700.5	5990	0.0	48.6	47.93464531	-103.88780922	2122.721							
6000	WELD	26,749.1	6000	0.0	47.9	47.93464770	-103.88800094	2133.935							
6010	WELD	26,797.0	6010	0.0	44.1	47.93464875	-103.88819294	2141.339							
6020	WELD	26,841.1	6020	0.0	6.0	47.93464256	-103.88837144	2141.752							
6030	WELD	26,847.1	6030	0.0	48.1	47.93464070	-103.88839581	2141.330							
6040	WELD	26,895.3	6040	0.0	48.6	47.93462379	-103.88858654	2133.458							
6050	WELD	26,943.9	6050	0.0	48.8	47.93460252	-103.88877639	2122.395							
6060	WELD	26,992.7	6060	0.0	48.7	47.93458084	-103.88896931	2117.601							
6070	WELD	27,041.4	6070	0.0	48.6	47.93456130	-103.88916063	2126.612							
6080	WELD	27,090.0	6080	0.0	49.6	47.93454392	-103.88935239	2136.409							
6090	WELD	27,139.6	6090	0.0	49.6	47.93452728	-103.88955016	2143.671							
6100	WELD	27,189.2	6100	0.0	49.6	47.93451504	-103.88975125	2145.628							
6110	WELD	27,238.8	6110	0.0	49.6	47.93450769	-103.88995278	2146.080							
6120	WELD	27,288.5	6120	0.0	49.2	47.93450435	-103.89015465	2146.626							
6130	WELD	27,337.7	6130	0.0	44.8	47.93450406	-103.89035503	2146.187							
6140	WELD	27,382.6	6140	0.0	49.2	47.93450418	-103.89053747	2144.183							
6150	WELD	27,431.7	6150	0.0	49.3	47.93450458	-103.89073685	2139.619							
6160	WELD	27,481.1	6160	0.0	49.3	47.93450465	-103.89093710	2137.323							
6170	WELD	27,530.4	6170	0.0	44.7	47.93450543	-103.89113693	2140.937							
6180	WELD	27,575.1	6180	0.0	49.4	47.93450590	-103.89131766	2145.778							
20000006	Seam Variation	27,588.2	6180	13.0	36.4	47.93450617	-103.89137091	2146.268	102	3:15	-	0.71	0.60		

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)
6190	WELD	27,624.5	6190	0.0	49.4	47.93450605	-103.89151799	2143.063							
6200	WELD	27,673.9	6200	0.0	49.4	47.93450399	-103.89171483	2133.080							
6210	WELD	27,723.3	6210	0.0	49.4	47.93450064	-103.89191023	2122.145							
6220	WELD	27,772.7	6220	0.0	49.6	47.93449914	-103.89210829	2114.815							
6230	WELD	27,822.3	6230	0.0	44.4	47.93450530	-103.89230543	2123.606							
6240	WELD	27,866.6	6240	0.0	47.3	47.93451321	-103.89247776	2136.716							
6250	WELD	27,913.9	6250	0.0	45.8	47.93452327	-103.89266439	2147.610							
10000020	Bend right - 16 deg., 98D	27,928.7	6250	5.7	40.1	47.93453112	-103.89272283	2149.756	0	12:00					
6260	WELD	27,959.7	6260	0.0	46.5	47.93456529	-103.89283808	2150.690							
6270	WELD	28,006.2	6270	0.0	49.4	47.93464265	-103.89298747	2146.526							
6280	WELD	28,055.6	6280	0.0	49.5	47.93473701	-103.89313154	2143.150							
6290	WELD	28,105.1	6290	0.0	39.5	47.93483423	-103.89327130	2143.980							
11000022	WT CHANGE	28,144.6	6290	0.0	0.0	47.93491051	-103.89338343	2147.201				0.322	52000	0.72	
6300	WELD	28,144.6	6300	0.0	42.2	47.93491058	-103.89338354	2147.205							
6310	WELD	28,186.8	6310	0.0	42.2	47.93498983	-103.89350749	2149.803							
6320	WELD	28,228.9	6320	0.0	42.2	47.93506876	-103.89363246	2151.943							
6330	WELD	28,271.1	6330	0.0	42.2	47.93515015	-103.89375315	2155.625							
6340	WELD	28,313.3	6340	0.0	42.2	47.93522914	-103.89387776	2157.560							
6350	WELD	28,355.5	6350	0.0	14.1	47.93530737	-103.89400387	2158.656							
6360	WELD	28,369.6	6360	0.0	31.4	47.93533355	-103.89404610	2158.969							
6370	WELD	28,401.1	6370	0.0	1.6	47.93539250	-103.89413930	2159.021							
10000021	Bend left-up - 45 deg., 3D	28,401.8	6370	0.1	1.5	47.93539349	-103.89414181	2159.028	0	12:00					
11000023	WT CHANGE	28,402.6	6370	0.0	0.0	47.93539404	-103.89414473	2159.052				0.188	52000	0.72	
6380	WELD	28,402.7	6380	0.0	7.0	47.93539405	-103.89414488	2159.054							
6390	WELD	28,409.7	6390	0.0	31.9	47.93539360	-103.89417449	2159.555							
6400	WELD	28,441.6	6400	0.0	41.2	47.93539055	-103.89430406	2161.834							
6410	WELD	28,482.8	6410	0.0	31.2	47.93538953	-103.89447195	2162.880							
6420	WELD	28,514.0	6420	0.0	31.7	47.93538861	-103.89459884	2162.251							
6430	WELD	28,545.7	6430	0.0	33.7	47.93538885	-103.89472771	2161.786							
20000007	Seam Variation	28,570.1	6430	24.3	9.3	47.93538946	-103.89482681	2161.553	317	10:30	-	0.71	0.69		
6440	WELD	28,579.4	6440	0.0	29.8	47.93538990	-103.89486464	2161.491							
6450	WELD	28,609.2	6450	0.0	30.4	47.93539132	-103.89498572	2161.317							
6460	WELD	28,639.6	6460	0.0	49.4	47.93539199	-103.89510944	2161.316							
6470	WELD	28,688.9	6470	0.0	34.9	47.93539209	-103.89531037	2162.002							
6480	WELD	28,723.9	6480	0.0	44.0	47.93539083	-103.89545242	2162.571							
6490	WELD	28,767.9	6490	0.0	38.3	47.93538814	-103.89563128	2163.176							
6500	WELD	28,806.1	6500	0.0	38.1	47.93538541	-103.89578718	2164.247							

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)
6510	WELD	28,844.2	6510	0.0	49.6	47.93538342	-103.89594195	2165.008							
6520	WELD	28,893.9	6520	0.0	40.9	47.93538161	-103.89614343	2165.955							
6530	WELD	28,934.8	6530	0.0	49.7	47.93538093	-103.89630933	2166.825							
6540	WELD	28,984.5	6540	0.0	49.6	47.93538152	-103.89651114	2167.083							
6550	WELD	29,034.1	6550	0.0	48.1	47.93538216	-103.89671270	2167.421							
6560	WELD	29,082.2	6560	0.0	49.6	47.93538070	-103.89690825	2168.294							
6570	WELD	29,131.9	6570	0.0	49.5	47.93537800	-103.89710960	2170.456							
6580	WELD	29,181.3	6580	0.0	48.0	47.93537537	-103.89731020	2171.940							
6590	WELD	29,229.3	6590	0.0	49.5	47.93537472	-103.89750511	2173.297							
6600	WELD	29,278.8	6600	0.0	49.5	47.93537677	-103.89770564	2174.773							
6610	WELD	29,328.3	6610	0.0	49.6	47.93537897	-103.89790603	2176.310							
6620	WELD	29,377.9	6620	0.0	48.9	47.93537982	-103.89810711	2177.944							
20000008	Seam Variation	29,393.5	6620	15.6	33.3	47.93537992	-103.89817067	2178.340	297	9:45	-	0.47	0.52		
6630	WELD	29,426.8	6630	0.0	49.6	47.93537954	-103.89830562	2179.822							
6640	WELD	29,476.5	6640	0.0	49.6	47.93537933	-103.89850710	2181.410							
6650	WELD	29,526.1	6650	0.0	49.5	47.93537935	-103.89870846	2183.483							
6660	WELD	29,575.6	6660	0.0	49.3	47.93537866	-103.89890974	2185.173							
6670	WELD	29,624.9	6670	0.0	49.5	47.93537752	-103.89911026	2186.638							
6680	WELD	29,674.4	6680	0.0	49.5	47.93537680	-103.89931160	2186.903							
6690	WELD	29,724.0	6690	0.0	49.6	47.93537724	-103.89951315	2187.595							
6700	WELD	29,773.6	6700	0.0	49.6	47.93537787	-103.89971482	2188.132							
6710	WELD	29,823.1	6710	0.0	49.5	47.93537763	-103.89991649	2189.226							
6720	WELD	29,872.6	6720	0.0	49.5	47.93537689	-103.90011777	2189.555							
6730	WELD	29,922.1	6730	0.0	49.5	47.93537572	-103.90031888	2189.074							
6740	WELD	29,971.7	6740	0.0	49.6	47.93537421	-103.90052049	2188.327							
6750	WELD	30,021.2	6750	0.0	49.5	47.93537243	-103.90072184	2187.534							
6760	WELD	30,070.8	6760	0.0	49.5	47.93537229	-103.90092319	2186.598							
6770	WELD	30,120.3	6770	0.0	49.3	47.93537184	-103.90112485	2186.021							
6780	WELD	30,169.6	6780	0.0	37.0	47.93537080	-103.90132556	2185.038							
6790	WELD	30,206.5	6790	0.0	33.0	47.93536984	-103.90147598	2184.231							
6800	WELD	30,239.5	6800	0.0	30.4	47.93536939	-103.90161006	2183.299							
6810	WELD	30,269.9	6810	0.0	37.3	47.93536883	-103.90173391	2182.989							
6820	WELD	30,307.2	6820	0.0	32.7	47.93536773	-103.90188544	2182.645							
6830	WELD	30,339.8	6830	0.0	9.3	47.93536675	-103.90201814	2181.943							
6840	WELD	30,349.1	6840	0.0	6.1	47.93536677	-103.90205595	2181.526							
6850	WELD	30,355.2	6850	0.0	1.5	47.93536672	-103.90208066	2181.262							
10000022	Bend right - 45 deg., 3D	30,356.0	6850	0.1	1.4	47.93536717	-103.90208358	2181.235	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)
6860	WELD	30,356.7	6860	0.0	32.0	47.93536818	-103.90208622	2181.214						
6870	WELD	30,388.7	6870	0.0	31.0	47.93543087	-103.90217851	2181.007						
6880	WELD	30,419.7	6880	0.0	28.5	47.93549340	-103.90226398	2180.994						
6890	WELD	30,448.2	6890	0.0	49.2	47.93555326	-103.90233875	2180.833						
6900	WELD	30,497.5	6900	0.0	49.0	47.93565926	-103.90246307	2180.788						
6910	WELD	30,546.5	6910	0.0	49.3	47.93576375	-103.90258805	2180.869						
6920	WELD	30,595.8	6920	0.0	49.2	47.93586742	-103.90271639	2180.886						
6930	WELD	30,645.0	6930	0.0	48.7	47.93596992	-103.90284613	2180.410						
6940	WELD	30,693.7	6940	0.0	7.5	47.93607037	-103.90297644	2180.120						
6950	WELD	30,701.2	6950	0.0	1.6	47.93608590	-103.90299652	2180.283						
10000023	Bend left - 45 deg., 3D	30,702.0	6950	0.1	1.4	47.93608713	-103.90299905	2180.283	0 12:00					
6960	WELD	30,702.8	6960	0.0	10.2	47.93608776	-103.90300185	2180.263						
6970	WELD	30,713.0	6970	0.0	27.3	47.93608989	-103.90304423	2179.778						
6980	WELD	30,740.2	6980	0.0	49.3	47.93609530	-103.90315508	2179.130						
6990	WELD	30,789.5	6990	0.0	27.6	47.93610554	-103.90335492	2178.902						
7000	WELD	30,817.1	7000	0.0	31.4	47.93611121	-103.90346705	2178.245						
7010	WELD	30,848.5	7010	0.0	30.2	47.93611953	-103.90359479	2177.734						
7020	WELD	30,878.7	7020	0.0	49.4	47.93612850	-103.90371668	2176.809						
7030	WELD	30,928.1	7030	0.0	48.2	47.93614102	-103.90391662	2175.497						
7040	WELD	30,976.3	7040	0.0	40.9	47.93615128	-103.90411224	2174.136						
7050	WELD	31,017.2	7050	0.0	27.0	47.93616018	-103.90427803	2172.958						
11000024	WT CHANGE	31,044.2	7050	0.0	0.0	47.93616724	-103.90438676	2171.585			0.322	52000	0.72	
7060	WELD	31,044.3	7060	0.0	31.0	47.93616725	-103.90438696	2171.582						
10000024	AGM 060, Sta. 313+40, 155 Ave. NW -- Han #116	31,053.5	7060	9.2	21.8	47.93617004	-103.90442413	2170.838						
7070	WELD	31,075.3	7070	0.0	42.2	47.93617623	-103.90451200	2169.220						
7080	WELD	31,117.5	7080	0.0	42.2	47.93618725	-103.90468190	2165.634						
7090	WELD	31,159.7	7090	0.0	42.3	47.93618844	-103.90485310	2164.834						
7100	WELD	31,202.0	7100	0.0	42.1	47.93619784	-103.90502414	2165.870						
11000025	WT CHANGE	31,244.1	7100	0.0	0.0	47.93623375	-103.90518594	2167.308			0.188	52000	0.72	
7110	WELD	31,244.1	7110	0.0	29.6	47.93623378	-103.90518608	2167.309						
7120	WELD	31,273.8	7120	0.0	32.8	47.93626423	-103.90529782	2166.502						
7130	WELD	31,306.6	7130	0.0	35.5	47.93630099	-103.90541917	2164.623						
7140	WELD	31,342.1	7140	0.0	38.6	47.93634018	-103.90555116	2163.268						
7150	WELD	31,380.7	7150	0.0	37.9	47.93638082	-103.90569595	2162.356						
7160	WELD	31,418.6	7160	0.0	40.3	47.93642016	-103.90583789	2161.198						
7170	WELD	31,458.8	7170	0.0	49.6	47.93646210	-103.90598884	2160.608						

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)
7180	WELD	31,508.5	7180	0.0	39.5	47.93651415	-103.90617466	2159.018						
7190	WELD	31,547.9	7190	0.0	38.0	47.93655659	-103.90632169	2158.119						
7200	WELD	31,585.9	7200	0.0	45.6	47.93659702	-103.90646368	2157.297						
7210	WELD	31,631.5	7210	0.0	34.3	47.93664379	-103.90663529	2156.631						
7220	WELD	31,665.8	7220	0.0	30.4	47.93667864	-103.90676430	2155.612						
7230	WELD	31,696.2	7230	0.0	40.0	47.93670994	-103.90687835	2154.743						
7240	WELD	31,736.2	7240	0.0	27.8	47.93675138	-103.90702854	2154.890						
7250	WELD	31,764.0	7250	0.0	43.5	47.93677969	-103.90713341	2154.820						
7260	WELD	31,807.6	7260	0.0	49.3	47.93682421	-103.90729697	2154.790						
7270	WELD	31,856.8	7270	0.0	49.5	47.93687550	-103.90748221	2154.202						
7280	WELD	31,906.4	7280	0.0	49.6	47.93692727	-103.90766802	2153.453						
7290	WELD	31,956.0	7290	0.0	49.6	47.93697829	-103.90785477	2153.235						
7300	WELD	32,005.6	7300	0.0	49.6	47.93702889	-103.90804131	2153.424						
7310	WELD	32,055.2	7310	0.0	49.6	47.93708126	-103.90822686	2152.536						
7320	WELD	32,104.8	7320	0.0	49.6	47.93713440	-103.90841246	2151.266						
7330	WELD	32,154.4	7330	0.0	49.6	47.93718658	-103.90859865	2150.370						
7340	WELD	32,204.0	7340	0.0	49.5	47.93723761	-103.90878547	2149.826						
7350	WELD	32,253.5	7350	0.0	49.6	47.93728761	-103.90897247	2149.054						
7360	WELD	32,303.1	7360	0.0	49.5	47.93733732	-103.90915983	2148.471						
7370	WELD	32,352.6	7370	0.0	49.5	47.93738789	-103.90934647	2147.618						
7380	WELD	32,402.2	7380	0.0	49.5	47.93743898	-103.90953291	2146.652						
7390	WELD	32,451.7	7390	0.0	49.6	47.93749089	-103.90971897	2146.079						
7400	WELD	32,501.3	7400	0.0	49.2	47.93754269	-103.90990528	2144.834						
7410	WELD	32,550.5	7410	0.0	49.4	47.93759364	-103.91009031	2143.937						
7420	WELD	32,599.9	7420	0.0	49.4	47.93764460	-103.91027652	2143.198						
7430	WELD	32,649.3	7430	0.0	49.3	47.93769551	-103.91046238	2142.573						
7440	WELD	32,698.6	7440	0.0	49.3	47.93774704	-103.91064776	2141.910						
7450	WELD	32,747.9	7450	0.0	49.4	47.93779958	-103.91083256	2141.565						
7460	WELD	32,797.3	7460	0.0	49.3	47.93785085	-103.91101817	2141.242						
7470	WELD	32,846.6	7470	0.0	36.6	47.93789989	-103.91120507	2141.084						
7480	WELD	32,883.2	7480	0.0	49.0	47.93793608	-103.91134408	2140.181						
7490	WELD	32,932.3	7490	0.0	13.6	47.93798716	-103.91152832	2140.381						
7500	WELD	32,945.9	7500	0.0	49.5	47.93800119	-103.91157981	2140.492						
7510	WELD	32,995.4	7510	0.0	49.5	47.93805236	-103.91176630	2139.957						
7520	WELD	33,044.9	7520	0.0	49.2	47.93810471	-103.91195217	2139.436						
7530	WELD	33,094.1	7530	0.0	49.5	47.93815689	-103.91213693	2138.587						
7540	WELD	33,143.6	7540	0.0	49.6	47.93821055	-103.91232195	2138.308						

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)
7550	WELD	33,193.3	7550	0.0	49.3	47.93826404	-103.91250740	2138.216							
7560	WELD	33,242.6	7560	0.0	49.5	47.93831564	-103.91269282	2138.130							
7570	WELD	33,292.0	7570	0.0	49.5	47.93836627	-103.91287941	2137.787							
7580	WELD	33,341.5	7580	0.0	49.5	47.93841504	-103.91306760	2137.664							
7590	WELD	33,391.0	7590	0.0	43.4	47.93846487	-103.91325512	2138.329							
7600	WELD	33,434.4	7600	0.0	49.2	47.93850994	-103.91341871	2138.068							
7610	WELD	33,483.6	7610	0.0	43.8	47.93856189	-103.91360339	2137.896							
7620	WELD	33,527.4	7620	0.0	49.5	47.93860748	-103.91376802	2137.540							
7630	WELD	33,576.8	7630	0.0	49.2	47.93865864	-103.91395462	2137.497							
7640	WELD	33,626.0	7640	0.0	49.4	47.93870924	-103.91414038	2136.976							
7650	WELD	33,675.5	7650	0.0	49.3	47.93876013	-103.91432749	2136.752							
7660	WELD	33,724.8	7660	0.0	49.4	47.93881035	-103.91451385	2136.415							
7670	WELD	33,774.2	7670	0.0	46.8	47.93886028	-103.91470084	2135.784							
11000026	WT CHANGE	33,821.0	7670	0.0	0.0	47.93890664	-103.91487761	2134.894				0.322	52000	0.72	
7680	WELD	33,821.0	7680	0.0	41.8	47.93890668	-103.91487776	2134.893							
7690	WELD	33,862.8	7690	0.0	42.2	47.93894795	-103.91503564	2131.682							
7700	WELD	33,905.0	7700	0.0	42.3	47.93899059	-103.91519456	2129.171							
7710	WELD	33,947.3	7710	0.0	42.3	47.93903546	-103.91535223	2128.178							
7720	WELD	33,989.6	7720	0.0	42.2	47.93908900	-103.91550413	2128.296							
7730	WELD	34,031.8	7730	0.0	42.2	47.93915420	-103.91564564	2127.685							
11000027	WT CHANGE	34,074.0	7730	0.0	0.0	47.93922629	-103.91577924	2127.940				0.188	52000	0.72	
7740	WELD	34,074.0	7740	0.0	18.3	47.93922636	-103.91577936	2127.941							
20000009	Seam Variation	34,083.2	7740	9.2	9.1	47.93924239	-103.91580845	2128.207	71	2:15	-	0.59	0.56		
7750	WELD	34,092.3	7750	0.0	49.3	47.93925804	-103.91583710	2128.483							
7760	WELD	34,141.7	7760	0.0	49.5	47.93934139	-103.91599485	2129.665							
7770	WELD	34,191.1	7770	0.0	49.5	47.93942395	-103.91615404	2132.320							
7780	WELD	34,240.6	7780	0.0	49.5	47.93950432	-103.91631536	2133.632							
7790	WELD	34,290.1	7790	0.0	49.5	47.93958493	-103.91647724	2133.459							
7800	WELD	34,339.6	7800	0.0	49.1	47.93966747	-103.91663684	2132.923							
7810	WELD	34,388.7	7810	0.0	49.4	47.93974994	-103.91679461	2132.326							
7820	WELD	34,438.1	7820	0.0	49.5	47.93983227	-103.91695398	2132.104							
7830	WELD	34,487.6	7830	0.0	49.5	47.93991428	-103.91711367	2131.829							
7840	WELD	34,537.1	7840	0.0	49.5	47.93999659	-103.91727383	2130.866							
7850	WELD	34,586.6	7850	0.0	49.6	47.94007942	-103.91743302	2129.708							
7860	WELD	34,636.2	7860	0.0	49.6	47.94016204	-103.91759255	2128.820							
7870	WELD	34,685.9	7870	0.0	49.5	47.94024381	-103.91775322	2128.177							
7880	WELD	34,735.4	7880	0.0	49.5	47.94032594	-103.91791327	2127.489							

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)
7890	WELD	34,785.0	7890	0.0	48.8	47.94040801	-103.91807321	2126.740							
7900	WELD	34,833.8	7900	0.0	49.6	47.94048925	-103.91823034	2125.984							
7910	WELD	34,883.4	7910	0.0	49.5	47.94057140	-103.91839029	2125.812							
7920	WELD	34,932.9	7920	0.0	49.0	47.94065382	-103.91854955	2125.057							
7930	WELD	34,981.9	7930	0.0	49.2	47.94073531	-103.91870730	2124.055							
7940	WELD	35,031.1	7940	0.0	49.5	47.94081643	-103.91886575	2123.240							
7950	WELD	35,080.6	7950	0.0	49.5	47.94089817	-103.91902579	2122.959							
7960	WELD	35,130.2	7960	0.0	49.5	47.94097996	-103.91918610	2122.707							
7970	WELD	35,179.7	7970	0.0	49.5	47.94106068	-103.91934688	2122.212							
7980	WELD	35,229.1	7980	0.0	49.5	47.94114099	-103.91950817	2121.719							
7990	WELD	35,278.6	7990	0.0	49.6	47.94122209	-103.91966854	2122.009							
8000	WELD	35,328.2	8000	0.0	49.0	47.94130511	-103.91982784	2122.308							
8010	WELD	35,377.2	8010	0.0	48.7	47.94138713	-103.91998543	2122.715							
8020	WELD	35,425.9	8020	0.0	39.9	47.94146863	-103.92014189	2123.048							
8030	WELD	35,465.8	8030	0.0	49.6	47.94153552	-103.92027036	2123.939							
8040	WELD	35,515.4	8040	0.0	49.7	47.94161881	-103.92042998	2124.518							
10000066	AGM 070, Sta. 358+09, Gravel Rd. -- Han #115	35,534.3	8040	18.9	30.7	47.94164996	-103.92049153	2124.145							
8050	WELD	35,565.1	8050	0.0	49.5	47.94169952	-103.92059234	2124.125							
8060	WELD	35,614.6	8060	0.0	49.6	47.94177937	-103.92075557	2123.691							
8070	WELD	35,664.2	8070	0.0	49.4	47.94186054	-103.92091735	2123.406							
8080	WELD	35,713.6	8080	0.0	29.6	47.94194427	-103.92107502	2123.527							
8090	WELD	35,743.2	8090	0.0	6.3	47.94199644	-103.92116695	2122.587							
11000028	WT CHANGE	35,749.4	8090	0.0	0.0	47.94200754	-103.92118583	2122.361				0.322	52000	0.72	
8100	WELD	35,749.5	8100	0.0	1.5	47.94200762	-103.92118595	2122.359							
10000025	Bend right - 45 deg., 1.5D	35,750.2	8100	0.1	1.5	47.94200928	-103.92118782	2122.318	0	12:00					
8110	WELD	35,751.0	8110	0.0	30.7	47.94201135	-103.92118882	2122.257							
8120	WELD	35,781.8	8120	0.0	42.2	47.94209504	-103.92119100	2119.229							
8130	WELD	35,824.0	8130	0.0	42.2	47.94221015	-103.92118816	2117.742							
8140	WELD	35,866.1	8140	0.0	42.2	47.94232532	-103.92118367	2118.965							
8150	WELD	35,908.3	8150	0.0	11.7	47.94244036	-103.92117725	2121.914							
8160	WELD	35,920.0	8160	0.0	1.6	47.94247231	-103.92117470	2122.549							
10000026	Bend left - 45 deg., 3D	35,920.9	8160	0.2	1.5	47.94247442	-103.92117510	2122.588	0	12:00					
11000029	WT CHANGE	35,921.6	8160	0.0	0.0	47.94247618	-103.92117631	2122.616				0.188	52000	0.72	
8170	WELD	35,921.7	8170	0.0	47.0	47.94247626	-103.92117641	2122.618							
8180	WELD	35,968.7	8180	0.0	49.5	47.94257382	-103.92130143	2125.064							
8190	WELD	36,018.2	8190	0.0	49.5	47.94267606	-103.92143347	2126.584							

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)
8200	WELD	36,067.7	8200	0.0	49.0	47.94277645	-103.92156841	2127.264						
8210	WELD	36,116.7	8210	0.0	49.3	47.94287470	-103.92170409	2128.557						
8220	WELD	36,166.0	8220	0.0	49.4	47.94297203	-103.92184296	2129.883						
8230	WELD	36,215.4	8230	0.0	49.3	47.94307076	-103.92198009	2131.670						
8240	WELD	36,264.7	8240	0.0	49.3	47.94316857	-103.92211804	2133.733						
8250	WELD	36,314.0	8250	0.0	49.3	47.94326572	-103.92225652	2135.645						
8260	WELD	36,363.3	8260	0.0	49.5	47.94336310	-103.92239528	2136.591						
8270	WELD	36,412.7	8270	0.0	49.5	47.94346138	-103.92253317	2137.892						
8280	WELD	36,462.2	8280	0.0	49.4	47.94355998	-103.92267140	2138.916						
8290	WELD	36,511.6	8290	0.0	49.3	47.94365875	-103.92280854	2138.399						
8300	WELD	36,560.9	8300	0.0	49.6	47.94375633	-103.92294705	2139.462						
8310	WELD	36,610.5	8310	0.0	49.5	47.94385403	-103.92308734	2142.389						
8320	WELD	36,659.9	8320	0.0	49.1	47.94394715	-103.92323284	2144.781						
8330	WELD	36,709.0	8330	0.0	49.7	47.94401358	-103.92340428	2147.272						
8340	WELD	36,758.7	8340	0.0	49.5	47.94403210	-103.92360348	2148.384						
8350	WELD	36,808.2	8350	0.0	49.6	47.94403196	-103.92380517	2147.772						
8360	WELD	36,857.8	8360	0.0	49.6	47.94403354	-103.92400670	2147.156						
8370	WELD	36,907.4	8370	0.0	49.6	47.94403967	-103.92420796	2144.551						
8380	WELD	36,957.1	8380	0.0	49.6	47.94404433	-103.92440962	2142.926						
8390	WELD	37,006.7	8390	0.0	49.4	47.94404455	-103.92461139	2143.395						
8400	WELD	37,056.1	8400	0.0	49.4	47.94404163	-103.92481246	2144.015						
8410	WELD	37,105.5	8410	0.0	47.9	47.94403981	-103.92501336	2144.267						
8420	WELD	37,153.4	8420	0.0	49.5	47.94403635	-103.92520810	2144.554						
8430	WELD	37,202.9	8430	0.0	48.6	47.94402858	-103.92540939	2144.576						
8440	WELD	37,251.5	8440	0.0	49.0	47.94401668	-103.92560614	2144.252						
8450	WELD	37,300.5	8450	0.0	49.4	47.94400197	-103.92580423	2143.910						
8460	WELD	37,349.9	8460	0.0	49.1	47.94398551	-103.92600322	2140.900						
8470	WELD	37,399.0	8470	0.0	49.4	47.94396839	-103.92620122	2138.848						
8480	WELD	37,448.4	8480	0.0	49.4	47.94395257	-103.92640069	2138.195						
8490	WELD	37,497.7	8490	0.0	49.7	47.94393730	-103.92660024	2136.950						
8500	WELD	37,547.4	8500	0.0	49.5	47.94392199	-103.92680089	2136.313						
8510	WELD	37,596.9	8510	0.0	49.6	47.94390815	-103.92700135	2134.564						
8520	WELD	37,646.6	8520	0.0	49.5	47.94389500	-103.92720158	2131.791						
8530	WELD	37,696.1	8530	0.0	49.5	47.94388067	-103.92740082	2129.041						
8540	WELD	37,745.6	8540	0.0	49.4	47.94386625	-103.92760021	2126.390						
8550	WELD	37,795.0	8550	0.0	49.5	47.94385305	-103.92779964	2123.698						
8560	WELD	37,844.5	8560	0.0	49.6	47.94384086	-103.92799947	2121.183						

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)
8570	WELD	37,894.0	8570	0.0	49.7	47.94382832	-103.92819971	2118.798							
8580	WELD	37,943.8	8580	0.0	49.6	47.94381502	-103.92840034	2116.834							
8590	WELD	37,993.4	8590	0.0	49.6	47.94380035	-103.92860075	2115.446							
8600	WELD	38,043.0	8600	0.0	49.3	47.94378515	-103.92880092	2116.869							
8610	WELD	38,092.3	8610	0.0	49.3	47.94376912	-103.92899975	2119.015							
8620	WELD	38,141.6	8620	0.0	49.4	47.94375254	-103.92919859	2118.931							
8630	WELD	38,191.1	8630	0.0	49.2	47.94373442	-103.92939750	2117.789							
8640	WELD	38,240.3	8640	0.0	40.5	47.94371336	-103.92959514	2118.366							
8650	WELD	38,280.8	8650	0.0	1.2	47.94369334	-103.92975751	2117.824							
10000027	Bend left - 35 deg., 3D	38,281.4	8650	0.1	1.1	47.94369281	-103.92975987	2117.816	0	12:00					
8660	WELD	38,282.0	8660	0.0	34.2	47.94369193	-103.92976196	2117.822							
8670	WELD	38,316.2	8670	0.0	49.2	47.94362741	-103.92986409	2119.296							
8680	WELD	38,365.4	8680	0.0	49.6	47.94353693	-103.93001272	2122.277							
8690	WELD	38,415.0	8690	0.0	49.4	47.94344502	-103.93016100	2124.236							
8700	WELD	38,464.4	8700	0.0	49.4	47.94335130	-103.93030569	2122.935							
8710	WELD	38,513.8	8710	0.0	49.5	47.94325676	-103.93044925	2121.296							
8720	WELD	38,563.3	8720	0.0	49.5	47.94316143	-103.93059193	2120.190							
8730	WELD	38,612.8	8730	0.0	49.4	47.94306542	-103.93073423	2119.941							
8740	WELD	38,662.2	8740	0.0	49.5	47.94297041	-103.93087690	2119.113							
8750	WELD	38,711.7	8750	0.0	49.2	47.94287581	-103.93102123	2118.598							
8760	WELD	38,760.9	8760	0.0	49.4	47.94278117	-103.93116368	2117.680							
8770	WELD	38,810.3	8770	0.0	49.3	47.94268459	-103.93130433	2116.931							
8780	WELD	38,859.6	8780	0.0	49.2	47.94258785	-103.93144389	2115.852							
8790	WELD	38,908.8	8790	0.0	33.1	47.94249263	-103.93158568	2114.875							
8800	WELD	38,941.9	8800	0.0	49.4	47.94242928	-103.93168147	2113.514							
8810	WELD	38,991.3	8810	0.0	49.0	47.94233379	-103.93182375	2111.081							
8820	WELD	39,040.4	8820	0.0	49.3	47.94223873	-103.93196432	2108.256							
8830	WELD	39,089.7	8830	0.0	49.5	47.94214326	-103.93210538	2108.315							
8840	WELD	39,139.2	8840	0.0	49.2	47.94204703	-103.93224643	2110.169							
8850	WELD	39,188.4	8850	0.0	49.5	47.94195082	-103.93238633	2111.616							
8860	WELD	39,238.0	8860	0.0	44.6	47.94185464	-103.93252817	2111.497							
8870	WELD	39,282.5	8870	0.0	31.0	47.94177065	-103.93265938	2111.092							
8880	WELD	39,313.5	8880	0.0	35.2	47.94171344	-103.93275252	2111.055							
8890	WELD	39,348.7	8890	0.0	34.6	47.94164933	-103.93285991	2110.760							
20000010	Seam Variation	39,376.3	8890	27.6	7.0	47.94159976	-103.93294455	2110.054	266	8:45	-	0.35	0.33		
8900	WELD	39,383.3	8900	0.0	38.8	47.94158726	-103.93296606	2109.826							
8910	WELD	39,422.1	8910	0.0	49.3	47.94151839	-103.93308562	2108.311							

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)
8920	WELD	39,471.4	8920	0.0	49.6	47.94143061	-103.93323798	2106.654							
8930	WELD	39,521.0	8930	0.0	49.6	47.94134246	-103.93339093	2105.877							
8940	WELD	39,570.6	8940	0.0	49.5	47.94125336	-103.93354343	2105.247							
8950	WELD	39,620.1	8950	0.0	49.4	47.94116482	-103.93369640	2105.438							
8960	WELD	39,669.6	8960	0.0	49.5	47.94107622	-103.93384866	2106.690							
20000011	Seam Variation	39,693.4	8960	23.8	25.7	47.94103319	-103.93392157	2107.617	238	7:45	-	0.59	0.61		
20000012	Seam Variation	39,694.1	8960	24.5	25.0	47.94103192	-103.93392368	2107.642	238	7:45	-	0.47	0.56		
8970	WELD	39,719.1	8970	0.0	49.4	47.94098658	-103.93399970	2107.959							
8980	WELD	39,768.4	8980	0.0	49.5	47.94089668	-103.93415028	2107.740							
8990	WELD	39,818.0	8990	0.0	49.5	47.94080691	-103.93430094	2107.261							
9000	WELD	39,867.5	9000	0.0	49.5	47.94071799	-103.93445260	2104.555							
9010	WELD	39,917.0	9010	0.0	48.6	47.94063257	-103.93460577	2097.225							
9020	WELD	39,965.5	9020	0.0	48.7	47.94054977	-103.93475737	2089.981							
9030	WELD	40,014.2	9030	0.0	49.4	47.94046590	-103.93491117	2086.618							
9040	WELD	40,063.6	9040	0.0	49.3	47.94038152	-103.93506822	2085.225							
9050	WELD	40,112.9	9050	0.0	49.2	47.94029948	-103.93522732	2086.049							
9060	WELD	40,162.1	9060	0.0	49.4	47.94022322	-103.93539224	2087.740							
9070	WELD	40,211.5	9070	0.0	43.5	47.94015398	-103.93556464	2087.549							
9080	WELD	40,255.0	9080	0.0	49.1	47.94009943	-103.93572163	2084.930							
9090	WELD	40,304.0	9090	0.0	49.0	47.94004004	-103.93590069	2084.529							
9100	WELD	40,353.0	9100	0.0	49.4	47.93997959	-103.93607886	2084.926							
9110	WELD	40,402.4	9110	0.0	49.0	47.93991185	-103.93625169	2082.968							
9120	WELD	40,451.4	9120	0.0	49.6	47.93983227	-103.93640895	2075.805							
9130	WELD	40,501.0	9130	0.0	49.4	47.93974272	-103.93654632	2061.094							
9140	WELD	40,550.4	9140	0.0	49.6	47.93964702	-103.93666948	2044.231							
9150	WELD	40,600.0	9150	0.0	48.8	47.93953893	-103.93677956	2032.069							
9160	WELD	40,648.8	9160	0.0	49.1	47.93941725	-103.93685166	2023.988							
9170	WELD	40,697.9	9170	0.0	49.3	47.93928684	-103.93688993	2017.677							
9180	WELD	40,747.2	9180	0.0	49.3	47.93915409	-103.93691617	2012.295							
9190	WELD	40,796.5	9190	0.0	49.5	47.93902080	-103.93693757	2007.686							
9200	WELD	40,846.0	9200	0.0	30.0	47.93888687	-103.93696117	2003.125							
11000030	WT CHANGE	40,875.9	9200	0.0	0.0	47.93880653	-103.93697548	2000.106				0.322	52000	0.72	
9210	WELD	40,876.0	9210	0.0	6.1	47.93880642	-103.93697550	2000.102							
9220	WELD	40,882.1	9220	0.0	42.3	47.93878988	-103.93697810	1999.224							
9230	WELD	40,924.4	9230	0.0	42.3	47.93867594	-103.93699640	1994.917							
9240	WELD	40,966.7	9240	0.0	42.2	47.93856184	-103.93700102	1989.654							
9250	WELD	41,008.8	9250	0.0	42.2	47.93845096	-103.93697309	1981.262							

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)
9260	WELD	41,051.1	9260	0.0	42.2	47.93834347	-103.93691758	1974.982							
9270	WELD	41,093.3	9270	0.0	42.2	47.93823758	-103.93685352	1969.898							
9280	WELD	41,135.5	9280	0.0	42.3	47.93813282	-103.93678483	1965.376							
9290	WELD	41,177.7	9290	0.0	37.4	47.93802895	-103.93671233	1961.254							
9300	WELD	41,215.1	9300	0.0	9.9	47.93793403	-103.93665945	1958.340							
10000028	Bend right - 90 deg., 10D	41,219.8	9300	1.6	8.3	47.93792158	-103.93665963	1958.090	0	12:00					
11000031	WT CHANGE	41,224.9	9300	0.0	0.0	47.93791487	-103.93667692	1958.089				0.188	52000	0.72	
9310	WELD	41,225.0	9310	0.0	11.8	47.93791484	-103.93667712	1958.089							
9320	WELD	41,236.8	9320	0.0	14.6	47.93790711	-103.93672408	1958.194							
11000032	WT CHANGE	41,251.4	9320	0.0	0.0	47.93789718	-103.93678122	1957.963				0.322	52000	0.72	
9330	WELD	41,251.4	9330	0.0	4.0	47.93789716	-103.93678137	1957.963							
9340	WELD	41,255.4	9340	0.0	1.5	47.93789445	-103.93679739	1957.893							
10000029	Bend up - 45 deg., 7D	41,256.2	9340	0.1	1.4	47.93789399	-103.93680021	1958.042	0	12:00					
9350	WELD	41,256.9	9350	0.0	9.1	47.93789360	-103.93680276	1958.405							
10000030	Fitting on top of pipe	41,257.1	9350	0.1	9.0	47.93789355	-103.93680310	1958.478	25	12:45					
10000067	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	41,258.6	9350	1.6	7.5	47.93789292	-103.93680753	1959.493							
9360	WELD	41,266.1	9360	0.0	1.6	47.93788954	-103.93683069	1961.101							
10000031	Bend down - 45 deg., 1.5D	41,266.9	9360	0.3	1.3	47.93788908	-103.93683367	1961.142	0	12:00					
9370	WELD	41,267.7	9370	0.0	3.0	47.93788853	-103.93683688	1960.957							
10000032	Fitting on top of pipe	41,269.2	9370	1.4	1.6	47.93788741	-103.93684322	1960.268	354	11:45					
9380	WELD	41,270.7	9380	0.0	3.3	47.93788628	-103.93684966	1959.538							
10000033	Flange	41,271.2	9380	0.5	2.8	47.93788598	-103.93685136	1959.345	0	12:00					
10000034	Valve, AGM 080, Sta. 414+59, Gravel Rd.	41,272.4	9380	1.7	1.6	47.93788521	-103.93685563	1958.859							
10000035	Flange	41,273.5	9380	2.8	0.5	47.93788431	-103.93686065	1958.843	0	12:00					
9390	WELD	41,274.0	9390	0.0	3.0	47.93788393	-103.93686273	1958.837							
10000036	Fitting on top of pipe	41,275.5	9390	1.4	1.6	47.93788289	-103.93686851	1958.820	355	11:45					
9400	WELD	41,277.0	9400	0.0	1.6	47.93788182	-103.93687441	1958.815							
10000037	Bend down - 45 deg., 3D	41,277.8	9400	0.2	1.5	47.93788126	-103.93687739	1958.649	0	12:00					
9410	WELD	41,278.6	9410	0.0	9.2	47.93788073	-103.93687998	1958.251							
9420	WELD	41,287.8	9420	0.0	1.6	47.93787524	-103.93690496	1951.900							
10000038	Bend up - 45 deg., 1.5D	41,288.6	9420	0.3	1.2	47.93787469	-103.93690761	1951.482	0	12:00					
9430	WELD	41,289.4	9430	0.0	4.1	47.93787417	-103.93691027	1951.292							
11000033	WT CHANGE	41,293.4	9430	0.0	0.0	47.93787126	-103.93692597	1951.248				0.188	52000	0.72	
9440	WELD	41,293.4	9440	0.0	38.3	47.93787123	-103.93692612	1951.247							

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)
9450	WELD	41,331.7	9450	0.0	49.4	47.93784527	-103.93707687	1951.098						
9460	WELD	41,381.1	9460	0.0	42.8	47.93781004	-103.93727128	1950.427						
9470	WELD	41,423.9	9470	0.0	49.6	47.93777849	-103.93743897	1950.353						
9480	WELD	41,473.5	9480	0.0	49.5	47.93774046	-103.93763288	1949.364						
9490	WELD	41,523.0	9490	0.0	49.3	47.93770143	-103.93782581	1947.970						
9500	WELD	41,572.3	9500	0.0	49.6	47.93766251	-103.93801787	1946.943						
9510	WELD	41,622.0	9510	0.0	49.5	47.93762364	-103.93821140	1946.235						
9520	WELD	41,671.5	9520	0.0	49.4	47.93758754	-103.93840568	1945.945						
9530	WELD	41,720.9	9530	0.0	49.6	47.93755694	-103.93860140	1945.404						
9540	WELD	41,770.5	9540	0.0	49.3	47.93752498	-103.93879723	1945.170						
9550	WELD	41,819.8	9550	0.0	49.2	47.93748165	-103.93898705	1944.365						
9560	WELD	41,869.1	9560	0.0	42.9	47.93741646	-103.93916114	1942.524						
9570	WELD	41,912.0	9570	0.0	34.6	47.93734935	-103.93930373	1940.907						
9580	WELD	41,946.6	9580	0.0	49.2	47.93729331	-103.93941730	1940.894						
9590	WELD	41,995.8	9590	0.0	49.2	47.93721258	-103.93957728	1940.944						
9600	WELD	42,044.9	9600	0.0	49.6	47.93713317	-103.93973878	1939.785						
9610	WELD	42,094.6	9610	0.0	49.6	47.93705258	-103.93990039	1938.101						
9620	WELD	42,144.1	9620	0.0	48.9	47.93697206	-103.94006315	1936.822						
9630	WELD	42,193.0	9630	0.0	49.6	47.93689428	-103.94022433	1935.735						
9640	WELD	42,242.7	9640	0.0	49.3	47.93681749	-103.94039021	1934.543						
9650	WELD	42,292.0	9650	0.0	49.5	47.93674483	-103.94055926	1933.554						
9660	WELD	42,341.5	9660	0.0	49.7	47.93667673	-103.94073311	1932.397						
9670	WELD	42,391.1	9670	0.0	49.5	47.93661089	-103.94091012	1930.449						
9680	WELD	42,440.7	9680	0.0	49.3	47.93654427	-103.94108560	1930.009						
9690	WELD	42,490.0	9690	0.0	49.4	47.93647677	-103.94125987	1928.360						
9700	WELD	42,539.4	9700	0.0	49.4	47.93641062	-103.94143532	1927.357						
9710	WELD	42,588.8	9710	0.0	49.3	47.93635329	-103.94161763	1925.801						
9720	WELD	42,638.1	9720	0.0	49.3	47.93631163	-103.94180868	1924.872						
9730	WELD	42,687.5	9730	0.0	48.0	47.93628965	-103.94200669	1921.724						
9740	WELD	42,735.5	9740	0.0	49.3	47.93627467	-103.94220082	1922.805						
9750	WELD	42,784.7	9750	0.0	49.4	47.93626390	-103.94240118	1923.804						
9760	WELD	42,834.1	9760	0.0	38.0	47.93625416	-103.94260204	1924.777						
9770	WELD	42,872.2	9770	0.0	32.3	47.93624560	-103.94275648	1926.727						
9780	WELD	42,904.4	9780	0.0	34.4	47.93623669	-103.94288695	1928.063						
9790	WELD	42,938.8	9790	0.0	34.2	47.93622376	-103.94302520	1930.795						
9800	WELD	42,973.1	9800	0.0	38.7	47.93620590	-103.94316048	1935.742						
9810	WELD	43,011.7	9810	0.0	33.0	47.93617670	-103.94331019	1941.135						

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)
9820	WELD	43,044.8	9820	0.0	35.6	47.93614400	-103.94343494	1943.826						
9830	WELD	43,080.4	9830	0.0	35.2	47.93610146	-103.94356476	1947.522						
11000034	WT CHANGE	43,115.6	9830	0.0	0.0	47.93605328	-103.94368671	1951.827			0.322	52000	0.72	
9840	WELD	43,115.6	9840	0.0	42.1	47.93605321	-103.94368687	1951.833						
9850	WELD	43,157.7	9850	0.0	42.2	47.93599013	-103.94382897	1957.267						
9860	WELD	43,199.9	9860	0.0	42.2	47.93592513	-103.94396887	1963.097						
9870	WELD	43,242.1	9870	0.0	42.3	47.93585984	-103.94410865	1968.666						
9880	WELD	43,284.3	9880	0.0	42.3	47.93579640	-103.94425164	1971.871						
9890	WELD	43,326.7	9890	0.0	42.2	47.93575240	-103.94440929	1968.597						
9900	WELD	43,368.9	9900	0.0	42.2	47.93571342	-103.94456619	1959.495						
9910	WELD	43,411.1	9910	0.0	42.2	47.93565063	-103.94470711	1952.522						
9920	WELD	43,453.4	9920	0.0	42.2	47.93558651	-103.94484576	1944.400						
9930	WELD	43,495.6	9930	0.0	42.2	47.93552685	-103.94498767	1935.318						
9940	WELD	43,537.8	9940	0.0	42.3	47.93546596	-103.94512732	1925.028						
9950	WELD	43,580.1	9950	0.0	42.2	47.93540765	-103.94526957	1914.661						
9960	WELD	43,622.3	9960	0.0	42.2	47.93535493	-103.94541524	1903.148						
9970	WELD	43,664.5	9970	0.0	42.3	47.93529768	-103.94555848	1892.956						
9980	WELD	43,706.8	9980	0.0	42.0	47.93524166	-103.94570710	1887.737						
11000035	WT CHANGE	43,748.7	9980	0.0	0.0	47.93521648	-103.94587279	1883.884			0.188	52000	0.72	
9990	WELD	43,748.8	9990	0.0	9.2	47.93521646	-103.94587299	1883.879						
10000	WELD	43,758.0	10000	0.0	49.0	47.93521307	-103.94590992	1883.068						
11000036	WT CHANGE	43,807.0	10000	0.0	0.0	47.93520168	-103.94610750	1878.788			0.322	52000	0.72	
10010	WELD	43,807.0	10010	0.0	41.8	47.93520167	-103.94610766	1878.784						
10020	WELD	43,848.8	10020	0.0	42.2	47.93519877	-103.94627669	1874.663						
10030	WELD	43,891.0	10030	0.0	42.3	47.93520078	-103.94644812	1872.220						
10040	WELD	43,933.3	10040	0.0	42.2	47.93520285	-103.94661963	1869.888						
10050	WELD	43,975.5	10050	0.0	42.3	47.93520562	-103.94679115	1868.651						
10060	WELD	44,017.8	10060	0.0	42.3	47.93521057	-103.94696262	1867.528						
10070	WELD	44,060.1	10070	0.0	42.3	47.93521742	-103.94713367	1865.620						
10080	WELD	44,102.3	10080	0.0	42.2	47.93522284	-103.94730504	1865.705						
10000039	AGM 090, Sta. 442+88, Route 7 -- Han #102	44,129.3	10080	27.0	15.2	47.93522499	-103.94741482	1866.778						
10090	WELD	44,144.5	10090	0.0	42.2	47.93522664	-103.94747666	1867.094						
10100	WELD	44,186.7	10100	0.0	27.0	47.93523083	-103.94764803	1866.463						
11000037	WT CHANGE	44,213.7	10100	0.0	0.0	47.93523192	-103.94775772	1865.974			0.188	52000	0.72	
10110	WELD	44,213.7	10110	0.0	48.1	47.93523192	-103.94775788	1865.974						
10120	WELD	44,261.9	10120	0.0	33.0	47.93523479	-103.94795435	1866.008						

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)
10130	WELD	44,294.9	10130	0.0	29.3	47.93523715	-103.94808896	1866.613							
10140	WELD	44,324.2	10140	0.0	39.9	47.93524035	-103.94820827	1866.590							
10150	WELD	44,364.1	10150	0.0	33.9	47.93524555	-103.94837072	1866.478							
10160	WELD	44,398.0	10160	0.0	39.5	47.93525080	-103.94850829	1866.611							
40000001	Metal Loss - EXTERNAL	44,418.4	10160	20.4	19.1	47.93525381	-103.94859128	1866.508	66	2:00	23%	1.24	0.48	1760	100%
10170	WELD	44,437.5	10170	0.0	44.8	47.93525645	-103.94866884	1866.237							
10180	WELD	44,482.3	10180	0.0	38.1	47.93525834	-103.94885111	1866.056							
10190	WELD	44,520.4	10190	0.0	37.7	47.93525708	-103.94900586	1866.075							
10200	WELD	44,558.0	10200	0.0	40.1	47.93525790	-103.94915930	1866.207							
10210	WELD	44,598.2	10210	0.0	32.6	47.93525955	-103.94932249	1866.345							
10220	WELD	44,630.8	10220	0.0	37.9	47.93526085	-103.94945511	1866.417							
10230	WELD	44,668.6	10230	0.0	40.1	47.93526318	-103.94960927	1866.756							
10240	WELD	44,708.7	10240	0.0	40.0	47.93526612	-103.94977227	1867.308							
10250	WELD	44,748.7	10250	0.0	41.0	47.93526815	-103.94993499	1867.436							
10260	WELD	44,789.7	10260	0.0	33.7	47.93526988	-103.95010175	1867.505							
10270	WELD	44,823.4	10270	0.0	30.1	47.93527158	-103.95023936	1867.474							
10280	WELD	44,853.6	10280	0.0	39.9	47.93527304	-103.95036209	1867.542							
10290	WELD	44,893.5	10290	0.0	28.8	47.93527488	-103.95052489	1867.609							
40000002	Metal Loss - INTERNAL	44,915.7	10290	22.2	6.6	47.93527636	-103.95061518	1867.606	225	7:30	12%	0.39	0.43	1760	100%
10300	WELD	44,922.3	10300	0.0	39.3	47.93527689	-103.95064198	1867.689							
10310	WELD	44,961.6	10310	0.0	32.1	47.93528035	-103.95080167	1867.882							
20000015	Seam Variation	44,978.7	10310	17.1	15.0	47.93528139	-103.95087147	1867.644	269	8:45	-	0.47	0.52		
10320	WELD	44,993.6	10320	0.0	49.5	47.93528219	-103.95093220	1867.644							
10330	WELD	45,043.1	10330	0.0	48.5	47.93528488	-103.95113357	1867.435							
10340	WELD	45,091.6	10340	0.0	31.3	47.93528880	-103.95133037	1866.949							
10350	WELD	45,122.9	10350	0.0	42.4	47.93529166	-103.95145776	1867.572							
10360	WELD	45,165.3	10360	0.0	39.9	47.93529479	-103.95163067	1867.845							
10370	WELD	45,205.3	10370	0.0	41.4	47.93529741	-103.95179318	1868.156							
10380	WELD	45,246.6	10380	0.0	23.5	47.93530155	-103.95196160	1867.703							
10390	WELD	45,270.1	10390	0.0	37.4	47.93530521	-103.95205721	1867.878							
10400	WELD	45,307.5	10400	0.0	30.6	47.93531206	-103.95220937	1867.837							
11000038	WT CHANGE	45,338.0	10400	0.0	0.0	47.93531591	-103.95233347	1865.840				0.500	52000	0.72	
10410	WELD	45,338.1	10410	0.0	16.1	47.93531592	-103.95233366	1865.833							
10420	WELD	45,354.1	10420	0.0	42.3	47.93531765	-103.95239739	1863.054							
10430	WELD	45,396.4	10430	0.0	42.2	47.93532335	-103.95256451	1853.473							
10440	WELD	45,438.7	10440	0.0	42.3	47.93532832	-103.95273275	1845.237							
10450	WELD	45,480.9	10450	0.0	42.2	47.93533089	-103.95290188	1837.979							

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)
10460	WELD	45,523.2	10460	0.0	42.3	47.93533079	-103.95307137	1831.239						
10470	WELD	45,565.5	10470	0.0	42.3	47.93533264	-103.95324074	1824.153						
10480	WELD	45,607.7	10480	0.0	42.3	47.93533562	-103.95341057	1818.009						
10490	WELD	45,650.0	10490	0.0	42.3	47.93533856	-103.95358120	1813.219						
10500	WELD	45,692.3	10500	0.0	42.3	47.93534147	-103.95375204	1809.048						
10510	WELD	45,734.6	10510	0.0	42.3	47.93534418	-103.95392308	1805.352						
10520	WELD	45,776.9	10520	0.0	42.3	47.93534681	-103.95409444	1802.489						
10530	WELD	45,819.1	10530	0.0	42.3	47.93534969	-103.95426608	1800.397						
10540	WELD	45,861.4	10540	0.0	42.3	47.93535262	-103.95443770	1798.636						
10550	WELD	45,903.7	10550	0.0	42.3	47.93535592	-103.95460933	1797.059						
10560	WELD	45,946.0	10560	0.0	42.3	47.93535977	-103.95478099	1795.508						
10570	WELD	45,988.2	10570	0.0	42.2	47.93536392	-103.95495264	1794.607						
10580	WELD	46,030.5	10580	0.0	42.3	47.93536914	-103.95512413	1794.112						
10590	WELD	46,072.8	10590	0.0	42.3	47.93537294	-103.95529587	1794.078						
10600	WELD	46,115.0	10600	0.0	42.3	47.93537701	-103.95546746	1793.821						
10610	WELD	46,157.3	10610	0.0	42.3	47.93538012	-103.95563913	1793.021						
10620	WELD	46,199.6	10620	0.0	42.3	47.93538239	-103.95581068	1792.423						
10630	WELD	46,241.8	10630	0.0	42.3	47.93538244	-103.95598257	1792.535						
10640	WELD	46,284.1	10640	0.0	42.3	47.93538200	-103.95615422	1792.526						
10650	WELD	46,326.5	10650	0.0	42.3	47.93538137	-103.95632620	1792.804						
10660	WELD	46,368.7	10660	0.0	42.3	47.93538315	-103.95649799	1792.654						
10670	WELD	46,411.0	10670	0.0	42.3	47.93538379	-103.95666979	1792.267						
10680	WELD	46,453.3	10680	0.0	42.3	47.93538401	-103.95684154	1792.185						
10690	WELD	46,495.5	10690	0.0	42.3	47.93538491	-103.95701326	1791.969						
10700	WELD	46,537.8	10700	0.0	42.3	47.93538708	-103.95718514	1791.677						
10710	WELD	46,580.1	10710	0.0	42.3	47.93538869	-103.95735690	1791.456						
10720	WELD	46,622.4	10720	0.0	42.3	47.93539067	-103.95752874	1791.401						
10730	WELD	46,664.7	10730	0.0	42.3	47.93539228	-103.95770025	1791.522						
10740	WELD	46,707.0	10740	0.0	42.3	47.93539570	-103.95787210	1791.513						
10750	WELD	46,749.2	10750	0.0	42.3	47.93539999	-103.95804382	1791.356						
10760	WELD	46,791.5	10760	0.0	42.2	47.93540173	-103.95821560	1791.257						
10770	WELD	46,833.8	10770	0.0	39.0	47.93540291	-103.95838727	1792.030						
10780	WELD	46,872.8	10780	0.0	42.4	47.93540361	-103.95854580	1792.769						
10790	WELD	46,915.1	10790	0.0	42.3	47.93540456	-103.95871757	1792.904						
10800	WELD	46,957.4	10800	0.0	42.3	47.93540548	-103.95888943	1793.250						
10810	WELD	46,999.7	10810	0.0	42.2	47.93540726	-103.95906120	1793.808						
10820	WELD	47,042.0	10820	0.0	42.3	47.93540790	-103.95923299	1793.356						

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)
10830	WELD	47,084.2	10830	0.0	42.3	47.93540892	-103.95940466	1792.969							
10840	WELD	47,126.5	10840	0.0	42.3	47.93541133	-103.95957664	1793.270							
10850	WELD	47,168.8	10850	0.0	42.3	47.93541289	-103.95974827	1794.164							
10860	WELD	47,211.1	10860	0.0	42.3	47.93541230	-103.95992008	1794.990							
10870	WELD	47,253.4	10870	0.0	42.3	47.93541134	-103.96009208	1795.943							
10880	WELD	47,295.7	10880	0.0	42.3	47.93541236	-103.96026376	1795.888							
10890	WELD	47,337.9	10890	0.0	42.3	47.93541342	-103.96043537	1794.867							
40000003	Metal Loss - INTERNAL	47,354.7	10890	16.7	25.6	47.93541457	-103.96050340	1794.210	291	9:30	38%	0.99	0.44	4680	100%
10900	WELD	47,380.2	10900	0.0	42.3	47.93541677	-103.96060724	1793.460							
10910	WELD	47,422.5	10910	0.0	42.3	47.93542205	-103.96077866	1793.323							
10920	WELD	47,464.8	10920	0.0	42.3	47.93542654	-103.96095011	1794.248							
10930	WELD	47,507.1	10930	0.0	42.3	47.93542904	-103.96112188	1794.720							
10940	WELD	47,549.3	10940	0.0	42.3	47.93542966	-103.96129346	1794.358							
10950	WELD	47,591.6	10950	0.0	42.2	47.93543135	-103.96146512	1793.273							
10960	WELD	47,633.8	10960	0.0	42.3	47.93543624	-103.96163645	1792.617							
10970	WELD	47,676.1	10970	0.0	42.3	47.93544257	-103.96180782	1792.119							
10980	WELD	47,718.4	10980	0.0	42.3	47.93544987	-103.96197906	1790.396							
10990	WELD	47,760.7	10990	0.0	42.3	47.93545986	-103.96215001	1788.592							
11000	WELD	47,803.0	11000	0.0	42.3	47.93546991	-103.96232112	1787.641							
11010	WELD	47,845.2	11010	0.0	42.3	47.93548038	-103.96249194	1787.178							
11020	WELD	47,887.5	11020	0.0	42.3	47.93548949	-103.96266296	1787.035							
11030	WELD	47,929.8	11030	0.0	42.3	47.93549617	-103.96283422	1787.016							
11040	WELD	47,972.1	11040	0.0	42.3	47.93550161	-103.96300562	1787.102							
11050	WELD	48,014.4	11050	0.0	42.3	47.93550672	-103.96317712	1786.999							
11060	WELD	48,056.7	11060	0.0	42.3	47.93551051	-103.96334869	1786.986							
11070	WELD	48,099.0	11070	0.0	42.3	47.93551525	-103.96352022	1787.031							
11080	WELD	48,141.3	11080	0.0	42.3	47.93551992	-103.96369175	1786.452							
11090	WELD	48,183.6	11090	0.0	42.3	47.93552416	-103.96386332	1785.815							
11100	WELD	48,225.9	11100	0.0	42.3	47.93552850	-103.96403488	1785.446							
11110	WELD	48,268.3	11110	0.0	42.3	47.93553326	-103.96420656	1785.371							
11120	WELD	48,310.5	11120	0.0	42.3	47.93553811	-103.96437791	1785.364							
11130	WELD	48,352.9	11130	0.0	42.3	47.93554258	-103.96454934	1785.335							
11140	WELD	48,395.2	11140	0.0	42.3	47.93554626	-103.96472082	1785.128							
11150	WELD	48,437.4	11150	0.0	42.3	47.93554753	-103.96489244	1785.088							
11160	WELD	48,479.7	11160	0.0	42.3	47.93554672	-103.96506402	1785.218							
11170	WELD	48,522.0	11170	0.0	42.3	47.93554602	-103.96523551	1785.908							
11180	WELD	48,564.3	11180	0.0	42.3	47.93554499	-103.96540712	1786.547							

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)
11190	WELD	48,606.6	11190	0.0	42.3	47.93554383	-103.96557888	1786.972							
11200	WELD	48,648.9	11200	0.0	42.3	47.93554210	-103.96575042	1787.300							
11210	WELD	48,691.2	11210	0.0	42.3	47.93554090	-103.96592205	1787.512							
11220	WELD	48,733.4	11220	0.0	42.3	47.93553985	-103.96609372	1787.582							
11230	WELD	48,775.7	11230	0.0	42.3	47.93553970	-103.96626543	1787.756							
11240	WELD	48,818.1	11240	0.0	42.3	47.93553934	-103.96643702	1787.909							
11250	WELD	48,860.3	11250	0.0	42.3	47.93553806	-103.96660881	1787.915							
11260	WELD	48,902.6	11260	0.0	42.3	47.93553720	-103.96678036	1787.854							
11270	WELD	48,944.9	11270	0.0	42.3	47.93553792	-103.96695184	1787.590							
11280	WELD	48,987.2	11280	0.0	42.2	47.93554210	-103.96712353	1787.667							
11290	WELD	49,029.4	11290	0.0	42.3	47.93554741	-103.96729485	1788.698							
11300	WELD	49,071.7	11300	0.0	42.3	47.93555345	-103.96746624	1790.814							
11310	WELD	49,114.0	11310	0.0	42.3	47.93555912	-103.96763719	1794.184							
11320	WELD	49,156.4	11320	0.0	42.3	47.93556472	-103.96780781	1798.330							
11330	WELD	49,198.6	11330	0.0	42.3	47.93556987	-103.96797813	1803.061							
11340	WELD	49,241.0	11340	0.0	42.3	47.93557078	-103.96814836	1808.616							
11350	WELD	49,283.3	11350	0.0	42.3	47.93556717	-103.96831773	1815.542							
11360	WELD	49,325.5	11360	0.0	42.3	47.93556006	-103.96848583	1823.579							
11370	WELD	49,367.8	11370	0.0	42.3	47.93555349	-103.96865361	1832.078							
11380	WELD	49,410.1	11380	0.0	42.3	47.93554788	-103.96882147	1840.741							
11390	WELD	49,452.3	11390	0.0	42.3	47.93554259	-103.96898873	1849.791							
11400	WELD	49,494.6	11400	0.0	42.3	47.93553698	-103.96915595	1859.085							
10000040	AGM 100, Sta. 496+26, 158 Ave NW -- Han #142	49,518.9	11400	24.3	17.9	47.93553318	-103.96925202	1864.660							
11410	WELD	49,536.9	11410	0.0	42.3	47.93553085	-103.96932364	1867.953							
11420	WELD	49,579.2	11420	0.0	42.3	47.93552687	-103.96949518	1869.731							
11430	WELD	49,621.4	11430	0.0	41.6	47.93552405	-103.96966670	1869.183							
11000039	WT CHANGE	49,663.0	11430	0.0	0.0	47.93552330	-103.96983571	1869.147				0.188	52000	0.72	
11440	WELD	49,663.0	11440	0.0	11.2	47.93552330	-103.96983587	1869.147							
11450	WELD	49,674.1	11450	0.0	47.9	47.93552350	-103.96988123	1869.373							
11460	WELD	49,722.0	11460	0.0	49.3	47.93552521	-103.97007624	1869.892							
20000017	Seam Variation	49,743.4	11460	21.3	28.0	47.93552676	-103.97016296	1869.731	62	2:00	-	0.59	0.57		
11470	WELD	49,771.3	11470	0.0	49.6	47.93552847	-103.97027657	1869.514							
11480	WELD	49,820.9	11480	0.0	47.4	47.93553163	-103.97047816	1869.843							
11490	WELD	49,868.3	11490	0.0	48.9	47.93553325	-103.97067150	1869.716							
11500	WELD	49,917.2	11500	0.0	49.5	47.93553543	-103.97087133	1869.957							
11510	WELD	49,966.7	11510	0.0	49.6	47.93553756	-103.97107309	1870.368							

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)
11520	WELD	50,016.3	11520	0.0	49.7	47.93554007	-103.97127504	1871.206							
11530	WELD	50,066.0	11530	0.0	49.6	47.93554349	-103.97147664	1872.946							
11540	WELD	50,115.6	11540	0.0	49.7	47.93554719	-103.97167793	1872.664							
11550	WELD	50,165.3	11550	0.0	44.9	47.93554981	-103.97187963	1872.720							
11560	WELD	50,210.2	11560	0.0	45.7	47.93555201	-103.97206187	1872.478							
11570	WELD	50,255.9	11570	0.0	46.8	47.93555454	-103.97224758	1872.536							
20000018	Seam Variation	50,300.6	11570	44.6	2.2	47.93555550	-103.97242922	1872.370	12	12:15	-	1.18	1.12		
11580	WELD	50,302.7	11580	0.0	49.7	47.93555550	-103.97243802	1872.361							
11590	WELD	50,352.4	11590	0.0	49.3	47.93555489	-103.97264016	1872.244							
11600	WELD	50,401.7	11600	0.0	49.7	47.93555358	-103.97284076	1871.896							
11610	WELD	50,451.3	11610	0.0	45.9	47.93555330	-103.97304271	1872.170							
11620	WELD	50,497.2	11620	0.0	49.3	47.93555211	-103.97322927	1872.344							
11630	WELD	50,546.5	11630	0.0	36.9	47.93555317	-103.97342998	1872.294							
11000040	WT CHANGE	50,583.4	11630	0.0	0.0	47.93555743	-103.97357977	1871.961				0.322	52000	0.72	
11640	WELD	50,583.4	11640	0.0	42.2	47.93555744	-103.97357993	1871.960							
11650	WELD	50,625.6	11650	0.0	42.3	47.93556274	-103.97375118	1870.661							
11660	WELD	50,667.8	11660	0.0	42.2	47.93555816	-103.97392264	1870.665							
11670	WELD	50,710.0	11670	0.0	42.2	47.93555543	-103.97409450	1870.369							
11680	WELD	50,752.2	11680	0.0	41.9	47.93556140	-103.97426623	1870.619							
11000041	WT CHANGE	50,794.1	11680	0.0	0.0	47.93556657	-103.97443653	1870.817				0.188	52000	0.72	
11690	WELD	50,794.2	11690	0.0	28.0	47.93556657	-103.97443669	1870.817							
11700	WELD	50,822.2	11700	0.0	49.0	47.93556848	-103.97455049	1870.630							
11710	WELD	50,871.2	11710	0.0	49.5	47.93556783	-103.97474998	1870.372							
11720	WELD	50,920.7	11720	0.0	48.8	47.93556682	-103.97495164	1869.479							
11730	WELD	50,969.6	11730	0.0	42.3	47.93556782	-103.97515032	1868.739							
11740	WELD	51,011.9	11740	0.0	49.6	47.93556835	-103.97532266	1869.078							
11750	WELD	51,061.5	11750	0.0	49.2	47.93556823	-103.97552446	1870.617							
11760	WELD	51,110.6	11760	0.0	49.4	47.93556756	-103.97572450	1870.234							
11770	WELD	51,160.0	11770	0.0	49.5	47.93556567	-103.97592551	1870.141							
11780	WELD	51,209.6	11780	0.0	49.6	47.93556310	-103.97612697	1870.263							
11790	WELD	51,259.2	11790	0.0	49.8	47.93556027	-103.97632855	1871.750							
11800	WELD	51,309.0	11800	0.0	49.6	47.93555805	-103.97653045	1871.406							
11810	WELD	51,358.5	11810	0.0	41.6	47.93555738	-103.97673230	1870.443							
11820	WELD	51,400.2	11820	0.0	48.6	47.93555788	-103.97690158	1870.897							
11830	WELD	51,448.8	11830	0.0	49.7	47.93555869	-103.97709887	1871.363							
11840	WELD	51,498.4	11840	0.0	49.5	47.93555768	-103.97730066	1871.267							
11850	WELD	51,547.9	11850	0.0	49.5	47.93555678	-103.97750197	1870.979							

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)
11860	WELD	51,597.4	11860	0.0	48.5	47.93555545	-103.97770287	1871.127							
11870	WELD	51,645.9	11870	0.0	48.4	47.93555467	-103.97790015	1871.210							
11880	WELD	51,694.3	11880	0.0	42.6	47.93555522	-103.97809713	1870.757							
11890	WELD	51,736.8	11890	0.0	49.6	47.93555560	-103.97827026	1870.526							
11900	WELD	51,786.4	11900	0.0	48.3	47.93555492	-103.97847224	1871.036							
11910	WELD	51,834.8	11910	0.0	49.6	47.93555384	-103.97866899	1871.121							
11920	WELD	51,884.3	11920	0.0	49.5	47.93555347	-103.97887104	1871.556							
11930	WELD	51,933.9	11930	0.0	49.6	47.93555322	-103.97907258	1872.034							
11940	WELD	51,983.5	11940	0.0	26.4	47.93555359	-103.97927411	1871.959							
11000042	WT CHANGE	52,009.8	11940	0.0	0.0	47.93555506	-103.97938077	1871.651				0.322	52000	0.72	
11950	WELD	52,009.8	11950	0.0	42.1	47.93555506	-103.97938093	1871.651							
11960	WELD	52,052.0	11960	0.0	42.2	47.93555463	-103.97955261	1871.489							
11970	WELD	52,094.2	11970	0.0	42.2	47.93555238	-103.97972443	1870.071							
11980	WELD	52,136.4	11980	0.0	42.2	47.93555369	-103.97989631	1869.869							
11990	WELD	52,178.6	11990	0.0	6.0	47.93555600	-103.98006787	1871.475							
11000043	WT CHANGE	52,184.5	11990	0.0	0.0	47.93555608	-103.98009206	1871.454				0.188	52000	0.72	
12000	WELD	52,184.6	12000	0.0	36.0	47.93555608	-103.98009225	1871.453							
12010	WELD	52,220.6	12010	0.0	49.5	47.93555411	-103.98023881	1870.877							
12020	WELD	52,270.1	12020	0.0	49.2	47.93555346	-103.98044077	1870.499							
20000019	Seam Variation	52,278.3	12020	8.1	41.1	47.93555374	-103.98047413	1870.548	356	11:45	-	0.47	0.50		
12030	WELD	52,319.3	12030	0.0	31.5	47.93555394	-103.98064155	1870.272							
12040	WELD	52,350.8	12040	0.0	49.6	47.93555382	-103.98076946	1870.300							
12050	WELD	52,400.4	12050	0.0	49.6	47.93555436	-103.98097140	1870.102							
12060	WELD	52,450.0	12060	0.0	49.6	47.93555532	-103.98117319	1870.621							
12070	WELD	52,499.6	12070	0.0	49.6	47.93555696	-103.98137507	1870.268							
12080	WELD	52,549.2	12080	0.0	49.6	47.93555884	-103.98157656	1870.303							
12090	WELD	52,598.7	12090	0.0	49.6	47.93556107	-103.98177827	1870.203							
12100	WELD	52,648.3	12100	0.0	49.3	47.93556235	-103.98197999	1870.296							
12110	WELD	52,697.6	12110	0.0	49.6	47.93556478	-103.98218054	1870.114							
12120	WELD	52,747.1	12120	0.0	49.7	47.93556785	-103.98238256	1869.696							
12130	WELD	52,796.9	12130	0.0	49.6	47.93557050	-103.98258481	1869.422							
12140	WELD	52,846.4	12140	0.0	49.3	47.93557244	-103.98278663	1869.248							
12150	WELD	52,895.8	12150	0.0	48.6	47.93557544	-103.98298792	1869.468							
12160	WELD	52,944.4	12160	0.0	49.6	47.93557727	-103.98318573	1869.596							
12170	WELD	52,993.9	12170	0.0	49.6	47.93557885	-103.98338762	1868.863							
12180	WELD	53,043.5	12180	0.0	41.6	47.93558002	-103.98358941	1868.979							
12190	WELD	53,085.1	12190	0.0	7.7	47.93558124	-103.98375843	1868.176							

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Dore Junction to Dore Station

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)
11000044	WT CHANGE	53,092.7	12190	0.0	0.0	47.93558100	-103.98378946	1868.223				0.322	52000	0.72	
12200	WELD	53,092.8	12200	0.0	41.2	47.93558100	-103.98378966	1868.224							
12210	WELD	53,134.0	12210	0.0	42.2	47.93557912	-103.98395722	1867.060							
12220	WELD	53,176.1	12220	0.0	42.2	47.93557774	-103.98412861	1864.367							
12230	WELD	53,218.4	12230	0.0	42.2	47.93557847	-103.98430040	1863.427							
12240	WELD	53,260.5	12240	0.0	42.2	47.93558264	-103.98447203	1862.973							
12250	WELD	53,302.7	12250	0.0	42.2	47.93558763	-103.98464367	1863.843							
12260	WELD	53,344.9	12260	0.0	42.2	47.93558961	-103.98481530	1865.544							
11000045	WT CHANGE	53,387.1	12260	0.0	0.0	47.93558675	-103.98498659	1865.041				0.188	52000	0.72	
12270	WELD	53,387.2	12270	0.0	43.8	47.93558674	-103.98498679	1865.040							
12280	WELD	53,431.0	12280	0.0	49.6	47.93557722	-103.98516435	1864.968							
12290	WELD	53,480.6	12290	0.0	49.5	47.93556518	-103.98536550	1865.623							
12300	WELD	53,530.1	12300	0.0	49.5	47.93555472	-103.98556689	1865.772							
12310	WELD	53,579.6	12310	0.0	49.6	47.93554286	-103.98576768	1865.971							
12320	WELD	53,629.2	12320	0.0	47.6	47.93553241	-103.98596902	1865.938							
12330	WELD	53,676.8	12330	0.0	49.4	47.93552397	-103.98616238	1865.636							
12340	WELD	53,726.2	12340	0.0	49.4	47.93551606	-103.98636330	1865.656							
12350	WELD	53,775.6	12350	0.0	48.1	47.93550772	-103.98656422	1865.776							
12360	WELD	53,823.7	12360	0.0	49.6	47.93550015	-103.98675988	1865.581							
12370	WELD	53,873.3	12370	0.0	42.5	47.93549373	-103.98696127	1865.464							
12380	WELD	53,915.8	12380	0.0	6.1	47.93548871	-103.98713380	1864.669							
11000046	WT CHANGE	53,921.8	12380	0.0	0.0	47.93548746	-103.98715808	1864.892				0.322	52000	0.72	
12390	WELD	53,921.8	12390	0.0	42.0	47.93548745	-103.98715824	1864.893							
12400	WELD	53,963.8	12400	0.0	42.3	47.93548094	-103.98732901	1865.391							
12410	WELD	54,006.0	12410	0.0	42.2	47.93547521	-103.98749759	1857.623							
12420	WELD	54,048.3	12420	0.0	29.8	47.93545971	-103.98766708	1855.601							
12430	WELD	54,078.1	12430	0.0	4.2	47.93545100	-103.98778755	1857.660							
12440	WELD	54,082.3	12440	0.0	1.5	47.93544999	-103.98780465	1857.932							
10000041	Bend up - 45 deg., 8D	54,083.1	12440	0.3	1.3	47.93544977	-103.98780765	1858.195	0	12:00					
12450	WELD	54,083.8	12450	0.0	14.9	47.93544957	-103.98780988	1858.636							
12460	WELD	54,098.7	12460	0.0	1.6	47.93544601	-103.98784793	1869.860							
10000042	Bend down - 45 deg., 3D	54,099.6	12460	0.3	1.3	47.93544588	-103.98785096	1870.360	0	12:00					
12470	WELD	54,100.4	12470	0.0	3.0	47.93544579	-103.98785372	1870.570							
10000043	Fitting on top of pipe	54,101.8	12470	1.4	1.6	47.93544566	-103.98785965	1870.727	340	11:15					
12480	WELD	54,103.3	12480	0.0	3.4	47.93544552	-103.98786573	1870.869							
10000044	Flange	54,103.9	12480	0.5	2.9	47.93544548	-103.98786743	1870.908	0	12:00					

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)
10000045	Valve, AGM 110, Sta. 541+92, ROW	54,105.1	12480	1.8	1.6	47.93544541	-103.98787161	1870.997							
10000046	Flange	54,106.3	12480	2.9	0.4	47.93544553	-103.98787779	1871.607	0	12:00					
12490	WELD	54,106.7	12490	0.0	3.0	47.93544558	-103.98788015	1871.837							
10000047	Fitting on top of pipe	54,108.2	12490	1.5	1.5	47.93544573	-103.98788758	1872.580	347	11:30					
12500	WELD	54,109.7	12500	0.0	1.6	47.93544589	-103.98789479	1873.272							
10000048	Bend down - 45 deg., 6D	54,110.6	12500	0.3	1.3	47.93544600	-103.98789906	1873.461	0	12:00					
12510	WELD	54,111.3	12510	0.0	15.0	47.93544609	-103.98790207	1873.403							
10000068	Corr. 15' D/S of Valve C/L, 158 Ave. NW -- Han #142	54,120.3	12510	9.0	6.0	47.93544719	-103.98793541	1871.281							
12520	WELD	54,126.3	12520	0.0	1.6	47.93544707	-103.98795406	1867.561							
10000049	Bend up - 45 deg., 1.5D	54,127.1	12520	0.3	1.3	47.93544704	-103.98795691	1867.270	0	12:00					
12530	WELD	54,127.9	12530	0.0	4.1	47.93544699	-103.98795994	1867.211							
12540	WELD	54,132.0	12540	0.0	11.0	47.93544669	-103.98797609	1867.771							
12550	WELD	54,143.0	12550	0.0	42.2	47.93544586	-103.98801989	1869.322							
12560	WELD	54,185.2	12560	0.0	42.2	47.93544088	-103.98819101	1872.031							
12570	WELD	54,227.4	12570	0.0	42.2	47.93542766	-103.98836167	1872.205							
12580	WELD	54,269.6	12580	0.0	38.5	47.93542308	-103.98853295	1874.776							
11000047	WT CHANGE	54,308.0	12580	0.0	0.0	47.93542511	-103.98868913	1876.385				0.188	52000	0.72	
12590	WELD	54,308.1	12590	0.0	38.9	47.93542511	-103.98868933	1876.385							
12600	WELD	54,347.0	12600	0.0	49.6	47.93542492	-103.98884760	1876.905							
12610	WELD	54,396.6	12610	0.0	49.7	47.93542334	-103.98904917	1876.810							
12620	WELD	54,446.2	12620	0.0	45.1	47.93542133	-103.98925090	1876.596							
12630	WELD	54,491.3	12630	0.0	49.0	47.93541954	-103.98943359	1876.233							
12640	WELD	54,540.3	12640	0.0	48.9	47.93541868	-103.98963213	1876.355							
12650	WELD	54,589.2	12650	0.0	49.5	47.93541751	-103.98983058	1876.270							
12660	WELD	54,638.6	12660	0.0	49.2	47.93541480	-103.99003161	1876.004							
11000048	WT CHANGE	54,687.8	12660	0.0	0.0	47.93541250	-103.99023120	1875.623				0.322	52000	0.72	
12670	WELD	54,687.8	12670	0.0	38.7	47.93541250	-103.99023140	1875.623							
12680	WELD	54,726.6	12680	0.0	42.2	47.93541225	-103.99038837	1875.501							
12690	WELD	54,768.8	12690	0.0	42.2	47.93541022	-103.99056009	1875.948							
11000049	WT CHANGE	54,811.0	12690	0.0	0.0	47.93540769	-103.99073136	1875.189				0.188	52000	0.72	
12700	WELD	54,811.0	12700	0.0	36.3	47.93540769	-103.99073151	1875.189							
12710	WELD	54,847.3	12710	0.0	49.3	47.93540416	-103.99087919	1875.498							
12720	WELD	54,896.6	12720	0.0	49.7	47.93540063	-103.99107970	1874.985							
12730	WELD	54,946.3	12730	0.0	49.5	47.93539783	-103.99128153	1874.381							
12740	WELD	54,995.7	12740	0.0	49.3	47.93539570	-103.99148273	1874.148							

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)
12750	WELD	55,045.1	12750	0.0	49.6	47.93539243	-103.99168315	1874.400						
12760	WELD	55,094.7	12760	0.0	49.4	47.93539090	-103.99188497	1874.445						
12770	WELD	55,144.1	12770	0.0	49.2	47.93538945	-103.99208622	1874.238						
12780	WELD	55,193.2	12780	0.0	49.5	47.93538753	-103.99228615	1874.028						
12790	WELD	55,242.8	12790	0.0	44.6	47.93538576	-103.99248791	1874.050						
12800	WELD	55,287.4	12800	0.0	49.4	47.93538257	-103.99266973	1874.124						
12810	WELD	55,336.8	12810	0.0	49.6	47.93538046	-103.99287097	1873.354						
12820	WELD	55,386.4	12820	0.0	49.5	47.93537837	-103.99307287	1873.717						
12830	WELD	55,435.9	12830	0.0	49.4	47.93537535	-103.99327459	1873.335						
12840	WELD	55,485.3	12840	0.0	49.3	47.93537389	-103.99347575	1873.288						
12850	WELD	55,534.6	12850	0.0	49.6	47.93537227	-103.99367643	1873.229						
12860	WELD	55,584.1	12860	0.0	49.6	47.93537021	-103.99387829	1873.092						
12870	WELD	55,633.7	12870	0.0	49.4	47.93536885	-103.99408029	1873.267						
12880	WELD	55,683.1	12880	0.0	49.5	47.93536655	-103.99428173	1873.018						
12890	WELD	55,732.6	12890	0.0	49.4	47.93536339	-103.99448298	1873.353						
12900	WELD	55,781.9	12900	0.0	49.3	47.93536105	-103.99468362	1873.136						
12910	WELD	55,831.2	12910	0.0	49.6	47.93535929	-103.99488431	1873.522						
12920	WELD	55,880.8	12920	0.0	49.7	47.93535756	-103.99508544	1873.599						
12930	WELD	55,930.5	12930	0.0	49.4	47.93535672	-103.99528716	1873.498						
12940	WELD	55,979.9	12940	0.0	49.5	47.93535635	-103.99548746	1873.051						
12950	WELD	56,029.4	12950	0.0	49.7	47.93535557	-103.99568908	1873.553						
12960	WELD	56,079.1	12960	0.0	43.6	47.93535481	-103.99589106	1872.040						
12970	WELD	56,122.6	12970	0.0	49.4	47.93535374	-103.99606802	1871.726						
12980	WELD	56,172.0	12980	0.0	49.8	47.93535178	-103.99626882	1871.738						
12990	WELD	56,221.9	12990	0.0	40.5	47.93534924	-103.99647092	1871.613						
13000	WELD	56,262.4	13000	0.0	43.8	47.93534740	-103.99663556	1871.863						
13010	WELD	56,306.2	13010	0.0	31.0	47.93534473	-103.99681327	1871.863						
13020	WELD	56,337.2	13020	0.0	27.6	47.93534226	-103.99693927	1872.027						
13030	WELD	56,364.8	13030	0.0	41.4	47.93534083	-103.99705170	1871.685						
13040	WELD	56,406.2	13040	0.0	48.8	47.93533921	-103.99722006	1871.984						
13050	WELD	56,455.0	13050	0.0	42.7	47.93533758	-103.99741866	1871.858						
13060	WELD	56,497.7	13060	0.0	49.5	47.93533611	-103.99759253	1871.731						
13070	WELD	56,547.2	13070	0.0	49.4	47.93533426	-103.99779350	1872.094						
13080	WELD	56,596.6	13080	0.0	49.5	47.93531469	-103.99799061	1872.269						
13090	WELD	56,646.1	13090	0.0	21.6	47.93524210	-103.99815959	1872.246						
11000050	WT CHANGE	56,667.6	13090	0.0	0.0	47.93520505	-103.99822756	1872.274			0.322	52000	0.72	
13100	WELD	56,667.7	13100	0.0	6.7	47.93520498	-103.99822769	1872.274						

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)
13110	WELD	56,674.4	13110	0.0	42.2	47.93519322	-103.99824870	1872.283							
13120	WELD	56,716.6	13120	0.0	42.2	47.93511888	-103.99838012	1871.803							
13130	WELD	56,758.7	13130	0.0	42.1	47.93504684	-103.99851439	1872.235							
13140	WELD	56,800.9	13140	0.0	42.1	47.93497580	-103.99864923	1871.218							
13150	WELD	56,843.0	13150	0.0	41.9	47.93490453	-103.99878415	1870.712							
11000051	WT CHANGE	56,884.9	13150	0.0	0.0	47.93483563	-103.99892049	1872.082				0.188	52000	0.72	
13160	WELD	56,884.9	13160	0.0	32.3	47.93483555	-103.99892065	1872.084							
13170	WELD	56,917.3	13170	0.0	49.5	47.93478428	-103.99902823	1872.382							
13180	WELD	56,966.8	13180	0.0	49.7	47.93470371	-103.99919019	1872.622							
13190	WELD	57,016.5	13190	0.0	49.8	47.93461978	-103.99934900	1872.130							
13200	WELD	57,066.3	13200	0.0	49.5	47.93453766	-103.99950950	1870.856							
13210	WELD	57,115.8	13210	0.0	49.7	47.93445595	-103.99967005	1870.955							
13220	WELD	57,165.5	13220	0.0	49.3	47.93437267	-103.99982926	1870.546							
13230	WELD	57,214.7	13230	0.0	49.7	47.93428911	-103.99998581	1870.680							
40000004	Metal Loss - EXTERNAL	57,261.9	13230	47.2	2.6	47.93420984	-104.00013680	1870.863	232	7:30	10%	1.12	0.93	1760	100%
13240	WELD	57,264.4	13240	0.0	49.5	47.93420566	-104.00014493	1870.858							
13250	WELD	57,314.0	13250	0.0	49.3	47.93412375	-104.00030526	1870.781							
13260	WELD	57,363.3	13260	0.0	49.6	47.93404246	-104.00046495	1870.954							
13270	WELD	57,412.9	13270	0.0	49.7	47.93396080	-104.00062593	1871.135							
13280	WELD	57,462.6	13280	0.0	28.1	47.93387885	-104.00078668	1871.348							
11000052	WT CHANGE	57,490.7	13280	0.0	0.0	47.93383314	-104.00087781	1871.378				0.322	52000	0.72	
13290	WELD	57,490.7	13290	0.0	42.1	47.93383306	-104.00087797	1871.378							
13300	WELD	57,532.8	13300	0.0	42.2	47.93376465	-104.00101562	1870.802							
13310	WELD	57,575.0	13310	0.0	42.2	47.93369454	-104.00115197	1870.415							
13320	WELD	57,617.2	13320	0.0	42.2	47.93362269	-104.00128625	1870.535							
13330	WELD	57,659.3	13330	0.0	13.7	47.93355210	-104.00142212	1870.511							
11000053	WT CHANGE	57,673.0	13330	0.0	0.0	47.93352971	-104.00146643	1870.949				0.188	52000	0.72	
13340	WELD	57,673.0	13340	0.0	46.4	47.93352964	-104.00146655	1870.950							
13350	WELD	57,719.4	13350	0.0	49.6	47.93345290	-104.00161719	1870.946							
13360	WELD	57,769.0	13360	0.0	49.5	47.93337137	-104.00177843	1870.624							
13370	WELD	57,818.5	13370	0.0	49.6	47.93328994	-104.00193970	1870.259							
13380	WELD	57,868.1	13380	0.0	49.5	47.93320697	-104.00209955	1870.177							
13390	WELD	57,917.7	13390	0.0	49.5	47.93312331	-104.00225800	1870.087							
13400	WELD	57,967.1	13400	0.0	49.6	47.93304216	-104.00241936	1869.761							
13410	WELD	58,016.7	13410	0.0	49.6	47.93296038	-104.00258041	1869.649							
13420	WELD	58,066.3	13420	0.0	49.6	47.93287781	-104.00274062	1869.655							
20000021	Seam Variation	58,101.0	13420	34.7	14.8	47.93282005	-104.00285299	1869.277	265	8:45	-	0.47	0.48		

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)
13430	WELD	58,115.9	13430	0.0	49.5	47.93279544	-104.00290098	1869.093							
13440	WELD	58,165.4	13440	0.0	49.4	47.93271297	-104.00306112	1868.803							
13450	WELD	58,214.8	13450	0.0	49.5	47.93262972	-104.00321981	1868.604							
13460	WELD	58,264.4	13460	0.0	44.7	47.93254767	-104.00337984	1868.858							
40000005	Metal Loss - EXTERNAL	58,294.2	13460	29.8	14.9	47.93249852	-104.00347619	1868.826	342	11:15	16%	0.64	0.41	1760	100%
13470	WELD	58,309.0	13470	0.0	49.6	47.93247400	-104.00352418	1869.025							
13480	WELD	58,358.6	13480	0.0	49.7	47.93239232	-104.00368471	1868.750							
13490	WELD	58,408.3	13490	0.0	49.3	47.93231002	-104.00384494	1869.092							
13500	WELD	58,457.7	13500	0.0	49.2	47.93222861	-104.00400428	1868.668							
13510	WELD	58,506.8	13510	0.0	49.6	47.93214744	-104.00416295	1868.337							
13520	WELD	58,556.4	13520	0.0	49.6	47.93206580	-104.00432370	1868.502							
13530	WELD	58,606.0	13530	0.0	49.4	47.93198475	-104.00448558	1868.035							
13540	WELD	58,655.4	13540	0.0	49.6	47.93190329	-104.00464577	1867.900							
13550	WELD	58,705.0	13550	0.0	49.6	47.93182079	-104.00480573	1868.143							
13560	WELD	58,754.6	13560	0.0	49.6	47.93173837	-104.00496553	1868.256							
13570	WELD	58,804.2	13570	0.0	48.6	47.93165619	-104.00512555	1868.451							
20000023	Seam Variation	58,829.7	13570	25.4	23.2	47.93161303	-104.00520688	1868.337	181	6:00	-	0.35	0.40		
20000024	Seam Variation	58,839.1	13570	34.9	13.7	47.93159676	-104.00523677	1868.305	180	6:00	-	0.59	0.52		
11000054	WT CHANGE	58,852.8	13570	0.0	0.0	47.93157318	-104.00527995	1868.110				0.322	52000	0.72	
13580	WELD	58,852.8	13580	0.0	9.6	47.93157310	-104.00528011	1868.109							
13590	WELD	58,862.4	13590	0.0	42.2	47.93155682	-104.00531030	1867.789							
13600	WELD	58,904.6	13600	0.0	42.2	47.93148705	-104.00544643	1864.720							
13610	WELD	58,946.8	13610	0.0	42.1	47.93142296	-104.00558921	1865.787							
13620	WELD	58,988.9	13620	0.0	42.1	47.93135249	-104.00572501	1867.043							
13630	WELD	59,031.1	13630	0.0	26.7	47.93127810	-104.00585586	1868.099							
11000055	WT CHANGE	59,057.7	13630	0.0	0.0	47.93123231	-104.00594025	1868.319				0.188	52000	0.72	
13640	WELD	59,057.7	13640	0.0	14.8	47.93123224	-104.00594038	1868.319							
13650	WELD	59,072.6	13650	0.0	49.4	47.93120675	-104.00598750	1868.278							
13660	WELD	59,122.0	13660	0.0	49.5	47.93112225	-104.00614469	1868.034							
13670	WELD	59,171.4	13670	0.0	49.5	47.93103683	-104.00630068	1867.765							
13680	WELD	59,220.9	13680	0.0	49.5	47.93095046	-104.00645578	1867.837							
13690	WELD	59,270.4	13690	0.0	49.4	47.93086473	-104.00661176	1867.635							
13700	WELD	59,319.8	13700	0.0	49.4	47.93077856	-104.00676665	1868.056							
13710	WELD	59,369.2	13710	0.0	49.5	47.93069190	-104.00692085	1867.894							
13720	WELD	59,418.7	13720	0.0	49.3	47.93060418	-104.00707437	1867.970							
13730	WELD	59,468.1	13730	0.0	47.8	47.93051683	-104.00722762	1867.994							
13740	WELD	59,515.8	13740	0.0	49.5	47.93043245	-104.00737635	1867.930							

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)
13750	WELD	59,565.3	13750	0.0	49.3	47.93034535	-104.00753006	1868.116							
13760	WELD	59,614.7	13760	0.0	49.6	47.93025828	-104.00768296	1867.889							
13770	WELD	59,664.3	13770	0.0	49.2	47.93017151	-104.00783788	1867.676							
13780	WELD	59,713.5	13780	0.0	48.4	47.93008595	-104.00799277	1867.852							
13790	WELD	59,761.9	13790	0.0	48.4	47.93000372	-104.00814724	1868.258							
13800	WELD	59,810.3	13800	0.0	44.6	47.92992252	-104.00830257	1868.108							
13810	WELD	59,854.9	13810	0.0	47.1	47.92984562	-104.00844293	1868.906							
13820	WELD	59,902.0	13820	0.0	49.2	47.92976291	-104.00858944	1868.868							
13830	WELD	59,951.2	13830	0.0	49.7	47.92967637	-104.00874280	1869.123							
13840	WELD	60,000.9	13840	0.0	48.5	47.92958912	-104.00889743	1869.455							
13850	WELD	60,049.4	13850	0.0	48.2	47.92950434	-104.00904899	1869.480							
13860	WELD	60,097.5	13860	0.0	40.9	47.92942017	-104.00919995	1869.479							
13870	WELD	60,138.4	13870	0.0	49.3	47.92934868	-104.00932769	1869.042							
20000025	Seam Variation	60,165.7	13870	27.2	22.1	47.92930124	-104.00941328	1869.147	342	11:15	-	0.59	0.90		
13880	WELD	60,187.7	13880	0.0	49.5	47.92926278	-104.00948244	1869.122							
13890	WELD	60,237.3	13890	0.0	49.6	47.92917689	-104.00963827	1869.338							
13900	WELD	60,286.9	13900	0.0	49.5	47.92909129	-104.00979477	1868.851							
13910	WELD	60,336.4	13910	0.0	49.6	47.92900505	-104.00995060	1868.507							
13920	WELD	60,386.0	13920	0.0	49.5	47.92891922	-104.01010648	1868.472							
13930	WELD	60,435.5	13930	0.0	49.5	47.92883386	-104.01026313	1868.640							
13940	WELD	60,485.0	13940	0.0	49.5	47.92874809	-104.01041907	1868.775							
13950	WELD	60,534.5	13950	0.0	49.3	47.92866127	-104.01057403	1868.465							
13960	WELD	60,583.8	13960	0.0	49.5	47.92857427	-104.01072699	1868.272							
13970	WELD	60,633.3	13970	0.0	49.5	47.92848566	-104.01087920	1867.498							
13980	WELD	60,682.9	13980	0.0	49.6	47.92839878	-104.01103404	1867.642							
13990	WELD	60,732.4	13990	0.0	49.5	47.92831432	-104.01119132	1867.599							
14000	WELD	60,782.0	14000	0.0	49.4	47.92823043	-104.01134992	1867.784							
14010	WELD	60,831.4	14010	0.0	49.7	47.92814429	-104.01150445	1867.498							
14020	WELD	60,881.1	14020	0.0	49.2	47.92805824	-104.01165984	1864.826							
14030	WELD	60,930.3	14030	0.0	49.6	47.92797015	-104.01181098	1865.645							
14040	WELD	60,979.8	14040	0.0	49.6	47.92788249	-104.01196448	1866.151							
14050	WELD	61,029.4	14050	0.0	48.9	47.92779885	-104.01212309	1865.480							
10000050	AGM 120, Sta. 601+58, ROW -- Han #116	61,054.3	14050	24.8	24.1	47.92775718	-104.01220281	1864.924							
14060	WELD	61,078.3	14060	0.0	49.6	47.92771554	-104.01227858	1865.199							
14070	WELD	61,127.9	14070	0.0	49.1	47.92762615	-104.01243000	1865.582							
14080	WELD	61,177.0	14080	0.0	9.9	47.92753323	-104.01257450	1865.068							

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)
14090	WELD	61,186.9	14090	0.0	48.8	47.92751413	-104.01260325	1865.039							
11000056	WT CHANGE	61,235.7	14090	0.0	0.0	47.92741865	-104.01274116	1864.529				0.322	52000	0.72	
14100	WELD	61,235.7	14100	0.0	1.5	47.92741857	-104.01274131	1864.528							
10000051	Bend right - 45 deg., 3D	61,236.5	14100	0.1	1.4	47.92741754	-104.01274389	1864.508	0	12:00					
14110	WELD	61,237.2	14110	0.0	20.3	47.92741708	-104.01274709	1864.449							
14120	WELD	61,257.6	14120	0.0	42.1	47.92741740	-104.01282962	1862.058							
14130	WELD	61,299.7	14130	0.0	42.1	47.92741790	-104.01300028	1858.069							
14140	WELD	61,341.8	14140	0.0	42.1	47.92741972	-104.01317181	1856.862							
14150	WELD	61,384.0	14150	0.0	42.1	47.92741957	-104.01334331	1856.165							
14160	WELD	61,426.1	14160	0.0	42.1	47.92741798	-104.01351485	1855.641							
14170	WELD	61,468.2	14170	0.0	42.1	47.92741556	-104.01368620	1855.184							
14180	WELD	61,510.4	14180	0.0	42.2	47.92741205	-104.01385758	1854.903							
14190	WELD	61,552.5	14190	0.0	42.2	47.92740733	-104.01402907	1854.444							
14200	WELD	61,594.7	14200	0.0	42.1	47.92740193	-104.01420056	1853.864							
14210	WELD	61,636.9	14210	0.0	42.2	47.92739604	-104.01437202	1852.670							
14220	WELD	61,679.0	14220	0.0	42.2	47.92739010	-104.01454318	1850.750							
14230	WELD	61,721.2	14230	0.0	42.2	47.92738592	-104.01471468	1849.914							
14240	WELD	61,763.5	14240	0.0	42.2	47.92738443	-104.01488626	1850.117							
14250	WELD	61,805.7	14250	0.0	42.2	47.92738610	-104.01505791	1850.633							
14260	WELD	61,847.9	14260	0.0	42.2	47.92739035	-104.01522932	1851.679							
14270	WELD	61,890.2	14270	0.0	42.2	47.92739405	-104.01540069	1853.144							
14280	WELD	61,932.4	14280	0.0	42.2	47.92739649	-104.01557219	1854.565							
14290	WELD	61,974.6	14290	0.0	42.2	47.92740062	-104.01574362	1855.278							
14300	WELD	62,016.8	14300	0.0	42.2	47.92740506	-104.01591496	1855.266							
14310	WELD	62,059.0	14310	0.0	42.2	47.92740910	-104.01608642	1855.379							
14320	WELD	62,101.2	14320	0.0	42.2	47.92741321	-104.01625778	1855.776							
14330	WELD	62,143.4	14330	0.0	42.2	47.92741984	-104.01642899	1856.768							
14340	WELD	62,185.6	14340	0.0	42.2	47.92742794	-104.01660008	1857.439							
14350	WELD	62,227.8	14350	0.0	42.2	47.92743579	-104.01677131	1857.363							
14360	WELD	62,270.0	14360	0.0	42.2	47.92744278	-104.01694237	1856.950							
14370	WELD	62,312.2	14370	0.0	42.2	47.92744857	-104.01711362	1856.936							
14380	WELD	62,354.4	14380	0.0	42.2	47.92745324	-104.01728489	1856.765							
14390	WELD	62,396.6	14390	0.0	42.2	47.92745496	-104.01745631	1856.281							
14400	WELD	62,438.7	14400	0.0	42.2	47.92745519	-104.01762775	1855.631							
14410	WELD	62,480.9	14410	0.0	42.2	47.92745731	-104.01779908	1855.025							
14420	WELD	62,523.1	14420	0.0	42.2	47.92746181	-104.01797038	1854.351							
14430	WELD	62,565.3	14430	0.0	42.1	47.92746379	-104.01814186	1853.687							

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)
14440	WELD	62,607.4	14440	0.0	42.1	47.92746618	-104.01831317	1852.850							
14450	WELD	62,649.5	14450	0.0	42.1	47.92747118	-104.01848445	1852.723							
14460	WELD	62,691.7	14460	0.0	42.2	47.92747447	-104.01865592	1852.655							
14470	WELD	62,733.8	14470	0.0	42.1	47.92747765	-104.01882754	1852.569							
14480	WELD	62,776.0	14480	0.0	42.2	47.92748067	-104.01899877	1852.462							
14490	WELD	62,818.1	14490	0.0	42.2	47.92748358	-104.01917026	1851.943							
14500	WELD	62,860.3	14500	0.0	42.1	47.92748703	-104.01934162	1852.279							
14510	WELD	62,902.5	14510	0.0	42.1	47.92749138	-104.01951311	1852.902							
14520	WELD	62,944.6	14520	0.0	42.2	47.92749534	-104.01968433	1853.518							
14530	WELD	62,986.7	14530	0.0	42.1	47.92749695	-104.01985579	1853.172							
14540	WELD	63,028.9	14540	0.0	42.1	47.92750014	-104.02002704	1853.616							
14550	WELD	63,071.0	14550	0.0	42.1	47.92750158	-104.02019856	1853.361							
14560	WELD	63,113.2	14560	0.0	42.2	47.92750444	-104.02036990	1853.274							
14570	WELD	63,155.3	14570	0.0	42.2	47.92750966	-104.02054115	1853.422							
14580	WELD	63,197.5	14580	0.0	42.2	47.92751486	-104.02071251	1853.511							
14590	WELD	63,239.6	14590	0.0	42.1	47.92751766	-104.02088380	1853.751							
14600	WELD	63,281.8	14600	0.0	42.1	47.92751945	-104.02105516	1854.059							
14610	WELD	63,323.9	14610	0.0	42.2	47.92752471	-104.02122634	1855.403							
14620	WELD	63,366.1	14620	0.0	42.1	47.92753307	-104.02139674	1859.230							
14630	WELD	63,408.2	14630	0.0	42.2	47.92753774	-104.02156664	1864.508							
14640	WELD	63,450.4	14640	0.0	28.0	47.92753812	-104.02173703	1868.979							
14650	WELD	63,478.5	14650	0.0	1.6	47.92753822	-104.02185067	1871.128							
10000052	Bend right - 45 deg., 3D	63,479.3	14650	0.3	1.3	47.92753888	-104.02185397	1871.170	0	12:00					
14660	WELD	63,480.0	14660	0.0	16.7	47.92753993	-104.02185626	1871.172							
11000057	WT CHANGE	63,496.7	14660	0.0	0.0	47.92757155	-104.02190509	1870.917				0.188	52000	0.72	
14670	WELD	63,496.7	14670	0.0	47.2	47.92757162	-104.02190520	1870.916							
14680	WELD	63,543.9	14680	0.0	1.5	47.92765899	-104.02204582	1869.753							
10000053	Bend left - 45 deg., 3D	63,544.7	14680	0.1	1.4	47.92765988	-104.02204857	1869.746	0	12:00					
14690	WELD	63,545.4	14690	0.0	39.7	47.92766024	-104.02205165	1869.755							
14700	WELD	63,585.0	14700	0.0	49.2	47.92765845	-104.02221348	1870.794							
14710	WELD	63,634.3	14710	0.0	49.6	47.92765906	-104.02241408	1870.508							
14720	WELD	63,683.9	14720	0.0	49.6	47.92765916	-104.02261583	1870.581							
14730	WELD	63,733.5	14730	0.0	46.5	47.92765893	-104.02281717	1870.999							
14740	WELD	63,780.0	14740	0.0	49.6	47.92765773	-104.02300614	1870.833							
14750	WELD	63,829.7	14750	0.0	49.4	47.92765682	-104.02320740	1870.929							
14760	WELD	63,879.0	14760	0.0	49.4	47.92765556	-104.02340788	1871.091							
14770	WELD	63,928.4	14770	0.0	49.3	47.92765378	-104.02360844	1871.368							

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)
14780	WELD	63,977.7	14780	0.0	49.6	47.92765255	-104.02380864	1871.486							
14790	WELD	64,027.3	14790	0.0	49.6	47.92765141	-104.02401022	1871.692							
14800	WELD	64,077.0	14800	0.0	49.3	47.92765223	-104.02421185	1871.873							
14810	WELD	64,126.3	14810	0.0	49.6	47.92765276	-104.02441260	1872.021							
14820	WELD	64,175.9	14820	0.0	49.4	47.92765214	-104.02461424	1872.213							
14830	WELD	64,225.3	14830	0.0	43.7	47.92765302	-104.02481553	1872.326							
14840	WELD	64,269.0	14840	0.0	49.5	47.92765318	-104.02499331	1872.477							
14850	WELD	64,318.6	14850	0.0	49.3	47.92765290	-104.02519506	1872.489							
14860	WELD	64,367.9	14860	0.0	49.5	47.92765365	-104.02539581	1872.578							
14870	WELD	64,417.4	14870	0.0	43.6	47.92765438	-104.02559771	1872.693							
14880	WELD	64,461.0	14880	0.0	49.5	47.92765466	-104.02577504	1872.888							
14890	WELD	64,510.5	14890	0.0	49.3	47.92765449	-104.02597629	1873.031							
14900	WELD	64,559.8	14900	0.0	49.6	47.92765474	-104.02617697	1873.882							
14910	WELD	64,609.4	14910	0.0	49.6	47.92765393	-104.02637880	1873.196							
14920	WELD	64,659.0	14920	0.0	49.6	47.92765385	-104.02658042	1872.774							
14930	WELD	64,708.5	14930	0.0	49.2	47.92765449	-104.02678223	1872.890							
14940	WELD	64,757.8	14940	0.0	49.1	47.92765499	-104.02698254	1873.043							
14950	WELD	64,806.8	14950	0.0	49.5	47.92765482	-104.02718182	1873.308							
14960	WELD	64,856.4	14960	0.0	49.6	47.92765523	-104.02738336	1874.695							
14970	WELD	64,906.0	14970	0.0	49.5	47.92765496	-104.02758504	1874.201							
14980	WELD	64,955.4	14980	0.0	49.2	47.92765528	-104.02778667	1873.897							
14990	WELD	65,004.7	14990	0.0	49.2	47.92765514	-104.02798731	1873.952							
15000	WELD	65,053.9	15000	0.0	49.2	47.92765566	-104.02818759	1874.065							
15010	WELD	65,103.1	15010	0.0	49.5	47.92765805	-104.02838770	1874.142							
40000006	Metal Loss - EXTERNAL	65,144.6	15010	41.5	8.0	47.92766003	-104.02855699	1874.324	346	11:30	11%	0.48	0.43	1760	100%
15020	WELD	65,152.6	15020	0.0	49.4	47.92766039	-104.02858941	1874.356							
15030	WELD	65,202.0	15030	0.0	49.5	47.92765996	-104.02879075	1874.957							
15040	WELD	65,251.5	15040	0.0	49.4	47.92765970	-104.02899200	1875.038							
15050	WELD	65,300.9	15050	0.0	49.5	47.92765960	-104.02919348	1875.032							
15060	WELD	65,350.4	15060	0.0	49.5	47.92765935	-104.02939524	1875.292							
15070	WELD	65,399.9	15070	0.0	49.4	47.92766073	-104.02959692	1875.386							
15080	WELD	65,449.3	15080	0.0	45.1	47.92766146	-104.02979831	1875.652							
15090	WELD	65,494.4	15090	0.0	11.6	47.92765942	-104.02998159	1876.303							
11000058	WT CHANGE	65,505.9	15090	0.0	0.0	47.92766144	-104.03002831	1876.453				0.322	52000	0.72	
15100	WELD	65,506.0	15100	0.0	1.0	47.92766142	-104.03002851	1876.454							
10000054	Bend left - 35 deg., 1.5D	65,506.5	15100	0.1	1.0	47.92766125	-104.03003052	1876.467	0	12:00					
15110	WELD	65,507.0	15110	0.0	11.4	47.92766074	-104.03003252	1876.472							

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)
15120	WELD	65,518.4	15120	0.0	42.2	47.92764496	-104.03007330	1876.460							
15130	WELD	65,560.6	15130	0.0	42.1	47.92758028	-104.03021468	1874.442							
15140	WELD	65,602.7	15140	0.0	42.1	47.92750372	-104.03034212	1871.888							
15150	WELD	65,644.8	15150	0.0	16.0	47.92741498	-104.03044953	1876.468							
15160	WELD	65,660.8	15160	0.0	1.6	47.92738075	-104.03048978	1877.570							
10000055	Bend left - 45 deg., 3D	65,661.6	15160	0.1	1.5	47.92737887	-104.03049085	1877.592	0	12:00					
11000059	WT CHANGE	65,662.3	15160	0.0	0.0	47.92737686	-104.03049120	1877.596				0.188	52000	0.72	
15170	WELD	65,662.4	15170	0.0	7.6	47.92737674	-104.03049120	1877.596							
15180	WELD	65,670.0	15180	0.0	49.1	47.92735540	-104.03048739	1877.597							
20000027	Seam Variation	65,688.1	15180	18.1	31.0	47.92730593	-104.03047948	1877.974	60	2:00	-	0.47	0.34		
15190	WELD	65,719.1	15190	0.0	49.3	47.92722129	-104.03046764	1878.156							
15200	WELD	65,768.3	15200	0.0	49.1	47.92708665	-104.03045248	1878.089							
15210	WELD	65,817.4	15210	0.0	49.5	47.92695249	-104.03044259	1877.825							
15220	WELD	65,866.9	15220	0.0	46.4	47.92681729	-104.03043462	1878.466							
15230	WELD	65,913.3	15230	0.0	49.3	47.92669009	-104.03042655	1878.422							
15240	WELD	65,962.6	15240	0.0	49.4	47.92655599	-104.03042138	1877.913							
15250	WELD	66,012.1	15250	0.0	49.3	47.92641977	-104.03041660	1878.304							
20000028	Seam Variation	66,017.8	15250	5.7	43.6	47.92640412	-104.03041605	1878.381	124	4:00	-	0.47	0.60		
15260	WELD	66,061.4	15260	0.0	48.2	47.92628473	-104.03041007	1878.412							
15270	WELD	66,109.6	15270	0.0	49.4	47.92615280	-104.03040354	1878.778							
15280	WELD	66,158.9	15280	0.0	47.8	47.92601764	-104.03039635	1878.596							
15290	WELD	66,206.7	15290	0.0	49.2	47.92588707	-104.03038913	1878.362							
15300	WELD	66,255.9	15300	0.0	49.2	47.92575265	-104.03038177	1878.836							
15310	WELD	66,305.1	15310	0.0	45.0	47.92561808	-104.03037232	1879.005							
11000060	WT CHANGE	66,350.1	15310	0.0	0.0	47.92549519	-104.03036318	1878.922				0.322	52000	0.72	
15320	WELD	66,350.1	15320	0.0	11.1	47.92549508	-104.03036317	1878.921							
15330	WELD	66,361.2	15330	0.0	42.2	47.92546462	-104.03036187	1878.626							
15340	WELD	66,403.4	15340	0.0	42.1	47.92534925	-104.03035860	1878.268							
15350	WELD	66,445.5	15350	0.0	39.5	47.92523434	-104.03034946	1880.058							
11000061	WT CHANGE	66,485.0	15350	0.0	0.0	47.92512654	-104.03033738	1880.702				0.188	52000	0.72	
15360	WELD	66,485.1	15360	0.0	13.5	47.92512644	-104.03033737	1880.703							
15370	WELD	66,498.6	15370	0.0	49.6	47.92508956	-104.03033419	1880.622							
15380	WELD	66,548.2	15380	0.0	49.6	47.92495384	-104.03032980	1880.241							
15390	WELD	66,597.8	15390	0.0	48.3	47.92481845	-104.03033030	1878.341							
15400	WELD	66,646.1	15400	0.0	49.8	47.92468686	-104.03032830	1877.973							
15410	WELD	66,695.8	15410	0.0	49.7	47.92455126	-104.03032818	1878.438							
15420	WELD	66,745.6	15420	0.0	49.6	47.92441569	-104.03032760	1879.268							

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)
15430	WELD	66,795.1	15430	0.0	49.5	47.92428004	-104.03032710	1879.439							
15440	WELD	66,844.6	15440	0.0	48.9	47.92414464	-104.03032980	1878.638							
15450	WELD	66,893.5	15450	0.0	49.7	47.92401089	-104.03033370	1878.820							
15460	WELD	66,943.2	15460	0.0	49.6	47.92387516	-104.03033874	1879.268							
15470	WELD	66,992.8	15470	0.0	49.6	47.92373937	-104.03034376	1879.349							
15480	WELD	67,042.4	15480	0.0	49.6	47.92360374	-104.03034670	1879.099							
15490	WELD	67,092.0	15490	0.0	43.3	47.92346826	-104.03034996	1879.823							
15500	WELD	67,135.3	15500	0.0	43.0	47.92334990	-104.03035343	1880.081							
15510	WELD	67,178.3	15510	0.0	49.3	47.92323209	-104.03035759	1880.370							
15520	WELD	67,227.7	15520	0.0	49.5	47.92309711	-104.03036408	1880.691							
15530	WELD	67,277.1	15530	0.0	49.3	47.92296174	-104.03036920	1880.863							
15540	WELD	67,326.4	15540	0.0	49.6	47.92282680	-104.03037260	1881.313							
15550	WELD	67,376.1	15550	0.0	49.6	47.92269101	-104.03037620	1881.580							
15560	WELD	67,425.7	15560	0.0	49.5	47.92255561	-104.03038014	1882.053							
15570	WELD	67,475.2	15570	0.0	49.2	47.92242037	-104.03038576	1882.483							
20000029	Seam Variation	67,505.6	15570	30.4	18.7	47.92233713	-104.03039037	1883.000	249	8:15	-	0.35	0.35		
15580	WELD	67,524.4	15580	0.0	49.2	47.92228598	-104.03039402	1883.555							
15590	WELD	67,573.6	15590	0.0	49.4	47.92215162	-104.03040412	1884.120							
15600	WELD	67,623.0	15600	0.0	49.2	47.92201667	-104.03041111	1883.969							
15610	WELD	67,672.2	15610	0.0	49.1	47.92188222	-104.03041718	1884.491							
15620	WELD	67,721.3	15620	0.0	49.5	47.92174783	-104.03042324	1884.948							
15630	WELD	67,770.8	15630	0.0	49.5	47.92161235	-104.03042440	1884.982							
15640	WELD	67,820.3	15640	0.0	49.5	47.92147711	-104.03042066	1884.836							
15650	WELD	67,869.9	15650	0.0	49.5	47.92134172	-104.03041476	1885.368							
15660	WELD	67,919.4	15660	0.0	49.5	47.92120626	-104.03040885	1886.325							
15670	WELD	67,969.0	15670	0.0	49.5	47.92107067	-104.03040375	1885.853							
15680	WELD	68,018.5	15680	0.0	21.3	47.92093509	-104.03040340	1885.318							
11000062	WT CHANGE	68,039.7	15680	0.0	0.0	47.92087719	-104.03040370	1884.776				0.322	52000	0.72	
15690	WELD	68,039.8	15690	0.0	23.9	47.92087705	-104.03040370	1884.774							
15700	WELD	68,063.7	15700	0.0	42.1	47.92081156	-104.03040300	1883.407							
15710	WELD	68,105.9	15710	0.0	42.1	47.92069720	-104.03039809	1878.319							
15720	WELD	68,148.0	15720	0.0	42.1	47.92058314	-104.03037988	1874.529							
15730	WELD	68,190.1	15730	0.0	42.1	47.92047127	-104.03033990	1875.522							
15740	WELD	68,232.3	15740	0.0	42.1	47.92036264	-104.03028581	1880.497							
15750	WELD	68,274.3	15750	0.0	0.8	47.92025449	-104.03022943	1884.898							
10000056	Bend right - 24 deg., 3D	68,274.7	15750	0.1	0.7	47.92025341	-104.03022925	1884.913	0	12:00					
15760	WELD	68,275.1	15760	0.0	4.1	47.92025238	-104.03022923	1884.917							

Pipeline Listing

TDW Services, Inc.

Hiland Crude, LLC

Dore Junction to Dore Station

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)
15770	WELD	68,279.2	15770	0.0	1.5	47.92024134	-104.03023027	1884.879							
10000057	Bend up - 45 deg., 3D	68,279.9	15770	0.1	1.4	47.92023920	-104.03023047	1885.089	0	12:00					
15780	WELD	68,280.7	15780	0.0	10.6	47.92023735	-104.03023069	1885.548							
10000069	Pipe Exiting the Ground, Dore Station -- Han #257	68,287.8	15780	7.1	3.5	47.92022385	-104.03023270	1890.430							
15790	WELD	68,291.3	15790	0.0	1.6	47.92021707	-104.03023363	1892.889							
10000058	Bend down - 45 deg., 3D	68,292.1	15790	0.1	1.5	47.92021517	-104.03023385	1893.258	0	12:00					
15800	WELD	68,292.9	15800	0.0	3.0	47.92021304	-104.03023406	1893.393							
15810	WELD	68,295.9	15810	0.0	1.0	47.92020494	-104.03023482	1893.415							
10000059	Flange	68,296.4	15810	0.5	0.5	47.92020368	-104.03023495	1893.415	0	12:00					
15820	WELD	68,297.0	15820	0.0	1.3	47.92020224	-104.03023509	1893.415							
10000060	Tee at 90 deg.	68,297.6	15820	0.2	1.1	47.92020059	-104.03023525	1893.415	76	2:30					
15830	WELD	68,298.2	15830	0.0	1.3	47.92019895	-104.03023542	1893.415							
10000061	Pipe Support	68,299.0	15830	0.7	0.6	47.92019687	-104.03023561	1893.415							
15840	WELD	68,299.5	15840	0.0	3.0	47.92019560	-104.03023568	1893.415							
10000062	Flange	68,299.9	15840	0.4	2.5	47.92019437	-104.03023577	1893.415	0	12:00					
10000063	Valve (Receiver), Sta. 671+28, Dore Station	68,301.0	15840	1.5	1.5	47.92019138	-104.03023616	1893.413							
10000064	Flange	68,302.1	15840	2.6	0.4	47.92019139	-104.03023615	1893.413	0	12:00					
15850	WELD	68,302.5	15850	0.0	-	47.92019139	-104.03023615	1893.413							
12000001	End Run Tickle	68,341.1	15850	38.6	-	47.92019139	-104.03023615	1893.413							

Type	Number
DEFORMATION	0
GAINS	0
GROUPED PITS	7
LOCATIONS	70
MISC	2
SEAM VARIATION	23
WT CHANGES	63
WELDS	1575

General Inline Inspection Terms

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.

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.

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.

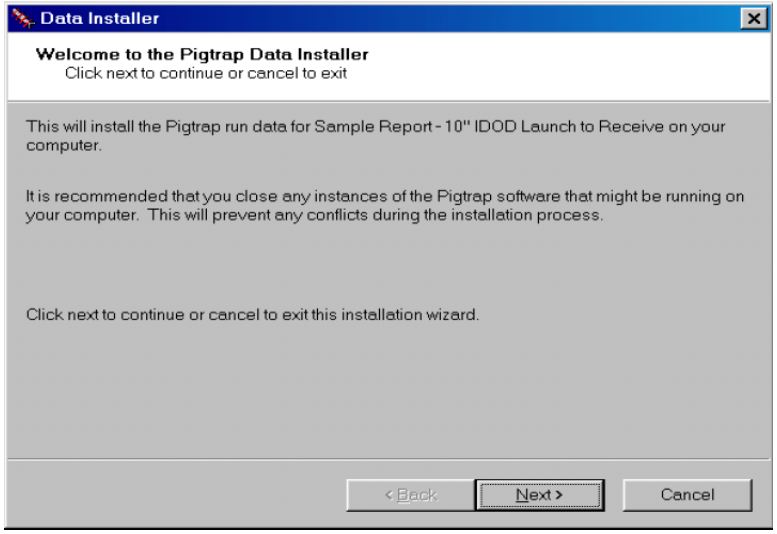
- Database – .MBD (Microsoft Data Base) Files of this type may be viewed through Microsoft Access. This file contains the analysis of the inspection.
- .rsf – This is a PigTrap™ reference file which holds specific settings for the run to be viewed.
- Spreadsheet – .XLS (Microsoft Excel) A Pipeline Listing 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.

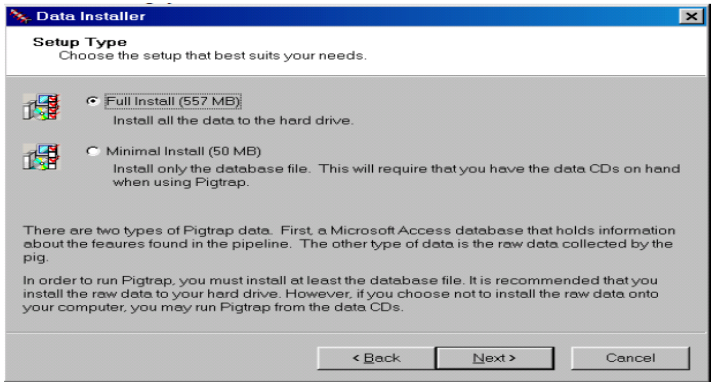


Note: If you want to install only the Pigtrap™ software and not the run data (advanced users only), choose Cancel and go to the Pigtrap™ Installation steps on page 3.

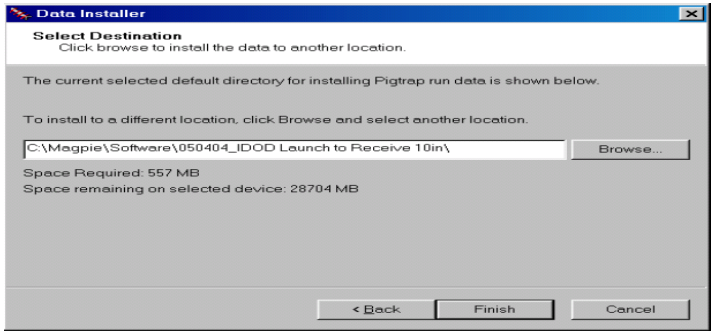
3. Click Next to continue installing the run data.

Appendix B

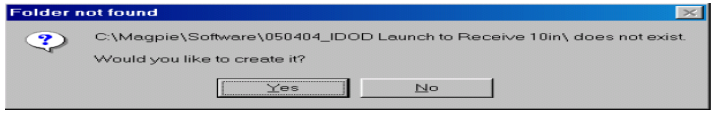
4. Choose the type of install you would like to perform: Full Install (recommended) or Minimal Install. The size of the installation is shown next to each type of installation. The database file must be installed for PigTrap™ to operate properly, but you may choose to not install the raw data. If you 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.



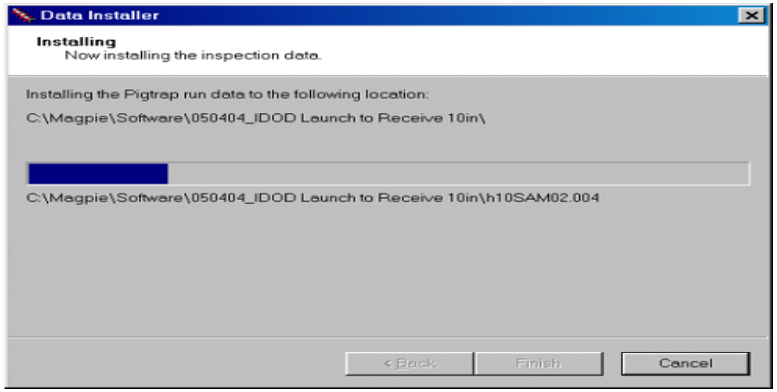
5. Choose the installation location on your computer for the data files. The default and recommended location is C:\Magpie\Software. The location inside this folder is based on the trap date, name, and size of the run. If you would like to specify another location, click the Browse... button. Click Finish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



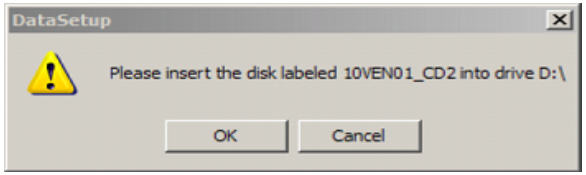
6. If the installation folder does not already exist, then you will be prompted to create it. Click Yes to create the new folder.



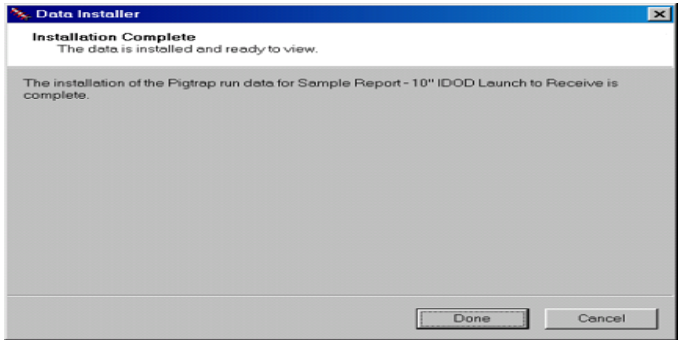
7. The following progress bar will appear. There may be a short delay while the database is being copied. Be patient, this is normal.



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.



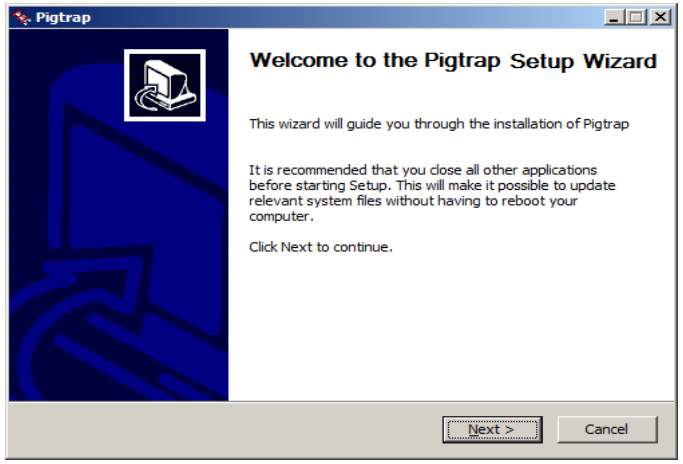
10. After clicking Done in the Data Installer PigTrap™ Installation will automatically launch.

Appendix B

PigTrap™ Installation

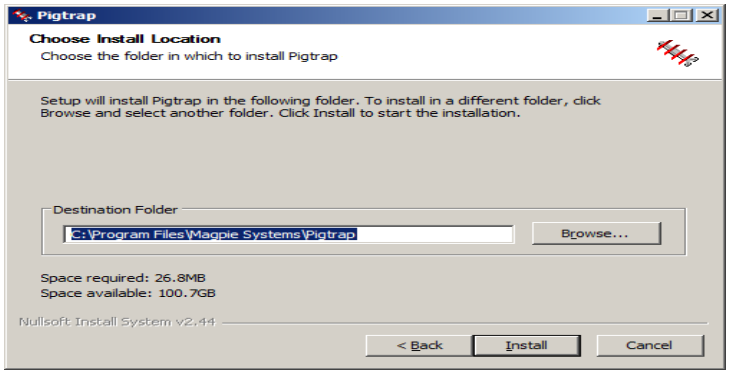
Note: CD and DVDs follow a slightly different installation process. Steps 1 and 2 are for external drives, if you are installing from CDs or DVDs please skip to step 3.

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.

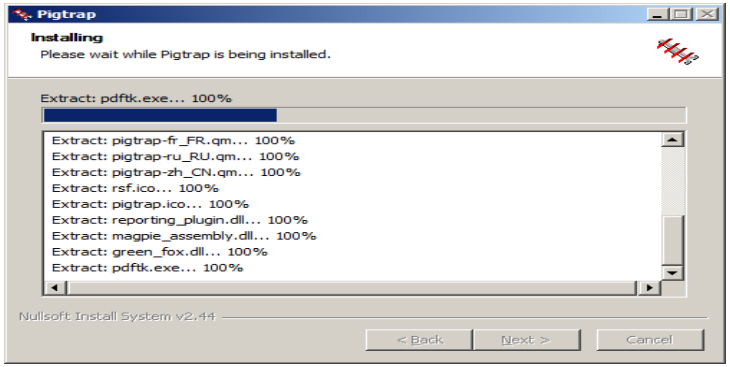


4. The Software License Agreement will appear. Read the agreement select I Agree to continue. You must accept the agreement to install PigTrap™.

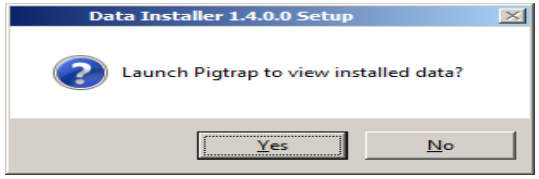
5. Choose the installation location on your computer for the PigTrap™ software. The default and recommended location is C:\Magpie\Software. Click Install to continue.



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.



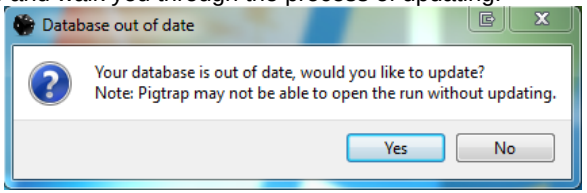
Appendix B

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.

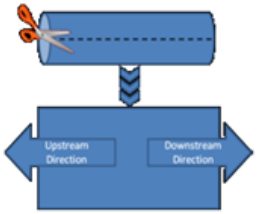
PigTrap™ was designed so you would have the ability to review previous TDW/Magpie inspection data when needed. However, you may need to acquire an updated Microsoft Access Data-base from one of our TDW representatives. When opening previous data in PigTrap™ you may encounter the message, "Your database 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.

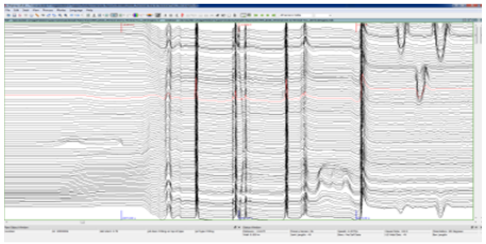


We packed so much into the new PigTrap™ the older reference files just couldn't hold it all so a new one may need to be created. Once the new reference file finishes, you will be able to freely navigate around in PigTrap™.

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

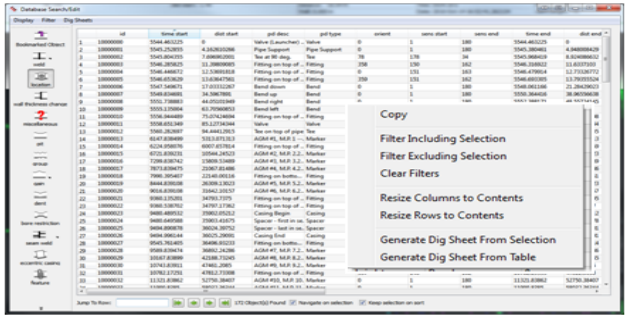
The horizontal scrollbar at the bottom of the main view moves the view upstream or downstream. Clicking on the left arrow moves upstream while clicking on the right arrow moves downstream.

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.

Sensor Buttons
Grayscale Backdrop
Color Backdrop
Thermal Backdrop
Sensor Trace
Odometer Buttons
Tool Speed Trace
IDOD Buttons
IDOD Backdrop
IDOD Trace
INS Buttons
Pitch/Yaw Bends
Raw INS Trace
Marker Trips
Weld Trace
Welds
Locations
Wall Thickness
Miscellaneous
Pits
Groups
Gains
Dents
Bore Restrictions
Seam Welds
Spiral Welds
Eccentric Casings
Bookmarks
Calibration event

Main

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

Open
Save
Open Database
Run Settings
Jump to Time
Jump to Distance
Find (DSE)
Undo Last View
Redo Last View
Zoom out
Zoom in
Auto Scroll u/s
Auto Scroll d/s

Database Navigation

These buttons navigate to features listed in the DSE.

Find by Time
Find by List
Jump to First
Jump to Previous
Jump to Next
Jump to Last

Sensor Visibility

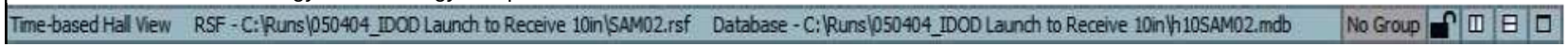
PigTrap™ allows user to zoom in on specific set of sensors, this dialog will display what sensors are currently being viewed. To return to viewing all sensors simply zoom out (-).

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.



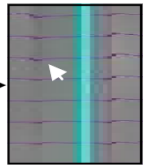
Display view
Technology
View Specifics
RSF Path
Database Path
Grouped Views
Lock View
Split Horizontal
Split Vertical
Maximize

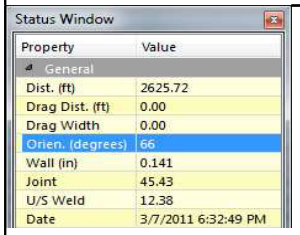
Displayed Information and Shortcuts

Pipe Object and Status Windows

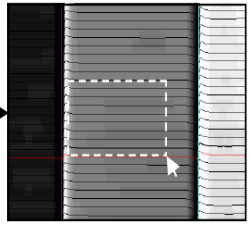
The Pipe Object and Status Windows will be defaulted to the right side of PigTrap™. Both windows can be docked and undocked by double clicking the title bar, left clicking and dragging or clicking the undock button located in the top right corner. As PigTrap™ has the ability to display multiple datasets 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.

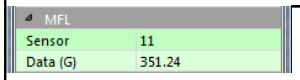
The pipe object window will display information about a highlighted feature, such as a weld, providing the weld ID and Distance. Features are highlighted when the cursor is placed upstream of an object and the object becomes highlighted with a teal color.



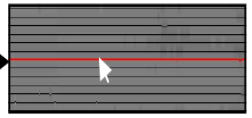


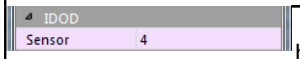
The General section of the Status Window will display information pertaining to all datasets. The information is dependent on the cursor location, displaying the current distance, orientation, wall thickness, joint length, up stream weld and date and time. The drag distance and drag width is populated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



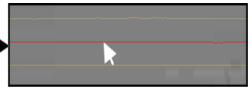


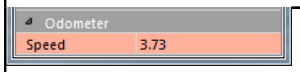
The MFL window will display information for the current highlighted sensor. The highlighted sensor will be a red line over the entire sensor. These sensors can be turned on and off using the Esc key.



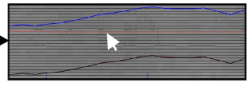


The IDOD window will display information for the current highlighted IDOD sensor. The IDOD sensors can be turned on by pressing the tilde (~) key.





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



Status Bar

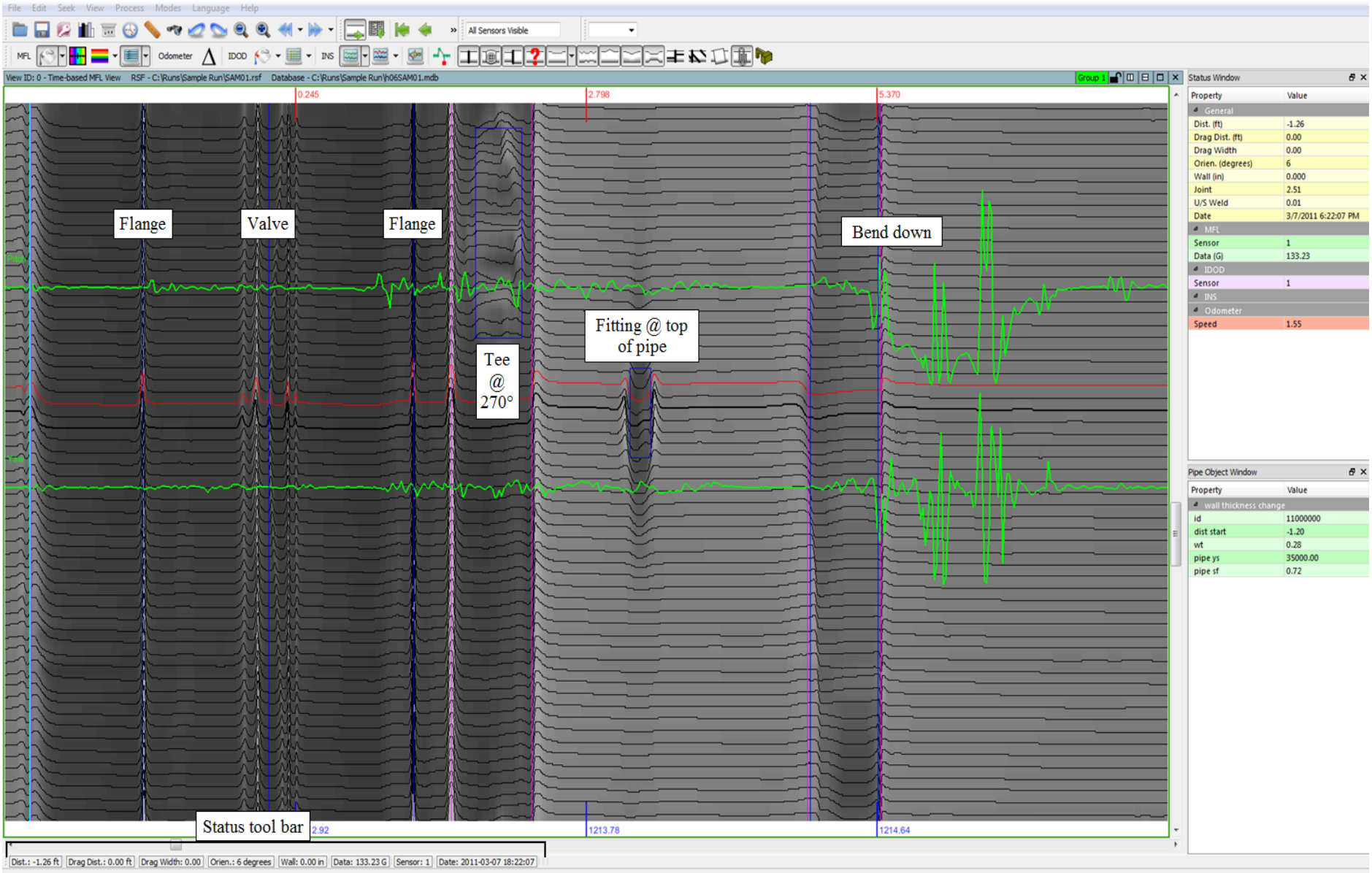
The Status Bar is located at the bottom left of PigTrap™ and contains much of the same information as the General section of the Status Window. It can also be customized by right clicking and selecting what information to display. The order can also be adjusted by clicking and dragging a section above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

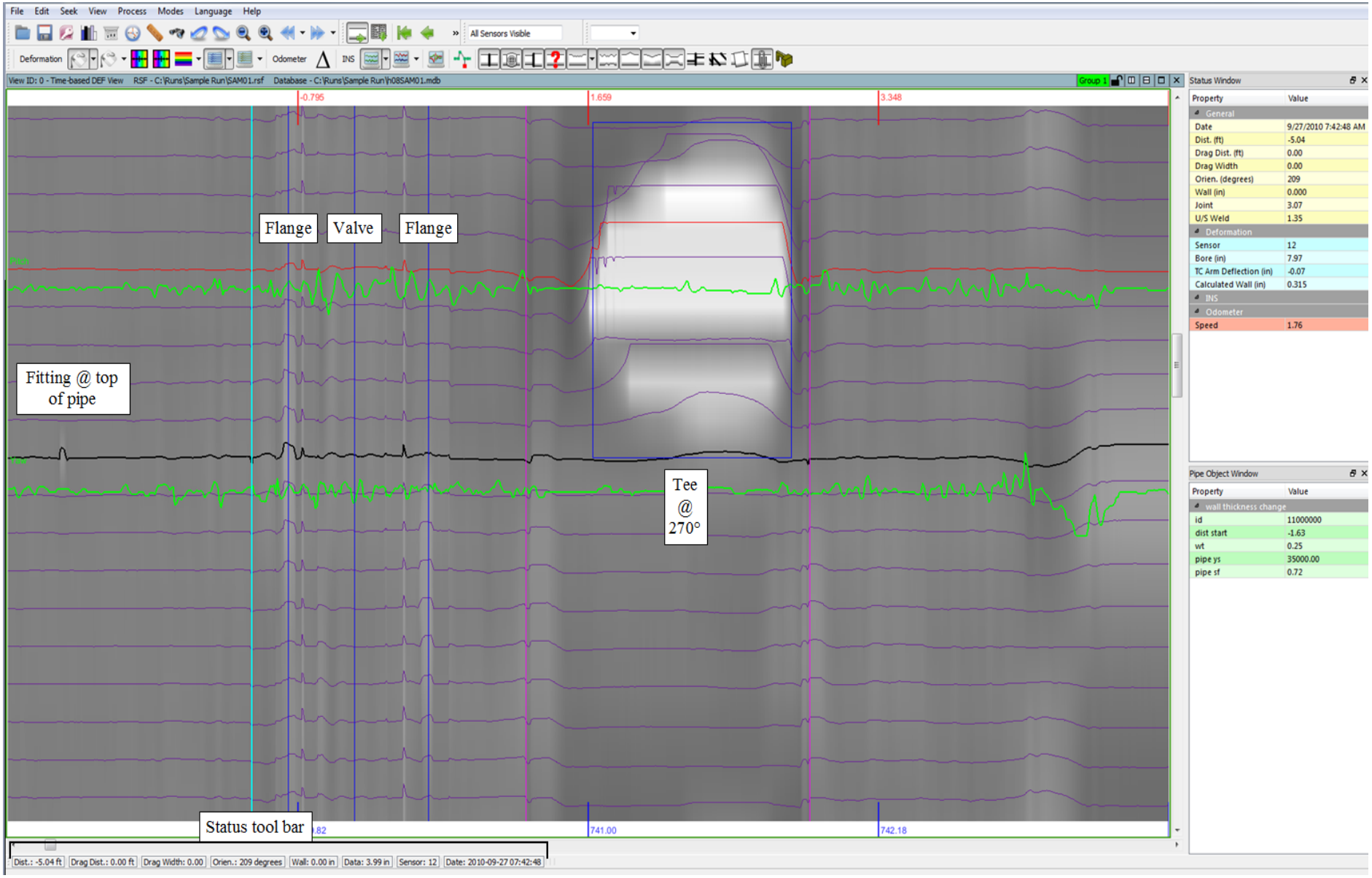
Appendix B

PigTrap™ MFL Runs



Appendix B

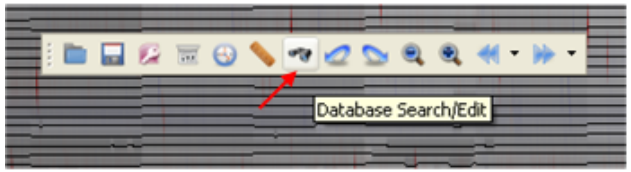
PigTrap™ DEF Runs



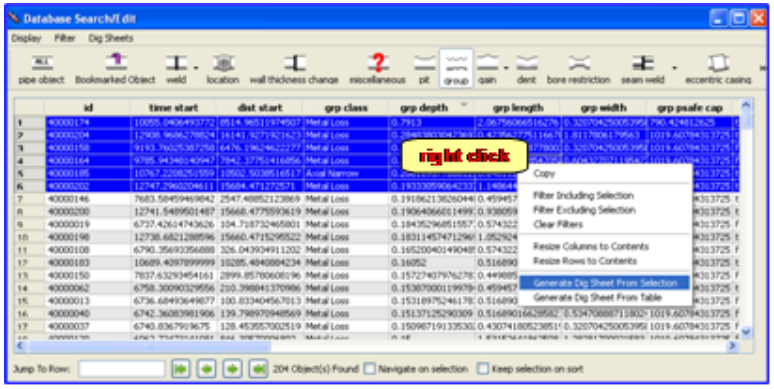
The user can view and print dig sheets for any anomaly or feature detected in the pipeline including Metal Loss (Groups or Pits), Dents, Locations, Gains, Wall Thickness changes, Welds, Miscellaneous notes, etc.

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.