End Of Workover Report
NLW-GT-02-S1 (Producer)

TRIAS WESTLAND B.V

Operator:	Trias Westland B.V p.a. Westland infra 2685 AP Poeldijk
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	Name	Function	Signature	Date
Prepared by	Leen Vlaming / Per Gwalter/ Axel Sanden	Site Supervisors		18-07-2019
Checked by	Axel Sanden	Production Technologist		18-07-2019
Approved by	Marleen Peeters	Senior Well Engineer		22-07-2019

Document Revision Control:

Revision no.	Chapter	Changed Items
0.0	Draft	
1.0	Final	Final inhole tallies and well status diagram

CONTENTS

1. Executive Summary

Operator Trias Westland has a geothermal doublet with a production well (NLW-GT-02-S1) and an injection well (NLW-GT-01). These wells were completed beginning of 2018. The wells were not taken into production as yet.

For both these wells, an alternative corrosion management strategy was designed where a tapered inner string of Glass Reinforced Epoxy (GRE) was planned to be installed. This GRE tubing will protect the primary casing through being sealed at the GRE shoe by means of a Polished Bore Receptacle (PBR) and seal stem.

Objectives:

- Safe handling of equipment
- Retrieve 13 5/8" casing
- Install 9 5/8" liner hanger-packer with Polished Bore Receptacle
- Install GRE casing
- Install Down Hole pump

The WO was partly conducted with the WellGear 460K HWO unit, and partly using an Odfjell work platform in combination with a crane.

Summary of operations:

- Hartmann removed x-mas tree, spool and wellhead section
- Retrieve hanger with 8 5/8" kill joint
- Rig up WellGear HWU
- Retrieve 13 5/8" Hanger with 996m 13 5/8" casing
- Install wear bushing in wellhead
- Set liner hanger-packer with PBR at 2420 m AHGL (bottom of tool)
- RIH 7", 9 5/8" and 13 3/8" GRE casing
- Due to obstruction the completion was POOH, centralizers removed and RIH again
- Completion stabbed in PBR and 21 ¼" hanger landed in wellhead
- Installed 13 5/8" wellhead
- RIH ESP on 8 5/8" coated casing and made splice/connection to pigtail
- Installed 7 1/16" X-mas tree

The work was performed from 10th of April to 8th May 2019. The well was officially handed over to Operations on 20th of May 2019.

2. Project Data

General

Supervisory personnel

Gerrit Schurink – Drilling Manager
Marleen Peeters – Senior Well engineer
Leen Vlaming / Per Gwalter / Axel Sanden / Joost van den Tilborg – site supervisors

Basic Well Data

Well Name	NLW-GT-02-S1
Operation	Install GRE string
Start of Operation	10th April 2019
Duration	25 days
Deviation	J-shaped well, max inclination 45.26°
Operator	Trias Westland B.V.
Grid Coordinate System	Rijksdriehoeksmeting / Netherlands New
Surface coordinates	X: 76154m (RD) Y: 445230m (RD)
Well Total Depth	2680.00 m MD, 2525.60 m TVD

Well intervention Unit

Work units : WellGear 460k Hydraulic Workover Unit
Boekesteijn Crane & Odfjell Work Platform

3. Borehole Section data

Depth references

Elevation	RT – GL	9.32 m
	GL – NAP	-0.90 m (NAP is 0.9 m BELOW Ground Level)
	NAP – RT	8.42 m

Tubing, GRE.

Well completion diagram – See appendix II

Casing detail

Item	Top (m MD)	Bottom (m MD)	Weight	Grade	Connection
30" Conductor	0	133	0.5" WT	S355	Welded
20" Casing	0	1244	133 ppf	NT95	BTC
13 ⅜" GRE Casing	0	899	37.8 ppf	2000 psi	GRE 4Rd/inch
9 ⅝" GRE Casing	899	2252	14.8 ppf	1750 psi	GRE 8Rd/inch
7" GRE	2252	2412.6*	8.3 ppf	1750 psi	GRE 8Rd/inch
8 ⅝" Polseal	0	662.30	32 ppf	L80	Polseal

*Length of NOV Seal stack plus x-over is 8.5m

4. Mud Properties

The well was full with production water.

5. Geological Data

NA – refer to original EOWR

6. HSE performance

Incidents / Accidents

No incidents

Drills / Exercises

I Muster drill,
Toolboxes each shift
Toolboxes with personnel involved when operation predicted.
WellGear had toolboxes each shift change

7. Daily Operations

10th April 2019
Hartmann removed x-mas tree and spool piece. Unseated 13 5/8" hanger with 1 tonne overpull due to vacuum. Removed 13 5/8" section of wellhead. Prepared location for HWU arrival. Checked equipment available on location X-Overs.

11th April 2019
WellGear commenced rigging up HWU
NOV packer PBR and seal stem equipment arrived on location.

12th April 2019
WellGear continued rigging up HWU
9 containers with GRE casing arrived on location.

13th April 2019
WellGear completed rig up.
Retrieved Hartmann casing hanger with a pull force from the wellhead of 181 tonne, the
13 5/8" string was retrieved out of the PBR with 207 ton, weight reduced to 154 tonne when seals were above the PBR. Retrieved 13 5/8" casing from the well. Casing was checked for NORM, no increase compared to background observed.
5 containers with GRE casing arrived on location.
It was decided to cancel the scraper run in well NLW-GT-02 (program amendment in place).

14th April 2019
Installed wear bushing in wellhead, prepare HWU for running PBR on packer.
Run in hole 9 5/8" NOV liner hanger packer with PBR on 5" DP

15th April 2019
Continued RIH NOV 9 5/8" liner hanger packer with 20'PBR. Observed tool string passing through 9 5/8" liner hanger at 2325mAHGL. Set 9 5/8" NOV liner hanger at 2417.2 m AHGL (mid packer) mule shoe at 2420m AHBGL. PT annulus and packer to 30 bar / 15 mins. Sheared NOV setting tool at 130 bar. POOH 5" DP.

16th April 2019
WellGear retrieved 5" DP and NOV running tool at surface.
Retrieved wear bushing from wellhead.
WellGear commenced rigging down HWU and skid over to well NLW-GT-01-ST

21th April 2019
Odfjell rigged up platform for running GRE completion. Toolbox prior running 7" GRE casing, observed difficulty with making up connections. Learning is to rule out:

Too much tape, tape up and down the pin, minimum overlap
Dope pin, thread must be filled
Dope box minimum
Take off all tong marks on casing for avoiding hang up of elevator
Make up casing until thread is disappeared into box (torque is less important)
Use chain tong for screwing in the first 5 threads

22nd April 2019
RIH GRE casing, observed difficulty making up 9 5/8" 8Rd/inch connection. Discussed with FPI engineer method of making up connections. 4 rejects, threads were damaged. Followed supervisor instructions making up GRE casing.

23rd April 2019
RIH GRE casing. Special care was taken for Teflon taping and dope as per FPI instructions

24th April 2019
RIH GRE casing.

25th April 2019
RIH GRE casing. Observed spike of 3 ton weight loss and obstruction at 2322mAHGL. Set weight loss of 8 ton of string weight to 21 ton. Ordered big volume water pump to clear mule shoe area of GRE casing.

26th April 2019
Reciprocated GRE string in order to solve blockage. Pumped 3 m3 fresh water, unable to ran in the hole with GRE string. It was decided to retrieve the string. POOH 13 3/8" GRE casing.
Lay out GRE string in doubles

27th April 2019
Observed high percentage of thread damage with 9 5/8" casing on pin and box. High breaking force. Torque above 15000 ft.lb to 25000 ft.lb was observed at surface. Casing with damages were rejected by the FPI engineer. The threads, pin and box show high torque and thread dame/blockage of Teflon tape.

28th April 2019
Retrieve 9 5/8" from the well. High percentage of rejected casing due to damaged threads.

29th April 2019
Retrieve 9 5/8" from the well. High percentage of rejected casing due to damaged threads.

30th April 2019
Retrieve 7" GRE casing from the well with all centralizers attached to the casing. Removed centralizers, OD of 7" casing and centralizers exceeded maximum tolerance of the 9 5/8" casing. Checked NOV equipment, noticed malfunction of Self Aligned Mule shoe. Repaired SAM and run in hole on 7" casing.
Changed amount of Teflon to 1 wrap from bottom to top of pin and less dope as prescribed.

1st May 2019
Continued running in the hole with GRE casing, x-over to 9 5/8" and continued running in the hole.

2nd May 2019
Continued running in the hole with 9 5/8" GRE casing. X-over to 13 3/8" and continued with 13 3/8" GRE casing

3rd May 2019
Continued running in the hole with GRE casing, passed top PBR 13 5/8" x 9 5/8" with 4 attempts and ¼ turn of the string. Spaced out casing into the 9 5/8" liner hanger at 2410mAHGL (top liner hanger) PUW is 41.6 tonne and SOW is 32.8 tonne. No indication of sharing of shear ring observed. RIH with string to bottom of PBR for confirmation of space out.

4th May 2019
Landed 13 5/8" casing hanger, bottom of seal stack is 2412.6AHGL (first seal 2m into PBR). Expro rigged up coated slickline and run in hole with 3.4" drift to 2451mAHGL. Expro run in hole with MTI (memory Multi Tube Integrity logging tool) to determine the status of the metal casing of the well. Commenced logging from 2424 to 1150mAHGL 4 metre per minute. Decreased logging speed to 2 metre per minute from 1150m to 780m AHGL.

5th May 2019

Continued logging to surface and performed repeating pass for confirmation. Expro completed logging operation. Pressure tested annulus to 10 bar with Haskel pump, good test.
GEBH prepared ESP pump equipment. Changed out the oil of the pumps. Hartmann installed 13 5/8" wellhead section.

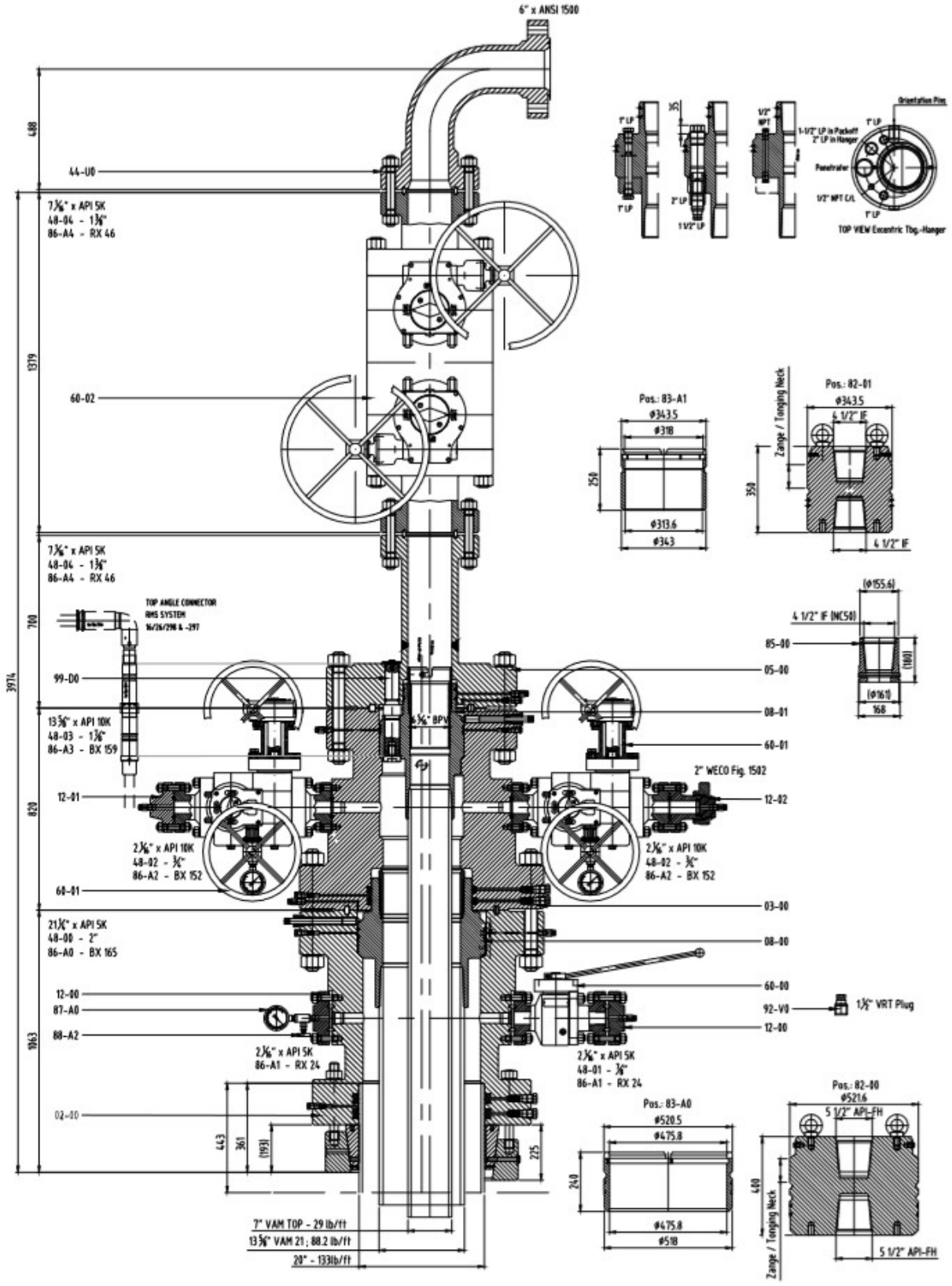
6th May 2019
GEBH continued preparing the ESP pump. Run in hole ESP pump with 8 5/8" Polseal coated casing to 662.3mAHGL (bottom of tool). Cable was clamped on each coupling to surface, GEBH made splice and lower pigtail.

7th May 2019
Landed hanger in 13 5/8" wellhead and rigged down Odfjell working platform.
Handed well to operations. Operations observed movement in the wellhead while tying in flowline.

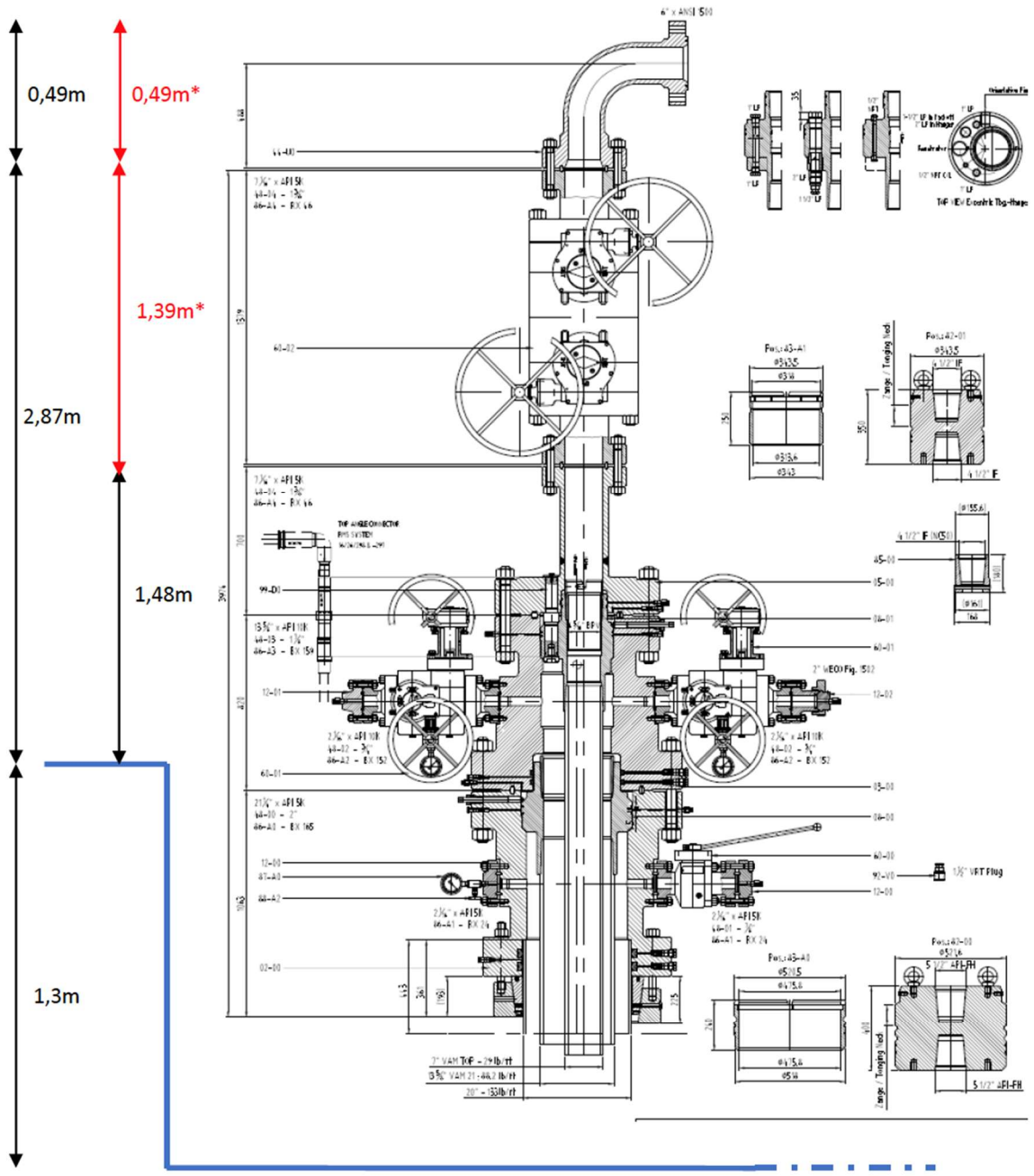
8th May 2019
Hartmann arrived on location and checked both wells, Sliplocks of both are in good order, no movement on well NLW-GT-01. Observed that the 20" casing is not well cemented in. HUD in 20" -30" annulus was measured at 6m below ground level.

8. APPENDICES

Appendix I – Wellhead and X-tree

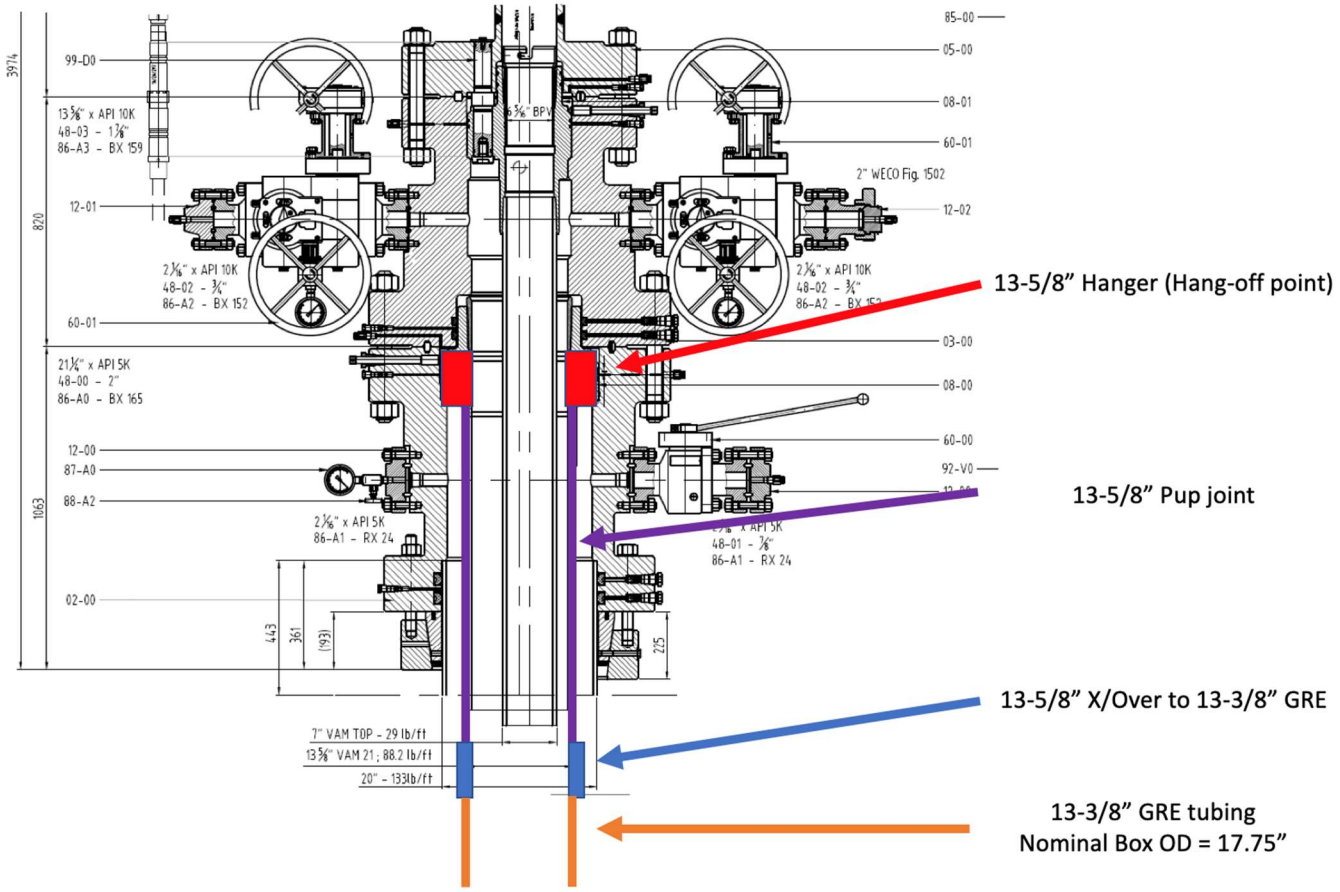


Current Well Head and Cellar Dimensions for NLW-GT-01 / NLW-GT-02-S1



*Installation not strictly required, replaceble with approx 0,20-0,25m component (blind valve or similar).
Cellar dimension: 3m x 3m x 1,3m (length x width x depth)

Hartmann 5000psi Wellhead System



Appendix II – Well Status Diagrams –

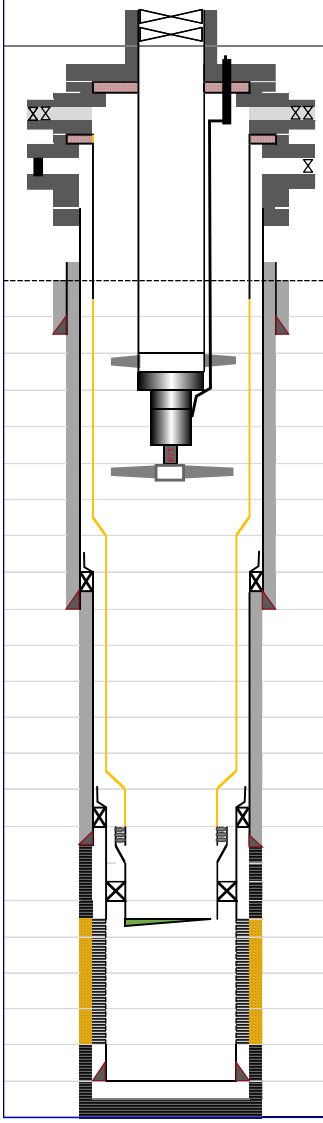
Well Name: NLW-GT-02-S1-P	Revision Date: May 7, 2019	GRE Tapered String	Drawing is not to scale!			
Well Schematic	Depth		Items	OD	ID	Drift	Notes
	m AHGL	m TVDGL		In	In	In	
	0	0	WELLHEAD Hartmann 5k psi 2x 7-1/16 + 5000PSI Gate Valves Ground Level				
			Flange + Tubing hanger (BPV threadprotector installed) + Penetrator				
			2 x 2x 2-1/16" - 5000PSI Gate Valve				
			1x 2-1/16" - 5000PSI Ball Valve + blind flange				
			Slip on Wellhead				
			13-5/8" Pupjoint				
			Bottom Cellar				
	1.58		13-5/8" casing X/O to 13-3/8" GRE				
	93	93	Static Fluid Level				
			8 5/8" 32ppf L80 Tubing	8.625	7.921	7.796	
	635	tbd	18 stages pump intake	9.000			
	639		Seal bottom	6.75			
	660		Motor bottom	7.25			
	661	tbd	Pressure temperature gauge (bottom)				
			13-3/8" GRE Tubing (Nominal Box OD = 17.75")	13.770	11.970	11.870	
	899		13-3/8" GRE X/O to 9-5/8" GRE				
	983	967	20" x 16" Liner Hanger. Slips & Packer X/O to 13-5/8" (TOL)				
	1093	1076	Surface Casing: 20" 133ppf NT95DE ERW BTC	20.000	18.730	18.542	Drilled with 24" bit
			9-5/8" GRE Tubing (Nominal Box OD = 11.85")	8.98	7.84	7.75	
	2252		9-5/8" GRE X/O to 7" GRE				
	2316	2254	13-5/8" x 9-5/8" Liner Hanger. Slips & Packer (TOL)				
	2366	2287	Intermediate Liner: 13-5/8" 88.2ppf L80 VAM 21	13.625	12.380	12.250	
			7" GRE Tubing (Nominal Box OD = 8.10")	7.11	6.21	6.11	Drilled with 17.5" bit
	2410		Top PBR				
	2413		Self aligning muleshoe of tie back seal stem.	8.26	6.24	6.15	
			Seal stack (Mule shoe) Internally coated				
	2420		Wireline entry guide			6.15	
	2451	2356	Top Screens				
			7" GRE Tubing (Nominal Box OD = 8.10")	6.97	6.21	6.11	
	2569	2444	Bottom screens				
	2633	2490	Production liner: 9-5/8" 53.5ppf L80 VAM 21 WWS	9 5/8	8.535	8.5	
	2671	2633	TD				Drilled with 12.25" bit

Figure 1: NLW-GT-02-S1: Current Status - Producer

Appendix III – Directional Plots

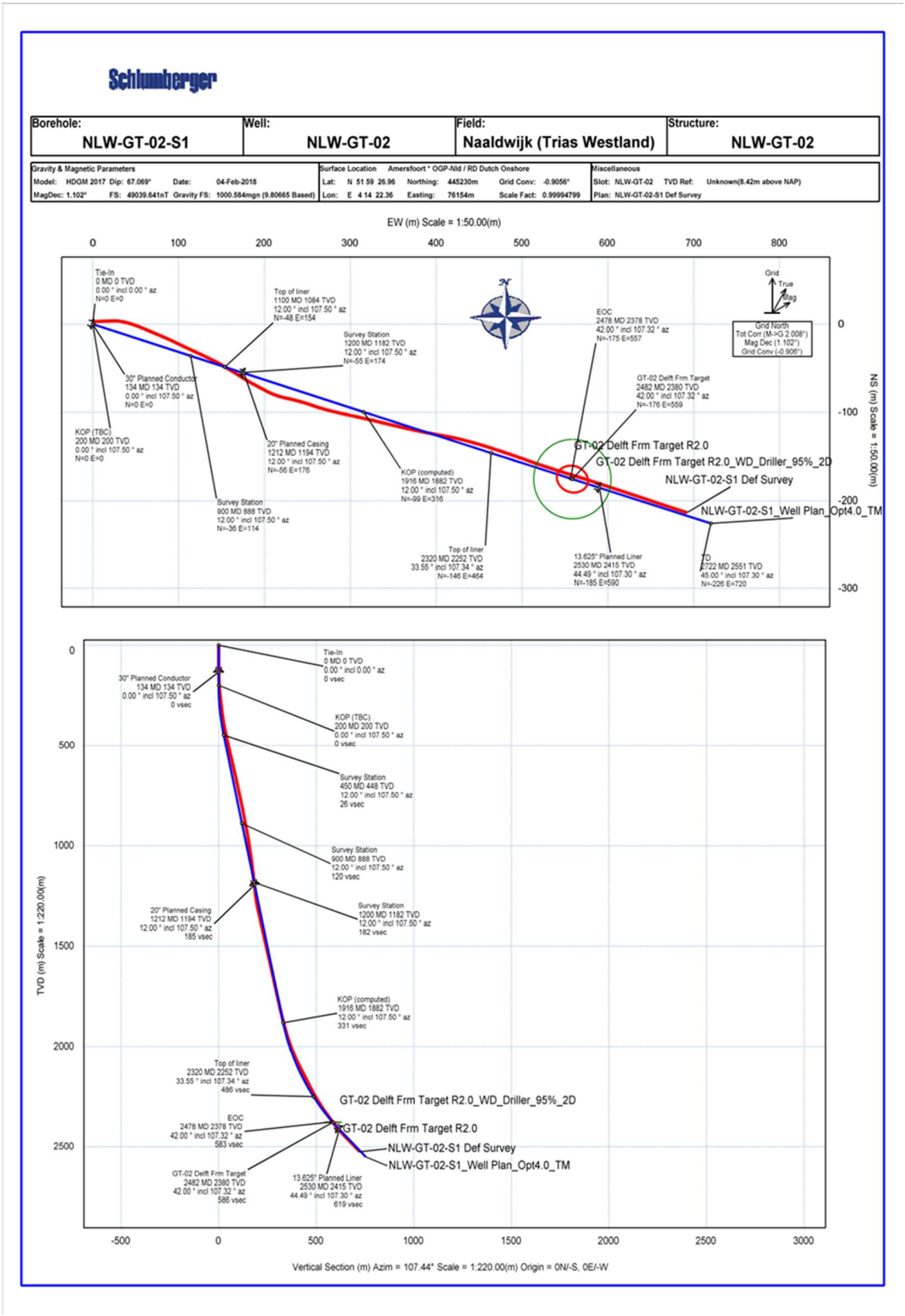


Figure 1: NLW-GT-02-S1 Vertical Section plot and plan view plot- drilled vs. planned

Appendix IV - Well data

Well tested in May 2018

Well Bore Fluids:

- Brine

Reservoir fluid Bottom Hole temperature: 90°C

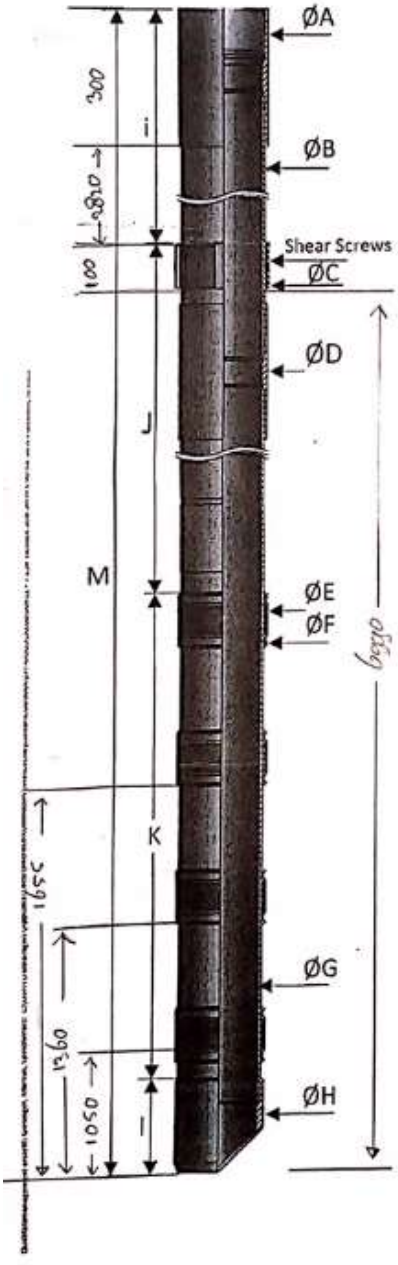
Drawing PBR and Seal Stack

AFTER LOCATOR SHEAR ST/ 9,1 M TO LAND M.SHOE ON SETTING SLEEVE.

NOV Completion & Production Solutions

Dimensional Inspection Sheet – Seal Stem

Erstellt:	Revision:	Seite:
18.04.2018	0.2	1/1



Tool Description	7" 23# Tieback Seal Stem L 80 Incl. 4Seals for 30ft PBR – VAM21 Box
Item Number	30.80.00411
Serial Number	ASSY 34037/1/1

Dimensions as per Drawing: 30.80.00411 and sub drawings – Rev 01

#	Drawing Measurement	Unit	#	Physical Measurement	Unit
A	190.90+1.40	mm	A	191.6	mm
B	177.80 +1.78 +0.40	mm	B	179,2	mm
C	210.00 -0.50	mm	C	209,8	mm
D	187.70+0.75	mm	D	188,2	mm
E	190.50 +0.10	mm	E	191,8	mm
F	189.50 ±0.10	mm	F	189,4 ✓	mm
G	161.70 +0.50	mm	G	159,9	mm
H	186.50 -0.50	mm	H	186,9	mm
I	3117.00	mm	I	3117	mm
J	5399.00	mm	J	5042	mm
K	1 057.00	mm	K	1354	mm
L	200.00 +12/-0	mm	L	200	mm
M	9773.00 ±1.00	mm	M	9417	mm

Maximum OD:	209,8		mm
Minimum ID:	159,9		mm
Drift Diameter:	158,6		
Shear Screw(s) Installed	Yes / ~~No~~	QTY:	6 [3]
Shear Force per Screw:	1,11	Ton / ~~Lbf~~	
Total Shear Force:	6,66 [3,33]	Ton / ~~Lbf~~	

Measuring Equipment Serial Numbers

Calipers:	MS 7347 /
Drift:	DK9

Additional Comments: Sonderfreigabe
Drift nicht nach Vorgabe Soll 7" 23# ist 7" 26# Freigabe F. Piengar

	Name	Signature	Date
Measured by:	M. Borgardy	M. Borgardy	01.04.19
Verified by:	[illegible]	[illegible]	01.04.19

Self aligning Muleshoe added,
Top seal stack removed as per customer, Leon Fleming

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Casing tallies

GRE – String:

ing+ X-over data														
Type	Description	OD	Max Box OD	ID	Grade	Weight	Capacity	Casing Displ	tom Connection		Top Connection		MU loss	Total in string
		Inch	Inch	Inch		kg/m	l/m	l/m	BOX/PIN	Thread	BOX/PIN	Thread	(m)	
1	Seal stack	7.5	8.27	6.366	Steel		21	14	None	-	Box	VAM21	0.10	1
2	X-over 7"x7" pin pin	7	na	4.778	Steel		12	13	Pin	VAM21	Pin	8Rd LTC	0.23	1
3	Steel 7" coupler	7.656	7.656		L80		0	30	Box	8Rd LTC	Box	8Rd LTC	0.00	1
4	7" GRE	7.11	8.2	6.21	GRE-RB1750	12.4	20	6	Pin	8Rd LTC	Box	8Rd LTC	0.11	17
5	7" GRE bevelled couplers	7.11	8.2	6.21	GRE-RB1750	12.4	20	6	Pin	8Rd LTC	Box	8Rd LTC	0.11	0
6	7" x 9-5/8" GRE Reducer				GRE-RB1750		0	0	Pin	8Rd LTC	Box	8Rd LTC	0.11	1
7	9-5/8" GRE	8.98	12	7.84	GRE-RB1750	22	31	10	Pin	8Rd LTC	Box	8Rd LTC	0.18	0
8	9-5/8" GRE bevelled couplers	8.98	12	7.84	GRE-RB1750	22	31	10	Pin	8Rd LTC	Box	8Rd LTC	0.13	157
9	9-5/8" x 10-3/4" GRE reducer				GRE-RB1750		0	0	Pin	8Rd LTC	Box		0.00	1
10	10-3/4" x 11-3/4" GRE reducer				GRE-RB1750		0	0	Pin		Box		0.00	1
11	11-3/4" x 13-3/8" GRE reducer				GRE-RB1750		0	0	Pin		Box	4Rd LTC	0.00	1
12	13-3/8" GRE	13.77	17.9	11.97	GRE-RB2000	54.6	73	23	Pin	4Rd LTC	Box	4Rd LTC	0.21	105
13	13-3/8" GRE pin x pin	13.77	17.9	11.97	GRE-RB2000	54.6	73	23	Pin	4Rd LTC	Pin	4Rd LTC	0.19	0
14	Steel 13-3/8" coupler	14.375	14.375		L80		0	105	Box	4Rd LTC	Box	4Rd LTC	0.10	0
15	X-over 13-3/8" x 13-5/8"	13.625	14.699	12	L80		73	21	Pin	4Rd LTC	Box	VAM21	0.10	1
16	13-5/8" pup-joint				L80		0	0	Pin	VAM21	Pin	VAM21	0.15	1
17	Casing Hanger 13-5/8"	14.76	20.5	12.4	AISI410 (Cr13)		78	32	Box	VAM21	Box	VAM21	0.15	1

Running order	Joint name	Type	Joint No	Pipe Length [m]	Make up length [m]	Cumul. Length [m]	Top depth TDB [m]
0	Shoe depth						2412.6
1	Seal stack	1	55	7.04	6.9	6.9	2405.649
2	X-over 7"x7" pin pin	2	X-O	1.82	1.6	8.5	2404.0576
3	Steel 7" coupler	3	X-O	0.23	0.2	8.8	2403.8276
4	7" GRE	4	31	9.04	8.9	17.7	2394.9019
5	7" GRE	4	2	8.97	8.9	26.5	2386.0462
6	7" GRE	4	43	9.01	8.9	35.4	2377.1505
7	7" GRE	4	21	9.00	8.9	44.3	2368.2648
8	7" GRE	4	3	8.82	8.7	53.0	2359.5591
9	7" GRE	4	41	8.99	8.9	61.9	2350.6834
10	7" GRE	4	22	9.00	8.9	70.8	2341.7977
11	7" GRE	4	59	9.01	8.9	79.7	2332.902
12	7" GRE	4	46	9.04	8.9	88.6	2323.9763
13	7" GRE	4	40	9.02	8.9	97.5	2315.0706
14	7" GRE	4	58	9.04	8.9	106.4	2306.1449
15	7" GRE	4	45	9.00	8.9	115.3	2297.2592
16	7" GRE	4	11	9.06	8.9	124.3	2288.3135
17	7" GRE	4	38	9.02	8.9	133.2	2279.4078
18	7" GRE	4	51	8.97	8.9	142.0	2270.5521
19	7" GRE	4	52	9.05	8.9	151.0	2261.6164
20	7" GRE	4	54	9.04	8.9	159.9	2252.6907
21	7" x 9-5/8" GRE Reducer	6	X-O	0.88	0.8	160.7	2251.925
22	9-5/8" GRE bevelled couplers	8	225	8.96	8.8	169.5	2243.09
23	9-5/8" GRE bevelled couplers	8	203	8.94	8.8	178.3	2234.275
24	9-5/8" GRE bevelled couplers	8	279	8.94	8.8	187.1	2225.46
25	9-5/8" GRE bevelled couplers	8	281	8.92	8.8	195.9	2216.665
26	9-5/8" GRE bevelled couplers	8	344	8.90	8.8	204.7	2207.89
27	9-5/8" GRE bevelled couplers	8	253	9.01	8.9	213.6	2199.005
28	9-5/8" GRE bevelled couplers	8	255	9.02	8.9	222.5	2190.11
29	9-5/8" GRE bevelled couplers	8	347	8.92	8.8	231.3	2181.315
30	9-5/8" GRE bevelled couplers	8	339	9.02	8.9	240.2	2172.42
31	9-5/8" GRE bevelled couplers	8	315	9.00	8.9	249.0	2163.545
32	9-5/8" GRE bevelled couplers	8	272	8.96	8.8	257.9	2154.71
33	9-5/8" GRE bevelled couplers	8	204	8.91	8.8	266.7	2145.925
34	9-5/8" GRE bevelled couplers	8	200	9.03	8.9	275.6	2137.02
35	9-5/8" GRE bevelled couplers	8	349	9.02	8.9	284.5	2128.125
36	9-5/8" GRE bevelled couplers	8	43	9.01	8.9	293.3	2119.24
37	9-5/8" GRE bevelled couplers	8	358	9.02	8.9	302.2	2110.345
38	9-5/8" GRE bevelled couplers	8	214	9.03	8.9	311.1	2101.44
39	9-5/8" GRE bevelled couplers	8	189	8.99	8.9	320.0	2092.575
40	9-5/8" GRE bevelled couplers	8	355	9.01	8.9	328.9	2083.69
41	9-5/8" GRE bevelled couplers	8	47	9.01	8.9	337.8	2074.805
42	9-5/8" GRE bevelled couplers	8	40	8.97	8.8	346.6	2065.96
43	9-5/8" GRE bevelled couplers	8	404	9.04	8.9	355.5	2057.045
44	9-5/8" GRE bevelled couplers	8	412	8.98	8.9	364.4	2048.19
45	9-5/8" GRE bevelled couplers	8	154	8.77	8.6	373.0	2039.545
46	9-5/8" GRE bevelled couplers	8	191	8.97	8.8	381.9	2030.7
47	9-5/8" GRE bevelled couplers	8	213	9.01	8.9	390.8	2021.815
48	9-5/8" GRE bevelled couplers	8	276	8.92	8.8	399.6	2013.02
49	9-5/8" GRE bevelled couplers	8	205	8.98	8.9	408.4	2004.165
50	9-5/8" GRE bevelled couplers	8	322	8.93	8.8	417.2	1995.36
51	9-5/8" GRE bevelled couplers	8	408	8.90	8.8	426.0	1986.585
52	9-5/8" GRE bevelled couplers	8	39	9.03	8.9	434.9	1977.68
53	9-5/8" GRE bevelled couplers	8	219	8.93	8.8	443.7	1968.875
54	9-5/8" GRE bevelled couplers	8	54	8.99	8.9	452.6	1960.01
55	9-5/8" GRE bevelled couplers	8	52	8.96	8.8	461.4	1951.175
56	9-5/8" GRE bevelled couplers	8	157	9.02	8.9	470.3	1942.28
57	9-5/8" GRE bevelled couplers	8	70	8.99	8.9	479.2	1933.415
58	9-5/8" GRE bevelled couplers	8	174	9.00	8.9	488.0	1924.54
59	9-5/8" GRE bevelled couplers	8	180	8.97	8.8	496.9	1915.695
60	9-5/8" GRE bevelled couplers	8	288	9.03	8.9	505.8	1906.79
61	9-5/8" GRE bevelled couplers	8	175	9.00	8.9	514.7	1897.915
62	9-5/8" GRE bevelled couplers	8	65	9.01	8.9	523.6	1889.03
63	9-5/8" GRE bevelled couplers	8	218	8.96	8.8	532.4	1880.195

64	9-5/8" GRE bevelled couplers	8	169	8.93	8.8	541.2	1871.39
65	9-5/8" GRE bevelled couplers	8	360	9.01	8.9	550.1	1862.505
66	9-5/8" GRE bevelled couplers	8	152	9.00	8.9	559.0	1853.63
67	9-5/8" GRE bevelled couplers	8	194	8.92	8.8	567.8	1844.835
68	9-5/8" GRE bevelled couplers	8	25	9.02	8.9	576.6	1835.94
69	9-5/8" GRE bevelled couplers	8	375	8.95	8.8	585.5	1827.115
70	9-5/8" GRE bevelled couplers	8	316	8.96	8.8	594.3	1818.28
71	9-5/8" GRE bevelled couplers	8	342	8.92	8.8	603.1	1809.485
72	9-5/8" GRE bevelled couplers	8	50	8.96	8.8	611.9	1800.65
73	9-5/8" GRE bevelled couplers	8	197	8.94	8.8	620.8	1791.835
74	9-5/8" GRE bevelled couplers	8	151	9.02	8.9	629.6	1782.94
75	9-5/8" GRE bevelled couplers	8	114	9.00	8.9	638.5	1774.065
76	9-5/8" GRE bevelled couplers	8	403	8.99	8.9	647.4	1765.2
77	9-5/8" GRE bevelled couplers	8	90	9.01	8.9	656.3	1756.315
78	9-5/8" GRE bevelled couplers	8	101	8.96	8.8	665.1	1747.48
79	9-5/8" GRE bevelled couplers	8	126	8.91	8.8	673.9	1738.695
80	9-5/8" GRE bevelled couplers	8	296	8.84	8.7	682.6	1729.98
81	9-5/8" GRE bevelled couplers	8	84	9.00	8.9	691.5	1721.105
82	9-5/8" GRE bevelled couplers	8	87	8.95	8.8	700.3	1712.28
83	9-5/8" GRE bevelled couplers	8	44	8.90	8.8	709.1	1703.505
84	9-5/8" GRE bevelled couplers	8	79	8.91	8.8	717.9	1694.72
85	9-5/8" GRE bevelled couplers	8	111	9.02	8.9	726.8	1685.825
86	9-5/8" GRE bevelled couplers	8	391	8.94	8.8	735.6	1677.01
87	9-5/8" GRE bevelled couplers	8	364	8.88	8.8	744.3	1668.255
88	9-5/8" GRE bevelled couplers	8	222	9.01	8.9	753.2	1659.37
89	9-5/8" GRE bevelled couplers	8	215	8.96	8.8	762.1	1650.535
90	9-5/8" GRE bevelled couplers	8	29	8.99	8.9	770.9	1641.67
91	9-5/8" GRE bevelled couplers	8	378	8.99	8.9	779.8	1632.805
92	9-5/8" GRE bevelled couplers	8	231	8.93	8.8	788.6	1624
93	9-5/8" GRE bevelled couplers	8	244	8.85	8.7	797.3	1615.275
94	9-5/8" GRE bevelled couplers	8	308	8.98	8.9	806.2	1606.42
95	9-5/8" GRE bevelled couplers	8	34	8.96	8.8	815.0	1597.585
96	9-5/8" GRE bevelled couplers	8	227	8.97	8.8	823.8	1588.74
97	9-5/8" GRE bevelled couplers	8	182	8.94	8.8	832.7	1579.925
98	9-5/8" GRE bevelled couplers	8	295	8.96	8.8	841.5	1571.09
99	9-5/8" GRE bevelled couplers	8	300	9.03	8.9	850.4	1562.185
100	9-5/8" GRE bevelled couplers	8	310	9.02	8.9	859.3	1553.29
101	9-5/8" GRE bevelled couplers	8	389	9.07	8.9	868.2	1544.345
102	9-5/8" GRE bevelled couplers	8	184	9.02	8.9	877.1	1535.45
103	9-5/8" GRE bevelled couplers	8	49	9.00	8.9	886.0	1526.575
104	9-5/8" GRE bevelled couplers	8	394	9.05	8.9	894.9	1517.65
105	9-5/8" GRE bevelled couplers	8	164	9.04	8.9	903.9	1508.735
106	9-5/8" GRE bevelled couplers	8	387	8.94	8.8	912.7	1499.92
107	9-5/8" GRE bevelled couplers	8	48	8.95	8.8	921.5	1491.095
108	9-5/8" GRE bevelled couplers	8	202	8.95	8.8	930.3	1482.27
109	9-5/8" GRE bevelled couplers	8	274	8.99	8.9	939.2	1473.405
110	9-5/8" GRE bevelled couplers	8	228	9.01	8.9	948.1	1464.52
111	9-5/8" GRE bevelled couplers	8	229	8.95	8.8	956.9	1455.695
112	9-5/8" GRE bevelled couplers	8	271	8.94	8.8	965.7	1446.88
113	9-5/8" GRE bevelled couplers	8	262	9.00	8.9	974.6	1438.005
114	9-5/8" GRE bevelled couplers	8	72	9.02	8.9	983.5	1429.11
115	9-5/8" GRE bevelled couplers	8	242	8.98	8.9	992.3	1420.255
116	9-5/8" GRE bevelled couplers	8	4	8.91	8.8	1001.1	1411.47
117	9-5/8" GRE bevelled couplers	8	311	8.97	8.8	1010.0	1402.625
118	9-5/8" GRE bevelled couplers	8	23	8.98	8.9	1018.8	1393.77
119	9-5/8" GRE bevelled couplers	8	16	8.88	8.8	1027.6	1385.015
120	9-5/8" GRE bevelled couplers	8	267	8.97	8.8	1036.4	1376.17
121	9-5/8" GRE bevelled couplers	8	241	8.90	8.8	1045.2	1367.395
122	9-5/8" GRE bevelled couplers	8	236	9.03	8.9	1054.1	1358.49
125	9-5/8" GRE bevelled couplers	8	379	8.96	8.8	1062.9	1349.655
126	9-5/8" GRE bevelled couplers	8	302	8.99	8.9	1071.8	1340.79
127	9-5/8" GRE bevelled couplers	8	45	9.03	8.9	1080.7	1331.885
128	9-5/8" GRE bevelled couplers	8	285	8.98	8.9	1089.6	1323.03
129	9-5/8" GRE bevelled couplers	8	243	8.95	8.8	1098.4	1314.205
130	9-5/8" GRE bevelled couplers	8	380	8.89	8.8	1107.1	1305.44
131	9-5/8" GRE bevelled couplers	8	250	9.02	8.9	1116.0	1296.545
132	9-5/8" GRE bevelled couplers	8	341	8.98	8.9	1124.9	1287.69

133	9-5/8" GRE bevelled couplers	8	305	9.03	8.9	1133.8	1278.785
134	9-5/8" GRE bevelled couplers	8	41	8.83	8.7	1142.5	1270.08
135	9-5/8" GRE bevelled couplers	8	337	8.94	8.8	1151.3	1261.265
136	9-5/8" GRE bevelled couplers	8	258	8.95	8.8	1160.1	1252.44
137	9-5/8" GRE bevelled couplers	8	336	8.98	8.9	1169.0	1243.585
138	9-5/8" GRE bevelled couplers	8	284	8.87	8.7	1177.7	1234.84
139	9-5/8" GRE bevelled couplers	8	313	8.97	8.8	1186.6	1225.995
140	9-5/8" GRE bevelled couplers	8	346	8.93	8.8	1195.4	1217.19
141	9-5/8" GRE bevelled couplers	8	338	8.98	8.9	1204.3	1208.335
142	9-5/8" GRE bevelled couplers	8	372	8.96	8.8	1213.1	1199.5
143	9-5/8" GRE bevelled couplers	8	393	8.96	8.8	1221.9	1190.665
144	9-5/8" GRE bevelled couplers	8	415	8.96	8.8	1230.8	1181.83
145	9-5/8" GRE bevelled couplers	8	406	8.97	8.8	1239.6	1172.985
146	9-5/8" GRE bevelled couplers	8	371	8.93	8.8	1248.4	1164.18
147	9-5/8" GRE bevelled couplers	8	369	9.01	8.9	1257.3	1155.295
148	9-5/8" GRE bevelled couplers	8	345	8.82	8.7	1266.0	1146.6
149	9-5/8" GRE bevelled couplers	8	370	8.96	8.8	1274.8	1137.765
150	9-5/8" GRE bevelled couplers	8	414	8.91	8.8	1283.6	1128.98
151	9-5/8" GRE bevelled couplers	8	411	8.97	8.8	1292.5	1120.135
152	9-5/8" GRE bevelled couplers	8	365	8.91	8.8	1301.2	1111.35
153	9-5/8" GRE bevelled couplers	8	325	8.79	8.7	1309.9	1102.685
156	9-5/8" GRE bevelled couplers	8	32	8.96	8.84	1318.7	1093.85
157	9-5/8" GRE bevelled couplers	8	356	8.93	8.8	1327.5	1085.045
158	9-5/8" GRE bevelled couplers	8	368	8.90	8.8	1336.3	1076.27
159	9-5/8" GRE bevelled couplers	8	38	8.99	8.9	1345.2	1067.405
160	9-5/8" GRE bevelled couplers	8	350	8.99	8.9	1354.0	1058.54
161	9-5/8" GRE bevelled couplers	8	376	9.03	8.9	1363.0	1049.635
162	9-5/8" GRE bevelled couplers	8	136	9.01	8.9	1371.8	1040.75
163	9-5/8" GRE bevelled couplers	8	382	8.94	8.8	1380.7	1031.935
164	9-5/8" GRE bevelled couplers	8	307	8.92	8.8	1389.4	1023.14
165	9-5/8" GRE bevelled couplers	8	384	8.93	8.8	1398.3	1014.335
166	9-5/8" GRE bevelled couplers	8	230	8.97	8.8	1407.1	1005.49
167	9-5/8" GRE bevelled couplers	8	36	8.85	8.7	1415.8	996.765
168	9-5/8" GRE bevelled couplers	8	235	8.96	8.8	1424.7	987.93
169	9-5/8" GRE bevelled couplers	8	206	8.95	8.8	1433.5	979.105
170	9-5/8" GRE bevelled couplers	8	292	8.97	8.8	1442.3	970.26
171	9-5/8" GRE bevelled couplers	8	277	8.99	8.9	1451.2	961.395
172	9-5/8" GRE bevelled couplers	8	166	9.04	8.9	1460.1	952.48
173	9-5/8" GRE bevelled couplers	8	188	8.99	8.9	1469.0	943.615
174	9-5/8" GRE bevelled couplers	8	357	8.98	8.9	1477.8	934.76
175	9-5/8" GRE bevelled couplers	8	359	8.98	8.9	1486.7	925.905
176	9-5/8" GRE bevelled couplers	8	298	8.98	8.9	1495.5	917.05
177	9-5/8" GRE bevelled couplers	8	405	9.00	8.9	1504.4	908.175
178	9-5/8" GRE bevelled couplers	8	-	8.96	8.8	1513.2	899.34
179	9-5/8" x 10-3/4" GRE reducer	9	XO2	0.21	0.2	1513.5	899.13
180	10-3/4" x 11-3/4" GRE reducer	10	XO3	0.17	0.2	1513.6	898.96
181	11-3/4" x 13-3/8" GRE reducer	11	XO4	0.46	0.5	1514.1	898.5
182	13-3/8" GRE	12	81	8.75	8.5	1522.6	889.96
183	13-3/8" GRE	12	27	8.93	8.7	1531.3	881.24
184	13-3/8" GRE	12	44	8.7	8.5	1539.8	872.75
185	13-3/8" GRE	12	30	8.96	8.8	1548.6	864
186	13-3/8" GRE	12	69	8.96	8.8	1557.3	855.25
187	13-3/8" GRE	12	32	8.66	8.5	1565.8	846.8
188	13-3/8" GRE	12	12	8.79	8.6	1574.4	838.22
189	13-3/8" GRE	12	99	8.99	8.8	1583.1	829.44
190	13-3/8" GRE	12	90	8.87	8.7	1591.8	820.78
191	13-3/8" GRE	12	48	8.89	8.7	1600.5	812.1
192	13-3/8" GRE	12	19	8.86	8.7	1609.1	803.45
193	13-3/8" GRE	12	57	8.88	8.7	1617.8	794.78
194	13-3/8" GRE	12	104	8.85	8.6	1626.4	786.14
195	13-3/8" GRE	12	91	8.98	8.8	1635.2	777.37
196	13-3/8" GRE	12	52	8.86	8.7	1643.9	768.72
197	13-3/8" GRE	12	47	8.88	8.7	1652.5	760.05
198	13-3/8" GRE	12	79	8.82	8.6	1661.1	751.44
199	13-3/8" GRE	12	89	8.95	8.7	1669.9	742.7
200	13-3/8" GRE	12	86	8.99	8.8	1678.7	733.92
201	13-3/8" GRE	12	53	8.90	8.7	1687.4	725.23

202	13-3/8" GRE	12	66	8.71	8.5	1695.9	716.73
203	13-3/8" GRE	12	63	8.91	8.7	1704.6	708.03
204	13-3/8" GRE	12	20	8.72	8.5	1713.1	699.52
205	13-3/8" GRE	12	80	8.81	8.6	1721.7	690.92
206	13-3/8" GRE	12	71	8.94	8.7	1730.4	682.19
207	13-3/8" GRE	12	96	8.91	8.7	1739.1	673.49
208	13-3/8" GRE	12	87	8.84	8.6	1747.7	664.86
209	13-3/8" GRE	12	49	8.87	8.7	1756.4	656.2
210	13-3/8" GRE	12	68	8.91	8.7	1765.1	647.5
211	13-3/8" GRE	12	50	8.91	8.7	1773.8	638.8
212	13-3/8" GRE	12	62	8.87	8.7	1782.4	630.14
213	13-3/8" GRE	12	98	8.91	8.7	1791.1	621.44
214	13-3/8" GRE	12	82	8.91	8.7	1799.8	612.74
215	13-3/8" GRE	12	40	8.90	8.7	1808.5	604.05
216	13-3/8" GRE	12	51	8.82	8.6	1817.1	595.44
217	13-3/8" GRE	12	103	8.91	8.7	1825.8	586.74
218	13-3/8" GRE	12	41	8.87	8.7	1834.5	578.08
219	13-3/8" GRE	12	76	8.85	8.6	1843.1	569.44
220	13-3/8" GRE	12	100	8.96	8.8	1851.9	560.69
221	13-3/8" GRE	12	102	8.85	8.6	1860.5	552.05
222	13-3/8" GRE	12	67	8.78	8.6	1869.1	543.48
223	13-3/8" GRE	12	43	8.94	8.7	1877.8	534.75
224	13-3/8" GRE	12	38	8.88	8.7	1886.5	526.08
225	13-3/8" GRE	12	28	8.90	8.7	1895.2	517.39
226	13-3/8" GRE	12	35	8.84	8.6	1903.8	508.76
227	13-3/8" GRE	12	42	9.00	8.8	1912.6	499.97
228	13-3/8" GRE	12	60	8.85	8.6	1921.3	491.33
229	13-3/8" GRE	12	54	8.96	8.8	1930.0	482.58
230	13-3/8" GRE	12	46	8.91	8.7	1938.7	473.88
231	13-3/8" GRE	12	16	8.89	8.7	1947.4	465.2
232	13-3/8" GRE	12	88	8.89	8.7	1956.1	456.52
233	13-3/8" GRE	12	18	8.87	8.7	1964.7	447.86
234	13-3/8" GRE	12	2	8.88	8.7	1973.4	439.19
235	13-3/8" GRE	12	75	8.87	8.7	1982.1	430.53
236	13-3/8" GRE	12	70	8.81	8.6	1990.7	421.93
237	13-3/8" GRE	12	5	8.65	8.4	1999.1	413.49
238	13-3/8" GRE	12	9	8.91	8.7	2007.8	404.79
239	13-3/8" GRE	12	56	8.92	8.7	2016.5	396.08
240	13-3/8" GRE	12	10	8.93	8.7	2025.2	387.36
241	13-3/8" GRE	12	105	8.97	8.8	2034.0	378.6
242	13-3/8" GRE	12	11	8.58	8.4	2042.4	370.23
243	13-3/8" GRE	12	3	8.68	8.5	2050.8	361.76
244	13-3/8" GRE	12	1	8.89	8.7	2059.5	353.08
245	13-3/8" GRE	12	4	8.85	8.6	2068.1	344.44
246	13-3/8" GRE	12	77	8.45	8.2	2076.4	336.2
247	13-3/8" GRE	12	73	8.91	8.7	2085.1	327.5
248	13-3/8" GRE	12	29	8.89	8.7	2093.8	318.82
249	13-3/8" GRE	12	107	8.92	8.7	2102.5	310.11
250	13-3/8" GRE	12	36	8.87	8.7	2111.1	301.45
251	13-3/8" GRE	12	65	8.94	8.7	2119.9	292.72
252	13-3/8" GRE	12	15	8.85	8.6	2128.5	284.08
253	13-3/8" GRE	12	14	8.77	8.6	2137.1	275.52
254	13-3/8" GRE	12	78	8.90	8.7	2145.8	266.83
255	13-3/8" GRE	12	37	8.86	8.7	2154.4	258.18
256	13-3/8" GRE	12	94	8.90	8.7	2163.1	249.49
257	13-3/8" GRE	12	74	8.95	8.7	2171.8	240.75
258	13-3/8" GRE	12	84	8.95	8.7	2180.6	232.01
259	13-3/8" GRE	12	108	8.90	8.7	2189.3	223.32
260	13-3/8" GRE	12	101	8.94	8.7	2198.0	214.59
261	13-3/8" GRE	12	95	8.97	8.8	2206.8	205.83
262	13-3/8" GRE	12	106	8.78	8.6	2215.3	197.26
263	13-3/8" GRE	12	59	8.86	8.7	2224.0	188.61
264	13-3/8" GRE	12	83	8.71	8.5	2232.5	180.11
265	13-3/8" GRE	12	61	8.65	8.4	2240.9	171.67
266	13-3/8" GRE	12	31	8.97	8.8	2249.7	162.91
267	13-3/8" GRE	12	92	8.92	8.7	2258.4	154.2
268	13-3/8" GRE	12	85	8.99	8.8	2267.2	145.42

269	13-3/8" GRE	12	24	8.91	8.7	2275.9	136.72
270	13-3/8" GRE	12	33	8.89	8.7	2284.5	128.04
271	13-3/8" GRE	12	17	8.85	8.6	2293.2	119.4
272	13-3/8" GRE	12	13	8.82	8.6	2301.8	110.79
273	13-3/8" GRE	12	34	8.91	8.7	2310.5	102.09
274	13-3/8" GRE	12	22	8.87	8.7	2319.2	93.43
275	13-3/8" GRE	12	97	8.87	8.7	2327.8	84.77
276	13-3/8" GRE	12	72	8.91	8.7	2336.5	76.07
277	13-3/8" GRE	12	26	8.86	8.7	2345.2	67.42
278	13-3/8" GRE	12	21	8.91	8.7	2353.9	58.72
279	13-3/8" GRE	12	39	8.85	8.6	2362.5	50.08
280	13-3/8" GRE	12	7	8.90	8.7	2371.2	41.39
281	13-3/8" GRE	12	58	8.85	8.6	2379.8	32.75
282	13-3/8" GRE	12	8	8.85	8.6	2388.5	24.11
283	13-3/8" GRE	12	25	8.95	8.7	2397.2	15.37
284	13-3/8" GRE	12	23	8.87	8.7	2405.9	6.71
285	13-3/8" GRE	12	-	1.21	1.0	2406.9	5.71
286	13-3/8" GRE	12	-	3.04	2.8	2409.7	2.88
287	X-over 13-3/8" x 13-5/8"	15	XO	1.30	1.3	2411.0	1.58
288	13-5/8" pup-joint	16	XO	1.20	1.2	2412.2	0.4
289	Casing Hanger 13-5/8"	17	HNGR	0.40	0.4	2412.6	0

8 5/8" tubing tally

Rig :
DSV: Leen Vlaming, Joost van Tilborg
Well : NLW-GT-02
Date: 06-05-19

Depth reference :	RT	TD :	m	Buoyancy :	0.86
RT-GL :	3.40 m	Rat hole :	m	Block weight :	metric Tons
RT-HOP :	0.00 m	Shoe depth :	m	PUW :	metric Tons
		Mud weight :	1.08 sg	SOW :	metric Tons

Casing or DP data (DP used as running string)

Type	OD	ID	Grade	Weight	Capacity	Metal displ.	Thread	Make up torque ftJb			MU Loss
	(inch)	(inch)		(lb/ft)	(l/m)	(l/m)		Min	Optimum	Max	(m)
1	8.625"		L80	32.00	77.61		Polseal	8,460	9,400	10,340	0.130
2	Pump assembly										0.000
3											
4											

Running number	Joint #	Type n°	Total length m	Make up length m	In string Y/N	Cumul. length m	Top depth AHGL m	Hook load mT	Mud gain (m3)	Thread (bottom)	Remarks (centralizers, cable splices, floats etc.)
					y		662.30	0			
	Gauge	2	0.86	0.86	y	0.86	661.44	0	0.0		
	Bull nose	2	0.25	0.25	y	1.11	661.19	0	0.0		
	Motor 1	2	10.58	10.58	y	11.69	650.61	0	0.0		
	Motor 2	2	10.58	10.58	y	22.27	640.03	0	0.0		
	Seal 1	2	2.07	2.07	y	24.34	637.96	0	0.0		
	Seal 2	2	2.07	2.07	y	26.41	635.89	0	0.0		
	Pump	2	5.08	5.08	y	31.49	630.81	0	0.0		
	X-Over	2	1.30	1.30	y	32.79	629.51	0	0.0		
1	8 5/8" joint	1	11.57	11.44	y	44.23	618.07	0	0.0		
2	8 5/8" joint	1	10.45	10.32	y	54.55	607.75	1	0.0		
3	8 5/8" joint	1	12.13	12.00	y	66.55	595.75	1	0.0		
4	8 5/8" joint	1	11.49	11.36	y	77.91	584.39	2	0.0		
5	8 5/8" joint	1	11.65	11.52	y	89.43	572.87	2	0.0		
6	8 5/8" joint	1	11.53	11.40	y	100.83	561.47	3	0.0		
7	8 5/8" joint	1	11.10	10.97	y	111.80	550.50	3	0.0		
8	8 5/8" joint	1	11.73	11.60	y	123.40	538.90	4	0.0		
9	8 5/8" joint	1	11.18	11.05	y	134.45	527.85	4	0.0		
10	8 5/8" joint	1	11.54	11.41	y	145.86	516.44	5	0.0		
11	8 5/8" joint	1	10.70	10.57	y	156.43	505.87	5	0.0		
12	8 5/8" joint	1	10.68	10.55	y	166.98	495.32	6	0.0		
13	8 5/8" joint	1	11.47	11.34	y	178.32	483.98	6	0.0		
14	8 5/8" joint	1	11.64	11.51	y	189.83	472.47	6	0.0		
15	8 5/8" joint	1	11.10	10.97	y	200.80	461.50	7	0.0		
16	8 5/8" joint	1	11.07	10.94	y	211.74	450.56	7	0.0		
17	8 5/8" joint	1	11.65	11.52	y	223.26	439.04	8	0.0		
18	8 5/8" joint	1	11.63	11.50	y	234.76	427.54	8	0.0		
19	8 5/8" joint	1	11.06	10.93	y	245.69	416.61	9	0.0		
20	8 5/8" joint	1	10.69	10.56	y	256.25	406.05	9	0.0		
21	8 5/8" joint	1	11.41	11.28	y	267.53	394.77	10	0.0		
22	8 5/8" joint	1	11.51	11.38	y	278.91	383.39	10	0.0		
23	8 5/8" joint	1	11.65	11.52	y	290.43	371.87	11	0.0		
24	8 5/8" joint	1	11.26	11.13	y	301.56	360.74	11	0.0		
25	8 5/8" joint	1	11.59	11.46	y	313.02	349.28	12	0.0		
26	8 5/8" joint	1	11.66	11.53	y	324.55	337.75	12	0.0		
27	8 5/8" joint	1	11.45	11.32	y	335.87	326.43	12	0.0		
28	8 5/8" joint	1	11.18	11.05	y	346.92	315.38	13	0.0		
29	8 5/8" joint	1	11.27	11.14	y	358.06	304.24	13	0.0		
30	8 5/8" joint	1	11.23	11.10	y	369.16	293.14	14	0.0		
31	8 5/8" joint	1	10.58	10.45	y	379.61	282.69	14	0.0		
32	8 5/8" joint	1	11.70	11.57	y	391.18	271.12	15	0.0		
33	8 5/8" joint	1	11.55	11.42	y	402.60	259.70	15	0.0		
34	8 5/8" joint	1	11.19	11.06	y	413.66	248.64	16	0.0		
35	8 5/8" joint	1	11.51	11.38	y	425.04	237.26	16	0.0		
36	8 5/8" joint	1	11.57	11.44	y	436.48	225.82	17	0.0		
37	8 5/8" joint	1	11.39	11.26	y	447.74	214.56	17	0.0		
38	8 5/8" joint	1	10.39	10.26	y	458.00	204.30	17	0.0		
39	8 5/8" joint	1	11.80	11.67	y	469.67	192.63	18	0.0		
40	8 5/8" joint	1	11.78	11.65	y	481.32	180.98	18	0.0		
41	8 5/8" joint	1	11.78	11.65	y	492.97	169.33	19	0.0		
42	8 5/8" joint	1	11.21	11.08	y	504.05	158.25	19	0.0		
43	8 5/8" joint	1	10.58	10.45	y	514.50	147.80	20	0.0		
44	8 5/8" joint	1	11.33	11.20	y	525.70	136.60	20	0.0		
45	8 5/8" joint	1	11.85	11.72	y	537.42	124.88	21	0.0		
46	8 5/8" joint	1	11.26	11.13	y	548.55	113.75	21	0.0		
47	8 5/8" joint	1	11.82	11.69	y	560.24	102.06	22	0.0		
48	8 5/8" joint	1	11.50	11.37	y	571.61	90.69	22	0.0		
49	8 5/8" joint	1	10.87	10.74	y	582.35	79.95	23	0.0		
50	8 5/8" joint	1	11.45	11.32	y	593.67	68.63	23	0.0		
51	8 5/8" joint	1	10.53	10.40	y	604.07	58.23	23	0.0		
52	8 5/8" joint	1	11.33	11.20	y	615.27	47.03	24	0.0		
53	8 5/8" joint	1	11.75	11.62	y	626.89	35.41	24	0.0		
54	8 5/8" joint	1	11.88	11.75	y	638.64	23.66	25	0.0		
55	8 5/8" joint	1	11.18	11.05	y	649.69	12.61	25	0.0		
56	8 5/8" joint	1	11.59	11.46	y	661.15	1.15	26	0.0		
57	8 5/8" joint	1	1.28	1.15	y	662.30	0.00	26	0.0		Hanger