

District I

1625 N French Dr, Hobbs, NM 88240

District II

1301 W Grand Avenue, Artesia, NM 88210

District III

1000 Rio Brazos Road, Aztec, NM 87410

District IV

1220 S St Francis Dr, Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural ResourcesOil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

SEP 26 2008

Form C-101

June 16, 2008

OCD-ARTESIA

Submit to appropriate District Office

☐ AMENDED REPORT

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

Operator Name and Address Devon Energy Production Company L.P. 20 North Broadway OKC, OK 73102-8260		OGRID Number 6137
Property Code 34619		API Number 30-015-34147
Property Name Townsend 28		Well No 1
Proposed Pool 1 Carlsbad, Morrow, South		Proposed Pool 2

Surface Location

UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	28	22S	27E		1310	North	1520	West	Eddy

Proposed Bottom Hole Location If Different From Surface

UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	28	22S	27E		1980	North	660	West	Eddy

Additional Well Information

Work Type Code Recomplete	Well Type Code Gas	Cable/Rotary R	Lease Type Code State	Ground Level Elevation 3128'
Multiple N	Proposed Depth TVD 11,370' MD 14,532'	Formation Morrow	Contractor	Spud Date 08/01/2008
Depth to Groundwater		Distance from nearest fresh water well		Distance from nearest surface water
Pit Liner Synthetic <input type="checkbox"/> mils thick Clay <input type="checkbox"/> Pit Volume _____ bbls Drilling Method _____ Closed-Loop System <input checked="" type="checkbox"/> Fresh Water <input type="checkbox"/> Brine <input type="checkbox"/> Diesel/Oil-based <input type="checkbox"/> Gas/Air <input type="checkbox"/>				

Current Casing and Cement Program

Hole Size	Casing Size	Casing weight/foot	Setting Depth	Sacks of Cement	Estimated TOC
17 1/2"	13 3/8"	48# H-40 ST&C	324'	435 ss. CLC	Surface
12 1/2"	9 5/8"	36# J-55 ST&C	2630'	1120 ss. CLC	Surface
8 3/4"	5 1/2"	17# P-110 L T&C	12000'	2950 ss. CLC	TOC @ 4270'
					2100'

22 Describe the proposed program If this application is to DEEPEN or PLUG BACK, give the data on the present productive zone and proposed new productive zone Describe the blowout prevention program, if any Use additional sheets if necessary

Devon proposes to drill laterally into the Morrow Lime by setting a CIBP @ ~ 11,250' We will then set a whipstock @ ~ 11,230' & cut a window in the 5 1/2" casing Estimated KOP @ ~ 11,200' TVD We propose to directionally drill to a BHL of 1980' FNL & 660' FWL at a TVD of 11,370' & MD of 14,532' An ISO-PAK Open Hole system will be used in the wellbore

- See Current & Proposed Wellbore Schematic
- Directional Survey

Depth to groundwater is 50' or more, but less than 100', distance to surface water is approximately 1000' or more, well is not in the wellhead protection area Closed loop system to be utilized, see attached C-144 CLEZ No H2S is expected to be encountered, H2S plan provided 5000 psi Double and HydriL with drilling spool & rotating head to be used If it is deemed non-commercial then it will be plugged and abandoned in accordance with the rules and regulations established by the New Mexico OCD

Pits must be registered, operated, maintained and closed per 19.15.17 [NMAC]

e and complete to the the drilling pit will be eneral permit ☐ or

OIL CONSERVATION DIVISION

Approved

Jim W. Green
District II Supervisor

Approval Date

10/9/08

Expiration Date

10/9/10

Printed name Stephanie A Ysasaga

Title Sr Staff Engineering Technician

E-mail Address Stephanie.Ysasaga@den.com

Date 09/15/2008

Phone (405)-552-7802

Conditions of Approval Attached

☒ PRODUCTION CSG FILE
BACK CHANGE.

ENTERED
10/9/08

DISTRICT I
1825 N. French Dr., Hobbs, NM 88240

DISTRICT II
811 South First, Artesia, NM 88210

DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410

DISTRICT IV
2040 South Pacheco, Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Form C-102
Revised March 17, 1999

Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

OIL CONSERVATION DIVISION

2040 South Pacheco
Santa Fe, New Mexico 87504-2088

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015-34147	Pool Code 73960	Pool Name Carlsbad, Morrow South
Property Code 34619	Property Name TOWNSEND "28"	Well Number 1
OGRD No. 6137	Operator Name DEVON ENERGY PRODUCTION COMPANY LP	Elevation 3128'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	28	22 S	27 E		1310	NORTH	1520	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
Dedicated Acres 320	Joint or Infill	Consolidation Code	Order No.						

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

	<p>OPERATOR CERTIFICATION</p> <p>I hereby certify the the information contained herein is true and complete to the best of my knowledge and belief</p> <p><i>Norvella Adams</i> Signature Norvella Adams</p> <p>Printed Name Sr. Staff Eng. Tech</p> <p>Title 2/11/05</p> <p>Date</p>
	<p>SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.</p> <p>December 02, 2004</p> <p>Date Surveyed</p>
	<p>Signature & Seal of Professional Surveyor</p> <p><i>[Signature]</i></p> <p>W.O. No. 4874</p> <p>Certificate No. Gary L. Jones 7977</p> <p>JLP</p>

DEVON ENERGY PRODUCTION COMPANY LP

Well Name: TOWNSEND 28-1		Field: INDIAN DRAW	
Location: 1310' FNL & 1520' FWL; SEC 28-T225-R27E		County: EDDY	State: NM
Elevation 3145' KB		Spud Date: 3/14/06	Compl Date:
API# 30-015-34147	Prepared by: Ronnie Slack	Date 4/24/07	Rev.

17-1/2" hole
13-3/8", 48#, H40, @ 324'
 Cmt'd w/435 Sx

12-1/4" hole
9-5/8", 36#, J55, ST&C @ 2630'
 Cmt'd w/1120 Sx

TOC @ 4770' (cbl 5/28/06)

DV Tool @ 8018'

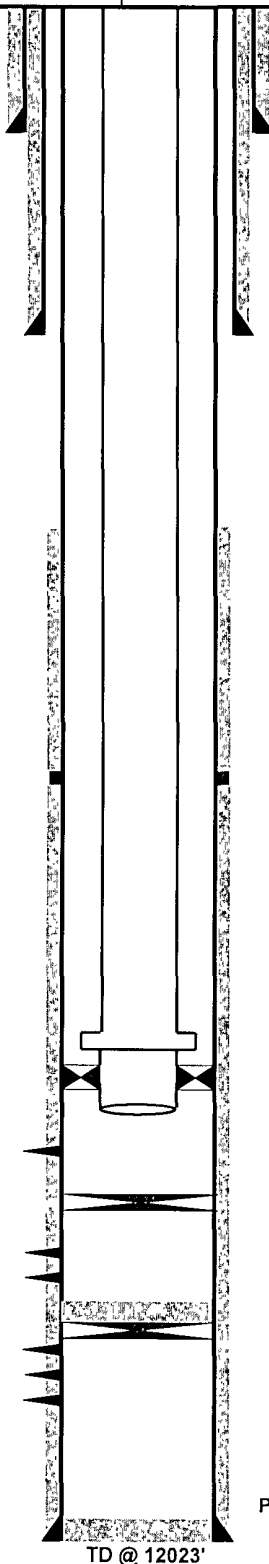
MORROW (4/12/07) 4 spf 90°
11374' - 11386'
 4/13/07 Acidized 11374-386 w/5000 gals 15% HCL

MORROW (6/1/06) 6 SPF 120°
11512' - 11516'
11523' - 11530'

MORROW (6/1/06) 6 SPF 120°
11580' - 11582'
11614' - 11623'
11758' - 11767'

6/3/06 acidized w/3000 gals 7 5%
 6/6/06 Fraced w/47K# 18/40 ultra prop

8-3/4" Hole
5-1/2", 17#, P110, LTC, @ 12009'
 Cmt'd w/2950 Sx



Current Wellbore Configuration

2-7/8", 6.5#, Production Tubing

Packer @ 11335 (4/12/07)

RBP 11450' (4/12/07)

10' Cement. 11540' PBTD
 CIBP @ 11,550' (4/12/07)

PBD @ 11922'

TD @ 12023'

PROPOSED WELLPATH REPORT (CSV version)

Prepared by Baker Hughes INTEQ
Software System WellArchitect®2.0

REFERENCE WELLPATH IDENTIFICATION

Operator Devon Energy
Area Eddy County, NM
Field (Townsend) Sec 28, T22S, R27
Facility Townsend 28 No 1H
Slot No 1H SHL
Well No. 1H
Wellbore No 1H PWB
Wellpath Plan #1
Sidetrack (none)

REPORT SETUP INFORMATION

Projection NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet
North Refe Grid
Scale 0 999911
Converger 0.07° East
Software S WellArchitect®
User Victor Hernandez
Report Ge 9/19/2008 at 11 24 22 AM
DataBase/ WA_Midland/ev8384 xml

WELLPAT	Local North	Local East	Grid East	Grid North	Latitude	Longitude
	[ft]	[ft]	[ft]	[ft]		
Slot Locati	0	0	583078 3	497353 5	32°22'02 0	104°11'53 300"W
Facility Re			583078 3	497353 5	32°22'02.0	104°11'53 300"W
Field Refer			583078 3	497353 5	32°22'02 0	104°11'53 300"W

WELLPATH DATUM

Calculator Minimum curvature
Horizontal Slot
Vertical Re Rig on No 1H SHL (RT)
MD Refere Rig on No 1H SHL (RT)
Field Vertic Mean Sea Level
Rig on No 18 00ft
Rig on No 3146 00ft
Facility Ver 0 00ft
Section Or 0 00ft
Section Or 0 00ft
Section Az 101.79°

WELLPATH DATA	Wellbore No 1H PWB	Wellpath Plan #1	† = interpolated/extrapolated station												
MD	Inclination	Azimuth	TVD	Vert Sect	North	East	Grid East	Grid North	DLS	Comments					
[ft]	[°]	[°]	[ft]	[ft]	[ft]	[ft]	[srv ft]	[srv ft]	[°/100ft]						
0	0	101 785	0	0	0	0	583078 3	497353 5	0	Tie On					
11200	0	101 785	11200	0	0	0	583078 3	497353 5	0	EST KOP					
† 11300	30 476	101 785	11295 35	25 97	-5 31	25 43	583103 7	497348 2	30 48						
† 11400	60 952	101 785	11364 35	96 72	-19 75	94 68	583173	497333 7	30 48						
11496 43	90 34	101 785	11388	189 12	-38 63	185 13	583263 4	497314 9	30 48	EOC					
† 11500	90 34	101 785	11387 98	192 69	-39 36	188 63	583266 9	497314 1	0						
† 11600	90.34	101.785	11387 39	292 69	-59 78	286 52	583364 8	497293 7	0						
† 11700	90 34	101 785	11386.79	392 69	-80 2	384 41	583462 7	497273 3	0						
† 11800	90.34	101.785	11386 2	492 68	-100 63	482 3	583560 5	497252 9	0						
† 11900	90 34	101 785	11385 61	592 68	-121 05	580 19	583658 4	497232 5	0						
† 12000	90 34	101 785	11385 01	692 68	-141 47	678 08	583756 3	497212	0						

†	12100	90 34	101 785	11384 42	792 68	-161 9	775 97	583854 2	497191 6	0
†	12200	90 34	101 785	11383 83	892 68	-182 32	873 86	583952 1	497171 2	0
†	12300	90 34	101 785	11383 24	992 67	-202 75	971 75	584050	497150 8	0
†	12400	90 34	101 785	11382 64	1092 67	-223 17	1069 64	584147 8	497130 3	0
†	12500	90 34	101 785	11382 05	1192 67	-243 59	1167 53	584245 7	497109 9	0
†	12600	90 34	101 785	11381 46	1292 67	-264 02	1265 42	584343 6	497089 5	0
†	12700	90 34	101 785	11380 86	1392 67	-284 44	1363 31	584441 5	497069 1	0
†	12800	90 34	101 785	11380 27	1492 67	-304 86	1461 2	584539 4	497048 7	0
†	12900	90 34	101 785	11379 68	1592 66	-325 29	1559 09	584637 2	497028 2	0
†	13000	90 34	101 785	11379 09	1692 66	-345 71	1656 98	584735 1	497007 8	0
†	13100	90 34	101 785	11378 49	1792 66	-366 14	1754 87	584833	496987 4	0
†	13200	90 34	101 785	11377 9	1892 66	-386 56	1852 76	584930 9	496967	0
†	13300	90 34	101 785	11377 31	1992 66	-406 98	1950 65	585028 8	496946 6	0
†	13400	90 34	101 785	11376 71	2092 66	-427 41	2048 54	585126 7	496926 1	0
†	13500	90 34	101 785	11376 12	2192 65	-447 83	2146 43	585224 5	496905 7	0
†	13600	90 34	101 785	11375 53	2292 65	-468 25	2244 32	585322 4	496885 3	0
†	13700	90 34	101 785	11374 94	2392 65	-488 68	2342 21	585420 3	496864 9	0
†	13800	90 34	101 785	11374 34	2492 65	-509 1	2440 1	585518 2	496844 4	0
†	13900	90 34	101 785	11373 75	2592 65	-529 53	2537 99	585616 1	496824	0
†	14000	90 34	101 785	11373 16	2692 64	-549 95	2635 89	585713 9	496803 6	0
†	14100	90 34	101 785	11372 56	2792 64	-570 37	2733 78	585811 8	496783 2	0
†	14200	90 34	101 785	11371 97	2892 64	-590 8	2831 67	585909 7	496762 8	0
†	14300	90 34	101 785	11371 38	2992 64	-611 22	2929 56	586007 6	496742 3	0
†	14400	90 34	101 785	11370 79	3092 64	-631 65	3027 45	586105 5	496721 9	0
†	14500	90 34	101 785	11370 19	3192 64	-652 07	3125 34	586203 3	496701 5	0
	14532 54	90 34	101 785	11370	3225 18	-658 72	3157 19	586235 2	496694 8	0 No 1H BH 1

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grnd East [srv ft]	Grnd North [srv ft]	Latitude	Longitude	Shape	Comment	Design Comments
(1) No 1H	14532 54	11370	-658 72	3157 19	586235 2	496694 8	32°21'55 4	104°11'16	point		

SURVEY PROGRAM Ref Wellbore No 1H PWB Ref Wellpath Plan #1
 Start MD End MD Pos Unc M Log Name Wellbore
 [ft] [ft]
 18 14532 54 NaviTrak (Standard) No 1H PWB



Devon Energy

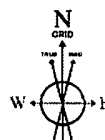
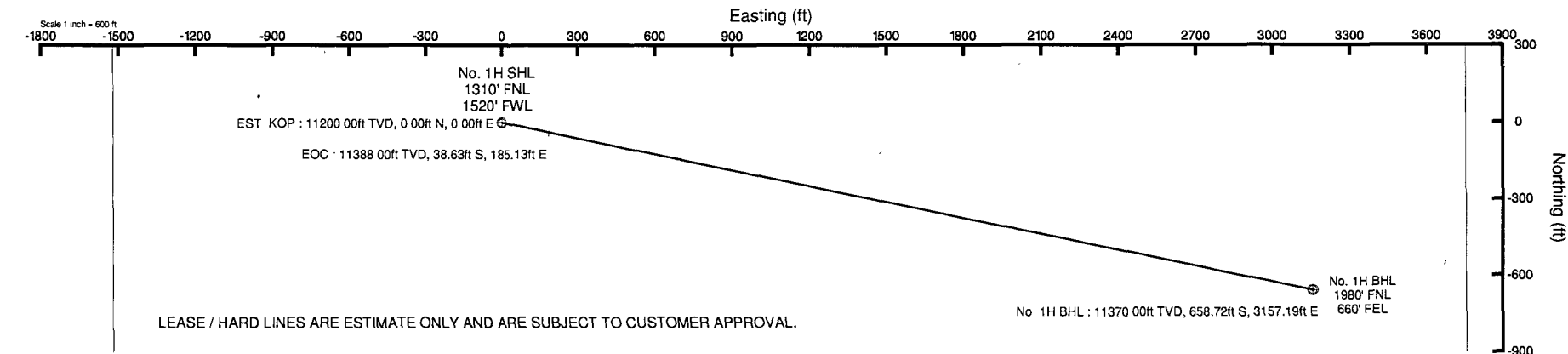
Location: Eddy County, NM
Field: (Townsend) Sec 28, T22S, R27
Facility: Townsend 28 No. 1H

Slot: No. 1H SHL
Well: No. 1H
Wellbore: No. 1H PWB

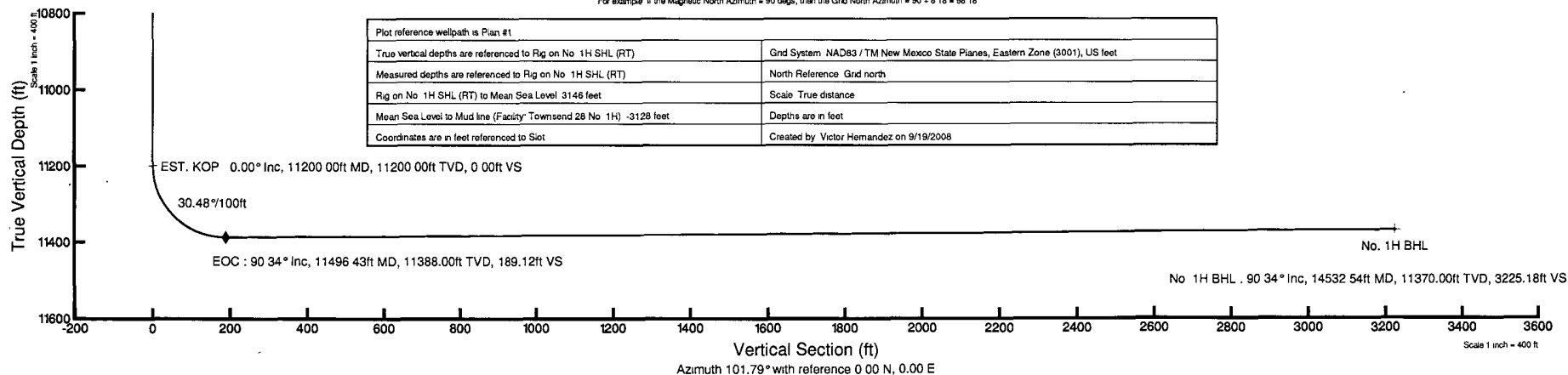


Well Profile Data

Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (%/100ft)	VS (ft)
Tie On	0.00	0.000	101.785	0.00	0.00	0.00	0.00	0.00
EST. KOP	11200.00	0.000	101.785	11200.00	0.00	0.00	0.00	0.00
EOC	11496.43	90.340	101.785	11388.00	-38.63	185.13	30.48	189.12
No. 1H BHL	14532.54	90.340	101.785	11370.00	-658.72	3157.19	0.00	3225.18



BCGM (1945 0 to 2009 0) Do 60.28° Field 46822.1 mT
Magnetic North is 8.25 degrees East of True North (as 9/19/2008)
Grid North is 0.07 degrees East of True North
To correct azimuth from True to Grid subtract 0.07 degrees
To correct azimuth from Magnetic to Grid add 8.18 degrees
For example if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 8.18 = 98.18





Planned Wellpath Report

Plan #1
Page 1 of 3



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Devon Energy	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(Townsend) Sec 28, T22S, R27	Wellbore	No. 1H PWB
Facility	Townsend 28 No. 1H		

REPORT SETUP INFORMATION

Projection System	NAD83 / TM New Mexico State Planes, Eastern Zone (3001), US feet	Software System	WellArchitect® 2.0
North Reference	Grid	User	Victor Hernandez
Scale	0.999911	Report Generated	9/19/2008 at 11:24:21 AM
Convergence at slot	0.07° East	Database/Source file	WA_Midland/No. 1H_PWB.xml

WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[USft]	Northing[USft]	Latitude	Longitude
Slot Location	0.00	0.00	583078.29	497353.49	32°22'02.000"N	104°11'53.300"W
Facility Reference Pt			583078.29	497353.49	32°22'02.000"N	104°11'53.300"W
Field Reference Pt			583078.29	497353.49	32°22'02.000"N	104°11'53.300"W

WELLPATH DATUM

Calculation method	Minimum curvature	Rig on No. 1H SHL (RT) to Facility Vertical Datum	18.00ft
Horizontal Reference Pt	Slot	Rig on No. 1H SHL (RT) to Mean Sea Level	3146.00ft
Vertical Reference Pt	Rig on No. 1H SHL (RT)	Facility Vertical Datum to Mud Line (Facility)	0.00ft
MD Reference Pt	Rig on No. 1H SHL (RT)	Section Origin	N 0.00, E 0.00 ft
Field Vertical Reference	Mean Sea Level	Section Azimuth	101.79°



Planned Wellpath Report

Plan #1
Page 2 of 3



REFERENCE WELLPATH IDENTIFICATION

Operator	Devon Energy	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(Townsend) Sec 28, T22S, R27	Wellbore	No. 1H PWB
Facility	Townsend 28 No. 1H		

WELLPATH DATA (37 stations) † = interpolated/extrapolated station

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]	Comments
0.00	0.000	101.785	0.00	0.00	0.00	0.00	583078.29	497353.49	0.00	Tie On
11200.00	0.000	101.785	11200.00	0.00	0.00	0.00	583078.29	497353.49	0.00	EST. KOP
11300.00†	30.476	101.785	11295.35	25.97	-5.31	25.43	583103.71	497348.19	30.48	
11400.00†	60.952	101.785	11364.35	96.72	-19.75	94.68	583172.96	497333.74	30.48	
11496.43	90.340	101.785	11388.00	189.12	-38.63	185.13	583263.40	497314.87	30.48	EOC
11500.00†	90.340	101.785	11387.98	192.69	-39.36	188.63	583266.90	497314.14	0.00	
11600.00†	90.340	101.785	11387.39	292.69	-59.78	286.52	583364.78	497293.72	0.00	
11700.00†	90.340	101.785	11386.79	392.69	-80.20	384.41	583462.66	497273.30	0.00	
11800.00†	90.340	101.785	11386.20	492.68	-100.63	482.30	583560.54	497252.87	0.00	
11900.00†	90.340	101.785	11385.61	592.68	-121.05	580.19	583658.42	497232.45	0.00	
12000.00†	90.340	101.785	11385.01	692.68	-141.47	678.08	583756.31	497212.03	0.00	
12100.00†	90.340	101.785	11384.42	792.68	-161.90	775.97	583854.19	497191.61	0.00	
12200.00†	90.340	101.785	11383.83	892.68	-182.32	873.86	583952.07	497171.19	0.00	
12300.00†	90.340	101.785	11383.24	992.67	-202.75	971.75	584049.95	497150.76	0.00	
12400.00†	90.340	101.785	11382.64	1092.67	-223.17	1069.64	584147.83	497130.34	0.00	
12500.00†	90.340	101.785	11382.05	1192.67	-243.59	1167.53	584245.71	497109.92	0.00	
12600.00†	90.340	101.785	11381.46	1292.67	-264.02	1265.42	584343.59	497089.50	0.00	
12700.00†	90.340	101.785	11380.86	1392.67	-284.44	1363.31	584441.48	497069.08	0.00	
12800.00†	90.340	101.785	11380.27	1492.67	-304.86	1461.20	584539.36	497048.66	0.00	
12900.00†	90.340	101.785	11379.68	1592.66	-325.29	1559.09	584637.24	497028.23	0.00	
13000.00†	90.340	101.785	11379.09	1692.66	-345.71	1656.98	584735.12	497007.81	0.00	
13100.00†	90.340	101.785	11378.49	1792.66	-366.14	1754.87	584833.00	496987.39	0.00	
13200.00†	90.340	101.785	11377.90	1892.66	-386.56	1852.76	584930.88	496966.97	0.00	
13300.00†	90.340	101.785	11377.31	1992.66	-406.98	1950.65	585028.76	496946.55	0.00	
13400.00†	90.340	101.785	11376.71	2092.66	-427.41	2048.54	585126.65	496926.12	0.00	
13500.00†	90.340	101.785	11376.12	2192.65	-447.83	2146.43	585224.53	496905.70	0.00	
13600.00†	90.340	101.785	11375.53	2292.65	-468.25	2244.32	585322.41	496885.28	0.00	
13700.00†	90.340	101.785	11374.94	2392.65	-488.68	2342.21	585420.29	496864.86	0.00	
13800.00†	90.340	101.785	11374.34	2492.65	-509.10	2440.10	585518.17	496844.44	0.00	
13900.00†	90.340	101.785	11373.75	2592.65	-529.53	2537.99	585616.05	496824.01	0.00	



Planned Wellpath Report

Plan #1
Page 3 of 3



INTEQ

REFERENCE WELLPATH IDENTIFICATION

Operator	Devon Energy	Slot	No. 1H SHL
Area	Eddy County, NM	Well	No. 1H
Field	(Townsend) Sec 28, T22S, R27	Wellbore	No. 1H PWB
Facility	Townsend 28 No. 1H		

WELLPATH DATA (37 stations) † = interpolated/extrapolated station

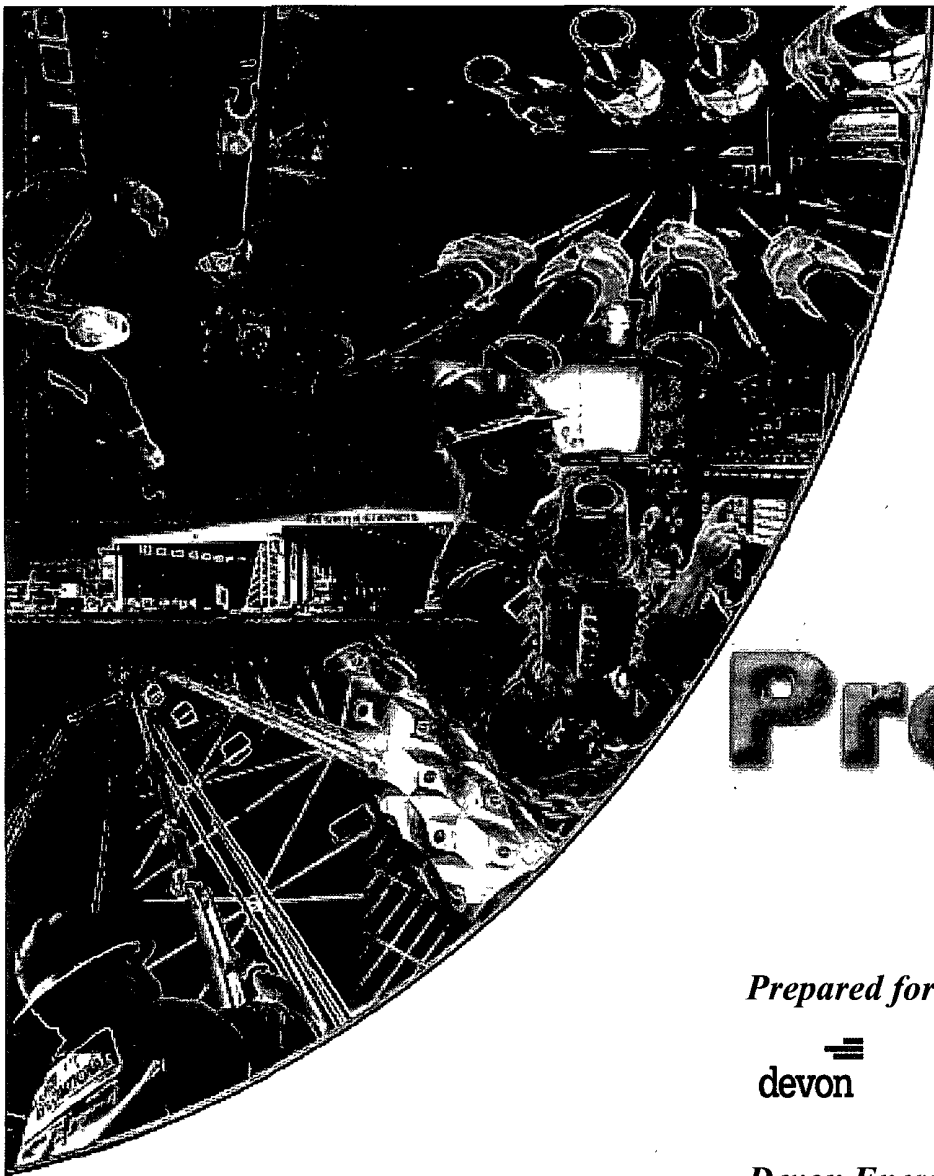
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	DLS [°/100ft]	Comments
14000.00†	90.340	101.785	11373.16	2692.64	-549.95	2635.89	585713.93	496803.59	0.00	
14100.00†	90.340	101.785	11372.56	2792.64	-570.37	2733.78	585811.82	496783.17	0.00	
14200.00†	90.340	101.785	11371.97	2892.64	-590.80	2831.67	585909.70	496762.75	0.00	
14300.00†	90.340	101.785	11371.38	2992.64	-611.22	2929.56	586007.58	496742.33	0.00	
14400.00†	90.340	101.785	11370.79	3092.64	-631.65	3027.45	586105.46	496721.90	0.00	
14500.00†	90.340	101.785	11370.19	3192.64	-652.07	3125.34	586203.34	496701.48	0.00	
14532.54	90.340	101.785	11370.00 ¹	3225.18	-658.72	3157.19	586235.20	496694.84	0.00	No. 1H BHL

TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [srv ft]	Grid North [srv ft]	Latitude	Longitude	Shape
1) No. 1H BHL	14532.54	11370.00	-658.72	3157.19	586235.20	496694.84	32°21'55.441"N	104°11'16.501"W	point

SURVEY PROGRAM Ref Wellbore: No. 1H PWB Ref Wellpath: Plan #1

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
18.00	14532.54	NaviTrak (Standard)		No. 1H PWB



Wellbore Departure
Proposal

Prepared for:



Devon Energy

Don Webb

TOWNSEND 28-1

7/25/2008

Value through
Technology





A Business Unit of Smith International, Inc.

Devon Energy

ATTENTION: Don Webb
TELEPHONE:
FAX:

DATE: July 25, 2008
QUOTE NO.: DERV068
WELL: TOWNSEND
WELL NO.: 28-1
BLOCK:
LOCATION: Land
RIG NO.: U/N
AFE

Item	Description	Qty	Minimum Price	Charge Type	Add Qty	Add'l Price	Total Price
1	TRACKMASTER® PLUS SYSTEM/ MECHANICAL - 5 1/2		\$47,924.00	each	1	\$28,555.00	\$28,555.00
2	HYBRID INSERTS	1	\$4,470.00				\$4,470.00
3	UBHO SUB	1	\$1,694.00				\$1,694.00
4	DAILY RATES - Remedial Supervisor Estimate Days(Land/Offshore)	1	\$1,950.00	PER DAY	1	\$1,950.00	\$3,900.00
5	TRANSPORTATION - Pickup or 4 Wheel Drive	200	\$3.50	PER MILE			\$700.00
6	Subsistence - Per Person, \$275 Per Day, if not supplied by customer.	2	\$275.00				\$550.00
7	For equipment requiring inspection,	6	\$35.00				\$210.00
8	Inspection on mill Body	1	\$500.00				\$500.00
9	MAGNET - Ditch Magnets - FIRST DAY	1	\$663.00	FIRST DAY		\$619.00	\$663.00
Estimated Job Total							\$41,242.00

Technical Proposal

General Running Procedures

Pre Planning for Mechanical TrackMaster® Plus Applications

Selecting a Setting and Milling Depth

The anchor assembly of the tool should be placed 2' to 6' above a collar. This will ensure a smooth and true ID for the TrackMaster® Plus and allow milling to be performed in the middle of the casing joint away from the collar.

Sidetracking should be in an area with a good cement bond, to allow for positive displacement of the new well from the old well and reduce the chance of the mills tracking the old casing once off the whip. (However jobs have been successfully completed without the proper bonds.) Also it is not recommended to mill a window in a sand formation when using crush carbide mills.

Orientation Planning

The TrackMaster® Plus may be oriented by placing a mule shoe sub above the tool in the BHA and using a bottom hole orienting device, or with a MWD. In a straight hole, the tool may be set in any direction. However, if a hole deviation of 2 degrees or more is present, the orientation is recommended from 0-90 degrees left or right of the high side, no greater than 105 degrees. Low side orientation should be avoided.

Hole Preparation Planning

A bit, casing scraper, and full gauge watermelon mill run is strongly recommended to clean the casing ID of scale and other possible restrictions and to check the casing ID for possible tight spots. If a full gauge mill is not run prior to the whipstock, we recommend making a *gauge ring run the same OD size as the mills*.

A collar locator run is required to accurately determine collar location for setting the TrackMaster® Plus.

Mud Requirements

The drilling fluid should be in good condition, clean and compatible with the formation surrounding the milled window prior to running the whipstock. Due to the small size and amount of cuttings to be milled, mud properties used in drilling the new well will be sufficient to clean the hole. High viscosity sweeps are recommended periodically and for "bottom up" circulation prior to pulling out of the hole at the end of the sidetrack. We recommend a flow rate of 35 to 50 gpm per inch of casing ID to properly clean the hole. Ditch magnets should be placed in the first tank beyond the shale shakers.

BHA Requirements

Drill collars are recommended during milling operations. However, the same bottom hole assembly set up for the sidetrack can be used for the milling. Available weight will be needed for milling depending on casing size per chart below.

The use of non-shouldering connections in this milling application is **not** recommended. On

jobs using 3½ OD drill collars and smaller, sufficient ID is required for survey instrumentation.

Make-up Procedure

Procedures vary from rig to rig and a JSA is highly recommended.

Pick up the assembly from top to bottom. Start with a lifting sub and the orientation sub.

Snug up connection with the tongs.

Pick up a single joint of high grade drill pipe or heavy weight drill.

Pick up the TrackMaster® Plus mill with a lifting sub. Set mill in mousehole or rotary table with drill collar and safety clamp. Remove lifting sub from the mill. Make up the HWDP to the mill (crossover may be required) and torque to specifications. (**Note:** On larger mills, this may need to be done prior to picking up the above.) Install jets and move assembly out of the way to pick up the whipstock.

Pick up whipstock assembly by the catline hook. Remove shipping container from anchor slips and hang the whipstock assembly through the rotary table. Secure with drill collar slips and safety clamp.

Slowly lower the mill to the top of the whipstock face. Align the mill with the shear bolt and attach.

Pick up assembly and remove catline hook, drill collar slips and safety clamp. Continue to pick up and remove the plunger cap from the bottom of the whipstock.

Align the whipstock face to the orientation sub by scribing a line from the center of the whipstock face up the assembly to the orientation sub or MWD. Orient the key to the scribed line.

Pick up drill collars and/or heavy weight drill pipe equivalent to the recommended milling weight plus a minimum of 25%. No jars should be run with this assembly.

RUNNING PROCEDURE

Trip the assembly into the hole slowly with the hook on the block in the unlocked position.

Monitor weight indicator for hole drag.

When the desired depth is reached, minimum 50 feet above bridge plug, work the string up and down to determine hole drag. Slack off to a neutral weight. **Care should be taken not to run into the bridge and set the anchor.**

Survey the orientation of the whipstock assembly.

Orient the Whipstock Assembly

Turn the assembly to the required tool face. Work the torque out by moving the pipe 20-30 feet three times. Repeat as needed.

Shear the Mill from the Whipstock

Gradually set 0-3600 pounds onto the assembly to shear the pins in the plunger. Pick up 3 - 5 feet off plug, then ease weight back down. If assembly returns to the plug, then repeat the process. When the anchor supports weight off the plug, begin applying set down weight of half (1/2) the shear bolt shear value and return to neutral position. (Caution should be taken not to over pull the assembly, stop at neutral.) Repeat three times, then apply the

recommended set down weight for appropriate size anchor. On high angle holes, care should be taken to insure all weight gets to the anchor.

APPROXIMATE SHEAR VALUES ARE LISTED BELOW:

Size (in)	Set Down Load (lb)	Shear Value (lb)
9 $\frac{5}{8}$	65,000	55,000
7 $\frac{5}{8}$	50,000	40,000
7	50,000	35,000
5 $\frac{1}{2}$	30,000	20,000
4 $\frac{1}{2}$	25,000	15,000

Cut Out and Milling Window

Begin rotation. Record rotary speed, torque, circulation rate and pressure.

Slowly lower the mill until it contacts the whipstock. A light amount of weight <2,000# should be used during the initial milling. Mill according to the recommended milling parameters:

TrackMaster Milling Parameters

Casing Size (in)	Wt. on Bit (1,000 lbs)	Rpm	Whip Face
13 $\frac{3}{8}$	2 - 20	60 - 120	16.7'
11 $\frac{3}{4}$	2 - 17	60 - 120	14.8'
10 $\frac{3}{4}$	2 - 15	60 - 120	13.3'
9 $\frac{5}{8}$	2 - 15	60 - 120	11.7'
7 $\frac{5}{8}$	2 - 12	60 - 120	8.6'
7	2 - 12	60 - 120	7.8'
5 $\frac{1}{2}$	2 - 7	60 - 120	6.1'
4 $\frac{1}{2}$	1 - 7	60 - 120	4.7'

If the penetration rate falls below what is expected for the amount of time spent milling, pull out of the hole. Replace the mill and continue milling.

Drill required rat hole (usually 4-6 feet). The length of the rat hole should be sufficient to accommodate the drilling assembly. If additional rat hole is required, it can be drilled if directional control allows utilizing a FastTrack™ or GeoTrack™ milling system.

Make several reaming passes through the window and back to bottom to clean up the window. Then slide through the window (without rotating) to verify window is clean.

Circulate bottoms up and pull out of the hole.

Gauge the mill to verify that the window condition is acceptable and in gauge. If necessary, pickup additional milling assembly and TIH to clean and elongate window.

DRILLING RECOMMENDATIONS

It is not recommended to rotate a bit or stabilizer down the face of the whipstock. Doing so may damage the edge of the whipstock or cause the drilling assembly to be caught on the

whipstock.

If the window and the rat hole have to be squeezed, the window may be reopened utilizing a window mill or a roller cone bit in conjunction with a watermelon mill. Leave the hook unlocked on all trips out of the hole. Pass through the window very slowly on all trips. Pick up the desired drilling assembly and continue normal drilling operations.

Note: The parameters stated above are recommended and actual drilling conditions may require alternate parameters. Refer to ES 20.39385 for specific operating procedures

Quality, Health, Safety and Environment (QHSE)

Smith International's Quality Policy is to -

"establish a relentless focus on satisfying customer needs and expectations."

Our quality objectives are to:

- Provide customers with quality products and services.
- Make these products and services available when and where customers want them.
- Develop a cost structure that enables competitive pricing.
- Build and maintain a reputation for absolute trustworthiness.

Meeting the requirements of the Quality Assurance Manual is the responsibility of every employee. We are committed to an atmosphere that promotes job ownership and pride while fulfilling those responsibilities. Each employee is expected to be familiar with the contents of the Quality Assurance Manual, especially the areas that affect their job responsibilities.

Management Policy on Safety

It is the policy of Smith International, Inc. that every employee be entitled to a safe and healthful place to work. To this end, every reasonable effort will be made in the interest of accident prevention, fire protection, and health preservation.

Our management concept is not production and safety; it is production with safety. We must establish an attitude in our people that accidents can be prevented. We are human beings and cannot hope to eliminate all accidents, but we can and must try to prevent them. When production with safety is achieved, production with efficiency is attained simultaneously.

We fully intend to make every employee's safety a part of our daily, hourly concern. Adherence to the rules and regulations contained in the Occupational Safety and Health Act of 1970, and in accordance with the National and Local authority regulations in each country will aid us in achieving that goal.

The successful operation of Smith International, Inc. will depend not only on manufacturing, sales and service, but also on how safely each job is performed. There is no job so important - nor any service so urgent - that we cannot take time to work safely. We consider the safety of all Smith employees of prime importance, and we expect your full co-operation in making our safety program effective.

Environmental Policy

Smith International, Inc. recognizes that it is the responsibility of each of our worldwide operations to conform and conduct its business in compliance with the laws and regulations designed to protect the vital natural resources of clean air, water, and land. Smith International acknowledges the legitimate environmental interests of those communities where we operate. Smith International therefore, undertakes to be a good corporate citizen and neighbor where we manufacture and service our products as well as where our products are marketed and sold.

Environmental protection and prevention of pollution goals are integrated into all business decisions and strategies. During the design, installation and use of new processes, practices, or chemical products, Smith International will preferentially consider options that avoid, reduce or control pollution and/or that are more energy efficient. Smith International will regularly review existing processes, practices and chemical products and initiate modifications, wherever practical, to enhance environmental protection and prevention of pollution efforts.

Environmental protection and prevention of pollution are the responsibility of every Smith International employee regardless of his or her role in the company. Each employee is expected to maintain a keen sensitivity to environmental issues as they pertain to his or her workplace and to act to minimize adverse environmental effects of these activities. Employees are actively encouraged to propose ideas to reduce or prevent pollution and to improve our environmental programs.

The Environmental Affairs Department has responsibility for the overall coordination of the Company's environmental activities, and works with operations and management worldwide to comply with environmental law and regulation.

Smith International is committed to continual improvement of the Company's environmental performance. The Environmental Affairs Department and Smith International management will regularly review the components of the Company's Environmental Management System for improvement opportunities.

Doug Rock
Chairman and CEO

Bryan Dudman
President, Smith Services

SINGLE LATERAL MULTI-STAGE PROPOSAL



Peak Completion Technologies

Strata-pak system

Well Details

- 5.50" 20# P110 Casing in vertical
- 4.75" Open Hole

Frac Details

- Sand Frac

Open Hole Tool Specs

ISO-PAK

- 5.50" x 2.875" hydraulic set isolation packer
- Minimum ID 2.375" x 60.13"
- Max OD 4.25"
- Total length 60.13"
- 10K differential rating with P110 material
- Solid dual element design ensures isolation
- Easily adjustable setting pressure on location
- Easily adjustable releasing shear on location
- Integral anti-preset system
- Mechanical locking system ensures packer stays set

Hydro-Pak Open Hole Anchor

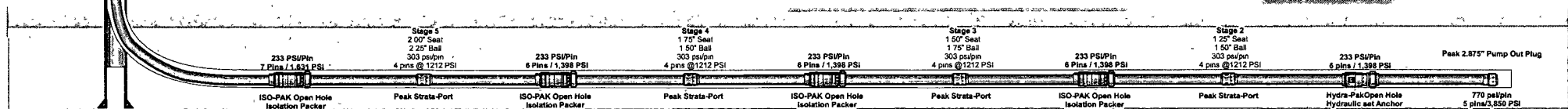
- 5.50" x 2.875" hydraulic set open-hole anchor
- Min ID 2.838" x 54"
- Max OD 4.50"
- Total Length 54"
- easily adjustable setting and releasing shear systems
- Integral anti-preset system reduces mechanical risk
- Mechanical locking system ensures packer stays set
- Compensates for piston effect on bottom packers and anchors system from moving

Strata-Port

- 2.875" Ball actuated frac port
- Min ID 1.50" seal - 2.00" seal
- Max OD 4.00"
- Total Length 28.25"
- P110 material body and seal

System Advantages

- System is run and set in lateral with a single trip
- Open hole packers isolate the heel section without the need for cement minimizing mechanical risk and completion time
- First Stage is opened hydraulically without the need to manipulate mechanically before the stimulation
- All equipment is installed and tested before any frac equipment is moved onto location to reduce potential moving costs
- Zones are treated individually and treatment point is known at all times
- Adaptable to many different open hole sizes and configurations
- Water isolation can be incorporated into the same system
- High differential ratings are possible with open hole packer design
- Integral anti-preset system ensures that packers will not set until the proper time
- Strata-pak system packers can be installed in short radius wellbores and still maintain differential rating
- Horsepower requirements are reduced while maintaining or increasing available fluid rate per foot due to the zonal isolation in the lateral thereby reducing overall cost
- All zones can be produced immediately after the treatment at the same time



SINGLE LATERAL MULTI-STAGE PROPOSAL



Well Details

- 5.50" 20# P110 Casing in vertical
- 4.75" Open hole

Frac Details.

- Sand Frac

Open Hole Tool Specs:

ISO-PAK

- 5.50" x 2.875" hydraulic set isolation packer
- Minimum ID 2.375" x 60.13"
- Max OD 4.25"
- Total length 60.13"
- 10K differential rating with P110 material
- Solid dual element design ensures isolation
- Easily adjustable setting pressure on location
- Easily adjustable releasing shear on location
- Integral anti-press system
- Mechanical locking system ensures packer stays set

Hydro-Pak Open Hole Anchor

- 5.50" x 2.875" hydraulic set open-hole anchor
- Min ID 2.335" x 54"
- Max OD 4.50"
- Total Length 54"
- easily adjustable setting and releasing shear systems
- Integral anti-press system reduces mechanical risk
- Mechanical locking system ensures packer stays set
- Compensates for piston effect on bottom packers and anchors system from moving

Strata-Port

- 2.875" Ball actuated frac port
- Min ID 1.50" seat - 2.00" seat
- Max OD 4.00"
- Total Length 28.25"
- P110 material body and seat

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