



**Total Directional**  
Services, LLC  
USA Operations

## Final MWD Survey Certification

Lea County, New Mexico

Client: Devon Energy

Well Name: Thistle Unit 153H

Total Job No: 2019-202-X20

API No: 30-025-43589

Start Date: 04/20/2019

End Date: 05/17/2019

Measured Start Depth: 0 feet

Measured End Depth: 22,786 feet

Vertical Section from well center at TD: 10155.64feet

**HOBBS OCD**  
**OCT 10 2019**  
**RECEIVED**

I, Dean Williamson, certify that; I am employed by Total Directional Services, LLC and we conducted or supervised the taking of these open hole MWD surveys at the request of this client. This data is true, correct, complete and within the limitations of the tool as set forth by Total Directional Services, LLC. I am authorized and qualified to make this report and have reviewed this report and find that it conforms to the principals and procedures as set forth by Total Directional Services, LLC.

Date: 5/17/2019

Signed: *Dean Williamson*

# DIRECTIONAL SURVEY REPORT

**Company name:** Devon Energy

**Start date:** 04/24/2019

**Well name:** Thistle Unit 153H

**End date:** 05/17/2019

**Field:** Delaware Basin Bone Springs Sands

**Proposed direction:** 359.59

**Rig:** Nabors X20

**Declination:** 6.33

**API/UWI:** 30-025-43589

**North Reference:** Grid

**State/Province:** New Mexico

**Latitude/Longitude:** 32.254847

**County/Parish:** Lea

**KB:** 3693.5

**Location** Lea County

| SVY   | Depth   | Inc  | Azm    | CL     | TVD     | VS    | NS    | EW     | DLS  |
|-------|---------|------|--------|--------|---------|-------|-------|--------|------|
| Tiein | 0.00    | 0.00 | 0.00   |        | 0.00    | 0.00  | 0.00  | 0.00   | 0.00 |
| 1     | 232.00  | 0.60 | 247.10 | 232.00 | 232.00  | -0.46 | -0.47 | -1.12  | 0.26 |
| 2     | 359.00  | 0.60 | 252.70 | 127.00 | 358.99  | -0.91 | -0.93 | -2.37  | 0.05 |
| 3     | 422.00  | 0.60 | 236.60 | 63.00  | 421.99  | -1.19 | -1.21 | -2.96  | 0.27 |
| 4     | 549.00  | 0.30 | 253.60 | 127.00 | 548.98  | -1.64 | -1.67 | -3.83  | 0.26 |
| 5     | 613.00  | 0.30 | 250.70 | 64.00  | 612.98  | -1.74 | -1.77 | -4.15  | 0.02 |
| 6     | 676.00  | 0.20 | 255.60 | 63.00  | 675.98  | -1.82 | -1.85 | -4.41  | 0.16 |
| 7     | 740.00  | 0.10 | 278.20 | 64.00  | 739.98  | -1.84 | -1.87 | -4.58  | 0.18 |
| 8     | 803.00  | 0.20 | 268.90 | 63.00  | 802.98  | -1.83 | -1.87 | -4.74  | 0.16 |
| 9     | 867.00  | 0.20 | 302.30 | 64.00  | 866.98  | -1.77 | -1.81 | -4.95  | 0.18 |
| 10    | 930.00  | 0.10 | 320.30 | 63.00  | 929.98  | -1.67 | -1.71 | -5.07  | 0.17 |
| 11    | 993.00  | 0.20 | 303.50 | 63.00  | 992.98  | -1.57 | -1.61 | -5.20  | 0.17 |
| 12    | 1056.00 | 0.00 | 264.00 | 63.00  | 1055.98 | -1.51 | -1.55 | -5.29  | 0.32 |
| 13    | 1120.00 | 0.20 | 292.90 | 64.00  | 1119.98 | -1.46 | -1.50 | -5.40  | 0.31 |
| 14    | 1183.00 | 0.30 | 292.80 | 63.00  | 1182.98 | -1.35 | -1.39 | -5.65  | 0.16 |
| 15    | 1247.00 | 0.30 | 308.70 | 64.00  | 1246.98 | -1.18 | -1.23 | -5.93  | 0.13 |
| 16    | 1310.00 | 0.30 | 193.40 | 63.00  | 1309.98 | -1.24 | -1.28 | -6.10  | 0.80 |
| 17    | 1374.00 | 0.30 | 285.60 | 64.00  | 1373.98 | -1.36 | -1.40 | -6.30  | 0.68 |
| 18    | 1411.00 | 0.80 | 262.00 | 37.00  | 1410.97 | -1.36 | -1.41 | -6.65  | 1.46 |
| 19    | 1565.00 | 0.30 | 340.40 | 154.00 | 1564.97 | -1.12 | -1.18 | -7.85  | 0.52 |
| 20    | 1606.00 | 0.40 | 330.40 | 41.00  | 1605.97 | -0.90 | -0.95 | -7.96  | 0.28 |
| 21    | 1701.00 | 0.30 | 338.20 | 95.00  | 1700.97 | -0.38 | -0.44 | -8.21  | 0.12 |
| 22    | 1796.00 | 0.30 | 327.40 | 95.00  | 1795.96 | 0.07  | 0.01  | -8.44  | 0.06 |
| 23    | 1891.00 | 0.30 | 333.40 | 95.00  | 1890.96 | 0.50  | 0.44  | -8.68  | 0.03 |
| 24    | 1987.00 | 0.20 | 334.20 | 96.00  | 1986.96 | 0.88  | 0.81  | -8.87  | 0.10 |
| 25    | 2082.00 | 0.30 | 339.30 | 95.00  | 2081.96 | 1.26  | 1.19  | -9.03  | 0.11 |
| 26    | 2177.00 | 0.30 | 335.00 | 95.00  | 2176.96 | 1.72  | 1.65  | -9.22  | 0.02 |
| 27    | 2272.00 | 0.30 | 334.10 | 95.00  | 2271.96 | 2.17  | 2.10  | -9.44  | 0.00 |
| 28    | 2368.00 | 0.30 | 343.80 | 96.00  | 2367.96 | 2.64  | 2.57  | -9.62  | 0.05 |
| 29    | 2463.00 | 0.30 | 344.20 | 95.00  | 2462.96 | 3.12  | 3.05  | -9.75  | 0.00 |
| 30    | 2557.00 | 0.30 | 347.60 | 94.00  | 2556.95 | 3.59  | 3.52  | -9.87  | 0.02 |
| 31    | 2652.00 | 0.30 | 1.60   | 95.00  | 2651.95 | 4.09  | 4.02  | -9.92  | 0.08 |
| 32    | 2747.00 | 0.60 | 279.50 | 95.00  | 2746.95 | 4.42  | 4.35  | -10.40 | 0.67 |
| 33    | 2842.00 | 1.70 | 250.30 | 95.00  | 2841.93 | 4.04  | 3.95  | -12.22 | 1.28 |
| 34    | 2938.00 | 2.50 | 246.50 | 96.00  | 2937.87 | 2.75  | 2.64  | -15.48 | 0.85 |
| 35    | 3033.00 | 3.50 | 237.50 | 95.00  | 3032.73 | 0.40  | 0.25  | -19.83 | 1.16 |
| 36    | 3128.00 | 3.80 | 226.40 | 95.00  | 3127.54 | -3.30 | -3.47 | -24.55 | 0.81 |

|    |         |      |        |        |         |         |         |         |      |
|----|---------|------|--------|--------|---------|---------|---------|---------|------|
| 37 | 3223.00 | 4.80 | 226.80 | 95.00  | 3222.27 | -8.15   | -8.37   | -29.73  | 1.05 |
| 38 | 3318.00 | 4.80 | 228.60 | 95.00  | 3316.94 | -13.46  | -13.72  | -35.61  | 0.16 |
| 39 | 3413.00 | 4.60 | 227.10 | 95.00  | 3411.62 | -18.64  | -18.94  | -41.38  | 0.25 |
| 40 | 3504.00 | 4.50 | 227.90 | 91.00  | 3502.34 | -23.48  | -23.81  | -46.70  | 0.13 |
| 41 | 3604.00 | 4.30 | 227.40 | 100.00 | 3602.04 | -28.61  | -28.98  | -52.37  | 0.20 |
| 42 | 3699.00 | 4.10 | 228.50 | 95.00  | 3696.79 | -33.23  | -33.64  | -57.54  | 0.23 |
| 43 | 3795.00 | 2.60 | 226.00 | 96.00  | 3792.62 | -36.99  | -37.43  | -61.68  | 1.57 |
| 44 | 3890.00 | 4.20 | 231.60 | 95.00  | 3887.45 | -40.62  | -41.09  | -65.95  | 1.72 |
| 45 | 3985.00 | 5.00 | 230.30 | 95.00  | 3982.14 | -45.38  | -45.89  | -71.86  | 0.85 |
| 46 | 4080.00 | 5.40 | 228.70 | 95.00  | 4076.75 | -50.93  | -51.49  | -78.41  | 0.45 |
| 47 | 4176.00 | 5.10 | 228.40 | 96.00  | 4172.35 | -56.69  | -57.30  | -84.99  | 0.31 |
| 48 | 4270.00 | 5.10 | 227.50 | 94.00  | 4265.98 | -62.25  | -62.90  | -91.20  | 0.09 |
| 49 | 4365.00 | 4.80 | 227.10 | 95.00  | 4360.62 | -67.76  | -68.46  | -97.22  | 0.32 |
| 50 | 4461.00 | 4.50 | 218.10 | 96.00  | 4456.31 | -73.42  | -74.16  | -102.49 | 0.82 |
| 51 | 4556.00 | 4.50 | 220.60 | 95.00  | 4551.01 | -79.15  | -79.92  | -107.21 | 0.21 |
| 52 | 4651.00 | 4.70 | 237.40 | 95.00  | 4645.71 | -84.03  | -84.84  | -112.92 | 1.43 |
| 53 | 4746.00 | 4.50 | 232.40 | 95.00  | 4740.41 | -88.36  | -89.22  | -119.15 | 0.47 |
| 54 | 4842.00 | 4.30 | 223.60 | 96.00  | 4836.12 | -93.23  | -94.12  | -124.61 | 0.73 |
| 55 | 4937.00 | 4.30 | 231.40 | 95.00  | 4930.86 | -97.99  | -98.92  | -129.85 | 0.62 |
| 56 | 5032.00 | 4.90 | 244.60 | 95.00  | 5025.55 | -101.91 | -102.88 | -136.30 | 1.28 |
| 57 | 5127.00 | 4.80 | 245.90 | 95.00  | 5120.21 | -105.22 | -106.25 | -143.60 | 0.16 |
| 58 | 5222.00 | 4.40 | 245.00 | 95.00  | 5214.91 | -108.33 | -109.41 | -150.53 | 0.43 |
| 59 | 5317.00 | 4.40 | 244.10 | 95.00  | 5309.63 | -111.41 | -112.54 | -157.11 | 0.07 |
| 60 | 5413.00 | 4.40 | 244.10 | 96.00  | 5405.34 | -114.58 | -115.76 | -163.73 | 0.00 |
| 61 | 5508.00 | 4.30 | 243.10 | 95.00  | 5500.07 | -117.74 | -118.96 | -170.19 | 0.13 |
| 62 | 5603.00 | 4.30 | 243.10 | 95.00  | 5594.80 | -120.92 | -122.18 | -176.54 | 0.00 |
| 63 | 5698.00 | 4.20 | 243.20 | 95.00  | 5689.54 | -124.05 | -125.36 | -182.82 | 0.11 |
| 64 | 5794.00 | 4.00 | 242.80 | 96.00  | 5785.30 | -127.12 | -128.48 | -188.94 | 0.21 |
| 65 | 5889.00 | 4.00 | 243.10 | 95.00  | 5880.07 | -130.10 | -131.49 | -194.84 | 0.02 |
| 66 | 5984.00 | 4.00 | 242.90 | 95.00  | 5974.83 | -133.06 | -134.50 | -200.74 | 0.01 |
| 67 | 6079.00 | 4.00 | 243.20 | 95.00  | 6069.60 | -136.02 | -137.51 | -206.65 | 0.02 |
| 68 | 6175.00 | 3.80 | 242.50 | 96.00  | 6165.38 | -138.96 | -140.48 | -212.46 | 0.21 |
| 69 | 6270.00 | 4.10 | 238.20 | 95.00  | 6260.15 | -142.16 | -143.73 | -218.14 | 0.44 |
| 70 | 6365.00 | 4.70 | 240.60 | 95.00  | 6354.87 | -145.82 | -147.43 | -224.42 | 0.66 |
| 71 | 6460.00 | 5.20 | 237.20 | 95.00  | 6449.52 | -150.01 | -151.67 | -231.43 | 0.61 |
| 72 | 6555.00 | 5.40 | 234.40 | 95.00  | 6544.11 | -154.89 | -156.60 | -238.68 | 0.34 |
| 73 | 6651.00 | 5.40 | 234.00 | 96.00  | 6639.69 | -160.12 | -161.89 | -246.01 | 0.04 |
| 74 | 6746.00 | 5.40 | 233.70 | 95.00  | 6734.27 | -165.35 | -167.16 | -253.23 | 0.03 |
| 75 | 6841.00 | 5.10 | 234.10 | 95.00  | 6828.87 | -170.42 | -172.29 | -260.25 | 0.32 |
| 76 | 6936.00 | 4.80 | 234.90 | 95.00  | 6923.51 | -175.13 | -177.05 | -266.92 | 0.32 |
| 77 | 7032.00 | 4.70 | 234.40 | 96.00  | 7019.18 | -179.68 | -181.65 | -273.41 | 0.11 |
| 78 | 7127.00 | 4.50 | 235.10 | 95.00  | 7113.88 | -184.04 | -186.04 | -279.63 | 0.22 |
| 79 | 7222.00 | 4.30 | 234.50 | 95.00  | 7208.60 | -188.20 | -190.24 | -285.58 | 0.22 |
| 80 | 7317.00 | 4.10 | 234.20 | 95.00  | 7303.34 | -192.21 | -194.30 | -291.24 | 0.21 |
| 81 | 7412.00 | 4.00 | 232.50 | 95.00  | 7398.11 | -196.18 | -198.30 | -296.62 | 0.16 |
| 82 | 7508.00 | 3.90 | 229.80 | 96.00  | 7493.88 | -200.28 | -202.45 | -301.77 | 0.22 |
| 83 | 7603.00 | 4.00 | 236.60 | 95.00  | 7588.65 | -204.16 | -206.36 | -307.00 | 0.50 |
| 84 | 7698.00 | 4.00 | 236.40 | 95.00  | 7683.42 | -207.77 | -210.02 | -312.53 | 0.01 |
| 85 | 7793.00 | 3.90 | 234.10 | 95.00  | 7778.19 | -211.46 | -213.74 | -317.91 | 0.20 |

|     |          |       |        |        |          |         |         |         |       |
|-----|----------|-------|--------|--------|----------|---------|---------|---------|-------|
| 86  | 7888.00  | 4.40  | 230.80 | 95.00  | 7872.95  | -215.62 | -217.94 | -323.35 | 0.58  |
| 87  | 7984.00  | 4.40  | 229.90 | 96.00  | 7968.66  | -220.28 | -222.64 | -329.02 | 0.07  |
| 88  | 8079.00  | 4.00  | 230.30 | 95.00  | 8063.41  | -224.71 | -227.10 | -334.36 | 0.42  |
| 89  | 8174.00  | 3.80  | 229.60 | 95.00  | 8158.19  | -228.83 | -231.26 | -339.30 | 0.22  |
| 90  | 8269.00  | 4.40  | 229.60 | 95.00  | 8252.94  | -233.19 | -235.66 | -344.47 | 0.63  |
| 91  | 8365.00  | 4.70  | 230.80 | 96.00  | 8348.64  | -238.02 | -240.54 | -350.33 | 0.33  |
| 92  | 8460.00  | 4.40  | 231.60 | 95.00  | 8443.34  | -242.70 | -245.26 | -356.20 | 0.32  |
| 93  | 8555.00  | 4.20  | 231.00 | 95.00  | 8538.07  | -247.12 | -249.71 | -361.76 | 0.22  |
| 94  | 8651.00  | 3.90  | 231.70 | 96.00  | 8633.83  | -251.31 | -253.95 | -367.05 | 0.32  |
| 95  | 8746.00  | 4.00  | 232.90 | 95.00  | 8728.61  | -255.28 | -257.95 | -372.23 | 0.14  |
| 96  | 8841.00  | 3.90  | 235.00 | 95.00  | 8823.38  | -259.09 | -261.80 | -377.52 | 0.19  |
| 97  | 8936.00  | 3.50  | 238.70 | 95.00  | 8918.18  | -262.42 | -265.16 | -382.64 | 0.49  |
| 98  | 9031.00  | 3.40  | 236.20 | 95.00  | 9013.01  | -265.45 | -268.23 | -387.46 | 0.19  |
| 99  | 9127.00  | 3.00  | 236.50 | 96.00  | 9108.86  | -268.39 | -271.20 | -391.92 | 0.42  |
| 100 | 9222.00  | 2.90  | 236.50 | 95.00  | 9203.74  | -271.06 | -273.90 | -396.00 | 0.11  |
| 101 | 9317.00  | 2.40  | 234.80 | 95.00  | 9298.64  | -273.51 | -276.38 | -399.63 | 0.53  |
| 102 | 9412.00  | 2.00  | 229.10 | 95.00  | 9393.57  | -275.72 | -278.61 | -402.51 | 0.48  |
| 103 | 9507.00  | 2.10  | 223.90 | 95.00  | 9488.50  | -278.04 | -280.95 | -404.97 | 0.22  |
| 104 | 9602.00  | 2.40  | 220.70 | 95.00  | 9583.43  | -280.79 | -283.71 | -407.47 | 0.34  |
| 105 | 9698.00  | 2.40  | 215.50 | 96.00  | 9679.35  | -283.93 | -286.87 | -409.95 | 0.23  |
| 106 | 9793.00  | 2.60  | 206.50 | 95.00  | 9774.26  | -287.46 | -290.42 | -412.07 | 0.46  |
| 107 | 9888.00  | 1.30  | 207.30 | 95.00  | 9869.20  | -290.34 | -293.30 | -413.52 | 1.37  |
| 108 | 9984.00  | 1.50  | 207.50 | 96.00  | 9965.17  | -292.41 | -295.39 | -414.60 | 0.21  |
| 109 | 10079.00 | 1.70  | 199.00 | 95.00  | 10060.13 | -294.84 | -297.82 | -415.63 | 0.33  |
| 110 | 10174.00 | 1.90  | 199.60 | 95.00  | 10155.09 | -297.65 | -300.64 | -416.62 | 0.21  |
| 111 | 10269.00 | 2.20  | 199.80 | 95.00  | 10250.03 | -300.84 | -303.84 | -417.77 | 0.32  |
| 112 | 10365.00 | 2.20  | 204.00 | 96.00  | 10345.96 | -304.25 | -307.25 | -419.14 | 0.17  |
| 113 | 10459.00 | 0.80  | 202.90 | 94.00  | 10439.92 | -306.49 | -309.51 | -420.13 | 1.49  |
| 114 | 10555.00 | 0.30  | 235.20 | 96.00  | 10535.92 | -307.25 | -310.27 | -420.60 | 0.59  |
| 115 | 10650.00 | 0.40  | 204.70 | 95.00  | 10630.91 | -307.69 | -310.71 | -420.94 | 0.22  |
| 116 | 10744.00 | 0.40  | 185.80 | 94.00  | 10724.91 | -308.31 | -311.33 | -421.11 | 0.14  |
| 117 | 10840.00 | 0.50  | 150.70 | 96.00  | 10820.91 | -309.01 | -312.03 | -420.94 | 0.30  |
| 118 | 10935.00 | 0.90  | 135.00 | 95.00  | 10915.90 | -309.91 | -312.92 | -420.21 | 0.46  |
| 119 | 11030.00 | 1.00  | 141.20 | 95.00  | 11010.89 | -311.09 | -314.10 | -419.16 | 0.15  |
| 120 | 11126.00 | 0.90  | 157.20 | 96.00  | 11106.88 | -312.44 | -315.44 | -418.34 | 0.29  |
| 121 | 11221.00 | 0.80  | 222.80 | 95.00  | 11201.87 | -313.62 | -316.62 | -418.51 | 0.97  |
| 122 | 11316.00 | 1.00  | 227.90 | 95.00  | 11296.86 | -314.65 | -317.66 | -419.57 | 0.23  |
| 123 | 11411.00 | 0.40  | 236.50 | 95.00  | 11391.85 | -315.38 | -318.40 | -420.46 | 0.64  |
| 124 | 11507.00 | 0.50  | 245.70 | 96.00  | 11487.85 | -315.73 | -318.76 | -421.12 | 0.13  |
| 125 | 11601.00 | 1.00  | 235.50 | 94.00  | 11581.84 | -316.36 | -319.39 | -422.17 | 0.55  |
| 126 | 11697.00 | 1.00  | 227.50 | 96.00  | 11677.82 | -317.39 | -320.43 | -423.48 | 0.15  |
| 127 | 11793.00 | 1.10  | 261.00 | 96.00  | 11773.81 | -318.09 | -321.14 | -425.01 | 0.64  |
| 128 | 11944.00 | 6.20  | 332.00 | 151.00 | 11924.49 | -311.07 | -314.16 | -430.27 | 3.93  |
| 129 | 12039.00 | 20.20 | 339.80 | 95.00  | 12016.75 | -290.99 | -294.14 | -438.39 | 14.82 |
| 130 | 12134.00 | 35.40 | 344.40 | 95.00  | 12100.55 | -248.75 | -251.99 | -451.53 | 16.15 |
| 131 | 12230.00 | 45.00 | 357.20 | 96.00  | 12173.91 | -187.76 | -191.06 | -460.70 | 13.15 |
| 132 | 12325.00 | 50.90 | 358.70 | 95.00  | 12237.52 | -117.28 | -120.60 | -463.18 | 6.32  |
| 133 | 12420.00 | 51.20 | 2.40   | 95.00  | 12297.25 | -43.43  | -46.74  | -462.47 | 3.05  |
| 134 | 12515.00 | 55.60 | 7.00   | 95.00  | 12353.90 | 32.47   | 29.21   | -456.14 | 6.04  |

|     |          |       |        |       |          |         |         |         |       |
|-----|----------|-------|--------|-------|----------|---------|---------|---------|-------|
| 135 | 12611.00 | 60.20 | 8.40   | 96.00 | 12404.90 | 112.95  | 109.77  | -445.22 | 4.95  |
| 136 | 12706.00 | 63.60 | 6.10   | 95.00 | 12449.64 | 195.99  | 192.88  | -434.67 | 4.17  |
| 137 | 12801.00 | 76.10 | 5.40   | 95.00 | 12482.31 | 284.49  | 281.45  | -425.77 | 13.18 |
| 138 | 12896.00 | 83.40 | 3.80   | 95.00 | 12499.20 | 377.55  | 374.56  | -418.30 | 7.86  |
| 139 | 12992.00 | 89.80 | 5.50   | 96.00 | 12504.89 | 472.95  | 470.03  | -410.53 | 6.90  |
| 140 | 13087.00 | 89.90 | 2.20   | 95.00 | 12505.14 | 567.68  | 564.80  | -404.15 | 3.48  |
| 141 | 13182.00 | 90.40 | 0.00   | 95.00 | 12504.89 | 662.64  | 659.77  | -402.33 | 2.37  |
| 142 | 13277.00 | 89.50 | 359.50 | 95.00 | 12504.97 | 757.64  | 754.77  | -402.74 | 1.08  |
| 143 | 13373.00 | 89.70 | 359.30 | 96.00 | 12505.64 | 853.63  | 850.76  | -403.75 | 0.29  |
| 144 | 13468.00 | 89.90 | 358.80 | 95.00 | 12505.98 | 948.63  | 945.75  | -405.32 | 0.57  |
| 145 | 13563.00 | 90.30 | 358.50 | 95.00 | 12505.81 | 1043.61 | 1040.72 | -407.56 | 0.53  |
| 146 | 13658.00 | 89.90 | 358.20 | 95.00 | 12505.64 | 1138.59 | 1135.68 | -410.30 | 0.53  |
| 147 | 13753.00 | 89.70 | 357.50 | 95.00 | 12505.98 | 1233.55 | 1230.62 | -413.86 | 0.77  |
| 148 | 13849.00 | 90.00 | 357.20 | 96.00 | 12506.23 | 1329.47 | 1326.51 | -418.30 | 0.44  |
| 149 | 13944.00 | 90.30 | 357.10 | 95.00 | 12505.98 | 1424.39 | 1421.39 | -423.02 | 0.33  |
| 150 | 14039.00 | 90.70 | 357.10 | 95.00 | 12505.15 | 1519.29 | 1516.27 | -427.83 | 0.42  |
| 151 | 14134.00 | 90.40 | 356.40 | 95.00 | 12504.24 | 1614.17 | 1611.11 | -433.21 | 0.80  |
| 152 | 14229.00 | 90.20 | 356.10 | 95.00 | 12503.74 | 1709.01 | 1705.91 | -439.43 | 0.38  |
| 153 | 14324.00 | 89.00 | 358.80 | 95.00 | 12504.40 | 1803.93 | 1800.80 | -443.65 | 3.11  |
| 154 | 14420.00 | 89.20 | 358.20 | 96.00 | 12505.91 | 1899.90 | 1896.75 | -446.17 | 0.66  |
| 155 | 14515.00 | 88.90 | 358.90 | 95.00 | 12507.49 | 1994.87 | 1991.71 | -448.57 | 0.80  |
| 156 | 14610.00 | 88.30 | 359.00 | 95.00 | 12509.81 | 2089.83 | 2086.67 | -450.31 | 0.64  |
| 157 | 14705.00 | 90.60 | 358.80 | 95.00 | 12510.72 | 2184.82 | 2181.64 | -452.13 | 2.43  |
| 158 | 14801.00 | 91.20 | 358.50 | 96.00 | 12509.21 | 2280.79 | 2277.60 | -454.39 | 0.70  |
| 159 | 14896.00 | 92.10 | 358.40 | 95.00 | 12506.48 | 2375.73 | 2372.52 | -456.96 | 0.95  |
| 160 | 14991.00 | 89.30 | 356.50 | 95.00 | 12505.32 | 2470.65 | 2467.41 | -461.19 | 3.56  |
| 161 | 15086.00 | 89.70 | 358.10 | 95.00 | 12506.14 | 2565.56 | 2562.30 | -465.66 | 1.74  |
| 162 | 15182.00 | 89.40 | 1.10   | 96.00 | 12506.90 | 2661.55 | 2658.28 | -466.33 | 3.14  |
| 163 | 15277.00 | 90.10 | 0.90   | 95.00 | 12507.31 | 2756.52 | 2753.26 | -464.68 | 0.77  |
| 164 | 15372.00 | 89.60 | 0.50   | 95.00 | 12507.56 | 2851.50 | 2848.26 | -463.52 | 0.67  |
| 165 | 15467.00 | 89.10 | 359.80 | 95.00 | 12508.64 | 2946.49 | 2943.25 | -463.27 | 0.91  |
| 166 | 15563.00 | 89.80 | 359.90 | 96.00 | 12509.56 | 3042.48 | 3039.24 | -463.52 | 0.74  |
| 167 | 15658.00 | 90.00 | 0.30   | 95.00 | 12509.73 | 3137.48 | 3134.24 | -463.35 | 0.47  |
| 168 | 15753.00 | 89.00 | 359.20 | 95.00 | 12510.56 | 3232.47 | 3229.24 | -463.77 | 1.56  |
| 169 | 15848.00 | 90.90 | 1.70   | 95.00 | 12510.64 | 3327.45 | 3324.22 | -463.02 | 3.31  |
| 170 | 15944.00 | 91.20 | 0.50   | 96.00 | 12508.88 | 3423.40 | 3420.18 | -461.18 | 1.29  |
| 171 | 16039.00 | 91.10 | 0.60   | 95.00 | 12506.97 | 3518.36 | 3515.16 | -460.27 | 0.15  |
| 172 | 16134.00 | 90.10 | 359.90 | 95.00 | 12505.98 | 3613.35 | 3610.15 | -459.85 | 1.28  |
| 173 | 16229.00 | 89.40 | 358.60 | 95.00 | 12506.39 | 3708.35 | 3705.14 | -461.10 | 1.55  |
| 174 | 16324.00 | 90.10 | 358.00 | 95.00 | 12506.81 | 3803.32 | 3800.10 | -463.91 | 0.97  |
| 175 | 16419.00 | 90.70 | 359.00 | 95.00 | 12506.14 | 3898.30 | 3895.06 | -466.40 | 1.23  |
| 176 | 16514.00 | 91.60 | 358.70 | 95.00 | 12504.24 | 3993.27 | 3990.02 | -468.31 | 1.00  |
| 177 | 16610.00 | 91.50 | 2.20   | 96.00 | 12501.64 | 4089.21 | 4085.97 | -467.55 | 3.65  |
| 178 | 16705.00 | 89.40 | 2.30   | 95.00 | 12500.89 | 4184.10 | 4180.89 | -463.82 | 2.21  |
| 179 | 16800.00 | 89.60 | 2.90   | 95.00 | 12501.72 | 4278.96 | 4275.79 | -459.51 | 0.67  |
| 180 | 16895.00 | 89.40 | 0.30   | 95.00 | 12502.55 | 4373.89 | 4370.74 | -456.86 | 2.74  |
| 181 | 16990.00 | 89.60 | 358.60 | 95.00 | 12503.38 | 4468.89 | 4465.73 | -457.77 | 1.80  |
| 182 | 17086.00 | 90.30 | 358.20 | 96.00 | 12503.46 | 4564.87 | 4561.69 | -460.45 | 0.84  |
| 183 | 17181.00 | 90.20 | 356.40 | 95.00 | 12503.05 | 4659.78 | 4656.58 | -464.93 | 1.90  |

|     |          |       |        |       |          |         |         |         |      |
|-----|----------|-------|--------|-------|----------|---------|---------|---------|------|
| 184 | 17276.00 | 89.60 | 353.20 | 95.00 | 12503.22 | 4754.44 | 4751.17 | -473.54 | 3.43 |
| 185 | 17371.00 | 89.20 | 352.80 | 95.00 | 12504.21 | 4848.81 | 4845.46 | -485.11 | 0.60 |
| 186 | 17466.00 | 90.30 | 352.20 | 95.00 | 12504.63 | 4943.08 | 4939.64 | -497.51 | 1.32 |
| 187 | 17562.00 | 90.40 | 350.00 | 96.00 | 12504.04 | 5038.02 | 5034.48 | -512.37 | 2.29 |
| 188 | 17657.00 | 90.60 | 347.40 | 95.00 | 12503.21 | 5131.30 | 5127.63 | -530.98 | 2.74 |
| 189 | 17752.00 | 90.40 | 344.40 | 95.00 | 12502.38 | 5223.58 | 5219.75 | -554.12 | 3.16 |
| 190 | 17847.00 | 90.90 | 341.50 | 95.00 | 12501.30 | 5314.59 | 5310.56 | -581.97 | 3.10 |
| 191 | 17942.00 | 91.20 | 340.70 | 95.00 | 12499.56 | 5404.67 | 5400.42 | -612.73 | 0.90 |
| 192 | 18037.00 | 90.90 | 339.50 | 95.00 | 12497.82 | 5494.21 | 5489.73 | -645.06 | 1.30 |
| 193 | 18133.00 | 89.90 | 338.40 | 96.00 | 12497.15 | 5584.04 | 5579.32 | -679.54 | 1.55 |
| 194 | 18228.00 | 89.90 | 337.70 | 95.00 | 12497.32 | 5672.41 | 5667.43 | -715.05 | 0.74 |
| 195 | 18323.00 | 90.30 | 338.90 | 95.00 | 12497.15 | 5760.92 | 5755.70 | -750.18 | 1.33 |
| 196 | 18419.00 | 90.00 | 341.30 | 96.00 | 12496.90 | 5851.41 | 5845.96 | -782.85 | 2.52 |
| 197 | 18514.00 | 92.10 | 344.00 | 95.00 | 12495.16 | 5942.26 | 5936.61 | -811.18 | 3.60 |
| 198 | 18609.00 | 92.10 | 345.90 | 95.00 | 12491.68 | 6034.11 | 6028.28 | -835.83 | 2.00 |
| 199 | 18705.00 | 92.20 | 348.40 | 96.00 | 12488.07 | 6127.78 | 6121.81 | -857.16 | 2.60 |
| 200 | 18801.00 | 92.60 | 351.30 | 96.00 | 12484.05 | 6222.31 | 6216.21 | -874.06 | 3.05 |
| 201 | 18897.00 | 91.70 | 354.40 | 96.00 | 12480.45 | 6317.56 | 6311.39 | -886.00 | 3.36 |
| 202 | 18992.00 | 90.50 | 359.30 | 95.00 | 12478.63 | 6412.41 | 6406.19 | -891.22 | 5.31 |
| 203 | 19087.00 | 90.80 | 0.30   | 95.00 | 12477.55 | 6507.40 | 6501.19 | -891.55 | 1.10 |
| 204 | 19183.00 | 90.90 | 0.20   | 96.00 | 12476.12 | 6603.38 | 6597.17 | -891.13 | 0.15 |
| 205 | 19278.00 | 91.00 | 359.90 | 95.00 | 12474.55 | 6698.37 | 6692.16 | -891.05 | 0.33 |
| 206 | 19373.00 | 90.70 | 359.60 | 95.00 | 12473.14 | 6793.35 | 6787.15 | -891.46 | 0.45 |
| 207 | 19469.00 | 90.90 | 0.30   | 96.00 | 12471.80 | 6889.34 | 6883.14 | -891.54 | 0.76 |
| 208 | 19564.00 | 89.80 | 0.20   | 95.00 | 12471.22 | 6984.33 | 6978.14 | -891.13 | 1.16 |
| 209 | 19659.00 | 90.40 | 0.30   | 95.00 | 12471.05 | 7079.33 | 7073.13 | -890.71 | 0.64 |
| 210 | 19754.00 | 92.40 | 2.90   | 95.00 | 12468.73 | 7174.23 | 7168.06 | -888.06 | 3.45 |
| 211 | 19849.00 | 91.90 | 2.50   | 95.00 | 12465.17 | 7269.02 | 7262.88 | -883.59 | 0.67 |
| 212 | 19944.00 | 92.10 | 2.50   | 95.00 | 12461.85 | 7363.84 | 7357.73 | -879.45 | 0.21 |
| 213 | 20039.00 | 92.30 | 2.60   | 95.00 | 12458.21 | 7458.64 | 7452.57 | -875.23 | 0.24 |
| 214 | 20134.00 | 91.10 | 1.30   | 95.00 | 12455.39 | 7553.52 | 7547.47 | -872.00 | 1.86 |
| 215 | 20229.00 | 90.70 | 359.70 | 95.00 | 12453.90 | 7648.49 | 7642.45 | -871.17 | 1.74 |
| 216 | 20325.00 | 90.70 | 359.40 | 96.00 | 12452.72 | 7744.48 | 7738.44 | -871.92 | 0.31 |
| 217 | 20420.00 | 90.60 | 359.60 | 95.00 | 12451.64 | 7839.48 | 7833.43 | -872.75 | 0.24 |
| 218 | 20515.00 | 90.00 | 359.60 | 95.00 | 12451.15 | 7934.47 | 7928.43 | -873.41 | 0.63 |
| 219 | 20610.00 | 91.90 | 359.90 | 95.00 | 12449.57 | 8029.46 | 8023.41 | -873.83 | 2.02 |
| 220 | 20707.00 | 92.30 | 359.60 | 97.00 | 12446.02 | 8126.39 | 8120.34 | -874.25 | 0.52 |
| 221 | 20802.00 | 90.80 | 0.30   | 95.00 | 12443.45 | 8221.35 | 8215.30 | -874.33 | 1.74 |
| 222 | 20898.00 | 90.40 | 1.00   | 96.00 | 12442.44 | 8317.33 | 8311.29 | -873.24 | 0.84 |
| 223 | 20993.00 | 90.60 | 0.70   | 95.00 | 12441.61 | 8412.30 | 8406.28 | -871.84 | 0.38 |
| 224 | 21088.00 | 90.30 | 0.40   | 95.00 | 12440.87 | 8507.28 | 8501.27 | -870.92 | 0.45 |
| 225 | 21183.00 | 89.20 | 0.50   | 95.00 | 12441.28 | 8602.27 | 8596.26 | -870.18 | 1.16 |
| 226 | 21278.00 | 90.60 | 0.20   | 95.00 | 12441.45 | 8697.26 | 8691.26 | -869.60 | 1.51 |
| 227 | 21374.00 | 89.70 | 0.70   | 96.00 | 12441.20 | 8793.25 | 8787.26 | -868.84 | 1.07 |
| 228 | 21469.00 | 91.30 | 0.30   | 95.00 | 12440.37 | 8888.23 | 8882.25 | -868.01 | 1.74 |
| 229 | 21564.00 | 90.50 | 0.10   | 95.00 | 12438.88 | 8983.21 | 8977.23 | -867.68 | 0.87 |
| 230 | 21659.00 | 90.70 | 357.60 | 95.00 | 12437.88 | 9078.19 | 9072.20 | -869.59 | 2.64 |
| 231 | 21755.00 | 90.20 | 357.40 | 96.00 | 12437.13 | 9174.12 | 9168.11 | -873.78 | 0.56 |
| 232 | 21850.00 | 90.00 | 356.70 | 95.00 | 12436.96 | 9269.03 | 9262.98 | -878.67 | 0.77 |

|     |          |       |        |       |          |          |          |         |      |
|-----|----------|-------|--------|-------|----------|----------|----------|---------|------|
| 233 | 21945.00 | 89.70 | 357.00 | 95.00 | 12437.21 | 9363.92  | 9357.83  | -883.89 | 0.45 |
| 234 | 22040.00 | 90.60 | 358.30 | 95.00 | 12436.96 | 9458.86  | 9452.75  | -887.78 | 1.66 |
| 235 | 22135.00 | 91.20 | 0.40   | 95.00 | 12435.47 | 9553.84  | 9547.73  | -888.86 | 2.30 |
| 236 | 22230.00 | 91.10 | 0.40   | 95.00 | 12433.56 | 9648.82  | 9642.71  | -888.20 | 0.11 |
| 237 | 22325.00 | 90.90 | 359.80 | 95.00 | 12431.90 | 9743.80  | 9737.69  | -888.03 | 0.67 |
| 238 | 22421.00 | 90.40 | 359.60 | 96.00 | 12430.81 | 9839.79  | 9833.68  | -888.53 | 0.56 |
| 239 | 22516.00 | 92.20 | 0.50   | 95.00 | 12428.66 | 9934.76  | 9928.65  | -888.45 | 2.12 |
| 240 | 22611.00 | 91.80 | 1.20   | 95.00 | 12425.34 | 10029.68 | 10023.59 | -887.04 | 0.85 |
| 241 | 22706.00 | 90.20 | 0.10   | 95.00 | 12423.69 | 10124.64 | 10118.56 | -885.96 | 2.04 |
| 242 | 22737.00 | 90.40 | 0.30   | 31.00 | 12423.52 | 10155.64 | 10149.56 | -885.86 | 0.91 |
| PTB | 22786.00 | 90.40 | 0.30   | 49.00 | 12423.18 | 10204.63 | 10198.56 | -885.60 | 0.00 |

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