

Apollo Operating, LLC

Loewen Multi Well Plan

Sec. 32, T4N, R68W

Loewen 22-32D - Slot 22-32D

Wellbore #1

Plan: Plan 2

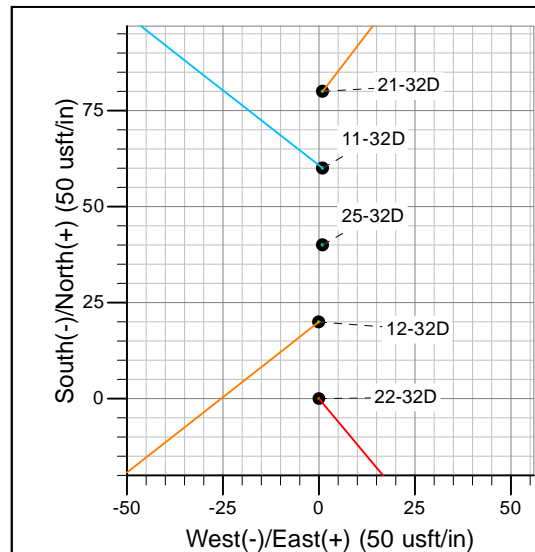
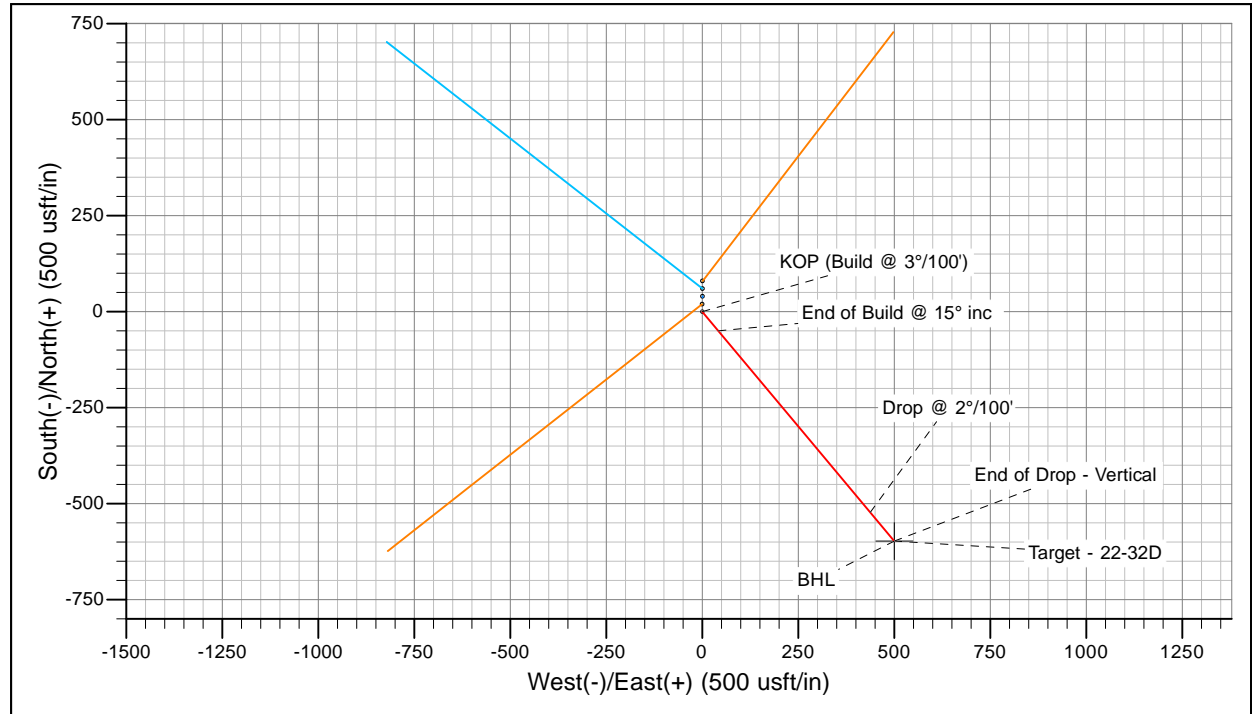
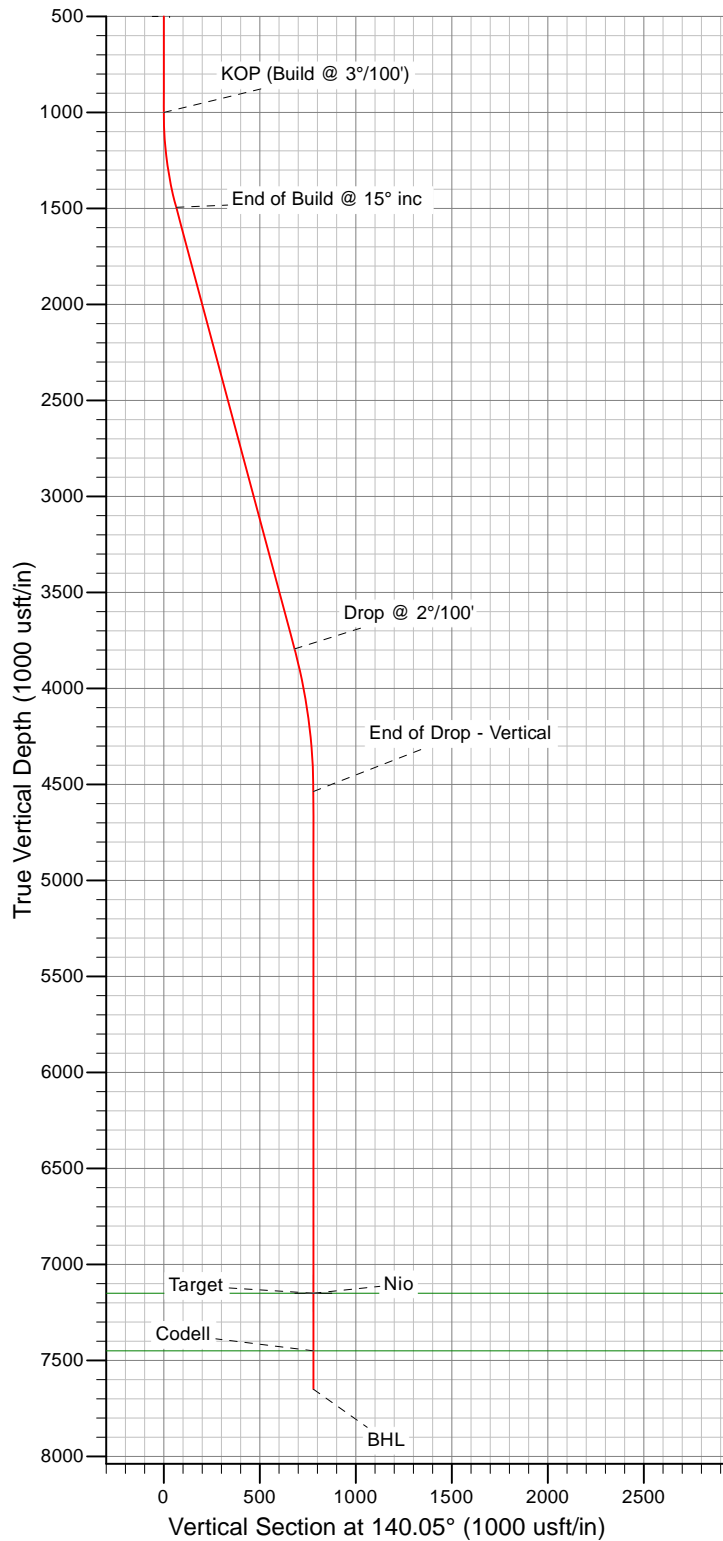
06 May, 2011

Directional Planning Report



Apollo Operating, LLC

Project: Loewen Multi Well Plan
 Site: Sec. 32, T4N, R68W
 Well: Loewen 22-32D
 Wellbore: Wellbore #1
 Design: Plan 2



Plan: Plan 2 (Loewen 22-32D/Wellbore #1)

Created By: Roopa Dattan Date: 11:14, May 06 2011

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| | | | |
|--------------------|--|----------------------|----------------|
| Project | Loewen Multi Well Plan | | |
| Map System: | Universal Transverse Mercator (US Survey Feet) | System Datum: | Mean Sea Level |
| Geo Datum: | NAD83 Colorado - HARN | | |
| Map Zone: | Zone 13N (108 W to 102 W) | | |

| | | | |
|------------------------------|----------------------|--------------------------|------------------|
| Site | Sec. 32, T4N, R68W | | |
| Site Position: | | Northing: | 4,458,068.71 m |
| From: | Lat/Long | Easting: | 497,389.93 m |
| Position Uncertainty: | 0.00 _{usft} | Slot Radius: | 13-3/16 " |
| | | Latitude: | 40° 16' 23.124 N |
| | | Longitude: | 105° 1' 50.520 W |
| | | Grid Convergence: | -0.02 ° |

| Well | Loewen 22-32D - Slot 22-32D | | | | | |
|----------------------|-----------------------------|-----------|---------------------|----------------|---------------|------------------|
| Well Position | +N/-S | 0.00 usft | Northing: | 4,458,044.32 m | Latitude: | 40° 16' 22.333 N |
| | +E/-W | 0.00 usft | Easting: | 497,389.61 m | Longitude: | 105° 1' 50.533 W |
| Position Uncertainty | | 0.00 usft | Wellhead Elevation: | usft | Ground Level: | 5,000.00 usft |

| | | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|--|
| Wellbore | Wellbore #1 | | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) | |
| | IGRF2010 | 5/5/2011 | 9.01 | 66.91 | 53,046 | |

| | | | | |
|--------------------------|--------------------------------|---------------------|----------------------|----------------------|
| Design | Plan 2 | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PLAN | Tie On Depth: | 0.00 |
| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
| | 0.00 | 0.00 | 0.00 | 140.05 |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Plan Sections | | | | | | | | | | |
|-----------------------|-----------------|-------------|-----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|---------|-----------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,500.00 | 15.00 | 140.05 | 1,494.31 | -49.89 | 41.79 | 3.00 | 3.00 | 0.00 | 140.05 | |
| 3,881.88 | 15.00 | 140.05 | 3,795.03 | -522.49 | 437.62 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 4,631.88 | 0.00 | 0.00 | 4,536.49 | -597.33 | 500.30 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 7,245.39 | 0.00 | 0.00 | 7,150.00 | -597.33 | 500.30 | 0.00 | 0.00 | 0.00 | 0.00 | Target - 22-32D |
| 7,745.39 | 0.00 | 0.00 | 7,650.00 | -597.33 | 500.30 | 0.00 | 0.00 | 0.00 | 0.00 | |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Planned Survey | | | | | | | | | | | |
|-----------------------|-----------------|-------------|------------|----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|-------------------------|------------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | TVD (usft) | Sub Sea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | Dogleg Rate (°/100usft) | Comment/Formation |
| 0.00 | 0.00 | 0.00 | 0.00 | 5,021.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 100.00 | 0.00 | 0.00 | 100.00 | 4,921.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 200.00 | 0.00 | 0.00 | 200.00 | 4,821.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 300.00 | 0.00 | 0.00 | 300.00 | 4,721.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 400.00 | 0.00 | 0.00 | 400.00 | 4,621.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 500.00 | 0.00 | 0.00 | 500.00 | 4,521.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | Surface Casing |
| 600.00 | 0.00 | 0.00 | 600.00 | 4,421.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 700.00 | 0.00 | 0.00 | 700.00 | 4,321.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 800.00 | 0.00 | 0.00 | 800.00 | 4,221.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 900.00 | 0.00 | 0.00 | 900.00 | 4,121.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 4,021.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | KOP (Build @ 3°/100') |
| 1,100.00 | 3.00 | 140.05 | 1,099.95 | 3,921.05 | -2.01 | 1.68 | 2.62 | 3.00 | 0.00 | 3.00 | |
| 1,200.00 | 6.00 | 140.05 | 1,199.63 | 3,821.37 | -8.02 | 6.72 | 10.46 | 3.00 | 0.00 | 3.00 | |
| 1,300.00 | 9.00 | 140.05 | 1,298.77 | 3,722.23 | -18.03 | 15.10 | 23.51 | 3.00 | 0.00 | 3.00 | |
| 1,400.00 | 12.00 | 140.05 | 1,397.08 | 3,623.92 | -32.00 | 26.80 | 41.74 | 3.00 | 0.00 | 3.00 | |
| 1,500.00 | 15.00 | 140.05 | 1,494.31 | 3,526.69 | -49.89 | 41.79 | 65.08 | 3.00 | 0.00 | 3.00 | End of Build @ 15° inc |
| 1,600.00 | 15.00 | 140.05 | 1,590.90 | 3,430.10 | -69.73 | 58.40 | 90.96 | 0.00 | 0.00 | 0.00 | |
| 1,700.00 | 15.00 | 140.05 | 1,687.49 | 3,333.51 | -89.57 | 75.02 | 116.84 | 0.00 | 0.00 | 0.00 | |
| 1,800.00 | 15.00 | 140.05 | 1,784.09 | 3,236.91 | -109.41 | 91.64 | 142.72 | 0.00 | 0.00 | 0.00 | |
| 1,900.00 | 15.00 | 140.05 | 1,880.68 | 3,140.32 | -129.26 | 108.26 | 168.60 | 0.00 | 0.00 | 0.00 | |
| 2,000.00 | 15.00 | 140.05 | 1,977.27 | 3,043.73 | -149.10 | 124.88 | 194.49 | 0.00 | 0.00 | 0.00 | |
| 2,100.00 | 15.00 | 140.05 | 2,073.86 | 2,947.14 | -168.94 | 141.50 | 220.37 | 0.00 | 0.00 | 0.00 | |
| 2,200.00 | 15.00 | 140.05 | 2,170.46 | 2,850.54 | -188.78 | 158.12 | 246.25 | 0.00 | 0.00 | 0.00 | |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Planned Survey | | | | | | | | | | | |
|-----------------------|-----------------|-------------|------------|----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|-------------------------|-------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | TVD (usft) | Sub Sea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | Dogleg Rate (°/100usft) | Comment/Formation |
| 2,300.00 | 15.00 | 140.05 | 2,267.05 | 2,753.95 | -208.62 | 174.74 | 272.13 | 0.00 | 0.00 | 0.00 | |
| 2,400.00 | 15.00 | 140.05 | 2,363.64 | 2,657.36 | -228.46 | 191.35 | 298.01 | 0.00 | 0.00 | 0.00 | |
| 2,500.00 | 15.00 | 140.05 | 2,460.23 | 2,560.77 | -248.31 | 207.97 | 323.90 | 0.00 | 0.00 | 0.00 | |
| 2,600.00 | 15.00 | 140.05 | 2,556.83 | 2,464.17 | -268.15 | 224.59 | 349.78 | 0.00 | 0.00 | 0.00 | |
| 2,700.00 | 15.00 | 140.05 | 2,653.42 | 2,367.58 | -287.99 | 241.21 | 375.66 | 0.00 | 0.00 | 0.00 | |
| 2,800.00 | 15.00 | 140.05 | 2,750.01 | 2,270.99 | -307.83 | 257.83 | 401.54 | 0.00 | 0.00 | 0.00 | |
| 2,900.00 | 15.00 | 140.05 | 2,846.60 | 2,174.40 | -327.67 | 274.45 | 427.42 | 0.00 | 0.00 | 0.00 | |
| 3,000.00 | 15.00 | 140.05 | 2,943.20 | 2,077.80 | -347.51 | 291.07 | 453.31 | 0.00 | 0.00 | 0.00 | |
| 3,100.00 | 15.00 | 140.05 | 3,039.79 | 1,981.21 | -367.36 | 307.69 | 479.19 | 0.00 | 0.00 | 0.00 | |
| 3,200.00 | 15.00 | 140.05 | 3,136.38 | 1,884.62 | -387.20 | 324.30 | 505.07 | 0.00 | 0.00 | 0.00 | |
| 3,300.00 | 15.00 | 140.05 | 3,232.97 | 1,788.03 | -407.04 | 340.92 | 530.95 | 0.00 | 0.00 | 0.00 | |
| 3,400.00 | 15.00 | 140.05 | 3,329.57 | 1,691.43 | -426.88 | 357.54 | 556.83 | 0.00 | 0.00 | 0.00 | |
| 3,500.00 | 15.00 | 140.05 | 3,426.16 | 1,594.84 | -446.72 | 374.16 | 582.71 | 0.00 | 0.00 | 0.00 | |
| 3,600.00 | 15.00 | 140.05 | 3,522.75 | 1,498.25 | -466.56 | 390.78 | 608.60 | 0.00 | 0.00 | 0.00 | |
| 3,700.00 | 15.00 | 140.05 | 3,619.34 | 1,401.66 | -486.41 | 407.40 | 634.48 | 0.00 | 0.00 | 0.00 | |
| 3,800.00 | 15.00 | 140.05 | 3,715.94 | 1,305.06 | -506.25 | 424.02 | 660.36 | 0.00 | 0.00 | 0.00 | |
| 3,881.80 | 15.00 | 140.05 | 3,794.95 | 1,226.05 | -522.48 | 437.61 | 681.53 | 0.00 | 0.00 | 0.00 | Drop @ 2°/100' |
| 3,881.88 | 15.00 | 140.05 | 3,795.03 | 1,225.97 | -522.49 | 437.62 | 681.55 | 0.00 | 0.00 | 0.00 | |
| 3,900.00 | 14.64 | 140.05 | 3,812.54 | 1,208.46 | -526.05 | 440.60 | 686.19 | -2.00 | 0.00 | 2.00 | |
| 4,000.00 | 12.64 | 140.05 | 3,909.72 | 1,111.28 | -544.12 | 455.74 | 709.76 | -2.00 | 0.00 | 2.00 | |
| 4,100.00 | 10.64 | 140.05 | 4,007.66 | 1,013.34 | -559.58 | 468.69 | 729.94 | -2.00 | 0.00 | 2.00 | |
| 4,200.00 | 8.64 | 140.05 | 4,106.24 | 914.76 | -572.42 | 479.44 | 746.68 | -2.00 | 0.00 | 2.00 | |
| 4,300.00 | 6.64 | 140.05 | 4,205.35 | 815.65 | -582.61 | 487.97 | 759.97 | -2.00 | 0.00 | 2.00 | |
| 4,400.00 | 4.64 | 140.05 | 4,304.86 | 716.14 | -590.14 | 494.28 | 769.79 | -2.00 | 0.00 | 2.00 | |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Planned Survey | | | | | | | | | | | |
|-----------------------|-----------------|-------------|------------|----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|-------------------------|------------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | TVD (usft) | Sub Sea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | Dogleg Rate (°/100usft) | Comment/Formation |
| 4,500.00 | 2.64 | 140.05 | 4,404.66 | 616.34 | -595.00 | 498.35 | 776.13 | -2.00 | 0.00 | 2.00 | |
| 4,600.00 | 0.64 | 140.05 | 4,504.61 | 516.39 | -597.19 | 500.19 | 778.99 | -2.00 | 0.00 | 2.00 | |
| 4,631.88 | 0.00 | 0.00 | 4,536.49 | 484.51 | -597.33 | 500.30 | 779.17 | -2.00 | -439.31 | 2.00 | End of Drop - Vertical |
| 4,700.00 | 0.00 | 0.00 | 4,604.61 | 416.39 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 4,800.00 | 0.00 | 0.00 | 4,704.61 | 316.39 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 4,900.00 | 0.00 | 0.00 | 4,804.61 | 216.39 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,000.00 | 0.00 | 0.00 | 4,904.61 | 116.39 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,100.00 | 0.00 | 0.00 | 5,004.61 | 16.39 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,200.00 | 0.00 | 0.00 | 5,104.61 | -83.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,300.00 | 0.00 | 0.00 | 5,204.61 | -183.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,400.00 | 0.00 | 0.00 | 5,304.61 | -283.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,500.00 | 0.00 | 0.00 | 5,404.61 | -383.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,600.00 | 0.00 | 0.00 | 5,504.61 | -483.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,700.00 | 0.00 | 0.00 | 5,604.61 | -583.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,800.00 | 0.00 | 0.00 | 5,704.61 | -683.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 5,900.00 | 0.00 | 0.00 | 5,804.61 | -783.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,000.00 | 0.00 | 0.00 | 5,904.61 | -883.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,100.00 | 0.00 | 0.00 | 6,004.61 | -983.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,200.00 | 0.00 | 0.00 | 6,104.61 | -1,083.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,300.00 | 0.00 | 0.00 | 6,204.61 | -1,183.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,400.00 | 0.00 | 0.00 | 6,304.61 | -1,283.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,500.00 | 0.00 | 0.00 | 6,404.61 | -1,383.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,600.00 | 0.00 | 0.00 | 6,504.61 | -1,483.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,700.00 | 0.00 | 0.00 | 6,604.61 | -1,583.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Planned Survey | | | | | | | | | | | |
|-----------------------|-----------------|-------------|------------|----------------------|--------------|--------------|-------------------------|------------------------|-----------------------|-------------------------|-------------------|
| Measured Depth (usft) | Inclination (°) | Azimuth (°) | TVD (usft) | Sub Sea Depth (usft) | +N/-S (usft) | +E/-W (usft) | Vertical Section (usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | Dogleg Rate (°/100usft) | Comment/Formation |
| 6,800.00 | 0.00 | 0.00 | 6,704.61 | -1,683.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 6,900.00 | 0.00 | 0.00 | 6,804.61 | -1,783.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,000.00 | 0.00 | 0.00 | 6,904.61 | -1,883.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,100.00 | 0.00 | 0.00 | 7,004.61 | -1,983.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,200.00 | 0.00 | 0.00 | 7,104.61 | -2,083.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,245.39 | 0.00 | 0.00 | 7,150.00 | -2,129.00 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | Target - Nio |
| 7,300.00 | 0.00 | 0.00 | 7,204.61 | -2,183.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,400.00 | 0.00 | 0.00 | 7,304.61 | -2,283.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,500.00 | 0.00 | 0.00 | 7,404.61 | -2,383.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,545.39 | 0.00 | 0.00 | 7,450.00 | -2,429.00 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | Codell |
| 7,600.00 | 0.00 | 0.00 | 7,504.61 | -2,483.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,700.00 | 0.00 | 0.00 | 7,604.61 | -2,583.61 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | |
| 7,745.39 | 0.00 | 0.00 | 7,650.00 | -2,629.00 | -597.33 | 500.30 | 779.17 | 0.00 | 0.00 | 0.00 | BHL |

| Casing Points | | | | | |
|-----------------------|-----------------------|----------------|---------------------|-------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") | |
| 500.00 | 500.00 | Surface Casing | 0 | 0 | |

Total Directional Services

Directional Planning Report



| | | | |
|------------------|------------------------|-------------------------------------|--|
| Database: | Total | Local Co-ordinate Reference: | Well Loewen 22-32D - Slot 22-32D |
| Company: | Apollo Operating, LLC | TVD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Project: | Loewen Multi Well Plan | MD Reference: | Est. KB @ 5021.00usft (Original Well Elev) |
| Site: | Sec. 32, T4N, R68W | North Reference: | True |
| Well: | Loewen 22-32D | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan 2 | | |

| Formations | | | | | |
|-----------------------|-----------------------|--------|-----------|---------|-------------------|
| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
| 7,245.39 | 7,150.00 | Nio | | 0.00 | |
| 7,545.39 | 7,450.00 | Codell | | 0.00 | |

| Plan Annotations | | | | | |
|-----------------------|-----------------------|-------------------|--------------|------------------------|--|
| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates | | Comment | |
| | | +N/-S (usft) | +E/-W (usft) | | |
| 1,000.00 | 1,000.00 | 0.00 | 0.00 | KOP (Build @ 3°/100') | |
| 1,500.00 | 1,494.31 | -49.89 | 41.79 | End of Build @ 15° inc | |
| 3,881.80 | 3,794.95 | -522.48 | 437.61 | Drop @ 2°/100' | |
| 4,631.88 | 4,536.49 | -597.33 | 500.30 | End of Drop - Vertical | |
| 7,245.39 | 7,150.00 | -597.33 | 500.30 | Target | |
| 7,745.39 | 7,650.00 | -597.33 | 500.30 | BHL | |