

Appendix K

Wellbore Schematic Diagrams for Pembina's Suspended Brine Mining Caverns

Wellbore Schematic Diagram

Dow HC No. 7, Moore - 25 - XI

Lic. No.: T003916

TD Date: Dec. 16, 1975

KB Elevation 196.0 m

Bedrock 47.7m

Fresh 35m

Surface Casing

Size 406.4 mm

Weight 96.9 kg/m

Grade K-55

Depth 81.4 mCF

Dundee 188.7m

Production Casing

Size 323.8 mm

Weight 59.5 kg/m

Grade A53 gr B

Depth 576.2 mCF

Lucas 225.2m

Sulphur 210m

Sulphur 236m

Hanging Tubing

Size 139.7 mm

Weight 35.7 kg/m

Grade K-55

Depth 621.3 mCF

Salina G-Unit 418.7m

Top of B2 Salt 582.5 m

Cavern Roof 597.0 mCF

Cavern Floor 633.0 mCF

TD 673.6 m

Wellbore Schematic Diagram

Dow HC No. 8, Moore - 25 - XI

Lic. No.: T003917

TD Date: Nov. 26, 1975

KB Elevation 196.0 m

Bedrock 44.2m

Fresh 35m

Surface Casing

Size 406.4 mm

Weight 96.9 kg/m

Grade K-55

Depth 63.1 mCF

Dundee 188.1m

Sulphur 210m

Production Casing

Size 323.8 mm

Weight 59.5 kg/m

Grade A53 gr B

Depth 582.1 mCF

Lucas 227.4m

Sulphur 236m

Hanging Tubing

Size 139.7 mm

Weight 35.7 kg/m

Grade K-55

Depth 621.3 mCF

Salina G-Unit 417.6m

Top of B2 Salt 581.9 m

Cavern Roof 629.2 mCF

Cavern Floor 652.4 mCF

TD 674.2 m

Wellbore Schematic Diagram

Dow HC #9, Moore - 25 - XI

Lic. No.: T006622

TD Date: Jan 21, 1985

KB Elevation 196.7 m

Bedrock 46.6m

Fresh 35m

Surface Casing

Size 508.0 mm

Weight 158.4 kg/m

Grade K-55

Depth 91.0 mCF

Dundee 189.8m

Production Casing

Size 339.7 mm

Weight 90.7 kg/m

Grade K-55

Depth 572.6 mCF

Lucas 223.4m

Sulphur 210m

Sulphur 236m

Hanging Tubing

Size 219.1 mm

Weight 35.7 kg/m

Grade K-55

Depth 642.7 mCF

Salina G-Unit 416.3m

Inner Tubing

Size 139.7 mm

Weight 20.8 kg/m

Grade K-55

Depth 647.3 mCF

Top of B2 Salt 583.0 m

Cavern Roof 630.0 mCF

TD 665.0 m

Cavern Floor 650.0 mCF

Wellbore Schematic Diagram

Dow HC #10, Moore - 25 - XI

Lic. No.: T006620

TD Date: Dec 27, 1984

KB Elevation 197.0 m

Bedrock 46.6m

Fresh 35m

Surface Casing

Size 508.0 mm

Weight 158.4 kg/m

Grade K-55

Depth 91.0 mCF

Dundee 190.0m

Sulphur 210m

Production Casing

Size 339.7 mm

Weight 90.7 kg/m

Grade K-55

Depth 572.6 mCF

Lucas 213.4m

Sulphur 236m

Hanging Tubing

Size 219.1 mm

Weight 35.7 kg/m

Grade K-55

Depth 643.4 mCF

Salina G-Unit 416.7m

Inner Tubing

Size 139.7 mm

Weight 20.8 kg/m

Grade K-55

Depth 649.4 mCF

Top of B2 Salt 582.3 m

Cavern Roof 633.0 mCF

TD 666.5 m

Cavern Floor 652.5 mCF

Wellbore Schematic Diagram

Dow HC #11, Moore - 25 - XI

Lic. No.: T006807

TD Date: Aug. 22, 1985

KB Elevation 195.1 m

Bedrock 46.0m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 71.4 kg/m

Grade K-55

Depth 93.0 mCF

Dundee 187.0m

Sulphur 210m

Lucas 213.0m est.

Sulphur 236m

Production Casing

Size 244.5 mm

Weight 53.7 kg/m

Grade K-55

Depth 574.4 mCF

Salina G-Unit 416.0m est.

Hanging Tubing

Size 177.8 mm

Weight 29.7 kg/m

Grade K-55

Depth 650.6 mCF

Top of B2 Salt 580.0 m

Inner Tubing

Size 114.3 mm

Weight 14.1 kg/m

Grade K-55

Depth 654.0 mCF

Cavern Roof 642.0 mCF

TD 670.0 m

Cavern Floor 657.0 mCF

Wellbore Schematic Diagram

Dow HC #12, Moore - 25 - XI

Lic. No.: T006809

TD Date: Sept. 14, 1985

KB Elevation 195.1 m

Bedrock 44.2m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 71.4 kg/m

Grade K-55

Depth 92.0 mCF

Dundee 186.2m

Production Casing

Size 244.5 mm

Weight 53.7 kg/m

Grade K-55

Depth 577.0 mCF

Lucas 234.0m

Sulphur 210m

Sulphur 236m

Hanging Tubing

Size 177.8 mm

Weight 29.7 kg/m

Grade K-55

Depth 654.0 mCF

Salina G-Unit 414.7m

Inner Tubing

Size 114.3 mm

Weight 14.1 kg/m

Grade K-55

Depth 657.3 mCF

Top of B2 Salt 578.4 m

Cavern Roof 650.0 mCF

Cavern Floor 660.0 mCF

TD 672.0 m

Wellbore Schematic Diagram

Dow #45, Moore - 25 - XII

Lic. No.: T003426

TD Date: May 29, 1972

KB Elevation 193.2 m

Bedrock 42.0m
Fresh 35m

Surface Casing
Size 339.7 mm
Weight 90.7 kg/m
Grade K-55
Depth 64.2 mCF

Dundee 173.7m

Production Casing
Size 219.1 mm
Weight 35.7 kg/m
Grade K-55
Depth 444.4 mCF

Lucas 199.7m
Sulphur 210m
Sulphur 236m

Hanging Tubing
Size 88.9 mm
Weight kg/m
Grade K-55
Depth 620.0 mCF

Salina G-Unit 416.7m

Top of B2 Salt 588.6 m

Cavern Roof 600.0 mCF

TD 761.1 m

Cavern Floor 645.0 mCF

Wellbore Schematic Diagram

Dow #61, Moore - 24 - XI

Lic. No.: T005210

TD Date: July 17, 1980

KB Elevation 197.4 m

Bedrock 43.0m

Fresh 35m

Dundee 182.9m

Lucas 214.0m

Sulphur 210m

Sulphur 236m

Salina G-Unit 418.5m

Top of B2 salt 584.0 m

Surface Casing

Size 339.7 mm

Weight 90.8 kg/m

Grade K-55

Depth 59.7 mCF

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 594.5 mCF

Cavern Roof 615 mCF

Cavern Floor 644 mCF

TD: 753.0 m

Wellbore Schematic Diagram

Dow #62, Moore - 24 - XI
Lic. No.: T005211
TD Date: July 6, 1980

KB Elevation 195.7 m

Bedrock 43.0m
Fresh 35m

Surface Casing
Size 339.7 mm
Weight 90.8 kg/m
Grade K-55
Depth 62.5 mCF

Dundee 183.0m

Lucas 214.0m
Sulphur 210m
Sulphur 236m

Production Casing
Size 244.5 mm
Weight 53.6 kg/m
Grade K-55
Depth 597.9 mCF

Salina G-Unit 418.5m

Top of B2 salt 584.0 m

Cavern Roof 610 mCF

Cavern Floor 644 mCF

TD: 753.0 m

Wellbore Schematic Diagram

Dow #65, Moore - 24 - XI

Lic. No.: T005553

TD Date: Mar. 11, 1981

KB Elevation 196.0 m

Bedrock 40.0m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 62.0 mCF

Dundee 171.0m

Sulphur 210m

Lucas 220.0m

Sulphur 236m

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 590.5 mCF

Salina G-Unit 416.0m

Hanging Tubing

Size 177.8 mm

Weight 29.76 kg/m

Grade K-55

Depth 640.0 mCF

Top of B2 salt 581.1 m

Cavern Roof 622.5 mCF

TD 748.5 m

Cavern Floor 655 mCF

Wellbore Schematic Diagram

Dow #66, Moore - 24 - XI

Lic. No.: T005552

TD Date: Mar. 25, 1981

KB Elevation 196.0 m

Bedrock 39.5m

Fresh 35m

Dundee 179.0m

Lucas 229.0m

Sulphur 210m

Sulphur 236m

Salina G-Unit 417.0m

Top of B2 salt 581.1 m

TD 745.6 m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 61.0 mCF

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 592.0 mCF

Hanging Tubing

Size 177.8 mm

Weight 29.76 kg/m

Grade K-55

Depth 700.0 mCF

Wellbore Schematic Diagram

Dow #67, Moore - 24 - XI

Lic. No.: T005218

TD Date: Feb. 13, 1981

KB Elevation 196.7 m

Bedrock 43.0m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 61.9 mCF

Dundee 181.9m

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 591.4 mCF

Lucas 204.0m

Sulphur 210m

Sulphur 236m

Salina G-Unit 415.0m

Hanging Tubing

Size 177.8 mm

Weight 29.67 kg/m

Grade K-55

Depth 655.0 mCF

Top of B2 salt 579.0 m

Cavern Roof 633.0 mCF

Cavern Floor 658.0 mCF

TD 750 m

Wellbore Schematic Diagram

Dow #68, Moore - 24 - XI

Lic. No.: T005217

TD Date: Feb. 24, 1981

KB Elevation 196.7 m

Bedrock 43.0m

Fresh 35m

Dundee 183.0m

Lucas 207.0m

Sulphur 210m

Sulphur 236m

Salina G-Unit 414.0m

Top of B2 salt 579.0 m

TD 750 m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 62.0 mCF

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 592.0 mCF

Hanging Tubing

Size 177.8 mm

Weight 29.76 kg/m

Grade K-55

Depth 700 mCF

Wellbore Schematic Diagram

Dow #69, Moore - 24 - XI

Lic. No.: T005781

TD Date: Jan. 28, 1982

KB Elevation 196.9 m

Bedrock 44.6m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 64.0 mCF

Dundee 184.9m

Sulphur 210m

Lucas 213.8m

Sulphur 236m

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 589.6 mCF

Salina G-Unit 416.6m

Top of B2 salt 580.5 m

Cavern Roof 626.0 mCF

Cavern Floor 651.0 mCF

TD 749 m

Wellbore Schematic Diagram

Dow #70, Moore - 24 - XI

Lic. No.: T005782

TD Date: Jan. 14, 1982

KB Elevation 196.4 m

Bedrock 43.0m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 64.0 mCF

Dundee 184.6m

Sulphur 210m

Lucas 213.8m

Sulphur 236m

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 591.2 mCF

Salina G-Unit 415.9m

Top of B2 salt 580.5 m

Cavern Roof 600.0 mCF

TD 749 m

Cavern Floor 643.0 mCF

Wellbore Schematic Diagram

Dow #71, Moore - 23 - XI

Lic. No.: T005783

TD Date: Dec. 11, 1981

KB Elevation 196.0 m

Bedrock 42.5m

Fresh 35m

Dundee 178.3m

Lucas 202.0m

Sulphur 210m

Sulphur 236m

Salina G-Unit 413.7m

Top of B2 salt 579.8 m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 64.0 mCF

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 592.0 mCF

Cavern Roof 629.0 mCF

Cavern Floor 657.0 mCF

TD 749 m

Wellbore Schematic Diagram

Dow #72, Moore - 23 - XI

Lic. No.: T005784

TD Date: Dec. 27, 1982

KB Elevation 199.3 m

Bedrock 42.5m

Fresh 35m

Surface Casing

Size 339.7 mm

Weight 81.1 kg/m

Grade K-55

Depth 64.0 mCF

Dundee 178.1m

Sulphur 210m

Lucas 202.6m

Sulphur 236m

Production Casing

Size 244.5 mm

Weight 53.6 kg/m

Grade K-55

Depth 592.5 mCF

Salina G-Unit 413.7m

Top of B2 salt 579.8 m

TD 749 m