**Homework #2 Risk Reports – Fall 2024**

In this homework, you will create three fundamental trading risk management reports for a producer in the Bakken and the Gulf Coast. They produce LLS and Bakken Guernsey at 200,000 barrels/month and 150,000 barrels/month, respectively.

The reports consist of the Position Report (POS), Mark-to-Market Report (MtM) and Profit/Loss Report (P/L). You will create the POS & MtM reports forJan. 1st, Feb. 1st, and March 1st of 2024 (10% each). You will also create P/L reports for the months of January, February, and March (13.33% each).

**The producer has the following hedges in place:**

1. On September 3, 2023, the producer bought at the money LLS put contracts priced using the Black Scholes model for January-February to hedge 20% of their LLS production.
2. On September 28, 2023, the producer purchased January through March spot basis spread options on the basis spread between Bakken Guernsey and WTI to hedge 30% of their Bakken Guernsey production. The option strikes were based on the spot price basis differential between the products on September 30th. On the same day, 30% February-March Bakken production was hedged at Cushing using futures contracts.
3. On November 6, 2023, the producer locked in a fixed-price swap for 25% of their Bakken Guernsey production at the daily weighted average forward price for the months of January and February.
4. On November 28th, 2023, the producer entered into a spot price costless collar priced using the Black Scholes model for 15% of their production at LLS for January, February, and March. The floor was set at $4 below the daily weighted average **WTI futures** price for the three months on that date plus/minus the basis differential between LLS and WTI.
5. On January 4, 2024, the producer sold call options priced using the Black Scholes model on their spot production at Bakken Guernsey for 25% of their March production. The cap is at $6 over the spot price. In addition, on Jan 5th they bought put options priced using the Black Scholes model at Bakken Guernsey for 20% of their March Bakken Guernsey production at $5 below the spot price.
6. On January 14, 2024 the producer performed a cost-less collar on the **WTI futures** contracts for February and March delivery for 10% of the Bakken production. The floor was set at $3.00 below the futures contract price for each month on the date of execution. The caps are different for each month. *(Jan-2months)*

**Notes:**

1. The risk-free rate is 3%
2. Use the prices provided for you with this homework on canvas.

|  |  |
| --- | --- |
| Volatilities | |
| WTI | 60% |
| Bakken Guernsey | 45% |
| LLS | 75% |

|  |  |
| --- | --- |
| Bakken Guernsey – WTI Correlations | |
| January | 85% |
| February | 90% |
| March | 75% |