# Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA

**US SEC Subpart 1300 Regulation S-K Compliant Report**
**National Instrument 43-101–*Standards of Disclosure for Mineral Projects***

ENERGY FUELS

## Prepared by the following Qualified Persons:


*Dan Kapostasy, P.G, SME R.M*
*Douglas Beahm, PE, PG SME R.M.*
*Terence P. McNulty, PE, PHD*


**Effective Date: December 31, 2021**

**Date and Signature Page**

**Energy Fuels Personnel:**

**Dan Kapostasy, P.G, SME R.M**

The Technical Report titled "Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA" has an effective date of December 31, 2021. I am a co-author of the report.

Dated this January 19, 2022
*"Original signed and sealed"*
*/s/* Dan Kapostasy
*Dan Kapostasy, P.G, SME R.M*

**Third Party Consultants:**

**Douglas L. Beahm:**

The Technical Report titled "Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA" has an effective date of December 31, 2021. I am a co-author of the report.

Dated this January 19, 2022
*"Original signed and sealed"*
*/s/* Douglas L. Beahm
Douglas L. Beahm, PE, PG, SME Registered Member

**Dr. Terence P. McNulty:**

The Technical Report titled "Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA" has an effective date of December 31, 2021. I am a co-author of the report.

Dated this January 19, 2022
*"Original signed and sealed"*
/s/ Terence P. McNulty
Terence P. McNulty, D. Sc., P. E., SME Registered Member

# Contents


1.0 EXECUTIVE SUMMARY ..... 1
- 1.1 Project Overview ..... 1
- 1.2 Project Description and Ownership ..... 2
- 1.3 Development Status ..... 4
- 1.4 Regulatory Status ..... 4
- 1.5 Geology and Mineralization ..... 4
- 1.6 Exploration and Drilling Status ..... 5
- 1.7 Mineral Resources and Reserves ..... 5
- 1.8 Capital and Operating Costs ..... 6
- 1.9 Economic Analysis ..... 8
- 1.10 Interpretations and Conclusions ..... 8
- 1.11 Recommendations ..... 9
- 1.12 Risks ..... 9

2.0 INTRODUCTION ..... 11
- 2.1 Introduction ..... 11
- 2.2 Registrant of Filing ..... 12
- 2.3 Terms of Reference ..... 12
- 2.4 Sources of Information ..... 12
- 2.5 Site Visit ..... 13
- 2.6 Purpose of Report ..... 13
- 2.7 Update of a Previously Filed Technical Report ..... 13
- 2.8 Effective Date ..... 13
- 2.9 List of Abbreviations ..... 13

3.0 RELIANCE ON OTHER EXPERTS ..... 15
- 3.1 Reliance Upon Information Provided by the Registrant ..... 15

4.0 PROPERTY DESCRIPTION AND LOCATION ..... 16
- 4.1 Introduction ..... 16
- 4.2 Land Tenure ..... 16
- 4.3 Royalties ..... 17
- 4.4 Permits ..... 20
- 4.5 Surface Rights ..... 21
- 4.6 Taxes ..... 21
- 4.7 Encumbrances and Risks ..... 21

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY ..... 22
- 5.1 Introduction ..... 22
- 5.2 Physiography ..... 22
  - 5.2.1 Topography and Elevation ..... 22
  - 5.2.2 Vegetation ..... 22
  - 5.2.3 Climate ..... 22
- 5.3 Access ..... 23
- 5.4 Infrastructure ..... 23
- 5.5 Personnel ..... 23

6.0 HISTORY ..... 24
- 6.1 Introduction ..... 24

6.2 Ownership History ....... 24
6.3 Historical Resource Estimates ....... 24
6.4 Historical Production ....... 25

7.0 GEOLOGICAL SETTING AND MINERALIZATION ....... 26
7.1 Regional Geology ....... 26
7.2 Local and Property Geology ....... 26
7.2.1 Quaternary Alluvium and Colluvium ....... 26
7.2.2 Crooks Gap Conglomerate ....... 26
7.2.3 Tertiary Battle Spring Formation ....... 29
7.2.4 Tertiary Fort Union Formation ....... 29
7.2.5 Cretaceous Cody Shale ....... 29
7.2.6 Structural Geology ....... 29
7.3 Hydrogeology ....... 29
7.4 Geotechnical ....... 30

8.0 DEPOSIT TYPES ....... 31
8.1 Mineralization and Deposit Types ....... 31

9.0 EXPLORATION ....... 33

10.0 DRILLING ....... 34
10.1 Drilling ....... 34
10.1.1 Pre-1988 Drilling ....... 34
10.1.2 Titan Drill Program ....... 34

11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY ....... 37
11.1 Introduction ....... 37
11.2 Gamma Logging ....... 37
11.2.1 Disequilibrium ....... 38
11.3 Core Sampling ....... 38
11.3.1 Sample Preparation ....... 38
11.3.2 Assaying and Analytical Procedure ....... 38
11.3.3 Density Analyses ....... 39
11.4 Opinion of Author ....... 39

12.0 DATA VERIFICATION ....... 40
12.1 Congo ....... 40
12.2 Sheep Underground ....... 40
12.3 Radiometric Equilibrium ....... 41
12.4 Opinions of Author ....... 43

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING ....... 44
13.1 Historic Mineral Processing ....... 44
13.2 Pre-Feasibility Metallurgical Studies ....... 44
13.3 Column Leach Studies ....... 45
13.4 Supplemental Laboratory Experiments ....... 46
13.5 Current Metallurgical Background and Industry Practice: ....... 47
13.6 Opinion of Author ....... 48

14.0 MINERAL RESOURCE ESTIMATES ....... 49
14.1 General Statement ....... 49
14.2 Drill Hole Database ....... 50
14.2.1 Congo Open Pit ....... 51

14.2.2 Sheep Underground ....53
14.3 Statistical Analysis ....55
14.3.1 Grade Capping ....55
14.4 Resource Estimation Methods ....56
14.4.1 Geologic Model ....56
14.4.2 GT Contour Method ....56
14.5 Past Production ....93
14.5.1 Congo Open Pit Mine ....93
14.5.2 Sheep Underground Mine ....93
14.6 Classification ....93

15.0 MINERAL RESERVE ESTIMATE ....95
15.1 General Statement ....95
15.2 Congo Pit Conversion of Resources to Reserves ....95
15.3 Sheep Underground Conversion of Resources to Reserves ....95
15.4 Cut-off Grade ....96
15.4.1 Mining and Mineral Processing Recovery Parameters and Sensitivity ....96

16.0 MINING METHODS ....98
16.1 Introduction ....98
16.2 Mine Productivity and Scheduling ....98
16.3 Congo Open Pit ....98
16.4 Sheep Underground ....115

17.0 RECOVERY METHODS ....130
17.1 Introduction ....130
17.2 Site Layout and Construction ....132

18.0 INFRASTRUCTURE ....138
18.1 Introduction ....138
18.2 Rights of Way ....138
18.3 Power and Utilities ....138
18.4 Process Water ....138
18.5 Site Access ....138
18.6 Mine Support Facilities ....138
18.7 Public Safety and Facility Maintenance ....138

19.0 MARKET STUDIES ....141
19.1 Uranium Market and Price ....141

20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND PLANS, NEGOTIATIONS, OR AGREEMENTS WITH LOCAL INDIVIDUALS OR GROUPS ....143
20.1 Introduction ....143
20.1 Environmental Studies ....143
20.2 Land Use ....144
20.3 Cultural Resource Surveys ....144
20.4 Meteorology and Air Monitoring ....144
20.5 Geology ....144
20.6 Hydrology ....144
20.7 Soils and Vegetation ....145
20.8 Wildlife ....145
20.9 Radiology ....145
20.10 Operating Plans ....145

20.11 Permitting Requirements ....145
20.11.1 Fremont County ....146
20.11.2 Wyoming Land Quality Division ....146
20.11.3 Wyoming Air Quality Division ....146
20.11.4 Wyoming Water Quality Division ....146
20.11.5 Wyoming State Engineers Office ....146
20.11.6 U.S. Bureau of Land Management ....146
20.11.7 U.S. Nuclear Regulatory Commission (Wyoming Agreement State) ....146
20.11.8 U.S. Environmental Protection Agency ....147
20.12 Social and Community Relations ....147
20.13 Closure and Reclamation Plans ....147
20.13.1 Congo Pit and Sheep Underground ....147
20.13.2 Heap Leach and Processing Plant ....148
20.14 Opinion of Author ....148

21.0 CAPITAL AND OPERATING COSTS ....149
21.1 Introduction ....149
21.2 Cost Assumptions ....149
21.3 Production Profile ....150
21.4 Capital Costs ....152
21.5 Operating Costs ....152
21.6 Reclamation and Closure Costs ....153
21.7 Additional Costs ....153
21.8 Personnel ....155

22.0 ECONOMIC ANALYSIS ....156
22.1 Sensitivity to Price ....156
22.2 Sensitivity to Other Factors ....157
22.3 Payback Period ....157
22.4 Breakeven Price ....157
22.5 Cash Flow ....157

23.0 ADJACENT PROPERTIES ....160

24.0 OTHER RELEVANT DATA AND INFORMATION ....161
24.1 Ground Water Conditions ....161

25.0 INTERPRETATION AND CONCLUSIONS ....162

26.0 RECOMMENDATIONS ....163

27.0 REFERENCES ....164

28.0 CERTIFICATE OF AUTHORS ....166

# TABLES

Table 1-1 Sheep Mountain Mineral Resources Inclusive of Mineral Reserves – April 9, 2019............5
Table 1-2 Sheep Mountain Mineral Reserves – December 31, 2021....................................................6
Table 1-3 Sheep Mountain Mineral Resources Exclusive of Mineral Reserves – April 9, 2019...........6
Table 1-4 Sheep Mountain Capital Costs ...............................................................................................6
Table 1-5 Sheep Mountain Operating Costs...........................................................................................7
Table 1-6 Sheep Mountain Recommended Work Program.....................................................................9
Table 2-1 List of Abbreviations .............................................................................................................14
Table 4-1. List of Claims held by EFR ....................................................................................................16
Table 5-1 Jeffrey City, Wyoming, Monthly Climate Summary[1] .............................................................22
Table 12-1 Comparison of 2009 Drilling to Historic Drilling .................................................................40
Table 12-2 Comparison of Radiometric Equilibrium based on Gamma and USAT Logging................42
Table 13-1 Summary of Column Leach Results .....................................................................................46
Table 14-1 Sheep Mountain Mineral Resources Inclusive of Mineral Reserves - April 9, 2019..........50
Table 14-2 Sheep Mountain Mineral Resources Exclusive of Mineral Reserves – April 9, 2019........50
Table 14-3. Congo Pit Area General Statistics (Raw Data)...................................................................52
Table 14-4. Congo Pit Area General Statistics (Composited Data)......................................................52
Table 14-5 Congo Pit Area Statistics by Mineralized Zone ..................................................................53
Table 14-6 Sheep Underground Area General Statistics (1 of 2)........................................................53
Table 14-7 Sheep Underground Area General Statistics (2 of 2)........................................................54
Table 14-8 Sheep Underground Area Statistics by Mineralized Zone.................................................54
Table 15-1 Sheep Mountain Mineral Reserves- April 13, 2012...........................................................95
Table 15-2 Breakeven Cut-off Grade.....................................................................................................96
Table 16-1 Open Pit Mining Equipment List .......................................................................................115
Table 16-2 Underground Mining Equipment List ................................................................................128
Table 21-1 Underground and Open pit Production Profile..................................................................151
Table 21-2 Sheep Mountain Capital Cost Summary ...........................................................................152
Table 21-3 Sheep Mountain Operating Costs**...................................................................................154
Table 22-1 Sheep Mountain Internal Rate of Return and Net Present Value...................................156
Table 22-2 Pre-tax Sensitivity Summary..............................................................................................156
Table 22-3 Pre-tax Sensitivity Summary..............................................................................................157
Table 22-4 Cash Flow ...........................................................................................................................158
Table 26-1 Recommended Work Program .........................................................................................163

## FIGURES

Figure 1-1 Sheep Mountain Existing Conditions....3
Figure 4-1. Sheep Mountain Location Map....18
Figure 4-2. Sheep Mountain Land Tenure Map....19
Figure 7-1. Stratigraphy of the Crooks Gap Area (modified from Stephens, 1964)....27
Figure 7-2. Geologic Map of the Sheep Mountain Area....28
Figure 7-3. Geologic Cross-Section (See Figure 7-2 for Location)....29
Figure 8-1 Uranium Roll Front in Golden Goose Mine....31
Figure 8-2 Little Sheep Decline....32
Figure 10-1. Drill Hole Location Map....36
Figure 14-1. GT Histogram for Congo Pit (12,070 Samples)....52
Figure 14-2. GT Histogram for Sheep Underground (3,222 Samples)....55
Figure 14-3. Congo Pit GT Contours - Sand 94....58
Figure 14-4. Congo Pit GT Contours - Sand 89....59
Figure 14-5. Congo Pit GT Contours - Sand 86....60
Figure 14-6. Congo Pit GT Contours - Sand 83....61
Figure 14-7. Congo Pit GT Contours - Sand 79....62
Figure 14-8. Congo Pit GT Contours - Sand 75....63
Figure 14-9. Congo Pit GT Contours - Sand 72....64
Figure 14-10. Congo Pit GT Contours - Sand 67....65
Figure 14-11. Congo Pit GT Contours - Sand 66....66
Figure 14-12. Congo Pit GT Contours - Sand 63....67
Figure 14-13. Congo Pit GT Contours - Sand 59....68
Figure 14-14. Congo Pit GT Contours - Sand 54-56....69
Figure 14-15. Congo Pit GT Contours - Sand 52....70
Figure 14-16. Congo Pit GT Contours - Sand 48....71
Figure 14-17. Congo Pit GT Contours - Sand 4....72
Figure 14-18. Congo Pit GT Contours - Sand 41....73
Figure 14-19. Congo Pit GT Contours - Sand 41A....74
Figure 14-20. Sheep Underground GT Contours - Zone 01....76
Figure 14-21. Sheep Underground GT Contours - Zone 02U....77
Figure 14-22. Sheep Underground GT Contours - Zone 02L....78
Figure 14-23. Sheep Underground GT Contours - Zone 03....79
Figure 14-24. Sheep Underground GT Contours - Zone 04....80
Figure 14-25. Sheep Underground GT Contours - Zone 05....81
Figure 14-26. Sheep Underground GT Contours - Zone 06....82
Figure 14-27. Sheep Underground GT Contours - Zone 07....83
Figure 14-28. Sheep Underground GT Contours - Zone 08....84
Figure 14-29. Sheep Underground GT Contours - Zone 09....85
Figure 14-30. Sheep Underground GT Contours - Zone 10....86
Figure 14-31. Sheep Underground GT Contours - Zone 11....87
Figure 14-32. Sheep Underground GT Contours - Zone 12....88
Figure 14-33. Sheep Underground GT Contours - Zone 13....89
Figure 14-34. Sheep Underground GT Contours - Zone 14....90

Figure 14-35. Sheep Underground GT Contours - Zone 15 ....91
Figure 14-36. Sheep Underground GT Contours - Zone 16 ....92
Figure 16-2. McIntosh Pit Circa 2010 ....100
Figure 16-4. Congo Pit - Year 01 ....102
Figure 16-5. Congo Pit - Year 02 ....103
Figure 16-6. Congo Pit - Year 03 ....104
Figure 16-7. Congo Pit - Year 04 ....105
Figure 16-8. Congo Pit - Year 05 ....106
Figure 16-9. Congo Pit - Year 06 ....107
Figure 16-10. Congo Pit - Year 07 ....108
Figure 16-11. Congo Pit - Year 08 ....109
Figure 16-12. Congo Pit - Year 09 ....110
Figure 16-13. Congo Pit - Year 10 ....111
Figure 16-14. Congo Pit - Year 11 ....112
Figure 16-15. Congo Pit - Year 12 ....113
Figure 16-16. Sheep Underground Overview Map ....117
Figure 16-17. Sheep Underground - Year 01 ....118
Figure 16-18. Sheep Underground - Year 02 ....119
Figure 16-19. Sheep Underground - Year 03 ....120
Figure 16-20. Sheep Underground - Year 04 ....121
Figure 16-21. Sheep Underground - Year 05 ....122
Figure 16-22. Sheep Underground - Year 06 ....123
Figure 16-23. Sheep Underground - Year 07 ....124
Figure 16-24. Sheep Underground - Year 08 ....125
Figure 16-25. Sheep Underground - Year 09 ....126
Figure 16-26. Sheep Underground - Year 10 ....127
Figure 16-27. Sheep Underground - Year 11 ....128
Figure 17-1. Typical Heap Leach Schematic ....131
Figure 17-2. Heap Leach Process Block Flow Diagram ....132
Figure 17-3. Heap Leach Initial Site Layout ....134
Figure 17-4. Heap Leach Year 08 Expansion ....135
Figure 17-5. Heap Leach Reclamation Cover ....136
Figure 17-6. Heap Leach Reclamation Cover Cross-Section (A-A') ....137
Figure 18-1 Existing Infrastructure Map ....140
Figure 19-1 TradeTech Uranium Market Price Projections- FAM1 (Nominal US$) ....142
Figure 19-2 TradeTech Uranium Market Price Projections- FAM1 (Nominal US$) ....142
Figure 21-1. Project Organizational Chart ....155

# 1.0 EXECUTIVE SUMMARY

This Technical Report has been prepared for Energy Fuels Inc. (Energy Fuels), the parent company of Energy Fuels Resources (USA) Inc. (EFR) by Dan Kapostasy, Douglas Beahm and Dr. Terry McNulty (collectively, the authors), on the Sheep Mountain Project (the Project), located in Fremont County, Wyoming, USA. and is based on a 2020 Canadian NI 43-101 compliant preliminary feasibility report by independent mining consultant Douglas Beahm, PE, Principal Engineer for BRS Engineering (BRS).

Mr. Kapostasy is the Director of Technical Services of Energy Fuels Resources (USA) Inc. ("EFR"), while Mr. Beahm is an independent consultant and Principal Engineer of BRS and Dr. McNulty is President of T.P. McNulty and Associates Inc. This report is a technical report summary and preliminary feasibility study that conforms to the US Securities and Exchange Commission (SEC) Regulation S-K subpart 1300 disclosure requirements and policies for mining properties (S-K 1300) and a technical report and preliminary feasibility study that meets the requirements of the Canadian Securities Administrators National Instrument 43-101 –Standards of Disclosure for Mineral Projects ("NI 43-101") and the Canadian Institute of Mining (CIM) Best Practice Guidelines for the Estimation of Mineral Resources and Mineral Reserves ("CIM Standards").

EFR's parent company, Energy Fuels, is incorporated in Ontario, Canada and is a wholly US-based uranium and vanadium mining company with projects located in Colorado, Utah, Arizona, Wyoming, Texas and New Mexico. EFR acts as the operator to this project, including the White Mesa Mill in Blanding Utah, the only conventional uranium mill operating in the U.S. today with a licensed capacity of over eight million pounds of $U_3O_8$ per year. Energy Fuels is listed on the NYSE American Stock Exchange (symbol UUUU), and the Toronto Stock Exchange (symbol EFR).

In February 2012, EFR and Titan Uranium Inc. ("TUI") announced that a Certificate of Arrangement giving effect to the Plan of Arrangement between the two companies was entered into on February 29, 2012, whereby EFR acquired TUI, thereby making its subsidiary, Titan Uranium USA Inc. ("Titan) a wholly owned subsidiary of Energy Fuels which is now named Energy Fuels Wyoming Inc.

## 1.1 Project Overview

The Sheep Mountain Project includes the Congo Pit, a proposed open pit development, and the re-opening of the existing Sheep Underground mine. While several processing alternatives have been considered, the recommended uranium recovery utilizes the processing of mined materials via an on-site heap leach facility. Figure 1.1 shows the overall project layout.

Permitting and licensing of the project is well advanced. A Plan of Operations ("POO") was approved by the Bureau of Land Management ("BLM") on January 6, 2017, through issuance of a Record of Decision ("RoD") and supporting Final Environmental Impact Statement ("FEIS"). In addition, a Major Revision to Mine Permit 381C was approved by the Wyoming Department of Environmental Quality, Land Quality Division ("WDEQ/LQD") on July 8, 2015 and remains in good standing. Other major permits that have been approved include an Air Quality Permit that was approved by the WDEQ, Air Quality Division ("AQD") on July 6, 2015, and a Water Discharge Permit that was approved by WDEQ, Water Quality Division ("WQD") on October 5, 2015.

Mining methods include a combination of underground and open pit methods. Mined product from the underground and open pit mine operations will be commingled at the stockpile site located near the underground portal in close proximity to the pit. At the stockpile the mine product will be sized, if needed, blended, and then conveyed via a covered overland conveyor system to the heap leach pad where it will be stacked on a double lined pad for leaching. The primary lixiviant will be sulfuric acid. Concentrated leach solution will be collected by gravity in a triple-lined collection pond and then transferred to the mineral processing facility for extraction and drying. The final product produced will be a uranium oxide, commonly referred to as "yellowcake."

The current open pit life of mine plan is 12 years, with an additional four years allotted for mine closure and reclamation. Similarly, the underground life of mine is planned for 12 years including one year for development of the primary decline. The heap leach facility is designed to accommodate the mined material from both open pit and underground mine operations over an operating life compatible with the open pit operations.

Estimated production rates vary from a low of 270,000 tons processed with approximately 640,000 pounds of uranium produced per year during the start of operations of the open pit and heap leach, to a high of 780,000 tons per year processed with approximately 2,000,000 pounds of uranium produced per year at peak production with both the open pit and underground mines in operation. On average the open pit is expected to produce 330,000 tons per year containing 760,000 pounds of uranium. Similarly, the underground is expected to produce an average of 290,000 tons per year containing 770,000 pounds of uranium. Average production from the heap leach and processing facility is estimated to be 1.4 million pounds of uranium recovered per year.

An economic analysis is presented in Section 22.0.

## 1.2 Project Description and Ownership

The Sheep Mountain Project is located in portions of Sections 15, 16, 17, 20, 21, 22, 27, 28, 29, 32, and 33, Township 28 North, Range 92 West at approximate Latitude 42º 24’ North and Longitude 107º 49’ West, within the Wyoming Basin physiographic province in the Great Divide Basin at the northern edge of the Great Divide Basin. The project is approximately eight miles south of Jeffrey City, Wyoming (see Figure 4-1. Sheep Mountain Location Map).

The mineral properties at the Sheep Mountain Project are comprised of 218 unpatented mining claims on land administered by the BLM, and approximately 640 acres within a State of Wyoming lease. The combination of the mineral holdings comprises approximately 5,055 acres.

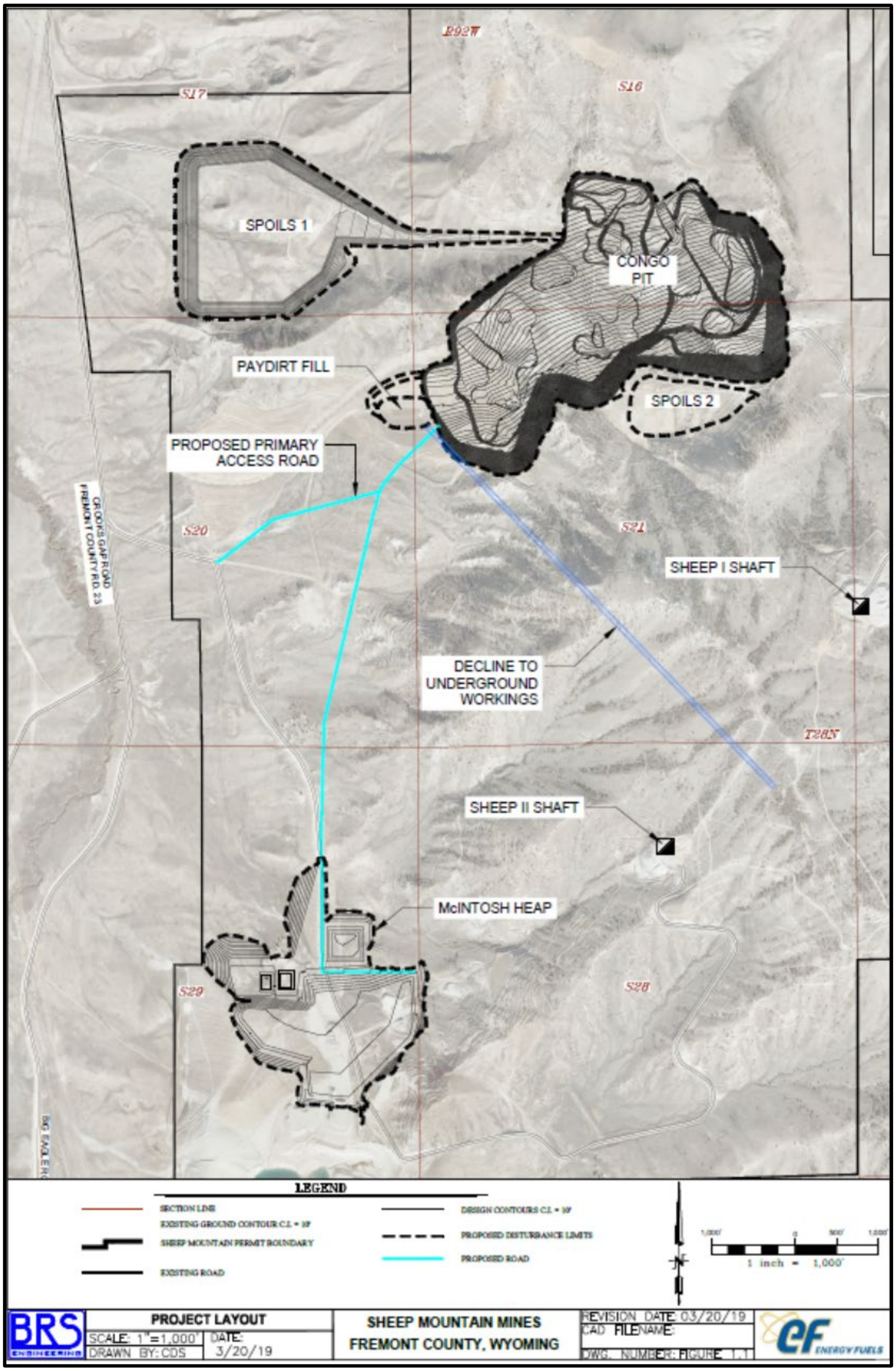
In February 2012, EFR purchased 320 acres of private surface overlaying some of the federal minerals covered by 18 of the claims. The purchased parcel includes the SW¼ Section 28 and SE¼, E½ SW¼, and NW¼ SW¼ Section 29, T28N, R92W. A final payment of $5,000 was made in January 2016 for the purchased parcel. The combination of land holdings gives EFR mineral rights to resources as defined in the Congo Pit and the Sheep Underground areas. After the 2012 Technical Report, EFR increased the Sheep Mountain property size by 26 unpatented mining claims (approximately 520 acres) through the acquisition of Strathmore Resources (US) Ltd. (“Strathmore”). These contiguous claims form a larger buffer, with potential for additional uranium resources, along the west side of the Project.

To maintain these mineral rights, EFR must comply with the lease provisions, including annual payments with respect to the State of Wyoming leases; BLM and Fremont County, as well as Wyoming filing and/or annual payment requirements to maintain the validity of the unpatented mining lode claims as follows. Mining claims are subject to annual filing requirements and payment of a fee of $155 per claim. Unpatented mining claims expire annually but are subject to indefinite annual renewal by filing appropriate documents and paying the fees described above. ML 0-15536 will expire on January 1, 2024. Annual payments to maintain ML 0-15536 are $2,560 per year.

The original claims owned by Western Nuclear in the Sheep Mountain Project are subject to an overall sliding scale royalty of 1% to 4% due to Western Nuclear, based on the Nuclear Exchange Corporation Exchange (“NUEXCO”) Value. Claims which were not included in the agreement are not subject to this royalty. Under Wyoming State Lease ML 0-15536, there is a royalty of 5% of the quantity or gross realization value of the $U_3O_8$, based on the total arms-length consideration received for uranium products sold.

Uranium mining in Wyoming is subject to both a gross products (County) and mineral severance tax (State). At the Federal level, aggregate corporate profit from mining ventures is taxable at corporate income tax rates, i.e., individual mining projects are not assessed Federal income tax but rather the corporate entity is assessed as a whole. For mineral properties, depletion tax credits are available on a cost or percentage basis, whichever is greater. The percentage depletion tax credit for uranium is 22%, among the highest for mineral commodities (IRS Pub. 535).

**Figure 1-1 Sheep Mountain Existing Conditions**



## 1.3 Development Status

This preliminary feasibility study for the project includes the preliminary design and sequencing of the open pit and underground mine operations in addition to the heap leach mineral processing facility. Designs and sequencing include pre-production, production, and decommissioning and reclamation phases. Capital and operating costs estimates ("CAPEX" and "OPEX") have been completed and are in 2021 U.S. dollars.

Telephone, electric and natural gas service has been established to the proposed plant site. In addition, electric service and a waterline have been extended via a Right of Way ("ROW") issued by the BLM in 2011 to the Sheep I and II shafts. Water rights held are adequate for planned operations. Publicly maintained access roads exist to within one mile of the project and private access roads from past operations are established throughout the project area.

## 1.4 Regulatory Status

The Sheep Mountain Project includes the proposed Congo Open Pit, the re-opening of the existing Sheep Underground Mine and the proposed Heap Leach processing of the mined product to produce yellowcake.

Permitting and licensing of the project is well advanced including:

- Baseline environmental studies have been completed for the requisite time frames required and/or recommended by state and federal regulatory guidance.
- A Major Revision to Mine Permit 381C has been approved by the WDEQ/LQD.
- An Air Quality Permit has been approved by the WDEQ/AQD.
- A Water Discharge Permit has been approved by the WDEQ/AQD.
- A PoO has been approved by the BLM.
- A draft Nuclear Regulatory Commission ("NRC") Source Material License application has been prepared including the Environmental Report ("ER") and Technical Report ("TR").
- A pre-application audit with the NRC has been completed and technical comments received.
- Wyoming is now an Agreement State and will issue and administer the Source Material License through the Wyoming Department of Environmental Quality (WDEQ).
- Previous work and submittals to the NRC will be applicable for submission to WDEQ.

## 1.5 Geology and Mineralization

Within the Sheep Mountain Project area, uranium mineralization is contained in the lower to middle Eocene Battle Spring Formation. The Battle Spring Formation, consisting of upper and lower members (designated the "A" for the lower and "B" for the upper), is a fluvial deposit. Mineralization is hosted by the Battle Spring Formation and has been described extensively since the 1960s and has been termed a "Wyoming Roll Front System." These deposits are often organic-rich, fine-grained lenses in tabular, or "roll front," configurations. The uranium mineralization occurs primarily in the lower member of the Battle Spring Formation (Stephens, 1964).

## 1.6 Exploration and Drilling Status

While mineralization was originally discovered by aerial and ground radiometric surveys completed in the early 1950s, exploration since that time has been dominantly by drilling. Drill data from approximately 4,000 drill holes were utilized in this study. EFR has the original geophysical and lithologic logs for the majority of the drill holes. This data was reviewed, reinterpreted and verified. In addition, 159 new drill holes have been completed on the project since 2005 to confirm and extend known mineralization and to delineate areas for mine planning.

Mineral Resource and Reserve estimates for the Sheep Mountain Project are based on radiometric data. Disequilibrium conditions were evaluated during drilling programs in 2006 and 2009 including the testing of 223 discrete samples taken in 2006 and the testing of 45 mineralized intervals in 2009. As discussed in this report, available data indicates that variations in radiometric equilibrium are local in their effect, which impacts the mining grade control program but does not appreciably affect the overall Mineral Resources or Reserves. Overall, a slight enrichment in uranium values with respect to radiometric equivalent values was noted.

## 1.7 Mineral Resources and Reserves

Based on the drill density, the apparent continuity of the mineralization along trends, geologic correlation and modeling of the deposit, a review of historic mining with respect to current resource projections, and verification drilling, the Mineral Resource estimate herein meets NI 43-101 and S-K 1300 criteria as an Indicated Mineral Resource. . Detailed information relative to Mineral Resources is provided in Section 14.0 of this report.

A summary of total Mineral Resources inclusive of Mineral reserves is provided in Table 1-1. A summary of the total Mineral Reserve estimate, fully exclusive and are not additive to the total Mineral Resources, is provided in Table 1.2. A summary of total Mineral Resources exclusive of Mineral reserves is provided in Table 1-3.

**Table 1-1 Sheep Mountain Mineral Resources Inclusive of Mineral Reserves – April 9, 2019**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Indicated* | Sheep Underground | 0.30 | 5,546 | 0.118% | 13,034 |
| *Indicated* | Congo Pit Area | 0.10 | 6,116 | 0.122% | 14,903 |
| **Total Indicated** | | | **11,663** | **0.120%** | **27,935** |

Notes:

1: NI 43-101 and S-K 1300 definitions were followed for Mineral Resources
2: Mineral Resource are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.30 (6 ft. of 0.05% $eU_3O_8$) for underground
3: Mineral Resources are estimated using a long-term Uranium price of US$65 per pound
4: Bulk density is 0.0625 tons/$ft^3$ (16 $ft^3$/ton)
5: Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability
6: Numbers may not add due to rounding

Mineral resources that are not Mineral Reserves do not have demonstrated economic viability.

The following Mineral Reserves are fully exclusive and are not additive to the total Mineral Resources, Table 1-1. The Probable Mineral Reserves for the Sheep Mountain Project, including both open pit and underground projected mining areas, is that portion of the indicated mineral resource that is included in current mine designs and is considered economic under current costs and a forward-looking commodity price of $65 per pound of uranium oxide. The Mineral Reserve estimates presented herein have been completed in accordance with NI 43-101 and S-K 1300 standards. A summary of the total Mineral Reserve estimate is provided in Table 1.2.

Detailed information relative to Probable Mineral Reserves is provided in Section 15.0 of this report.

**Table 1-2 Sheep Mountain Mineral Reserves – December 31, 2021**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Probable* | Sheep Underground | 0.45 | 3,498 | 0.132 | 9,248 |
| *Probable* | Congo Pit Area | 0.10 | 3,955 | 0.115 | 9,117 |
| **Total Probable** | | | **7,453** | **0.123%** | **18,365** |

Notes:

1: NI 43-101 and S-K 1300 definitions were followed for Mineral Reserve
2: Mineral Reserves are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.45 (6 ft. of 0.075% $eU_3O_8$) for underground
3: Mineral Reserves are estimated using a long-term Uranium price of US$60 per pound
4: Bulk density is 0.0625 tons/ft$^3$ (16 ft$^3$/ton)
5: Numbers may not add due to rounding

A summary of total Mineral Resources exclusive of Mineral reserves is provided in Table 1-3.

**Table 1-3 Sheep Mountain Mineral Resources Exclusive of Mineral Reserves – April 9, 2019**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Indicated* | Sheep Underground | 0.30 | 2,048 | 0.09% | 3,786 |
| *Indicated* | Congo Pit Area | 0.10 | 2,161 | 0.13% | 5,786 |
| **Total Indicated** | | | **4,210** | **0.11%** | **9,570** |

Notes:

1: NI 43-101 and S-K 1300 definitions were followed for Mineral Resources
2: Mineral Resource are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.30 (6 ft. of 0.05% $eU_3O_8$) for underground
3: Mineral Resources are estimated using a long-term Uranium price of US$65 per pound
4: Bulk density is 0.0625 tons/ft$^3$ (16 ft$^3$/ton)
5: Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability
6: Numbers may not add due to rounding

## 1.8 Capital and Operating Costs

The plan for development of the Sheep Mountain Project is an open pit and underground conventional mine operation with on-site mineral processing featuring an acid heap leach and solvent extraction recovery facility.

Estimated operating and capital costs are summarized in Tables 1-3 and 1-4 that follow.

**Table 1-4 Sheep Mountain Capital Costs**

| Capital Expenditures: * | Contingency | Initial Capital* | Years 4-12 | Life of Mine |
|---|---|---|---|---|
| Permitting (WDEQ) | ----- | $3,000 | $1,000 | $4,000 |
| Pre-Development Mine Design | ----- | $1,200 | --------- | $1,200 |
| OP Mine Equipment | 15% | $21,141 | $3,200 | $24,341 |
| UG Mine Equipment | 15-30% | $51,504 | $13,000 | $64,504 |
| Office, Shop, Dry, and support | 15% | $3,234 | ----- | $3,234 |
| Mineral Processing | 25% | $32,086 | $6,461 | $38,546 |
| **TOTAL CAPITAL EXPENDITURES** | | **$112,165** | **$23,661** | **$135,826** |
| **COST PER POUND RECOVERED** | | | | **$8.05** |

All costs in 2021 US dollars x 1,000

*Initial Capital includes year 0 to year 3. Does not include working capital and initial warehouse inventory.

**Table 1-5 Sheep Mountain Operating Costs**

| Operating Costs - OPEN PIT AND UNDERGROUND MINING | Open Pit and UG (US$000s) | Cost Per Ton Mined (US$) | Cost Per lb Mined (US$) | Cost Per lb Recovered (US$) |
|---|---|---|---|---|
| *Open Pit* | | | | |
| Strip | $ 80,331 | $ 20.31 | $ 8.81 | |
| Mining | $ 18,625 | $ 4.71 | $ 2.04 | |
| Support | $ 15,834 | $ 4.00 | $ 1.74 | |
| Staff | $ 23,485 | $ 5.94 | $ 2.58 | |
| Contingency | $ 11,062 | $ 2.80 | $ 1.21 | |
| **Total Surface Mine (3,955,000 tons, 9,117,000 lbs)** | **$ 149,336** | **$ 37.76** | **$ 16.38** | |
| *Underground Mine* | | | | |
| Production | $ 169,217 | $ 48.38 | $ 18.30 | |
| Development | $ 53,166 | $ 15.20 | $ 5.75 | |
| Support | $ 44,913 | $ 12.84 | $ 4.86 | |
| Staff | $ 18,825 | $ 5.38 | $ 2.04 | |
| Contingency | $ 22,890 | $ 6.54 | $ 2.48 | |
| **Total Underground Mine (3,498,000 tons, 9,248,000 lbs)** | **$ 309,011** | **$ 88.35** | **$ 33.42** | |
| **Blended Mining Costs* (7,435,000 tons, 18,365,000 lbs)** | **$ 458,347** | **$ 61.50** | **$ 24.96** | **$ 27.16** |
| *Reclamation and Closure* | | | | |
| Wyoming Agreement State Annual Inspection Fees | $ 1,800 | $ 0.24 | $ 0.10 | |
| Final Grading and Revegetation | $ 2,180 | $ 0.29 | $ 0.12 | |
| Plant Decommissioning and Reclamation | $ 11,166 | $ 1.50 | $ 0.61 | |
| **Total Reclamation and Closure** | **$ 15,146** | **$ 2.03** | **$ 0.83** | **$ 0.91** |
| *Heap Leach* | | | | |
| Cost per ton | $ 143,585 | $ 19.27 | $ 7.82 | |
| **Total Heap Leach** | **$ 143,585** | **$ 19.27** | **$ 7.82** | **$ 8.51** |
| **Reclamation Bond Mine and Heap** | **$ 6,120** | **$ 0.82** | **$ 0.33** | **$ 0.36** |
| *Taxes & Royalties* | | | | |
| Gross Products tax per/lb | $ 39,702 | $ 5.33 | $ 2.16 | |
| Severance Tax per/lb | $ 21,965 | $ 2.95 | $ 1.20 | |
| State lease (pit) | $ 26,966 | $ 3.62 | $ 1.47 | |
| Claim royalties (UG) | $ 21,640 | $ 2.90 | $ 1.18 | |
| **Total Taxes and Royalties** | **$ 110,273** | **$ 14.80** | **$ 6.00** | **$ 6.53** |
| **TOTAL DIRECT COSTS** | **$ 733,471** | **$ 98.42** | **$ 39.94** | **$ 43.47** |

*Blended mine cost represents the weighted average of open pit and underground mines and include open pit backfill.
Open pit and underground mine costs, itemized separately above, are not additive but are included in the blended mine costs.
**All costs 2021 US dollars x 1,000

## 1.9 Economic Analysis

The financial evaluation assumes constant U.S. dollars (2021) and an average sales price of US$65.00 per pound of uranium oxide. All costs are forward looking and do not include any previous project expenditures or sunk costs. Table 1-5 provides the Internal Rate of Return ("IRR") for the and the calculated Net Present Value ("NPV") at a range of discount rates before and after federal income tax (US$ x 1,000).

**Table 1-6 Sheep Mountain Internal Rate of Return and Net Present Value ($000)**

| | Before Federal Income Tax | After Federal Income Tax |
|---|---|---|
| IRR | 28% | 26% |
| NPV 5% | $141,749 | $120,725 |
| NPV 7% | $116,412 | $98,492 |
| NPV 10% | $85,627 | $71,381 |

## 1.10 Interpretations and Conclusions

The planned development of the Sheep Mountain Project is as an open pit and underground mine operation with an acid heap leach and solvent extraction recovery facility. The open pit and underground mine operations would be concurrent with a mine life of approximately 12 years.

The Sheep Mountain Project is profitable under the base case scenario and US$65 per pound selling price; the project is estimated to generate an IRR of 28% before taxes and has an NPV of approximately US$141.7 million at a 7% discount rate. The breakeven price of $51.00 per pound of uranium oxide for the project is based on the foregoing assumptions and preliminary mine limits. The technical risks related to the project are low as the mining and recovery methods are proven. The mining methods recommended have been employed successfully at the Project in the past. Successful uranium recovery from the mineralized material at Sheep Mountain and similar project such as the Gas Hills has been demonstrated via both conventional milling and heap leach recovery.

Risks are discussed below in Section 1.12.

## 1.11 Recommendations

As the Sheep Mountain Project (the Project) is sensitive to mining factors including resource recovery, dilution, and grade, and mineral processing factors related to the performance of the heap leach, it is recommended that a bulk sampling program and pilot scale heap leach testing be completed. Mineralization is shallow (less than 40 feet) in the northern portions of the Congo pit. A small test mine could be developed under the existing WDEQ Mine Permit and BLM Plan of Operations. This would allow access to examine and test the mineralization with respect to mining parameters and to collect a bulk sample for pilot scale heap leach testing. It is recommended that a bulk sample of approximately 2,000 tons be collected and transported to Energy Fuels Resources (USA) Inc. White Mesa Mill. At the Mill and under the Mill's Source Materials License, the mineralized material could be stacked at various heights in the range of 15 to 30 feet. The test plots would be lined and could be cribbed on two sides with an open face stacked at the angle of repose. Using 20 x 20-foot pads, four pilot tests could be completed. The testing would determine the geotechnical behavior of the material with respect to consolidation, slope stability, and the leaching characteristics with respect to acid consumption and mineral recovery. Flow and/or percolation rates retained moisture and other characteristics at various stacking heights could also be determined.

Table 1-6 summarizes the recommended work program to further develop the Project.

**Table 1-6 Sheep Mountain Recommended Work Program**

| Scope of Work | Est. Cost US$ |
|---|---|
| Test mine approximately ½ acre, 40,000 cy excavation at $150/cy | $60,000 |
| Testing the mineralization and collection of a bulk sample | $40,000 |
| Transportation of 2,000 tons, 500 miles at $0.17/ton mile | $170,000 |
| Heap pilot testing | $200,000 |
| Reclamation of test pit | $60,000 |
| Revise Preliminary Feasibility Study | $100,000 |
| **Total** | **$630,000** |

## 1.12 Risks

The technical risks related to the project are low as the mining and recovery methods are proven. The mining methods recommended have been employed successfully at the project in the past. Successful uranium recovery from the mineralized material at Sheep Mountain and similar project such as the Gas Hills has been demonstrated via both conventional milling and heap leach recovery.

Risks related to permitting and licensing the project are also low as the WDEQ Mine Permit and BLM Plan of Operations have been approved. The only major remaining permit needed for operations is the Source Materials License which would be issued through the WDEQ as Wyoming is an agreement state with the NRC.

The authors are not aware of any other specific risks or uncertainties that might significantly affect the Mineral Resource and Reserve estimates or the consequent economic analysis. Estimation of costs and uranium price for the purposes of the economic analysis over the life of mine is by its nature forward-looking and subject to various risks and uncertainties. No forward-looking statement can be guaranteed, and actual future results may vary materially.

Readers are cautioned that it would be unreasonable to rely on any such forward-looking statements and information as creating any legal rights, and that the statements and information are not guarantees and may involve known and unknown risks and uncertainties, and that actual results are likely to differ (and may differ materially) and objectives and strategies may differ or change from those expressed or implied in the forward-looking statements or information as a result of various factors. Such risks and uncertainties include risks generally encountered in the exploration, development, operation, and closure of mineral properties and processing facilities. Forward-looking statements are subject to a variety of known and unknown risks, uncertainties and other factors which could cause actual events or results to differ from those expressed or implied by the forward-looking statements, including, without limitation:

- risks associated with mineral reserve and resource estimates, including the risk of errors in assumptions or methodologies;
- risks associated with estimating mineral extraction and recovery, forecasting future price levels necessary to support mineral extraction and recovery, and EFR's ability to increase mineral extraction and recovery in response to any increases in commodity prices or other market conditions;
- uncertainties and liabilities inherent to conventional mineral extraction and recovery;
- geological, technical and processing problems, including unanticipated metallurgical difficulties, less than expected recoveries, ground control problems, process upsets, and equipment malfunctions;
- risks associated with labor costs, labor disturbances, and unavailability of skilled labor;
- risks associated with the availability and/or fluctuations in the costs of raw materials and consumables used in the production processes;
- risks associated with environmental compliance and permitting, including those created by changes in environmental legislation and regulation, and delays in obtaining permits and licenses that could impact expected mineral extraction and recovery levels and costs;
- actions taken by regulatory authorities with respect to mineral extraction and recovery activities;
- mineral tenure consists primarily of unpatented mining lode claims based on US laws dating to the Mining Act of 1872 and a change in the Act could affect the mineral tenure; and
- risks associated with the EFR's dependence on third parties in the provision of transportation and other critical services.

# 2.0 INTRODUCTION

## 2.1 Introduction

This Preliminary Feasibility Study (PFS has been prepared by the authors for Energy Fuels on the Sheep Mountain underground and open pit project (the Project), located in Fremont County, Wyoming, USA to satisfy the US Securities and Exchange Commission (SEC) disclosure requirements under S-K 1300 and policies for mining properties and the requirements of NI 43-101. This report supersedes the previous NI 43-101 report, “Updated Preliminary Feasibility Study, National Instrument 43-101, Technical Report, Amended and Restated” by Douglas L. Beahm of BRS and dated February 28, 2020.

The Sheep Mountain Project is located eight miles south of the Jeffrey City, Wyoming in portions of Sections 15, 16, 17, 20, 21, 22, 27, 28, 29, 32, and 33, Township 28 North, Range 92 West at approximate Latitude 42º 24’ North and Longitude 107º 49’ West, within the Wyoming Basin physiographic province in the Great Divide Basin at the northern edge of the Great Divide Basin. The mineral properties at the Sheep Mountain Project are comprised of 218 unpatented mining claims on land administered by the Bureau of Land Management (BLM), and approximately 640 acres within a State of Wyoming lease. The combination of the mineral holdings comprises approximately 5,055 acres.

Uranium was first discovered in the Crooks Gap district, which includes the Sheep Mountain area, in 1953 (Bendix, 1982). While the original discoveries were aided by aerial and ground radiometric surveys, exploration activities were primarily related to drilling and exploratory trenching. Three companies dominated the district by the mid-1950s: Western Nuclear Corporation (WNC), Phelps Dodge (PD) and Continental Uranium Corporation (CUC). WNC built the Split Rock Mill at Jeffrey City in 1957 and initiated production from the Paydirt pit in 1961, Golden Goose 1 in 1966 and Golden Goose 2 in 1970. PD was the principal shareholder and operator of the Green Mountain Uranium Corporation’s Ravine Mine which began production in 1956. CUC developed the Seismic Pit in 1956, the Seismic Mine in 1957, the Reserve Mine in 1961 and the Congo Decline in 1968. In 1967 CUC acquired the PD properties and in 1972 WNC acquired all of CUC’s Crooks Gap holdings. During the mid-1970s PD acquired an interest in WNC which began work on Sheep Mountain I in 1974, the McIntosh Pit in 1975, and Sheep Mountain II in 1976. WNC ceased production from the area in 1982.

Subsequent to closure of the Sheep Mountain I by WNC, during April to September 1987, Pathfinder Mines Corp. (“PMC”) mined a reported 12,959 tons, containing 39,898 pounds of uranium at an average grade of 0.154% $U_3O_8$ from Sheep Mountain I, (PMC, 1987). U.S. Energy-Crested Corp. (“USECC”) acquired the properties from WNC in 1988 and during May to October 1988 USECC mined 23,000 tons from Sheep Mountain I, recovering 100,000 lbs. of uranium for a mill head grade of 0.216% $U_3O_8$ (WGM, 1999). The material was treated at PMC’s Shirley Basin mill, 130 miles east of the mine.

In December 2004, Uranium Power Corp. (“UPC”) (then known as Bell Coast Capital) entered into a Purchase and Sales Agreement with USECC to acquire a 50% interest in the Sheep Mountain property. The acquisition was completed in late 2007 with aggregate payments to USECC of $7.05 million and the issuance of four million common shares to USECC. USECC sold all of its uranium assets, including its 50% interest in Sheep Mountain, to Uranium 1 (U1) in April 2007. Titan Uranium Inc. (Titan) acquired a 50% interest in the property when it acquired Uranium Power Corp (UPC) by a Plan of Arrangement in July 2009. The ownership was subsequently transferred to Titan wholly-owned subsidiary, Titan. The remaining 50% interest was purchased from U1 on October 1, 2009. Subsequently Energy Fuels Inc. and Titan announced that a Certificate of Arrangement giving effect to the Plan of Arrangement between Energy Fuels was issued on February 29, 2012, making, Titan a wholly-owned subsidiary of Energy Fuels which is now named Energy Fuels Wyoming Inc.

Historic reports by Pathfinder Mines, Western Nuclear, and others show that properties within the current Sheep Mountain project boundary were operated as underground and open pit mines at various times in the 1970s and 1980s. There were 5,063,813 tons of material mined and milled, yielding 17,385,116 pounds of uranium at an average grade of 0.17% $U_3O_8$. Mining was suspended in 1988.

## 2.2 Registrant of Filing

This PFS report was prepared for Energy Fuels which is incorporated in Ontario, Canada. Energy Fuel's subsidiary, Energy Fuels Resources (USA) Inc., is a US-based uranium and vanadium exploration and mine development company with projects located in the states of Colorado, Utah, Arizona, Wyoming, Texas, and New Mexico. Energy Fuels is listed on the NYSE American Stock Exchange (symbol: UUUU) and the Toronto Stock Exchange (symbol: EFR).

## 2.3 Terms of Reference

This work is based on an updated preliminary feasibility study conforming to Canadian NI 43-101 Standards of Disclosure for Mineral Projects completed by BRS on the Sheep Mountain Project in February, 2020 and is available on the Canadian Securities Administrators (CSA) filing system ("SEDAR", https://www.sedar.com/homepage_en.htm).

As the project continues on care and maintenance since the effective date of BRS's 2020 updated preliminary feasibility study, there has been no material change in the project.

The purpose of this report is to declare Mineral Resources and Mineral Reserves, and to constitute the inaugural S-K 1300 compliant technical report summary for the Project.

## 2.4 Sources of Information

This Technical Report is based on an original independent Technical Report conforming to Canadian NI 43-101 Standards of Disclosure for Mineral Projects completed by BRS on the project in 2020.

EFR QP's and the sections they are responsible for are:

Dan Kapostasy (P.G), Director of Technical Services: Sections 4, 5, 6, 7, 8, 9, 10, 11, 12, 18, 19 20 and relevant portions of Sections 1 and 2. Mr. Kapostasy is a registered Professional Geologist in the States of Wyoming and Utah and is a Registered Member of SME with 16 years of experience in the Uranium mining industry with Strathmore Resources and EFR. Mr. Kapostasy last visited the project on April 8, 2014. Since that time, no material changes have taken place at the Sheep Mountain Property.

Third Party QP's are:

Douglas L. Beahm, PE, PG and SME Registered Member. Mr. Beahm is independent of EFR and has no financial interest in the project. Mr. Beahm is experienced with uranium exploration, development, and mining including past employment with Homestake Mining Company, Union Carbide Mining and Metals Division, AGIP Mining USA and as a consultant. Mr. Beahm's professional experience dates to 1974. Mr. Beahm has worked previously on the project and was at the site 9 days in 2009, 23 days in 2010, and 19 days in 2011 assisting in the planning and execution of the drilling programs in 2009, 2010, and 2011. Mr. Beahm has been on site periodically since 2011 Mr. Beahm is responsible for Sections 3, 14, 15, 16, 22, 23, 24, 25, 26, 27and relevant portions of Sections 1, 2, and 21, specifically the mining capital and operating costs

Terrence P. McNulty, P.E., D.Sc.: Dr. McNulty is a Professional Engineer and Registered Member of the US Society of Mining, Metallurgy, and Exploration Inc. (SME Inc.). Dr. McNulty's experience in uranium dates to the 1960s when Dr. McNulty was involved in laboratory testing and process development for uranium resources being evaluated at Anaconda's exploration department, as well as providing technical services to the uranium operations. Dr. McNulty assisted in the planning and execution of the column leach testing and other metallurgical program for the project circa 2010 through 2012. Dr. McNulty is familiar with the extractive metallurgy of sandstone-hosted uranium deposits and is professionally qualified to address the requirements related to Section 17 of this report. Mr. McNulty is responsible for Sections 13, 17, and relevant portions of Section 21, specifically the mineral processing and heap leach facility capital and operating costs..

The documentation reviewed and other sources of information utilized in this report are listed in Section 27.0 (References).

Sources of information and data contained in this technical report or used in its preparation are from publicly available sources in addition to private information owned by EFR, including that of past property owners.

## 2.5 Site Visit

Mr. Kapostasy last visited the project site on April 8, 2014 while Mr. Beahm visited it on the 16$^{th}$ of September of 2021 and Dr. McNulty last visited the site in August of 2010.

## 2.6 Purpose of Report

The authors have prepared this study on the Sheep Mountain project in accordance with NI 43-101 and S-K 1300 requirements for preliminary feasibility studies.

## 2.7 Update of a Previously Filed Technical Report

This SEC compliant report is not an update of a previous technical report summary on the property, as it is the first S-K 1300 compliant technical report summary with respect to the Project. .

## 2.8 Effective Date

The effective date of this report is December 31, 2021. The effective date of the mineral resource estimate is April 9, 2019. The effective date of the mineral reserve and cost estimate is December 31, 2021.

## 2.9 List of Abbreviations

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US$) unless otherwise noted.

Table 2-1 shows the abbreviations used in this report.

**Table 2-1 List of Abbreviations**

| | | | |
|---|---|---|---|
| a | annum | μg | microgram |
| A | ampere | $m^3$ | cubic meters |
| btu | British thermal units | $m^3$/h | cubic meters per hour |
| °C | degree Celsius | mi | mile |
| cal | calorie | min | minute |
| cfm | cubic feet per minute | μm | micrometre |
| cm | centimeter | mm | millimetre |
| $cm^2$ | square centimeter | mph | miles per hour |
| d | day | MVA | megavolt-amperes |
| dia | diameter | MW | megawatt |
| °F | degree Fahrenheit | MWh | megawatt-hour |
| ft | foot | ppb | part per billion |
| $ft^2$ | square foot | ppm | part per million |
| $ft^3$ | cubic foot | psi | pound per square inch |
| ft/s | foot per second | psig | pound per square inch gauge |
| g | gram | s | second |
| gal | Imperial gallon | st | short ton |
| g/L | gram per litre | stpa | short ton per year |
| gpm | Imperial gallons per minute | stpd | short ton per day |
| hp | horsepower | t | metric tonne |
| hr | hour | tpa | metric tonne per year |
| Hz | hertz | tpd | metric tonne per day |
| in. | inch | US$ | United States dollar |
| $in^2$ | square inch | USg | United States gallon |
| J | joule | USgpm | US gallon per minute |
| k | kilo (thousand) | V | volt |
| kcal | kilocalorie | W | watt |
| kg | kilogram | wmt | wet metric tonne |
| km | kilometre | wt% | weight percent |
| kPa | kilopascal | $yd^3$ | cubic yard |
| kVA | kilovolt-amperes | yr | year |
| kW | kilowatt | | |

# 3.0 RELIANCE ON OTHER EXPERTS

## 3.1 Reliance Upon Information Provided by the Registrant

The Authors have relied upon Energy Fuels through Mr. Curtis Moore, Energy Fuel’s V.P. Marketing and Corporate Development for uranium pricing in Section 19.0 (Market Studies and Contracts) to the extent such information constitutes macroeconomic trends, data and assumptions. In this role Mr. Moore is in regular contact with uranium trade associations and utilities and has a detailed understanding of uranium markets in general. Mr. Kapostasy has reviewed Mr. Moore’s recommendations for commodity pricing and is of the opinion that it is reasonable for the purposes of this report.

# 4.0 PROPERTY DESCRIPTION AND LOCATION

## 4.1 Introduction

The Sheep Mountain Project (the Project) is located in portions of Sections 15, 16, 17, 20, 21, 22, 27, 28, 29, 32, and 33, Township 28 North, Range 92 West at approximate Latitude 42º 24’ North and Longitude 107º 49’ West, approximately, eight miles south of Jeffrey City, Wyoming. (Figure 4-1). The Project is located the Wyoming Basin physiographic province in the Great Divide Basin at the northern edge of the Great Divide Basin.

## 4.2 Land Tenure

Figure 4-2 represents the approximate location of unpatented mining lode claims and the state lease held by EFR. The mineral properties at the Sheep Mountain Project comprise approximately 5,195 acres consisting of:

- 218 unpatented mining claims on land administered by the BLM comprising, including:
    - 179 unpatented mining claims acquired through the acquisition of Titan.
    - 13 unpatented mining claims located by EFR.
    - 26 unpatented mining claims acquired through the acquisition of Strathmore Resources: and
- An approximately 640 acre of State of Wyoming lease ML 0-15536.

**Table 4-1. List of Claims held by EFR**

| Claim Block | Claim Numbers | No. of Claims | PLSS Location | Royalty (Y/N) |
|---|---|---|---|---|
| Christie | 4E | 1 | T28N R92W; Sec. 27 | Y |
| Cindy | 1D | 1 | T28N R92W; Sec. 29 | Y |
| Golden Goose | 1D, 2, 3C, 4D | 4 | T28N R92W; Sec. 21 | Y |
| Highland | 4D, 5D, 6D, 7D | 4 | T28N R92W; Sec. 21, 22 | Y |
| Key | 1D, 2D, 3D, 4D, 5C, 6D, 7D, 8D | 8 | T28N R92W; Sec. 21, 22, 27,28 | Y |
| Louise | 1D | 1 | T28N R92W; Sec. 21 | Y |
| Mike | A | 1 | T28N R92W; Sec. 21 | Y |
| NH | 1D ,2D, 3D, 4D | 4 | T28N R92W; Sec. 21, 22 | Y |
| Paydirt | 6, 7, 12D, 13C | 4 | T28N R92W; Sec. 21 | Y |
| Poorboy | 1D (amended) | 1 | T28N R92W; Sec. 21, 22 | Y |
| Snoball | 1D-4D, 5C, 6C (amended), 7D, 8C (amended) | 8 | T28N R92W; Sec. 28, 29 | Y |
| Sun | 3C, 4C, 5D | 3 | T28N R92W; Sec. 28 | Y |
| Sundog | 2D, 17C-22C | 7 | T28N R92W; Sec. 21, 28 | Y |
| Susan James | 4D | 1 | T28N R92W; Sec. 28 | Y |
| Trey | 1D, 2D | 2 | T28N R92W; Sec. 28, 29 | Y |
| Trey Jr. | 1D | 1 | T28N R92W; Sec. 29 | Y |
| Zeb | 1C, 2C-4C, 5D, 6D | 6 | T28N R92W; Sec.28 | Y |
| Carrie | 1-6 | 6 | T28N R92W; Sec. 29, 32 | N |
| Jamie | 1-46 | 46 | T28N R92W; Sec. 21, 22, 27, 28, | N |
| New Sheep | 1, 2 | 2 | T28N R92W; Sec. 28 | N |
| Last Chance | 1D | 1 | T28N R92W; Sec. 22 | N |
| JK | 3, 9, 15, 18 | 4 | T28N R92W; Sec. 8, 9 | N |
| Frankie | 1, 2, 3 | 3 | T28N R92W; Sec. 8, 29 | N |
| SM | 1-8, 8A, 9-28 | 29 | T28N R92W; Sec. 20, 21, 29 | N |
| Bev | 1-33, 33A, 34, 34A, 35-42 | 44 | T28N R92W; Sec. 8, 9 | N |
| SMN | 1-20, 22, 24, 26, 28, 30, 32 | 26 | T28N R92W; Sec. 17, 20 | N |

| Claim Block | Claim Numbers | No. of Claims | PLSS Location | Royalty (Y/N) |
|---|---|---|---|---|
| Total w/ Royalty | | 57 | | |
| Total w/o Royalty | | 161 | | |
| **Grand Total** | | **218** | | |

In February 2012, EFR purchased 320 acres of private surface overlaying some of the federal minerals covered by 18 of the claims. The purchased parcel includes the SW¼ Section 28 and SE¼, E½ SW¼, and NW¼ SW¼ Section 29, T28N, R92W. A final payment of $5,000 was made in January 2016 for the purchased parcel.

A mineral title opinion was completed for the project on behalf of Titan prior to the acquisition by EFR and is the basis of the information summarized herein up to that time (Harris & Thompson, 2011). No material changes have occurred since that time.

To maintain these mineral rights, EFR must comply with the lease provisions, including annual payments with respect to the State of Wyoming leases; private leases; BLM and Fremont County, as well as Wyoming filing and/or annual payment requirements to maintain the validity of the unpatented mining lode claims as follows. Mining claims are subject to annual filing requirements and payment of a fee of $165 per claim. Unpatented mining claims expire annually but are subject to indefinite annual renewal by filing appropriate documents and paying the fees described above. ML 0-15536 will expire on 1/1/2024. Annual Payments to maintain ML 0-15536 are $2,560 per year.

## 4.3 Royalties

The Sheep Mountain Project is subject to an overall sliding scale royalty of 1% to 4% due to Western Nuclear, based on the NUEXCO value. The Western Nuclear claims included additional royalties to private parties. These royalties vary from $0.50 per pound to 5% Gross Royalty depending on the claim. The total burden could reach 9%. These additional royalties are summarized in Appendix F of RPA, 2006. Claims which were not included in the agreement are not subject to this royalty. Federal mineral claims subject to the Western Nuclear royalty are located in sections 21, 22, 26, 28, and 29, T28N R92W.

Under Wyoming State Lease ML 0-15536 (Sec. 16, T28N R92W), there is a royalty of 4% of the quantity or gross realization value of the $U_3O_8$, based on the total arms-length consideration received for uranium products sold.

Approximately 90% of the Congo pit mineable resource is located under the Wyoming State lease and 10% is located under the federal claims. The remainder of the mineral resource, Sheep Underground, is located under the federal claims.

Land purchased from Ellen Fox on February 12, 2012, carries a 4% production royalty for any uranium from the property, based on the price for which the products are sold. However, no Mineral Resources are known to exist on this property.

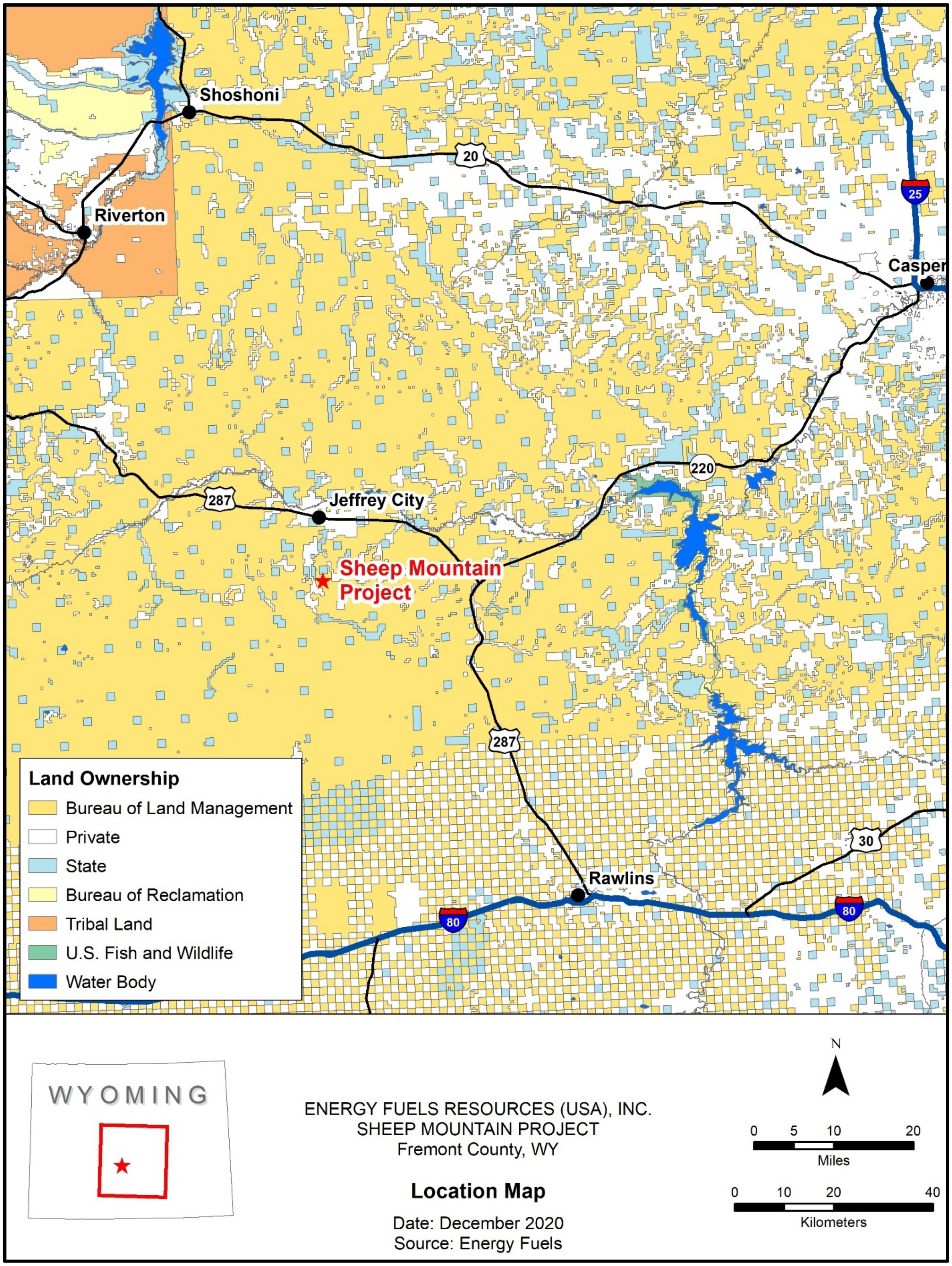



**Figure 4-1. Sheep Mountain Location Map**

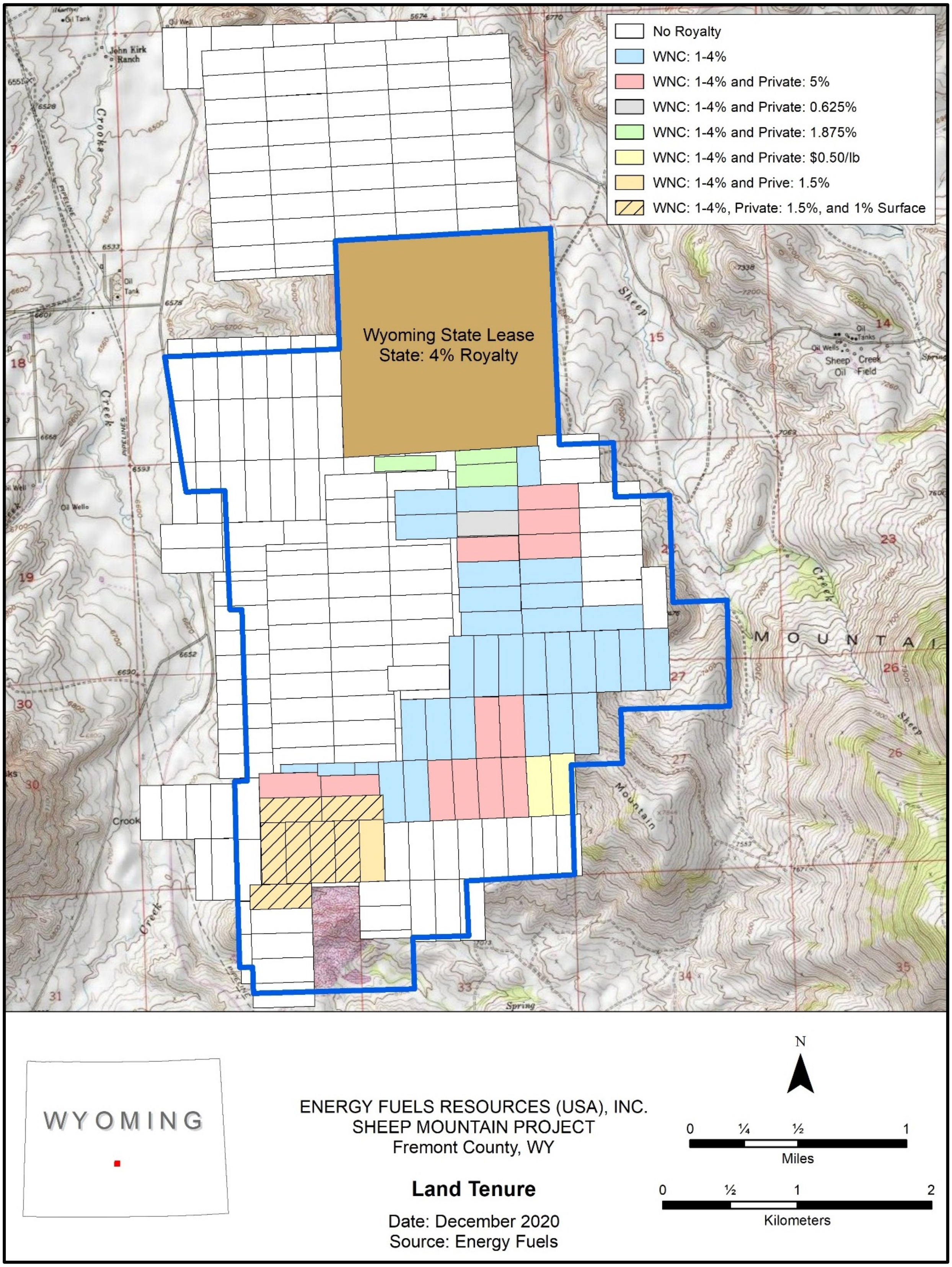



**Figure 4-2. Sheep Mountain Land Tenure Map**

## 4.4 Permits

In June 2010, baseline environmental studies commenced to support an application to the US Nuclear Regulatory Commission (NRC) for a Source Material and By-product Material License (the "License") for operation of a heap leach facility. Work was also initiated on a revision to the existing Wyoming Department of Environmental Quality (WDEQ) Mine Permit, as well as a Plan of Operation (PO) for the BLM. Baseline studies included wildlife and vegetation surveys, air quality and meteorological monitoring, ground and surface water monitoring, radiological monitoring, and cultural resource surveys.

Submission of the PO to the BLM was made in June 2011. The PO was accepted as complete by the BLM, and an environmental impact statement (EIS) was initiated in August 2011. EFR revised the PO in July 2012, consistent with the modified plan presented in the Sheep Mountain Technical Report. In July 2013, the PO was again revised to reflect a new waste rock disposal layout for the open pit mine and an improved and more economical heap leach and processing facility. The revised PO also included the option of transporting mineralized material off-site for processing. The Final Environmental Impact Study (FEIS) was completed in August of 2016. On January 6, 2017, the BLM issued its Record of Decision (RoD) and approved the PO.

In October 2011, a draft revision was submitted to the existing Mine Permit 381C to WDEQ. WDEQ then provided review comments as part of its "courtesy review." The proposed permit amendment was revised and resubmitted in January 2014. In July 2015, the revision was approved by WDEQ. The revision includes expansion of surface and underground mining operations and an updated reclamation plan consistent with current reclamation practices.

Development of an application to the NRC for a license to construct and operate the uranium recovery facility was taken to an advanced stage of preparation. This license would allow EFR to process the mineralized material into yellowcake at the Sheep Mountain Project site. The draft application to NRC for a Source Material License was reviewed in detail by the NRC in October 2011. The NRC audit report identified areas where additional information should be provided. During September 2018, the State of Wyoming became an NRC Agreement State for licensing of uranium milling activities, including heap leach facilities. Previous data, designs, and related applications prepared for NRC will now be referred to and reviewed by the State of Wyoming WDEQ as an Agreement State with the NRC with respect to Source Materials licensing. The review and approval process for the license by the State of Wyoming is anticipated to take approximately three to four years from the date submitted. Submittal of the license application to the State of Wyoming is on hold pending the Company's evaluation of off-site processing options for this project, and whether or not to proceed with an on-site uranium recovery facility, pending improvements in uranium market conditions.

The heap leach facility has been permitted through the BLM, yet still requires Source Material and Byproduct Material licensing through the State of Wyoming. The permitted capacity is 4 million tons of mineralized material which is 53% of the estimated Mineral Reserves. An expansion to the heap leach facility (including permitting) will be required in the future to process the remaining 47% of the estimated Mineral Reserves. Costs for the permitting, construction, and closure of the heap expansion are accounted for in the PFS. Mining could commence at this time under the existing PO and Mine Permit, but the mined material would need to be processed at a licensed off-site processing facility under a toll-milling or other arrangement. Costs to permit the expansion of the heap leach facility are accounted for in the first two years of the project's cash flow.

EFR is subject to liabilities for existing mine disturbances at the Sheep Mountain Project. The Company maintains a reclamation bond with the State of Wyoming in the total amount of US$950,000 as security for these liabilities. The company files annual reports with the State of Wyoming, and the amount of the bonds may be adjusted annually to endure sufficient surety is in place to cover the full cost of reclamation.

## 4.5 Surface Rights

EFR has federal surface rights to approximately 127 unpatented mining claims (2,624 acres). The remainder surface rights are split estate with state and private surface ownership.

EFR owns the surface of following described lands acquired under a transaction with Ellen Fox on February 22, 2012 (ref. examination of the described documents):

Township 28 North, Range 92 West, 6th P.M.:

Section 28: SW¼SW¼

Section 29: SE¼, E½SW¼, NW¼SW¼

This parcel was originally purchased by Titan for a processing facility and shop.

Under the terms of the State Lease, ML 0-15536, the lessee is given the exclusive right and privilege to prospect, mine, extract, and remove any deposits, together with the right to construct and maintain all works, buildings, plants, waterways, roads, communication lines, power lines, tipples, hoists, or other structures and appurtenances necessary for the full enjoyment thereof. A detailed description of the allowable workings is included in the state Lease, including both underground and surface extraction (see examination of the State Lease).

No other surface rights are needed for the planned operations. EFR is not aware of any other specific risks affecting the mineral title for the property.

## 4.6 Taxes

Uranium mining in Wyoming is subject to both a gross products (county) and mineral severance tax (state). At the federal level: aggregate corporate profit from mining ventures is taxable at corporate income tax rates, i.e., individual mining projects are not assessed federal income tax but rather the corporate entity is assessed as a whole. For mineral properties: depletion tax credits are available on a cost or percentage basis whichever is greater. The percentage depletion tax credit for uranium is 22%, among the highest for mineral commodities (IRS Pub. 535).

## 4.7 Encumbrances and Risks

To the authors knowledge there are no other significant factors or risks that may affect access, title, or the right or ability to perform work on the property, if the aforementioned requirements, payments, and notifications are met.

# 5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

## 5.1 Introduction

The Sheep Mountain Project (the Project) is located at approximate Latitude 42º 24' North and Longitude 107º 49' West, within the Wyoming Basin physiographic province at the northern edge of the Great Divide Basin. The Project is approximately 8 miles south of Jeffrey City, Wyoming the nearest population center. The nearest commercial airport is located in Riverton, Wyoming approximately 56 miles from Jeffrey City on a paved, two-lane, state highway. The Project is accessible via 2-wheel drive on existing county and two-track roads, as follows: Proceed south from Jeffrey City on the Crooks Gap/Wamsutter Road, County Road 23, towards Crooks Gap, approximately 7.2 miles; then proceed easterly on EFR's private road approximately 1 mile to the site.

## 5.2 Physiography

### 5.2.1 Topography and Elevation

The topography consists of rounded hills with moderate to steep slopes. Elevations range from 6,600 feet to 8,000 feet above sea level. The ground is sparsely vegetated with sage and grasses and occasional small to medium sized pine trees at higher elevations. Year-round operations are contemplated for the Project.

### 5.2.2 Vegetation

The ground at the Project is sparsely vegetated with sage and grasses and occasional small to medium sized pine trees at higher elevations.

### 5.2.3 Climate

The Project falls within the inter-mountain semi-desert weather province, with average maximum temperatures ranging from 31.1 °F (January and December) to 84.9 °F (July), average minimum temperatures ranging from 9.1 °F (January) to 49.2 °F (July), and average total monthly precipitation ranging from 0.36 inches (January) to 2.04 inches (May).

Historic climate records were available through a National Weather Service cooperative station until 2005. The Project falls within the intermountain semi-desert weather province. Table 5-1 is a summary of the climatic conditions.

**Table 5-1 Jeffrey City, Wyoming, Monthly Climate Summary[1]**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Avg. Max Temp. (F)* | 31.1 | 34.0 | 43.5 | 54.7 | 64.5 | 75.1 | 84.9 | 82.8 | 71.8 | 59.4 | 40.1 | 31.1 | 56.1 |
| *Avg. Min Temp. (F)* | 9.1 | 10.3 | 18.5 | 26.4 | 34.8 | 42.5 | 49.2 | 48.1 | 38.2 | 28.7 | 16.6 | 9.5 | 27.7 |
| *Avg. Total Precip. (in)* | 0.36 | 0.42 | 0.79 | 1.28 | 2.04 | 1.07 | 0.89 | 0.64 | 0.78 | 0.83 | 0.62 | 0.40 | 10.12 |
| *Avg. Total Snowfall (in)* | 5.1 | 6.6 | 8.3 | 9.7 | 4.0 | 0.3 | 0.0 | 0.0 | 1.1 | 5.4 | 9.7 | 6.2 | 56.5 |
| *Avg. Snow Depth (in)* | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 |

Notes: [1]Period of Record: April 10, 1964, to December 31, 2005

Past mining and mineral processing operations at the site and within the general area were conducted on a year-round basis. Current planning includes year-round operations.

## 5.3 Access

The project is located approximately 8 miles south of Jeffrey City, Wyoming the nearest population center. The nearest commercial airport is located in Riverton, Wyoming approximately 56 miles from Jeffrey City on a paved, two-lane, state highway. The project is accessible via 2-wheel drive on existing county and two-track roads, as follows: Proceed south from Jeffrey City on the Crooks Gap/Wamsutter Road, County Road 23, towards Crooks Gap, approximately 7.2 miles; then proceed easterly on EFR's private road approximately 1 mile to the site.

## 5.4 Infrastructure

Telephone, electric and natural gas service adequate for planned mine and mineral processing operations has been established to the proposed plant site. In addition, electric service and a waterline have been extended via a ROW issued by the BLM in 2011 to both the Sheep I and II shafts. Adequate water rights are held by EFR for planned mining and mineral processing operations but need to be updated with the Wyoming State Engineer with respect to type of industrial use, points of diversion, and points of use.

All planned mining, mineral processing, and related activities are located within the existing Mine Permit 381C. These lands are adequate for all planned mining operations including the disposal of mine wastes, but not heap leaching. The heap leach facility, including a triple lined pad, has adequate capacity to process 53% of the Mineral Resource with the remaining capacity planned to be permitted in the first two years of project development. The mineral processing waste or tailings will be decommissioned and reclaimed in place. EFR owns the land surface where the heap leach and ultimate disposal tailings will occur. As for the operational phases of the project, the mineral processing facility has been designed to accommodate the volume of waste and/or tailings generated by the operation over the planned mine life.

Personnel requirements for the planned operation are addressed in Section 21 of this report. The majority of the personnel can be recruited locally with some skilled and staff positions recruited regionally.

## 5.5 Personnel

At full production, the Project will require approximately 176 employees. Roughly, 56 employees will be required for operation of the open pit, heap leach, and mineral processing plant with the remainder required for the underground mine. Personnel for the open pit mine operation can be readily recruited locally as can the majority of the personnel needed for the heap leach and mineral processing plant. Some skilled positions and staff positions will need to be recruited regionally. Recruitment of underground mine personnel may pose a greater challenge. As a result, cost allowances for recruiting and training of underground miners were included in the cost estimate.

# 6.0 HISTORY

## 6.1 Introduction

Uranium was first discovered in the Crooks Gap district, which includes the Sheep Mountain area, in 1953 (Bendix, 1982). While the original discoveries were aided by aerial and ground radiometric surveys exploration activities were primarily related to drilling and exploratory trenching.

## 6.2 Ownership History

Three companies dominated the district by the mid-1950s: Western Nuclear Corporation (WNC), Phelps Dodge (PD) and Continental Uranium Corporation (CUC). WNC built the Split Rock Mill at Jeffrey City in 1957 and initiated production from the Paydirt pit in 1961, Golden Goose 1 in 1966 and Golden Goose 2 in 1970. PD was the principal shareholder and operator of the Green Mountain Uranium Corporation's Ravine Mine, which began production in 1956. CUC developed the Seismic Pit in 1956, the Seismic Mine in 1957, the Reserve Mine in 1961 and the Congo Decline in 1968. In 1967, CUC acquired the PD properties and in 1972, WNC acquired all of CUC's Crooks Gap holdings. During the mid-1970s, PD acquired an interest in WNC, which began work on Sheep Mountain I in 1974, the McIntosh Pit in 1975, and Sheep Mountain II in 1976. WNC ceased production from the area in 1982.

Subsequent to closure of the Sheep Mountain I by WNC, during April to September 1987, Pathfinder Mines Corp. (PMC) mined a reported 12,959 tons, containing 39,898 pounds of uranium at an average grade of 0.154% $U_3O_8$ from Sheep Mountain I, (PMC, 1987). U.S. Energy-Crested Corp. (USECC) acquired the properties from WNC in 1988 and during May to October 1988 USECC mined 23,000 tons from Sheep Mountain I, recovering 100,000 lbs. of uranium for a mill head grade of 0.216% $U_3O_8$ (WGM, 1999). The material was treated at PMC's Shirley Basin mill, 130 miles east of the mine.

In December 2004, Uranium Power Corp. (UPC), then known as Bell Coast Capital, entered into a Purchase and Sales Agreement with USECC to acquire a 50% interest in the Sheep Mountain property. The acquisition was completed in late 2007 with aggregate payments to USECC of $7.05 million and the issuance of four million common shares to USECC. USECC sold all of its uranium assets, including its 50% interest in Sheep Mountain, to Uranium One Inc. (U1) in April 2007. Titan Uranium Inc. acquired a 50% interest in the property when it acquired Uranium Power Corp (UPC) by a Plan of Arrangement in July 2009. The ownership was subsequently transferred to Titan Uranium Inc.'s wholly owned subsidiary, Titan Uranium USA (referred herein to as Titan). The remaining 50% interest was purchased from U1 on October 1, 2009. Subsequently Energy Fuels Inc. and Titan Uranium Inc. announced that a Certificate of Arrangement giving effect to the Plan of Arrangement between Energy Fuels was issued on February 29, 2012, making, Titan a wholly owned subsidiary of Energy Fuels which is now named Energy Fuels Wyoming Inc.

## 6.3 Historical Resource Estimates

Historical Mineral Resource and Reserves can be found publicly in previous technical reports completed to Canadian NI 43-101 standards, including:

- "Technical Report on the Sheep Mountain Uranium Project, Wyoming, Prepared for the Uranium Power Corp., NI 43-101 Report", Scott Wilson Roscoe Postle Associates, Inc., October 10, 2006.
- "Sheep Mountain Mines, Fremont County WY, USA, Pre-Feasibility Study, Prepared for Titan Uranium USA", BRS Engineering, April 8, 2010
- "Sheep Mountain Uranium Project, Fremont County, Wyoming USA, 43-101 Mineral Reserve and Resource Report, Prepared for Titan Uranium USA", BRS Engineering, March 20, 2012

Historical mineral Resource/Reserve estimates were prepared in accordance with Canada's NI 43-101 standards which were in effect at the time the report was issued and do not necessarily meet current standards. The reader should not rely on the historical Mineral Resource or Mineral Reserve estimates as they are superseded by the Mineral Resource estimate presented in Section 14.0 (Mineral Resource Estimates) and Section 15.0 (Mineral Reserve Estimate) of this report.

## 6.4 Historical Production

Historic reports by Pathfinder Mines, Western Nuclear, and others show that properties within the current Sheep Mountain project boundary were operated as underground and open pit mines at various times in the 1970s and 1980s. There were 5,063,813 tons of material mined and milled, yielding 17,385,116 pounds of uranium at an average grade of 0.17% $U_3O_8$. Mining was suspended in 1988.

# 7.0 GEOLOGICAL SETTING AND MINERALIZATION

## 7.1 Regional Geology

The host of uranium mineralization for the Sheep Mountain Project (the Project) is the Eocene Battle Spring Formation. Prior to deposition of the Battle Spring Formation and subsequent younger Tertiary formations, including the White River and Split Rock Formations, underlying Paleocene, Cretaceous, and older formations were deformed during the Laramide Orogeny. During the Laramide Orogeny, faults, including the Emigrant Thrust Fault at the northern end of the project area, were active and displaced sediments by over 20,000 feet (Rackely, 1975). Coincident with this mountain building event Paleocene and older formations were folded in a series of en echelon anticlines and synclines, generally trending from southeast to northwest.

The Battle Spring Formation was deposited unconformably on an erosional landscape influenced by these pre-depositional features. Initial stream channels transporting clastic sediments from the Granite Mountains formed in the synclinal valleys. With continued erosion of the Granite Mountains and deposition of sediments into the surrounding basins, the pre-tertiary surface was buried successively by the Battle Spring, White River, and Split Rock formations. The formations once blanketed the entire area. Subsequently, the Granite Mountains collapsed forming a series of normal faults including the Kirk Normal Fault at the northern end of the project.

The nature of the folding and faulting in the Battle Spring suggests that it was either contemporaneous with deposition of the sediments or occurred shortly after deposition. Post-Miocene erosion has exhumed portions of the Granite Mountains regionally and has exposed the Battle Spring Formation at the project.

The geologic setting of the project is important in that it controlled uranium mineralization by focusing the movement of the groundwater, which emplaced the uranium into the stream channels, which had developed on the pre-tertiary landscape. In a similar manner, the geologic setting influences the present groundwater system. Groundwater flow is from the north-northeast to the south-southwest. Groundwater flow in the Battle Spring at the site is isolated in the subsurface from the local surface drainages, Crooks Creek to the west, and Sheep Creek to the east. In addition, the recharge area for the groundwater system is limited, which will in turn limit dewatering requirements.

## 7.2 Local and Property Geology

Surface geology within the Project area includes Quaternary alluvium and colluvium, the Tertiary Crooks Gap Conglomerate, Battle Spring Formation, and Fort Union Formations and the Cretaceous Cody Shale. Descriptions of each of the units are below and are taken from the Geologic Map of the Bairoil 30'x60' Quadrangle, Carbon, Sweetwater, Fremont, and Natrona Counties, Wyoming (Jones, et al, 2001). Figure 7.1 shows local stratigraphy. Local geology is shown in plan on Figure 7.2 and in cross-section of Figure 7.3.

### 7.2.1 Quaternary Alluvium and Colluvium

Gravel, sand, silt, clay, weathered bedrock, and soil, deposited along recent and older flood plains; includes slop wash, weathered bedrock, and smaller alluvial fan deposits that coalesce with alluvium

### 7.2.2 Crooks Gap Conglomerate

Very large, subrounded granitic boulders, up to 40 feet across in a pink and gray siltstone and arkosic sandstone matric; abundant iron oxide-stained rinds on most boulders; occurs largely as remnants of fan deposits shed by the Granite Mountains. Thickness up to 1,500 feet. Historically the Crooks Gap Conglomerate is referred to as Member B of the Battle Spring Formation

| System | Series | Formation | Thickness (feet) | Lithology |
|---|---|---|---|---|
| Neogene | Miocene | Split Rock | 900 - 1,000 | Grayish-pink fine- to medium-grained sandstone; rounded grains; poorly consolidated, tuffaceous; contains thin lenses of arkose near the base; weathers to subdued hills generally capped by pediment gravel. |
| Paleogene | Oligocene | White River | 850-950 | Grayish-pink friable clayey tuffaceous siltstone; weathers to blocky fragments; generally concealed by gravel. |
| Paleogene | Lower Eocene | Battle Spring (incl. Crooks Gap Conglomerate) | 2,700-4,700 | Interbedded arkosic sandstone, granite-boulder conglomerate, and lenticular carbonaceouse siltstone; generally very light gray having brown and red iron staining; consists of an upper unfolded unit (member B - Also known as the Crooks Gap Conglomerate) and a lower folded unit (member A); known uranium deposits at Crooks Gap occur in member A. |
| Paleogene | Paleocene | Fort Union | 0-960 | Predominantly silty mudstone; interbedded with thin units of carbonaceous shale, impure coal beds, and thin drab sandstone lenses; thin lenses of dark chert-pebble conglomerate near the base; weathers to gentle slope. |
| Cretaceous | Upper Cretaceous | Cody Shale | 5,000-5,500 | Sandy shale and thin-bedded buff sandstone in upper half; gray to light-gray and tan shale and sandy shale in lower half; calcareous in part; nonresistant at Crooks Gap except for a few thin cross-laminated beds of sandstone that make small ledges; generally covered by alluvium or colluvial gravel. |
| Cretaceous | Upper Cretaceous | Frontier | 775-825 | Sandstone and shale; sandstone is gray, fine to medium grained fossiliferous; contains abundant dark grains; shaleis dark gray to black, sandy to silty; formation generally concealed by slope wash |
| Cretaceous | Lower Cretaceous | Mowry Shale | 450-525 | Black to dark-gray siliceous shale; weather light gray; contains fish scales; siltstone and bentonitic shale in upper part and bentonite beds in lower part. |
| Cretaceous | Lower Cretaceous | Thermopolis Shale | 125-135 | Black soft flaky shale; some fine-grained rust sandstone, gray siltstone, and light-gray bentonitic beds. Muddy sandstone members (20 to 40 ft. thick) in upper half is light gray, fine grained; shaly in part, weathers rusty. Formation very poorly exposed or covered by slope wash in Crooks Gap area. |
| Cretaceous / Jurassic | Lower Cretaceous / Upper Jurassic | Clovery and Morrison Formations, undifferen-iated | 350-425 | Cloverly Formation (Lower Cretaceous) sandstone and shale; sandstone is light gray, fine to coarse grained, sparkly; weathers rusty and contains some dark shale interbeds; sandstone underlain by conglomerate which is gray, weathers brown, contains black chert pebbles, is cross-laminated, and grades laterally into sandstone; sandstone and conglomerate form a prominent hogback around Sheep Creek anticline. Morrison Formation (Upper Jurassic) is verigated claystone having few sandstone ledges, usually poorly exposed. Lower contact is placed at base of 15-ft. massive clean white sandstone which forms low ridges. |
| Jurassic | Upper Jurassic | Sundance | 175-350 | Upper Sundance is interbedded sandstone, shale, and limestone. Sandstone is green, highly glauconitic, shaly in part; contains numerous Belemnites in lower part; limestone is brown, glauconitic, shaly in part; includes coquinite of large pelecypods. Lower Sundance is sandstone and shale; sandstone is buff to light gray, near top includes two thin red shaly zones; shale is pale green, sandy in part, calcareous in part. |

modified from Stehpens, 1964

**Figure 7-1. Stratigraphy of the Crooks Gap Area (modified from Stephens, 1964)**

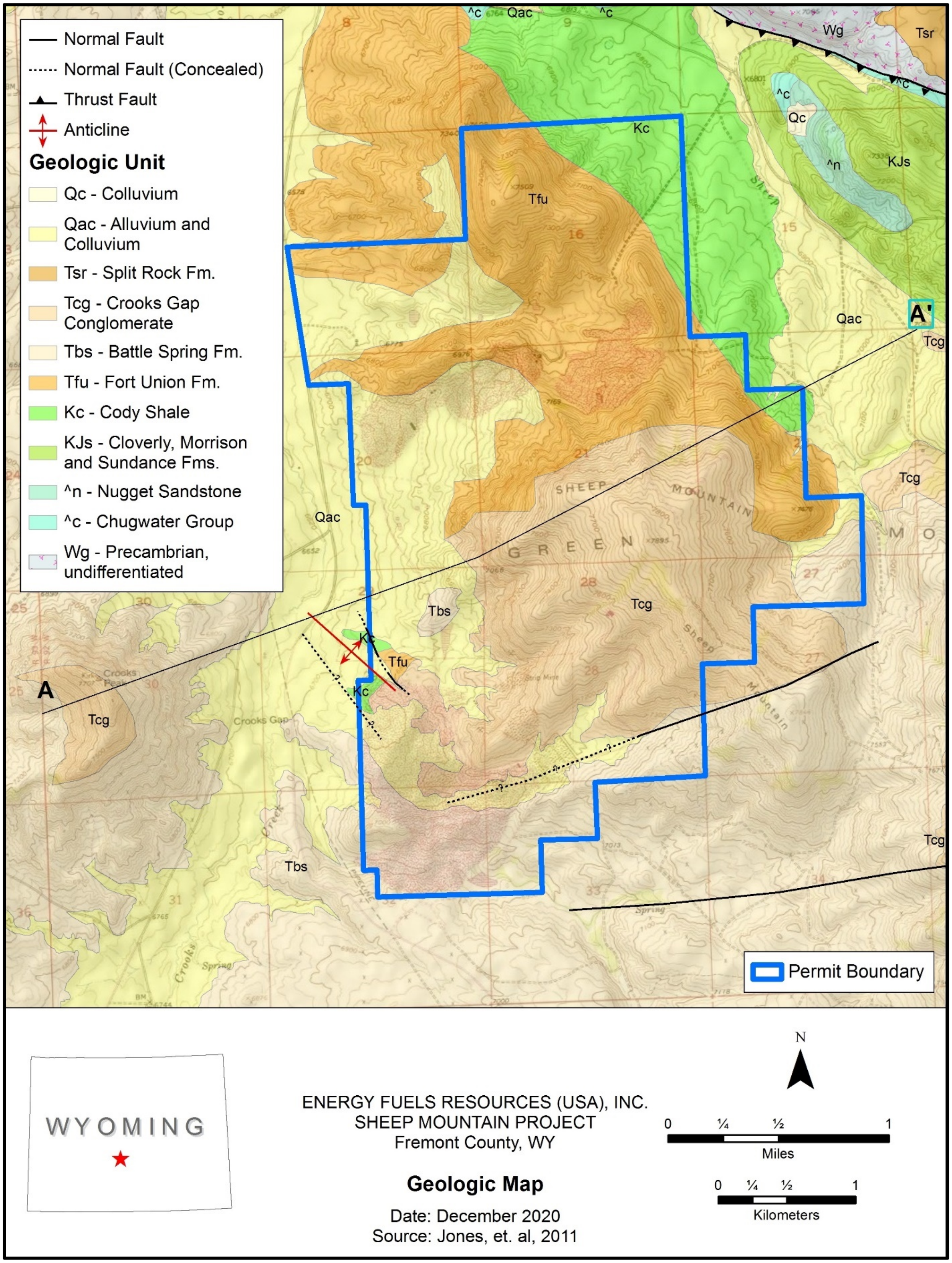



**Figure 7-2. Geologic Map of the Sheep Mountain Area**

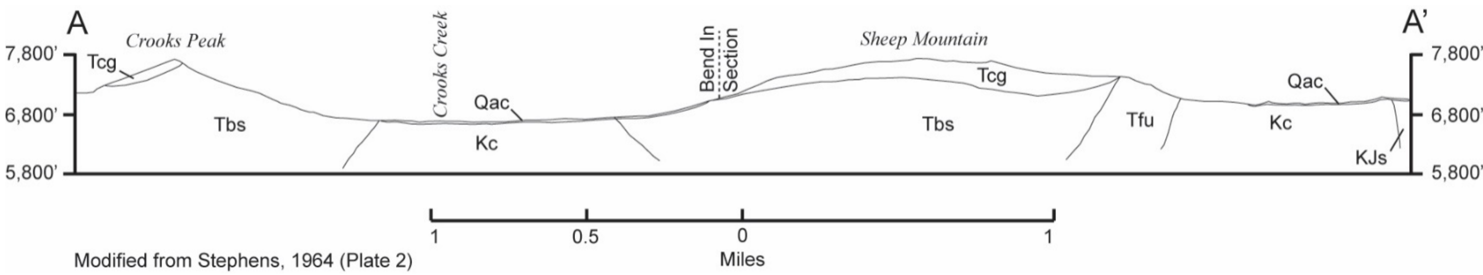



**Figure 7-3. Geologic Cross-Section (See Figure 7-2 for Location)**

### 7.2.3 Tertiary Battle Spring Formation

Light-gray, brown, yellowish-tan, medium-grained to very coarse grained, pebbly arkosic sandstone and conglomerate, with local greenish-gray, sandy mudstone; brownish, carbonaceous mudstone and claystone; yellowish-gray conglomerate interbedded with very coarse conglomerate' poorly indurated, with local well-indurated lenses and paleo-channels, cemented with calcite cement' scattered cobbles and boulders over one foot in diameter with some boulders up to several feet across which may be remnants of Crooks Gap Conglomerate; numerous iron-rich irregular and spheroidal concretions. Thickness varies considerably but generally increases basinward from approximately 1,000 to 3,500 feet. At the Project, the Battle Spring Formation is subdivided into an upper (Member B – Crooks Gap Conglomerate) and lower (Member A) unit.

### 7.2.4 Tertiary Fort Union Formation

Complexly interbedded, commonly lenticular or discontinuous sequence of beds; sandstone, light-brown to gray, argillaceous, very fine to medium-grained, commonly contains ferruginous concretions; siltstone, light-brown to orange, commonly ferruginous and argillaceous; shale, light- to dark-gray, locally maroon, locally contains numerous vertebrate and common invertebrate fossils, and plant fossils; coal beds are generally thin and discontinuous with lenticular thickenings to as much as 9 feet. Thickness approximately 1,500 feet.

### 7.2.5 Cretaceous Cody Shale

Marine shale, soft, gray to olive-gray, numerous bentonitic shales and siltstones, partly sandy, with limestone concretions; sandstone, very fine to fine-grained, gray to orangish-gray, glauconitic, thin-bedded, with trace fossils; lower part of Cody Formation is equivalent to the Niobara Formation (not present); shale gray to dark-gray, laminated, and calcareous; fossil-rich chalk beds near top, light-tan to buff, and laminated. Formation thickness ranges from 4,000-6,000 feet.

### 7.2.6 Structural Geology

Within the Project area, only limited faulting has been observed within the Battle Spring Formation, and where present, displacement is minor. The largest reported displacement from the historic mining is four feet. The Battle Spring is folded with a series of southeast plunging anticline/syncline features. Folding is reported to be more extensive in the lower Battle Spring or A Member than in the upper or B Member.

## 7.3 Hydrogeology

Groundwater within the Mine Permit boundary exists within the synclinal fold of the Battle Spring Formation and Fort Union Formation and is bounded by the Cody Shale, which acts as a local aquiclude to vertical groundwater migration. Groundwater in the uppermost aquifer, hosted predominantly by the Battle Spring Formation, has been well characterized over more than 20 years spanning active mining, a long post-mining period and current annual monitoring.

The Crooks Gap area regional hydrology, as determined by the Platte River Basin Water Plan, includes two separate formations or groups of formations that qualify as potentially productive for groundwater. The Quaternary aquifer system has both an alluvial and non-alluvial division. This is considered to be a discontinuous but major aquifer in the State of Wyoming. It is undetermined at this time whether this surface aquifer exists in the project area.

The second aquifer in the Crooks Gap area is the Tertiary Aquifer System. The System in the Crooks Gap region is comprised of the Fort Union and Battle Spring Formations. The Platte River Basin Water Plan describes the aquifer as comprised of complex inter-tonguing fluvial and lacustrine sediments. This is also classified as a major aquifer for the State of Wyoming.

Mining will occur in the Battle Spring Formation. Historic data indicates that sustained dewatering of the Sheep Underground mines required approximately 200 gpm, but that the cone of depression is limited in area and will not impact surface water sources in the area. In addition, dewatering of the Congo Open pit requires an estimated 150 gpm beginning in year seven and extending to the end of mining. Thus, approximately 350 gpm of water will be produced by the mines.

Despite a history of both open pit and underground mining on the project, no formal hydrologic study nor model was completed and utilized for the underground or surface mine design in this report. Mine design work is based on past water inflows, which were handled with pumping systems during past mining operations.

Future work is recommended to complete a detailed geotechnical study of both underground and surface mining.

## 7.4 Geotechnical

Despite a history of both open pit and underground mining on the project, no formal geotechnical on open pit slope stability nor underground drift and stope ground support was completed. Mine design work is based on past slope angles and stope dimensions which proved feasible during mine operations.

Future work is recommended to complete a detailed geotechnical study of both underground and surface mining.

# 8.0 DEPOSIT TYPES

## 8.1 Mineralization and Deposit Types

The host of uranium mineralization for the Project is the Battle Spring Formation. Most of the mineralization in the Crooks Gap district occurs in roll-front deposits (Bendix, 1982). Roll fronts have an erratic linear distribution but are usually concordant with the bedding. Deposits have been discovered from the surface down to a depth of 1,500 feet (Stephens, 1964). The two major uranium minerals are uranophane and autunite. Exploration drilling indicates that the deeper roll-type deposits are concentrated in synclinal troughs in the lower Battle Spring Formation. Three possible sources for uranium have been suggested: post-Eocene tuffaceous sediments, leached Battle Spring arkoses, and Precambrian granites (Granite Mountains).

Structural controls of uranium occurrences along roll fronts include carbonaceous siltstone beds that provide a local reducing environment for precipitation of uranium-bearing minerals, and abrupt changes in permeability along faults, where impermeable gouge is in contact with permeable sandstones (Stephens, 1964). Uranium has also been localized along the edges of stream channels and at contacts with carbonaceous shales (Bendix, 1982).

Further documentation of the type of mineralization can be found in the literature as with this historic photo (Figure 8.1) of a uranium roll front in the Golden Goose Mine (Bailey, 1969).

**Figure 8-1 Uranium Roll Front in Golden Goose Mine**

The following photo (Figure 8-2) shows alteration in the rib of the Little Sheep decline with remnant uranium mineralization concentrated around a clast of carbonaceous clay near the center of the photo. This exposure is typical of the geochemical alteration that occurs within the altered zone in advance of roll fronts.

**Figure 8-2  Little Sheep Decline**

# 9.0 EXPLORATION

To the author's knowledge, no relevant exploration work, other than drilling, as described in Section 10: Drilling, of this report has been conducted on the property in recent years. The Project is located within a brownfield site which has experienced past mine production and extensive exploration and development drilling. The initial discovery was based on aerial and ground radiometric surveys in the 1953 (Stephens, 1964), but since that time exploratory work on the site has been primarily drilling.

During the National Uranium Resource Evaluation ("NURE") program conducted by the U.S. Department of Energy ("DOE") in the late 1970s and early 1980s, the project area and vicinity were evaluated. This evaluation included aerial gamma, magnetic, and gravimetric surveys; soil and surface water geochemical surveys and sampling; and geologic studies and classification of environments favorable for uranium mineralization (Bendix, 1982). No specific data analysis of the aerial surveys was completed and the report, however, it is stated in the report that anomalous radioactivity was observed related to the Battle Spring Formation at the Crooks Gap mining district (Bendix, 1982), herein referred to as Sheep Mountain.

Since Energy Fuels Resources (USA) Inc. acquired the Sheep Mountain Project in 2012, no exploration work has been conducted. All drilling is considered historical in nature and is summarized in Section 10.0 of this report

# 10.0 DRILLING

## 10.1 Drilling

All drilling and drill data associated with the Project is considered historical in nature, as it was completed prior to EFR acquiring the Project in February 2012. The extent of drilling is shown for both the Congo Pit and Sheep underground areas in Figure 10.1.

### 10.1.1 Pre-1988 Drilling

Drilling in the mineral resource areas investigated as part of this report includes approximately 4,000 drill holes, most of which were open-hole rotary drilling, reliant upon down-hole geophysical logging to determine uranium grade. Some core drilling for chemical analyses was also completed; however, no physical samples are available for inspection or sampling. Pre-1988 drill maps show drill hole locations at the surface and downhole drift, the thickness and radiometric grade of uranium measured in weight percent $eU_3O_8$, elevation to the bottom of mineralized intercept, collar elevation, and elevation of the bottom of the hole. Also available are half foot and composite intercept data in paper printouts from Western Nuclear's 1979 and 1980 preliminary feasibility study and geostatistical resource modeling.

### 10.1.2 Titan Drill Program

In 2005, a drilling program consisting of 19 drill holes totaling 12,072 feet was completed. Coring was attempted in one hole, but recoveries were poor. Two of the 19 holes were located in Section 28 with the purpose of confirming mineralization within the Sheep Underground mine area. The remaining seventeen drill holes were completed in the planned Congo Pit area to test both shallow mineralization within the Congo Pit and to explore a deeper mineralized horizon, the 58 sand, which was shown in two historic drill holes. (RPA, 2006). Consultants Roscoe Postle Associates Inc. (RPA) were present during the 2005 drilling program and concluded in their report of October 10, 2005, that drilling has confirmed the presence of mineralization with the shallow horizons in the Congo Pit area and has identified and extended roll front mineralization in the 58 sands along strike. Further, RPA concluded that drilling in the Sheep Mountain area (referred to herein as the Sheep underground) has validated the presence of mineralization at depth.

In consideration of both the recommendations included in RPA's 2006 report and identified data needs for the continued development of the project, five holes were drilled in the Congo Pit in 2009 for a total of 1,700 feet. The five drill holes were planned and completed to serve multiple purposes including:

- Additional verification of mineralization in the Congo Pit area.
- Determination of radiometric equilibrium conditions utilizing a direct comparison of the Uranium Spectrum Analysis Tool (USAT) and conventional gamma logging.
- Collection of bulk samples of mineralized material for metallurgical testing; and
- Collection of bulk samples for characterization of overburden materials as required by WDEQ regulations.

The goals of the 2009 drilling program were met. The drill holes were completed by rotary air drilling to depths exceeding 300 feet using a top drive rotary drilling rig. Drill cuttings were collected continuously during the drilling process, in two-foot increments near anticipated mineralized horizons and in five-foot increments for overburden sampling. Over 500 pounds of mineralized material for metallurgical testing was collected in addition to the collection of representative samples for overburden analysis and characterization in accordance with WDEQ guidelines. In situ mineral grades for 2009 drilling were determined by geophysical logging including both conventional radiometric logging and the state-of-the-art USAT (BRS, 2010). Each drill hole was first logged using a conventional logging tool that provided a suite of gamma ray, Spontaneous Potential (SP), resistivity, and deviation. The best-mineralized zones were chosen for USAT logging. Both geophysical logging tools were provided commercially by Century Wireline Services (Century).

The 2010 and 2011 drilling programs were primarily designed to delineate the Congo Pit. The drilling was exclusively vertical rotary in 2010, while in 2011 the drilling included vertical rotary and reverse circulation. The drill holes generally ranged from 200 to slightly over 400 feet in depth, although some were designed to test deeper horizons at slightly greater than 600 feet. Geophysical logging was completed for all drill holes and was provided commercially by Century who delivered both hard copy geophysical logs and electronic files including LAS files. Estimations of equivalent uranium grades in weight percent were reported in half-foot intervals.

In 2010, an additional 62 exploratory drill holes and five monitor wells were completed in the Congo Pit Area with the intention of defining the pit limits. All of these drill holes encountered mineralization extending the pit limits, however, drilling extended mineralization and did not completely define the pit limits. Of the 62 drill holes completed in 2010 within the Congo Pit Area:

- 1 hole was lost
- 7 holes were barren
- 54 holes exceeded a 0.1 GT at a minimum grade of 0.03% $eU_3O_8$ including:
    - 51 exceeding a 0.25 GT
    - 37 exceeding a 0.50 GT
    - 25 exceeding a 1.0 GT

In 2011, an additional 73 exploratory drill holes and five monitor wells were completed in the Congo Pit Area to define the pit limits and confirm mineralization and the absence of underground mining in select areas. These objectives were met, and the pit limits and Mineral Reserves were expanded as detailed in this report. No additional holes have been drilled on the property since August 11, 2011.

Of the 73 drill holes completed in 2011 within the Congo Pit Area:

- 17 holes were barren
- 56 holes exceeded a 0.1 GT at a minimum grade of 0.03% $eU_3O_8$ including:
    - 35 exceeding a 0.25 GT
    - 20 exceeding a 0.50 GT9
    - 1 exceeding a 1.0 GT

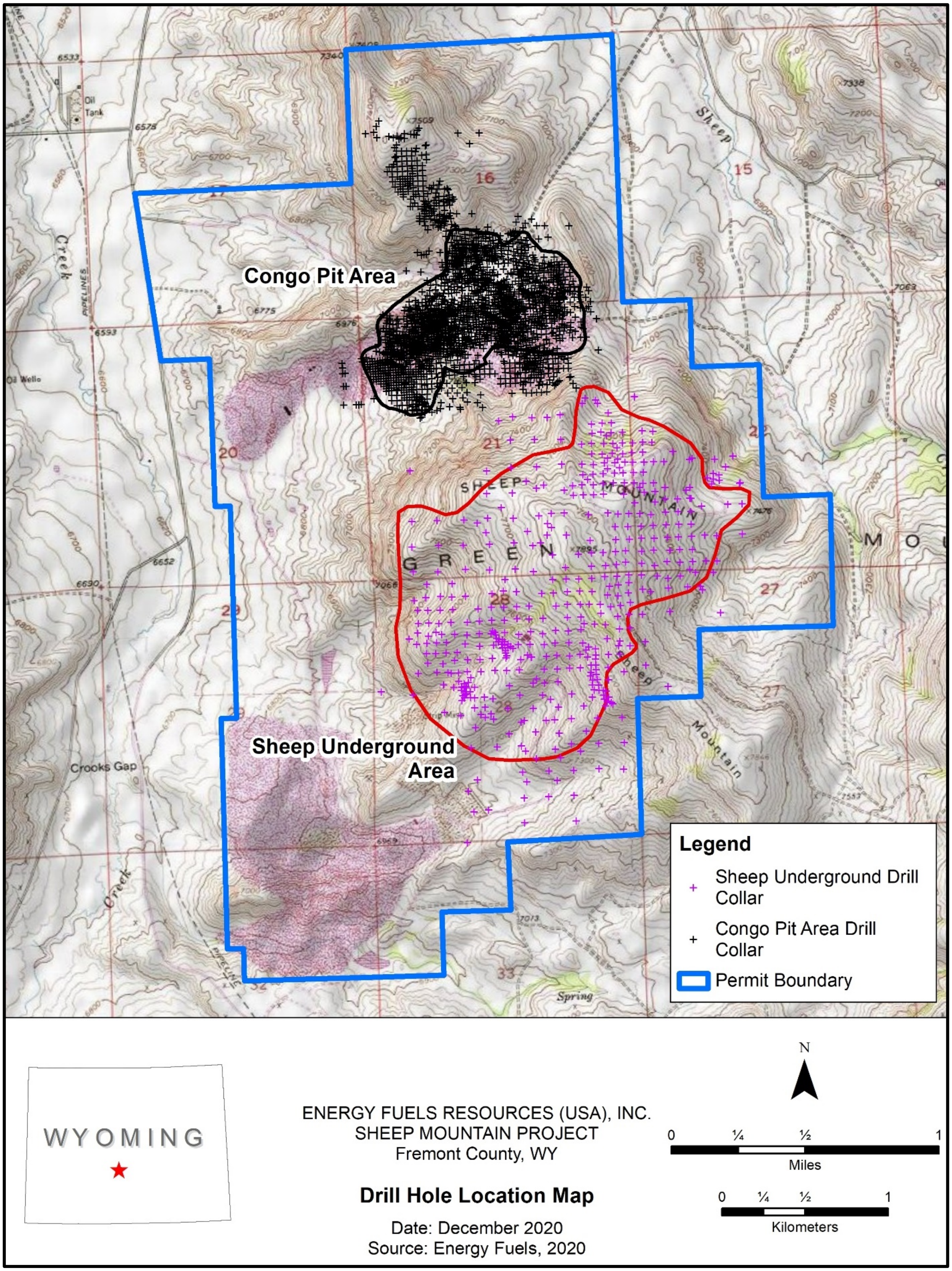



**Figure 10-1. Drill Hole Location Map**

# 11.0 SAMPLE PREPARATION, ANALYSIS, AND SECURITY

## 11.1 Introduction

Most of the sample data available for the evaluation of resources for the Sheep Mountain Project (the Project) is radiometric geophysical log data. Radiometric geophysical logs are completed following the drilling of a hole and provide a reading of equivalent $U_3O_8$ in percent (%e$U_3O_8$) at depth down hole. The practice of collecting geophysical logs as opposed to drill cuttings or core is common for uranium deposits in the United States.

## 11.2 Gamma Logging

The radiometric or gamma probe measures gamma radiation which is emitted during the natural radioactive decay of uranium (U) and variations in the natural radioactivity originating from changes in concentrations of the trace element thorium (Th) as well as changes in concentration of the major rock forming element potassium (K).

Potassium decays into two stable isotopes (argon and calcium) which are no longer radioactive and emits gamma rays with energies of 1.46 mega electron-volts (MeV). Uranium and thorium, however, decay into daughter products which are unstable (i.e., radioactive). The decay of uranium forms a series of about a dozen radioactive elements in nature that finally decay to a stable isotope of lead. The decay of thorium forms a similar series of radioelements. As each radioelement in the series decays, it is accompanied by emissions of alpha or beta particles, or gamma rays. The gamma rays have specific energies associated with the decaying radionuclide. The most prominent of the gamma rays in the uranium series originate from decay of 214Bi (bismuth 214), and in the thorium series from decay of 208Tl (thallium 208).

The natural gamma measurement is made when a detector emits a pulse of light when struck by a gamma ray. This pulse of light is amplified by a photomultiplier tube, which outputs a current pulse that is accumulated and reported as counts per second (cps). The gamma probe is lowered to the bottom of a drillhole, and data are recorded as the tool travels to the bottom and then is pulled back up to the surface. The current pulse is carried up a conductive cable and processed by a logging system computer that stores the raw gamma cps data.

The basis of the indirect uranium grade calculation (referred to as "e$U_3O_8$" for "equivalent $U_3O_8$") is the sensitivity of the detector used in the probe, which is the ratio of cps to known uranium grade and is referred to as the probe calibration factor. Each detector's sensitivity is measured when it is first manufactured and is also periodically checked throughout the operating life of each probe against a known set of standard "test pits," with various known grades of uranium mineralization or through empirical calculations. Application of the calibration factor, along with other probe correction factors, allows for immediate grade estimation in the field as each drillhole is logged.

Downhole total gamma data are subjected to a complex set of mathematical equations, taking into account the specific parameters of the probe used, speed of logging, size of bore hole, drilling fluids, and presence or absence of any type of drillhole casing. The result is an indirect measurement of uranium content within the sphere of measurement of the gamma detector.

The conversion coefficients for conversion of probe counts per second to %eU3O8 equivalent uranium grades are based on the calibration results obtained at the United States Department of Energy Uranium Calibration Pits.

Most of the sample data available for the evaluation of resources for the Sheep Mountain Project is radiometric geophysical log data. EFR possesses the complete hard copy data set which was passed through the chain of property title from WNC; through USECC; through the joint venture between UPC and U1; to Titan through its acquisition of UPC and acquisition of U1's share of the property; and ultimately to EFR, though its acquisition of Titan.

For the Congo Pit and Sheep Underground, the majority of the hard copy logs were reviewed both for data verification and for geologic interpretation. The majority of the Sheep Underground logs were also available as scanned images and were reviewed for both data verification and for geologic interpretation. In addition, the data includes an extensive collection of detailed mine and drill maps, both surface and underground. The underground maps show the extent of mining by date and include rib and longhole data. All pertinent maps with respect to mine design, extent of mining, drill maps, and mapping related to the mine permit have been scanned and rectified digitally.

Mineral Resource and Reserve estimates for the Sheep Mountain Project are based on radiometric data.

### 11.2.1 Disequilibrium

Disequilibrium in uranium deposits is the difference between equivalent ($eU_3O_8$) grades and assayed $U_3O_8$ grades. Disequilibrium can be either positive, where the assayed grade is greater than the equivalent grades, or negative, where the assayed grade is less than the equivalent grade. A uranium deposit is in equilibrium when the daughter products of uranium decay accurately represent the uranium present. Equilibrium occurs after the uranium is deposited and has not been added to or removed by fluids after approximately one million years. Disequilibrium is determined during drilling when a piece of core is taken and measured by two different methods, a counting method (closed-can) and chemical assay. If a positive or negative disequilibrium is determined, a disequilibrium factor can be applied to $eU_3O_8$ grades to account for this issue.

Chemical assays for verification of radiometric equilibrium are discussed in Section 12, Radiometric Equilibrium. As discussed in this report, available data indicates that variations in radiometric equilibrium are local in their effect which impacts the mining grade control program but does not appreciably affect the overall Mineral Resources or Reserves.

## 11.3 Core Sampling

Confirmatory drilling in accordance with Canadian NI 43-101 standards began in 2005. As part of this drilling program, drill core was collected for assay confirmation and overburden and metallurgical testing. A review by an EFR Consultant of the geologic and geophysical log data concluded that the data was collected in accordance with current industry practice and to be reliable. This data confirms historical drilling results and is current and applicable to this Preliminary Feasibility Study.

### 11.3.1 Sample Preparation

With respect to the 2009 drilling program, drill samples were collected for overburden testing per WDEQ regulations and for metallurgical testing. Drill samples for overburden testing were split with a standard rifling splitter with half of the sample sent to Energy Laboratories Inc. of Casper, Wyoming, an independent certified commercial analytical laboratory, for testing in accordance with WDEQ guidelines and the remainder was sealed in plastic bags and is currently stored in an on-site warehouse facility. Drill samples for metallurgical testing were stored and sealed in new 5-gallon plastic buckets. Samples within the mineralized zones as determined by radiometric and USAT logging were delivered to Lyntek's facility in Denver, Colorado for further assay and testing by BRS personnel. A chain of custody was established. Representative sample splits were prepared for chemical assay and were delivered to Energy Laboratories Inc. of Casper, Wyoming, an independent certified commercial analytical laboratory, for assay utilizing standard protocol and adhering to a chain of custody.

### 11.3.2 Assaying and Analytical Procedure

Assays from the 2009 drilling program were used in the selection of samples for metallurgical testing. In addition to the samples from the Congo Pit drilling, mineralized stockpiles from mine material at the Sheep I shaft was sampled, assayed, and utilized for metallurgical testing. Seven samples of the Sheep I stockpile were collected ranging in grade from 0.022% to 0.067% $U_3O_8$ and averaging 0.045% $U_3O_8$. Bottle roll leach tests have been completed for composite samples selected to represent mineralization at both the Congo Pit and Sheep Underground. The remaining samples, with the exception of reserves sample splits, were utilized in the column leach testing for heap leach amenability. Assays of blind duplicates of select samples and check assays, at Hazen Research, a separate and independent commercial laboratory were completed. The results of the assays compared favorably. The assay data was generally not used to verify the radiometric data as this had already been done using the USAT data. A general comparison of assay data to USAT data was completed and the results were comparable. Radiometric equilibrium determinations and verification of assay data is discussed in Section 12.

No samples were collected during the 2010 drilling program. Drill cuttings were logged in the field. All holes were logged by a commercial geophysical logging company. Geophysical log data was provided in both hard copy and electronic format with the down-hole count data converted to ½ foot equivalent % $U_3O_8$ grades. The author was present during the 2010 drilling program.

In 2011 both rotary and reverse circulation drilling was completed. Bulk samples from the reverse circulation drilling have been retained in sealed containers stored at the site for further metallurgical testing but no chemical assays have been completed as of the effective date of this report.

The reader should note that it is common industry practice for the exploration and evaluation of uranium mineralization in the United States to rely upon downhole radiometric geophysical log data for the determination of the thickness and grade of mineralization. The sampling and assay methods described herein were for the purposes of developing bulk composite samples for metallurgical testing and environmental testing.

Downhole radiometric geophysical log data was converted to equivalent uranium assays in half-foot increments for geophysical logs with digital data. Geophysical logs with only analog data were interpreted using standard methods set out originally by the Atomic Energy Commission ("AEC"). The primary method employed for this project is referred to as the half amplitude method. In the case of the half amplitude method the sample thickness is determined by the log signature and while interpreted to the nearest half foot the thickness of the sample varies.

### 11.3.3 Density Analyses

A unit weight of 16 cubic feet per ton or 2.439 tonnes/m3 was assumed for all Mineral Resource and Reserve calculations. This assumption was based on data from feasibility studies prepared by previous operators on the mining and production history of the mines within the Sheep Mountain Project but was not independently confirmed. Some previous estimates used a density of 15 cubic feet per ton. The use of 16 cubic feet per ton is recommended the Authors as a conservative value.

In summary, the data utilized in this report is considered accurate and reliable for the purposes of this report.

## 11.4 Opinion of Author

In the opinion the Authors, the sample preparation, security and analytical procedures are reliable and adequate for the purposes of this report

# 12.0 DATA VERIFICATION

## 12.1 Congo

Historic drill data for each drillhole consisting of radiometric data was posted on drill maps including collar elevation, elevation to the bottom of the mineralized intercept, thickness of mineralization, grade of mineralization, and elevation of the bottom of the hole. Half foot and composite intercept data in paper printouts were available from Western Nuclear's 1979 and 1980 Preliminary Feasibility Study geostatistical model. Data entry was checked and confirmed including a review of the original drill geophysical and lithologic logs. Drillhole locations were digitized from the drill maps to create a coordinate listing and then plotted. The resultant drill maps were then checked and confirmed by overlaying with the original maps.

Titan drilled 5 exploration holes for a total of 1,700 feet in 2009. The purpose of this program was to take samples for overburden classification and also to take bulk mineralized samples for heap leach testing. Overburden samples were gathered every five feet down hole until water was added for lifting cuttings. The depth where the holes either started making water or water was added was approximately 330 to 360 feet. Sampling stopped at that point in each hole if it was drilled deep enough to encounter that zone. Bulk samples were gathered every two feet through known mineralized zones. The drill locations were picked by "twinning" historic drill holes.

The following table provides a comparison of the 2009 drilling to adjacent or twinned historic drill holes.

**Table 12-1 Comparison of 2009 Drilling to Historic Drilling**

| Drill hole | Twinned hole | Offset Distance | Results |
|---|---|---|---|
| Congo 1 | S16-96 | 3' | Good correlation, marginally higher radiometric grades encountered |
| Congo 2 | S16-291 | 3' | Good correlation, slightly lower radiometric grades in some zones with higher in others |
| Congo 3 | GG1-36 | 24' | Radiometric zones correlated |
| Congo 3 | GG1-37 | 35' | Radiometric zones correlated |
| Congo 4 | S16-253 | 24' | Acceptable correlation, slightly lower radiometric grades in some zones with higher in others |
| Congo 5 | S16-146 | 21' | Good correlation, marginally higher radiometric grades encountered |

Drilling completed within the Congo Pit area in 2010 and 2011 helped to confirm and extend the mineralization as projected in the Congo Pit Area. The 2010 and 2011 drill data were compared to historic drilling by collating the geophysical logs and comparing the GT of the 2010 and 2011 drilling to historic drilling by individual sands.

## 12.2 Sheep Underground

Historic drill data for each drill hole consisting of radiometric data was posted on drill maps including collar elevation, elevation to the bottom of the mineralized intercept, thickness of mineralization, grade of mineralization, and elevation of the bottom of the hole. Data entry was checked and confirmed including a review of the original drill geophysical and lithologic logs. Drill hole locations were digitized from the drill maps to create a coordinate listing and then plotted. The resultant drill maps were then checked and confirmed by overlaying the original maps.

Once the database had been developed and data entry confirmed, each mineralized intercept within an individual drill hole was evaluated on a hole by hole basis and combined into the corresponding zone to represent a probable mining thickness appropriate for underground mining methods (minimum of six feet). This process eliminated some thin and/or isolated mineralized intercepts. The resultant data was then utilized to develop the Grade Thickness ("GT") map, GT and Thickness (T) Contours. The GT map was then compared to mine plans available from previous studies to verify the data and geologic interpretation.

A confirmatory drilling program in 2005 was completed consisting of 19 drill holes totaling 12,072 feet. Two of the 19 holes completed by UPC were located in Section 28 with the purpose of confirming mineralization within the Sheep underground mine area. Previous report concluded that the confirmatory drilling did verify historic drilling. The author reviewed the drilling and found that the data did reasonably correlate with respect to the geologic sand units and the general thickness and tenor of mineralization.

## 12.3 Radiometric Equilibrium

Radiometric equilibrium studies completed in 2006 evaluated data including some 223 samples for which there was gamma equivalent closed can analyses and chemical assays and concluded "Although the data exhibit high variability, there does not appear to be a significant bias and Scott Wilson RPA is of the opinion that the eU3O8 values are appropriate for use in the resource estimate," (RPA, 2006).

This data was reviewed by the Authors; however, the samples had not been preserved so no confirmatory analysis could be completed. At the consultant's recommendation, during the 2009 drilling program, USAT was employed to further examine radiometric equilibrium conditions (BRS, 2010). This technique was used since past drill programs had reported difficulty in sample recovery from coring and this method would ensure a direct comparison of gamma equivalent values and direct uranium measurements via the USAT from downhole logging.

Table 12-2 provides a direct comparison of the equivalent gamma and direct USAT measurement of in situ uranium values for the five drillholes completed in the Congo Pit in 2009. For the 2009 drilling program downhole logging of the drillholes was completed using standard gamma technology as well as a USAT, operated by Century Wireline Services of Tulsa OK. The USAT method measures the gamma intensity of $Pa^{234}$, the short lived ($t½$ = 6.7 hr.) second daughter product of $U^{238}$. $U^{238}$ reaches secular equilibrium with $Pa^{234}$ within approximately 4 months thus USAT gives a nearly direct measurement of uranium content and therefore allows determination of the equilibrium state of the uranium mineralization intersected in the hole. Note that the measurements reflected various mineralized zones vary in depth from 24.5 to 464 feet from the surface. The table displays the depth in feet of the top and bottom of the mineralized zone (from and to), the thickness of the mineralized zone ("THK") in feet, the grade of equivalent uranium in weight percent and GT determined by downhole gamma, and the grade of uranium in weight percent and GT determined by downhole USAT logging.

The disequilibrium factor (DEF) was calculated for each mineralized intercept and summarized for each drillhole. A DEF factor of 1 indicates that radiometric equilibrium exists. DEF factors less than 1 indicate a depletion of uranium with respect to gamma equivalent measurements and a DEF factor greater than 1 indicates an enrichment of uranium values with respect to gamma equivalent values. The DEF from 45 mineralized intercepts from the 2009 drilling ranged from a low factor of 0.73 to a high factor of 2.07 with an average value of 1.05. Although this data indicates the potential for radiometric enrichment, a conservative DEF of 1was used in the resource calculations.

**Table 12-2 Comparison of Radiometric Equilibrium based on Gamma and USAT Logging**

| Drill Hole | From | To | Thick | % $eU_3O_8$ (gamma) | GT Gamma | % $U_3O_8$ (USAT) | GT USAT | DEF |
|---|---|---|---|---|---|---|---|---|
| Congo 1 | 24.5 | 26.5 | 2 | 0.063 | 0.126 | 0.054 | 0.108 | 0.857 |
| | 58 | 60 | 2 | 0.05 | 0.1 | 0.061 | 0.122 | 1.220 |
| | 68 | 71 | 3 | 0.087 | 0.261 | 0.078 | 0.234 | 0.897 |
| | 71 | 77 | 6 | 0.031 | 0.186 | 4ft @ .096 | 0.384 | 2.065 |
| | 79.5 | 81 | 1.5 | 0.046 | 0.069 | 0.059 | 0.0885 | 1.283 |
| | 115 | 119 | 4 | 0.049 | 0.196 | Not run | N/A | N/A |
| sum/average | | | | | 0.742 | | 0.9365 | 1.262 |
| Congo 2 | 56.5 | 58.5 | 2 | 0.271 | 0.542 | 0.264 | 0.528 | 0.974 |
| | 74.5 | 76.5 | 2 | 0.183 | 0.366 | 4' @ .137 | 0.548 | 1.497 |
| | 95 | 98 | 3 | 0.06 | 0.18 | 0.048 | 0.144 | 0.800 |
| | 118.5 | 120.5 | 2 | 0.103 | 0.206 | Not run | N/A | N/A |
| | 213 | 216 | 3 | 0.09 | 0.27 | 0.066 | 0.198 | 0.733 |
| | 219.5 | 222.5 | 3 | 0.183 | 0.549 | 0.169 | 0.507 | 0.923 |
| | 236 | 239 | 3 | 0.114 | 0.342 | 0.111 | 0.333 | 0.974 |
| | 464 | 466.5 | 2.5 | 0.035 | 0.0875 | 0.035 | 0.0875 | 1.000 |
| sum/average | | | | | 2.3365 | | 2.3455 | 1.004 |
| Congo 3 | 52 | 65 | 13 | 0.073 | 0.949 | 0.071 | 0.923 | 0.973 |
| | 79 | 81 | 2 | 0.028 | 0.056 | Not run | N/A | N/A |
| | 90 | 94.5 | 4.5 | 0.097 | 0.4365 | 3' @ .115 | 0.345 | 0.790 |
| | 96 | 101 | 5 | 0.107 | 0.535 | 0.117 | 0.585 | 1.093 |
| | 117.5 | 121.5 | 4 | 0.08 | 0.32 | 6' @ .05 | 0.3 | 0.938 |
| | 124 | 126.5 | 2.5 | 0.027 | 0.0675 | 0.031 | 0.0775 | 1.148 |
| | 154 | 156.5 | 2.5 | 0.134 | 0.335 | 0.131 | 0.3275 | 0.978 |
| | 172.5 | 178 | 5.5 | 0.044 | 0.242 | 0.04 | 0.22 | 0.909 |
| sum/average | | | | | 2.885 | | 2.778 | 0.963 |
| Congo 4 | 49 | 52.5 | 3.5 | 0.028 | 0.098 | 0.023 | 0.0805 | 0.821 |
| | 88 | 89.5 | 1.5 | 0.023 | 0.035 | Not run | N/A | N/A |
| | 91 | 94 | 3 | 0.05 | 0.150 | Not run | N/A | N/A |
| | 100 | 101.5 | 1.5 | 0.029 | 0.044 | Not run | N/A | N/A |
| | 104.5 | 109 | 4.5 | 0.134 | 0.603 | 0.149 | 0.6705 | 1.112 |
| | 113 | 114.5 | 1.5 | 0.028 | 0.042 | Not run | N/A | N/A |
| | 132.5 | 136 | 3.5 | 0.072 | 0.252 | 0.073 | 0.2555 | 1.014 |
| | 166.5 | 169.5 | 3 | 0.088 | 0.264 | 0.099 | 0.297 | 1.125 |
| | 207.5 | 214 | 6.5 | 0.061 | 0.3965 | 0.054 | 0.351 | 0.885 |
| sum/average | | | | | 1.6135 | | 1.6545 | 1.025 |
| Congo 5 | 131.5 | 133.5 | 2 | 0.054 | 0.108 | 0.041 | 0.082 | 0.759 |
| | 143 | 146 | 3 | 0.025 | 0.075 | Not run | N/A | N/A |
| | 153 | 158.5 | 5 | 0.076 | 0.38 | 0.07 | 0.35 | 0.921 |
| | 160 | 167 | 7 | 0.151 | 1.057 | 0.162 | 1.134 | 1.073 |
| | 172.5 | 179 | 6.5 | 0.07 | 0.455 | 0.066 | 0.429 | 0.943 |
| | 199.5 | 206.5 | 7 | 0.047 | 0.329 | 0.041 | 0.287 | 0.872 |
| | 219 | 222.5 | 3.5 | 0.027 | 0.095 | Not run | N/A | N/A |
| | 267.5 | 272 | 4.5 | 0.051 | 0.2295 | 0.043 | 0.1935 | 0.843 |
| | 293.5 | 297 | 3.5 | 0.062 | 0.217 | 0.071 | 0.2485 | 1.145 |

| Drill Hole | From | To | Thick | % $eU_3O_8$ (gamma) | GT Gamma | % $U_3O_8$ (USAT) | GT USAT | DEF |
|---|---|---|---|---|---|---|---|---|
| | 303.5 | 305.5 | 2 | 0.075 | 0.15 | .5'@ .062 | 0.31 | 2.067 |
| | 311 | 316.5 | 5.5 | 0.056 | 0.308 | 0.076 | 0.418 | 1.357 |
| | 325 | 335 | 10 | 0.126 | 1.26 | 7.5'@.143 | 1.0725 | 0.851 |
| sum/average | | | | | 4.4935 | | 4.5245 | 1.007 |

## 12.4 Opinions of Author

In the opinion the Authors, the data verification are reliable and adequate for the purposes of this report

# 13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

## 13.1 Historic Mineral Processing

Western Nuclear Corporation (WNC) processed feed from Sheep Mountain over a 30-year period from the early 1950s through the mid-1980s at their Split Rock Mill, which was located north of Jeffrey City, WY, along the haul road to the Gas Hills. WNC also processed Gas Hills ores at its mill and operated a commercial heap leach, as did Union Carbide Corp. (UCC). Historical and published data indicate an acid consumption of 50 pounds per ton H2SO4 and a loss during heap leaching of 0.008% U3O8 (Woolery, 1978). Recent metallurgical laboratory test results, are consistent with or better than historic heap leach experience, indicating potentially higher uranium recovery and lower acid consumption.

Early Heap Leaching by Western Nuclear Inc.

In 1961, Western Nuclear began heap leaching of low-grade uranium bearing material from the Gas Hills region in central Wyoming[1]. Mineralized material was crushed to 90 percent minus 1-inch and hauled with 15-ton dump trucks. The mineralized material averaged 0.05-0.06% U3O8 and the overall consumption of sulfuric acid averaged 50.6 pounds per ton of ore. Uranium extraction into the pregnant leach solution averaged 75 percent, corresponding to a leached residue assay of approximately 0.013% U3O8. It is possible that the heap preparation and leaching practices that were employed by Western Nuclear impaired leaching performance, since large column tests (4-feet diameter x 17-foot depth) using the same parameters obtained 88.3 percent uranium extraction, leaving a residue assaying 0.006% U3O8 from mineralized material assaying 0.051% U3O8.

Early Heap Leaching by Union Carbide Corp.

Following a comprehensive laboratory and pilot-scale program, Union Carbide began construction in 1973 of a 225,000-ton heap[2]. Low-grade stockpiled material that was mostly unconsolidated (and therefore not crushed) was added to the heap to a depth of 20 feet over a compacted clay liner. With a sulfuric acid addition of approximately 40 pounds per ton of ore, leach residues assayed 0.008% U3O8. Union Carbide elected to avoid winter operation and only operated the heap from May 1 until October 1.

It is important to point out that the leaching heaps operated by Western Nuclear and Union Carbide did not benefit from the vast amount of design and operating experience that has been accumulated since the early-1980s from hundreds of heaps treated globally for extraction of gold and copper from low-grade oxidized ores. Given this collection of evolutionary improvements, is quite likely that heap leaching of the same uranium ores now would result in significantly higher extractions.

## 13.2 Pre-Feasibility Metallurgical Studies

In late-2009, drill cuttings and stockpile grab samples were obtained from the Congo Pit, the same resource that provided the feed for the Union Carbide heap leaching program. The drill cuttings were collected during mineral resource validation drilling and consisted of several wide-spaced holes The stockpiles had been left by UECC near the Sheep 1 Shaft. Bottle roll leach tests were conducted using both acid and alkaline lixiviants. Acid leaching was preferred on the basis of higher uranium extraction and lower reagent costs. Also, alkaline leaching caused swelling of clay minerals, which could reduce solution percolation in a heap leaching configuration. (This effect is commonly encountered with alkaline leaching and is usually the result of sodium ion.) These tests resulted in acid consumptions below 20 lb H2SO4 per ton of feed with residues assaying 0.009% U3O8 or less.

For the PFS, a constant residue of 0.010% U3O8, including soluble uranium losses in subsequent solution processing, was assumed. This assumption was conservative with respect to test results, but representative of

[1] Mashbir, D. S., "Heap Leaching of Low-Grade Uranium Ore", Mining Congress Journal, December 1964, pages 50-54.
[2] Woolery, R. G., et al., "Heap Leaching of Uranium*: A* Case History", Mining Engineering, March 1978, pages 285-290.

historic heap leaching experience with similar mineralized material. The soluble uranium loss in the rinsed heap residue and the impurity bleed to the evaporation pond will likely be on the order of two percent, suggesting a heap extraction of about 91.8 percent. This initial laboratory work was followed by large-scale column leaching tests, as described in Section 13.3.

In late 2009, drill cuttings were obtained from the Congo Pit during mineral resource validation drilling consisting of several wide spaced holes and from existing mineralized stockpiles left by USECC near the Sheep I Shaft. Bottle roll leach tests were conducted using both acid and alkaline lixiviants. Acid leaching was preferred based on recovery and cost of lixiviant. In addition, the alkaline leach tests showed some swelling of clay minerals, which could impede flow in the heap. Acid consumption was less than 20lbs./ton with losses of 0.009% $U_3O_8$ or less.

## 13.3 Column Leach Studies

Three laboratory-scale column leaching studies designed to mimic commercial heap performance were completed in mid-2010 to support the Sheep Mountain Project PFS. Mineralized material tested in the studies was obtained from existing stockpiles left in the 1980s and fresher mineralized rock collected during the 2010 exploration drilling program. The leaching chemistry that was selected was based on a combination of industry experience and results of the previous bottle roll tests. The lixiviant contained sulfuric acid, supplemented by sodium chlorate, NaClO3, which is traditionally used to oxidize insoluble tetravalent uranium to the soluble hexavalent state. Typically, bottle rolls will establish maximum estimates of both uranium extraction and acid consumption. The tests were conducted in Sheridan, WY, at Intermountain Laboratories, Inc., and were supervised by R. A. Garling of R&D Enterprises, Inc. Technical advice and support were provided by Lyntek, Inc., Dr. Terry McNulty, and Doug Beahm (author of the NI43-101 reports for Sheep Mountain).

The first two columns, Tests 1 and 2, were loaded with stockpile material which, due to 20-plus years of exposure to weathering, were believed to be fully oxidized. Two nearly identical columns were loaded with 70 kg (dry basis) of mineralized material assaying 0.075% U3O8. The columns were constructed of clear plastic with 6 inches inside diameter and a total height of 14 feet. The bottoms consisted of a supporting grid covered by canvas to minimize loss of fines into the pregnant leach solution (PLS). The initial charge height was 12 feet. The columns were operated in a downward flow mode to simulate heap leaching practice and the solution flowrate was 0.005 gallons per minute per square foot of charge surface, the industry standard for solution application rate. Following recommendations of the consultants, the lixiviant contained approximately 10 grams of sulfuric acid per liter (gpl H2SO4) and the equivalent of 3 lb/ton of sodium chlorate. After 22 days of leaching and a rinse and drain period of over one month, residue assays of 0.0001% U3O8 equated to about 99.9 percent extraction of the uranium.

Subsequently, a third column, Test 3, was conducted from November 12 through December 20, 2010. A single column was loaded with 80.5 kg of drill cuttings from the recent drilling program that assayed 0.104% U3O8. This test was designed to demonstrate the effectiveness of the leaching conditions on unoxidized material with a uranium grade approximately equivalent to the anticipated life-of-mine grade. The same lixiviant chemistry used in the first two columns extracted 97.5 percent of the uranium, leaving a residue assaying 0.0029% U3O8. Unlike the first test, in which over 95 percent of the uranium in the column was extracted by the first pore volume (PV) of lixiviant, the fresh mineralized material exhibited more traditional leaching behavior and required approximately 2 PV to achieve similar uranium extraction. The overall acid consumption in Test 3 was approximately 4 lb/ton, compared with about 1.7 lb/ton in Tests 1 and 2. Very little oxidation was required in any of the three tests, as the initial sodium chlorate addition was sufficient to maintain an Oxidation/Reduction Potential (ORP) of +450 mv.

In addition to demonstrating uranium leaching efficiency, the three tests provided information relevant to heap and process plant design criteria, as well as supporting a Source Materials license application. Information regarding slump of the column charge, pooling of solution on the column surface, and maximum allowable solution application rates was obtained from the tests. Data related to future health physics (radiological and chemical) issues likely to be encountered during licensing activities were also collected. Table 13-1 summarizes results from the three column tests.

**Table 13-1 Summary of Column Leach Results**

| Column # | 1 | 2 | 3 |
|---|---|---|---|
| Density (g/cm$^3$) | 1.50 | 1.36 | 1.46 |
| Uranium Moisture (%) | 8.5 | 8.5 | 4.3 |
| Sulfuric Acid Consumed (lb/st) | 1.68 | 1.62 | 3.90 |
| Lixiviate [H2SO4] (g/L) | 10 | 10 | 10 |
| Sodium Chlorate Addition Rate (lb/st) | 3 | 3 | 3 |
| Uranium Grade Assayed (%$U_3O_8$) | 0.077 | 0.077 | 0.1039 |
| Tails Grade Assayed (%$U_3O_8$) | 0.0001 | 0.0001 | 0.0029 |
| Tails Moisture (%) | 13.7 | 14.7 | 17.0 |
| Uranium Grade (%$U_3O_8$) | 0.0763 | 0.0729 | 0.1128 |
| Uranium Recovery (%) | 99.87 | 99.86 | 97.47 |

(RDE, 2011)

## 13.4 Supplemental Laboratory Experiments

Supplemental duplicates of samples prepared by Lyntek were analyzed by Energy Labs and Hazen Research, Inc., and then delivered to J. E. Litz and Associates in Golden, CO, for additional agitation leach tests, also with dilute aqueous sulfuric acid, but using flasks with internal agitator, rather than bottle rolls[3]. The tests were conducted with minus 28-mesh material in a 33 percent solids slurry with samples taken at 4, 8, 24, and 48 hours; tests were terminated at 48 hours. These sampling intervals provided kinetic data. Acidity was maintained at pH 1.1-1.6 with acid additions as needed, and the oxidation potential was kept above +450 mv (standard platinum vs. calomel electrodes) with sodium chlorate additions that varied between 0 and 5 lb/ton for different samples. Final free acid concentrations were not titrated, so true acid consumptions could not be calculated, but total acid additions were only in the range of 5.6 to 20.7 pounds per ton.

The samples tested by Litz were somewhat acidic in the range pH 2.90 to 6.55 prior to the addition of sulfuric acid, so there was evidence of moderate oxidation prior to sample collection. This was probably due to natural weathering, possibly accelerated by the action of bacteria. Doug Beahm commented[4] that "fresh" mineralized material was actually highly oxidized during Union Carbide's 1980s mining period, frequently resulting in the presence of dissolved uranium in surface and underground water. Mining of the Sheep Mountain deposit will eliminate this potential source of groundwater contamination by uranium.

The 48-hour uranium extractions obtained by Litz ranged from 86.6 to 93.6 percent, but residue assays were proportional to head assays, rather than being constant. Three samples with head assays averaging 0.067% U3O8 yielded residues averaging 0.0087% U3O8, whereas two samples with heads averaging 0.123% U3O8 produced residues averaging 0.019% U3O8. Examination of the laboratory worksheets did not reveal a satisfactory resolution, but it is possible that the residues were not adequately rinsed to remove soluble uranium. The important lesson from the Litz test series was that a different leaching technique confirmed high extractability of the uranium with reasonable acid consumptions and low oxidant demand.

Key points with respect to project economics and operational efficiencies:

- The low acid consumptions observed in all of the column tests, if experienced on a production scale would significantly reduce operating costs per pound of U3O8, compared with most uranium milling operations. The 2010 PFS, completed prior to the column leach test program, made a conservative assumption, as

[3] Litz, J. E., "Preliminary Tests of Titan Drill Cuttings", February 26, 2010.
[4] Personal communication on February 10, 2010.

discussed previously, of 50 pounds of acid per ton of material. Since all of the tests required much lower acid consumptions, as summarized in Table 13-1, the assumption of 30 lb/ton used in the 2010 PFS was very conservative and probably more than will be experienced in practice.

- The very high uranium extractions observed in the column leach studies, if experienced on a production scale, would also significantly reduce operating costs per pound of uranium. Although the column tests yielded very high uranium extractions, as summarized in Table 13-1, the PFS conservatively used an overall uranium recovery of 91.7 percent, based on the average sample grade and a constant residue assay of 0.010 % U3O8, assuming soluble uranium losses of 2 percent (McNulty 2012).
- The relatively short leach cycles (2-3 pore volumes of lixiviant) and realistic application rates, if experienced on a production scale, will reflect favorably on operating costs and efficiencies.
- The behavior of the column charges during leaching and the observed geotechnical properties indicate that the material could be placed directly on the leach pads without a gravel drain layer, thereby reducing capital costs. However, the PFS conservatively included the cost of a gravel drain.

The samples for column testing were collected spatially from within the mineral deposit in order to produce a composite representative of production during the mine life, however, only a relatively small amount of material was actually tested. Analysis of solutions produced during testing did not reveal any deleterious elements that could have a significant effect on process performance or yellowcake marketability (RDE 2011). Additional tests on future samples of the resource could yield results that vary either positively or negatively from those obtained for the PFS. Conservative assumptions based on available test results, as summarized in Table 13-1, were incorporated in the cost estimates and financial evaluations. Heap leaching and solution processing are discussed in Section 17.

## 13.5 Current Metallurgical Background and Industry Practice:

Sulfuric acid consumption has two components: (1) The uranium minerals themselves require acid for dissolution and complexing of the uranium as uranyl sulfate. At Sheep Mountain, the dominant uranium minerals are uranophane, Ca(UO2)2(SiO2)2(OH)2•5H2O, and autunite, Ca(UO2)2(PO4)2•10-12H2O. Dissolving these minerals will form hydrated calcium sulfate (gypsum), silicic acid, and phosphoric acid, but the total acid consumption with a low-grade mineralized material is minor; (2) Other minerals in the mineralized material are host rock constituents and will consume acid as they are dissolved. At Sheep Mountain, the principal acid consumer in this category is probably calcite, calcium carbonate, which reacts to form gypsum. The known geology does not suggest that other common acid consuming minerals such as orthoclase, a potassium aluminum silicate, are present. Therefore, it is not surprising that the laboratory tests and column tests on samples from Sheep Mountain have revealed low acid consumptions.

When the PEA was submitted in 2010, there was no recent industry experience in heap leaching of uranium mineralization. Few examples existed, but they were confined to the 1960s and 1970s; however, since then, there have been 40 years of accumulated experience in heap leaching of low-grade oxidized gold ores. This experience has vastly improved our understanding of variables such as crushing, agglomeration, and heap construction of copper ores, as well as gold ores. Now, over half of domestic copper production derives from heap leaching. Also, about 30 percent of domestic gold production is extracted from heaps.

Furthermore, commercial production of uranium from heap leaching operations began in Brazil in 2010 (Gomeiro and Morais, 2010) and is now being practiced in Africa at Somair and Imouraren in Niger and Trekkopje in Namibia (Dunne, et. al., 2019). Most uranium heap leaching employs sulfuric acid as the dissolving and complexing agent. However, Trekkopje was unique when it began operations in 2019 because it employs alkaline heap leaching to accommodate the calcareous host rock which would require excessive sulfuric acid consumption. These heap leaching operations all employ heap heights in the range 20-30 feet with low mineralized material grades in the range 0.02-0.05% $U_3O_8$.

Although heap leaching is simple in principle, it is fairly complex in practice and judgment is required in designing and operating a heap to maximize contact of the rock fragments with leaching solution and to avoid solution loss. The uranium-bearing rock must be crushed to a small size to ensure adequate and rapid contact of the uranium minerals with the leaching solution. However, excessive crushing wastes energy and produces fines that can impede solution movement in the heap. The optimum top-size typically is in the range 0.75-2.0 inch but crushing to this product size will inevitably create fine particles that will migrate, collect, and create relatively impervious lenses which will block the downward percolation of leaching solution, thereby reducing uranium extraction.

The harmful effect of fines can be very effectively minimized by agglomeration, which binds the fine particles to coarser rock fragments. Whereas agglomeration ahead of the leaching of gold with alkaline cyanide solution is usually done with Portland cement, agglomeration of copper mineralized material is accomplished simply by addition of dilute aqueous sulfuric acid. The agglomeration mechanism is complex, but its effectiveness is partially due to the formation of gypsum, which acts as a cementing agent. The same technique can be applied to agglomeration of uranium-bearing material, and the method of acid addition as discussed in Section 17 of this report.

Another threat to heap permeability can occur during loading of mineralized material onto a pad while forming the heap. For a number of years, heaps that were leached for recovery of gold or copper were constructed by driving haul trucks onto the heap and dumping in piles that could be levelled with a tracked dozer. Eventually, the industry learned that this practice was also leading to impaired heap permeability resulting from compaction caused by ground pressure exerted by the trucks. Initial attempts to remedy compaction consisted of ripping the upper surface of the heap with a dozer tooth, but this generally proved to be ineffective.

Ultimately, the preferred solution was to construct the heap with a traversing conveyor that built the heap in a series of overlapping windrows. Various combinations of equipment were tried until the stacker was developed. This is a moveable conveyor with very high-speed belt that slings the mineralized material stream a distance of 50 to 100 feet, allowing construction of semi-circular rows of mineralized material that are uncompacted and uniformly permeable. The stacker is supplied with mineralized material by one or more conventional conveyors that can be moved to remain near the feed hopper for the mobile stacker. As discussed in Section 17, this is the heap construction method that is envisioned for the Sheep Mountain Project.

## 13.6 Opinion of Author

In the opinion of the Authors, the data are reliable and adequate for the purposes of this report.

# 14.0 MINERAL RESOURCE ESTIMATES

## 14.1 General Statement

The mineral resource estimation and geological interpretation methods methodology described herein have been employed by similar operating uranium mines in the Gas Hills. The mining methods and factors recommended have been employed successfully at the Sheep Mountain Project (the Project) in the past. Successful uranium recovery from the mineralized material at Sheep Mountain and similar areas such as the Gas Hills has been demonstrated via both conventional milling and heap leach recovery. The Project is a brown-field development located in the State of Wyoming, which tends to favor mining and industrial development. The Project has been well received locally and will also provide substantial revenues to both Fremont County and the State of Wyoming in addition to providing long-term employment for the region. Wyoming ranks 16th among 83 mining jurisdictions surveyed by the Fraser Institute in with respect to favourability for mining ventures. The Authors are not aware of any factors including environmental, permitting, taxation, socio-economic, marketing, political, or other factors, which would materially affect the mineral resource estimate, herein.

The estimates of Mineral Resources were completed for the Sheep Underground and Congo Pit areas. Within these areas preliminary mine designs were completed. Preliminary mine designs focused on the areas with the strongest and most continuous mineralization and were not optimized for maximum mineral resource extraction. Mineral Resources were estimated adjacent to both the Congo pit and Sheep underground, which have reasonable prospects for economic extraction. These areas would be accessible for mining from the pit highwalls by conventional drift mining or using modern highwall mining systems and through the underground with additional stopping and/or raises.

Those portions of the Mineral Resources not readily accessible from either the Congo pit or Sheep underground mine were excluded from the mineral resource estimation as they do not currently meet the criteria for reasonable prospects of economic extraction. Additional areas of mineralization are known within the project area, which have not been fully evaluated and/or do not meet reasonable prospects for eventual economic extraction based on currently available data. These areas have also been excluded in the mineral resource estimate.

Minimum cut-off grades, based on direct operating costs, are 0.05% $eU_3O_8$ for open pit mining and 0.075% $eU_3O_8$ for underground mining (Table 14-1). Mineral resource estimates were estimated using GT cut-offs of 0.1 for open pit mine areas and 0.3 for underground mine areas. Cut-off grades are discussed in Section 15.4.

The mineral resource estimates presented herein have been completed in accordance with NI 43-101 and S-K 1300 standards and represent the estimated in situ Mineral Resources. Based on the drill density, the apparent continuity of the mineralization along trends, geologic correlation and modeling of the deposit, a review of historic mining with respect to current resource projections, and verification drilling, the Mineral Resource estimate herein meets NI 43-101 and S-K 1300 criteria as an Indicated Mineral Resource. A summary of total mineral resource is provided in Table 14-1.

A summary of total Mineral Resources inclusive of Mineral reserves is provided in Table 14-1. Mineral Reserve estimate is discussed in Section 15. A summary of the Mineral Resource estimate, fully exclusive and are not additive to the total Mineral Resources, is provided in Table 15-1. A summary of total Mineral Resources exclusive of Mineral reserves is provided in Table 14-2.

A discussion of individual resource areas follows.

**Table 14-1 Sheep Mountain Mineral Resources Inclusive of Mineral Reserves - April 9, 2019**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Indicated* | Sheep Underground | 0.30 | 5,546 | 0.118% | 13,034 |
| *Indicated* | Congo Pit Area | 0.10 | 6,116 | 0.122% | 14,903 |
| **Total Indicated** | | | **11,663** | **0.120%** | **27,935** |

Notes:

1: NI 43-101 and S-K 1300 definitions were followed for Mineral Resources
2: In Situ Mineral Resource are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.30 (6 ft. of 0.05% $eU_3O_8$) for underground
3: Mineral Resources are estimated using a long-term Uranium price of US$65 per pound
4: Bulk density is 0.0625 tons/ft$^3$ (16 ft$^3$/ton)
5: Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability
6: Numbers may not add due to rounding

A summary of total Mineral Resources exclusive of Mineral reserves is provided in Table 1-3.

**Table 14-2 Sheep Mountain Mineral Resources Exclusive of Mineral Reserves – April 9, 2019**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Indicated* | Sheep Underground | 0.30 | 2,048 | 0.09% | 3,786 |
| *Indicated* | Congo Pit Area | 0.10 | 2,161 | 0.13% | 5,786 |
| **Total Indicated** | | | **4,210** | **0.11%** | **9,570** |

Notes:

1: NI 43-101 and S-K 1300 definitions were followed for Mineral Resources
2: Mineral Resource are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.30 (6 ft. of 0.05% $eU_3O_8$) for underground
3: Mineral Resources are estimated using a long-term Uranium price of US$65 per pound
4: Bulk density is 0.0625 tons/ft$^3$ (16 ft$^3$/ton)
5: Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability
6: Numbers may not add due to rounding

## 14.2 Drill Hole Database

The current drill hole database consists of:

<u>Congo Open Pit Area</u>

- 2,780 drill holes in total: 2,673 mineralized, 107 barren
- Includes recent drilling: 90
    - 2009 – 5 drill holes
    - 2010 – 62 drill holes
    - 2011 – 73 drill holes

<u>Sheep Underground Area</u>

- 485 drill holes
    - Includes 2 holes completed in 2005

The uranium quantities and grades are reported as %$eU_3O_8$, as measured by downhole gamma logging. The industry standard protocol for reporting uranium in sandstone-hosted deposits in the U.S. has been validated for the Sheep Mountain Project by test drilling at the deposit, as well as by correlation with previous mining activities.

### 14.2.1 Congo Open Pit

The Congo data set is composed of 2,780 drill holes of which 107 are barren and the remaining 2,673 drill holes contain mineralization. Within the 2,673 mineralized drill holes, 12,070 individual intercepts were present. A portion of the historic data consisted of ½-foot data from the Century Geophysical Compulog™ system. For this data, a minimum cut-off thickness and grade of 2 feet of 0.03% $eU_3O_8$ was applied resulting in 2,667 composite intercepts. The remaining 2,462 intercepts did not have ½ foot data but consisted of composite intercepts interpreted using the half amplitude convention for geophysical log interpretation. Log interpretation and intercepts from the historic database were spot checked especially with regards to higher-grade mineralized intercepts. Correlation of the mineralized sand units was available from historic reports. This historic naming convention for the sand units was maintained. The following table summarizes the mineralized intercepts in the Congo database by sand unit. A summary of mineralization reflected in the drill holes follows.

**Table 14-3. Congo Pit Area General Statistics (Raw Data)**

| | No Cut-Off (12,070 samples) | | | 0.1 GT Cut-Off (9,454 samples) | | |
|---|---|---|---|---|---|---|
| | Grade (%eU$_3$O$_8$) | Thickness (ft.) | Grade x Thickness (GT) | Grade (%eU$_3$O$_8$) | Thickness (ft.) | Grade x Thickness (GT) |
| Min. | 0.01 | 0.09 | 0.02 | 0.01 | 0.10 | 0.10 |
| Lower. Quart. | 0.05 | 2.00 | 0.11 | 0.07 | 2.00 | 0.18 |
| Median | 0.08 | 2.50 | 0.24 | 0.10 | 3.00 | 0.32 |
| Upper Quart. | 0.15 | 4.50 | 0.51 | 0.18 | 5.00 | 0.63 |
| Max. | 5.43 | 35.00 | 46.17 | 5.43 | 35.00 | 46.17 |
| Avg. | 0.13 | 3.71 | 0.49 | 0.15 | 4.13 | 0.61 |
| Std. Deviation | 0.18 | 3.09 | 0.98 | 0.19 | 3.33 | 1.07 |

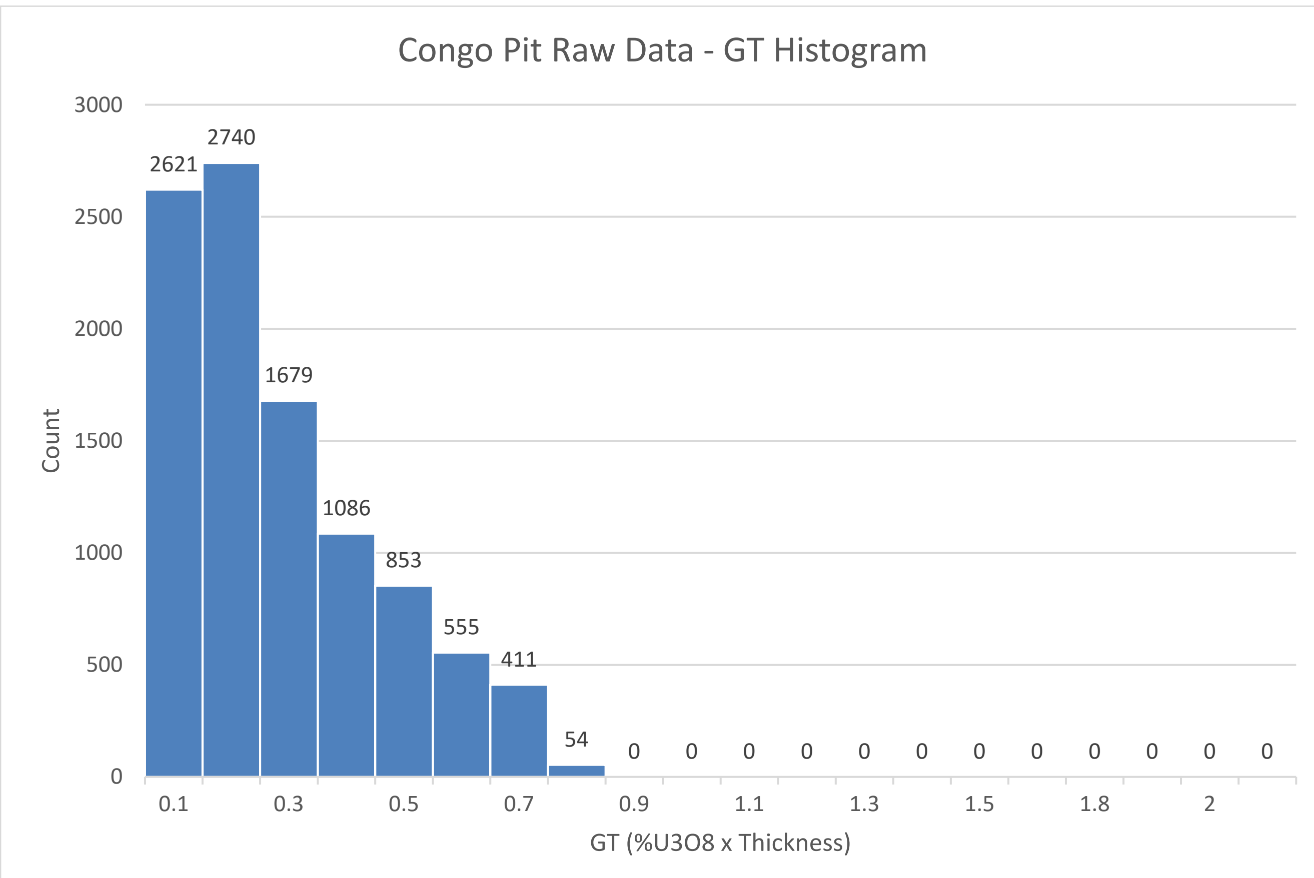



**Figure 14-1. GT Histogram for Congo Pit (12,070 Samples)**

**Table 14-4. Congo Pit Area General Statistics (Composited Data)**

| | No Cut-Off (5,129 samples) | 0.1 GT Cut-Off (4,533 samples) |
|---|---|---|

| | Grade (%$eU_3O_8$) | Thickness (ft.) | Grade x Thickness (GT) | Grade (%$eU_3O_8$) | Thickness (ft.) | Grade x Thickness (GT) |
|---|---|---|---|---|---|---|
| Min. | 0.030 | 2.0 | 0.06 | 0.030 | 2.0 | 0.10 |
| Lower. Quart. | 0.054 | 2.0 | 0.16 | 0.066 | 2.5 | 0.21 |
| Median | 0.090 | 3.0 | 0.32 | 0.100 | 3.5 | 0.37 |
| Upper Quart. | 0.150 | 5.0 | 0.62 | 0.160 | 5.1 | 0.69 |
| Max. | 5.432 | 5.4 | 46.17 | 5.432 | 5.4 | 46.17 |
| Avg. | 0.146 | 4.1 | 0.60 | 0.152 | 4.4 | 0.67 |
| Std. Deviation | 0.163 | 2.9 | 1.18 | 0.170 | 3.0 | 1.24 |

**Table 14-5 Congo Pit Area Statistics by Mineralized Zone**

| Zone | # Of Composite Intercepts | Avg. Thickness (ft.) | Avg. Grade (%$U_3O_8$) | Avg. GT (Grade x Thickness) | Avg. Depth to Bottom of Mineralization |
|---|---|---|---|---|---|
| 41A | 213 | 4.4 | 0.176 | 0.77 | 266 |
| 41 | 228 | 3.7 | 0.168 | 0.62 | 298 |
| 45 | 404 | 4.4 | 0.167 | 0.73 | 279 |
| 48 | 435 | 4.2 | 0.152 | 0.63 | 255 |
| 52 | 556 | 4.1 | 0.139 | 0.57 | 268 |
| 54/56 | 407 | 4.2 | 0.149 | 0.63 | 243 |
| 59 | 375 | 3.9 | 0.106 | 0.41 | 196 |
| 63 | 436 | 4.1 | 0.117 | 0.48 | 170 |
| 66 | 456 | 4.3 | 0.134 | 0.57 | 202 |
| 67 | 242 | 3.8 | 0.149 | 0.57 | 209 |
| 72 | 271 | 4.1 | 0.130 | 0.53 | 232 |
| 75 | 233 | 4.0 | 0.129 | 0.52 | 195 |
| 79 | 133 | 3.7 | 0.178 | 0.67 | 204 |
| 83 | 122 | 4.8 | 0.169 | 0.81 | 204 |
| 86 | 50 | 3.5 | 0.131 | 0.46 | 253 |
| 89 | 27 | 4.1 | 0.099 | 0.41 | 176 |
| 94 | 28 | 3.1 | 0.176 | 0.30 | 207 |
| Total | 4,616 | 4.0 | 0.143 | 0.57 | 189 |

### 14.2.2 Sheep Underground

The Sheep Underground data set is composed of 485 drill holes based on data from 483 historic drill holes and 2 confirmatory drill holes completed in 2005. Of those 485 drill holes only 33 were barren and 452 of the drill holes contained mineralization of at least 0.5 feet of 0.05% $eU_3O_8$. Within the 452 mineralized drill holes, 3,222 individual intercepts were present. Using the cut-off thickness and grade of 6 feet of 0.05% $eU_3O_8$, 549 composites diluted to a minimum thickness of 6 feet were created from the 3,222 individual intercepts. These 549 composited intercepts were then correlated into one of the 17 different mineralized zones based on geologic interpretations. If the composite could not be correlated within a zone it was designated as isolated and its influence in subsequent mineral resource estimation limited. Data summaries follow in Tables 14.5 through Table 14.7.

**Table 14-6 Sheep Underground Area General Statistics (1 of 2)**

| | 0.02 GT Cut-off (3,222 Samples) | | | 0.3 GT Cut-Off (704 samples) | | |
|---|---|---|---|---|---|---|
| | Grade (%$eU_3O_8$) | Thickness (ft.) | Grade x Thickness (GT) | Grade (%$eU_3O_8$) | Thickness (ft.) | Grade x Thickness (GT) |
| Min. | 0.03 | 0.50 | 0.02 | 0.05 | 1.00 | 0.30 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Lower. Quart. | 0.06 | 1.00 | 0.08 | 0.11 | 2.50 | 0.39 |
| Median | 0.08 | 1.50 | 0.13 | 0.16 | 4.00 | 0.53 |
| Upper Quart. | 0.13 | 2.50 | 0.27 | 0.25 | 6.00 | 0.86 |
| Max. | 2.19 | 19.0 | 9.86 | 2.19 | 19.0 | 9.86 |
| Avg. | 0.13 | 2.15 | 0.27 | 0.18 | 4.44 | 0.81 |
| Std. Deviation | 0.11 | 1.89 | 0.50 | 0.18 | 2.70 | 0.87 |

**Table 14-7 Sheep Underground Area General Statistics (2 of 2)**

| | **0.6 GT Cut-off (314 Samples)** | | | **0.9 GT Cut-Off (165 samples)** | | |
|---|---|---|---|---|---|---|
| | **Grade ($\%eU_3O_8$)** | **Thickness (ft.)** | **Grade x Thickness (GT)** | **Grade ($\%eU_3O_8$)** | **Thickness (ft.)** | **Grade x Thickness (GT)** |
| Min. | 0.07 | 1.00 | 0.60 | 0.10 | 1.00 | 0.91 |
| Lower. Quart. | 0.15 | 4.00 | 0.72 | 0.17 | 5.50 | 1.12 |
| Median | 0.19 | 6.00 | 0.93 | 0.23 | 6.50 | 1.45 |
| Upper Quart. | 0.29 | 7.50 | 1.49 | 0.31 | 8.50 | 2.01 |
| Max. | 2.19 | 19.0 | 9.86 | 2.19 | 19.0 | 9.86 |
| Avg. | 0.22 | 5.94 | 1.31 | 0.26 | 7.07 | 1.84 |
| Std. Deviation | 0.23 | 2.91 | 1.12 | 0.28 | 3.06 | 1.34 |

**Table 14-8 Sheep Underground Area Statistics by Mineralized Zone**

| **Zone** | **# Of Composite Intercepts** | **Avg. Thickness (ft)** | **Avg. Grade ($\%U_3O_8$)** | **Avg. GT (Grade x Thickness)** | **Avg. Depth to Bottom of Mineralization** |
|---|---|---|---|---|---|
| 1 | 8 | 6.6 | 0.07 | 0.46 | 758 |
| 2U | 6 | 6.0 | 0.07 | 0.39 | 1,040 |
| 2L | 11 | 6.4 | 0.10 | 0.66 | 878 |
| 3 | 24 | 6.6 | 0.11 | 0.73 | 838 |
| 4 | 50 | 6.8 | 0.12 | 0.82 | 1,010 |
| 5 | 37 | 7.8 | 0.14 | 1.09 | 1,039 |
| 6 | 35 | 7.3 | 0.15 | 1.12 | 1,016 |
| 7 | 40 | 8.2 | 0.20 | 1.62 | 997 |
| 8 | 51 | 7.0 | 0.11 | 0.79 | 1,038 |
| 9 | 47 | 7.4 | 0.16 | 1.19 | 957 |
| 10 | 38 | 8.2 | 0.14 | 1.19 | 1,151 |
| 11 | 36 | 7.7 | 0.14 | 1.09 | 1,173 |
| 12 | 28 | 8.5 | 0.13 | 1.07 | 1,214 |
| 13 | 30 | 6.6 | 0.13 | 0.85 | 1,313 |
| 14 | 31 | 7.4 | 0.11 | 0.83 | 1,349 |
| 15 | 12 | 7.3 | 0.15 | 1.08 | 1,354 |
| 16 | 11 | 6.3 | 0.13 | 0.79 | 1,252 |
| Isolated | 54 | 6.5 | 0.11 | 0.69 | 1,123 |
| Total | 549 | 7.1 | 0.13 | 0.91 | 1,089 |

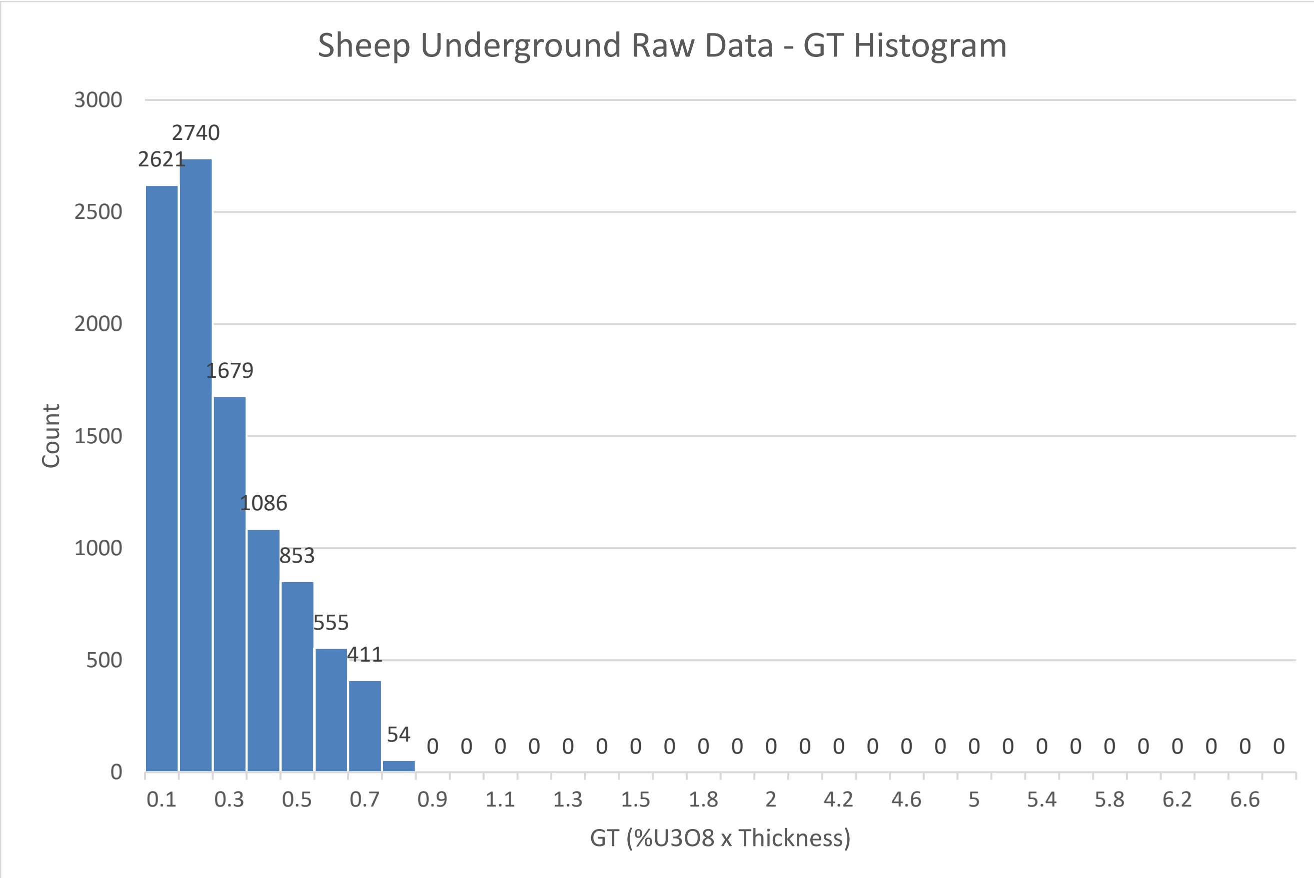



**Figure 14-2. GT Histogram for Sheep Underground (3,222 Samples)**

Sheep Underground mineralized thickness ranges from 0.5 feet to 19.0 feet. Grade varies from the minimum grade cut-off of 0.03% $eU_3O_8$ to a maximum reported grade of 2.19% $eU_3O_8$.

Estimated trend width and length were based on the geologic model and actual mine workings as follows. The Sheep typical trend width is approximately 100 feet. The mine maps available for the Sheep area show development drifts, ready for extraction, with widths greater than 100 feet. In the limited areas where full extraction occurred, mined out rooms were 50 feet to 100 feet or in some cases wider. The Sheep trend length varies from a few hundred feet to a maximum length of about 5,500 feet based on correlation of geophysical logs.

## 14.3 Statistical Analysis

### 14.3.1 Grade Capping

The GT contour method naturally limits the extent of high-grade samples by containing its area of influence within a contour. In addition, high-grade samples tend to be thin, and the GT method again limits the extent by a thin high-grade zone having a similar GT to a thick lower-grade zone. No grade capping was done for either the Congo Open Pit Mineral Resource or the Sheep Underground Mineral Resource

## 14.4 Resource Estimation Methods

### 14.4.1 Geologic Model

Geologic interpretation of the mineralized host sands was used, along with the intercepts that met the cut-off grade and thickness, to develop a geologic model, which was used in estimating the mineral resources at the Project. The three-dimensional locations along the drill hole of all mineralized intercepts were plotted in AutoCAD™. Each intercept was evaluated based on its geophysical log expression and location relative to adjacent intercepts. Whenever possible, geophysical logs were used to correlate and project intercepts between drill holes. Intercepts that met the minimum grade cut-off but were isolated above or below the host sand horizons; where data sets were incomplete and/or did not fully penetrate the host sand, were excluded from the mineralized envelope. The mineralized envelope was created by using the top and bottom of each intercept that was within the geologic host sands. The intercepts that were used to make this envelope were then used in the resource estimate GT method.

Drill spacing within the Project is not uniform due in part to the steep and irregular surface terrain and in part to random drill hole deviation. Drill spacing in the Congo (open pit areas) range from roughly 50-foot centers to greater than 100-foot centers. Drill spacing at Sheep Underground area varies from roughly 200-foot centers to over 400-foot centers. Drilling depths at Congo are typically less than 400 feet in the northern portions of the area to generally over 600 feet to the south. Drilling depths at Sheep exceed 1,000 feet but are typically less than 1,500 feet.

In developing the initial geologic envelope, both surface drill data and data from underground mine maps was reviewed. In the case of the Sheep Underground and other underground mines nearby (the Seismic and Reserve mines) and partially within the limits of the planned Congo Pit, the underground development and crosscut drifts were typically on 100-foot centers. Mining within the development drifts and crosscuts was completed by random room and pillar methods, extracting the mineralized material meeting the mine cut-off applicable at the time and leaving the lower grade material as pillars. In most cases entire 100x100 foot or larger blocks were mined and/or, in the case of the Sheep Underground, delineated by face sampling and longhole drilling but not mined.

The current geologic and resource model is in three dimensions based on geologic interpretation of 18 mineralized zones in the Congo area and 17 mineralized zones in the Sheep area.

Once the data were separated by zone an initial area of influence of 50 feet (maximum 25-foot radius or 50-foot diameter) was applied to each drill hole by zone at its drifted location to establish an initial geologic limit to the projection of mineralization. Refinement of the geologic limit and projection of mineralization along trend was then based on specific correlation and interpretation of geophysical logs on a hole-by-hole basis.

### 14.4.2 GT Contour Method

The mineral resource estimate was completed using the Grade x Thickness Contour Method (also known as the GT Method) on individual mineralized zones as defined in a full 3D geological model of the deposit. The GT Method is a well-established approach for estimating uranium resources and has been in use since the 1950s in the U.S. The technique is most useful in estimating tonnage and average grade of relatively planar bodies where lateral extent of the mineralized body is much greater than its thickness, as was observed in drilling of the Congo and Sheep deposits.

For tabular and roll front style deposits the GT Method provides a clear illustration of the distribution of the thickness and average grade of uranium mineralization. The GT Method is particularly applicable to the Congo and Sheep deposits as it can be effective in reducing the undue influence of high-grade or thick intersections as well as the effects of widely spaced, irregularly spaced, or clustered drill holes, all of which occur to some degree in the Congo and Sheep deposits. This method also makes it possible for the geologist to fit the contour pattern to the geologic interpretation of the deposit.

The GT Method is used as common practice for Mineral Reserve and Mineral Resource estimates for similar sandstone-hosted uranium projects ("Estimation of Mineral Resources and Mineral Reserves," adopted by CIM November 23, 2003, p. 51). It is the Authors' opinion that the GT Method, when properly constrained by geologic interpretation, provides an accurate estimation of contained pounds of uranium.

**Congo Pit**

Figures 14-3 thru 14-19 – Congo Open Pit, for GT contour maps which show the mineral resource areas and the areas of historic mining for each individual sand.

The 2011 mineral resource estimate grouped sands for the North Gap and South Congo areas in to the five major sand units and calculated the amount of resource removed by historic mining based on a deduction from past production records, BRS, 2011. For this report the North Gap, South Congo, and Congo mineralized zones were combined into a single unified mineral resource model and deletions of resources related to past mining were determined from underground mine maps.

The current mineral resource model includes 18 separate sand units for all areas and includes deletion of the portions of the mineral resource model that falls within the historic mine limits determined from mine maps, which equated to approximately 25% of the initial resource estimate. Historic mining limits were imported into the resource model by individual sand horizons in three dimensions. The extent of mining was taken to be the actual mapped underground mine limit or the GT boundary representing the historical mining cut-off (8 feet at 0.095 or a GT of 0.76), whichever was greatest. Although in many cases the mine maps showed remnant pillars, none of these areas were included in the Mineral Reserve estimate. Thus, the estimate of current Mineral Resources is conservative with respect to the exclusion of areas affected by historic mining.

The Congo sum GT, diluted to a minimum 2-foot mining thickness from the mineralized envelope for each drill hole, was plotted in AutoCAD. If the thickness exceeded 2 feet, no dilution was added. The diluted thickness of mineralization for each drill hole was also plotted. Resource estimates include deletion of the portions of the mineral resource model that fall within the historic mine limits as previously discussed.

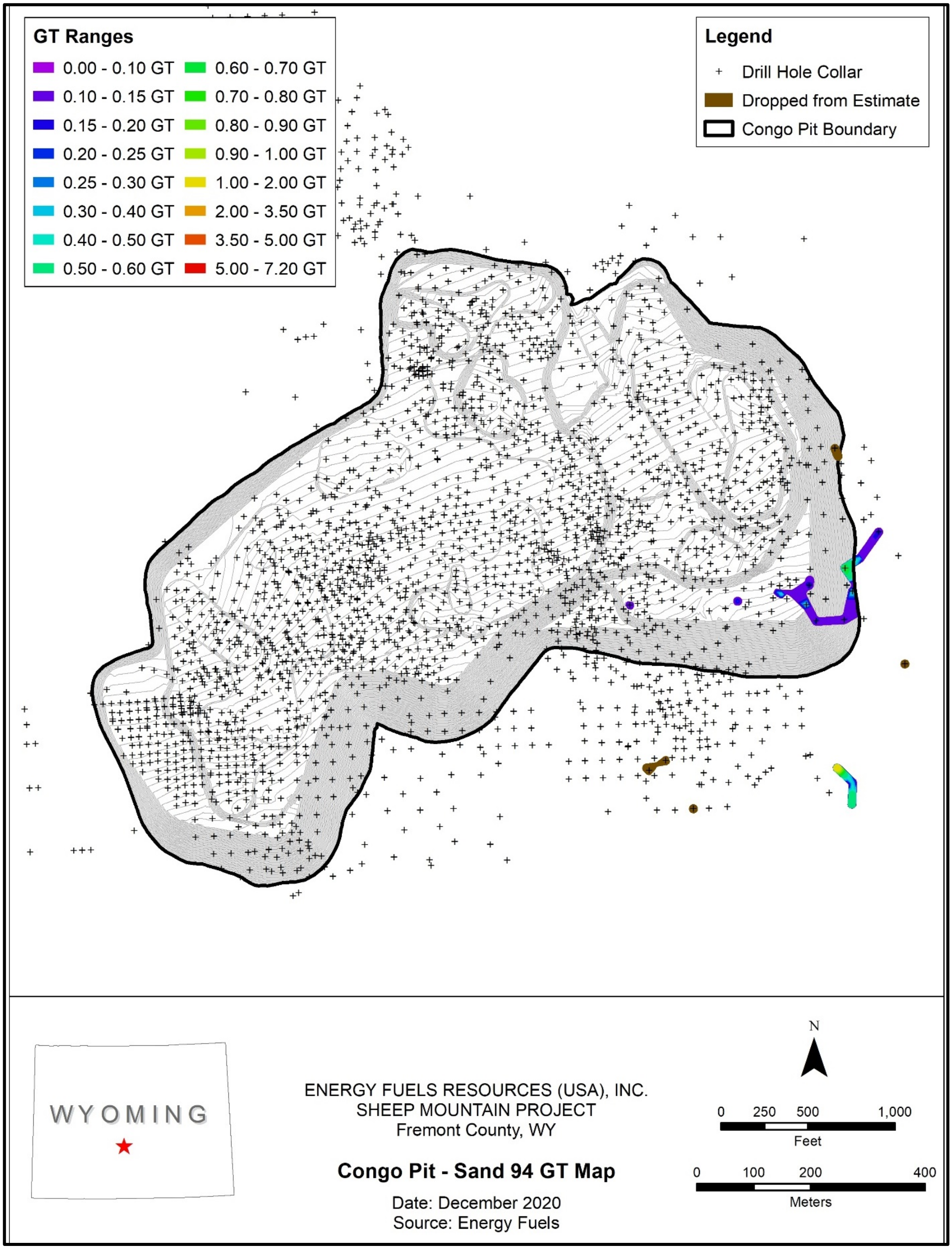



**Figure 14-3. Congo Pit GT Contours - Sand 94**

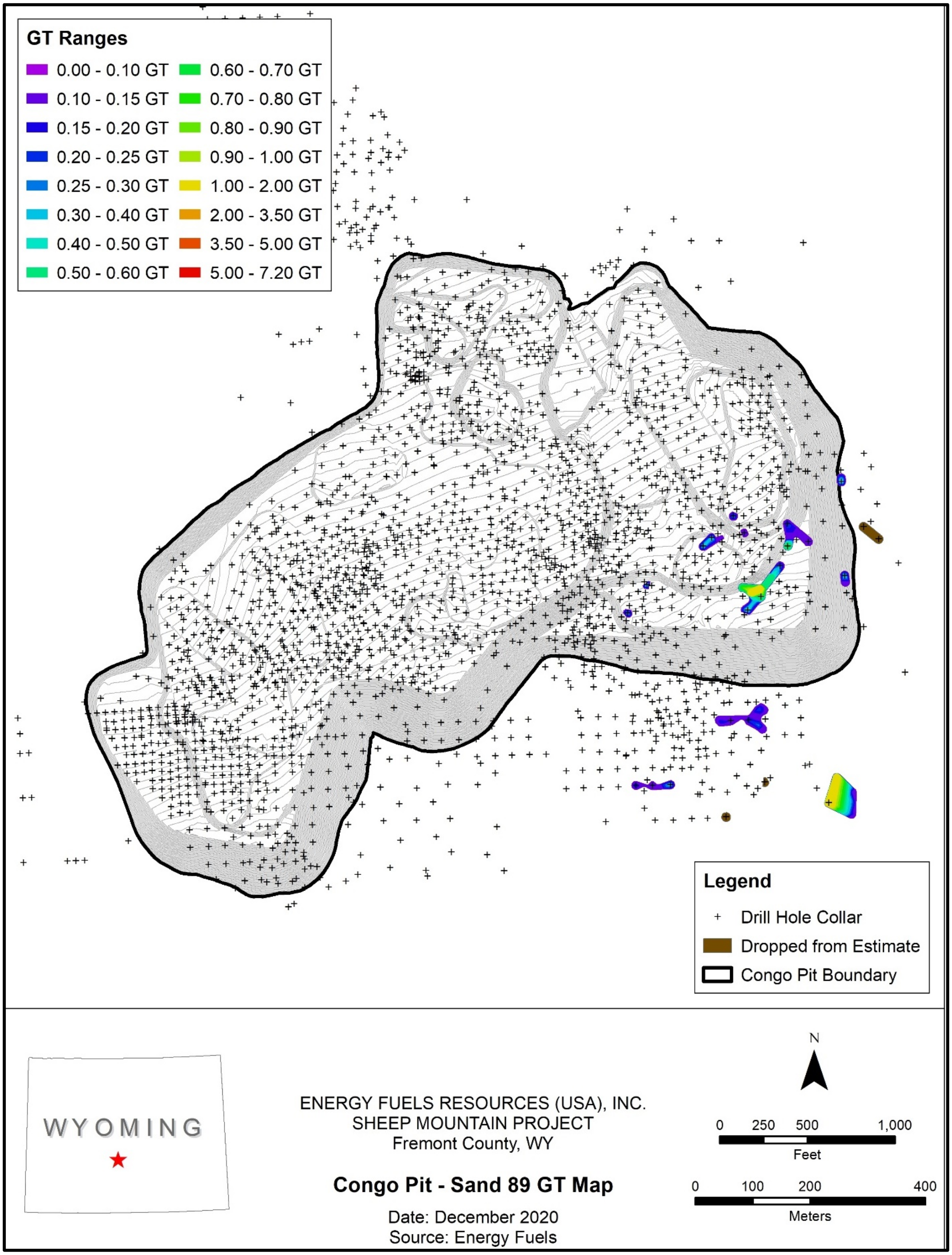



**Figure 14-4. Congo Pit GT Contours - Sand 89**

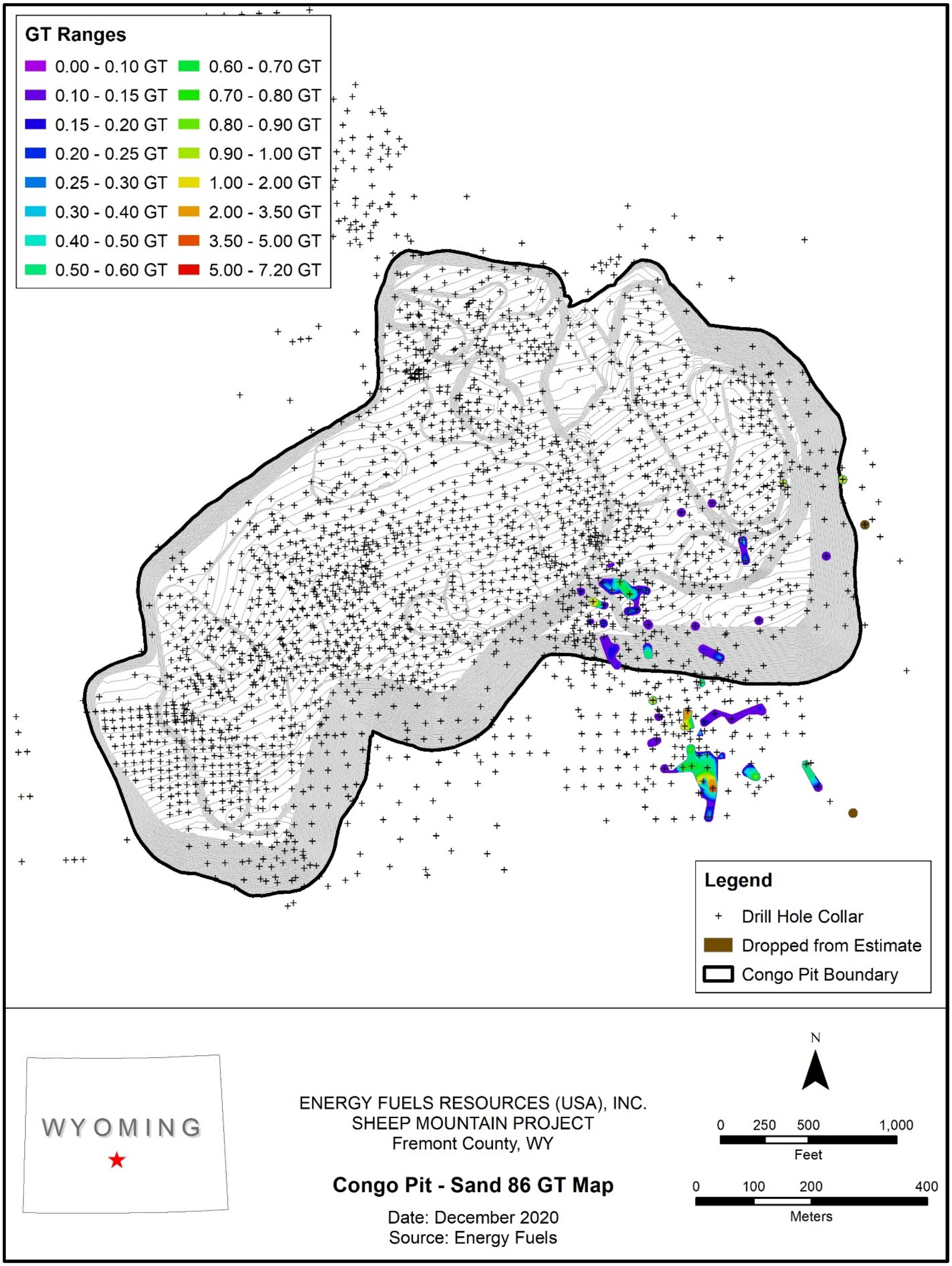



**Figure 14-5. Congo Pit GT Contours - Sand 86**

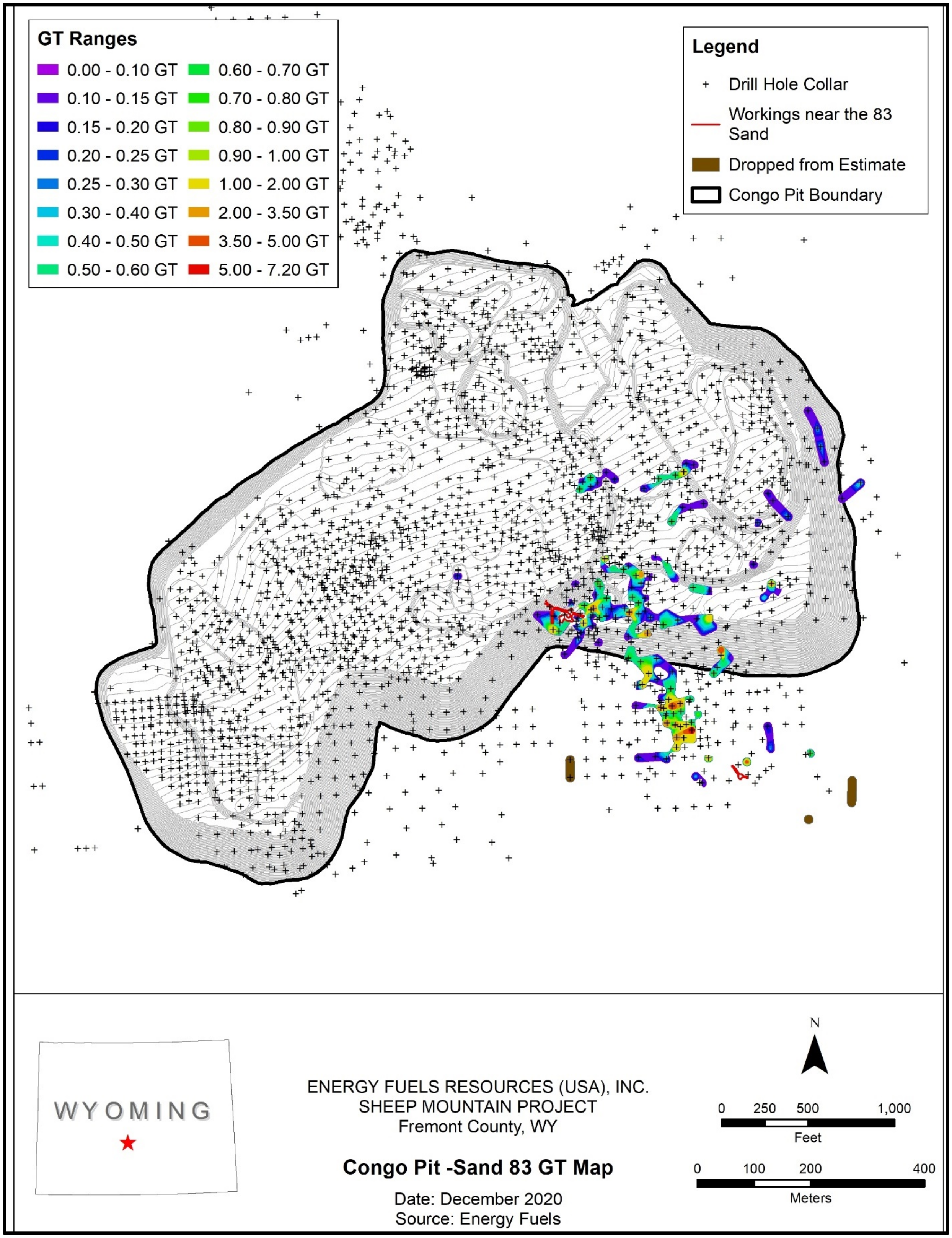



**Figure 14-6. Congo Pit GT Contours - Sand 83**

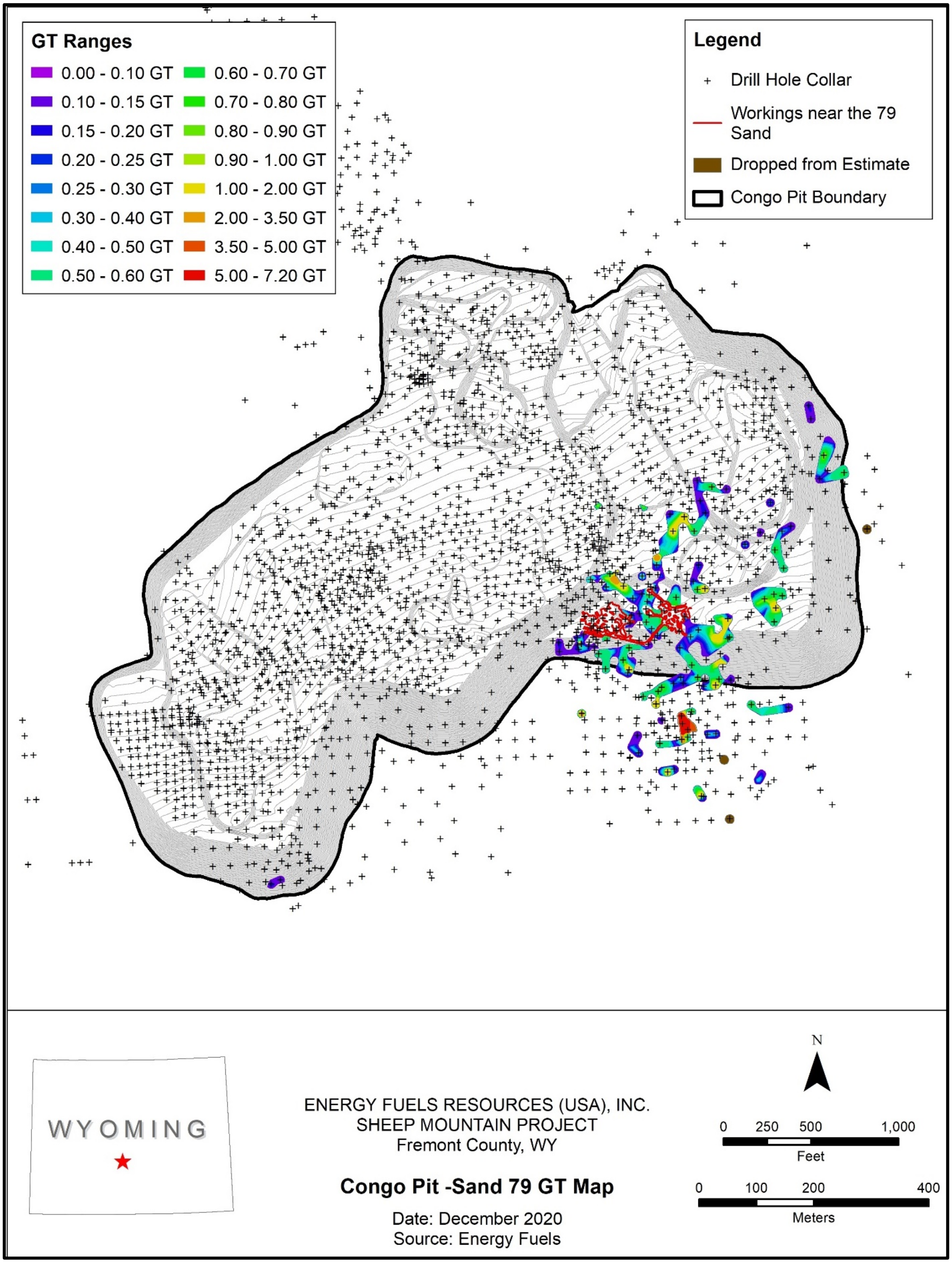



**Figure 14-7. Congo Pit GT Contours - Sand 79**

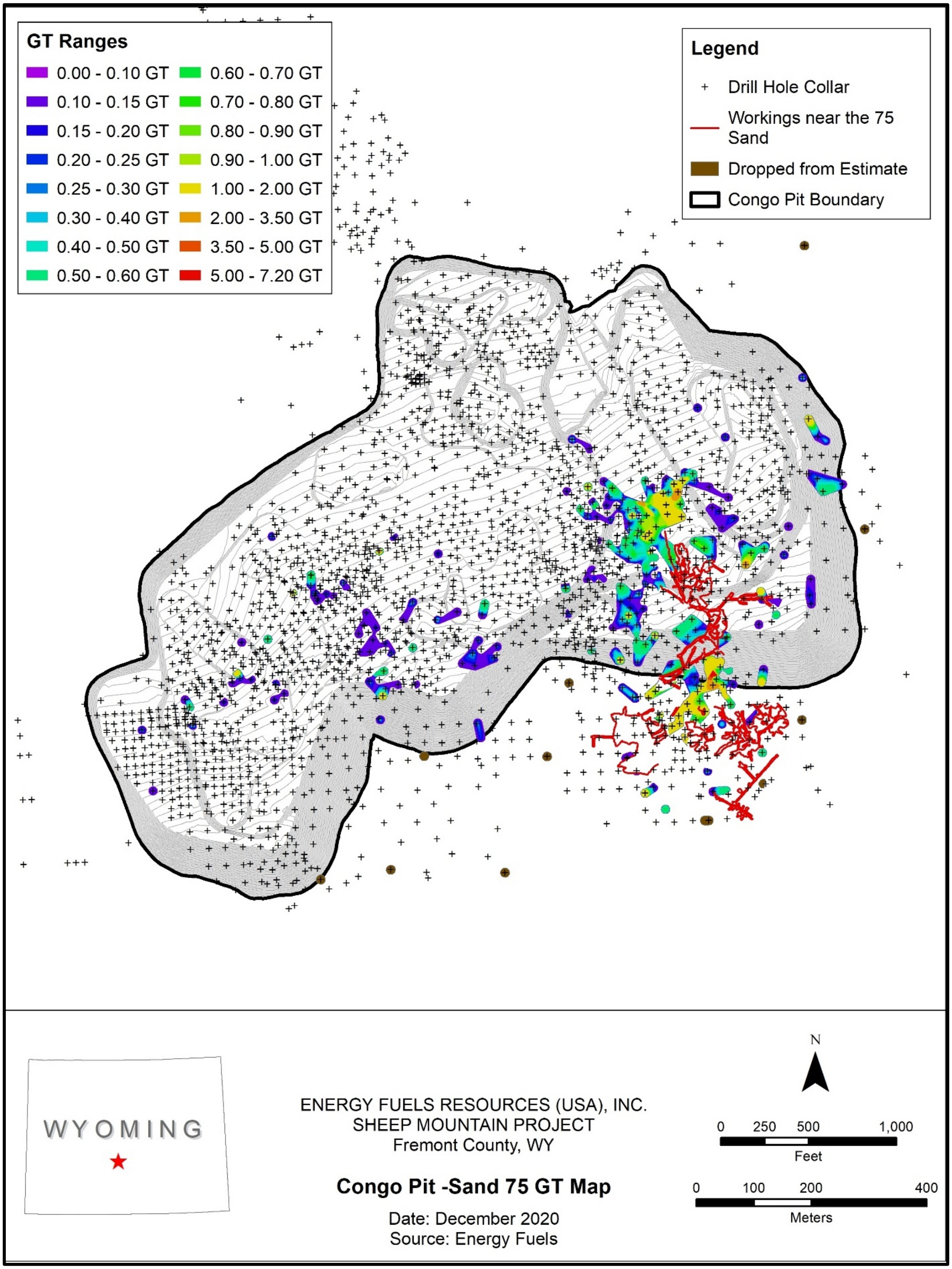



**Figure 14-8. Congo Pit GT Contours - Sand 75**

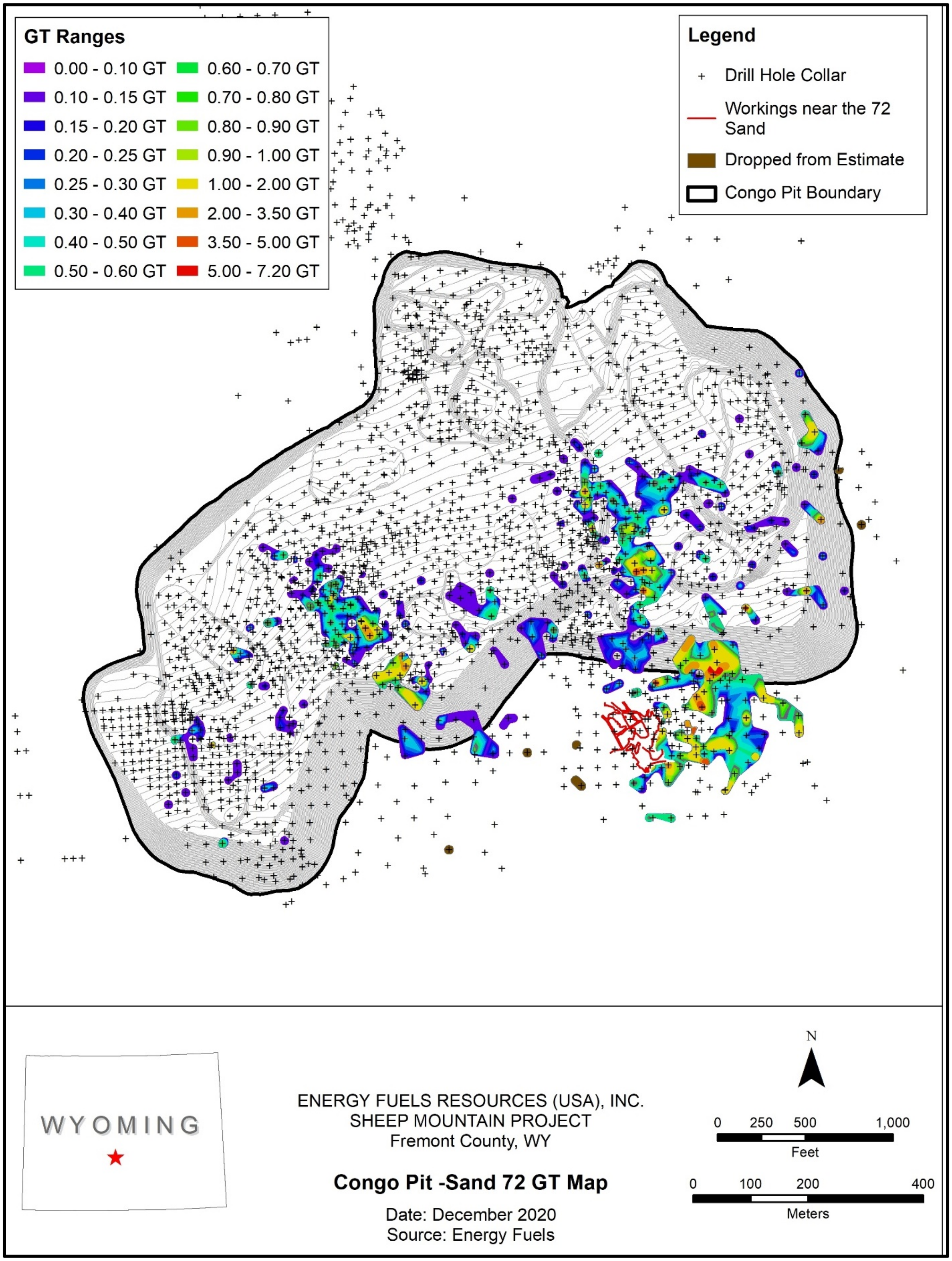



**Figure 14-9. Congo Pit GT Contours - Sand 72**

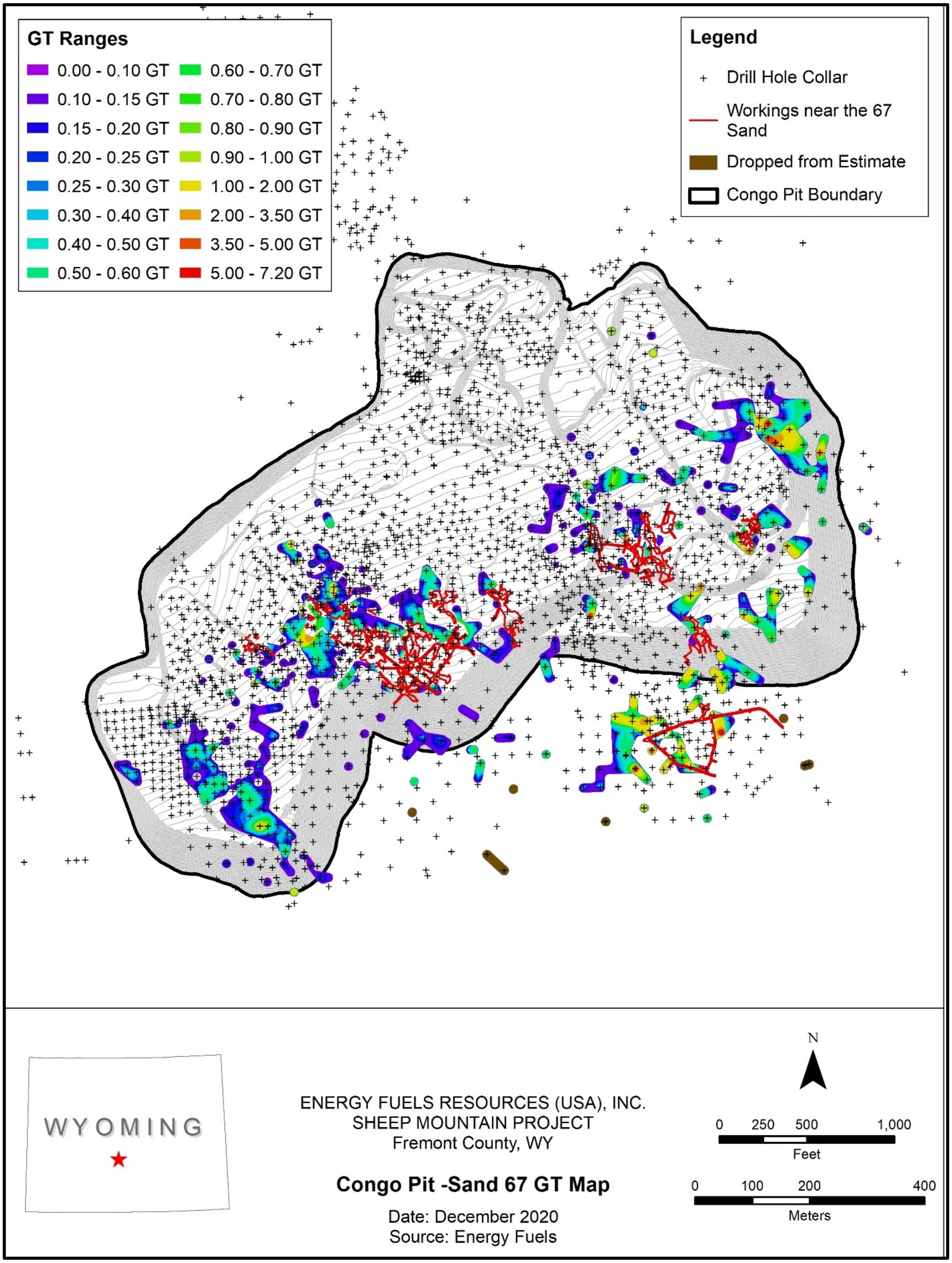



**Figure 14-10. Congo Pit GT Contours - Sand 67**

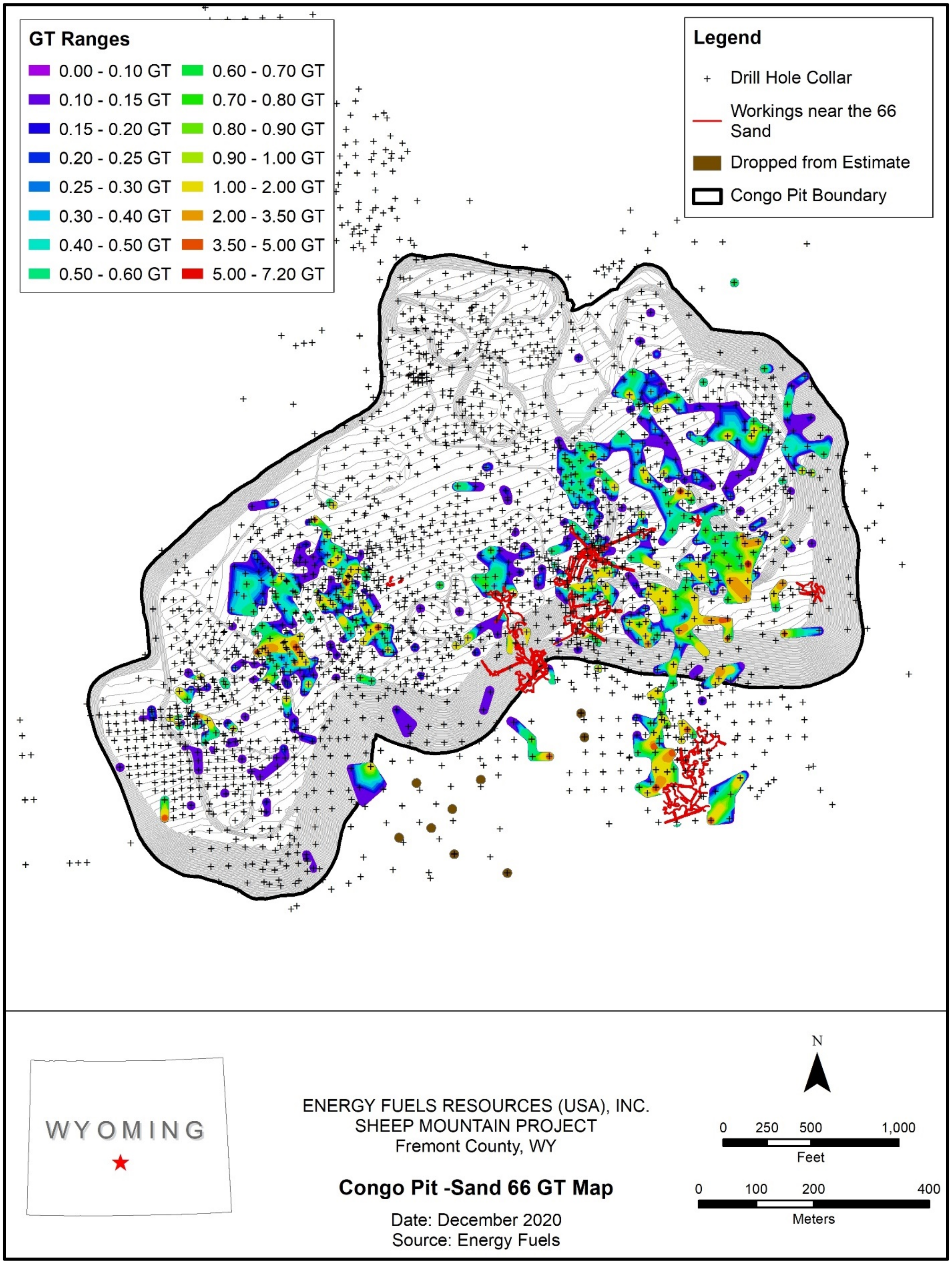



**Figure 14-11. Congo Pit GT Contours - Sand 66**

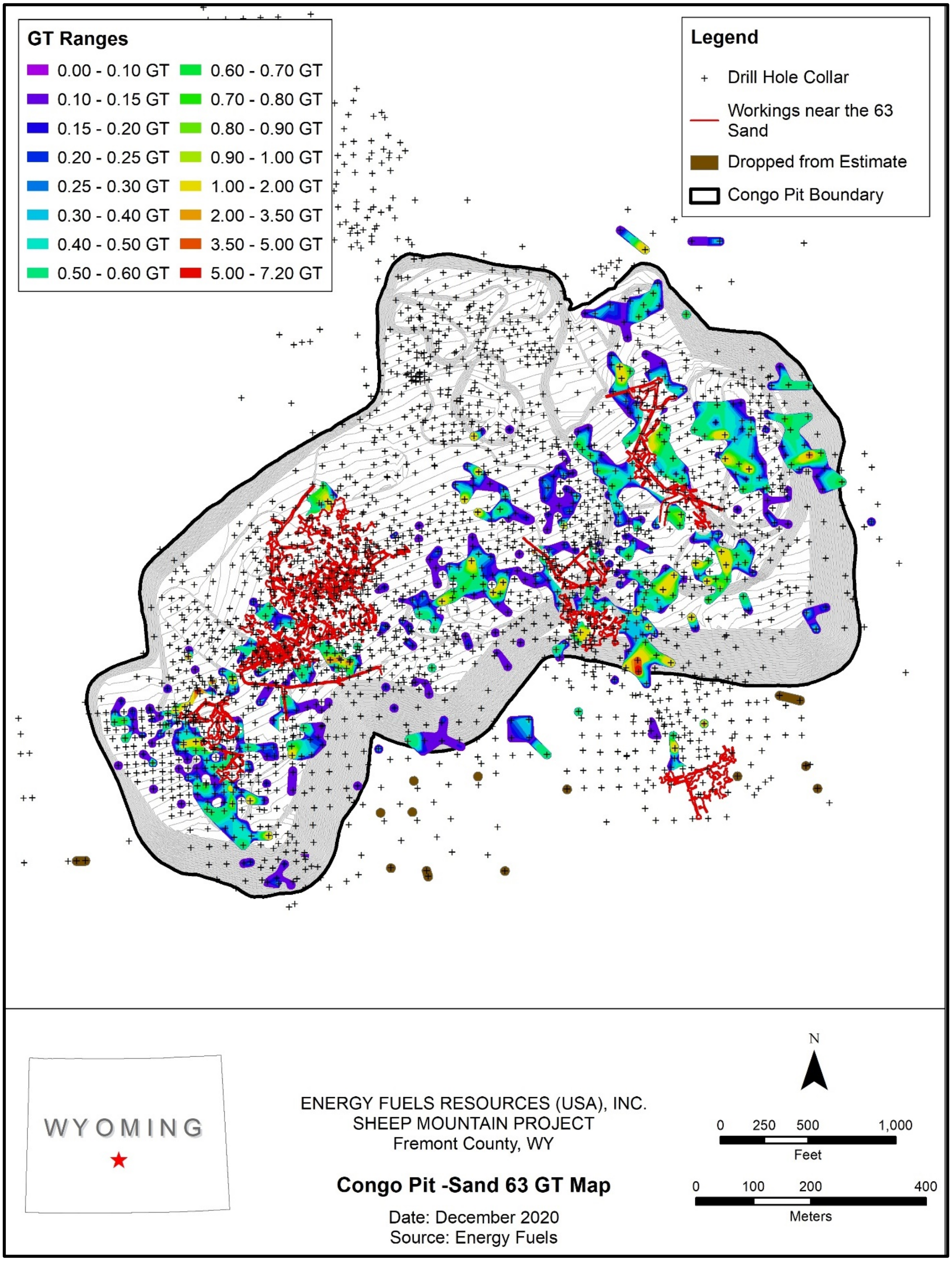



**Figure 14-12. Congo Pit GT Contours - Sand 63**

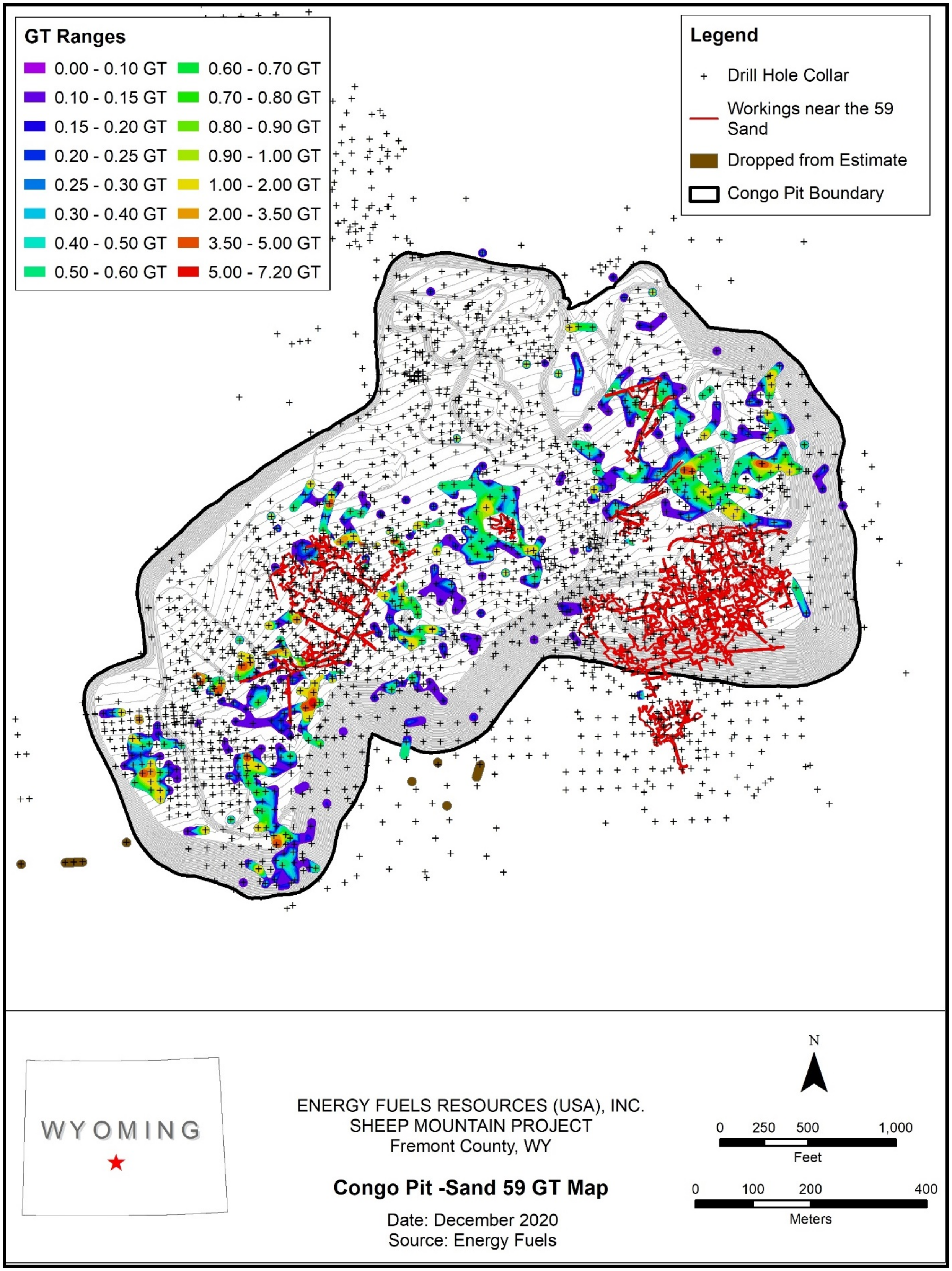



**Figure 14-13. Congo Pit GT Contours - Sand 59**

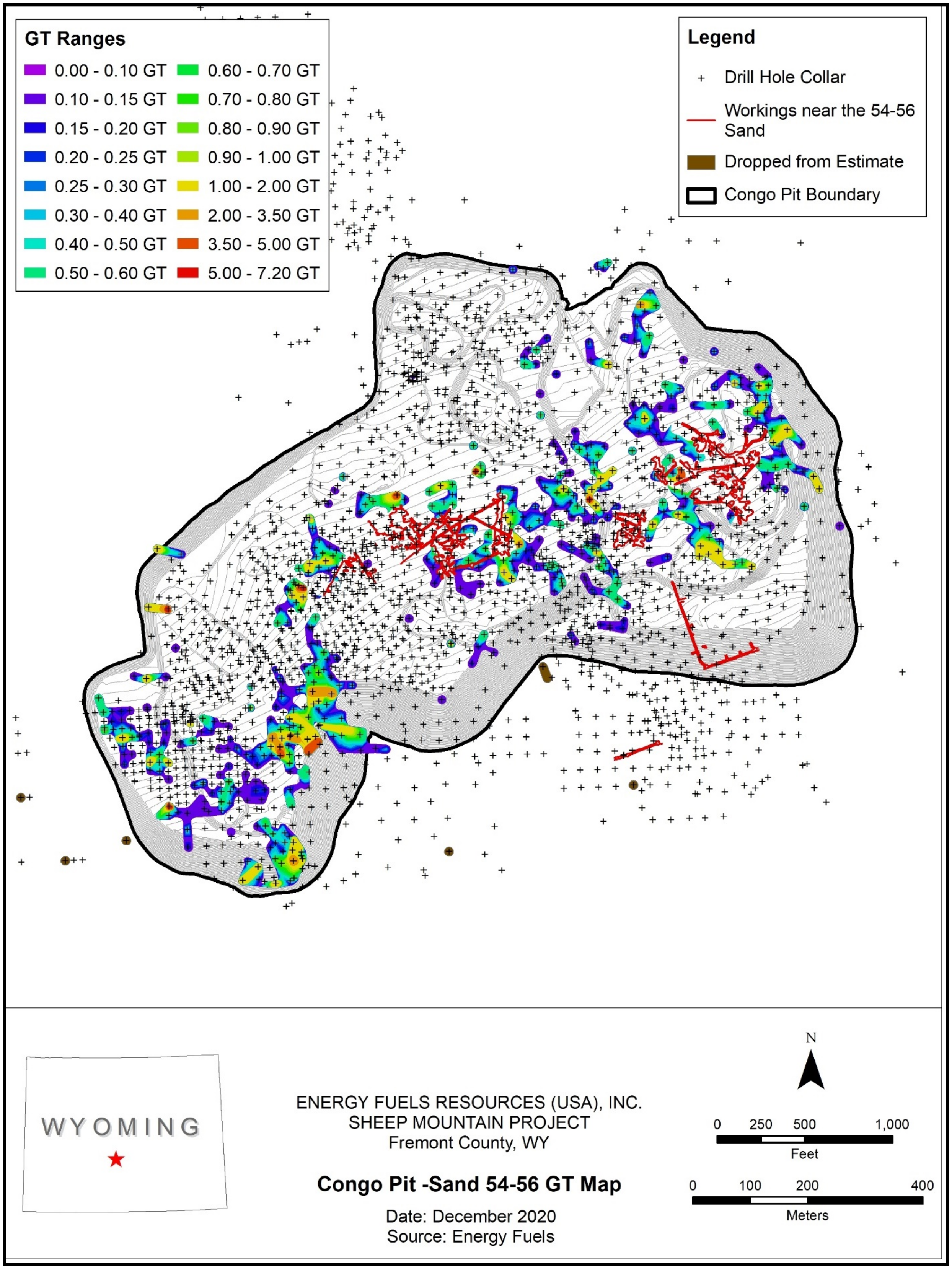



**Figure 14-14. Congo Pit GT Contours - Sand 54-56**

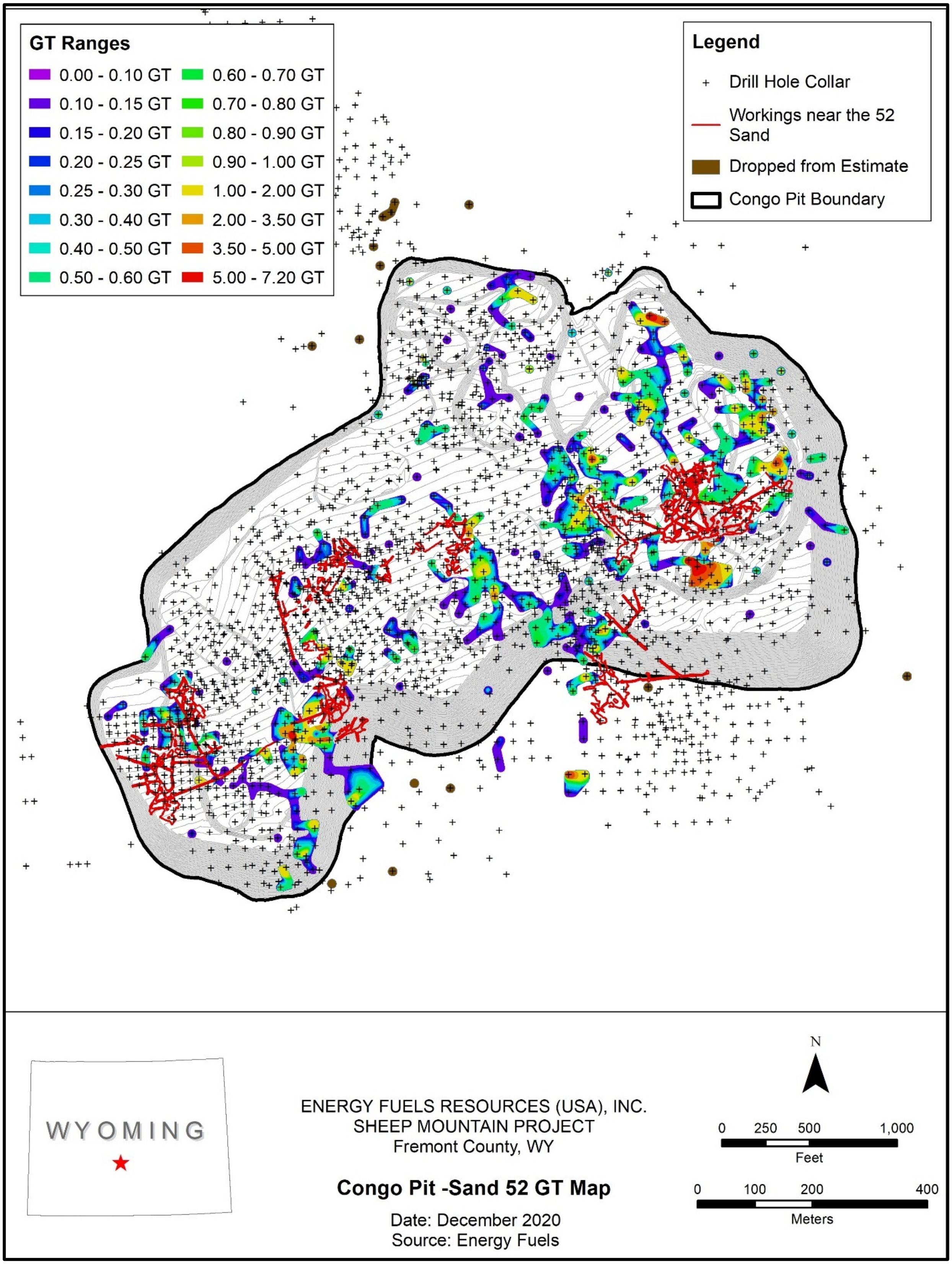



**Figure 14-15. Congo Pit GT Contours - Sand 52**

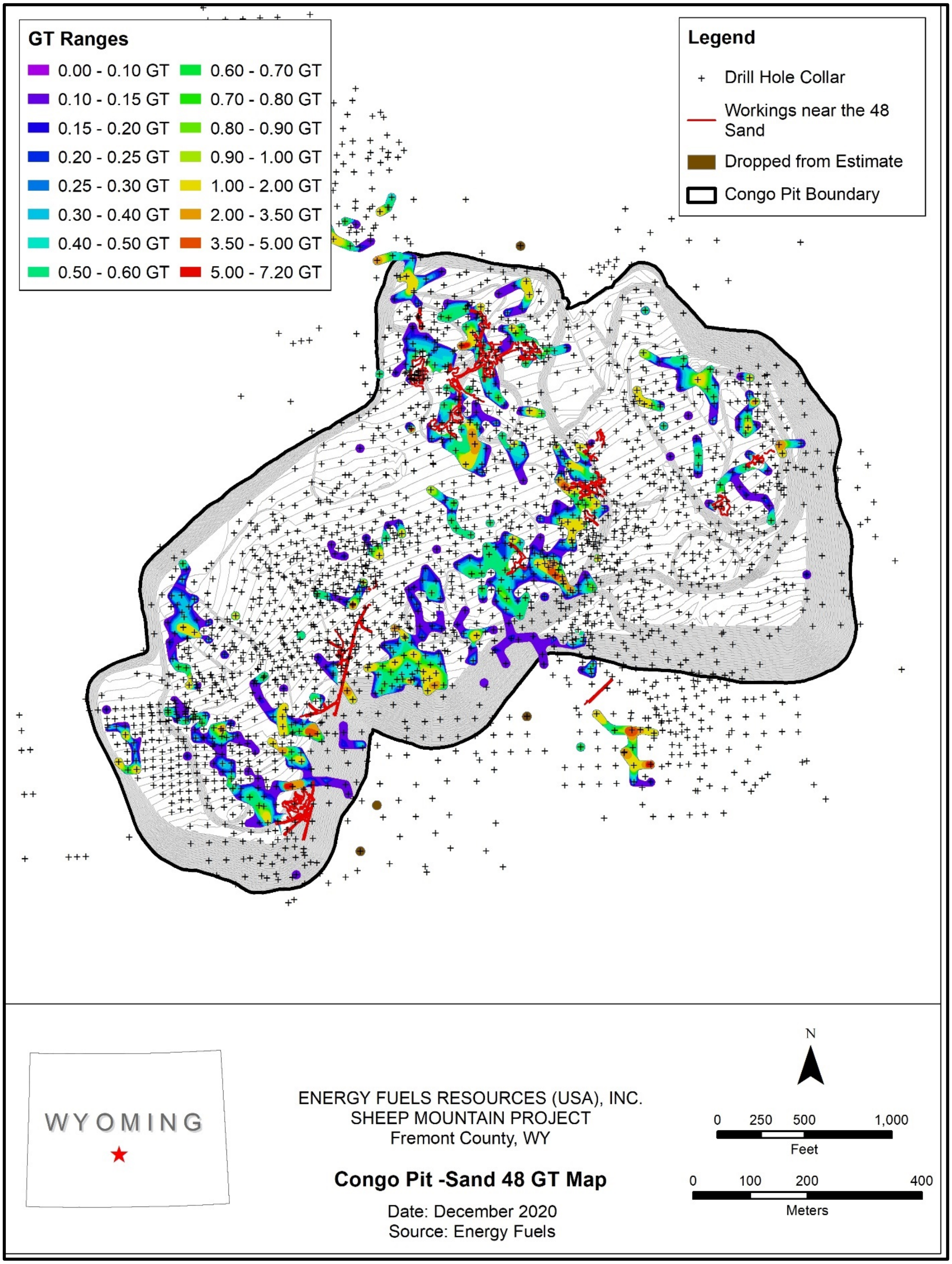



**Figure 14-16. Congo Pit GT Contours - Sand 48**

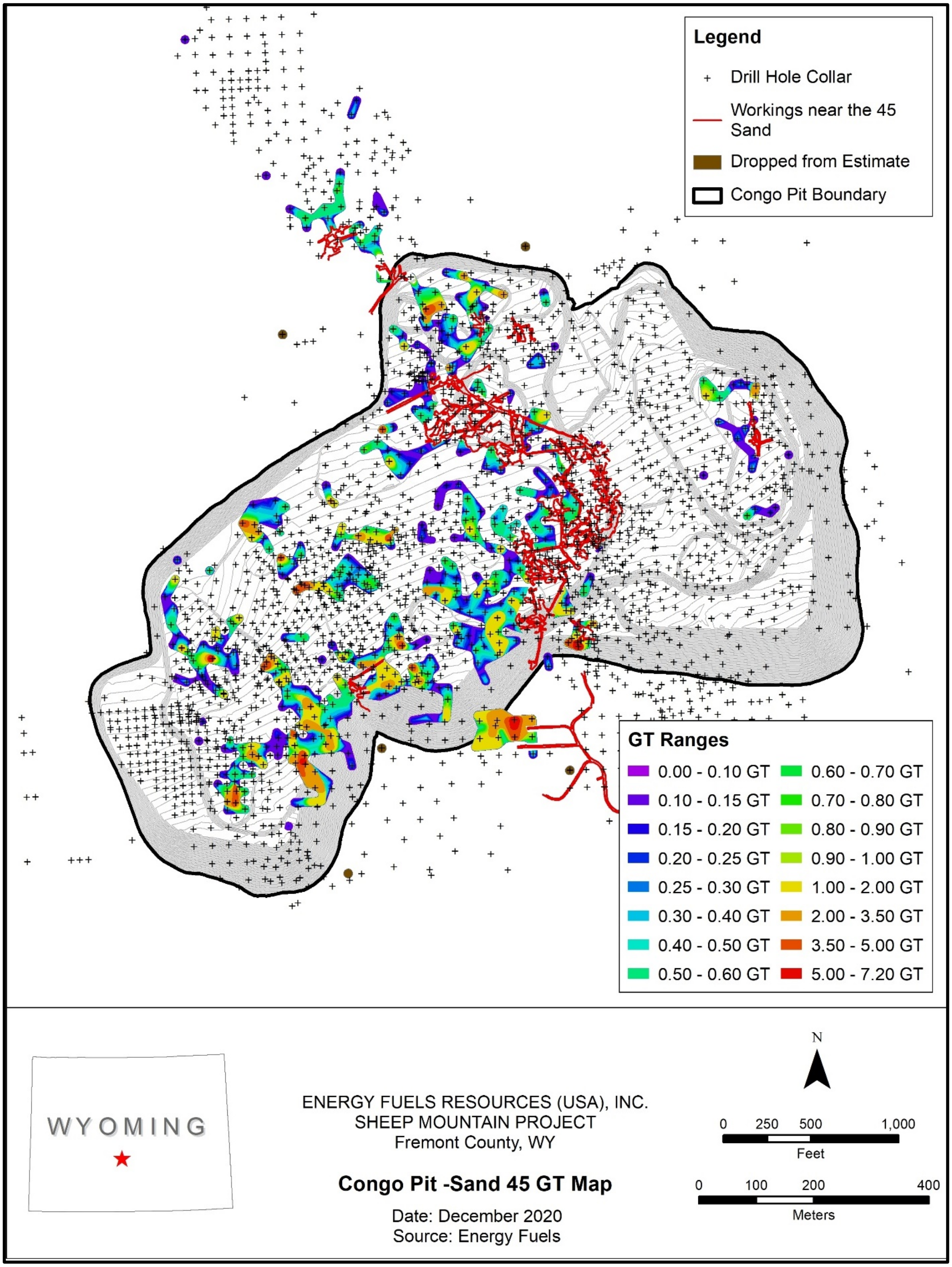



**Figure 14-17. Congo Pit GT Contours - Sand 4**

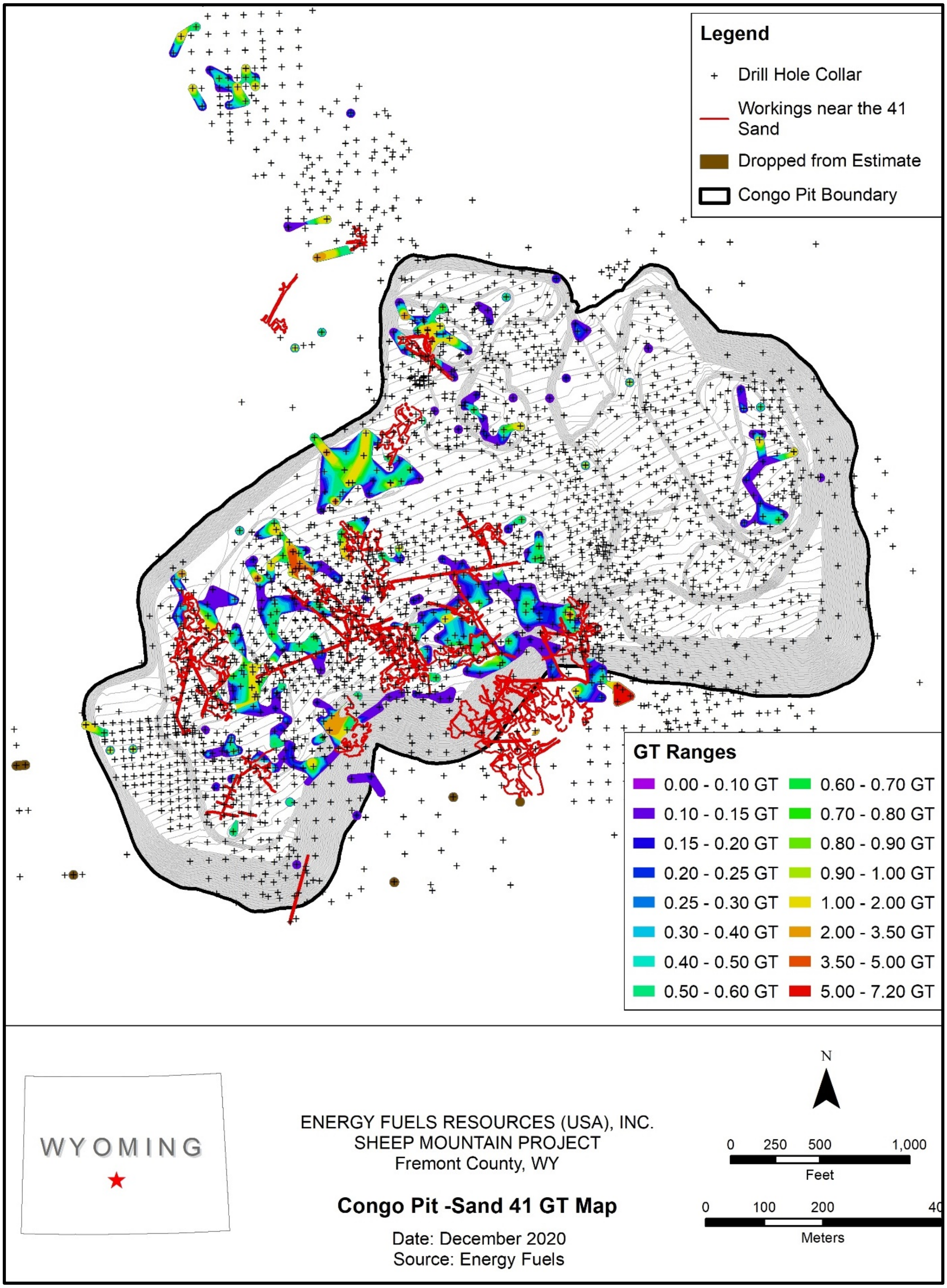



**Figure 14-18. Congo Pit GT Contours - Sand 41**

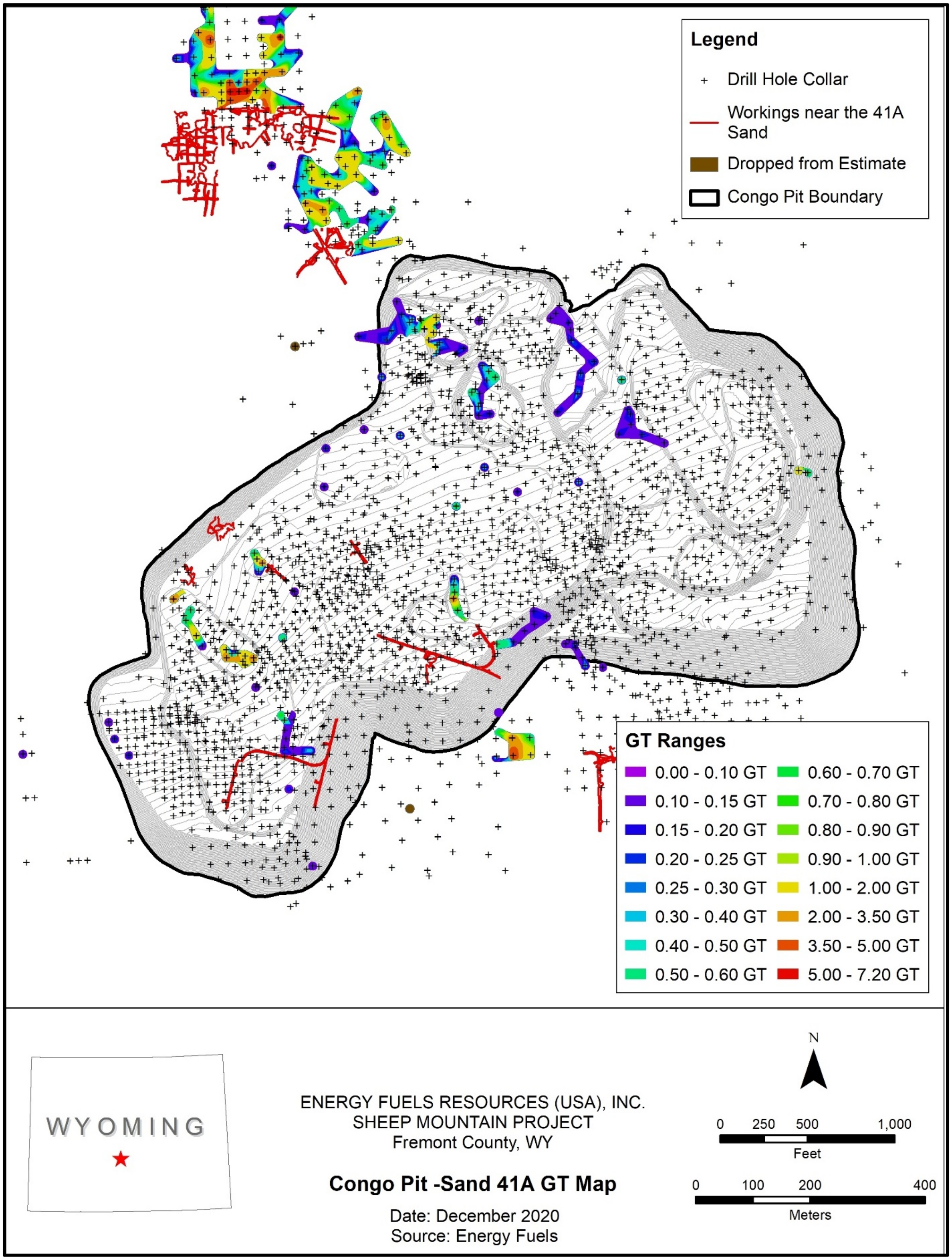



**Figure 14-19. Congo Pit GT Contours - Sand 41A**

**Sheep Underground**

Figures 14-20 through Figure 14-36 show the GT contour maps for the Sheep Underground. They are separated into individual sand maps that show mineral resource areas and the areas of historic mining.

The GT, diluted to a minimum 6-foot mining thickness from the mineralized envelope for each drill hole and each horizon, was plotted in AutoCAD™. If the thickness exceeded 6 feet no dilution was added. The diluted thickness of mineralization for each drill hole was also plotted. Mineral resource estimates account for the deletion of mined areas within the resource model estimated from surface drilling. The total reported mined tonnage from the Sheep I underground mine was 275,000 tons containing 522,500 pounds of $U_3O_8$ and an average grade of 0.095% $U_3O_8$. However, the portions of the current mineral resource estimates which were within the defined previously mined area was only an estimated 62,618 tons of material containing 160,666 pounds of $eU_3O_8$ and an average grade of 0.128% $eU_3O_8$. From review of the Sheep, I and II as-built mine plans, it was apparent that little or no material was mined at Sheep II and that only development work was completed. Further, it was apparent at the Sheep I mine that many of the mined areas were located by underground delineation drilling rather than by surface drilling. The mine history clearly shows that underground development drilling and sampling expanded the resource as compared to that which could be projected from the surface drilling alone.

For mine planning purposes, a three-dimensional block model was created from the Sheep GT, geologic and mineralized envelope models. The modeling utilized an automated routine that assigned the thickness of mineralization, GT, and mineralized elevation reflected by their respective contours, to the centroids of a uniform 25 x 25-foot (25'x25') grid. From the thickness and GT contours, average grade, mineralized and waste tonnages, and contained pounds was calculated and assigned to each block. Each 25'x25' block was then evaluated based on its grade and thickness for mine planning and scheduling.

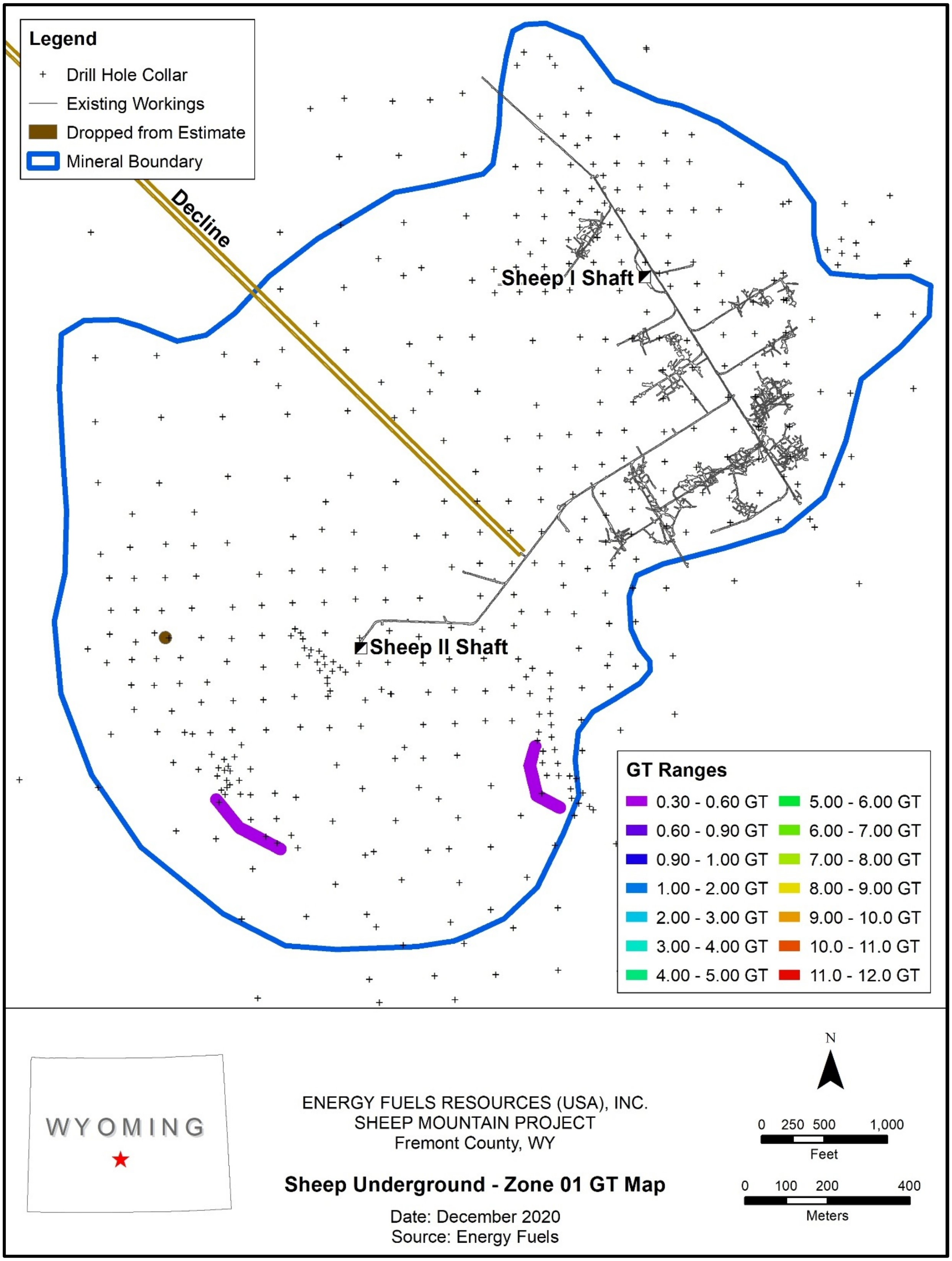



**Figure 14-20. Sheep Underground GT Contours - Zone 01**

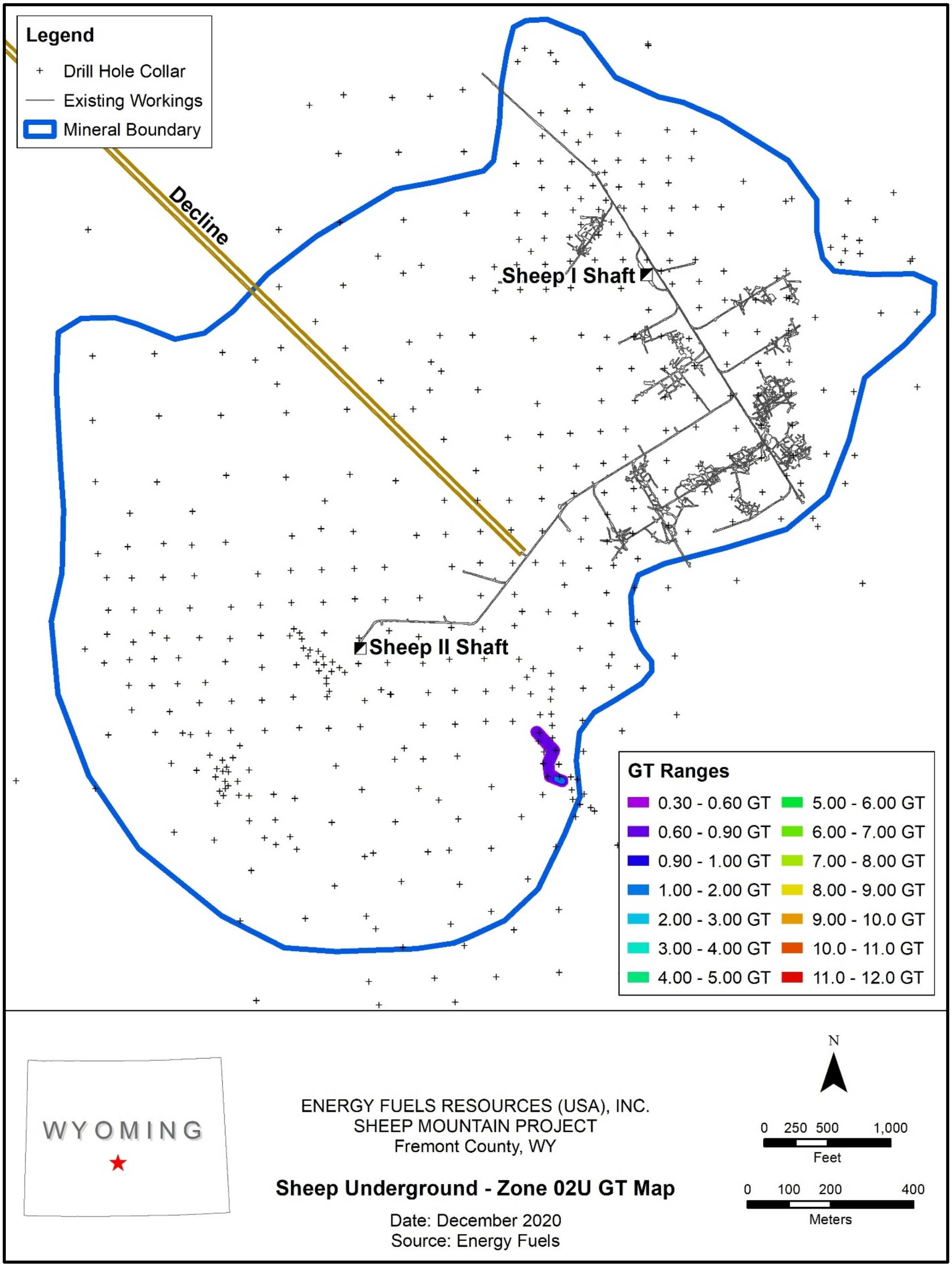



**Figure 14-21. Sheep Underground GT Contours - Zone 02U**

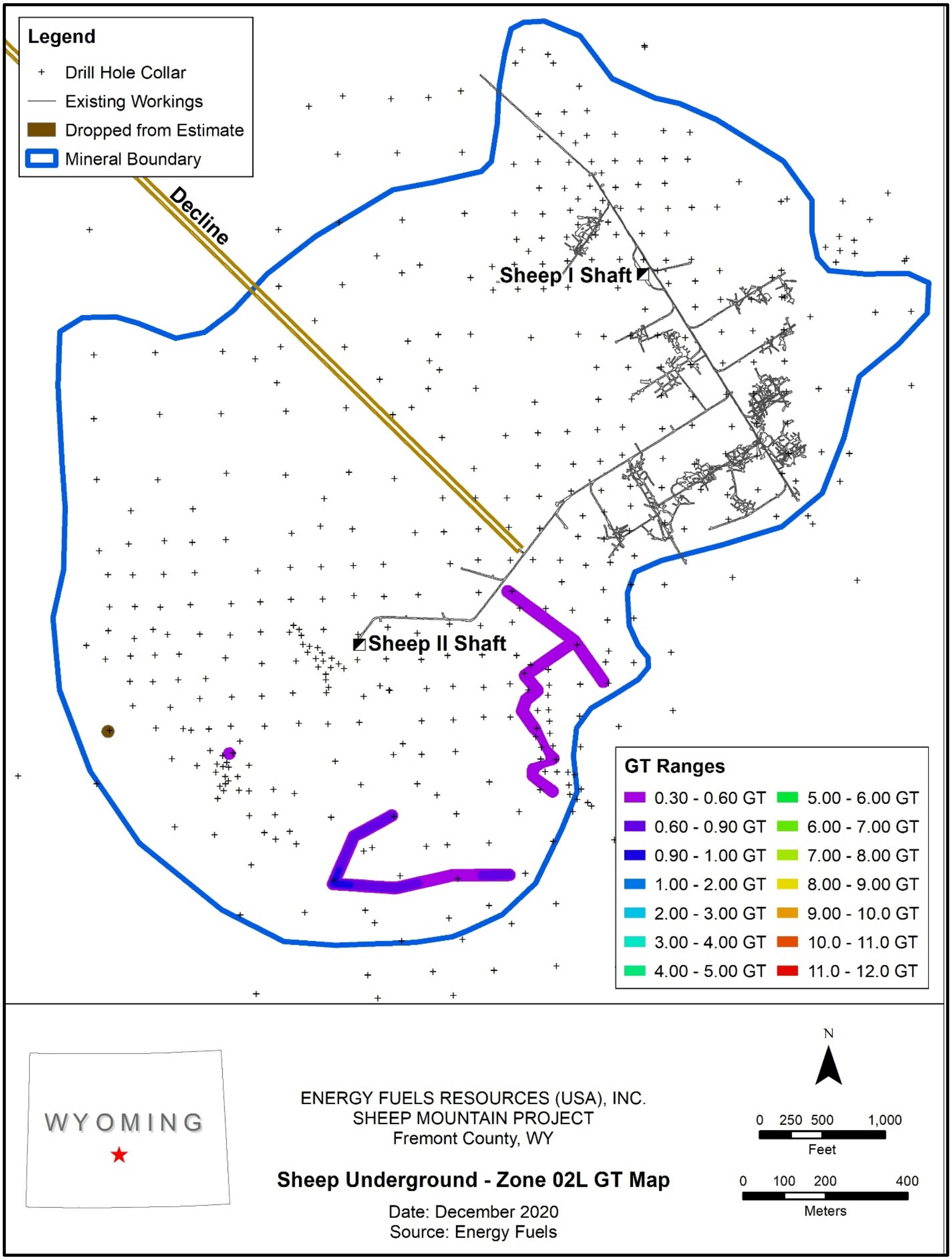



**Figure 14-22. Sheep Underground GT Contours - Zone 02L**

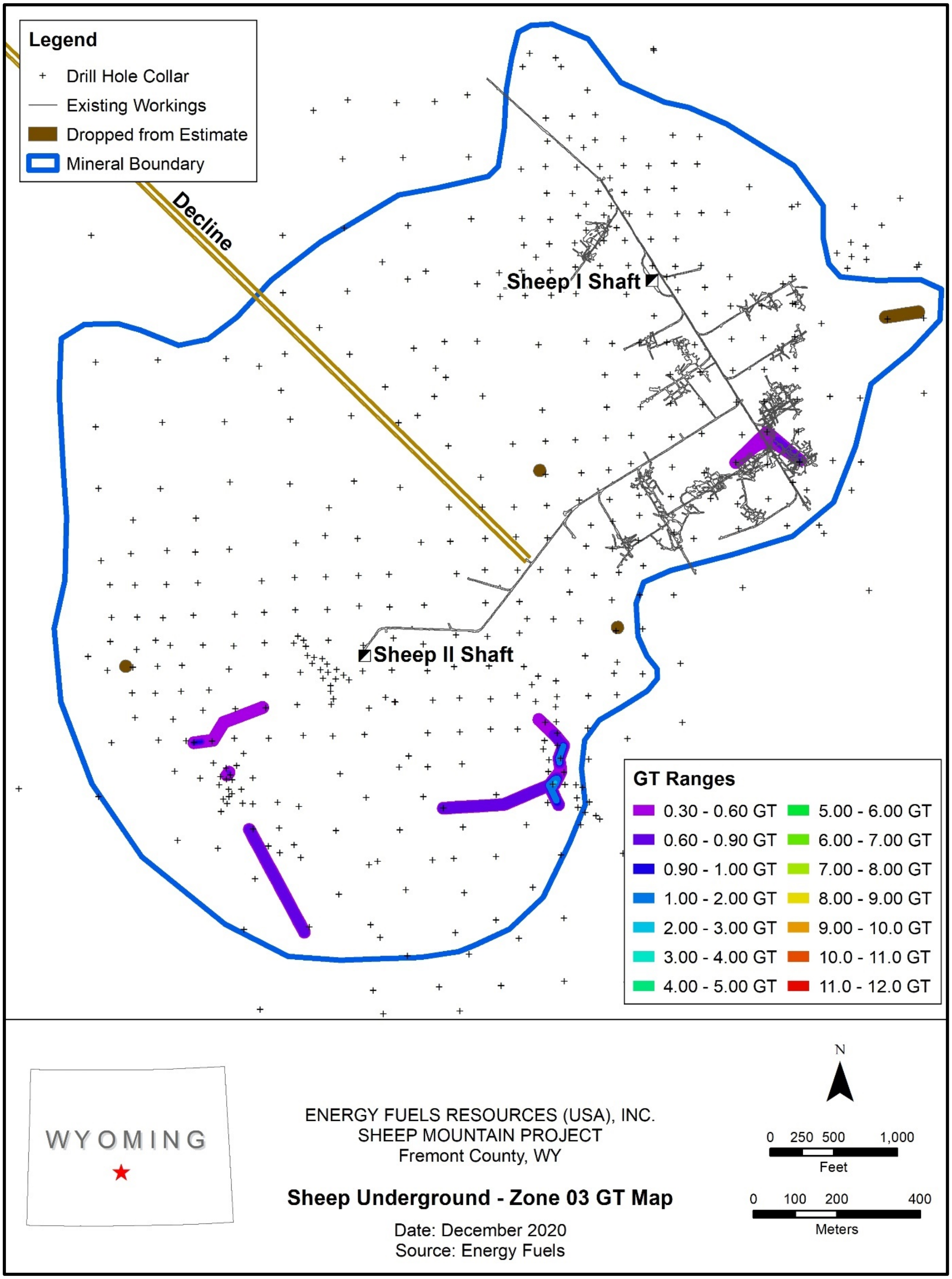



**Figure 14-23. Sheep Underground GT Contours - Zone 03**

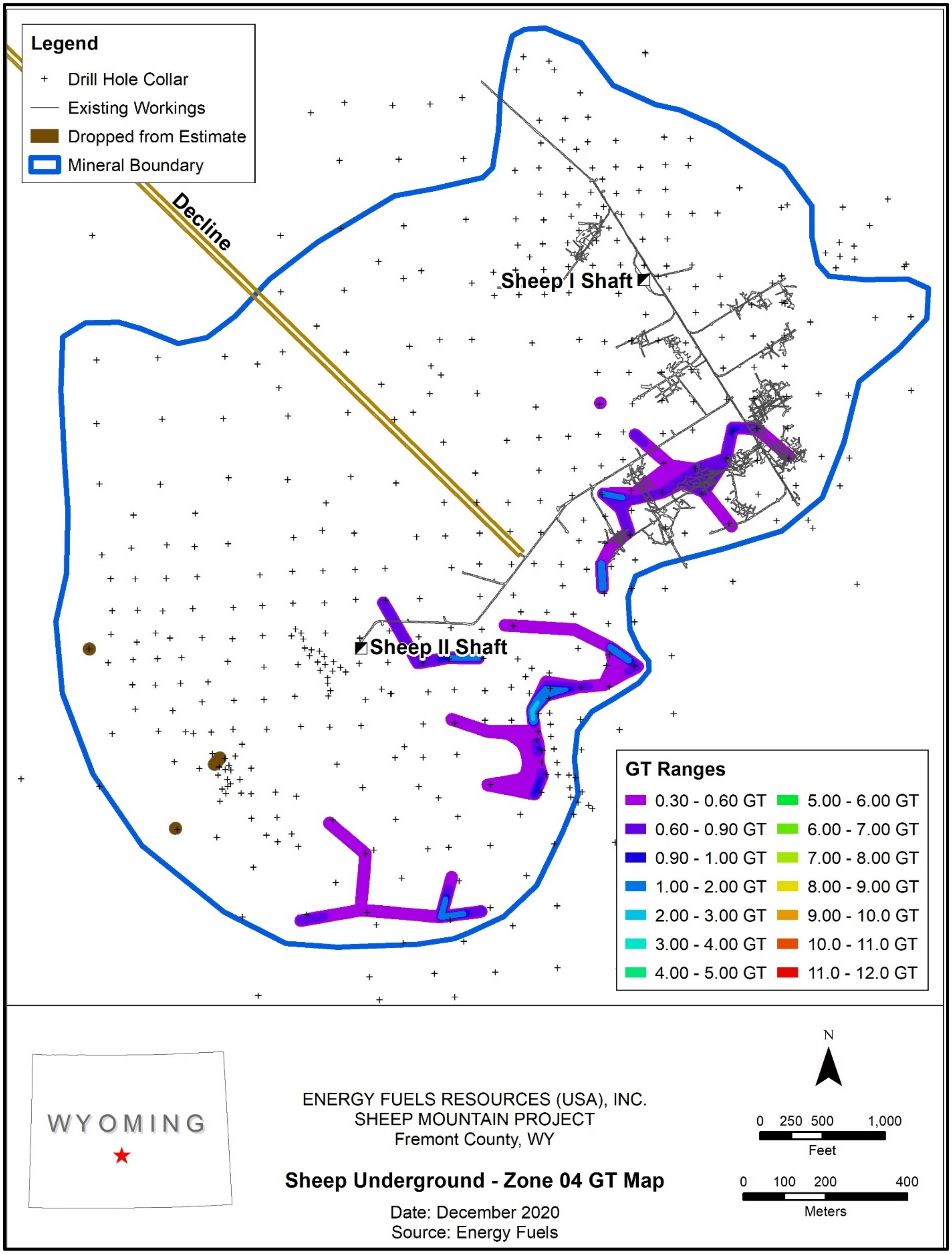



**Figure 14-24. Sheep Underground GT Contours - Zone 04**

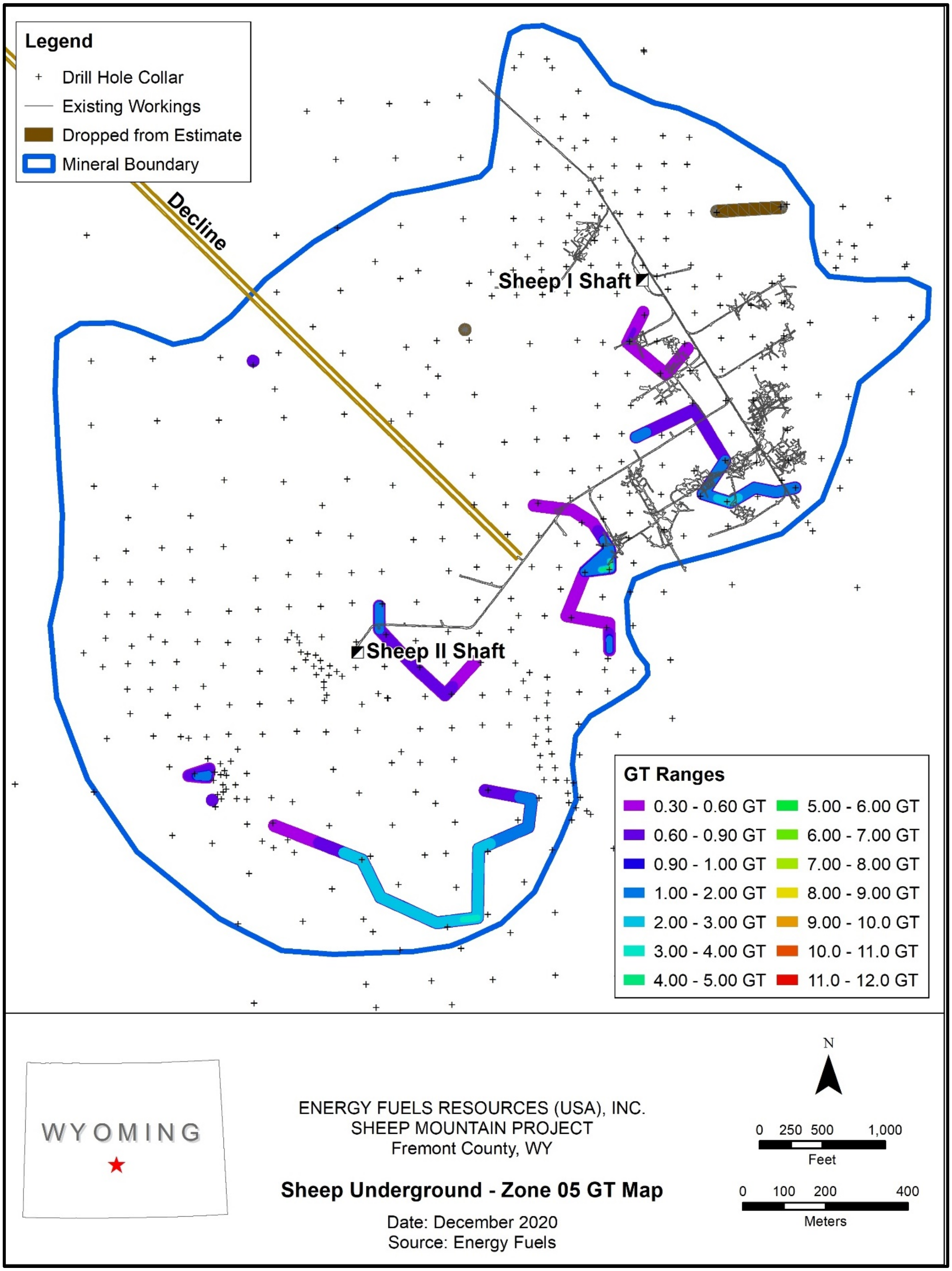



**Figure 14-25. Sheep Underground GT Contours - Zone 05**

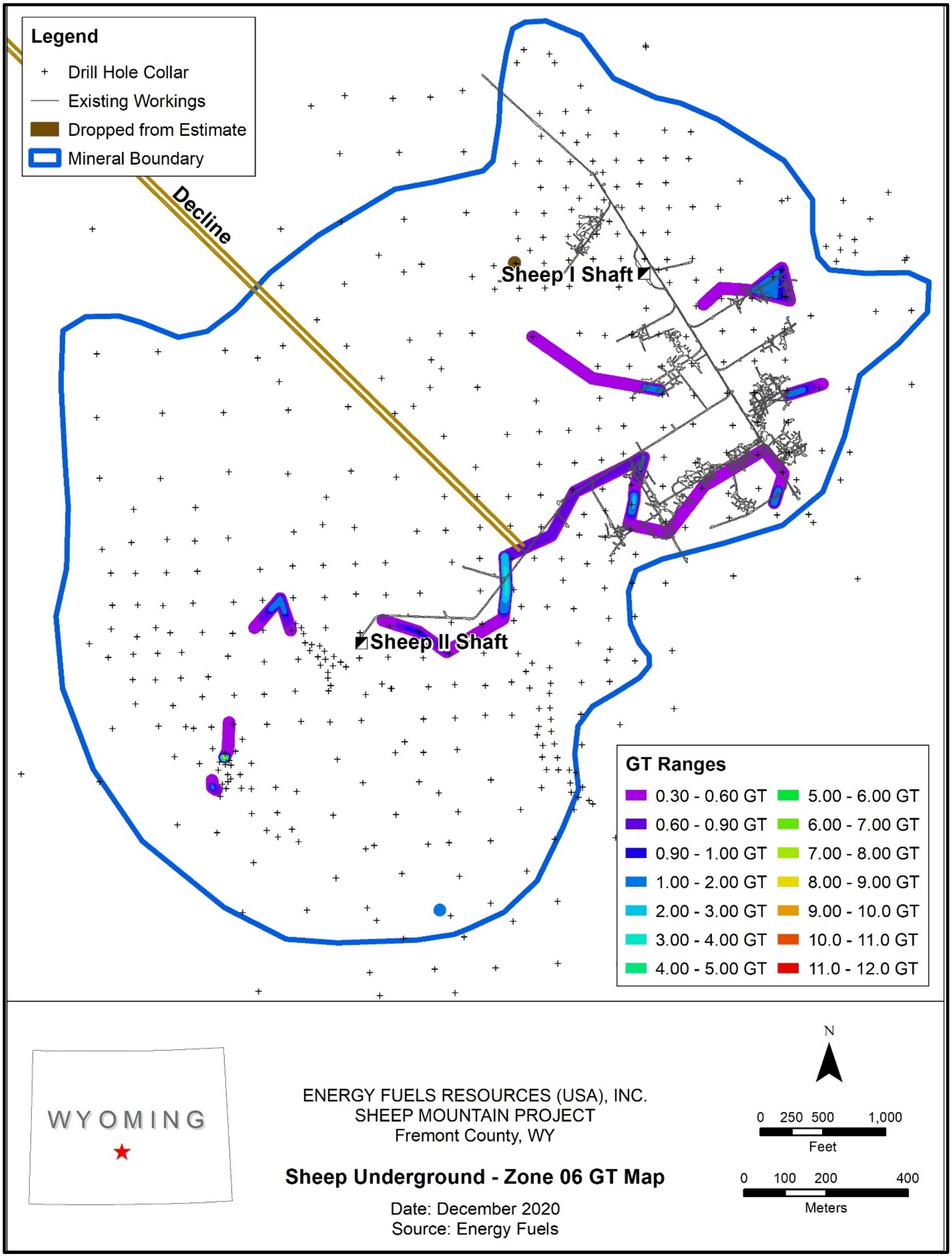



**Figure 14-26. Sheep Underground GT Contours - Zone 06**

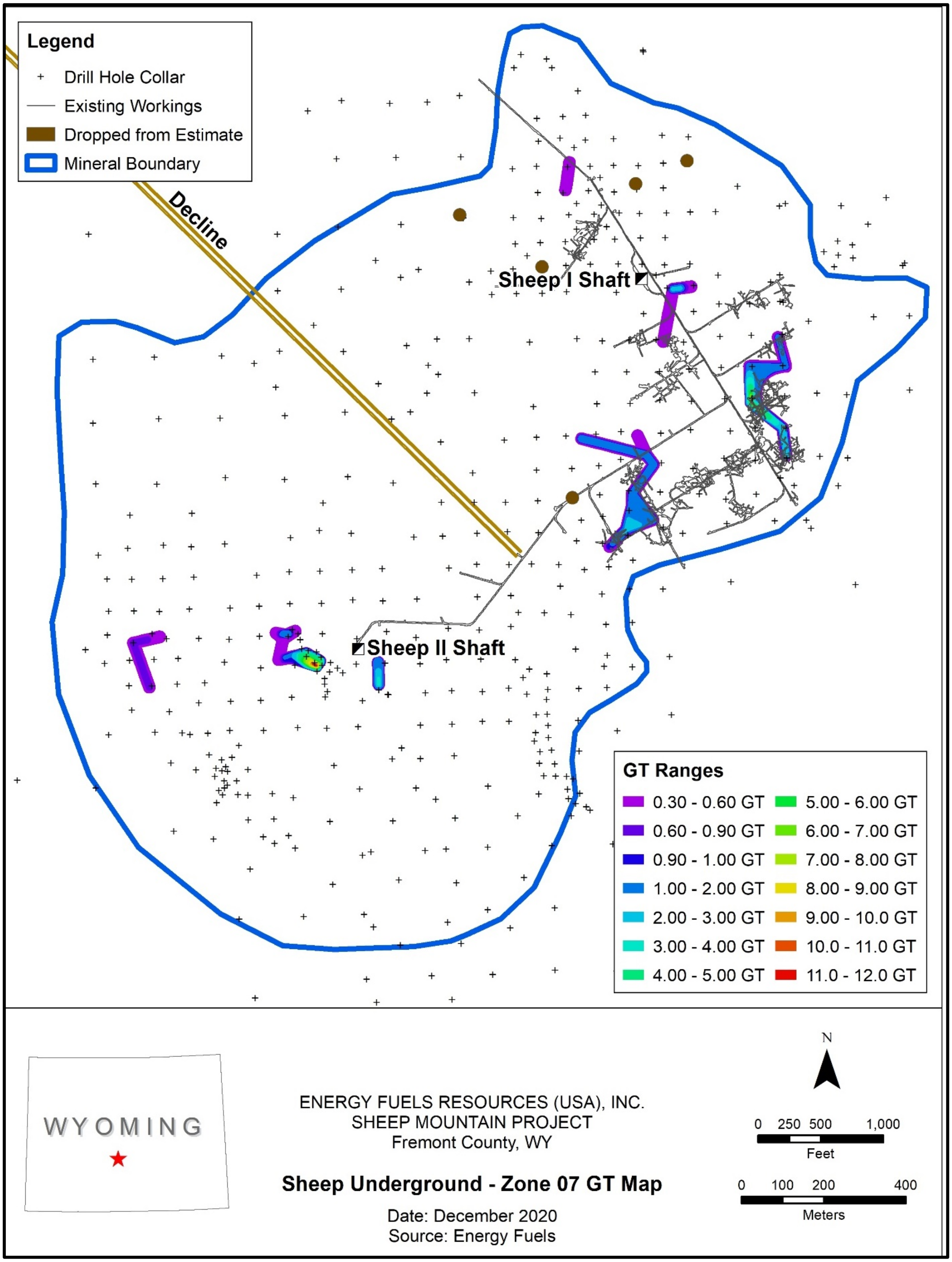



**Figure 14-27. Sheep Underground GT Contours - Zone 07**

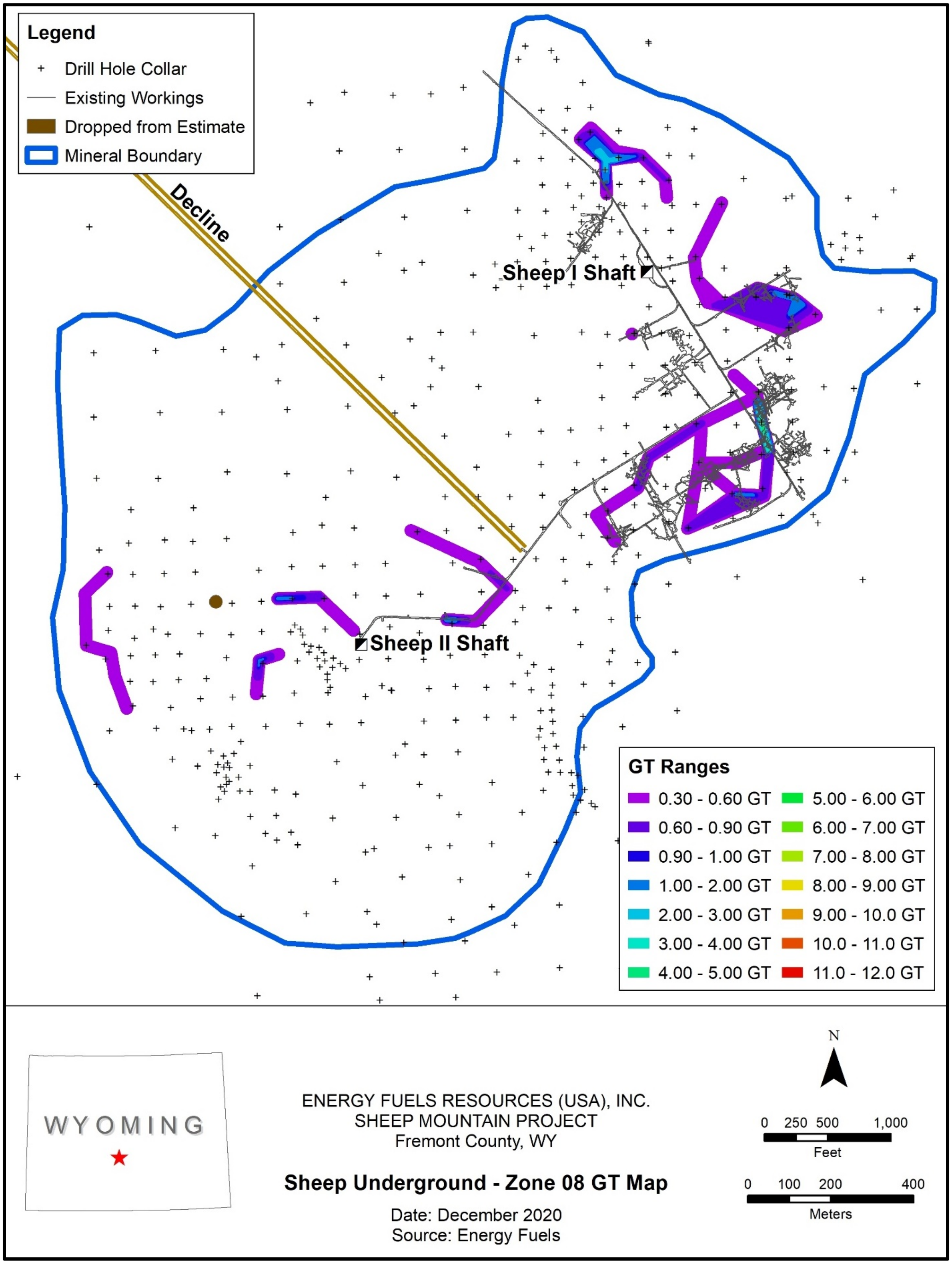



**Figure 14-28. Sheep Underground GT Contours - Zone 08**

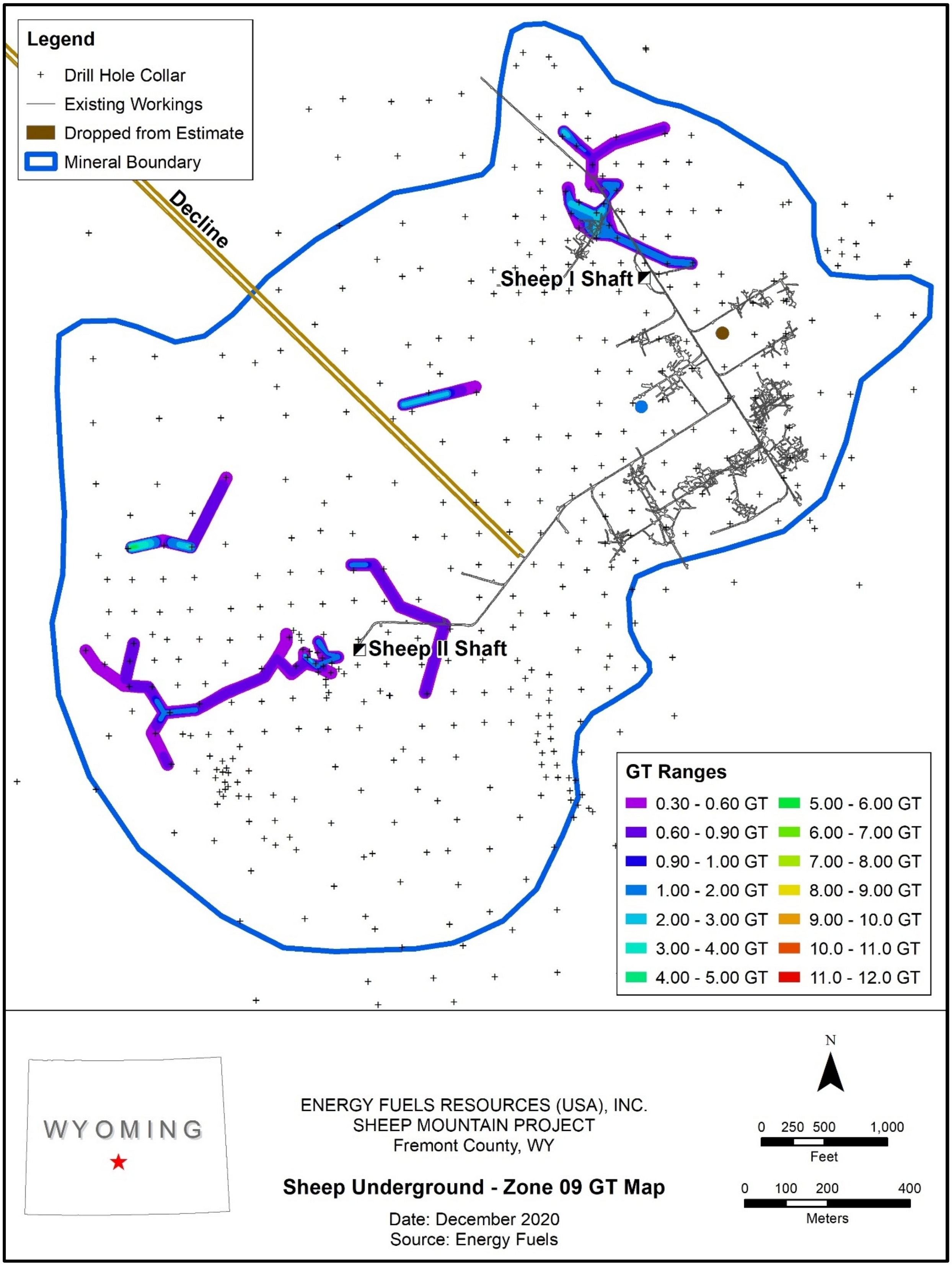



**Figure 14-29. Sheep Underground GT Contours - Zone 09**

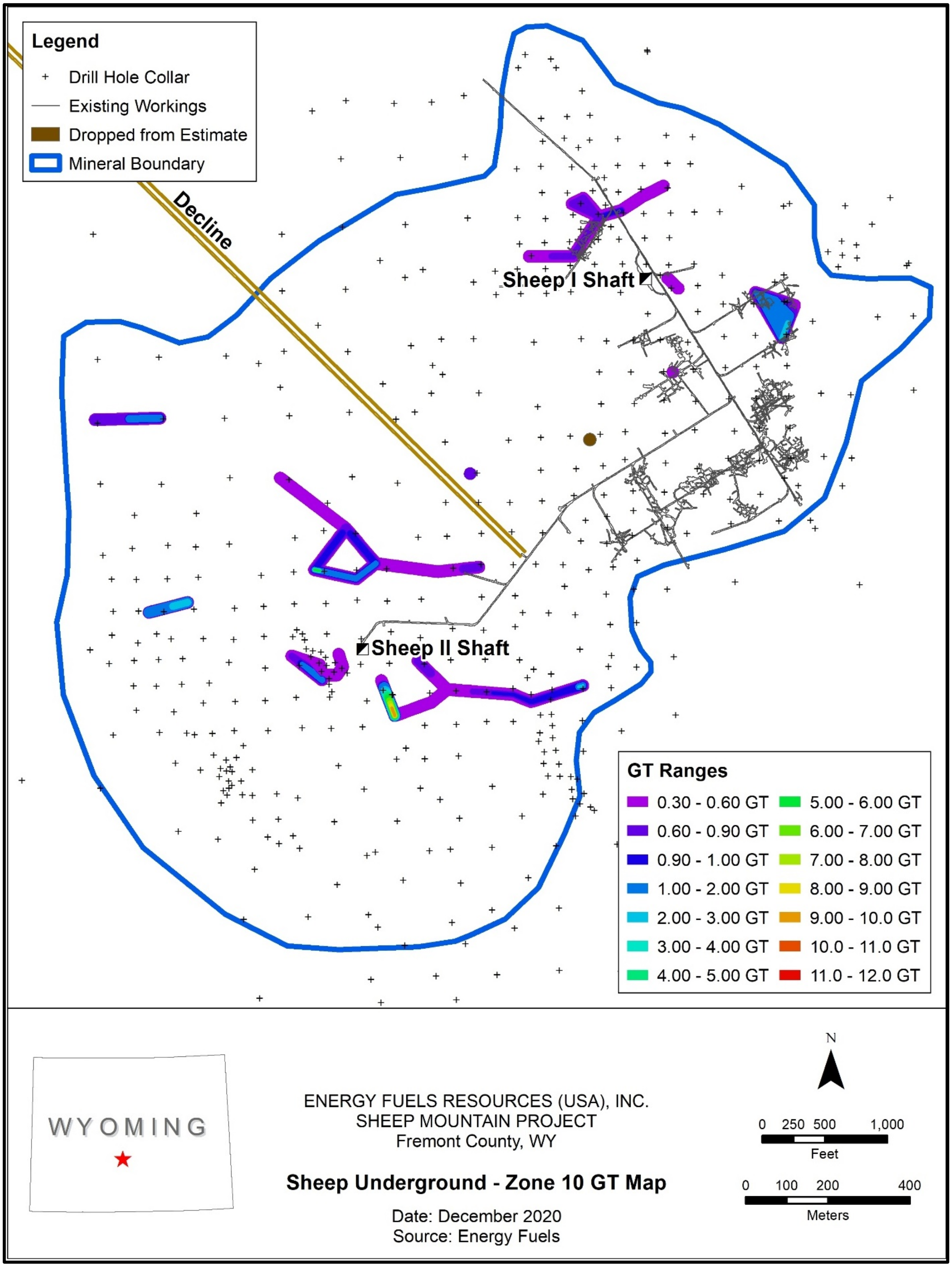



**Figure 14-30. Sheep Underground GT Contours - Zone 10**

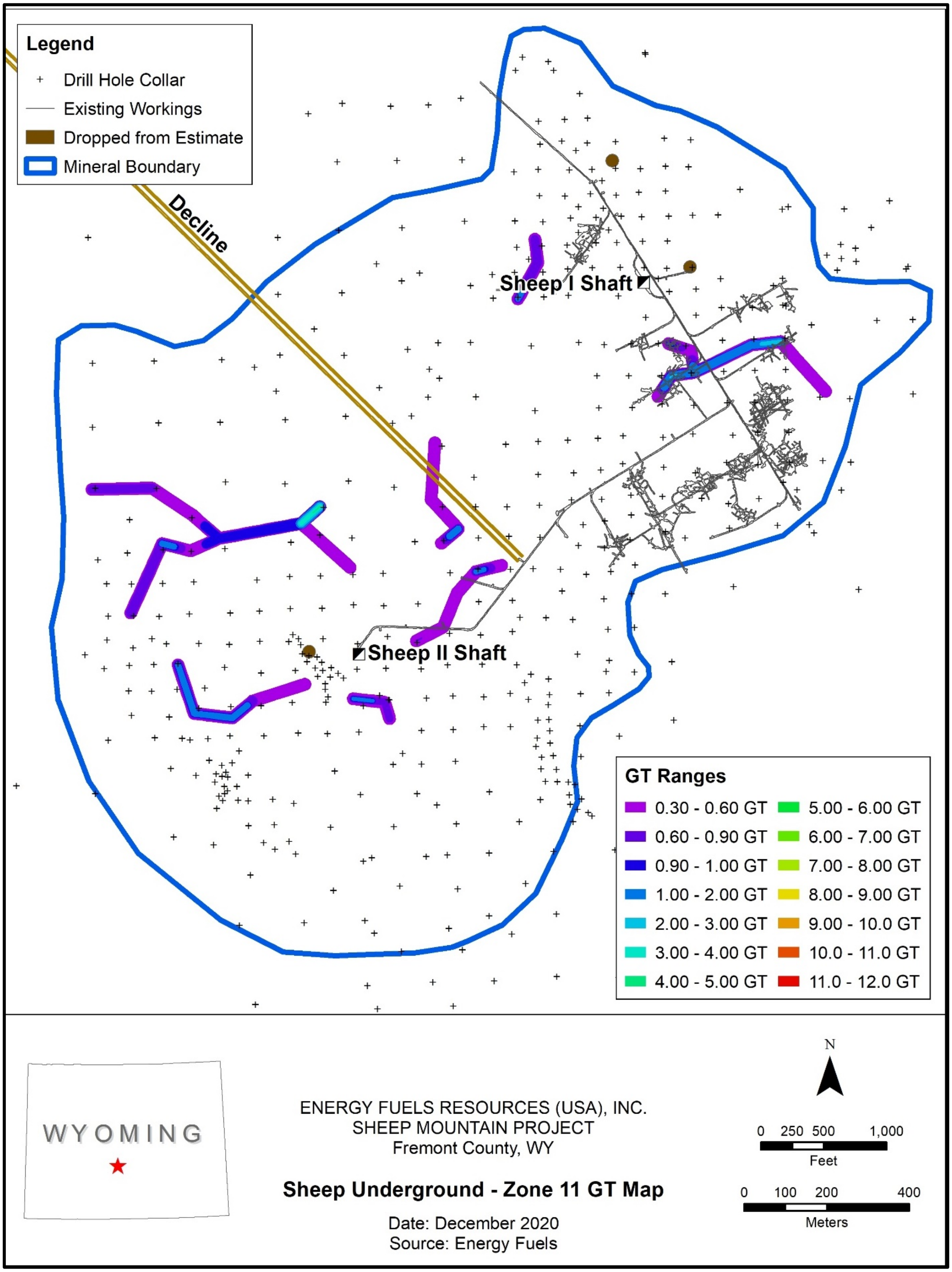



**Figure 14-31. Sheep Underground GT Contours - Zone 11**

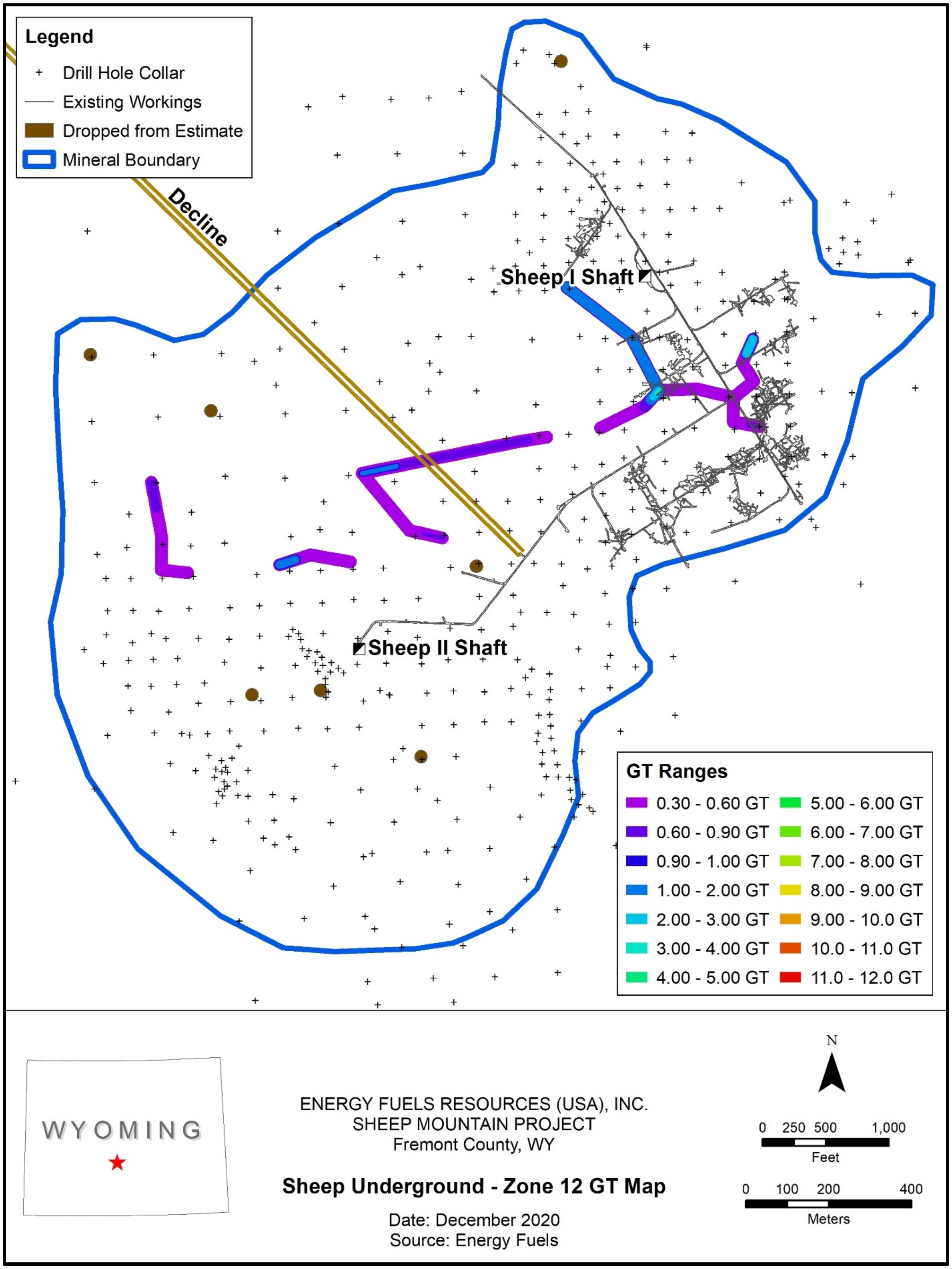



**Figure 14-32. Sheep Underground GT Contours - Zone 12**

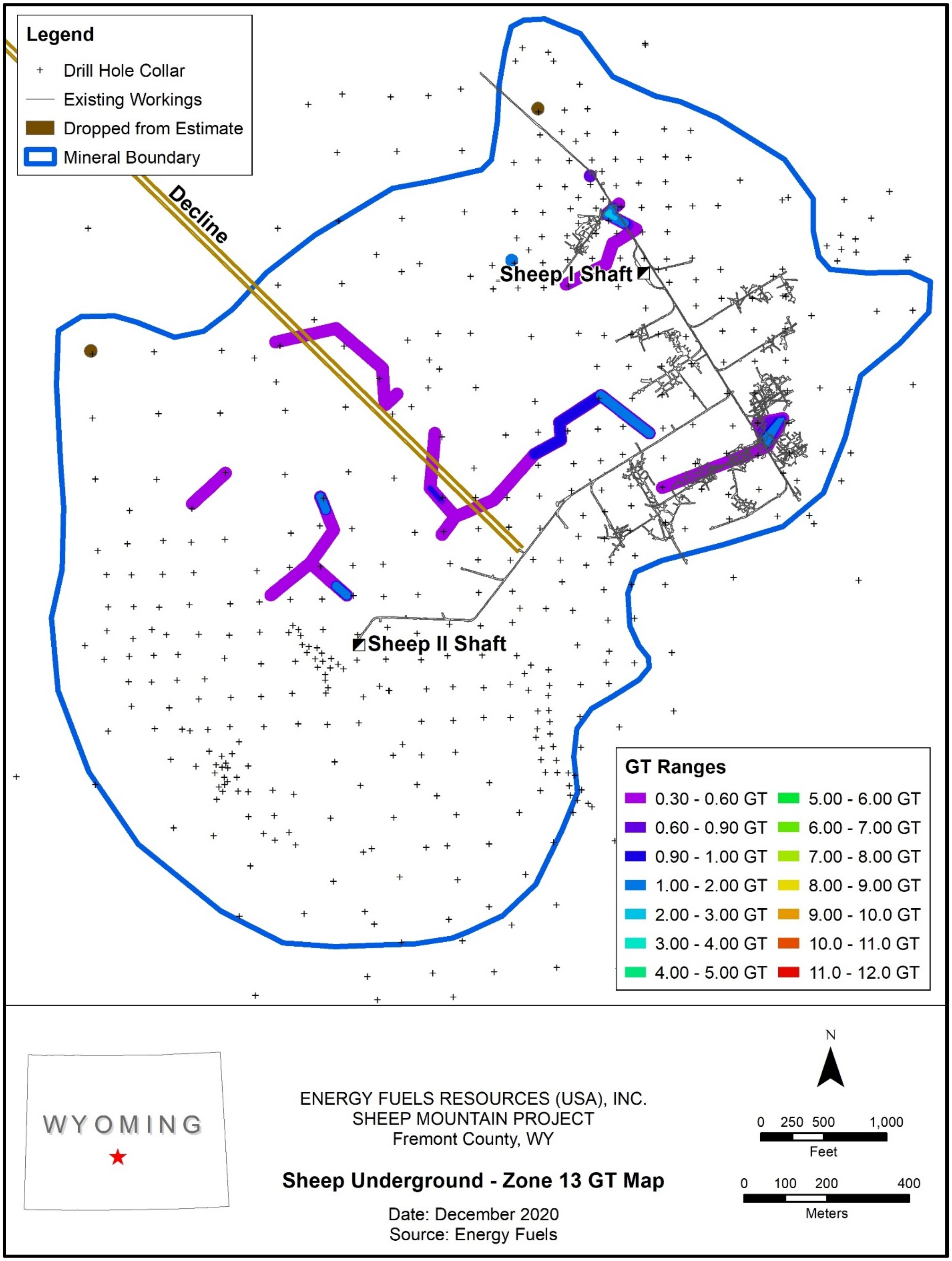



**Figure 14-33. Sheep Underground GT Contours - Zone 13**

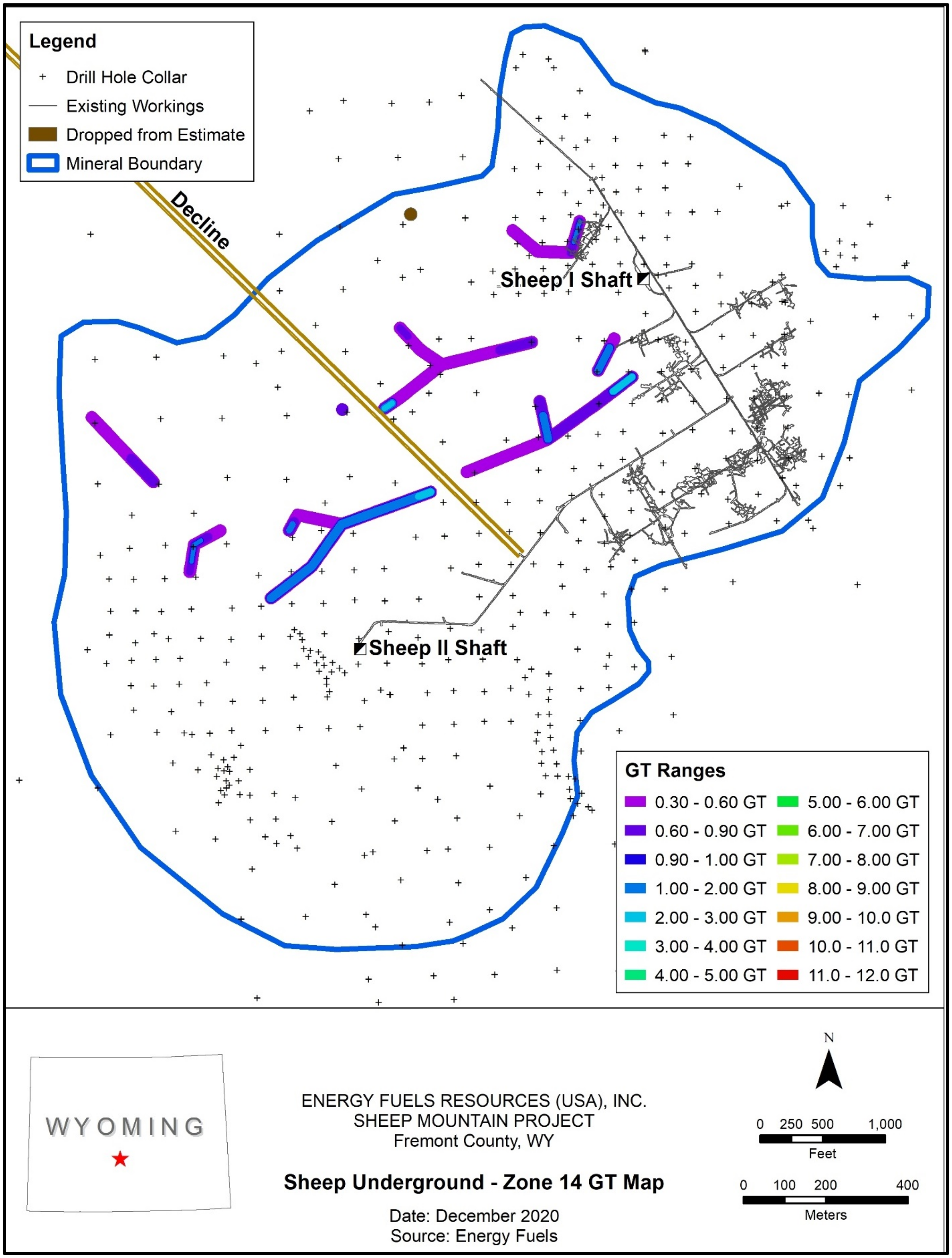



**Figure 14-34. Sheep Underground GT Contours - Zone 14**

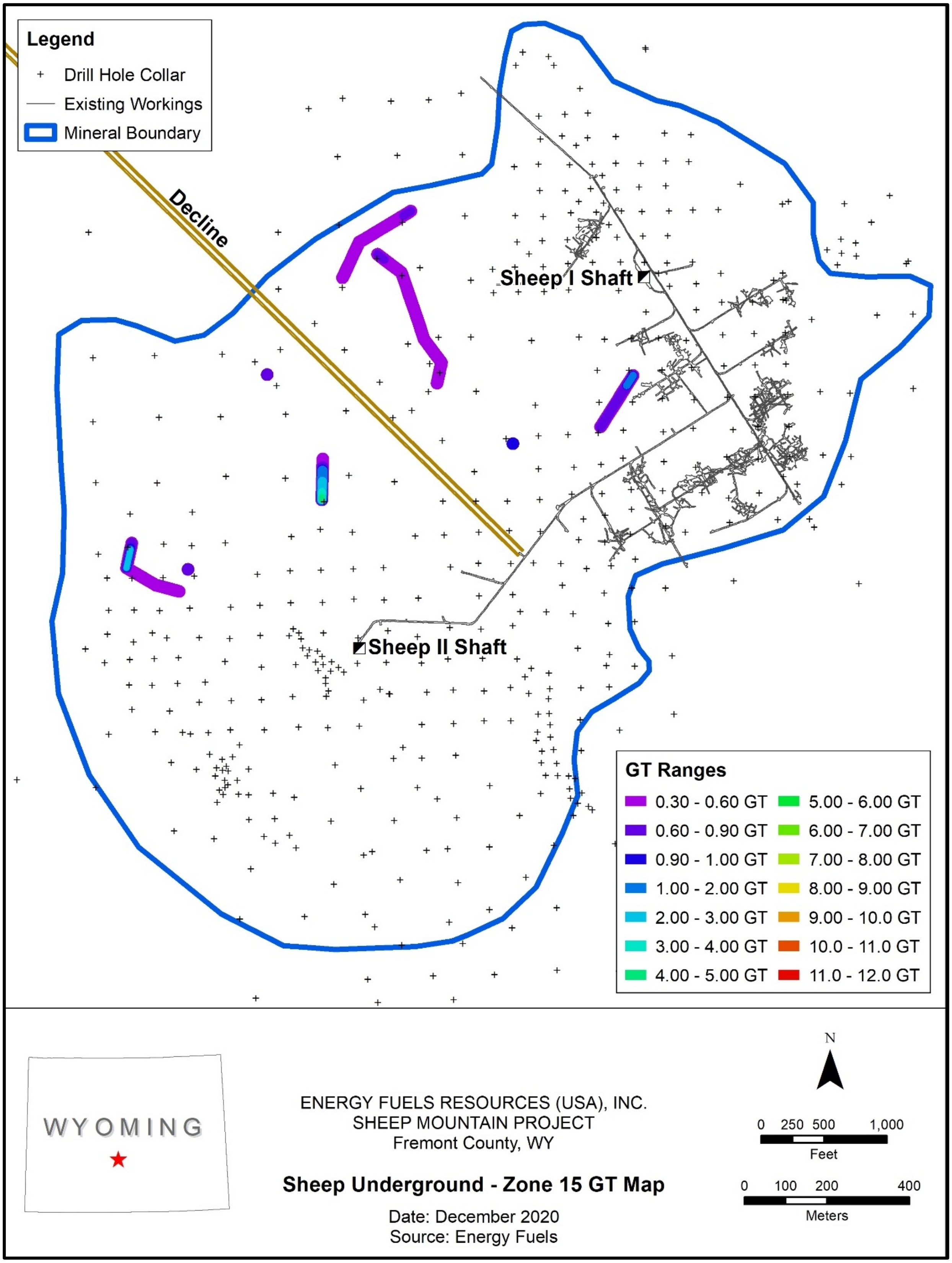



**Figure 14-35. Sheep Underground GT Contours - Zone 15**

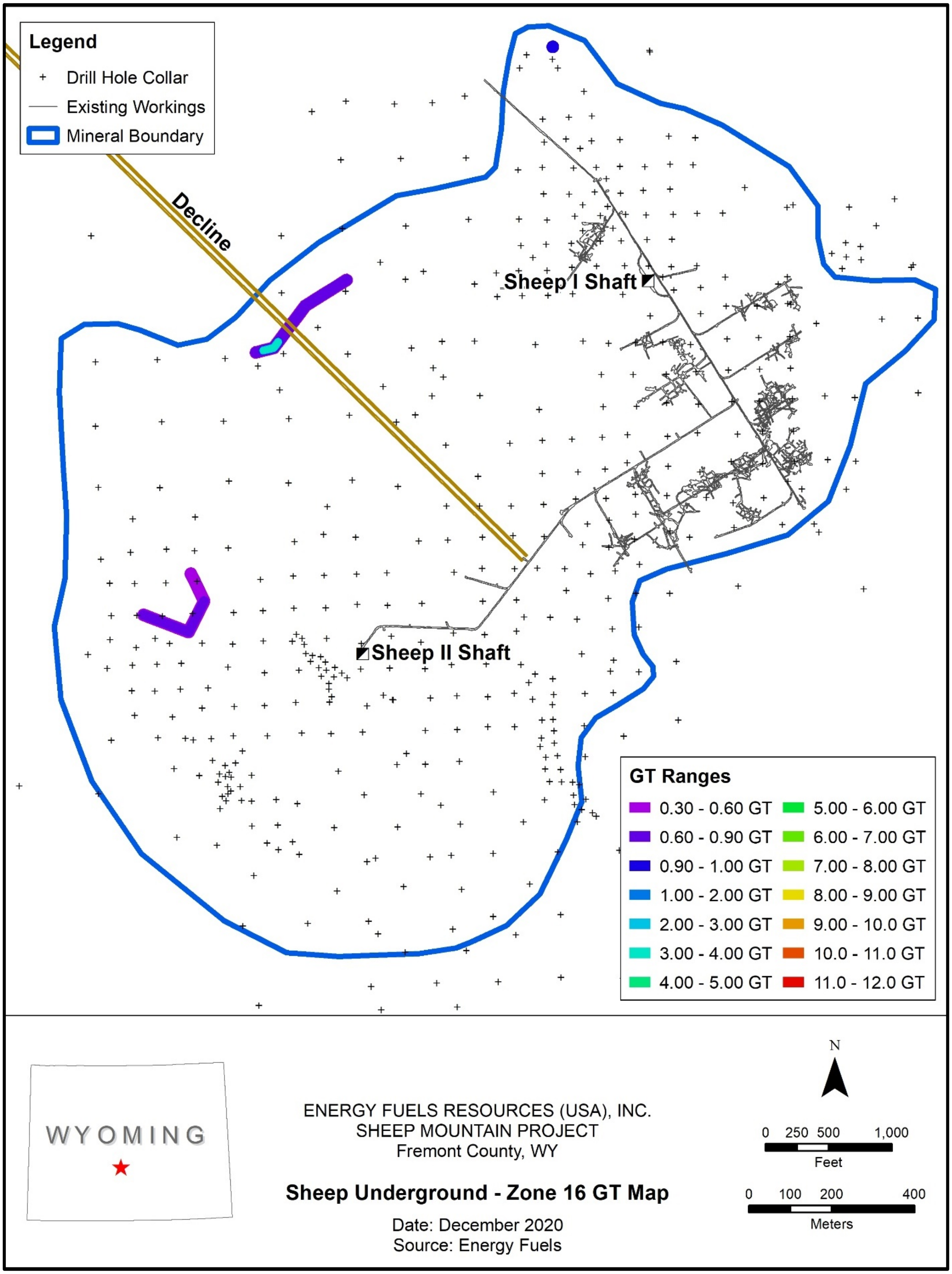



**Figure 14-36. Sheep Underground GT Contours - Zone 16**

## 14.5 Past Production

As the Project area was mined by both open pit and underground methods prior to 1988, removal of the resources from those past mining campaigns is necessary. Descriptions of how those resources were removed is detailed in the following sections.

### 14.5.1 Congo Open Pit Mine

This estimate includes deletion of the portions of the mineral resource model that falls within the historic mine limits that equated to approximately 25% of the initial resource estimate. Historic mining limits were imported into the resource model by individual sand horizons in three dimensions. The extent of mining was taken to be the actual mapped underground mine limit or the GT boundary representing the historical mining cut-off (8 feet at 0.095 or a GT of 0.76), whichever was greatest. Although in many cases the mine maps showed remnant pillars, none of these areas were included in the mineral resource estimate. Thus, the estimate of current Mineral Resources is conservative with respect to the exclusion of areas affected by historic mining. Estimated Mineral Resources for potential open pit areas were diluted to a minimum mining thickness of two feet.

EFR independently verified the removal of 25% of the resource by digitizing and triangulating the existing underground workings in 3D using Maptek's Vulcan mining software. Then, mineralized intercepts were flagged as being mined or not mined based on whether or not that intercept intersected the mine workings. Two polygonal resources were then calculated, one using all the drill holes and one that subtracted out the resource associated with the intercepts flagged as being mined. The result was as 26% reduction in resource, or essentially the same as the 25% reduction used in this report.

### 14.5.2 Sheep Underground Mine

This mineral resource accounts for the deletion of mined areas within our resource model estimated from surface drilling. The total reported mined tonnage from the Sheep I underground mine was 275,000 tons containing 522,500 pounds of $U_3O_8$ and an average grade of 0.095% $U_3O_8$. However, the portions of the current mineral resource estimates which were within the defined previously mined area was only an estimated 62,618 tons of material containing 160,666 pounds of $U_3O_8$ and an average grade of 0.128% $U_3O_8$.

From review of the Sheep I and II as-built mine plans, it was apparent that little or no material was mined at Sheep II and that only development work was completed. Further, it was apparent at the Sheep I mine that many of the mined areas were located by underground delineation drilling rather than by surface drilling.

## 14.6 Classification

***Measured mineral resource*** *is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of conclusive geological evidence and sampling. The level of geological certainty associated with a measured mineral resource is sufficient to allow a qualified person to apply modifying factors, as defined in this section, in sufficient detail to support detailed mine planning and final evaluation of the economic viability of the deposit. Because a measured mineral resource has a higher level of confidence than the level of confidence of either an indicated mineral resource or an inferred mineral resource, a measured mineral resource may be converted to a proven mineral reserve or to a probable mineral reserve.*

***Indicated mineral resource*** *is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of adequate geological evidence and sampling. The level of geological certainty associated with an indicated mineral resource is sufficient to allow a qualified person to apply modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Because an indicated mineral resource has a lower level of confidence than the level of confidence of a measured mineral resource, an indicated mineral resource may only be converted to a probable mineral reserve.*

***Inferred mineral resource** is that part of a mineral resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. The level of geological uncertainty associated with an inferred mineral resource is too high to apply relevant technical and economic factors likely to influence the prospects of economic extraction in a manner useful for evaluation of economic viability. Because an inferred mineral resource has the lowest level of geological confidence of all mineral resources, which prevents the application of the modifying factors in a manner useful for evaluation of economic viability, an inferred mineral resource may not be considered when assessing the economic viability of a mining project and may not be converted to a mineral reserve.*

As is common with uranium deposits, the primary method of assay is by radiometric probe. The probe provides a continuous log of the gamma decay of the daughter products of uranium, which is used along with various calibration constants to calculate the equivalent uranium grade (%eU3O8). The majority of the data used in the estimation of mineral resources at Sheep Mountain is historical radiometric probe data. As the data was not collected by EFR, there may be a level of uncertainty regarding the quality of the radiometric probe data. It is expected that this level of uncertainty is very low. Determining equivalent uranium content by radiometric probe is an industry standard method and has been used by a number of companies over a number of years. Probes are regularly calibrated and operated properly, they are a very reliable method of assay. This is supported by the fact historical resources were based on radiometric probe grades during past mining operations at the project.

The estimation method of GT contours is an industry standard method for flat lying or slightly dipping uranium deposits and has been employed on a number of different uranium deposits across the U.S. The Author has direct knowledge of the Sheep Mountain deposit, having worked there in the past along with a number of other similar uranium mines/deposits in Wyoming. The inputs into the GT contour method are based on a working knowledge of these types of deposits. It is believed that the uncertainty associated with the estimation method is low.

The method of accounting for the previously mined resource beneath the proposed Congo Open Pit Mine poses a level of uncertainty. That level of uncertainty is low as the method used by the Author to calculate the mined out portion of the Mineral Resource are considered conservative. This method was also independently verified by EFR using a different method.

Based on the drill density, the apparent continuity of the mineralization along trends, geologic correlation and modeling of the deposit, a review of historic mining with respect to current resource projections, and verification drilling, the Mineral Resource estimate herein meets NI 43-101 and S-K 1300 criteria as an Indicated Mineral Resource.

# 15.0 MINERAL RESERVE ESTIMATE

## 15.1 General Statement

With respect to the open pit mineral reserves, open pit mine designs and sequencing was completed for all areas, and the resultant mineral reserve estimate reflects the current open pit mine designs and economic evaluations.

The following Mineral Reserves are fully excluded in the total and are additive to the Indicated Mineral Resources reported in Section 14.0, Table 14.1. The total Probable Mineral Reserve for the Sheep Mountain Project including both open pit and underground projected mining areas is tabulated below. The Mineral Reserve estimates presented herein have been completed in accordance with NI 43-101 and S-K 1300 standards.

The metal price used in calculating mineral reserves is $60 per pound, which is lower than the price used for mineral resources ($65), since mineral reserves have a higher prospect of economic extraction and can be exploited in the short term.

**Table 15-1 Sheep Mountain Mineral Reserves- April 13, 2012**

| Classification | Zone | G.T. Cut-off | Tons (000s) | Grade % $eU_3O_8$ | Pounds $eU_3O_8$ (000s) |
|---|---|---|---|---|---|
| *Probable* | Sheep Underground | 0.45 | 3,498 | 0.132 | 9,248 |
| *Probable* | Congo Pit Area | 0.10 | 3,955 | 0.115 | 9,117 |
| **Total Indicated** | | | **7,453** | **0.123%** | **18,365** |

Notes:
1: NI 43-101 and S-K 1300 definitions were followed for Mineral Reserve
2: In situ Mineral Reserves are estimated at GT cut-off of 0.10 (2 ft. of 0.05% $eU_3O_8$) for open pit and 0.45 (6 ft. of 0.075% $eU_3O_8$) for underground
3: Mineral Reserves are estimated using a Uranium price of US$60 per pound
4: Bulk density is 0.0625 tons/$ft^3$ (16 $ft^3$/ton)
5: Numbers may not add due to rounding

## 15.2 Congo Pit Conversion of Resources to Reserves

The following Probable Mineral Reserves for the Congo Pit are fully included in the total Indicated Mineral Resources and are not additive to that total. The Probable Mineral Reserve is that portion of the Indicated Mineral Resource that is economic under reasonably foreseeable cost and pricing conditions (“modifying factors”).

This estimate includes deletion of the portions of the mineral resource model that fall within the historic mine limits. Historic mining limits were imported into the resource model by individual sand horizons in three dimensions. The extent of mining was taken to be the actual mapped underground mine limit or the GT boundary representing the historical mining cut-off (8 feet at 0.095 or a GT of 0.76), whichever was greatest. Although in many cases the mine maps showed remnant pillars, none of these areas were included in the mineral reserve estimate, though the potential exists for these to be mined. Both the estimated mineral resources and mineral reserves were diluted to a minimum mining thickness of two feet. The reported Probable Mineral Reserve is that portion of the reported Indicated Mineral Resource that is within the current open pit design.

The cut-off grade of 0.05% $eU_3O_8$ at a minimum mining height of 2 feet equates to a 0.10 GT cut-off. Table 15.1 summarizes the portion of the Congo Pit that is economically mineable and meets the open pit cut-off criteria.

## 15.3 Sheep Underground Conversion of Resources to Reserves

The following Probable Mineral Reserves are fully included in the total Indicated Mineral Resources for the Sheep Underground. The Probable Mineral Reserve is that portion of the Indicated Mineral Resource that is economic under reasonably foreseeable cost and pricing conditions.

This estimate includes deletion of the portions of the mineral resource model which falls within the historic mine limits. Both the estimated Mineral Resources and Mineral Reserves were diluted to a minimum mining thickness of six feet. The reported Probable Mineral Reserve is that portion of the reported Indicated Mineral Resource that is within the current underground mine design.

The cut-off grade of 0.075% $eU_3O_8$ at a minimum mining height of 6 feet equals a 0.45 GT cut-off. Table 15.1 summarizes the portion of the Sheep I and II Underground Mine that is economically mineable and meets the cut-off criteria.

## 15.4 Cut-off Grade

As the operating cost per ton varies substantially between the open pit and underground it is appropriate to have separate cut-off grade for the two operations. Table 15-2 provides a calculation of breakeven cut-off grades for both the open pit and underground mines based on current cost forecasts and a forward-looking commodity price of $65 per pound of $U_3O_8$. Costs per ton reflect operating costs only and do not include capital write off. Note that staff and support costs are included in both open pit and underground mining costs. Incremental underground mining costs are solely related to underground mining and mineral processing costs.

**Table 15-2 Breakeven Cut-off Grade**

| | Operating Cost $/Ton[1] | Breakeven Grade %$U_3O_8$ at $65/lb. Price | Approximate Value per Ton |
|---|---|---|---|
| Open Pit Mine and Mineral Processing OPEX | $61.00 | 0.05% $U_3O_8$ | $65.00 |
| Underground Mine and Mineral Processing OPEX | $102.37 | 0.075% $U_3O_8$ | $97.50 |

Notes:

1. Operating Costs include mining costs, support, staff, mineral processing, reclamation, taxes and royalties for open pit mining and underground mining, mineral processing, taxes and reclamation for underground mining.

From this evaluation, and other factors such as minimum mining thickness, the mine design cut-offs were set at or above the minimum breakeven cut-off grades at.

- Open Pit
  - Minimum 2-foot thickness
  - Minimum grade .05% $U_3O_8$
  - Minimum GT 0.10
- Underground
  - Minimum 6-foot thickness
  - Minimum grade 0.075% $U_3O_8$
  - Minimum GT 0.45

Based on these parameters, the average grade mined from a combined open pit and underground operation is estimated at 0.123% $eU_3O_8$. As mining proceeds, mineralized material encountered below the mine GT cut-off, which has to be excavated as part of the mine plan and would otherwise be disposed of as mine waste, could be salvaged at grades below calculated breakeven cut-off grades provided the grade would support haulage and mineral processing costs. The mineral reserve as stated herein does not include the potential mineralized material, which may be salvaged, which meets the breakeven grade cut-off but is less than the mine design GT cut-offs.

### 15.4.1 Mining and Mineral Processing Recovery Parameters and Sensitivity

Mineral reserves are that portion of the Indicated Mineral Resource, Section 14.0, which are economically recoverable under reasonably foreseeable cost and pricing conditions. The mineral resource model, the GT contour estimation methodology, and the geologic interpretations, as described in Section 14.0, also apply to the mineral reserve estimate. The key parameters in the conversion of mineral resource to mineral reserves include mine dilution and recovery.

As previously discussed in Sections 14.0 and 15.0, mineral resource and mineral reserve estimates account for mine dilution. Mine dilution is a function of the mineralized thickness and the mining method and selectivity. With respect to both the Congo Pit and Sheep Underground, selective mining methods and appropriate mining equipment were selected to minimize mine dilution. Mine dilution was assessed by diluting mineralized thicknesses to minimum mining thicknesses, 2 feet for open pit mining and 6 feet for underground mining. Thus, the dilution factor varies with the thickness of mineralization. The sensitivity of estimated costs with respect to mine dilution is further addressed in Section 22.0. A change of 10% in mine grade due to dilution is estimated to affect the Internal Rate of Return (IRR) by 6%. Mine recovery was assessed by the inclusion of only those mineralized zones with adequate thickness, grade, and continuity to be mined. Thin and/or low-grade mineralized zones were excluded from the mineral reserve through the application of dilution to minimum thickness and the subsequent application of GT cut-off. Isolated and/or discontinuous mineralization was excluded from the mineral reserve estimate through the mine planning process. For the Congo Pit an estimated 60% of the mineral resource was converted to a mineral reserve. For the Sheep Underground an estimated 70% of the mineral resource was converted to a mineral reserve. Preliminary mine designs focused on the areas with the strongest and most continuous mineralization and were not optimized for maximum mineral resource extraction. Mineral Resources were included in the mineral resource estimate in areas adjacent to both the Congo pit and Sheep underground, which have reasonable prospects for economic extraction. These areas would be accessible for mining from the open pit highwalls by conventional drift mining or using modern highwall mining systems and through the underground through additional stopping and/or raises. Those portions of the Mineral Resources not readily accessible from either the Congo pit or Sheep underground mine were excluded from the mineral resource estimation as they do not currently meet the criteria for reasonable prospects of eventual economic extraction.

Mineral processing recovery is discussed in Section 13.0. Due to the nature of the mineralization whereby the uranium minerals occur as interstitial material between the sand grains, mineral processing commonly results in a rather uniform residual uranium value that remains in the solid material. This loss or “tail” is consistent irrespective of the initial grade. This has been confirmed by column leach testing which showed a constant tail of less than 0.002% $U_3O_8$ (RDE, 2011). In addition, there are uranium losses related to the recovery of the uranium values from the leach solutions. These “liquid’ losses are typically 0.002% $U_3O_8$ (Woolery, 1978). Thus, based on testing to date an overall loss of 0.004% $U_3O_8$ is indicated. However, to provide conservatism in the estimate and to account for potential variations in the mineralized material with respect to the materials tested and overall loss of 0.010% $U_3O_8$ was applied. Based on the estimated mine life grade of 0.123% $eU_3O_8$ this results in an overall mineral processing recovery factor of approximately 92%.

The mining and mineral processing methods and factors recommended in this report have previously been successfully employed at similar projects in the Sheep Mountain area. Successful uranium recovery from the mineralized material at Sheep Mountain and similar areas such as the Gas Hills has been demonstrated via both conventional milling and heap leach recovery. The project is a brown-field development located in a State, which tends to favor mining and industrial development. The project has been well received locally and will provide substantial revenues to both Fremont County and the State of Wyoming in addition to providing long-term employment for the region.

For these reasons, the Author believes that the Sheep Mountain reserves have a low probability of being affected by risk associated with the modifying factors, which include but are not limited to, mining; processing; metallurgical; infrastructure; economic; marketing; legal; environmental compliance; plans, negotiations or agreements with local individuals or groups; and governmental factors. The author is not aware of any factors including environmental, permitting, taxation, socio-economic, marketing, political, or other factors, which would materially affect the mineral resource estimate, herein.

# 16.0 MINING METHODS

## 16.1 Introduction

The Sheep Mountain Project includes the Congo Pit, a proposed open pit development, and the re-opening of the existing Sheep Underground mine.

The open pit is phased in 12 smaller pits over a 12-year production life to facilitate internal backfilling in order to reduce longer haul distances to waste dumps. The average daily production rate of the open pit is 1300 mineralized material tons per day with a strip ratio over the life of mine of 33:1, or an average of 44000 tons per day of waste. The open pit uses backhoes to mine, on average, 4-foot thick mineralized material zones that are stacked in multiple sub-horizontal horizons. Mineralized material is loaded into trucks, while wheel tractor scrapers are used in waste stripping due to the weak nature of the waste rock. Past surface mining operations used this equipment and mining method in the Sheep Mountain and Gas Hills District.

Underground mining at Sheep Mountain averages 1300 mineralized material tons per day, also over a 12-year mine life, using a modified room and pillar mining method sequenced from bottom to top. A twin decline will be developed in the Paydirt open pit and end below the underground deposit. Mineralized material will be hauled using a 36-inch conveyor located in one of the declines to a surface stockpile shared with the open pit operations. An 8,500 foot long surface conveyor belt with take both surface and underground mineralized material to the processing facility.

Although other processing alternatives were considered, the recommended uranium recovery method includes the processing of mined materials via an on-site heap leach facility as discussed in Section 13.0 of this report.

Figure 16.1 depicts the overall project. Mining will be completed by both underground and open pit methods as subsequently described. Mined product from the underground and open pit mine operations will be commingled at the stockpile site located near the underground portal and in close proximity to the pit. At the stockpile, the mined product will be sized, if needed, blended, and then conveyed via a covered overland conveyor system to the heap leach pad where it will be stacked on a double lined pad for leaching. The primary lixiviant will be sulfuric acid. Concentrated leach solution will be collected by gravity in a double lined collection pond and then transferred to the mineral processing facility for extraction and drying. The final product produced will be a uranium oxide commonly referred to as yellowcake.

Personnel requirements are discussed in Sections 5.5 and 21.8

## 16.2 Mine Productivity and Scheduling

The project consists of two distinct and independent mining areas, the Congo Open Pit and the Sheep Underground, with common processing on mine material via a heap leach recovery facility. The currently planned mine life of the open pit is 12 years with an additional four years allotted for mine closure and reclamation. The currently planned mine life of the underground is 12 years which includes one year for development and 11 years mine production. The heap leach facility is designed to accommodate the mined material from both open pit and underground mine operations over an operating life compatible with the open pit operations. Referring to the mine production profile in Table 21-1, both the open pit and underground mines are scheduled to end at approximately the same time.

## 16.3 Congo Open Pit

The current mine design for the Congo Pit includes typical highwall heights in the range of 100 to 400 feet and reaches a maximum depth of 600 feet in localized areas in the southeast pit corner. The open pit design employs similar design parameters and mining equipment configurations to those used successfully in past Wyoming conventional mine operations. Highwall design is based upon the performance of past projects in the Sheep

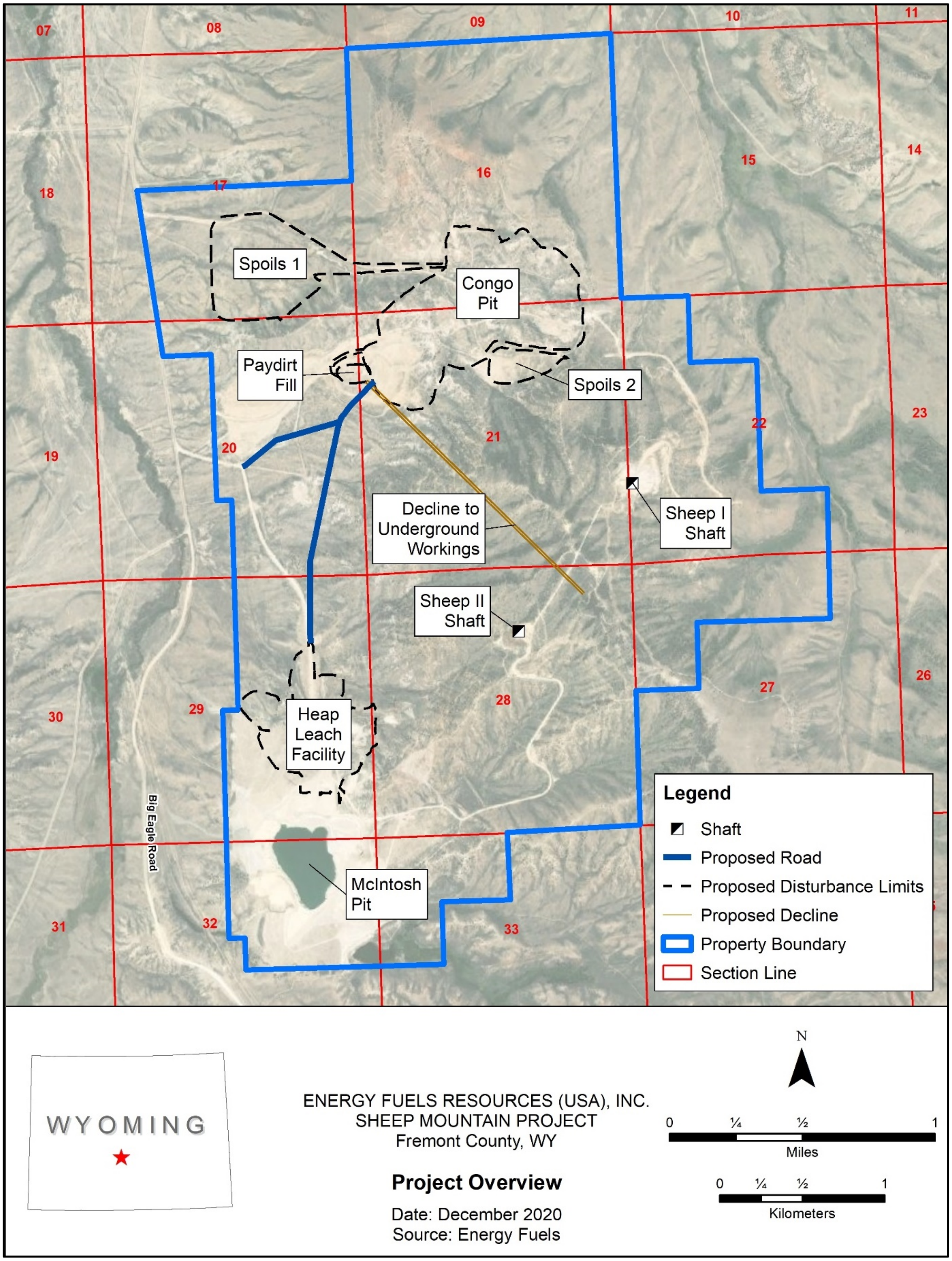



**Figure 16-1 Project Overview**

**Figure 16-1. McIntosh Pit Circa 2010**

Mountain and Gas Hills districts and includes an average highwall slope of 0.7:1 (horizontal: vertical), which reflects the average of a 10-foot bench width and 50-foot highwall at a 0.5:1 slope.

As depicted in Figure 16.2, the open pit highwalls at the McIntosh pit, built to a similar design some 40 years ago, remain remarkably stable. However, moving forward, geotechnical studies are recommended for final determination of highwall design parameters.

Figure 16.3 displays the general mine sequence and annual limits of mining. Due to the nature and extent of mineralization, the Congo Pit is essentially a single open pit that will be developed sequentially to accommodate the desired mine production and allow for internal backfilling. This sequential schedule and internal backfilling reduces the amount of double-handling of mine waste material required to backfill and reclaim the mined pit during the life of the mine.

The host formation is exposed at the surface and dips between 9 and 16 degrees to the southeast. The initial pit construction will create access from the open pit mine area to the mine waste and stockpile areas. Subsequent pit extensions will utilize this access. Shallow mineralized areas exist along the north and northwest portions of the pit. As a result, the overall mine sequence begins in the areas where the mineralized zones have the least amount of cover and proceeds essentially along formational dip. The first 6 pits are constructed in a panel along the up-dip portion of the deposit and are the shallowest. During this time, the out of pit mine spoils areas will be developed. Subsequent pits will be completed in successive panels proceeding down and along dip, i.e., pits 7 through 10; 11 through 12 which reach the greatest depths. Beginning with pit 7, the great majority of the mine waste will be sequentially backfilled in previous pits.

Detailed Open Pit Mine Sequence drawings follow as Figure 16.4 to Figure 16.15. representing the annual open pit mining sequence for pits 1 through 12, respectively.

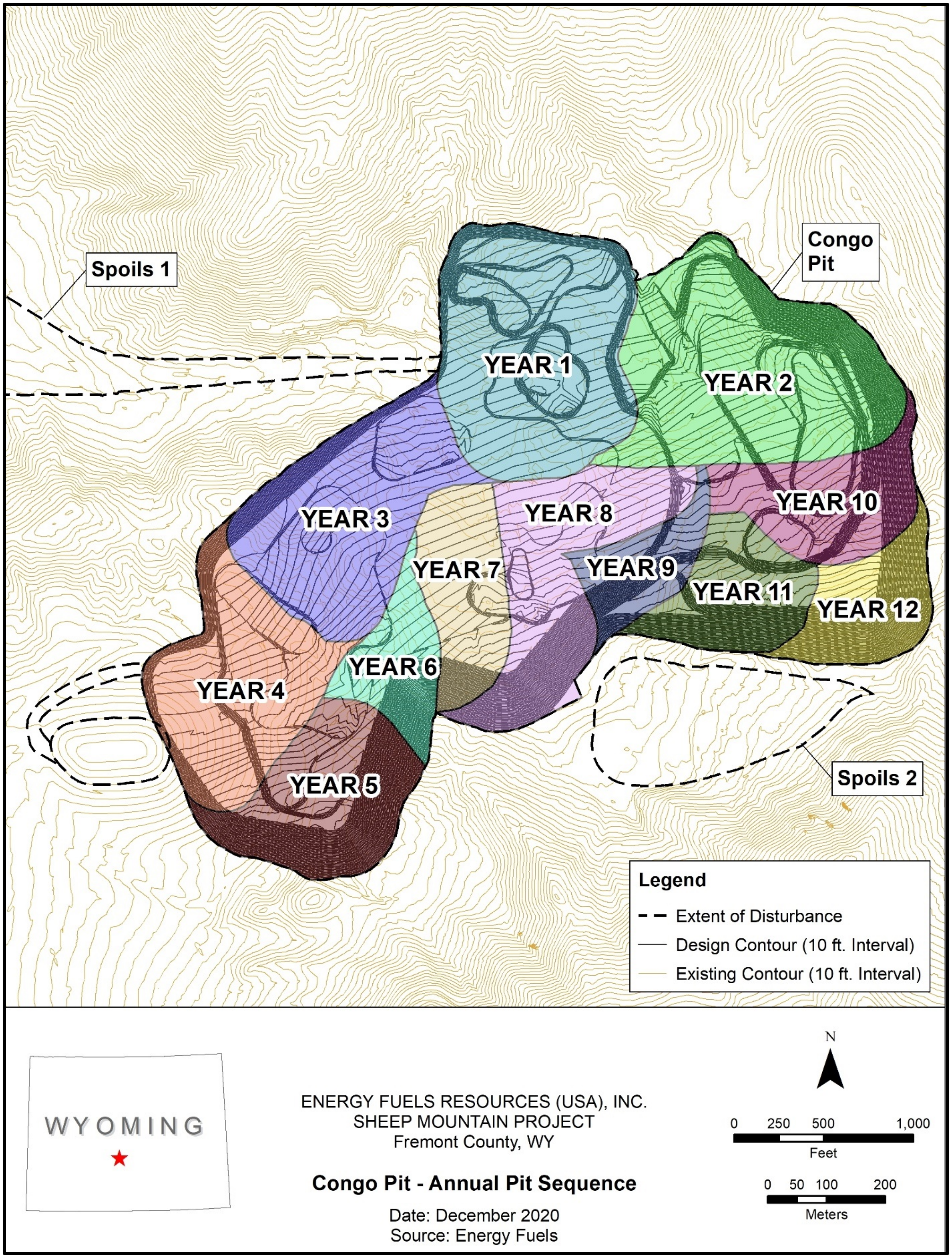



**Figure 16-3. Congo Pit - Annual Pit Sequence**

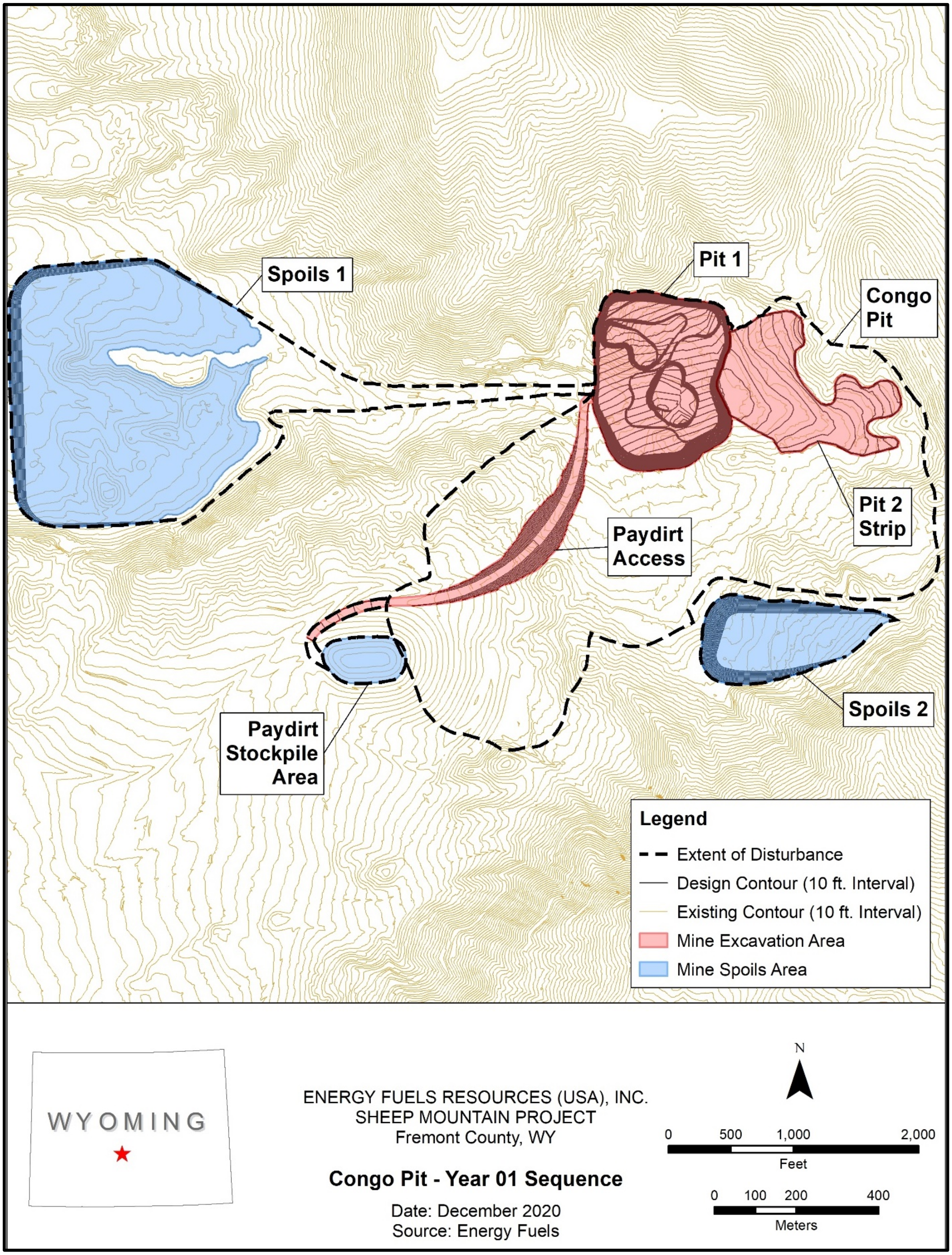



**Figure 16-2. Congo Pit - Year 01**

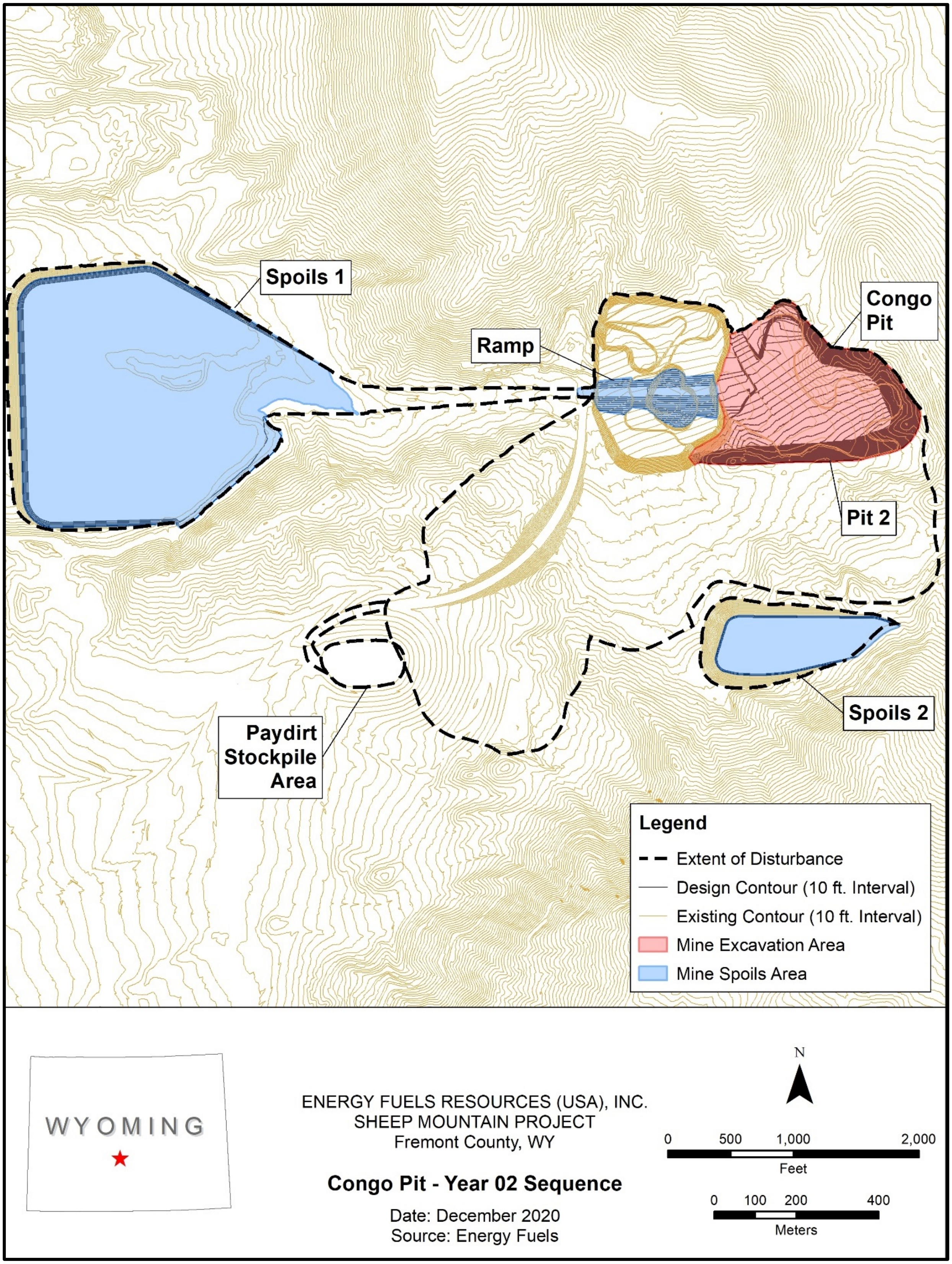



**Figure 16-3. Congo Pit - Year 02**

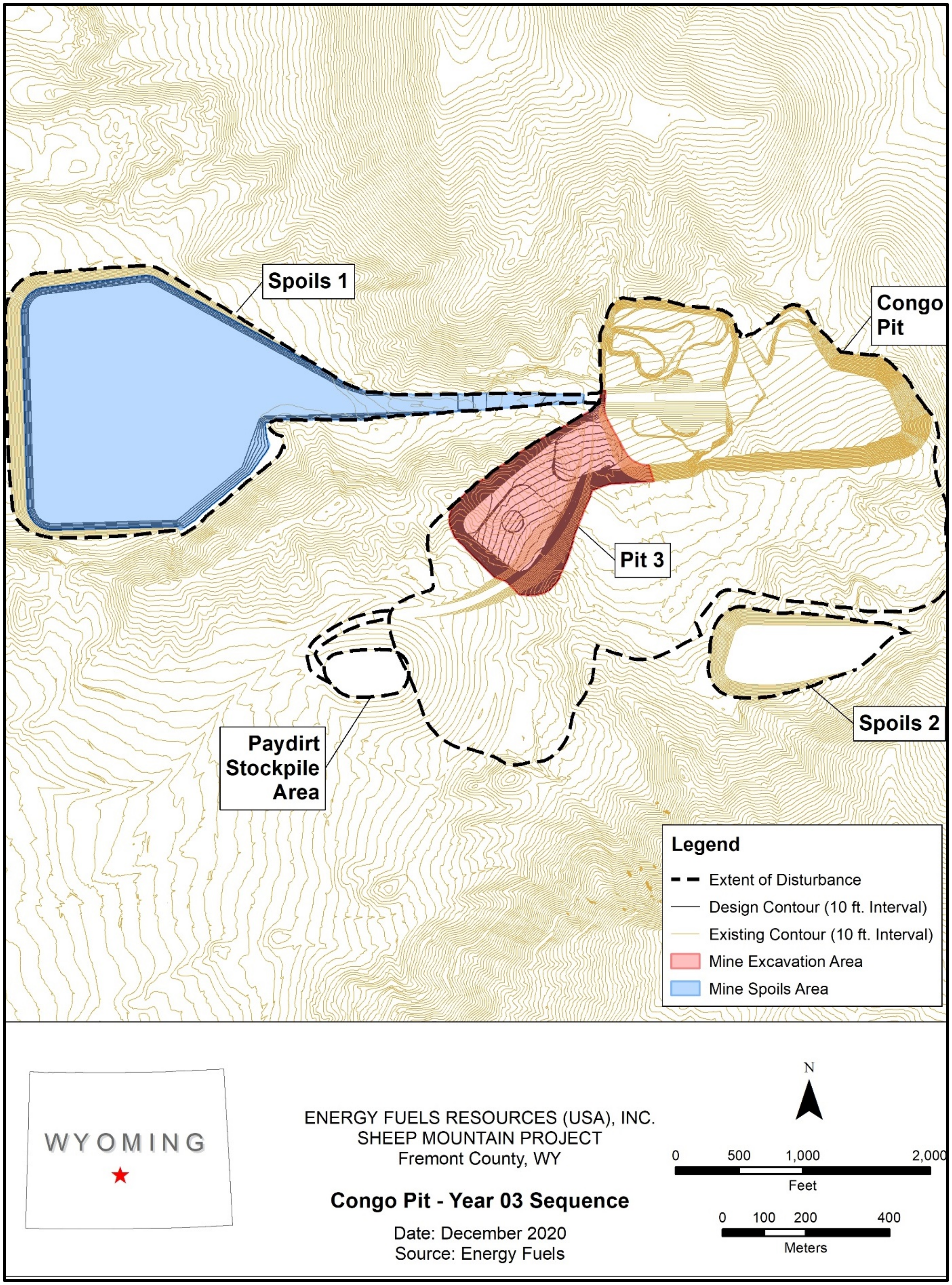



**Figure 16-4. Congo Pit - Year 03**

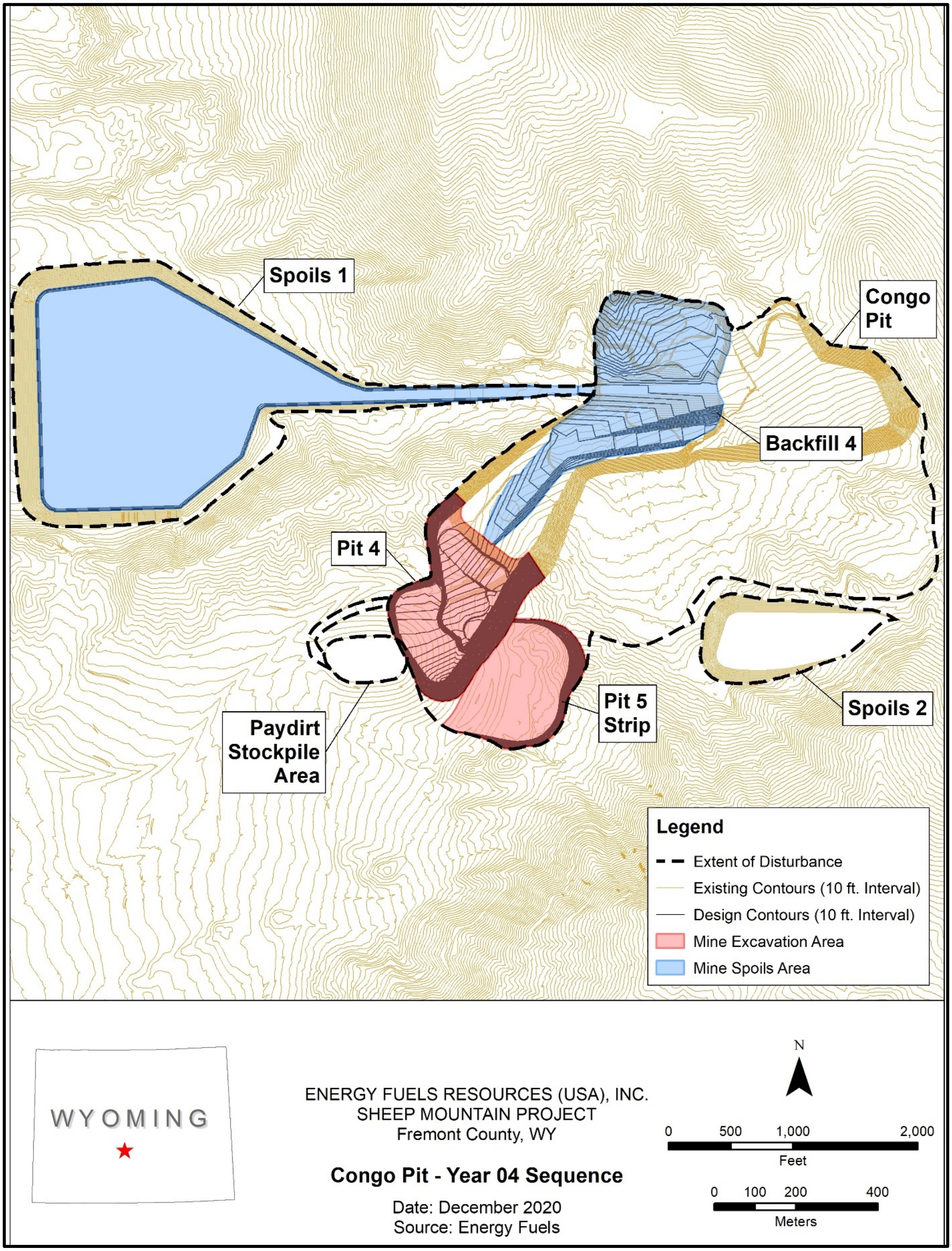



**Figure 16-5. Congo Pit - Year 04**

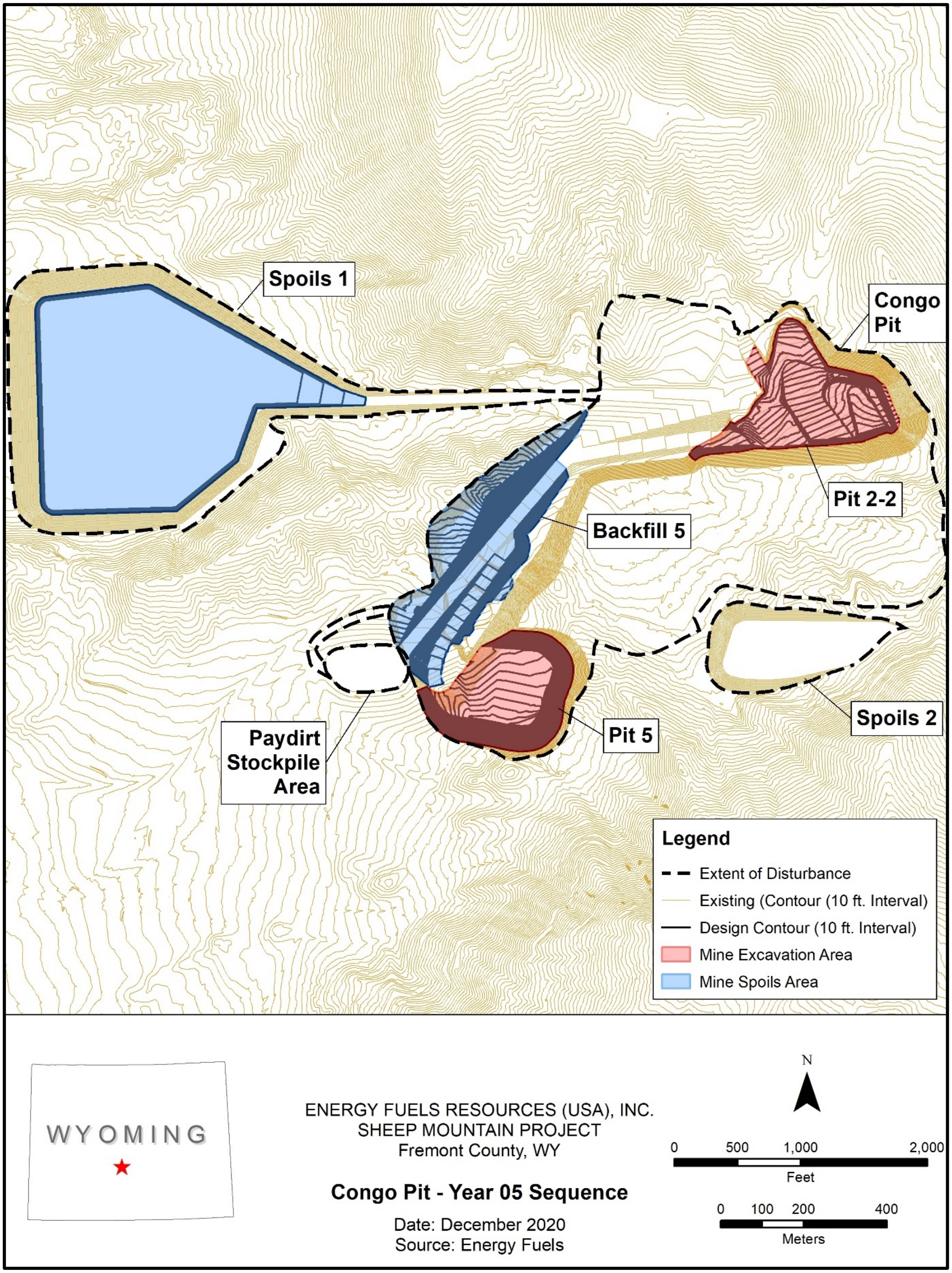



**Figure 16-6. Congo Pit - Year 05**

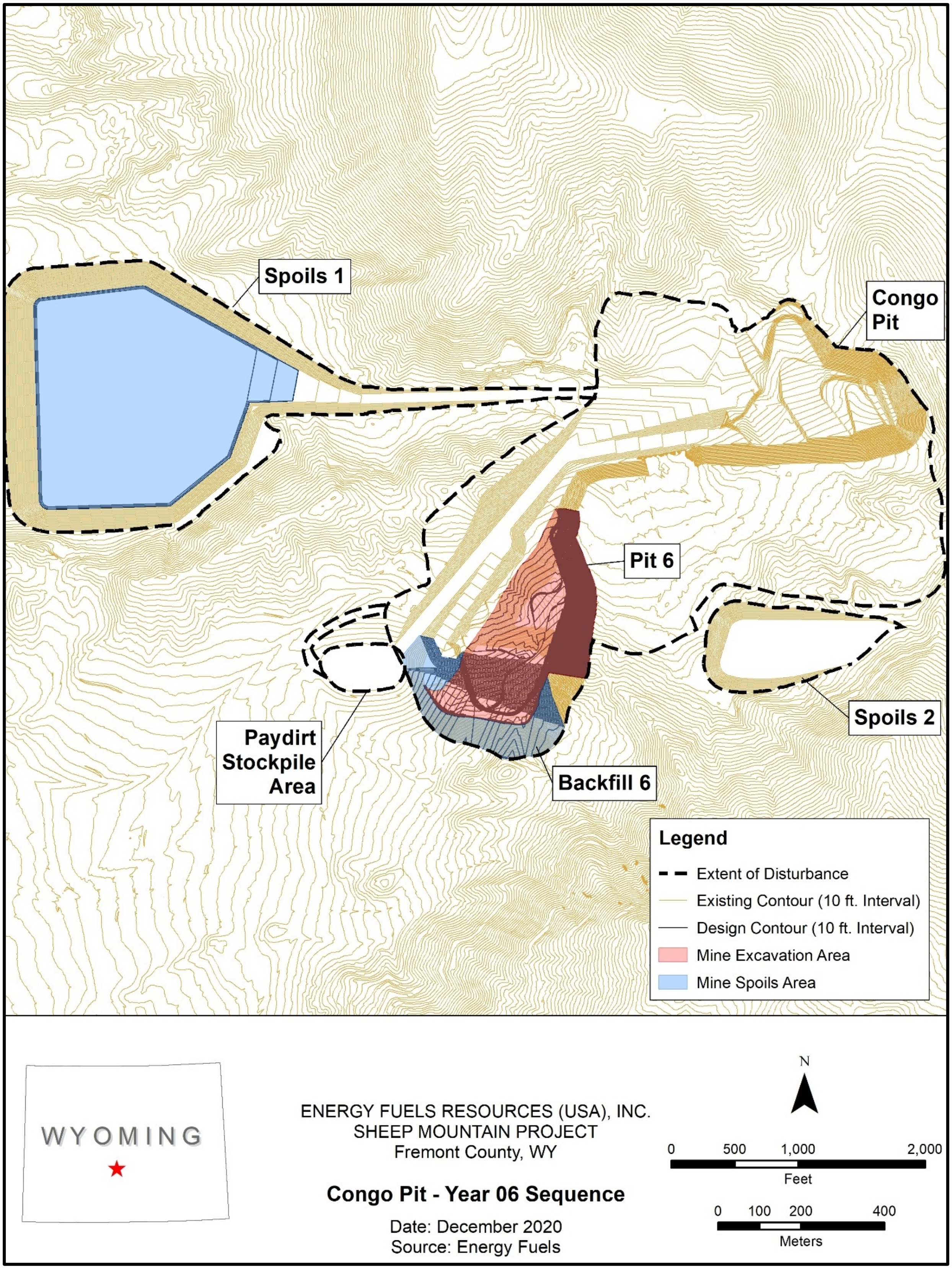



**Figure 16-7. Congo Pit - Year 06**

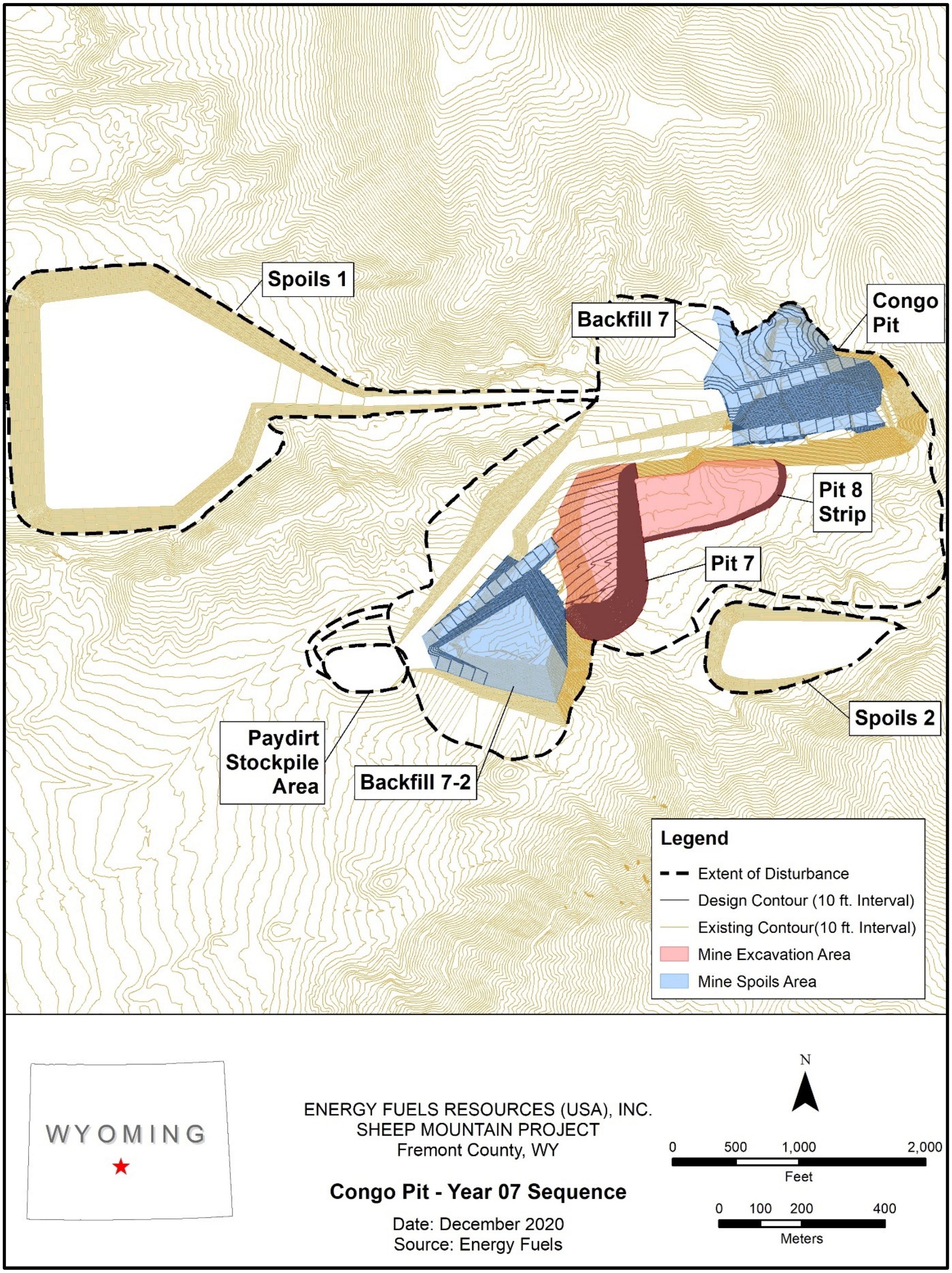



**Figure 16-8. Congo Pit - Year 07**

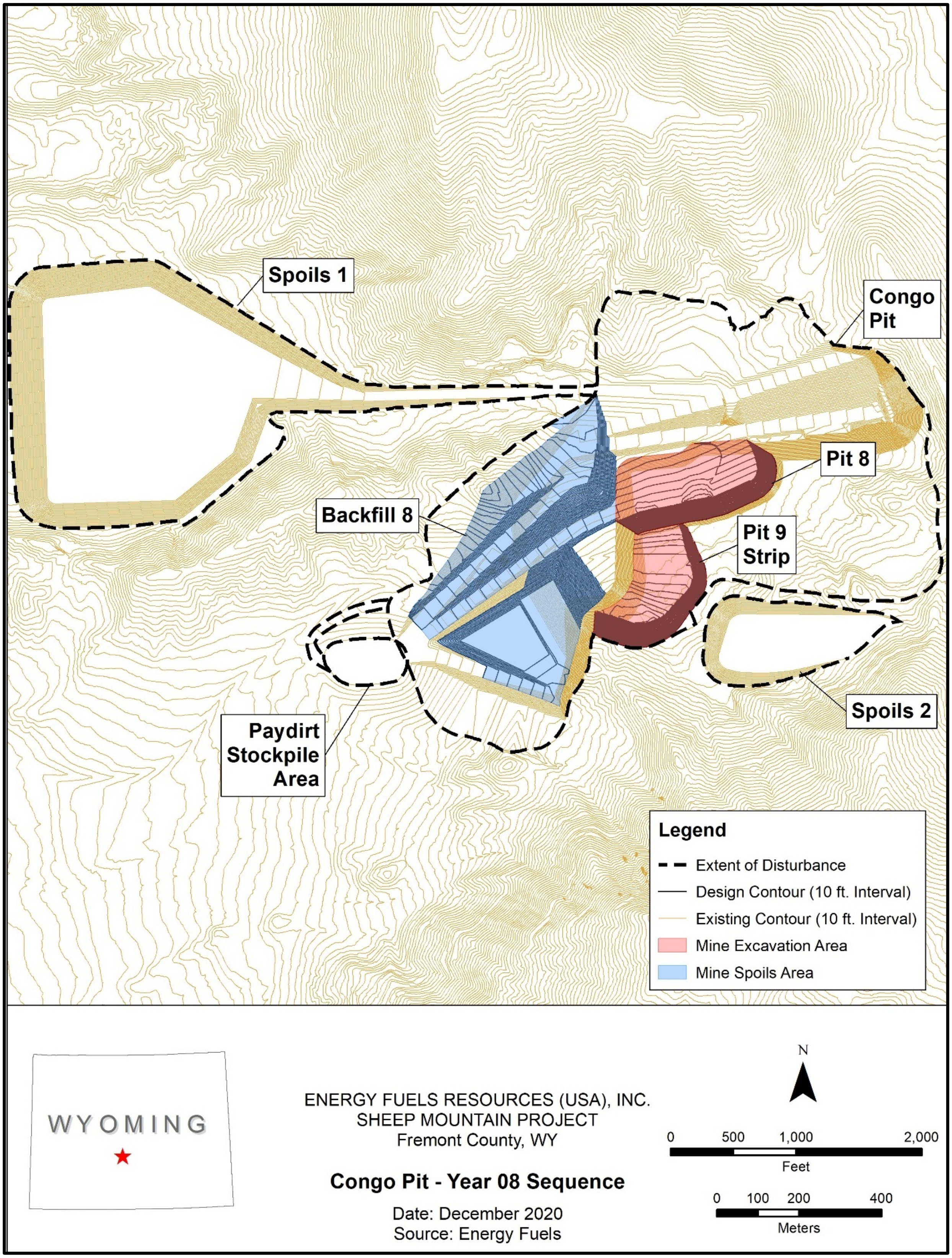



**Figure 16-9. Congo Pit - Year 08**

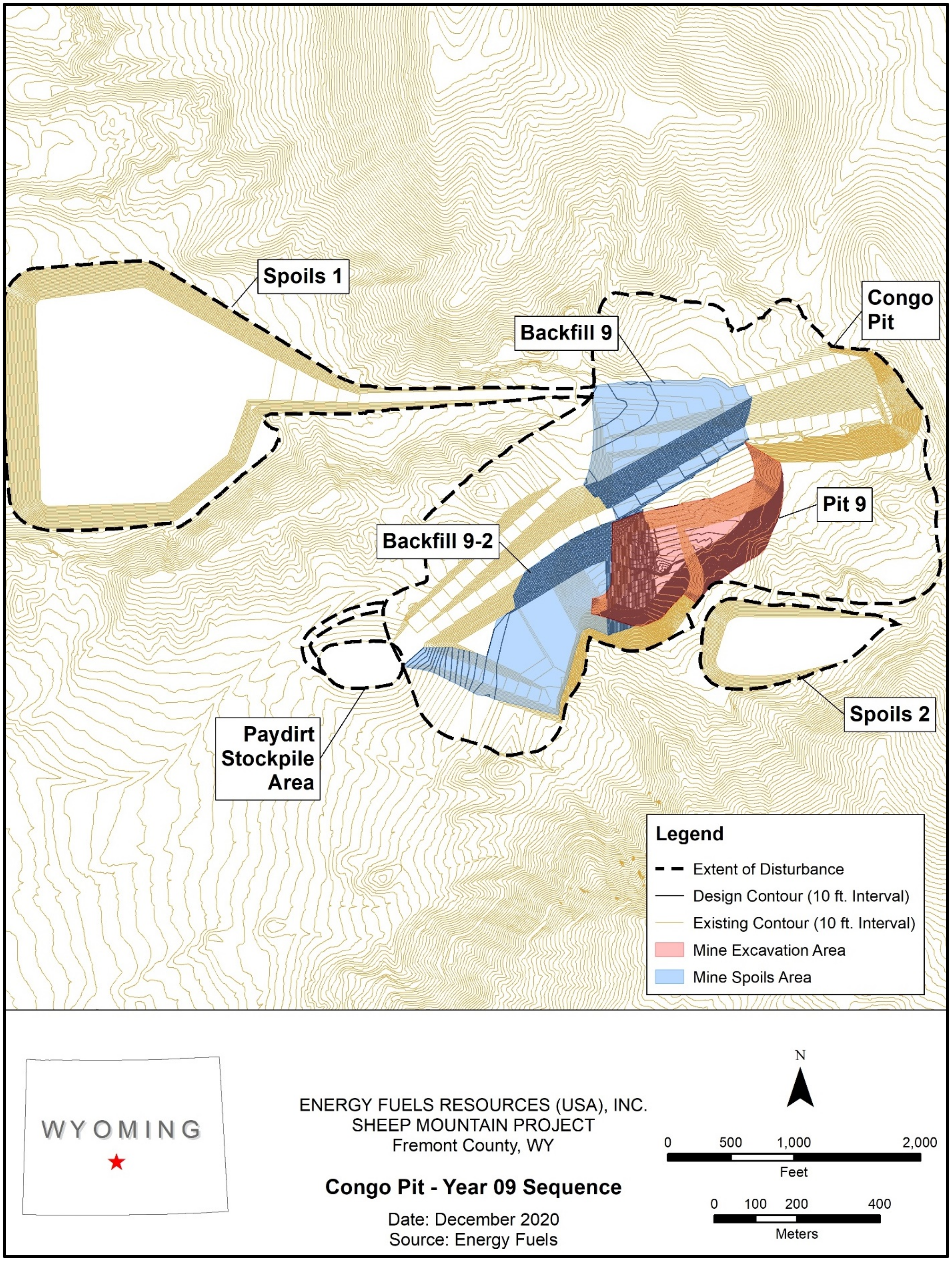



**Figure 16-10. Congo Pit - Year 09**

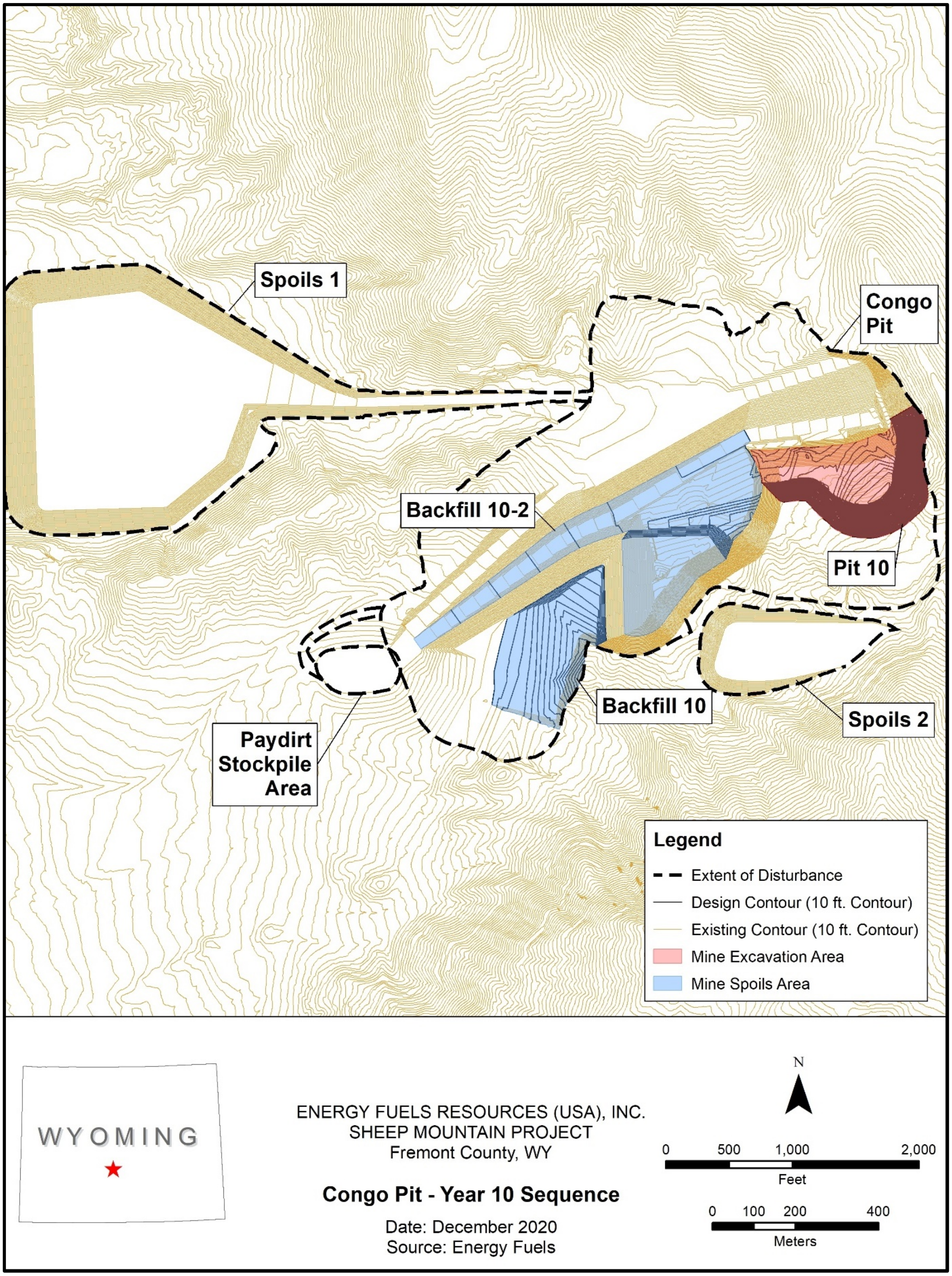



**Figure 16-11. Congo Pit - Year 10**

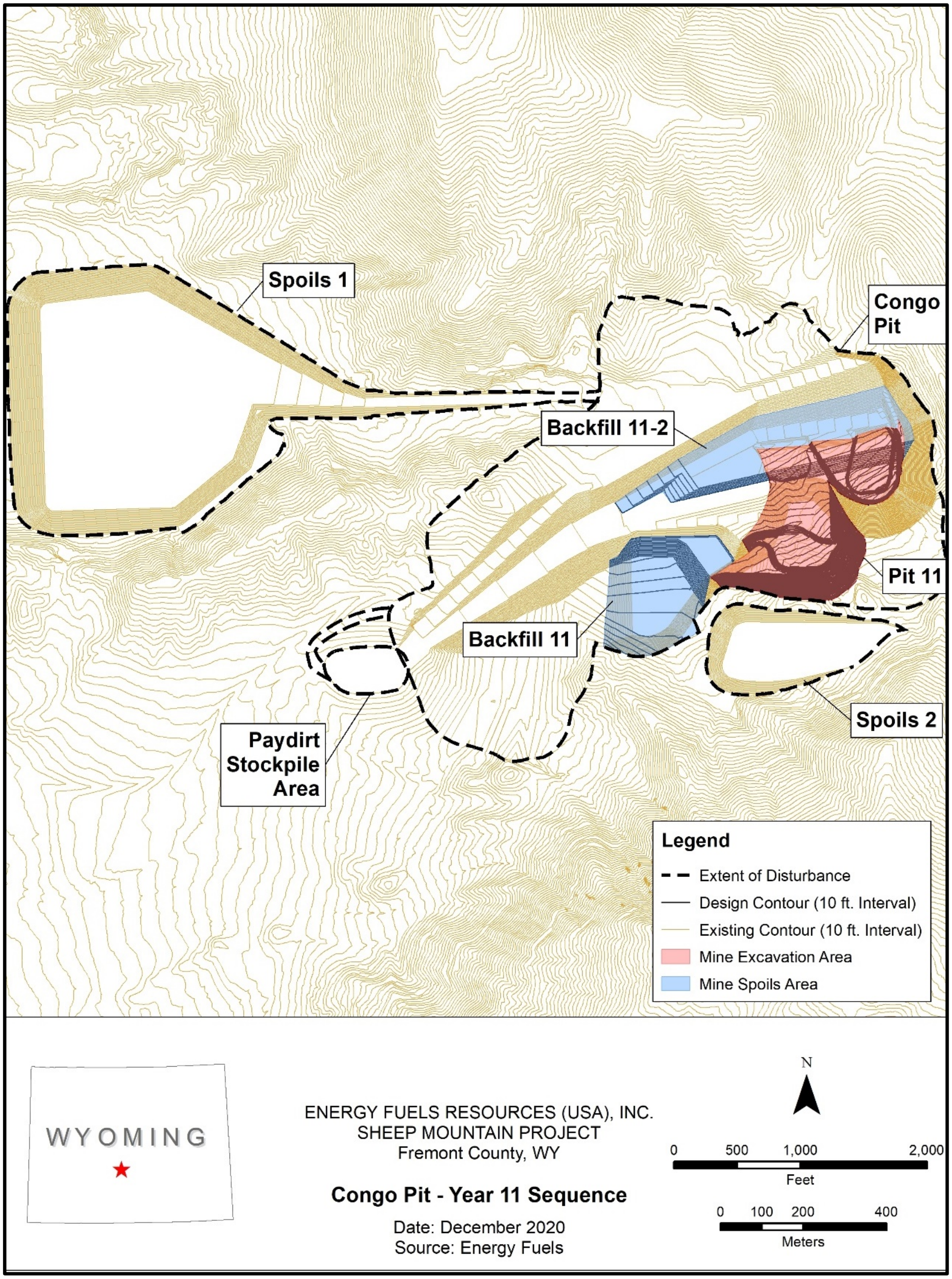



**Figure 16-12. Congo Pit - Year 11**

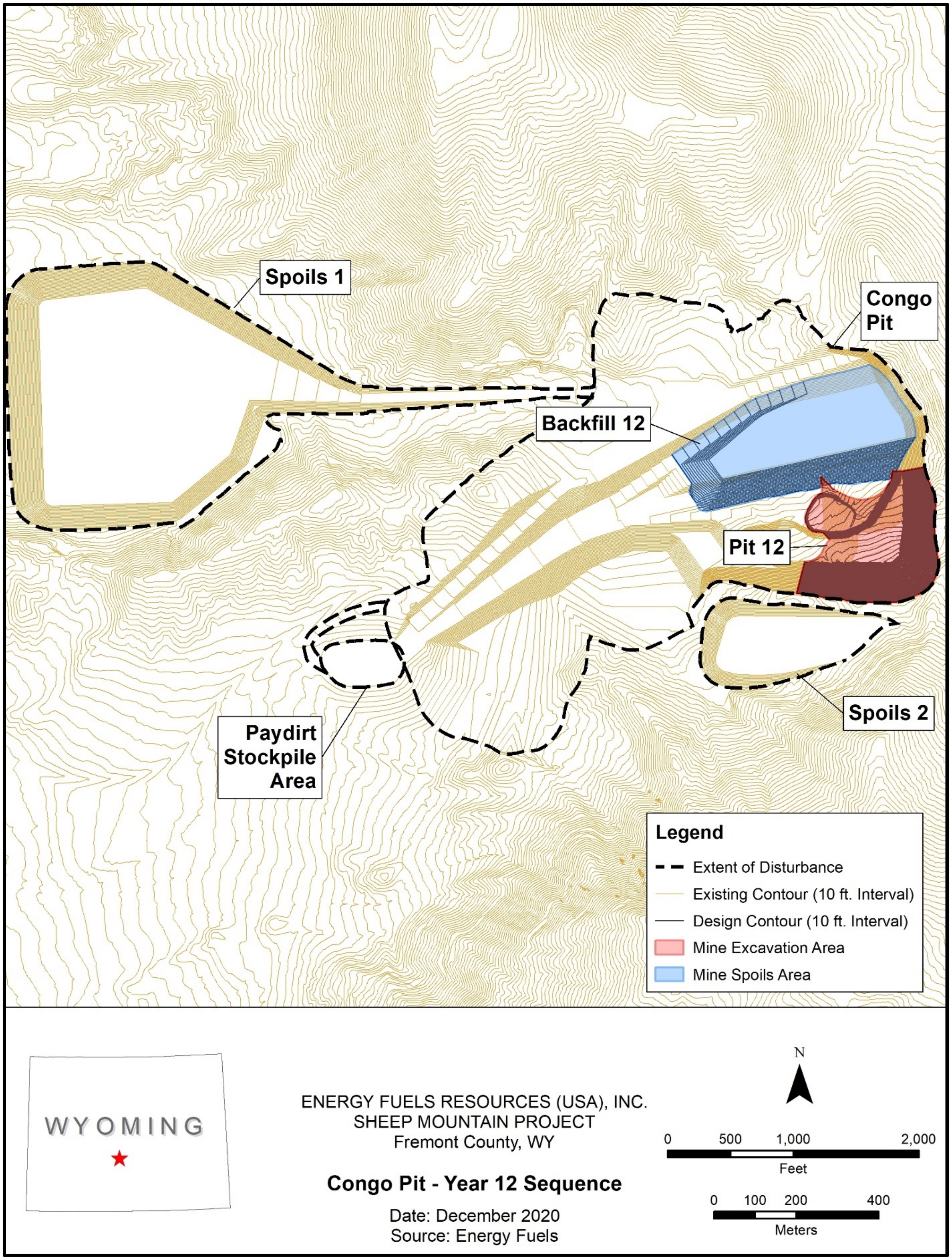



**Figure 16-13. Congo Pit - Year 12**

Historic underground mine workings will be encountered during open pit operations. In order to ensure the safety of surface mine personnel, underground workings will be identified prior to surface mining in a given area by the Engineering department, with access to the digital 3D modeling of the underground mines based on the historic underground mine mapping. Underground workings identified in this way will be uncovered during the pit excavation by the use of a mining crew using a medium sized excavator, medium sized dozer and in-pit drill, all overseen by a field engineer. The basic procedure for this process will be to locate shallow underground zones below the pit floor based upon the mine mapping and backfill waste into the mine voids. This may be achieved by over-excavating around the voids and dumping in-pit waste into them or using the in-pit drilling equipment to drill into the workings and blast overlying waste rock into the cavities. Additional assistance in location of the voids may be provided by shallow seismic testing.

Based upon site relief in the Congo area, surface water inflow can be kept out of the pit by ditching around the highwall crest and day-lighting the runoff to offsite drainages. In addition to controlling surface water runoff, the ditching will serve as a safety berm to prevent access to the highwall. All offsite drainage will meet the requirements of the WYPDES permit, including appropriate sediment control measures. Excess groundwater inflow in the pit will be used as a part of the daily operation of the pit for dust control on haul roads or consumed at the processing facility.

With respect to ground water, current data indicates that ground water flow will average less than 150 gpm and will not be encountered until pit 7.

Equipment cycle times have been estimated for both stripping and mining using the specific haulage profile for each pit. Based on these estimates, both the stripping and mining can be accomplished in a single 10-hour daily shift, 5 days per week. This is desirable to accommodate the mining of multiple dipping mineralized zones which will be encountered. The proposed primary stripping fleet consists of four 637 CAT twin engine scrapers paired with four 631 CAT single engine scrapers in a push-pull configuration. Both stripping and mining equipment will be supported by dozers and motor graders. The nominal capacity of this configuration is capable of excavation and placement of 11.0 million tons of waste and 330,000 tons of mineralized material on an annual basis over the open pit life of mine.

Surface mining will be completed in a selective manner with a 2-3 cubic-yard bucket on a medium-size excavator loading four articulated mine haul trucks. The mining crew is projected to have excess annual capacity and will thus be responsible for handling the majority of the internal mine waste and an additional 845,000 tons of material per year. This increases the annual stripping capacity. Table 16-1 summarizes the open pit mining fleet.

In-pit grade control will be a critical aspect of the project. This type of sandstone hosted uranium deposit may exhibit local variability in grade and thickness, and potentially variable radiometric equilibrium conditions. To address these conditions, minimize mine dilution, and maximize mine extraction: a tiered systematic grade control program is essential. The following describes the grade control program.

- Tier 1, Radiometric Scanning: Field personnel equipped with calibrated hand-held gamma meters will be assigned to both the stripping and mining crews.

- Tier 2, In-Pit Assay: A portable sample trailer equipped with a portable x-ray fluorescence ("XRF") assay instrument, and appropriate sample preparation equipment will be located in the pit. Mine trucks will be sampled with an auger system; the samples prepped and assayed; and trucks will then be directed to deliver the material to the stockpile or mine waste area depending on the results of the assay.

- Tier 3, Quality Control: As each mine truck is sampled and tested, the field assay sample rejects will be collected and separated by grade ranges. The daily pit samples will be blended and split to provide representative samples which will in turn be assayed at the plant laboratory. The plant lab will assay both solid and liquid samples and will be subject to an outside and/or third-party quality control system.

**Table 16-1 Open Pit Mining Equipment List**

| Major Equipment* | Number | Capacity/ Load Factor |
|---|---|---|
| 336 Excavator | 1 | 2 to 3 cy |
| 345 Excavator | 1 | 4½ cy |
| 16M CAT Motor Grader | 1 | 16 ft blade |
| 140 CAT Motor Grader | 1 | 12 ft blade |
| D-6 LGP dozer | 1 | For Heap |
| D-8T CAT Track Dozer | 1 | 12.9 ft blade |
| D-9T CAT Track Dozer | 1 | 14.2 ft blade |
| D-10T CAT Track Dozer | 1 | 17.3 ft blade |
| A30D Volvo Articulated Truck | 4 | 32 tons/load |
| 980 CAT Wheel Loader | 1 | 6 cy |
| 637 CAT Twin Engine Scraper | 4 | 29 cy/load |
| 631G CAT Scraper | 4 | 29 cy/load |
| Water truck 3,000 gallons | 1 | 3,000 gal |
| Water truck 8,000 gallons | 1 | 8,000 gal |
| **Mine Support vehicles** | | |
| Fuel/lube truck | 1 | |
| Mechanical service truck | 1 | |
| Rubber tire backhoe CAT 414 | 1 | |
| Pickup trucks, 4WD, ¾-ton | 8 | |

*Specific equipment as specified or equivalent.

## 16.4 Sheep Underground

The Sheep Underground mine has operated as a conventional underground mine on three separate occasions. No reports of adverse ground conditions, flooding, cave-ins or any other unusual mining conditions are known to EFR. The historic mining method was a modified room and pillar method using conventional techniques. Jacklegs were used to drill out the rounds and underground track haulage was used to transport the mined material to Shaft No. 1.

The mining method proposed going forward is also a conventional method using a modified room and pillar method but utilizing modern mining equipment such as jumbo drills and scooptrams for haulage. A new double entry decline will be constructed starting at the Paydirt Pit and ending below the deposit. Haulage from the mine will be accomplished via a 36-inch conveyor within one of the double declines. The existing shafts will be used for ventilation purposes only, with exhaust fans mounted at both locations. If the existing borehole ventilation shafts can be rehabilitated, they will be used as intake shafts. The deposit is comprised of 16 mineralized zones with a total thickness of approximately 350 feet. The deposit will be mined primarily from bottom to top.

Sheep Underground mining method summary:

- Development drifts will utilize dual openings. 10 by 15-foot openings will be used for haulage, and 8 by 10-foot openings will be used for transportation and ventilation.
- Mining panels will utilize multiple entries depending on the width of the zone. Entries will be approximately 12 feet wide, minimum of 6 feet high and averaging 7 feet high.

- Crosscuts will be placed on 100-foot centers.
- Mining will be completed by advance and retreat methods.
- Advance mining is accomplished by driving approximately 12 by 7-foot drifts within zones meeting cut-off grade. Multiple drifts will be driven parallel to one another with crosscuts on 100-foot centers. The parallel drifts will be 27 feet apart on centerline.
- This will leave a pillar with a dimension of approximately 15 feet wide and 90 feet long. On retreat mining, these pillars are removed if they meet cut-off grade.
- Ventilation will be provided by two 500 HP exhaust fans at Sheep No. 1 Shaft and Sheep No. 2 Shaft assisted by multiple portable face fans. Ventilation requirements for this mine are approximately 220,000 cubic feet of air per minute. Fresh air must be directed across each of the working faces and through the drifts designed for personnel transport.
- Mine ventilation, which meets standards for removal of diesel emissions, will also provide adequate ventilation for radon gas given the anticipated mining grades.
- Blasting of the rock, both for development and mining, will be done by drilling 8 to 12-foot blast holes using jumbo drilling rigs and filling the blast holes with ANFO (Ammonium Nitrate and Fuel Oil).
- Haulage from the working faces to the haulage conveyor or to the loading chutes will utilize 4 cubic yard scoop trams that load, haul and dump mined product.
- Mined product will be hauled through development drifts directly to the decline or to two loading chutes to transport the mined product to the decline. The decline will be equipped with a 36-inch conveyor that will take the mined product and waste, when necessary, to the surface. Haulage drifts will be kept as level as practicable, not exceeding ten percent grades.
- The roof and sidewalls in the drifts, both mining and development, will be supported with rock bolts and wire mesh. A rock-bolting machine that can drill holes both vertically and horizontally will place the rock bolts on approximately four-foot centers as the drifts advance. There will be overlap of bolting and wire mesh between each round to ensure proper ground control coverage.
- Boreholes to construct loading chutes or to aid in ventilation will be drilled using raised boring methods.
- Waste rock, whenever possible, will be placed in mined out workings to minimize haulage of hauling the mined waste to the surface. When it is not possible, the waste will be taken to the surface where it will be stockpiled for final reclamation.
- Ground Support will, in addition to bolting and meshing, include:
    - In areas that do not have mineralized zones directly above them temporary support will be placed such as timbers or concrete cylinders, and the pillars will be removed allowing the roof to ultimately fail.
    - In areas with mineralized pods directly overhead, the adjoining rooms will be backfilled using a cemented backfill. The backfill will be a combination of waste rock mixed with three and one-half percent cement and three and one-half percent fly ash. This backfill will exceed the strength of the native rock and prevent the roof from failing and diluting the mineralized pods above them.

The planned location of the new decline in relation to the existing workings is shown on Figure 16.6. This figure is also an index map for the annual underground mine sequence maps that follow. Figures 16.17 through Figure 16.27 show the annual development and mining sequence for through eleven years of planned mining. Table 16-2 summarizes the underground mine fleet.

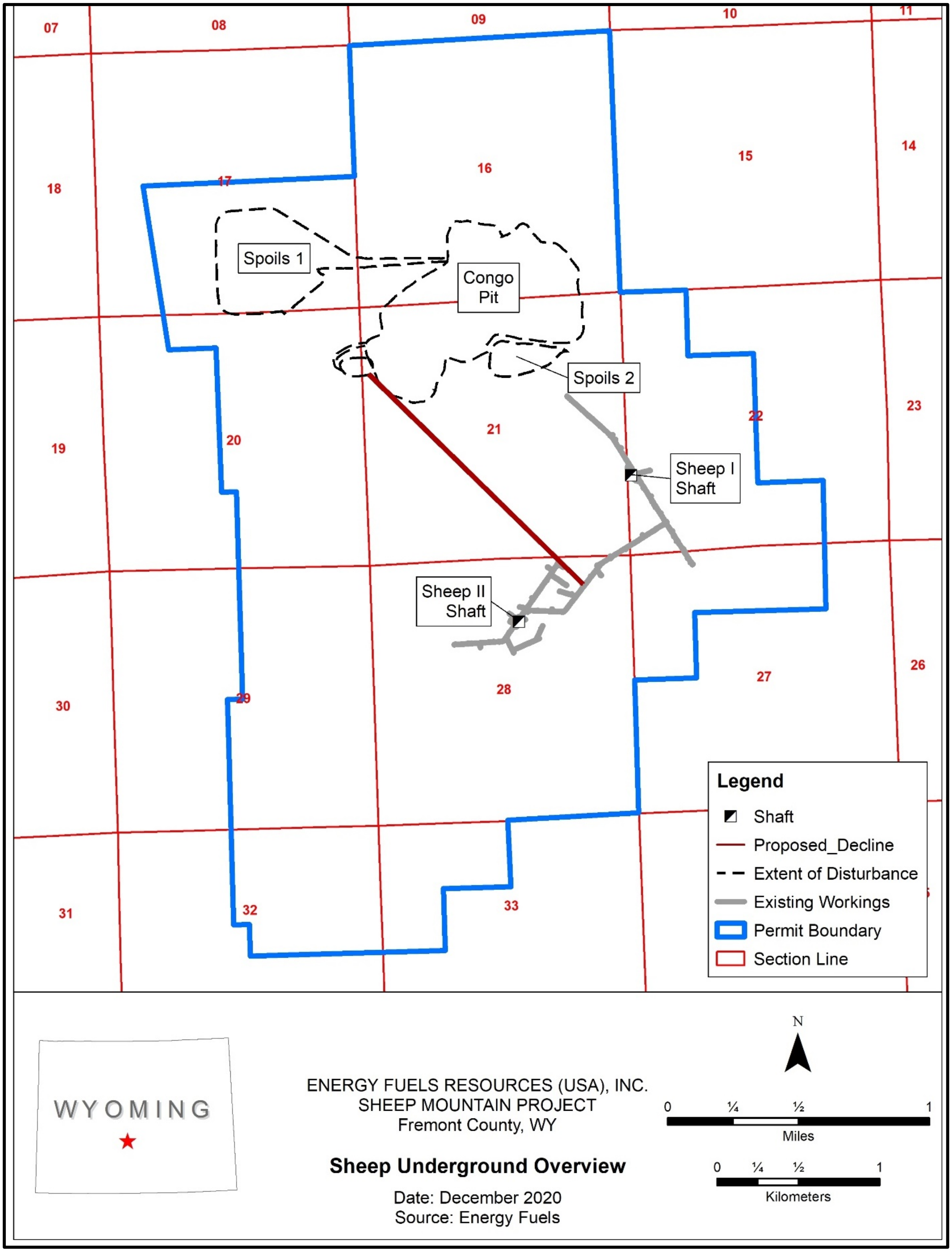



**Figure 16-14. Sheep Underground Overview Map**

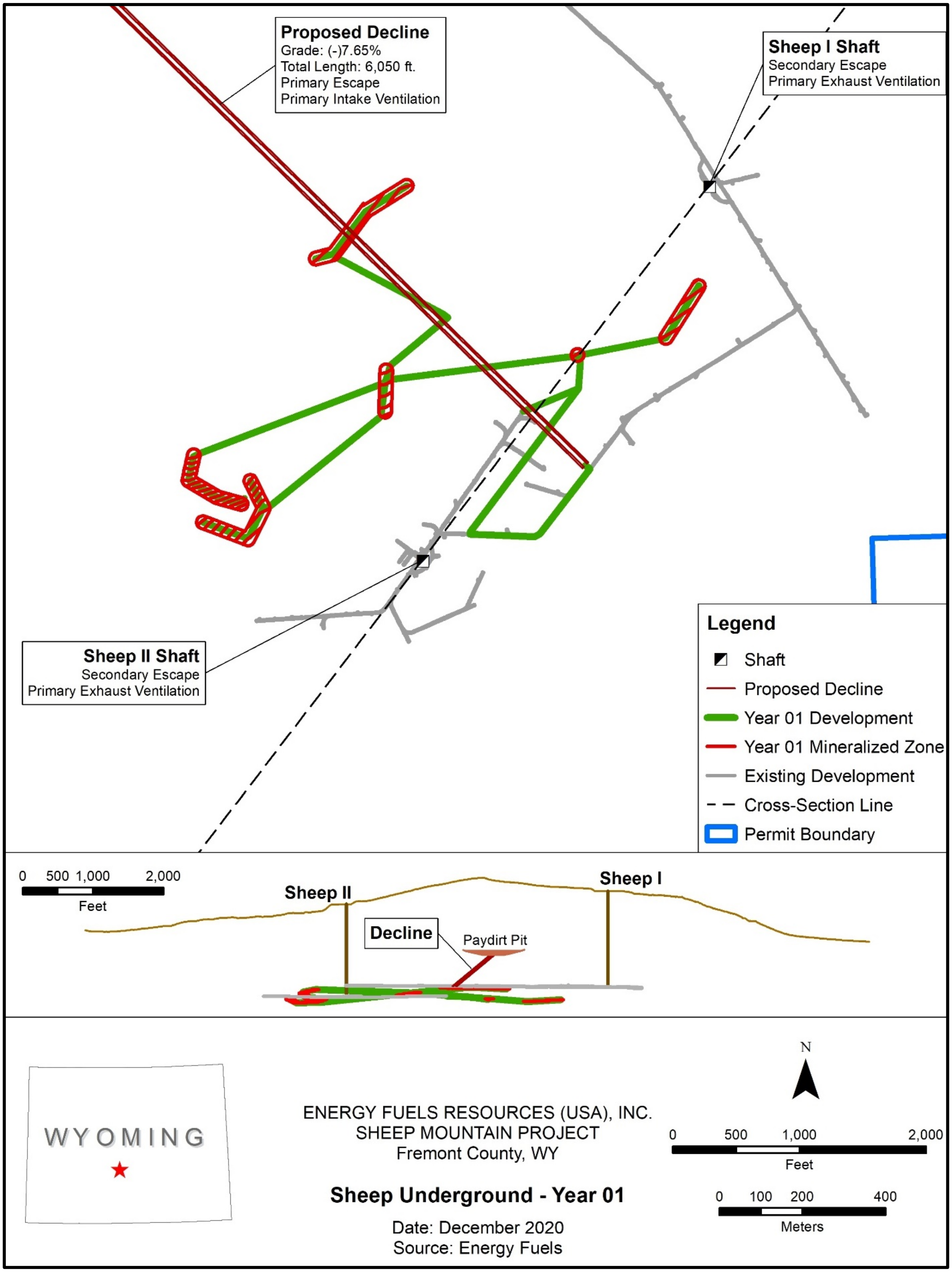



**Figure 16-15. Sheep Underground - Year 01**

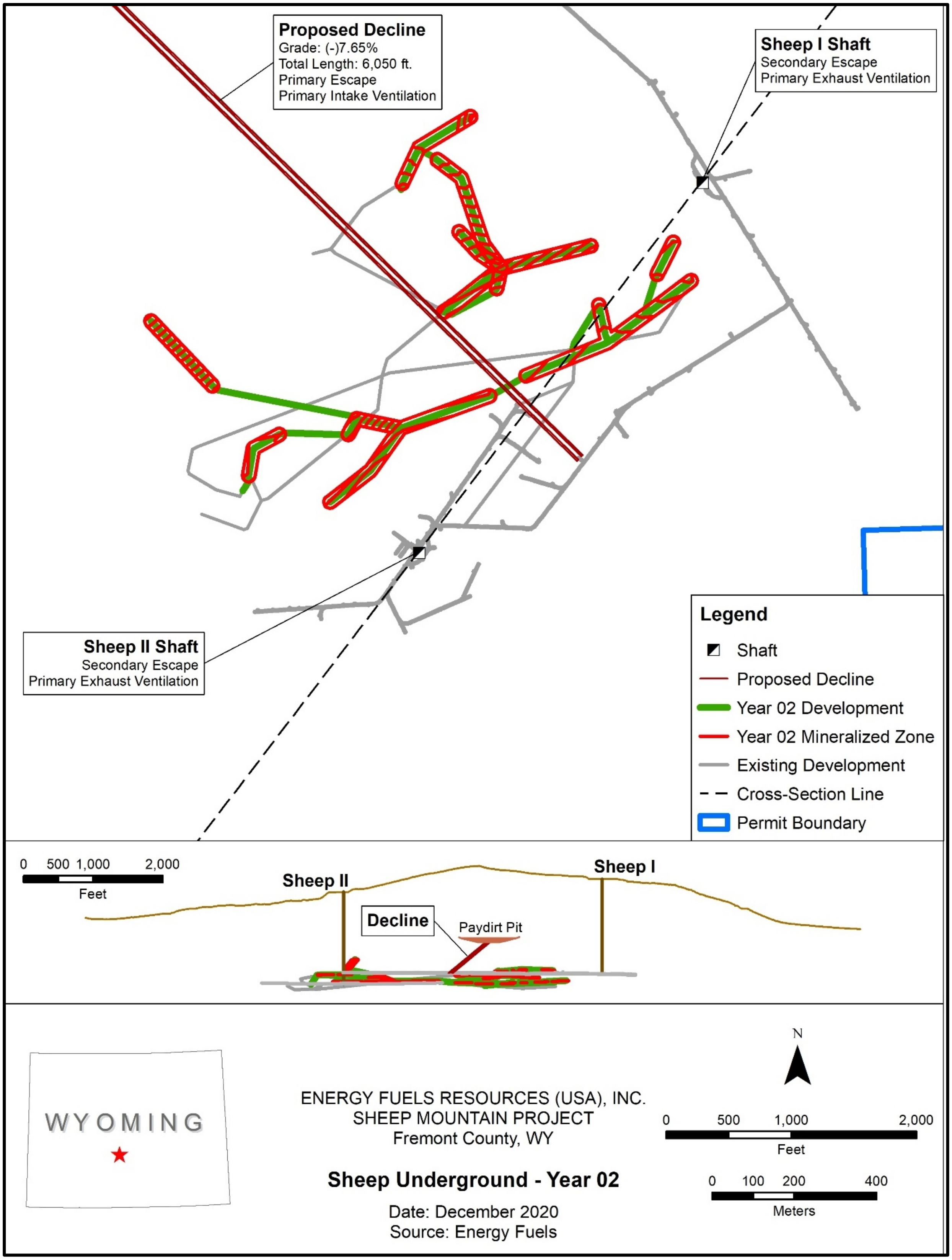



**Figure 16-16. Sheep Underground - Year 02**

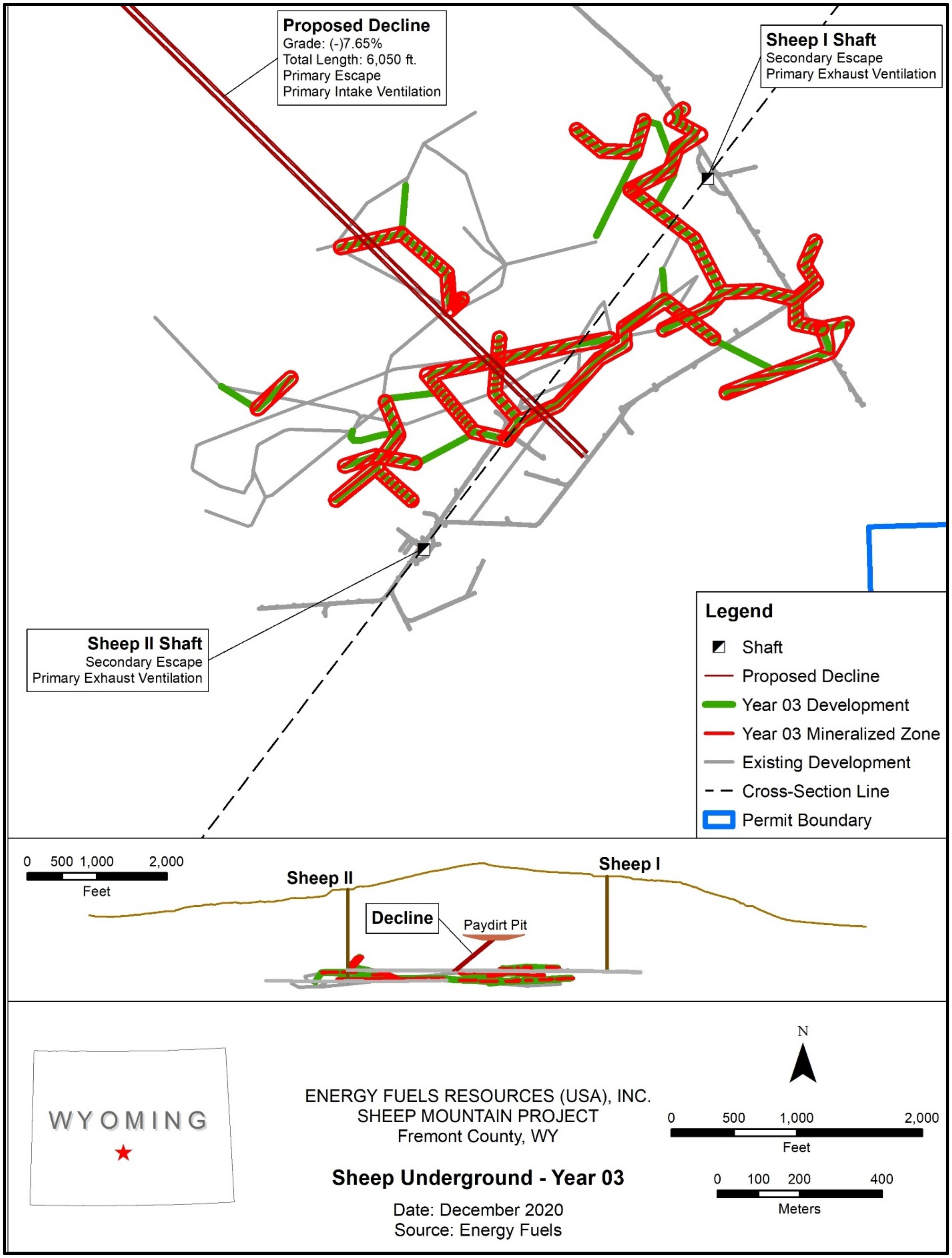



**Figure 16-17. Sheep Underground - Year 03**

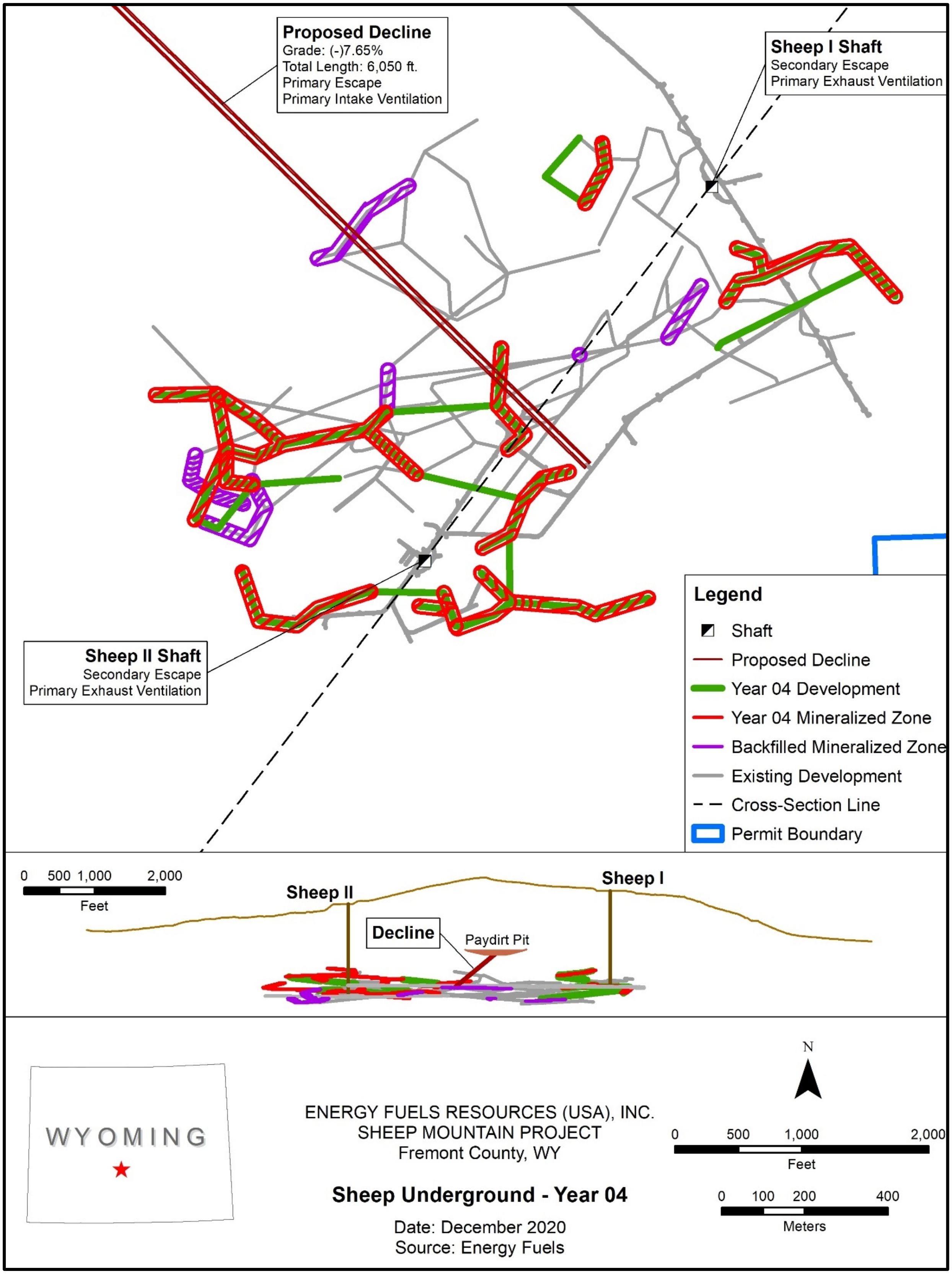



**Figure 16-18. Sheep Underground - Year 04**

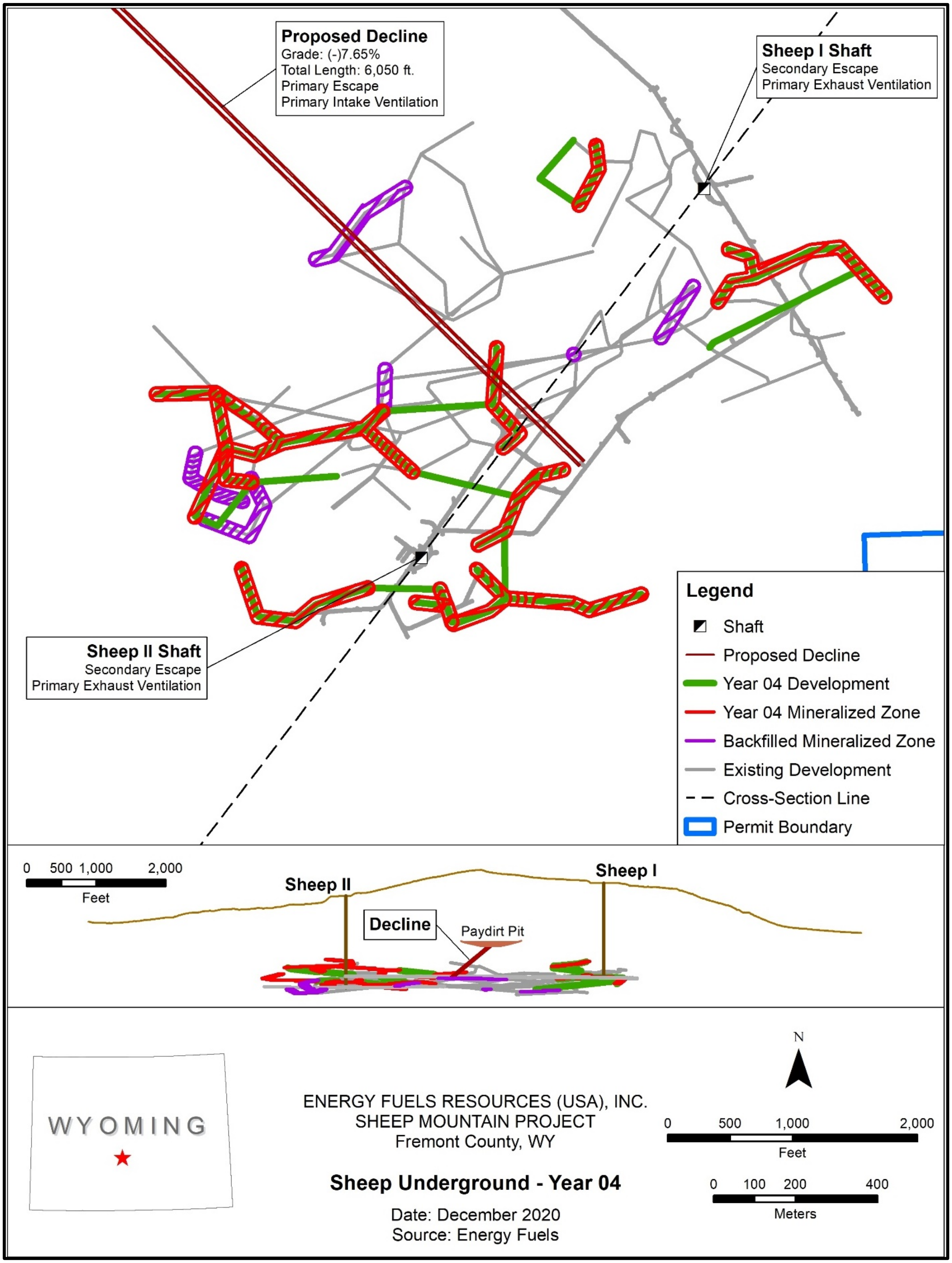



**Figure 16-19. Sheep Underground - Year 05**

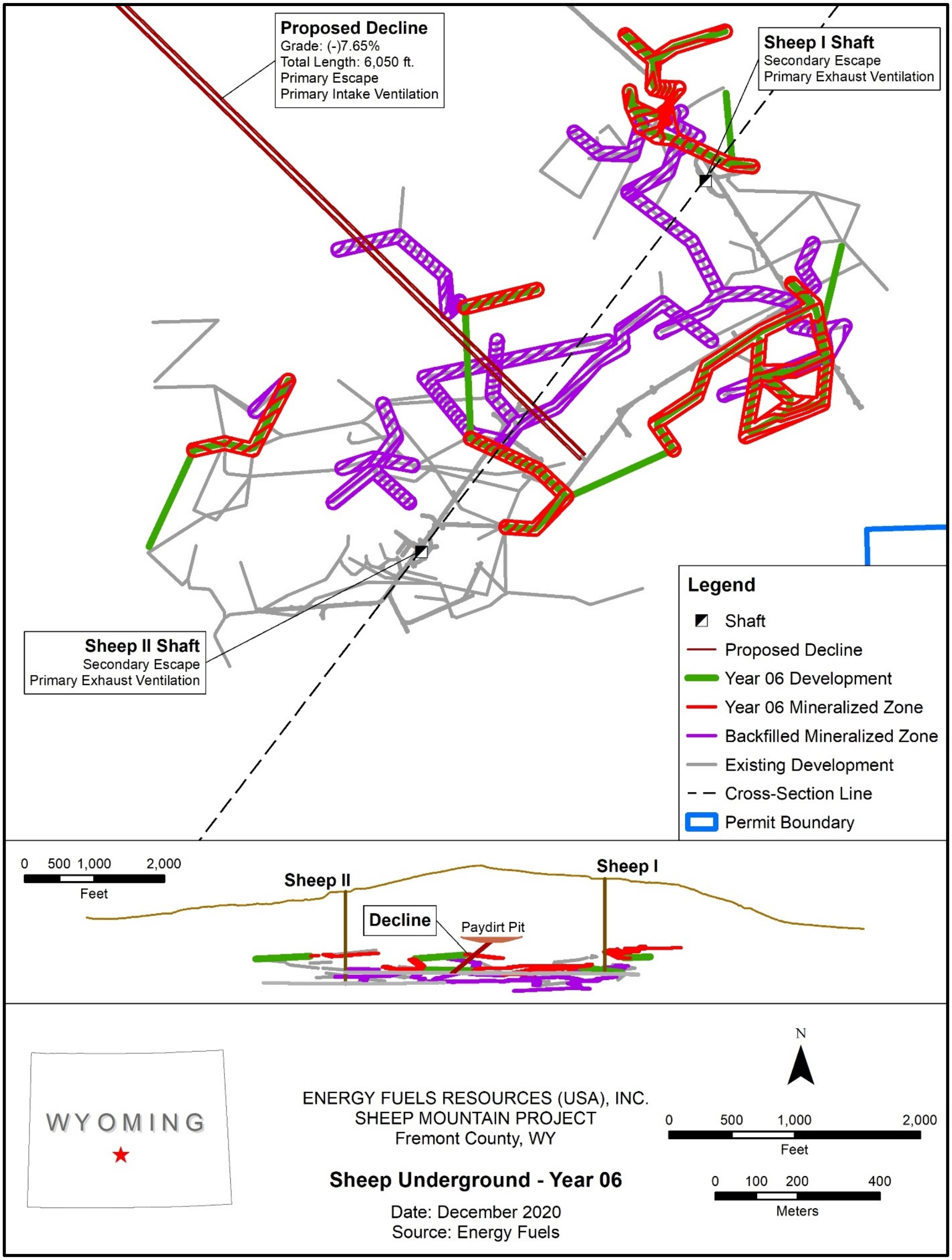



**Figure 16-20. Sheep Underground - Year 06**

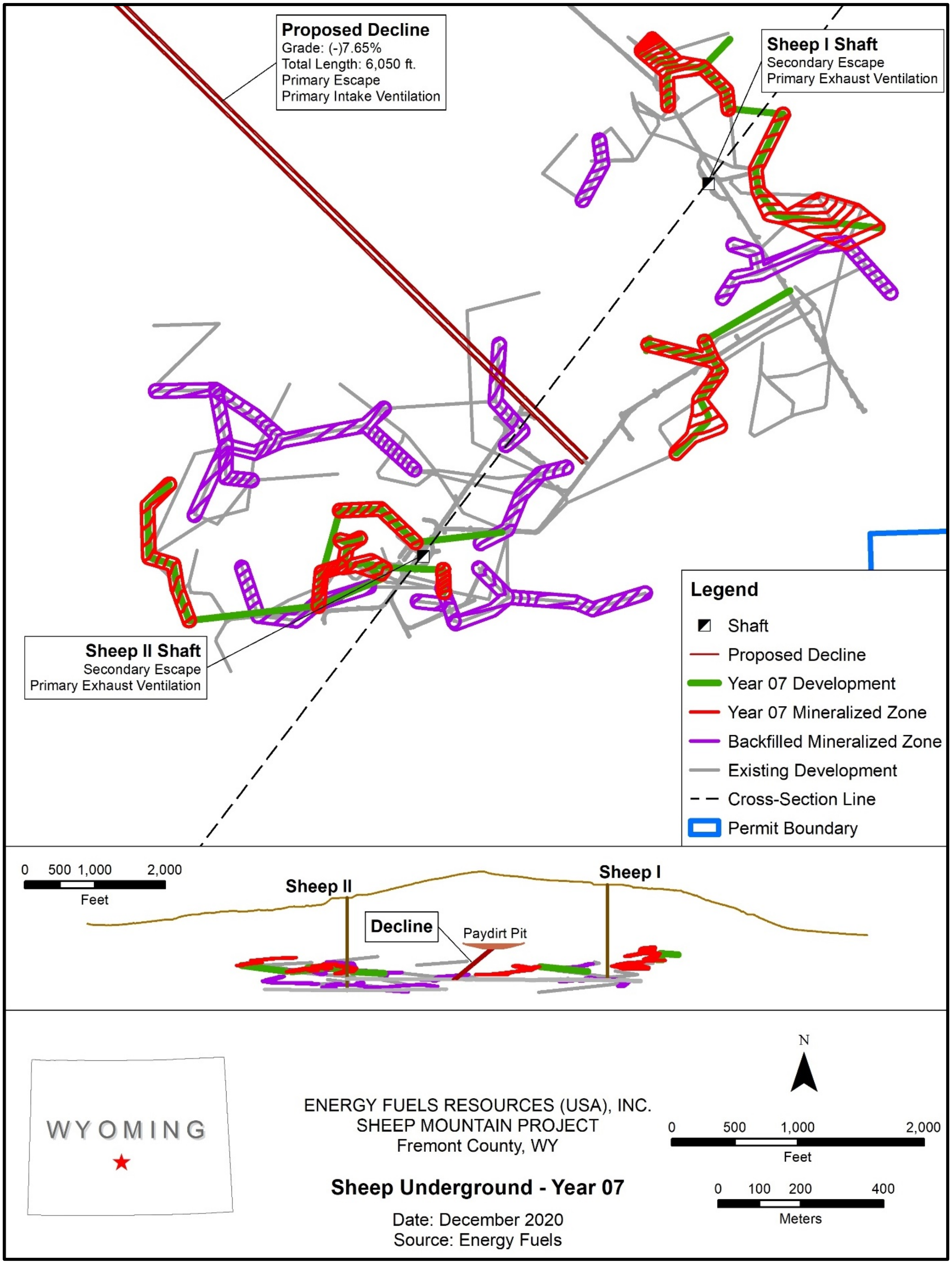



**Figure 16-21. Sheep Underground - Year 07**

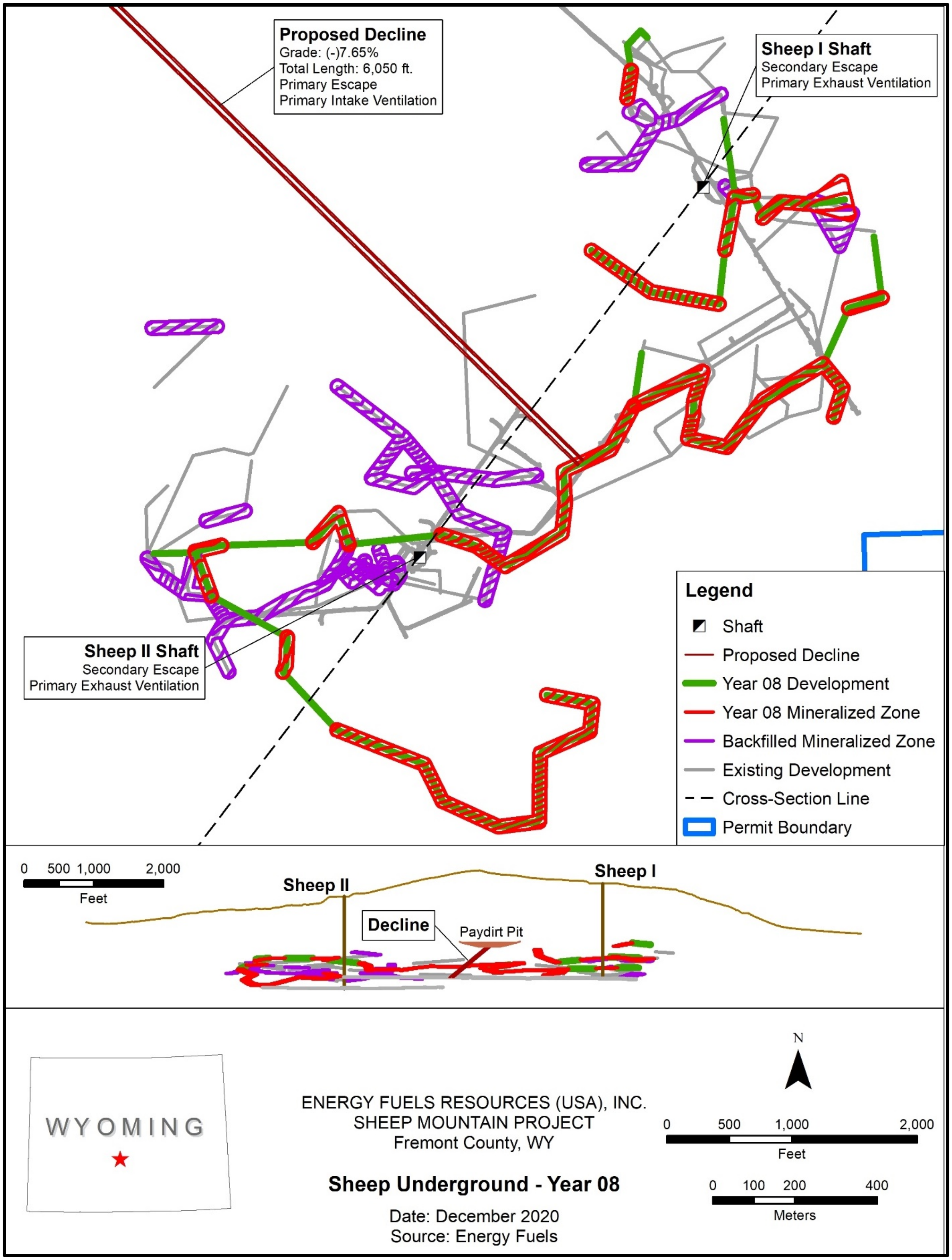



**Figure 16-22. Sheep Underground - Year 08**

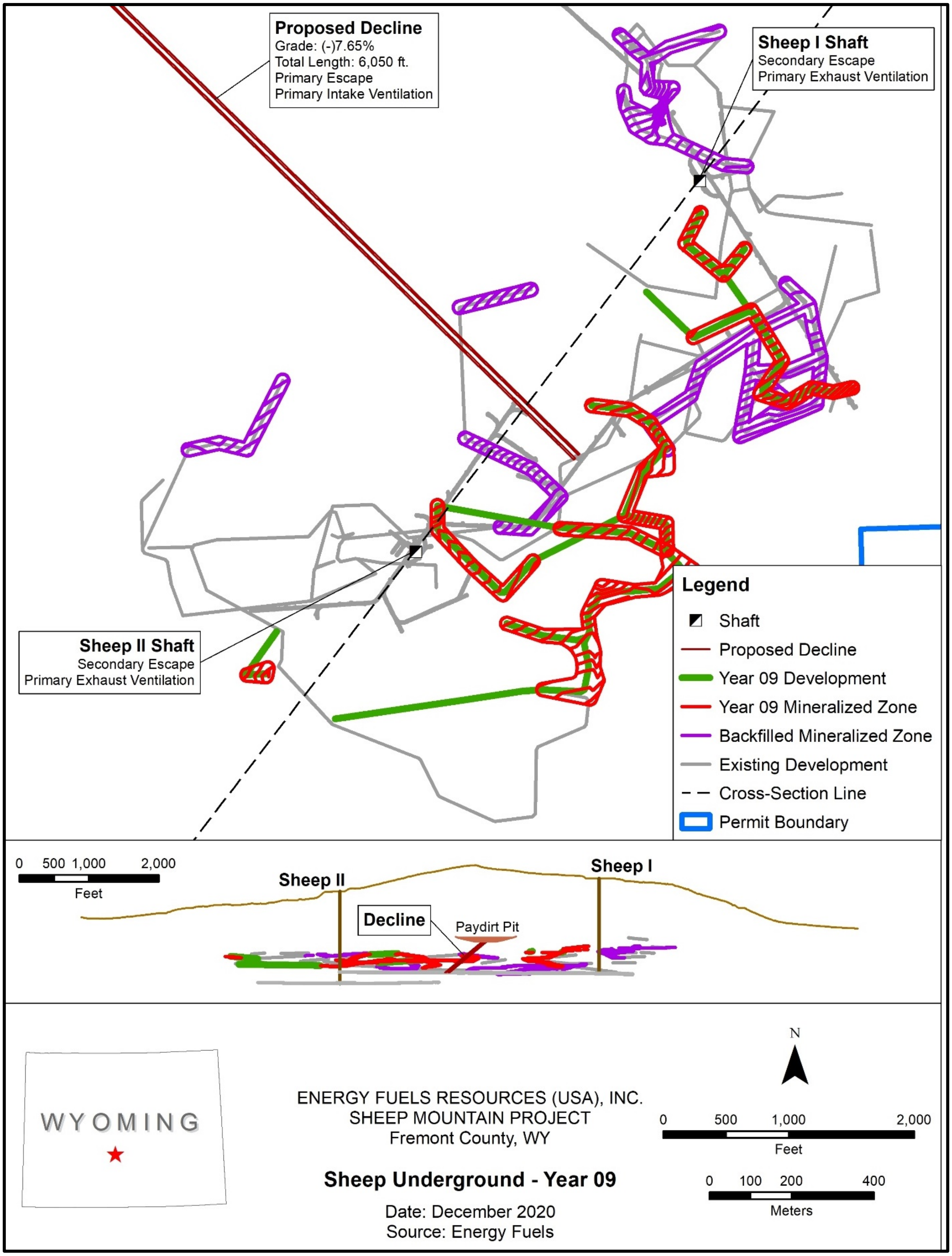



**Figure 16-23. Sheep Underground - Year 09**

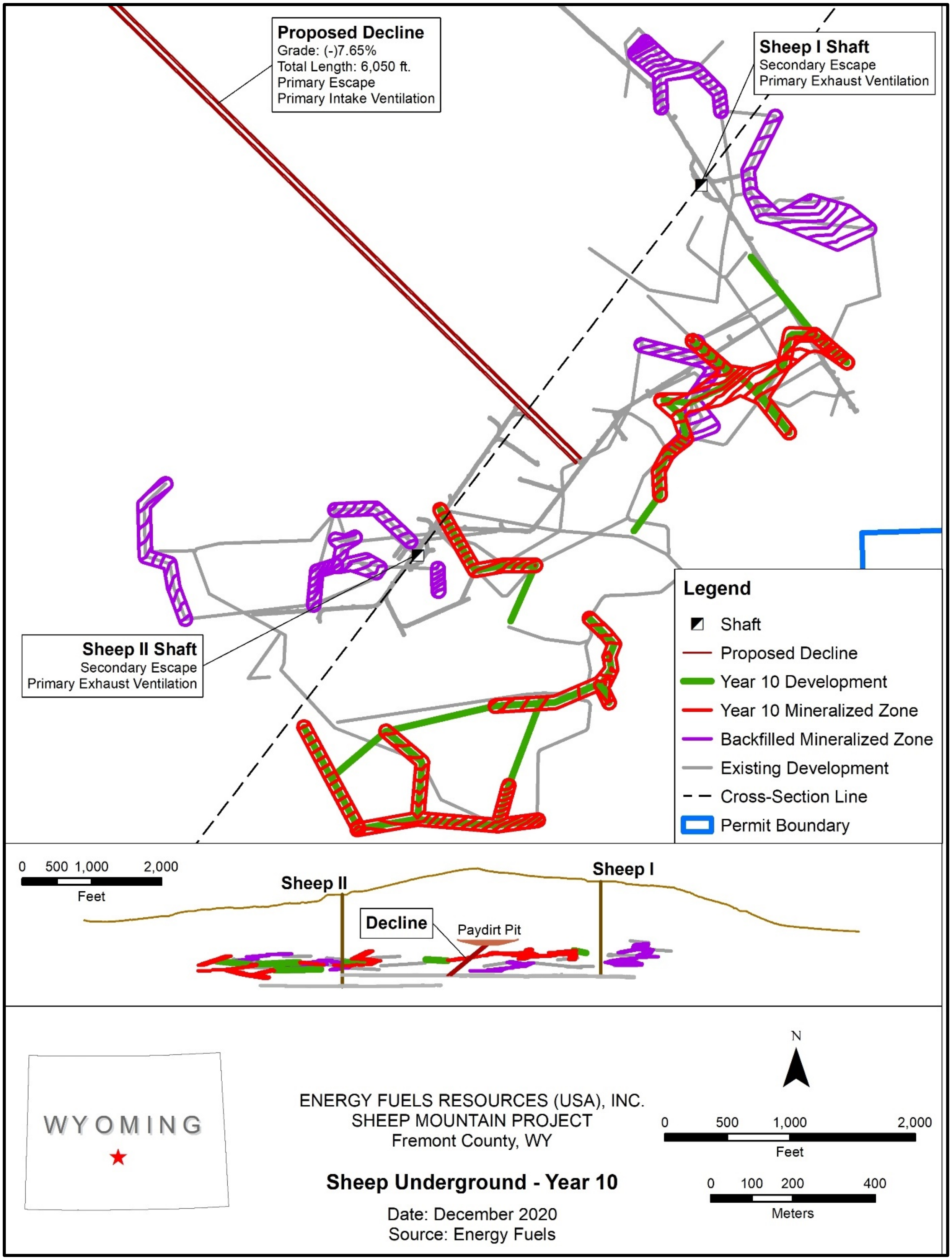



**Figure 16-24. Sheep Underground - Year 10**

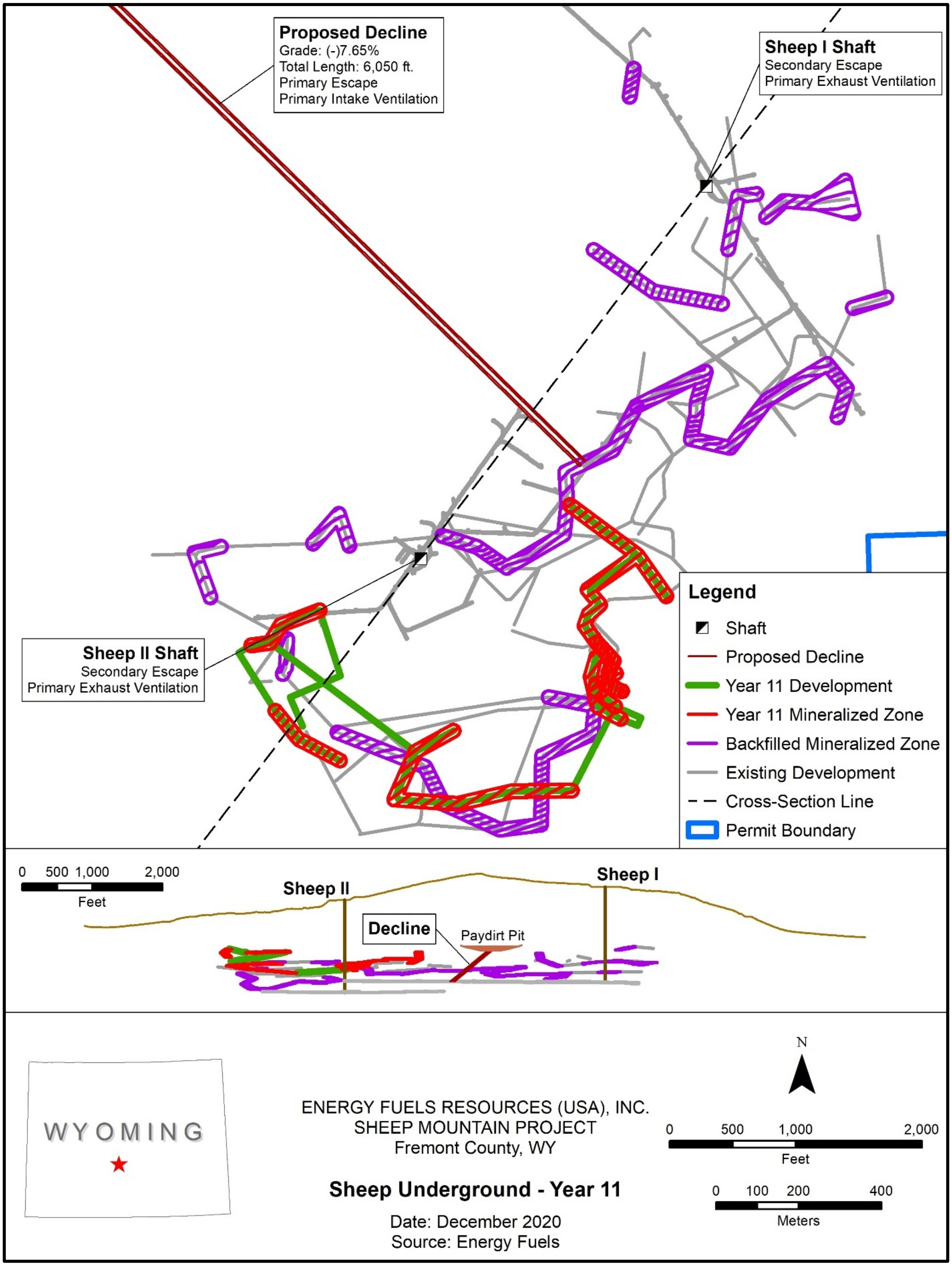



**Figure 16-25. Sheep Underground - Year 11**

**Table 16-2 Underground Mining Equipment List**

| Major Equipment | Number | Capacity/ Load Factor |
|---|---|---|
| Model Boomer S1L Face Drill | 4 | 74 HP-1xBOOM |
| Model Boomer 104 Face Drill | 1 | 74 HP-1xBOOM |
| Model Boomer S1D-DH Face Drill | 1 | 74 HP-1xBOOM |
| Model Boltec SL Bolter | 7 | 40 HP-1xBOOM |
| Model Boltec 235 Bolter | 2 | 97 HP-1xBOOM |
| Model ST7LP Scooptram | 4 | 4 CY |
| Model ST7 Scooptram | 2 | 4 CY |
| **Mine Support vehicles** | | |
| Powder Buggies | 2 | 129 HP |
| Bobcat Skidsteer | 3 | 3,200 lb. Lift |
| Utility Truck - Flatbed | 1 | N/A |
| Scissor Truck | 8 | N/A |
| Man trips | 6 | N/A |
| Pickup trucks, 4WD, ¾-ton | 8 | N/A |
| Fuel/lube truck | 1 | N/A |
| Mechanical service truck | 1 | N/A |
| Forklift | 1 | N/A |

# 17.0 RECOVERY METHODS

## 17.1 Introduction

The uranium recovery method at the Sheep Mountain Project (the Project) is conventional heap leaching, a process identical to that applied globally for the last five decades to the oxidized ores of copper and gold. This process embodies an oxidant to mobilize uranium minerals from the mined material stacked on the heap pad and dilute sulfuric acid to dissolve the uranium. The uranium-enriched solution is pumped to a recovery plant (mill) for purification and concentration of the uranium to a saleable product, using solvent extraction and precipitation systems. Over a 12 year mine life, the heaps will recover an average of 1.4 million pounds of U3O8 annually.

Uranium recovery at Sheep Mountain will include the following processes:

- stacking of mined material on the heap leach pad.
- application of leach solution.
- collection of pregnant leach solution ("PLS").
- filtering of sand and fines from PLS.
- solvent extraction to concentrate and purify the extracted uranium.
- precipitation of uranium oxide, or yellowcake.
- washing, drying, packaging, storage and loading of yellowcake product.
- management of process solid and liquid waste and bleed streams; and
- in-place reclamation of all "byproduct material," within the meaning of Section11e. (2) of the Atomic Energy Act of 1954, as amended hereinafter referred to as (11e. (2)), in a double lined disposal cell, which will include the existing lined heap leach pad and the Raffinate and Collection Ponds.

The uranium recovery or "milling" process equipment will be housed in several buildings within the proposed mill boundary. All solvent extraction processing and equipment will be located within the SX Plant to isolate potential fire hazards associated with the organic solutions. Yellowcake processing, including precipitation, washing, drying, packaging, storage, and loading will be located outside the Process Plant In separate buildings to minimize contamination. Reagent storage and distribution systems will be located within or near the process buildings. Ancillary buildings will be provided for gender-separate change rooms, for radiometric scanning of incoming and departing personnel, and for operations such as yellowcake drying and packaging that have an elevated potential, for exposure of personnel to radionuclides.

Processing, or "milling," begins as crushed uranium-bearing material that is stacked on the double-lined heap leach pad using covered belt conveyors and a covered radial arm stacking ("RAS") belt conveyor as depicted on Figure 17-1. The material is stacked to a height of 20 feet, forming a "lift." A protective layer of gravel is placed on top of the lift to mitigate fugitive dust and transport of radionuclide particulates from the heap. A drip irrigation system using conventional plastic piping is then installed on top of the completed lift, and the heap is ready for the application of an acidic leaching solution.

Figure 17.2 depicts the general flow of solutions and uranium within the heap and recovery plant. The process begins with pumping the leach solution from the Raffinate Pond to the top of the heap where it is applied using drip emitters. The leach solution consists of water, an oxidizing agent, such as sodium chlorate, to convert the uranium to a soluble U+6 valence state; and a complexing agent, sulfuric acid, to complex and solubilize the uranium. The heap leaching process yields a PLS containing a mixture of uranyl trisulfate ("UTS") and uranyl disulfate ("UDS"). PLS percolates through the stacked material via gravity drainage, is intercepted by the pad's liner system, and flows into a network of perforated pipes which drain by gravity into the collection pond. The PLS is then pumped from the collection pond into a clarifier tank where suspended particulates settle and are collected into a sludge that is pumped to a disposal pond. The clarified PLS is then filtered to remove the remaining very fine particulate matter and pumped to the solvent extraction ("SX") plant, where the uranium is recovered using organic ion exchange. The resulting uranium-depleted aqueous solution, called barren leach solution or "raffinate," flows by gravity from the SX Plant to the raffinate pond. This raffinate is fortified with acid, oxidant, and make-up water and is pumped back to the heap in a continuous cycle. From the SX Plant, uranium-rich strip

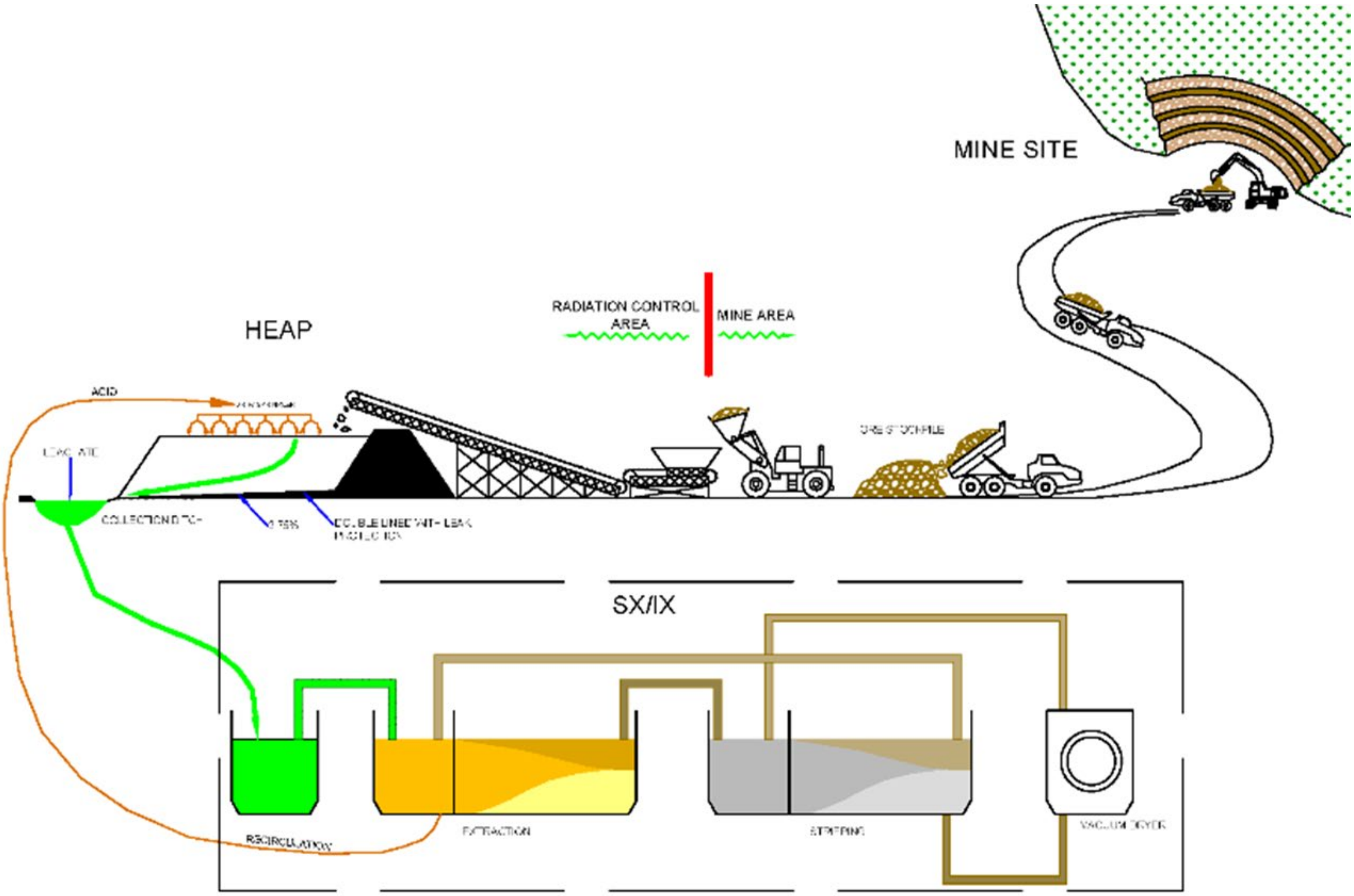



**Figure 17-1. Typical Heap Leach Schematic**

solution is sent to the Process Plant for precipitation of yellowcake. The precipitated yellowcake is then washed, dried, and packaged into sealed 55-gallon drums for shipment. Yellowcake is shipped via truck to an enrichment facility in regular shipments approximately once every two weeks.

To prevent buildup of undesirable ionic species in the circulating leach solution, a bleed stream representing a small, calculated fraction of the total leach solution flow is removed from the circuit. The bleed stream is sent to the holding pond for interim storage and transfer to the disposal pond. The bleed stream and other liquid wastes are concentrated by evaporation to a sludge that either remains in the holding pond or is spread on spent portions of the heap leach pad.

The application, collection, stripping, and re-application of the leach solution is a continuous process. The mined material remains on the heap leach pad throughout primary leaching, resting of the mined material between leach solution applications, secondary leaching, potential rinsing, and final drain down prior to closure. Only after the mined material is drained does it become a waste product under current regulatory definitions.

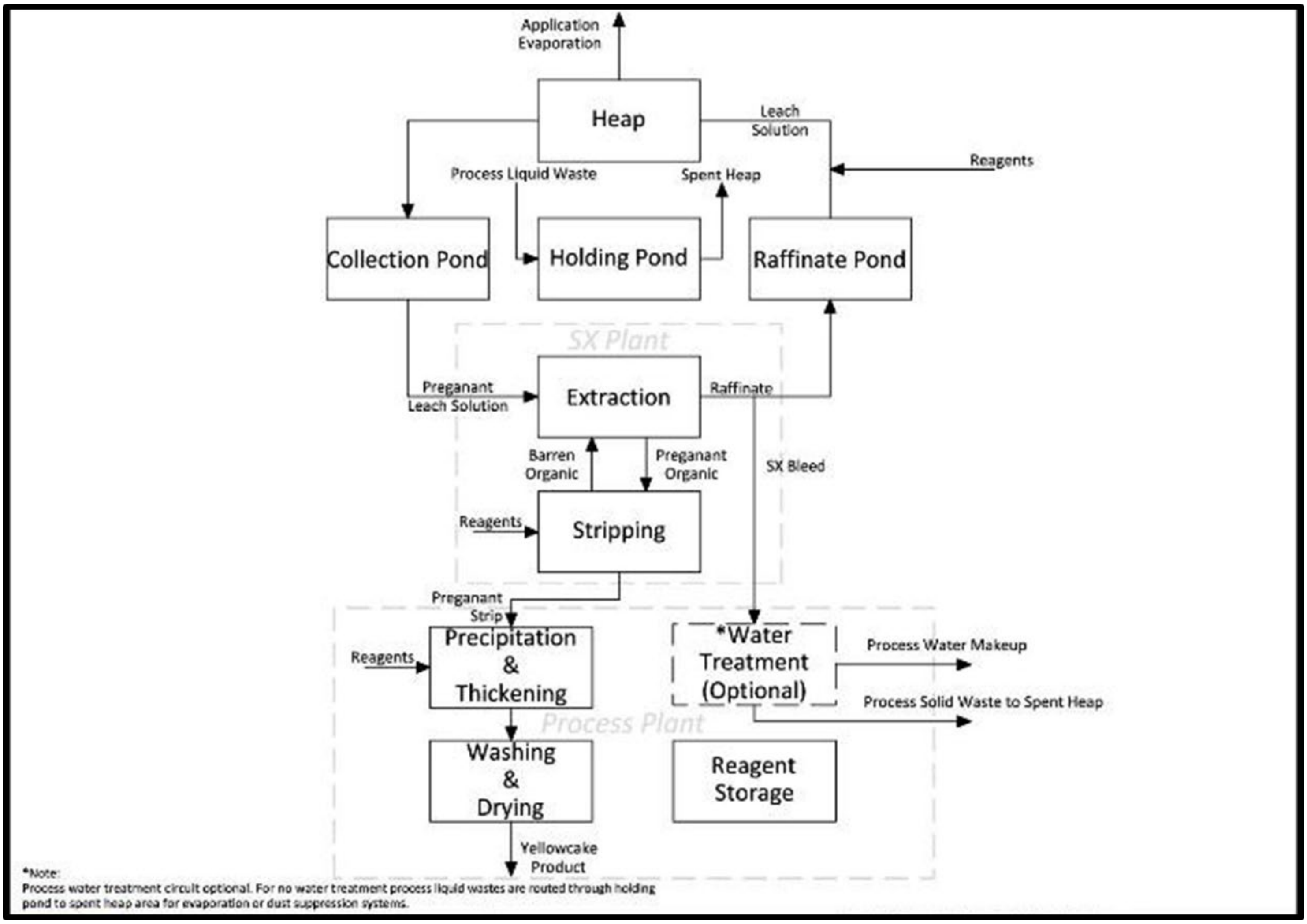



**Figure 17-2. Heap Leach Process Block Flow Diagram**

## 17.2 Site Layout and Construction

The general site layout and construction requirements for the heap leach and processing facility are shown on Figure 17-3. The construction costs related to the heap leach and processing facility are included in the capital cost estimate summarized in Section 21.

The initial heap leach pad area is approximately 40 acres, which is subdivided into cells that can be loaded with up to three lifts of approximately 20 feet in height or a total of 60 feet. Each lift will be separated with an interim liner and drainage system (Figure 17-3 and Figure 17.4). The stacking rate for individual lifts will depend on the variable mine production rates. The initial 40-acre heap leach pad has adequate space to accommodate approximately 1/2 of the total mined material. In year 6, an additional 40-acre pad will need to be constructed. This can be operated in the same manner as the initial heap pad or used to offload spent heap material from the initial heap pad to allow its continued use. The additional 40-acre expansion is proximate to the initial heap pad as shown on Figure 17.4.

Reclamation and decommissioning of the Sheep Mountain Project uranium recovery facility generally will consist of decommissioning the Process Plant, the SX Plant, ancillary facilities, and the holding pond, and placing the associated 11e. (2) byproduct material within the on-site disposal cell. The lined portions of the collection pond, raffinate pond, and heap leach pad will become the disposal cell for long-term isolation and stabilization of all liquid and solid 11e. (2) byproduct material associated with the planned operations. The proposed Source Materials License Area and other areas potentially affected by licensed operations will be assessed and remediated to meet appropriate release criteria, and the disposal cell will be capped with an approved cover to ensure compliance with the requirements of 10 CFR 40.

After the heap leach pad area has been completely filled and leaching, potential rinsing and potential treatment and subsequent drainage have been completed, spent heap materials (now tailings) will be graded to their final configuration. Any 11e. (2) byproduct material, including material from plant decommissioning, liner from the Holding Pond, and any other 11e. (2) byproduct materials requiring disposal will be appropriately sized and placed within the lined disposal cell prior to completing the reclamation cover. The final cover will consist of a clay-based radon barrier, a gravel/cobble capillary break, bio intrusion and freeze/thaw protection layer, and a rip rap erosion protection layer. This final reclamation cover is designed to be a zero-water balance cover using vegetation as a planned component of the cover water balance. The final reclamation plans are shown on Figure 17.5 in plan view and in Figure 17.6 in cross sectional view.

Costs for decommissioning and reclamation of the heap and mineral processing facilities are incorporated into the operating costs estimate, Section 21.

Detailed estimates of capital and operating expenses were completed (Lyntek, 2012) and have been updated to.2021 costs The following is a summary of the operating requirements for energy, water, and consumable materials for the entire mineral processing facility. Process water and electrical power are currently available on site and are adequate to serve the planned operations.

- Electrical Power – Operation of the heap leach, conveyor system, solution processing plant, yellowcake drying and packaging facility, and all related appurtenances is estimated to consume approximately 600 kilowatts per hour (kW/hr.) or approximately 5 million kW per year.
- Water demand – At full capacity, the mineral processing facility will require an average flow rate of 360 gallons per minute (gpm). However, the majority of the flow is recirculated, resulting in an estimated net water demand of 135 gpm. Process water will be provided from dewatering of the underground mine.
- The largest single consumable for mineral processing is sulfuric acid. Consumption of sulfuric acid is estimated at 30 pounds per ton. At the peak production of 660,000 tons per year this equates to approximately 10,000 tons of sulfuric acid per year. Sulfuric acid is available from an acid plant located in Riverton, Wyoming approximately 60 road miles from the site.
- Personnel requirements are discussed in Sections 5.5 and 21.8.

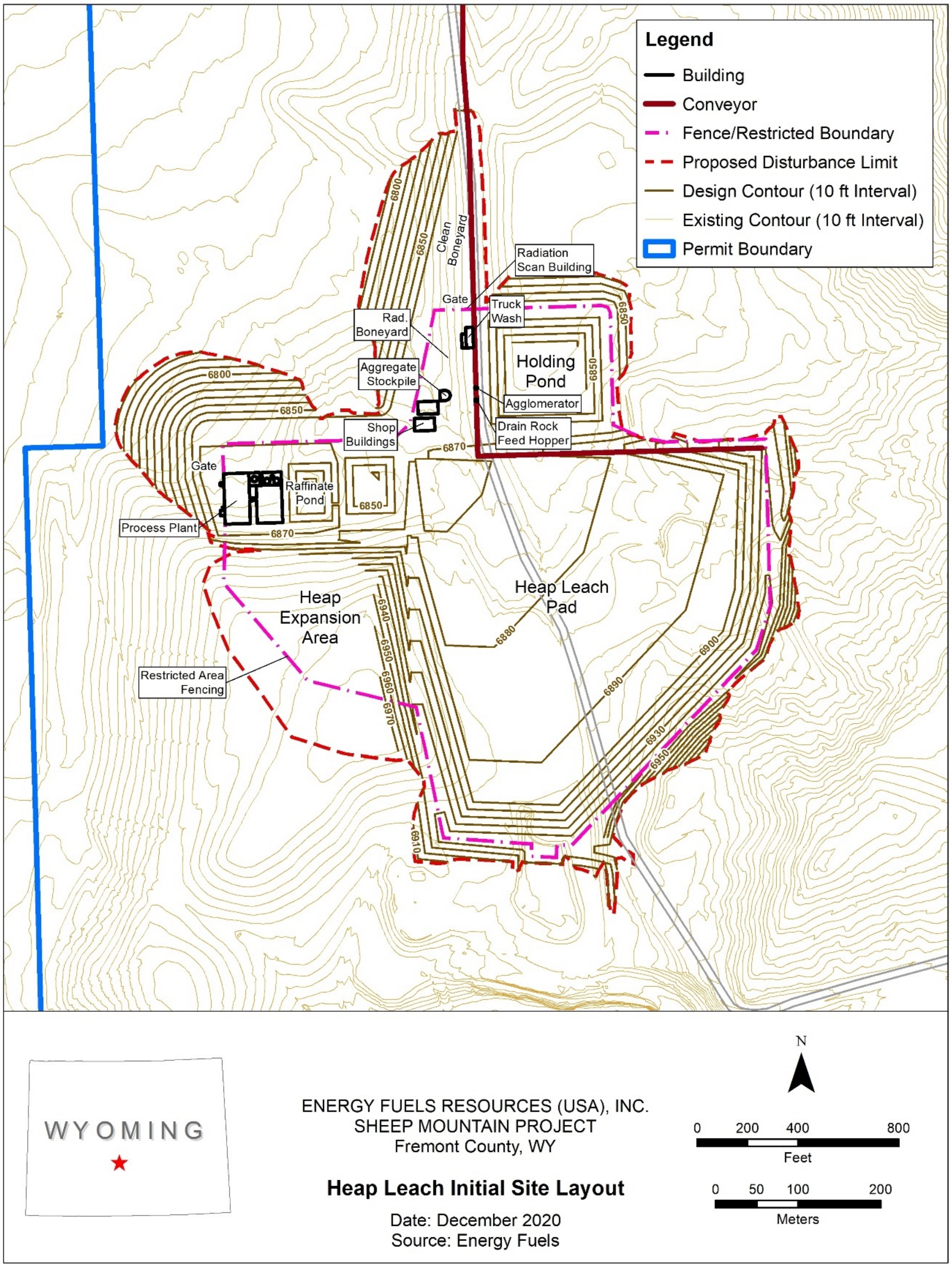



**Figure 17-3. Heap Leach Initial Site Layout**

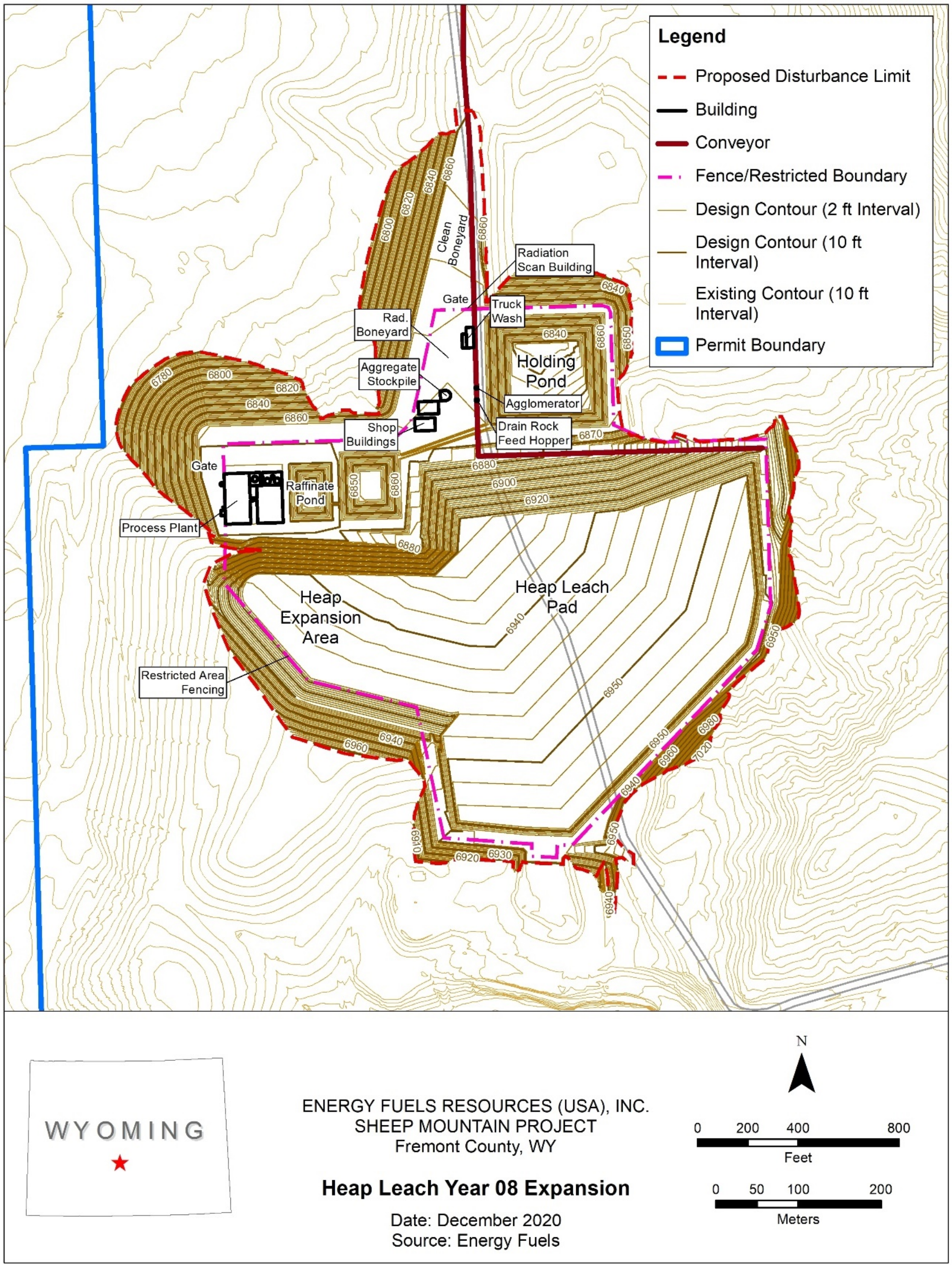



**Figure 17-4. Heap Leach Year 08 Expansion**

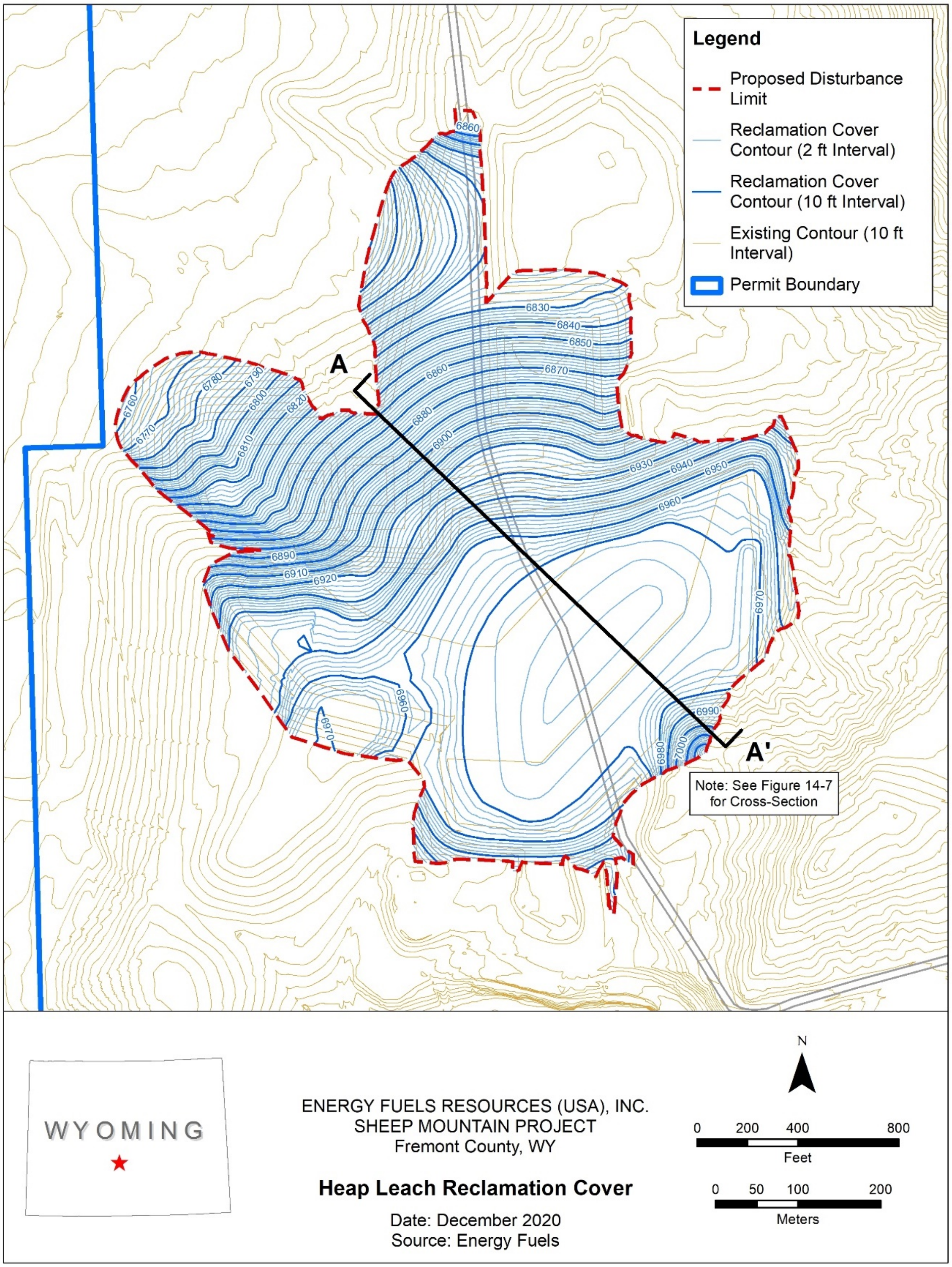



**Figure 17-5. Heap Leach Reclamation Cover**

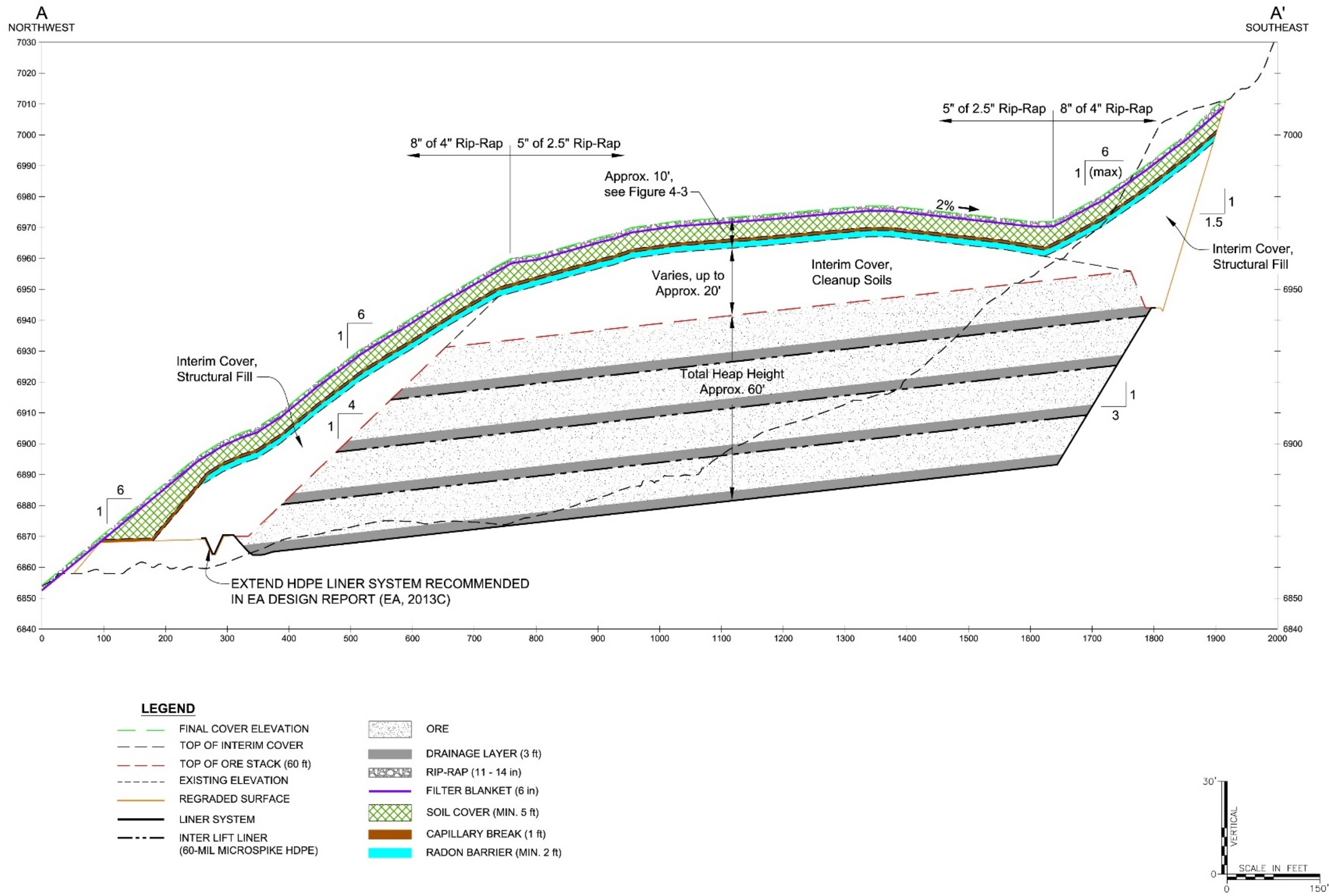



**Figure 17-6. Heap Leach Reclamation Cover Cross-Section (A-A')**

# 18.0 INFRASTRUCTURE

## 18.1 Introduction

All necessary utilities and general infrastructure for the planned project are either currently available on site or can readily be established. Existing infrastructure is depicted on Figure 18-1.

All planned mining, mineral processing, and related activities are located within the existing Mine Permit 381C which is held by EFR. These lands are adequate for all planned mining operations including the disposal of mine mineral processing wastes and/or tailings.

## 18.2 Rights of Way

Right of Way applications for an overhead power line and mine dewatering pipeline utility corridor from the heap facility area (located on private land) to the Sheep I and Sheep II shafts have been approved, and the right of ways have been granted under BLM Grants WYW168211 and WYW168212. The main water supply pipeline for the plant will be located on private lands from either the McIntosh Pit or Sheep underground to the plant site.

## 18.3 Power and Utilities

Telephone, electric and natural gas service are available at the site and were upgraded in 2011 to provide the required service for the planned project.

## 18.4 Process Water

With respect to mine and mineral processing operations, the mineral processing facility will operate at an average flow rate of 360 gpm. However, the majority of the flow is recirculated resulting in an estimate net water demand of 135 gpm. The largest consumptive use of water on the project will be for dust control for the open pit, hauls roads, stockpile areas, and the conveyor system. This use is estimated to average 150 gpm over a 9-month period or 100 gpm on an annual basis. Thus, the total water use is estimated at 235 gpm. Dewatering at the Sheep Underground mine produces approximately 200 gpm, based on past production records. In addition, dewatering of the Congo Open pit requires an estimated 150 gpm beginning in year seven and extending to the end of mining. Thus, approximately 350 gpm of water will be produced by the mines, which is adequate for the planned operations.

## 18.5 Site Access

Primary access to the site is provided via an existing county road. This road is designated as an industrial access corridor by the BLM in their current Resource Management Plan ("RMP"). The county road provides access to within one mile of the site from which there is an existing private gravel road to the site.

## 18.6 Mine Support Facilities

Mine support facilities will consist of an office, mine shop and warehouse, and a dry facility. In consideration of the remoteness of the site and the potential for hazardous winter driving conditions, emergency stores of non-perishable food and water will be kept on-site along with portable cots should it be necessary for personnel to remain on-site during such conditions.

## 18.7 Public Safety and Facility Maintenance

Access to the site will be controlled by fencing where appropriate at the Mine Permit 381C boundary and internally at the Radiation Control boundary. Initial public access to the mine and heap leach facility will be controlled through a single entrance with a guard shack manned during operating hours and gated at all other times. The mine facility will be regulated by MSHA and the State Mine Inspectors Office. Any persons wishing to enter the facility will be required to complete safety training as required by regulations and be equipped with appropriate Personal Protective Equipment (PPE) depending on which areas they wish to enter.

The heap leach processing facility is internal to the mine permit and will be enclosed by additional fencing. As with the main entrance to the project, the entrance to the radiation control area will be protected by a guard shack manned during operating hours and gated at all other times. In addition to confirming safety training, all visitors accessing the radiation control area will be subject to radiometric scanning prior to entering the area and prior to leaving the area. All visitors and personnel will have to pass the scan out procedure prior to leaving the facility.

Fire and emergency services are available from Fremont County and Jeffery City. The site is registered with emergency services and emergency contact numbers are posted at the mine office.

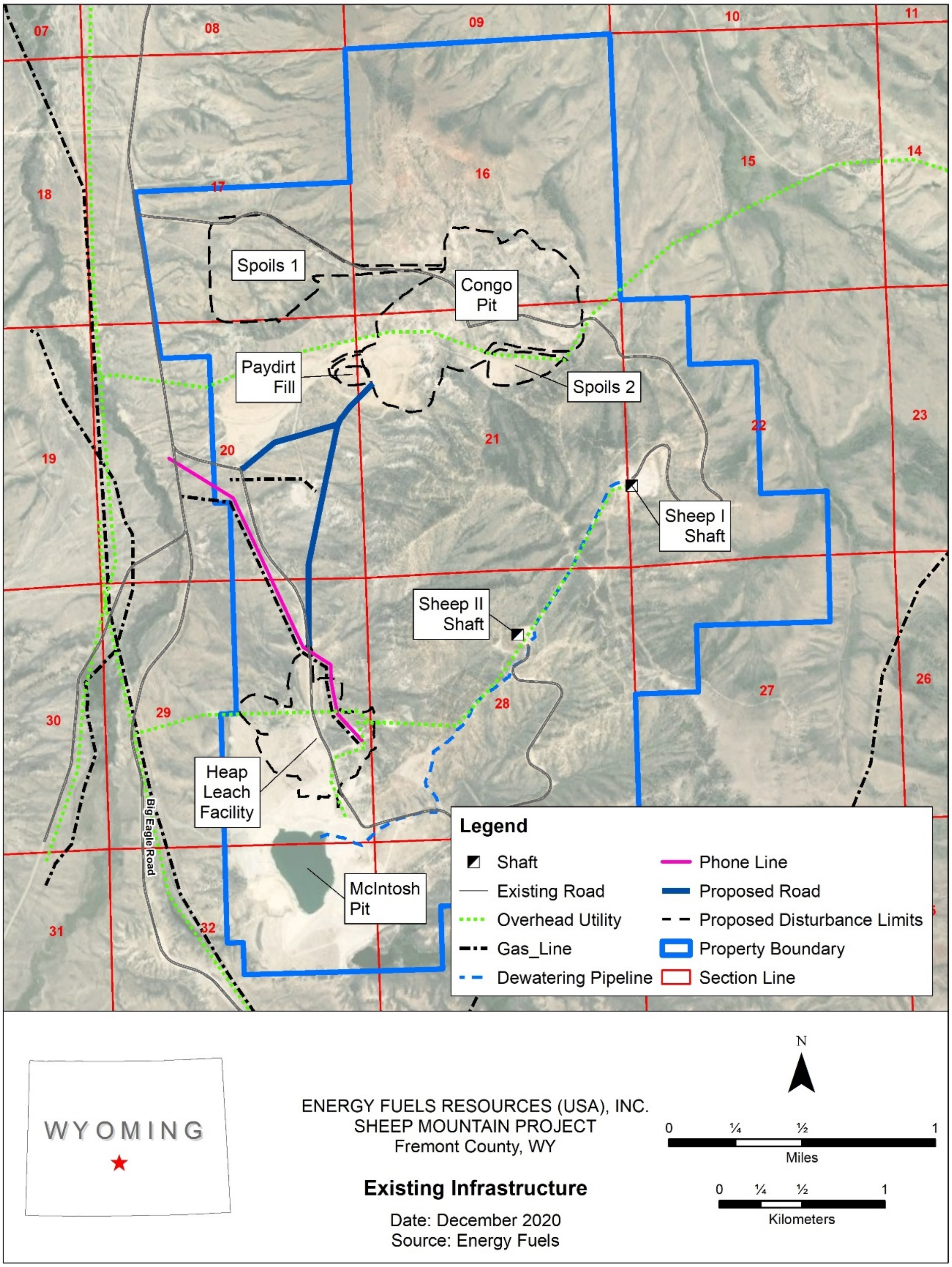



**Figure 18-1 Existing Infrastructure Map**

# 19.0 MARKET STUDIES

## 19.1 Uranium Market and Price

Uranium does not trade on the open market, and many of the private sales contracts are not publicly disclosed since buyers and sellers negotiate contracts privately. Monthly long-term industry average uranium prices based on the month-end prices are published by Ux Consulting, LLC, and Trade Tech, LLC. As a result, an accepted mining industry practice is to use "Consensus Prices" obtained by collating publicly available commodity price forecasts from credible sources. EFR has not begun any negotiations of any contracts to develop the property, including those associated with uranium sales, which is appropriate for a project at this level of development.

Figure 19-1 and Figure 19-2 provides a Long Term Uranium Price Forecast through 2039 from TradeTech LLC ("TradeTech") from 2021. The Forward Availability Model (FAM 1 and 2) forecast differ in assumptions as to how future uranium supply enters the market. "FAM 1 represents a good progression of planned uranium projects incorporating some delays to schedules, while FAM 2 assumes restricted project development because of an unsupportive economic environment." Currently most US producers are in a mode of care and maintenance and numerous facilities globally are also slowing or shutting in production at least on a temporary basis. At this time in the US, no new projects are being constructed, and very few are moving forward with permitting and/or licensing. This condition aligns more with the FAM 2 projections.

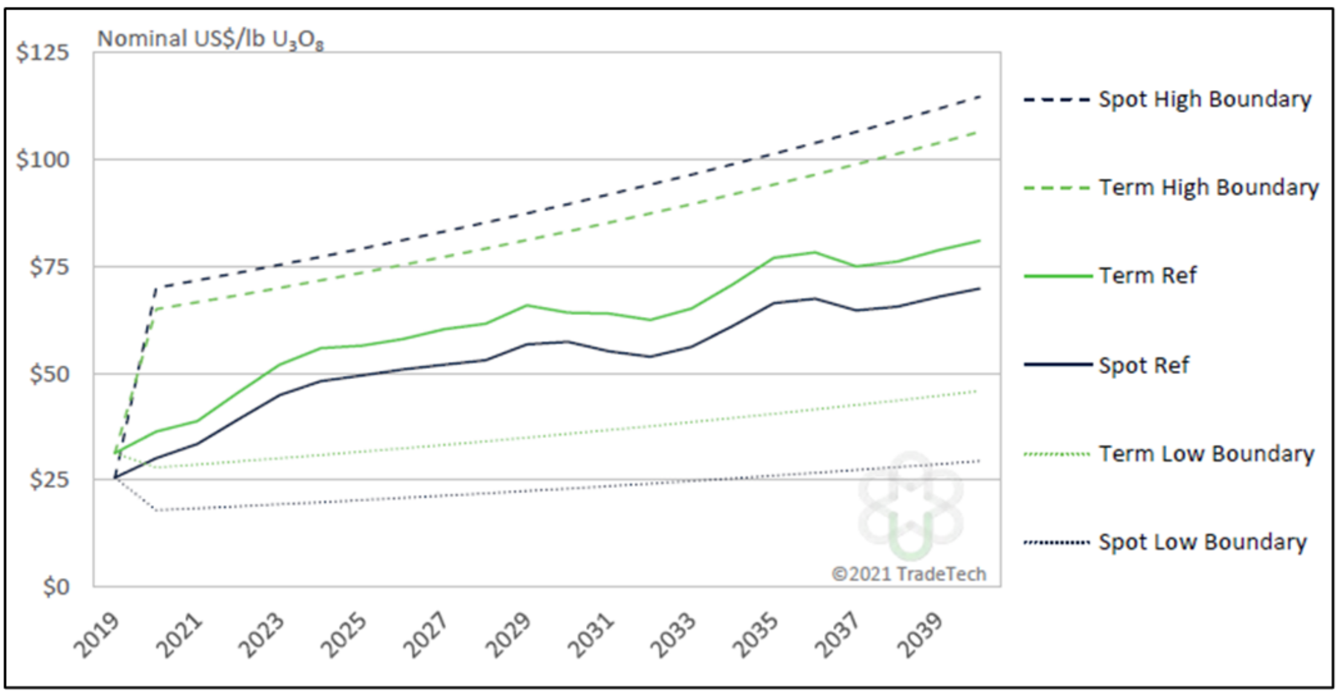


**Figure 19-1 TradeTech Uranium Market Price Projections- FAM1 (Nominal US$)**

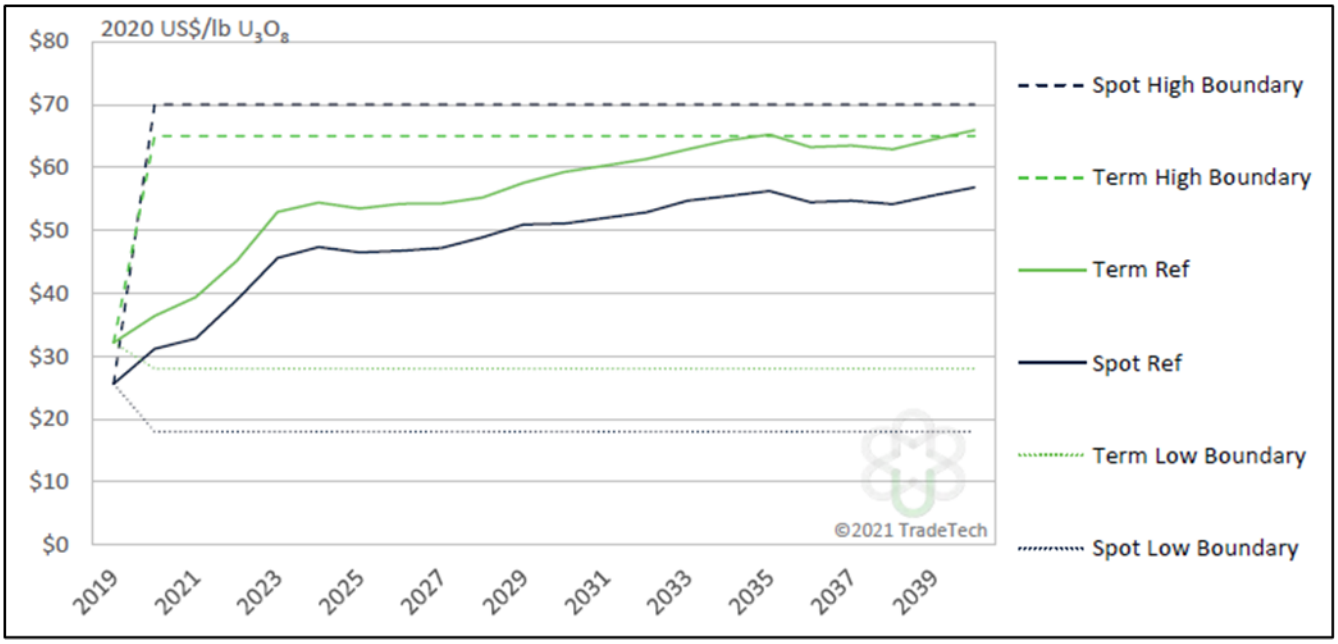



**Figure 19-2 TradeTech Uranium Market Price Projections- FAM1 (Nominal US$)**

Term forecasts beginning 2025 or later and extending into the future are considered the most reasonable for purposes of this report, as they consider the effects of prices on future existing and new production. In addition, larger projects are typically supported by long-term contracts with investment-grade nuclear utilities. Therefore, term prices are most appropriate for purposes of this report.

Based on the foregoing, the planned production from the project is projected to occur when the price projections under the assumption of FAM 2 are generally in excess of $65 per pound uranium oxide. EFR recommends the use of a long-term uranium price of $65.00 per pound uranium oxide as a base case for the project with the inclusion of an economic analysis including a sensitivity analysis of commodity price in the range of $50 to $70 per pound as presented in Section 22.0. The breakeven price of uranium oxide for the project based on the foregoing assumptions and preliminary mine limits is $51.51 per pound.

By their nature, all commodity price assumptions are forward-looking. No forward-looking statement can be guaranteed, and actual future results may vary materially.

# 20.0 ENVIRONMENTAL STUDIES, PERMITTING, AND PLANS, NEGOTIATIONS, OR AGREEMENTS WITH LOCAL INDIVIDUALS OR GROUPS

## 20.1 Introduction

Uranium mining at Sheep Mountain occurred from the mid-1950s through 1982, with only short periods of intermittent mining occurring since 1982. Both random room-and-pillar underground and open-pit surface mining methods were employed. In 1973, the State of Wyoming passed the Environmental Quality Act, which required mining operations to reclaim the land after the conclusion of mining. A substantial amount of reclamation has since been performed at the property by mining companies and by the WDEQ's Abandoned Mine Land Division ("AML"). WDEQ/AML is responsible for reclaiming mining activities that predate the implementation of the 1973 Act. Because of the intensive mining that has occurred over the years, most of the property has experienced surface disturbance and mining related impacts.

The Sheep Mountain Project is situated on a mixture of private fee land with federal mineral rights, federal land and minerals administered by the BLM, and State Trust lands with state-owned minerals administered by the WDEQ/LQD. The Sheep Mountain Project is permitted under an existing Mine Permit 381C, which is held by EFR and administered by the WDEQ/LQD. The original mine permit for the project was issued by the WDEQ/LQD in 1975 to Western Nuclear, Inc. The permit has been amended six times and remains active and in good standing. Initial environmental baseline studies for this Mine Permit were completed in the 1970s and early 1980s. Because of this mixture of land and mineral ownership, a number of state and federal agencies are involved in the permitting and licensing of this project. The WDEQ/LQD is the lead agency for the State, though other State agency approvals are necessary. The primary federal agencies involved include the BLM and U.S. Environmental Protection Agency ("EPA"). In addition, County approvals for construction are also required.

BLM and Wyoming have established a Memorandum of Understanding ("MOU") that allows WDEQ/LQD to issue the Mine Permit for both State and BLM lands while the BLM administers the National Environmental Policy Act ("NEPA") for activities and impacts to the federal lands based on a PoO prepared by the permittee. The BLM also comments on the mining, milling and reclamation activities proposed in the Mine Permit and Source and Byproduct Materials License applications.

This proposed mineral processing facility will consist of a heap leach operation and uranium processing facility that will produce a final product of yellow cake for shipment. The mineral processing facility will require a combined Source Materials and Byproduct Materials License through the State of Wyoming, which became an NRC Agreement State in September 2018.

This section provides a summary of the environmental studies conducted at the site, the proposed operating plans, state and federal permitting requirements for the project, potential social or community relations requirements, and the proposed mine closure and reclamation plans. With the exception of the combined Source and Byproduct Materials License through the State of Wyoming, all major permits have been obtained for the project and the risk in obtaining the remaining License for the heap leach facility is relatively low as the project has strong local support and there are no identified environmental issues that would materially affect project permitting.

No potential social or community related requirements, negotiations, and/or agreements are known to exist with local communities and/or agencies other than those discussed herein.

## 20.1 Environmental Studies

Initial environmental baseline studies for this Mine Permit were completed in the 1970s and early 1980s. EFR has conducted additional baseline studies from 2010 through the present time. Baseline studies include land use characterization, culture resource surveys, meteorology and air monitoring, geology, hydrology, soils, vegetation, wildlife, and radiology. These studies, which are summarized below, are being performed to the level of detail and quality typically required by state and federal agencies.

## 20.2 Land Use

The Sheep Mountain Project is situated in steep terrain, ranging in elevation from 6,600 feet to 8,000 feet. Wildlife density and diversity is limited due to the sparse vegetation and lack of tree overstory over most of the property. The project is remote with only one residence located within 1.5 miles of the project boundary. Land use within the Mine Permit boundary is limited to the permitted mining and exploration activities, livestock grazing under BLM grazing leases and seasonal hunting. Livestock grazing and hunting access will be restricted within the Mine Permit boundary during the proposed project lifecycle. However, the area removed from hunting and grazing represents a minute fraction of the available hunting and grazing area within the region and is not anticipated to have a significant impact on either land use. No land use impacts outside the Mine Permit Boundary are anticipated.

## 20.3 Cultural Resource Surveys

Cultural resource surveys were conducted on the land within the mine permit boundary. The scope for each of these studies was developed in consultation with BLM archaeologists. No enrolled or eligible National Register of Historic Places ("NRHP") cultural properties were found within the permit boundary. The closest NRHP eligible sites to the project are the Crooks Gap Stage Station and the Rawlins-to-Fort Washakie Road located outside the Mine Permit area. BLM has determined that the visual setting is not a contributing factor to these NRHP sites. Therefore, the project is not expected to materially impact either of these NRHP sites.

## 20.4 Meteorology and Air Monitoring

The Sheep Mountain Project falls within the intermountain semi-desert weather province. EFR installed a 10-meter-tall meteorological station directly down-wind of the proposed mineral processing facility in August of 2010 and has operated this station continuously since that time in accordance with EPA and NRC/WDEQ guidance.

EFR has also installed nine air monitoring stations around the project area. These monitoring stations include high volume air samplers that collect radio-particulates, Track Etch cups that detect radon, and Thermoluminescent Dosimeters ("TLDs") that record direct gamma radiation. The meteorological and air quality data have been used to support air quality permitting and will be used to support licensing of the proposed mineral processing facility with the State of Wyoming.

## 20.5 Geology

The project sits within a southeast plunging synclinal fold with the Battle Springs Formation comprising the uppermost geologic unit. It is underlain sequentially by the Fort Union Formation and Cody Shale, which extend several thousand feet below the site. The Mineral Reserves and Resources are hosted by the Battle Springs Formation. The geologic conditions have been sufficiently characterized to support the proposed permitting activities.

## 20.6 Hydrology

Surface water within the Mine Permit area is comprised of ephemeral drainages that flow only in response to snow melt and seasonal, high-intensity rainfall events. These ephemeral drainages drain to the west from Sheep Mountain into Crooks Creek, a locally perennial creek that flows south to north and is located approximately ½ mile west of the mine permit boundary. In addition, non-flowing surface water is present on the site in the McIntosh Pit, and seasonally in permitted storm water retention structures. Both flowing and non-flowing surface water quality and quantity have been characterized through multiple years of regular sampling and flow gauging.

Groundwater within the Mine Permit boundary exists within the synclinal fold of the Battle Spring Formation and Fort Union Formation and is bounded by the Cody Shale, which acts as a local aquiclude to vertical groundwater migration. Groundwater in the uppermost aquifer, hosted predominantly by the Battle Spring Formation, has been well characterized over more than 20 years spanning active mining, a long post-mining period and current annual monitoring. New monitoring wells have been installed in the areas proposed for mining and mineral processing. Collected groundwater quality data is representative of a full cycle of active mining and mine reclamation. No substantial changes to groundwater quality are anticipated from subsequent cycles of mining and reclamation.

## 20.7 Soils and Vegetation

Detailed soil and vegetation surveys were performed in 2010-2011 to update the 1980 data presented in the original Mine Permit. No Threatened and Endangered ("T&E") plant species were encountered on the study area during the 1980 field investigations or in the 2010-2011 surveys. One BLM-sensitive plant species, Pinus flexilus ("Limber Pine") is present within the affected area as well as the control area. Any mitigation measures associated with this species are expected to be minimal. Two wetlands were located and mapped during the 2010-2011 surveys within the project area. However, they are located in the southeast corner of the project area near an unnamed pond where no surface disturbance is proposed. These wetlands are isolated and are likely non-jurisdictional.

## 20.8 Wildlife

Wildlife surveys were performed in 2010 and 2011 to update the earlier studies presented in the existing Mine Permit. These studies include raptor surveys, Sage Grouse surveys, small and large mammal surveys, and fish surveys in local ponds. The proposed disturbances are outside the Sage Grouse Core Area designated by the State of Wyoming as well as crucial winter range for large game species. No T&E wildlife species were observed or are expected to occur within the permit area and no BLM sensitive species that warrant special attention were identified in site surveys. In summary, no wildlife management issues, or conflicts have been identified that would preclude the proposed mining and milling activities.

## 20.9 Radiology

Radiological surveys of the project area, as required by NRC Regulatory Guide 4.14, have been performed at the project site. These include gamma radiation surveys, soil radium-226 concentration mapping, ambient gamma dose rate and radon monitoring, air radio-particulate monitoring, radon flux measurements, as well as soil and sediment, groundwater, surface water, vegetation, and animal tissue sampling (cattle and fish) for radionuclides. The radiological survey results reflect the elevated baseline conditions present at the site due to natural mineralization and previous mining disturbances. The radiological surveys have been conducted in accordance with the precision, accuracy and quality assurance guidelines recommended by the NRC.

## 20.10 Operating Plans

The operating plans for the Congo Open Pit, Sheep Underground, and the heap leach and processing plant are described in detail in other sections of this report. Monitoring and reporting of air, ground water, surface water, reclamation and other mitigation measures will continue throughout the life of the project.

Health and safety at the mines will be primarily regulated through the Federal Mine Safety and Health Administration or MSHA.

## 20.11 Permitting Requirements

Permitting and licensing of the proposed mining and milling activities will involve county, state and federal agencies. Summaries of these permits and licenses follow.

#### 20.11.1 Fremont County

Construction permits for buildings and septic systems will be required by Fremont County. These permits applications will be developed and submitted prior to construction and once most substantive technical questions have been resolved with the State of Wyoming on the Source and Byproduct Materials License. The County permits are not anticipated to present technical or time critical issues in the development of this project.

#### 20.11.2 Wyoming Land Quality Division

A major revision to Mine Permit 381C was approved by the WDEQ/LQD on July 8, 2015.

#### 20.11.3 Wyoming Air Quality Division

The Wyoming AQD administers the provisions of the Clean Air Act as delegated to the state by EPA Region VIII. An Air Quality Construction Permit for the project was initially issued by AQD on July 6, 2015. The Air Quality Permit was re-issued on October 17, 2019. On September 9, 2021, authorization to construct was extended for an additional one-year period.

#### 20.11.4 Wyoming Water Quality Division

Discharges to surface water, if needed as part of the mine dewatering and mine water management program, are permitted by the Wyoming WQD through the Wyoming Pollutant Discharge Elimination System ("WYPDES") program under authority delegated by EPA Region VIII. A Water Discharge Permit for the project was approved by WQD on October 5, 2015. The WYPDES permit was re-issued on September 21, 2020.

#### 20.11.5 Wyoming State Engineers Office

The Wyoming State Engineers Office ("SEO") is responsible for permitting of wells and impoundments, and issuance and modification to water rights. Applications to relocate the point(s) of withdrawal for EFR's existing water rights have been approved by the Wyoming SEO for mine dewatering. In addition, future monitoring wells and impoundments will be permitted with the SEO once the combined Source and Byproduct Materials License application has passed completeness review and most substantive technical questions have been resolved. Approvals of the SEO permits are not anticipated to be time-critical approvals.

#### 20.11.6 U.S. Bureau of Land Management

On January 6, 2017, the BLM approved the PoO for the project through issuance of a RoD and supporting FEIS. The permitted capacity of the heap leach facility is 4 million tons of mineralized material which is 53% of the estimated Mineral Reserves. An expansion to the heap leach facility (including permitting) will be required in the future to process the remaining 47% of the estimated Mineral Reserves.

#### 20.11.7 U.S. Nuclear Regulatory Commission (Wyoming Agreement State)

Development of an application to the NRC for a license to construct and operate the uranium recovery facility has been taken to an advanced stage of preparation. This license would allow EFR to process the mineralized material into yellowcake at the Sheep Mountain Project site. The draft application to NRC for a Source Material License was reviewed in detail by the NRC in October 2011. The NRC audit report identified areas where additional information should be provided. During September 2018, the State of Wyoming became an NRC Agreement State for licensing of uranium milling activities, including heap leach facilities. Previous data, designs, and related applications prepared for NRC will now be referred to and reviewed by the State of Wyoming WDEQ as an Agreement State with the NRC with respect to Source Materials licensing. The review and approval process for the license by the State of Wyoming is anticipated to take approximately three to four years from the date submitted. Submittal of the license application to the State of Wyoming is on hold pending EFR's evaluation of off-site processing options for this project, and whether or not to proceed with an on-site uranium recovery facility, pending improvements in uranium market conditions.

#### 20.11.8 U.S. Environmental Protection Agency

The EPA oversees compliance with 40 CFR Part 61 Subpart B (underground mine venting of radon) and Subpart W (radon emissions from tailings). Prior to initiation of underground mine operations, EFR will submit construction plans to the EPA in which underground mine ventilation radon emissions will be modeled to demonstrate compliance with the requirements of Part 61, Subpart B. During underground operations, routine monitoring and annual modeling will be performed to verify regulatory compliance.

The project design currently includes control measures to minimize radon flux from the heap leach facility and to be consistent with the requirements of Part 61, Subpart W.

### 20.12 Social and Community Relations

The surrounding communities have a long history of working with and for the region's mining and mineral resource industry; and their support for this project has been strong.

The Fraser Institute Annual Survey of Mining Companies, 2020, ranks Wyoming as 2nd out of 77 jurisdictions using a Policy Perception Index, which indicates a very favorable perception by the mining industry towards Wyoming mining policies.

### 20.13 Closure and Reclamation Plans

The land encompassing the project area is currently used for livestock grazing, wildlife habitat, and recreation (primarily hunting). The reclamation plan will return the areas disturbed by the project to the same pre-mining uses, except for the approximately 100-acre, byproduct-material disposal cell that will be transferred to the DOE for long-term stewardship. Reclamation bonds will be in place prior to start up for both the mining and processing areas of the project in accordance with state and federal requirements. The amount of the reclamation bond for both the mine and mineral processing area is estimated at US$17 million. By current regulations the WDEQ requires the bond be posted based on reclamation of lands disturbed in the first year and then updated annually as part of the annual reporting process. Wyoming has become an agreement state with the NRC with jurisdiction for the mineral processing area and will require a bond for the full estimated closure and reclamation costs. The estimated closure and reclamation costs for the mine and mineral processing areas is approximately US$46 million projected to be spent over the life of mine under a concurrent reclamation scenario followed by an additional reclamation period of 4 years upon cessation of operations.

#### 20.13.1 Congo Pit and Sheep Underground

Mine overburden and waste rock from the Congo Pit will be used to backfill the pit in a phased manner over the life of the open pit. Initially, the waste will be removed from the pit and stockpiled in areas adjacent to the pit limits. As the pit deepens to the south, concurrent backfilling will be performed with waste placed in the mined-out portions of the pit. Backfilling will be performed in a selective manner so that the more mineralized and radioactive material is covered with less mineralized subsoils and topsoil. The proposed plan is to backfill the pit to approximate original contours, returning the ground surface to essentially the pre-mining topographic contours.

Selective backfilling will remove and isolate much of the naturally occurring radioactive materials left in the mine area from historical activities. The reclaimed Paydirt Pit will also be partially backfilled to create a flow-through drainage system, as opposed to the current closed drainage.

Underground operations will result in some additional waste rock being added to the open-pit overburden piles, as a result of the construction of vent shafts, declines, and the installation of additional mine buildings. At the conclusion of underground operations, the mine openings will be sealed, mine buildings demolished, and waste piles used as backfill or reclaimed.

### 20.13.2 Heap Leach and Processing Plant

Solid and liquid wastes from the processing of uranium ores will be managed on site. Upon closure, liquid wastes will either be: a) stabilized and placed in the spent heap leach pad, or b) evaporated on the heap leach pad surface prior to closure. Process buildings and equipment that cannot be released from the site, will be decommissioned, sized and placed in the spent heap according to WDEQ requirements. The heap leach pad and associated ponds will then be encapsulated within an engineered cover that is designed to minimize radon emissions and water infiltration. The disposal cell will then be monitored until the site meets DOE's requirements for long-term stewardship. Refer to Figure 17.5, McIntosh Heap Reclamation Cover for overall reclamation grading plan.

## 20.14 Opinion of Author

In the opinion of the Author, the current plans related to environmental compliance, permitting and social governance is reasonable.

# 21.0 CAPITAL AND OPERATING COSTS

## 21.1 Introduction

Estimated capital expenditures (“CAPEX”) and costs for operation and maintenance & repair (“OPEX”) of facilities are for a conventional combination open pit and underground mining operation with on-site treatment of mined material by heap leaching. All cost estimates in this report have been updated or escalated to 2021, based on either the 2021 Mining Cost Service (Cost Indexes) or recent internal cost files. It is the opinion of the authors that escalation of costs from March 2021 to the present is a function of short-term supply- chain issues currently being experienced in all sectors of the economy and are not reflective of longer term economic conditions, which the metal price and project development is based on. These cost estimates reflect complete costs going forward, including the costs of preproduction, permitting, mining, and mineral processing from heap leaching through production of yellowcake, to eventual reclamation and closure. CAPEX estimates, however, do not include sunk costs or property acquisition costs.

Mining and mineral processing methods are described in Sections 16 and 17, respectively. The project consists of two distinct and independent mining areas, the Congo open pit and the Sheep underground mine, with common processing of mined material in a heap leaching facility. The currently planned operating life of the two mines is 12 years, with an additional 4 years allotted for closure and reclamation. The heap leaching facility is designed to accommodate material excavated from both mining operations over their entire aggregated life. Although other alternatives were considered, the base case for this PFS is concurrent operation of the open pit and underground mines over approximately 12-years.

## 21.2 Cost Assumptions

In all cases, the estimates are based on proven approaches and technologies and conservative assumptions were employed. A summary of key assumptions follows.

**Capital Cost Estimates**

- Open pit equipment: 15% has been added to vendor quotations for all major equipment.
- Underground equipment: 15-30% has been added, depending on the nature of current information.
- Heap leaching and mineral processing equipment: 10-30% has been added, depending on whether the item is material, labor, or fees.

These adjustments in vendor quotations are specifically to account for ancillary costs of delivery and setup of the equipment at the Project and for initial specialty items tools, wear parts etc. typically not included in the vendor quotes. We have not applied contingencies to the capital cost estimates. There is a risk due to uncertainties in future availability of the specified equipment, purchase prices and changes in equipment size or design duty may affect the final equipment selection and corresponding capital cost.

**Operating Cost Estimates**

- Open Pit: all new equipment, 85% availability, 90% utilization, and an overall 8% contingency applied to all costs.
- Underground mine: 90% utilization and an overall 8% contingency applied to all costs.
- Heap leaching and mineral processing equipment: a 10% contingency has been applied to estimates for utilities and consumable chemicals.

**Heap Leach**

- Column leaching tests produced residues assaying 0.002% $U_3O_8$ or less.
- We have conservatively assumed a heap leach residue assay of 0.01% $U_3O_8$ (McNulty, 2012).
- The 0.01% $U_3O_8$ loss (residue assay) used in this study reflects a conservative 0.008% $U_3O_8$ loss in the solid residue and an entrained liquid loss equivalent to 0.002% $U_3O_8$, and this represents a life-of-mine average 91.9% $U_3O_8$ uranium leaching recovery.
- A loss of 0.01% $U_3O_8$ was achieved in the earliest pilot-scale heap leaching program in the Gas Hills (Woolery, 1978), but lower losses (higher extractions) were obtained from subsequent commercial-scale heaps.
- Sulfuric acid consumption in the current project is assumed to be 30 lb/ton of mineralized material (Lyntek, 2012), whereas current metallurgical testing has consistently required less than 15 pounds per ton.

**Open Pit**

Open Pit Mine reclamation costs account for backfill to original contours. Wyoming regulations do not require complete backfill but return to “equal or better use.” Regulations can be met with less complete backfill; however, the total backfill plan is conservative and can be readily permitted.

## 21.3 Production Profile

Table 21.1 provides the planned production profile for the Project. Annual production varies from a low of 270,000 tons processed to a high of 780,000 tons processed with an average annual production of approximately 680,000 tons, yielding 1.4 million pounds annually of U3O8 in yellowcake.

**Table 21-1 Underground and Open pit Production Profile**

| | | Production Year | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| *Congo Pit* | | | | | | | | | | | | | | |
| Tons of Resource Mined (000s) | 3,955 | | 269 | 467 | 217 | 400 | 333 | 516 | 198 | 382 | 413 | 334 | 286 | 140 |
| Pounds Contained (000s) | 9,118 | | 665 | 828 | 587 | 951 | 657 | 1,198 | 539 | 719 | 894 | 677 | 767 | 637 |
| Mine Grade (%$U_3O_8$) | 0.115 | | 0.124 | 0.089 | 0.135 | 0.119 | 0.099 | 0.116 | 0.136 | 0.094 | 0.108 | 0.101 | 0.134 | 0.228 |
| Cu. Yd. Stripped | 78,096 | | 7,062 | 6,660 | 6,460 | 6,493 | 7,576 | 6,275 | 6,500 | 6,500 | 6,754 | 6,618 | 6,349 | 4,847 |
| -Tons Overburden (000s) | 131,981 | | 11,934 | 11,255 | 10,918 | 10,974 | 12,803 | 10,606 | 10,985 | 10,985 | 11,414 | 11,185 | 10,730 | 8,192 |
| -Strip Ratio (tons: tons) | 33 | | 44 | 24 | 49 | 27 | 38 | 20 | 55 | 29 | 27 | 33 | 37 | 57 |
| -Strip Ratio (cu. yd.:lb) | 9 | | 11 | 8 | 11 | 7 | 12 | 5 | 12 | 9 | 8 | 10 | 8 | 8 |
| Reclamation (cu. yd.) | 25,530 | | | | | | | | | | | | | |
| *Sheep UG* | | | | | | | | | | | | | | |
| Tons of Resource Mined (000s) | 3,498 | | ----- | 100 | 223 | 431 | 386 | 367 | 351 | 386 | 315 | 299 | 416 | 224 |
| Pounds Contained (000s) | 9,248 | | ----- | 300 | 600 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 348 |
| Mine Grade (%$U_3O_8$) | 0.132 | | ----- | 0.151 | 0.134 | 0.116 | 0.130 | 0.136 | 0.142 | 0.130 | 0.159 | 0.167 | 0.120 | 0.077 |
| Development Tons | 2,176 | | 200 | 90 | 162 | 144 | 189 | 208 | 224 | 189 | 260 | 276 | 159 | 75 |
| ***Totals*** | | | | | | | | | | | | | | |
| Tons of Resource Mined (000s) | 7,453 | | 269 | 567 | 441 | 831 | 719 | 883 | 549 | 767 | 728 | 633 | 703 | 364 |
| Pounds Contained (000s) | 18,365 | | 665 | 1,128 | 1,187 | 1,951 | 1,657 | 2,198 | 1,539 | 1,719 | 1,894 | 1,677 | 1,767 | 984 |
| Mine Grade (%$U_3O_8$) | 0.123 | | 0.122 | 0.099 | 0.134 | 0.117 | 0.115 | 0.124 | 0.139 | 0.112 | 0.129 | 0.132 | 0.125 | 0.134 |
| Tons Processed (000s) | 7,453 | | 270 | 540 | 480 | 780 | 780 | 780 | 630 | 750 | 720 | 660 | 630 | 433 |
| Pounds Contained (000s) | 18,365 | | 667 | 1,074 | 1,274 | 1,828 | 1,799 | 1,946 | 1,743 | 1,679 | 1,868 | 1,747 | 1,584 | 1,157 |
| Plant Feed (%$U_3O_8$) | 0.123 | | 0.122 | 0.099 | 0.131 | 0.117 | 0.115 | 0.124 | 0.137 | 0.111 | 0.129 | 0.132 | 0.125 | 0.132 |
| Recovery Fraction ($U_3O_8$) | 0.919 | | 0.919 | 0.899 | 0.925 | 0.915 | 0.913 | 0.920 | 0.928 | 0.911 | 0.923 | 0.924 | 0.920 | 0.925 |
| Pounds Recovered (000s) | 16,875 | | 613 | 966 | 1,178 | 1,672 | 1,643 | 1,790 | 1,617 | 1,529 | 1,724 | 1,615 | 1,458 | 1,070 |

## 21.4 Capital Costs

Capital cost summaries follow for the Project. The additional capital in years two through twelve include major repair and/or replacement of mine equipment and cost related to interim liners for the heap leach and the permitting and construction of an addition heap pad area of approximately 20 acres in year eight. Capital costs for the Project are estimated at an AACE Class 3 accuracy range of -20% to +30% (AACE International 2005).

**Table 21-2 Sheep Mountain Capital Cost Summary**

| Capital Expenditures: * | Contingency | Initial Capital* | Years 4-12 | Life of Mine |
|---|---|---|---|---|
| Permitting (WDEQ) | ----- | $3,000 | $1,000 | $4,000 |
| Pre-Development Mine Design | ----- | $1,200 | ----- | $1,200 |
| OP Mine Equipment | 15% | $21,141 | $3,200 | $24,341 |
| UG Mine Equipment | 15-30% | $51,504 | $13,000 | $64,504 |
| Office, Shop, Dry, and support | 15% | $3,234 | ----- | $3,234 |
| Mineral Processing | 25% | $32,086 | $6,461 | $38,546 |
| **TOTAL CAPITAL EXPENDITURES** | | **$112,165** | **$23,661** | **$135,826** |
| **COST PER POUND RECOVERED** | | | | **$8.05** |

All costs in 2021 US dollars x 1,000

*Initial Capital includes year 0 to year 3. Does not include working capital and initial warehouse inventory.

## 21.5 Operating Costs

Operating cost estimates are based on a conventional open pit and underground mine operation with on-site processing via a heap leach facility. Operating costs reflect a full and complete operation including all mine and mineral processing costs through the production of yellowcake and through final reclamation. In all cases the estimates are based on proven approaches and technologies.

Operating cost estimates were based on vendor quotations, published mine costing data, and contractor quotations. Such estimates were generally provided for budgetary purposes and were considered valid at the time the quotations were provided. In all cases, appropriate suppliers, manufacturers, tax authorities, smelters, and transportation companies should be consulted before substantial investments or commitments are made.

<u>Open pit mine operating costs account for:</u>

- All earth moving costs related to excavation and placement including:
    - Primary stripping
    - Mining
    - Interburden
    - Preparation of heap base
- Surface support equipment
- Overall mine supervision including health and safety
- Surface mine and heap leach reclamation costs

<u>Underground mine operating costs account for:</u>

- All costs related to underground mine excavation
- Conveyance of mined material to the surface for loading on the heap
- Underground mine supervision, support and miner training
- Underground development between mining levels and areas

- Ventilation
- Dewatering
- Mine safety and ground control

<u>Mineral processing operating costs account for:</u>

- All costs related to the operation of the heap leach
  - Overland conveyor transport from the mine
  - Heap stacking and loading
  - Heap leaching and liquid handling
  - Power and water use and handling
- All costs related to processing of uranium bearing liquids from the heap leach
  - Solvent extraction
  - Ammonia stripping and precipitation
  - Yellowcake drying and packaging
  - Power use
- Mineral processing supervision and support
  - Radiation Safety and compliance
  - On site laboratory facilities
  - General supervision

## 21.6 Reclamation and Closure Costs

Reclamation and closure costs relate primarily to the open pit and heap leach/plant.

The current cost model is based on complete backfill of the open pit including sub-grade disposal of the heap leach material and appurtenances including liners, piping, and other materials deemed to be regulated material with respect to the combined Source and Byproduct Materials license.

Bonding costs are included as a line item based on an annual rate of 2% and an estimated bond for the mine and processing facility of an estimated US$17 million.

## 21.7 Additional Costs

Additional costs include a gross products tax payable to Fremont County; mineral severance tax payable to the State of Wyoming; and various claim and state lease royalties.

Wyoming Severance Tax is currently assessed at a rate of 4% of the gross value after applying an industry factor which for uranium is currently 0.42 which thereby reduces the effect severance tax rate.

Wyoming state lease royalties apply only to the Congo Pit area located on State section 16. The royalty under the current lease is 5% of gross value.

Individual mining claim royalties vary slightly but do not exceed 4% of gross value.

Note that all state and local sales taxes are included in the capital cost estimate. Use taxes, such as taxes on supplies and consumables, are included in the operating cost estimate.

Table 21-3 summarizes operating cost for the Project, which includes an 8% contingency.

**Table 21-3 Sheep Mountain Operating Costs****

| **Operating Costs - OPEN PIT AND UNDERGROUND MINING** | **Open Pit and UG (US$000s)** | **Cost Per Ton Mined (US$)** | **Cost Per lb Mined (US$)** | **Cost Per lb Recovered (US$)** |
|---|---|---|---|---|
| *Open Pit* | | | | |
| Strip | $ 80,331 | $ 20.31 | $ 8.81 | |
| Mining | $ 18,625 | $ 4.71 | $ 2.04 | |
| Support | $ 15,834 | $ 4.00 | $ 1.74 | |
| Staff | $ 23,485 | $ 5.94 | $ 2.58 | |
| Contingency | $ 11,062 | $ 2.80 | $ 1.21 | |
| **Total Surface Mine (3,955,000 tons, 9,117,000 lbs)** | **$ 149,336** | **$ 37.76** | **$ 16.38** | |
| *Underground Mine* | | | | |
| Production | $ 169,217 | $ 48.38 | $ 18.30 | |
| Development | $ 53,166 | $ 15.20 | $ 5.75 | |
| Support | $ 44,913 | $ 12.84 | $ 4.86 | |
| Staff | $ 18,825 | $ 5.38 | $ 2.04 | |
| Contingency | $ 22,890 | $ 6.54 | $ 2.48 | |
| **Total Underground Mine (3,498,000 tons, 9,248,000 lbs)** | **$ 309,011** | **$ 88.35** | **$ 33.42** | |
| **Blended Mining Costs* (7,435,000 tons, 18,365,000 lbs)** | **$ 458,347** | **$ 61.50** | **$ 24.96** | **$ 27.16** |
| *Reclamation and Closure* | | | | |
| Wyoming Agreement State Annual Inspection Fees | $ 1,800 | $ 0.24 | $ 0.10 | |
| Final Grading and Revegetation | $ 2,180 | $ 0.29 | $ 0.12 | |
| Plant Decommissioning and Reclamation | $ 11,166 | $ 1.50 | $ 0.61 | |
| **Total Reclamation and Closure** | **$ 15,146** | **$ 2.03** | **$ 0.83** | **$ 0.91** |
| *Heap Leach* | | | | |
| Cost per ton | $ 143,585 | $ 19.27 | $ 7.82 | |
| **Total Heap Leach** | **$ 143,585** | **$ 19.27** | **$ 7.82** | **$ 8.51** |
| **Reclamation Bond Mine and Heap** | **$ 6,120** | **$ 0.82** | **$ 0.33** | **$ 0.36** |
| *Taxes & Royalties* | | | | |
| Gross Products tax per/lb | $ 39,702 | $ 5.33 | $ 2.16 | |
| Severance Tax per/lb | $ 21,965 | $ 2.95 | $ 1.20 | |
| State lease (pit) | $ 26,966 | $ 3.62 | $ 1.47 | |
| Claim royalties (UG) | $ 21,640 | $ 2.90 | $ 1.18 | |
| **Total Taxes and Royalties** | **$ 110,273** | **$ 14.80** | **$ 6.00** | **$ 6.53** |
| **TOTAL DIRECT COSTS** | **$ 733,471** | **$ 98.42** | **$ 39.94** | **$ 43.47** |

*Blended mine cost represents the weighted average of open pit and underground mines and include open pit backfill.
Open pit and underground mine costs, itemized separately above, are not additive but are included in the blended mine costs.
**All costs 2021 US dollars x 1,000

## 21.8 Personnel

At full production, the Sheep Mountain Project will require approximately 176 employees. Roughly, 56 employees will be required for operation of the open pit, heap leach, and mineral processing plant with the remainder required for the underground mine. Personnel for the open pit mine operation can be readily recruited locally as can the majority of the personnel needed for the heap leach and mineral processing plant. Some skilled positions and staff positions will need to be recruited regionally. Recruitment of underground mine personnel may pose a greater challenge. As a result, cost allowances for recruiting and training of underground miners were included in the cost estimate. Figure 21-1 illustrates general project organization chart, based on a total headcount of 176 employees.

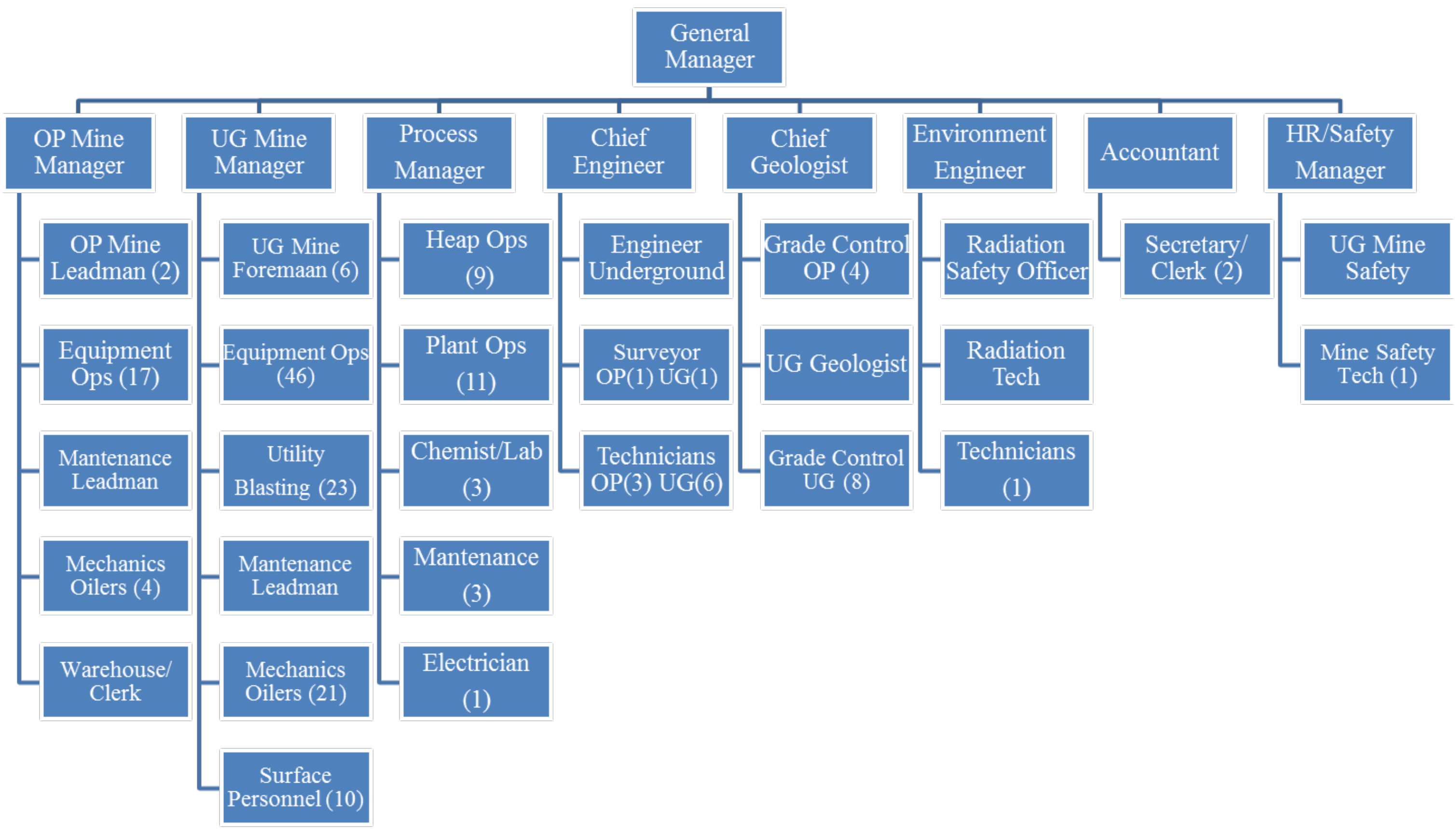



**Figure 21-1. Project Organizational Chart**

# 22.0 ECONOMIC ANALYSIS

Financial evaluations for the project assume constant 2021 U.S. dollars and an average sales price of $65.00 per pound of uranium oxide. Section 21.0 discusses operating and capital costs in detail. Operating costs includes all direct taxes and royalties, as discussed in Section 21.0, but do not include U.S. Federal Income Tax. As previously stated, all costs are forward-looking and do not include any previous project expenditures or sunk costs. The NPV is calculated at a range of discount rates as shown both before and after U.S. Federal Income Tax in Table 22-1, which summarizes the estimated Internal Rate of Return (IRR) and Net Present Value (NPV) for the Project. Subsequent sensitivity analysis is provided as pre-tax but is applicable, in principle, to post-tax. A detailed Cash Flow analysis is provided at the end of this section in Table 22-4.

**Table 22-1 Sheep Mountain Internal Rate of Return and Net Present Value**

| | Before Federal Income Tax | After Federal Income Tax |
|---|---|---|
| IRR | 28% | 26% |
| NPV 5% | $141,749 | $120,725 |
| NPV 7% | $116,412 | $98,492 |
| NPV 10% | $85,627 | $71,381 |

*2021 US dollars x 1000

## 22.1 Sensitivity to Price

The Sheep Mountain Project, like all similar projects, is quite sensitive to uranium price as shown in Table 22-2 and Table 22-3. A summary of sensitivity of the projected IRR and NPV with respect to key parameters other than price also follows. The project is roughly twice as sensitive to variances in mine recovery and/or dilution as it is to variance in operating and capital costs.

Higher heap recovery may be realized based on current metallurgical test work and historical production experience. An improvement in uranium loss from 0.10 to of 0.006% U3O8 loss would result in a 3% improvement in IRR and an improvement in NPV at 7% discount of $19 million. The sensitivity analysis shows that the project is not highly sensitive to changes in operating and/or capital costs. With respect to mine dilution affecting mined grade, the sensitivity is similar to that of uranium price in that much of the same costs are incurred, and any variance in mine recovery or dilution affects gross revenues either positively or negatively. The project is roughly twice as sensitive to variances in mine dilution as it is to variance in operating and capital costs. Mine dilution is highly dependent upon grade control and mining selectivity. The mine plan, equipment selection, and personnel allocations included in the cost estimate, for both the open pit and underground, provide for selective mining and tight grade control in recognition of this factor.

**Table 22-2 Pre-tax Sensitivity Summary**

| | Selling Price (USD/pound) | | |
|---|---|---|---|
| Discount Rate | $55 | $65 | $75 |
| NPV 5% (Million $) | $37 | $142 | $246 |
| NPV 7% (Million $) | $25 | $116 | $208 |
| NPV 10% (Million $) | $10 | $87 | $161 |
| IRR | 13% | 28% | 42% |

## 22.2 Sensitivity to Other Factors

Sensitivity of the projected IRR and NPV with respect to key parameters other than price, previously shown, is summarized in Table 22-3. The sensitivity analysis was performed with respect to the base case including $65 per pound uranium price, 8% operating cost contingency, and 0.01% $U_3O_8$ loss. As with the sensitivity analysis for price, the analysis in pre-tax, however, post-tax would be proportionate.

Higher heap recovery may be realized based on current metallurgical test work and historical production experience. An improvement in uranium loss from 0.10 to of 0.006% $U_3O_8$ loss would result in a 4% improvement in IRR and an improvement in NPV at 7% discount of $22 million. The sensitivity analysis shows that the project is not highly sensitive to changes in operating and/or capital costs. With respect to Mine dilution affecting mined grade, the sensitivity is similar to that of uranium price in that much of the same costs are incurred, and any variance in mine recovery or dilution affects gross revenues either positively or negatively. The project is roughly twice as sensitive to variances in mine dilution as it is to variance in operating and/or capital costs. Mine dilution is highly dependent upon grade control and mining selectivity. The mine plan, equipment selection, and personnel allocations included in the cost estimate, for both the open pit and underground, provide for selective mining and tight grade control in recognition of this factor.

**Table 22-3 Pre-tax Sensitivity Summary**

| Parameter | Change from Base Case | Change in IRR | Change in NPV at 7% discount |
|---|---|---|---|
| Grade | 10% | 11% | $49 million |
| Heap recovery | 0.006% $U_3O_8$ loss | 6% | $40 million |
| CAPEX | 10% | 3% | $7 million |
| OPEX | 10% | 5% | $16 million |

## 22.3 Payback Period

The project shows positive cumulative cash flow in year five. Refer to the cash flow summaries that follow.

## 22.4 Breakeven Price

The breakeven price of uranium oxide for the project based on the foregoing assumptions and preliminary mine limits is approximately $51 per pound.

## 22.5 Cash Flow

Table 22-4 shows the pre and after tax for both underground and surface mines at Sheep Mountain.

## Table 22-4 Cash Flow

| | Units | Totals | | Production Year 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Congo Pit* | | | | | | | | | | | | | | | | | | | | |
| Tons of resource mined | (000s) | 3,955 | | 269 | 467 | 217 | 400 | 333 | 516 | 198 | 382 | 413 | 334 | 286 | 140 | | | | | |
| Pounds Contained | (000s) | 9,118 | | 665 | 828 | 587 | 951 | 657 | 1,198 | 539 | 719 | 894 | 677 | 767 | 637 | | | | | |
| Mined Grade % U3O8 | % U3O8 | 0.115 | | 0.124 | 0.089 | 0.135 | 0.119 | 0.099 | 0.116 | 0.136 | 0.094 | 0.108 | 0.101 | 0.134 | 0.228 | | | | | |
| Interburden CY | (000s) | 2,333 | | 159 | 276 | 128 | 236 | 197 | 304 | 117 | 225 | 244 | 197 | 169 | 82 | | | | | |
| Cubic Yards stripped | (000s) | 78,096 | | 7,062 | 6,660 | 6,460 | 6,493 | 7,576 | 6,275 | 6,500 | 6,500 | 6,754 | 6,618 | 6,349 | 4,847 | | | | | |
| - tons Overburden | (000s) | 131,981 | | 11,934 | 11,255 | 10,918 | 10,974 | 12,803 | 10,606 | 10,985 | 10,985 | 11,414 | 11,185 | 10,730 | 8,192 | | | | | |
| - Strip Ratio tons:tons | | 447 | | 44 | 24 | 50 | 27 | 38 | 21 | 56 | 29 | 28 | 33 | 37 | 59 | | | | | |
| - Strip Ratio cy:pounds | | 108 | | 11 | 8 | 11 | 7 | 12 | 5 | 12 | 9 | 8 | 10 | 8 | 8 | | | | | |
| Reclamation CY | (000s) | 25,530 | | | | | | | | | | | | | | 5,400 | 5,400 | 5,400 | 5,400 | 3,930 |
| *Sheep UG* | | - | | | | | | | | | | | | | | | | | | |
| Tons of Resource | (000s) | 3,498 | | | 100 | 223 | 431 | 386 | 367 | 351 | 386 | 315 | 299 | 416 | 224 | | | | | |
| Pounds Contained | (000s) | 9,248 | | | 300 | 600 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 | 348 | | | | | |
| Mined Grade | % U3O8 | 0.132 | | | 0.151 | 0.134 | 0.116 | 0.130 | 0.136 | 0.142 | 0.130 | 0.159 | 0.167 | 0.120 | 0.077 | | | | | |
| Mine Extraction | | | | | | | | | | | | | | | | | | | | |
| Development Tons | (000s) | 2,176 | | 200 | 90 | 162 | 144 | 189 | 208 | 224 | 189 | 260 | 276 | 159 | 75 | | | | | |
| ***Total (Congo Pit + sheep UG)*** | | | | | | | | | | | | | | | | | | | | |
| **Total Tons Ore Mined** | (000s) | 7,453 | | 269 | 567 | 441 | 831 | 719 | 883 | 549 | 767 | 728 | 633 | 703 | 364 | | | | | |
| **Pounds Contained** | (000s) | 18,365 | | 665 | 1,128 | 1,187 | 1,951 | 1,657 | 2,198 | 1,539 | 1,719 | 1,894 | 1,677 | 1,767 | 984 | | | | | |
| **Mined Grade** | % U3O8 | 0.123 | | 0.124 | 0.099 | 0.135 | 0.117 | 0.115 | 0.125 | 0.140 | 0.112 | 0.130 | 0.132 | 0.126 | 0.135 | | | | | |
| **Tons Stockpiled** | (000s) | 203 | | (1) | 26 | (13) | 37 | (24) | 79 | (3) | 15 | 23 | (4) | 69 | (0) | | | | | |
| **Pounds Contained** | (000s) | 490 | | (2) | 52 | (36) | 88 | (55) | 197 | (7) | 33 | 59 | (11) | 172 | (0) | | | | | |
| **Grade** | % U3O8 | 0.120 | | 0.124 | 0.099 | 0.133 | 0.117 | 0.115 | 0.125 | 0.138 | 0.112 | 0.130 | 0.132 | 0.126 | | | | | | |
| **Tons Ore Processed** | (000s) | 7,453 | | 270 | 540 | 480 | 780 | 780 | 780 | 630 | 750 | 720 | 660 | 630 | 433 | | | | | |
| **Pounds Contained** | (000s) | 18,365 | | 667 | 1,074 | 1,274 | 1,828 | 1,799 | 1,946 | 1,743 | 1,679 | 1,868 | 1,747 | 1,584 | 1,157 | | | | | |
| **Plant feed** | % U3O8 | 0.123 | | 0.124 | 0.099 | 0.133 | 0.117 | 0.115 | 0.125 | 0.138 | 0.112 | 0.130 | 0.132 | 0.126 | 0.134 | | | | | |
| **Recovery fraction, $U_3O_8$** | | 0.919 | | 0.919 | 0.899 | 0.925 | 0.915 | 0.913 | 0.920 | 0.928 | 0.911 | 0.923 | 0.924 | 0.920 | 0.925 | | | | | |
| **Pounds $U_3O_8$ recovered** | (000s) | 16,875 | | 613 | 966 | 1,178 | 1,672 | 1,643 | 1,790 | 1,617 | 1,529 | 1,724 | 1,615 | 1,458 | 1,070 | | | | | |
| **$U_3O_8$** | US$/lb | 65 | | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | | | | |
| **GROSS REVENUES** | | **$ 1,096,861** | | **$ 39,839** | **$ 62,790** | **$ 76,567** | **$ 108,650** | **$ 106,791** | **$ 116,376** | **$ 105,110** | **$ 99,409** | **$ 112,052** | **$ 104,961** | **$ 94,754** | **$ 69,564** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| *Direct Costs:* | | | | | | | | | | | | | | | | | | | | |
| *Open Pit* | | | | | | | | | | | | | | | | | | | | |
| Strip | (US$000s) | 80,331 | 0 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,681 | 4,980 | 4,980 | 4,980 | 4,980 | 4,233 |
| Mining | (US$000s) | $ 18,625 | $ - | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ 1,552 | $ - | $ - | $ - | $ - | $ - |
| Support | (US$000s) | $ 15,834 | $ - | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 1,171 | $ 367 | $ 367 | $ 367 | $ 367 | $ 312 |
| Staff | (US$000s) | $ 23,485 | $ 1,113 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 1,656 | $ 515 | $ 515 | $ 515 | $ 515 | $ 438 |
| Subtotal | (US$000s) | $ 138,274 | $ 1,113 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 9,061 | $ 5,862 | $ 5,862 | $ 5,862 | $ 5,862 | $ 4,983 |
| Contingency | % | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 |
| **Total Surface Mine** | (US$000s) | 149,336 | $ 1,203 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 9,786 | $ 6,331 | $ 6,331 | $ 6,331 | $ 6,331 | $ 5,381 |
| *Underground Mine* | | | | | | | | | | | | | | | | | | | | |
| Production | (US$000s) | $ 169,217 | | $ - | $ 5,829 | $ 13,248 | $ 17,664 | $ 17,664 | $ 17,664 | $ 17,664 | $ 17,664 | $ 17,664 | $ 17,664 | $ 17,664 | $ 8,832 | | | | | |
| Development | (US$000s) | $ 53,166 | | $ 5,025 | $ 1,658 | $ 3,769 | $ 5,025 | $ 5,025 | $ 5,025 | $ 5,025 | $ 5,025 | $ 5,025 | $ 5,025 | $ 5,025 | $ 2,513 | | | | | |
| Support | (US$000s) | $ 44,913 | | $ 1,142 | $ 1,508 | $ 3,427 | $ 4,569 | $ 4,569 | $ 4,569 | $ 4,569 | $ 4,569 | $ 4,569 | $ 4,569 | $ 4,569 | $ 2,284 | | | | | |
| Staff | (US$000s) | $ 18,825 | | $ 818 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | $ 1,637 | | | | | |
| Subtotal | (US$000s) | $ 286,121 | $ - | $ 6,986 | $ 10,632 | $ 22,080 | $ 28,895 | $ 28,895 | $ 28,895 | $ 28,895 | $ 28,895 | $ 28,895 | $ 28,895 | $ 28,895 | $ 15,266 | | | | | |
| Contingency % | | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | 1.08 | | | | | |
| **Total Underground Mine** | (US$000s) | $ 309,011 | $ - | $ 7,545 | $ 11,483 | $ 23,847 | $ 31,206 | $ 31,206 | $ 31,206 | $ 31,206 | $ 31,206 | $ 31,206 | $ 31,206 | $ 31,206 | $ 16,487 | | | | | |
| Reclamation* | | - | | | | | | | | | | | | | | | | | | |
| NRC Annual Fees | (US$000s) | $ 1,800 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 | $ 100 |
| Final Grade Reveg. Mine and Heap | (US$000s) | $ 2,180 | | | | | | | | | | | | | | | | | | $ 2,180 |
| Heap Cover | (US$000s) | $ 11,166 | | | | | | | | | | | | | | | | | $ 11,166 | |
| **Total Mine (+ Reclamation)** | (US$000s) | $ 473,493 | $ 1,303 | $ 17,430 | $ 21,368 | $ 33,732 | $ 41,092 | $ 41,092 | $ 41,092 | $ 41,092 | $ 41,092 | $ 41,092 | $ 41,092 | $ 41,092 | $ 26,373 | $ 6,431 | $ 6,431 | $ 6,431 | $ 17,597 | $ 7,661 |

**Table 22-4 Cash Flow (Continued)**

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Heap Leach* | | - | | | | | | | | | | | | | | | | | |
| Includes Crusher/Conveyor (OPEX per ton) | (US$000s) | 143,585 | - | 5,202 | 10,404 | 9,248 | 15,027 | 15,027 | 15,027 | 12,138 | 14,449 | 13,872 | 12,716 | 12,138 | 8,338 | - | - | - | - | - |
| Subtotal | (US$000s) | 143,585 | - | 5,202 | 10,404 | 9,248 | 15,027 | 15,027 | 15,027 | 12,138 | 14,449 | 13,872 | 12,716 | 12,138 | 8,338 | - | - | - | - | - |
| Contingency % | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| **Total Heap Leach** | (US$000s) | 143,585 | - | 5,202 | 10,404 | 9,248 | 15,027 | 15,027 | 15,027 | 12,138 | 14,449 | 13,872 | 12,716 | 12,138 | 8,338 | - | - | - | - | - |
| *Reclamation Bond* | | - | | | | | | | | | | | | | | | | | | |
| **Total Reclamation Bond** | (US$000s) | 6,120 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 | 340 |
| *Taxes & Royalties* | | - | | | | | | | | | | | | | | | | | | |
| Gross Products Tax | (US$000s) | 39,702 | - | 1,442 | 2,273 | 2,771 | 3,933 | 3,865 | 4,212 | 3,805 | 3,598 | 4,056 | 3,799 | 3,430 | 2,518 | - | - | - | - | - |
| Severance Tax | (US$000s) | 21,965 | - | 798 | 1,257 | 1,533 | 2,176 | 2,139 | 2,331 | 2,105 | 1,991 | 2,244 | 2,102 | 1,898 | 1,393 | - | - | - | - | - |
| Claim royalties | (US$000s) | 26,966 | - | 1,967 | 2,448 | 1,735 | 2,812 | 1,942 | 3,542 | 1,595 | 2,126 | 2,644 | 2,001 | 2,269 | 1,883 | - | - | - | - | - |
| Claim royalties | (US$000s) | 21,640 | - | - | 702 | 1,404 | 2,340 | 2,340 | 2,340 | 2,340 | 2,340 | 2,340 | 2,340 | 2,340 | 814 | - | - | - | - | - |
| **Total Taxes and Royalties** | (US$000s) | 110,273 | - | 4,206 | 6,680 | 7,444 | 11,261 | 10,286 | 12,425 | 9,845 | 10,055 | 11,283 | 10,243 | 9,937 | 6,608 | - | - | - | - | - |
| **TOTAL DIRECT COSTS** | (US$000s) | 733,471 | 1,643 | 27,179 | 38,792 | 50,764 | 67,720 | 66,745 | 68,885 | 63,414 | 65,937 | 66,587 | 64,390 | 63,506 | 41,658 | 6,771 | 6,771 | 6,771 | 17,937 | 8,001 |
| Cash Flow Pre-tax | (US$000s) | 363,390 | (1,643) | 12,660 | 23,998 | 25,803 | 40,930 | 40,046 | 47,491 | 41,696 | 33,472 | 45,465 | 40,571 | 31,248 | 27,905 | (6,771) | (6,771) | (6,771) | (17,937) | (8,001) |
| TOTAL TAXES DUE | (US$000s) | 32,153 | - | - | 211 | 1,482 | 2,825 | 2,732 | 3,512 | 2,906 | 3,459 | 4,716 | 4,203 | 3,226 | 2,880 | - | - | - | - | - |
| Cash Flow After Taxes | (US$000s) | 331,237 | (1,643) | 12,660 | 23,787 | 24,321 | 38,105 | 37,313 | 43,979 | 38,790 | 30,013 | 40,749 | 36,368 | 28,022 | 25,025 | (6,771) | (6,771) | (6,771) | (17,937) | (8,001) |
| *Capital Expenditures:* | | | | | | | | | | | | | | | | | | | |
| Permitting (Wyo) | (US$000s) | 4,000 | 2,000 | 1,000 | - | - | - | - | - | 500 | 500 | - | - | - | - | - | - | - | - | - |
| Pre-Development Mine Design | (US$000s) | 1,200 | 800 | 400 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| OP Mine Equipment | (US$000s) | 24,341 | - | 21,141 | - | - | 800 | - | - | 800 | - | - | 800 | - | 800 | - | - | - | - | - |
| UG Mine Equipment | (US$000s) | 64,504 | - | 12,876 | 25,752 | 12,876 | - | 1,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | - | - | - | - | - | - |
| Office, Shop, Dry, and support | (US$000s) | 3,234 | - | 3,234 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Plant Equipment and Buildings | (US$000s) | 13,619 | 13,619 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Overland Conveyor | (US$000s) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Heap Pads and ponds | (US$000s) | 24,928 | 18,467 | - | - | - | - | - | 6,461 | - | - | - | - | - | - | - | - | - | - | - |
| Working capital | (US$000s) | - | - | 4,215 | - | - | - | - | - | - | - | - | - | - | (4,215) | - | - | - | - | - |
| Warehouse inventory | (US$000s) | - | - | 500 | - | - | - | - | - | - | - | - | - | - | (500) | - | - | - | - | - |
| Subtotal | (US$000s) | 135,826 | 34,886 | 43,366 | 25,752 | 12,876 | 800 | 1,000 | 8,461 | 3,300 | 2,500 | 2,000 | 2,800 | 2,000 | (3,915) | - | - | - | - | - |
| Contingency varies by line item | (US$000s) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | - | - | - | - |
| **TOTAL CAPITAL EXPENDITURES** | (US$000s) | 135,826 | 34,886 | 43,366 | 25,752 | 12,876 | 800 | 1,000 | 8,461 | 3,300 | 2,500 | 2,000 | 2,800 | 2,000 | (3,915) | - | - | - | - | - |
| NET CASH FLOW PRE TAX | (US$000s) | 227,564 | (36,528) | (30,706) | (1,754) | 12,927 | 40,130 | 39,046 | 39,030 | 38,396 | 30,972 | 43,465 | 37,771 | 29,248 | 31,820 | (6,771) | (6,771) | (6,771) | (17,937) | (8,001) |
| NET CASH FLOW AFTER TAX | (US$000s) | 195,411 | (36,528) | (30,706) | (1,965) | 11,445 | 37,305 | 36,313 | 35,518 | 35,490 | 27,513 | 38,749 | 33,568 | 26,022 | 28,940 | (6,771) | (6,771) | (6,771) | (17,937) | (8,001) |

## 23.0 ADJACENT PROPERTIES

The Sheep Mountain Project is within the Crooks Gap/Green Mountain Uranium District. Past production occurred at both Sheep Mountain by WNC and others, in addition to production at Green Mountain by Pathfinder Mines at their Big Eagle Mine. Rio Tinto Ltd., through its wholly owned subsidiary Kennecott Corp, USA, currently controls most of the known Mineral Resources in the Green Mountain area including the Big Eagle mine and the Sweetwater Mill 22 miles to the south, which is currently in reclamation. EFR has no interest in any adjacent properties to the Sheep Mountain Project.

The QPs have not been able to verify the information on the adjacent properties and the information is not necessarily indicative of the mineralization on the Project.

# 24.0 OTHER RELEVANT DATA AND INFORMATION

## 24.1 Ground Water Conditions

The Crooks Gap area regional hydrology, as determined by the Platte River Basin Water Plan, includes two separate formations or groups of formations that qualify as potentially productive for groundwater. The Quaternary aquifer system has both an alluvial and non-alluvial division. This is considered to be a discontinuous but major aquifer in the State of Wyoming. It is undetermined at this time whether this surface aquifer exists in the project area.

The second aquifer in the Crooks Gap area is the Tertiary Aquifer System. The System in the Crooks Gap region is comprised of the Fort Union and Battle Spring Formations. The Platte River Basin Water Plan describes the aquifer as comprised of complex inter-tonguing fluvial and lacustrine sediments. This is also classified as a major aquifer for the State of Wyoming.

Mining will occur in the Battle Spring Formation. Historic data indicates that sustained dewatering of the Sheep underground mines required approximately 200 gpm, but that the cone of depression is limited in area and will not impact surface water sources in the area. In addition, dewatering of the Congo Open pit requires an estimated 150 gpm beginning in year seven and extending to the end of mining. Thus, approximately 350 gpm of water will be produced by the mines.

With respect to mine and mineral processing operations, the mineral processing facility will operate at an average flow rate of 360 gpm. However, the majority of the flow is recirculated resulting in an estimate net water demand of 135 gpm. The largest consumptive use of water on the project will be for dust control for the open pit, hauls roads, stockpile areas, and the conveyor system. This use is estimated to average 150 gpm over a nine-month period or 100 gpm on an annual basis. Thus, the total water use is estimated at 235 gpm. This is significant in that the water produced by the mine operations is adequate for the consumptive needs of the project and that no additional water sources will be required.

# 25.0 INTERPRETATION AND CONCLUSIONS

The planned development of the Sheep Mountain Project is an open pit and underground conventional mine operation with on-site mineral processing featuring an acid heap leach and solvent extraction recovery facility. The open pit and underground mine operations would be concurrent with a mine life of approximately 12 years.

The Sheep Mountain Project if implemented would be profitable under the base case and US$65 per pound selling price the project is estimated to generate an IRR of 28% before taxes and has an NPV of approximately US$115 million at a 7% discount rate. An economic analysis including a sensitivity analysis of commodity price in the range of $50 to $70 per pound is presented in Section 22.0. The breakeven price of $51.00 per pound of uranium oxide for the project is based on the foregoing assumptions and preliminary mine limits. By their nature all commodity price assumptions are forward-looking. No forward-looking statement can be guaranteed, and actual future results may vary materially. The technical risks related to the project are low as the mining and recovery methods are proven. The mining methods recommended have been employed successfully at the project in the past. Successful uranium recovery from the mineralized material at Sheep Mountain and similar project such as the Gas Hills has been demonstrated via both conventional milling and heap leach recovery.

Risks related to permitting and licensing the project are also low as the WDEQ Mine Permit and BLM Plan of Operations have been approved. The major remaining permit needed to start operations is the combined Source and Byproduct Materials License which would be issued through the WDEQ as Wyoming is an agreement state with the NRC.

EFR is not aware of any other specific risks or uncertainties that might significantly affect the Mineral Resource and Mineral Reserve estimates or the resulting economic analysis. Estimation of costs and uranium price for the purposes of the economic analysis over the life of mine is by its nature forward-looking and subject to various risks and uncertainties. No forward-looking statement can be guaranteed, and actual future results may vary materially.

# 26.0 RECOMMENDATIONS

As the Sheep Mountain Project (the Project) is sensitive to mining factors including resource recovery, dilution, and grade, and mineral processing factors related to the performance of the heap leach, it is recommended that a bulk sampling program and pilot scale heap leach testing be completed. Mineralization is shallow (less than 40 feet) in the northern portions of the Congo pit. A small test mine could be developed under the existing WDEQ Mine Permit and BLM Plan of Operations. This would allow access to examine and test the mineralization with respect to mining parameters and to collect a bulk sample for pilot scale heap leach testing. It is recommended that a bulk sample of approximately 2,000 tons be collected and transported to Energy Fuels Resources (USA) Inc. White Mesa Mill. At the Mill and under the Mill's Source Materials License, the mineralized material could be stacked at various heights in the range of 15 to 30 feet. The test plots would be lined and could be cribbed on two sides with an open face stacked at the angle of repose. Using 20 x 20-foot pads, four pilot tests could be completed. The testing would determine the geotechnical behavior of the material with respect to consolidation, slope stability, and the leaching characteristics with respect to acid consumption and mineral recovery. Flow and/or percolation rates retained moisture and other characteristics at various stacking heights could also be determined.

Table 26-1 summarizes the recommended work program to further develop the Project.

**Table 26-1 Recommended Work Program**

| Scope of Work | Est. Cost US$ |
|---|---|
| Test mine approximately ½ acre, 40,000 cy excavation at $150/cy | $60,000 |
| Testing the mineralization and collection of a bulk sample | $40,000 |
| Transportation of 2,000 tons, 500 miles at $0.17/ton mile | $170,000 |
| Heap pilot testing | $200,000 |
| Reclamation of test pit | $60,000 |
| Revise Preliminary Feasibility Study | $100,000 |
| **Total** | **$630,000** |

## 27.0 REFERENCES

**Previous Reports:**

Beahm, D. L., Sheep Mountain Uranium Project, Fremont County, Wyoming, USA, Updated Preliminary Feasibility Study, National Instrument 43-101 Technical Report, Amended and Restated, February 28, 2020.

Beahm, D. L., Sheep Mountain Uranium Project, Fremont County, Wyoming, USA, Updated Preliminary feasibility Study, National Instrument 43-101 technical Report, April 13, 2012.

Beahm, D. L., David H. Scriven, D. H., McNulty, T.P., *Sheep Mountain Project 43-101 Mineral Resource and Reserve Report,* April 8, 2010.

Bendix, *National Uranium Resource Evaluation: Casper Quadrangle, Wyoming*, September 1982.

BRS Inc. (BRS), Beahm, *Sheep Mountain Project 43-101 Mineral Resource Update Report,* March 1, 2011.

Harris & Thompson*, Title Report on Sheep Mountain/Crooks Gap Properties, Fremont County, Wyoming,* 1/20/2005 and as updated 12/02/2011.

Irwin, R., *Evaluation of the ISL Potential of a Part of the Northern Crooks Gap District Freemont County* WY: Internal Report 1998

Lyntek, *Titan Uranium – Sheep Mtn. Heap Leach Project, Pre-Feasibility Study Report, Central Wyoming, USA*, February 2012.

Pathfinder Mines Corporation (PMC), Sheep Mountain Evaluation, Internal Report, September 1987.

R and D Enterprises, Inc. (RDE), *Sheep Mountain Uranium Project, Fremont County, WY, USA, Column Leach Studies*, February 21, 2011.

Roscoe Postle Associates Inc. (RPA), Wallis, S. and D. Rennie, *Technical Report on the Sheep Mountain Uranium Project, Wyoming*, Prepared for Uranium Power Corporation (UPC), October 10, 2006.

Roscoe Postle Associates Inc. (RPA), Wallis, S., *Technical Report on the Sheep Mountain Uranium Project, Wyoming*, Prepared for Uranium Power Corporation (UPC), January 10, 2005.

US Energy Corp., Healey, C., Wilson, J., *2006 Resource Study Sheep Mountain Project*, June 2, 2006.

U.S. Energy Corp and Crested Corp. (USE/CC), February 1990, Exhibit 4.

U.S. Energy Corp and Crested Corp. (USE/CC), Annual Reports Mine Permit 381C, 1990 through 2006.

Western Nuclear Inc., Douglas, S., *Ore Reserve Estimates, 1981.*

Western Nuclear Inc., *Proposed Congo Pit and all Anticipated Extensions, 1981.*

Watts Griffis & McQuat (WGM), *Valuation of US Uranium Limited*: Internal Report 1999

Western Nuclear Inc., *Wyoming DEQ Permit to Mine # 381C, 1980.*

Western Nuclear Inc., Oliver, D., *Ore Reserve Estimates, 1985.*

Wilson, J.C., *2005 Drilling Report Sheep Mountain Project Fremont County, Wyoming* 2005

**Publications Cited:**

AACE International, 2005, Cost Estimate Classification System – as Applied in Engineering, Procurement, and Construction for the Process Industries, TCM Framework: 7.3 – Cost Estimating and Budgeting, AACE International Recommended Practice No. 18R-97.

Boberg, W. W., Applied Exploration and Uranium Resources of Great Divide Basin, Wyoming, AAPG Bulletin, volume 63, 1979.

Dunne, R. C., Kawatra, K., and Young, C. A., Eds. 2019, Schnell, H., "Uranium". In SME Mineral Processing and Extractive Metallurgy Handbook, Vol. Two, Chapter 12.41.

Gomiero, L. A., Lima, H. A., and Morais, C. A. 2010, "Evaluation of a new milling process for the Caetite". In *Uranium 2010: Proceedings of the 3rd International Conference in Uranium.* Montreal, QC: Canadian Institute of Mining, Metallurgy and Petroleum.

Jones, N.R., Gregory, R.W., and McLaughlin, J.F., 2011, Geologic map of the Bairoil 30' x 60' quadrangle, Carbon, Fremont, Sweetwater, and Natrona counties, Wyoming: Wyoming State Geological Survey Map Series 86, scale 1:100,000.

Mining Cost Service, Cost Indexes and Metal Prices (October 2021). Pub. by InfoMine USA, Inc.

National Uranium Resources Evaluation (NURE), Casper Quadrangle, Wyoming, September 1982.

Rackley, Ruffin I., AAPG Bulletin 56, *Environment of Wyoming Tertiary Uranium Deposits*, 1972.

Stedman, Ashley, and Kenneth P. Green (2018). Fraser Institute Annual Survey of Mining Companies 2018. Fraser Institute.

Stephens, James G., *Geology and Uranium Deposits at Crooks Gap, Fremont County Wyoming,* Contributions to the Geology of Uranium, Geological Survey Bulletin 1147-F, 1964.

TradeTech, Uranium Market Study, 2019: Issue 4.

Woolery, R. G, et al, 1978, *Heap Leaching of Uranium A Case Study*, SME Mining Engineering Magazine, June 1978.

Wyoming Water Development Commission*, Platte River Basin Water Plan*, May 2006.

## 28.0 CERTIFICATE OF AUTHORS

Section 28 is added to this report for compliance to Canadian NI 43-101 standards.

I, Daniel D. Kapostasy, P.G., do hereby certify that:

1. I am currently employed as the Director of Technical Services with Energy Fuels Resources (USA) Inc., 225 Union Blvd. Suite 600, Lakewood, Colorado, 80228.
2. I graduated with a Bachelor of Sciences degree in Geology in May 2003 from the University of Dayton in Dayton, Ohio.
3. I graduated with a Master of Science Degree in December 2005 from The Ohio State University in Columbus, Ohio.
4. I am a Registered Professional Geologist in the State of Wyoming (PG-3778), a Registered Professional Geologist in the State of Utah (10110615-2250), and a Registered Member of SME (RM#04172231). I have worked as a geologist for a total of 16 years since my graduation. My relevant experience for the purpose of this Technical Report is:
    - Senior Geologist, Chief Geologist, Manager of Technical Resources and Director of Technical Resources with Energy Fuels (USA) Inc. since 2013 working on all aspects of developing their uranium assets including: resource evaluation and estimation, drill hole planning, underground mine geologist, permitting, and economic evaluation.
    - Geologist and Senior Geologist with Strathmore Resources between 2008 – 2013 working on drill programs, resource evaluation and permitting the Roca Honda uranium project and Pena Ranch uranium mill.
    - Geologist with Apogen Resources between 2006 – 2013 working as a consultant geologist on the Roca Honda uranium project.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. As I am currently employed by Energy Fuels (USA) Inc. I do not meet the definition of being independent of the issuer as described in section 1.5
7. I visited the Sheep Mountain Project on April 8, 2014.
8. I am responsible for Sections 4 – 12 and 18 – 20 and relevant portions of Sections 1 and 2 of this Technical Report
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.
10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 11th day of February 2022
*"Original signed and sealed"*
/s/Daniel D. Kapostasy
Daniel D. Kapostasy, SME Registered Member

I, Douglas L. Beahm, P.E., P.G., do hereby certify that:

1. I am the Principal Engineer and President of BRS, Inc., 1130 Major Avenue, Riverton, Wyoming 82501.
2. I am a co-author of the report "Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA" Dated December 31, 2021.
3. I graduated with a Bachelor of Science degree in Geological Engineering from the Colorado School of Mines in 1974. I am a licensed Professional Engineer in Wyoming, Colorado, Utah, and Oregon; a licensed Professional Geologist in Wyoming; a Registered Member of the SME.
4. I have worked as an engineer and a geologist for over 48 years. My work experience includes uranium exploration, mine production, and mine/mill decommissioning and reclamation. Specifically, I have worked with numerous uranium projects hosted in sandstone environments in Wyoming.
5. I was last present at the site on the 16th of September 2021.
6. I am responsible for Sections 3, 14, 15, 16, and 22 - 27 and relevant portions of Section 1, 2, and 21 of the report.
7. I am independent of the issuer in accordance with the application of Section 1.5 of NI 43-101. I have no financial interest in the property and am fully independent of Energy Fuels Inc.. I hold no stock, options or have any other form of financial connection to EFR. EFR is but one of many clients for whom I consult.
8. I do have prior working experience on the property as stated in the report.
9. I have read the definition of "qualified person" set out in National Instrument 43-101 and certify that by reason of my education, professional registration, and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with same.
11. As of the date of this report, to the best of my knowledge, information and belief, the parts of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

January 19, 2022
*"Original signed and sealed"*
*<u>/s/</u>* <u>Douglas L. Beahm</u>
Douglas L. Beahm, SME Registered Member

I, Terence P. ("Terry") McNulty, D. Sc., P. E., do hereby certify that:

1. I am president of T. P. McNulty and Associates, Inc., located at 4321 N. Camino de Carrillo, Tucson, AZ 85750-6375.
2. I am the author of Sections 13 and 17 of the report entitled "Preliminary Feasibility Study for the Sheep Mountain Project, Fremont County, Wyoming, USA", dated January 19, 2022.
3. I graduated in 1960 from Stanford University with a Bachelor of Science degree in Chemical Engineering. In 1963, I earned a Master of Science degree in Metallurgical Engineering from the Montana School of Mines, and in 1966, I was awarded a Doctor of Science degree in Metallurgy from the Colorado School of Mines. I am a Registered Professional Engineer in Colorado with License No. 24789 and am a Registered Member of SME, No. 2152450R.
4. I have worked as a metallurgist in the minerals industry for over 55 years and have had extensive experience in uranium processing, as well as in cost estimation, process engineering, plant design, and plant operations in the recovery of many metals and minerals from their ores. I have contributed to approximately forty-five NI 43-101 compliant studies for projects intended to recover uranium, gold, silver, and copper.
5. I was last present on the site in August 2010.
6. I am responsible for Sections 13, 17, and portions of 21 of the Technical Report.
7. I am independent of Energy Fuels Inc. and have no financial interest in the property to which this Technical Report applies.
8. I participated in a report on this property for another client in 2010.
9. Owing to my education, relevant industrial experience, and professional registration, I believe that I am a "qualified person" for the purposes of this Technical Report.
10. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with same.
11. As of the date of this report, and to the best of my knowledge based on information that has been provided to me, this Technical Report contains all information that must be disclosed to prevent the Technical Report from being in any way incomplete or misleading.

January 19, 2022
*"Original signed and sealed"*
*/s/*
Terence P. McNulty, D. Sc., P. E
P.E Seal: Colorado # 24789