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November 7, 2007

Our Ref.: 073-81694

Colorado Department of Public Health and Environment (CDPHE)  
4300 Cherry Creek Drive South  
Denver, Colorado 80246-1530

Attention: Mr. Philip V. Egidi, Environmental Protection Specialist

**RE: PROPOSED FACILITY LAYOUT CONCEPTS AND DETAILS, PIÑON RIDGE  
PLANT AND TAILINGS FACILITIES, PARADOX VALLEY, COLORADO**

Dear Mr. Egidi:

Golder Associates Inc. (Golder) has prepared this letter to present our current understanding of design requirements for the proposed tailings storage cells, evaporation ponds, and ore stockpiles for the Piñon Mill Project located in Montrose County, Colorado. We have developed the design recommendations based on our experience with similar types of facilities combined with the following industry and project-specific inputs:

- Review of the regulations regarding design of such facilities
- How these regulations have been applied at similar projects; and
- Preliminary understanding of the site geologic conditions based on results received to date from the on-going geotechnical field investigations.

We would like to emphasize that we are in the preliminary stages of project development, with an extensive data collection and interpretation effort ahead of us. However, we wanted to make use of this early opportunity to meet with you and other Colorado Department of Public Health and Environment (CDPHE) personnel to discuss the Colorado and Federal regulations, relevant to facility design and the site specific conditions that may impact the design requirements. Therefore, this letter has been prepared in advance of our meeting to provide you with early proposals for facility design which are geared to both develop open lines of communication between the project designers and the CDPHE, as well as keep design of the project on track for successful completion.

## **PROJECT BACKGROUND**

Energy Fuels Resources Corporation (EFRC) is in the process of designing and licensing a new conventional uranium mill, the Piñon Ridge Uranium Mill, located in Montrose County, Colorado. The site is located in the Paradox Valley, approximately 15 miles northwest of the town of Naturita on Highway 90.

Kleinfelder West Inc. (Kleinfelder) is nearing completion of the Phase 1 geotechnical investigations to develop general characterization of the site, a site on which no previous investigations had been conducted. Phase 2 geotechnical investigations have recently initiated, a joint effort between Golder and Kleinfelder, to support geotechnical designs of the tailings cells, evaporation ponds, ore

stockpiles, mill, roads, surface water controls, borrow sources, and facility closure. These geotechnical designs are scheduled to be completed in March 2008 and incorporated into the Environmental Report (ER) that will be submitted by EFRC to the CDPHE.

Due to the compressed time-frame for execution of the design, it is the intent of EFRC and the design team to work closely with CDPHE to ensure correct interpretation and application of the State and Federal regulations regarding design of the facilities. The facilities to be included in the ER are as follows: (1) two tailings cells with areal extents of approximately 20 acres each; (2) an evaporation pond with an areal extent of approximately 80 acres; and (3) an ore stockpile with an areal extent of approximately one acre. A second ore stockpile with an areal extent of approximately 5 acres will be permitted separately though the Division of Reclamation, Mining and Safety (DRMS) to be constructed in advance of the mill, which may eventually be rolled into the permit boundary for the mill.

## **GENERAL SITE CHARACTERISTICS**

As part of the Phase 1 geotechnical investigations, Kleinfelder advanced twenty (20) geotechnical boreholes (PR1-1 to PR-20) spaced across the site to depths ranging from 30.3 to 98.8 feet below the ground surface, installed six (6) monitoring wells (MW-1 to MW-6) at depths of 100.0 to 600.0 feet below the ground surface, and are nearing completion of three (3) seismic reflection/refraction geophysical lines extending approximately north-south across the site. Findings to-date reveal the following general site characteristics:

- No reasonable groundwater sources have been encountered, with high sulfur content groundwater encountered only in monitoring well MW-6 at a depth of 470 feet, near the southeast corner of the property;
- The site is underlain by a number of potential aquitards, with evaporite rock of the Hermosa Group underlying the northern half of the site making impacts to groundwater from leaks through the tailings cells or evaporation pond liner systems less of a concern because these rocks do not host any measurable amount of water; and
- Geophysical surveys completed to-date have identified several possible fault traces underlying the proposed mill and tailings cell areas. However, these features appear to be overlain by a minimum of 20 feet of undisturbed alluvial/colluvial soil, indicating that the possible faults are at least 10 million years old and are therefore likely to be judged non-capable according to Criterion 4E of 6 CCR 1007-1, Part 18 (i.e., section III(g) of Appendix A of 10 CFR Part 100). This will be confirmed during the proposed trenching program to be conducted in the near future.

## **PROPOSED FACILITY DESIGN**

Under the Uranium Mill Tailings Radiation Control Act (UMTRCA) of 1978, as amended, the Environmental Protection Agency (EPA) has the responsibility of establishing standards for exposure of the public to radioactive materials originating from mill tailings for active uranium extraction facilities licensed by the U.S. Nuclear Regulatory Commission (NRC) or its Agreement State. NRC regulations are issued under the United States Code of Federal Regulations (CFR) Title 10, Chapter 1.

Colorado is an Agreement State, whereby the CDPHE has the responsibility for licensing the possession and use of radioactive materials in Colorado under the Radiation Control Act (Title 25, Article 11), and the Rules and Regulations Pertaining to Radiation Control (6 CCR 1007-1). A thorough review of the regulations, especially as they pertain to groundwater protection (i.e., liner systems) for the facilities was conducted. This section discusses the proposed design considerations for the various facilities.

### ***Tailings Cell Design***

Design of two tailings storage cells, each approximately 20-acres in plan area, will be included in the Piñon Mill permit application. A preliminary alternatives evaluation has been conducted, looking at the following tailings disposal options:

- Option 1 – Partial Below Grade Disposal; and
- Option 2 – Full Below Grade Disposal.

The above two concepts, Option 1 and Option 2, are illustrated in Figures 1 and 2, respectively. Though 6 CCR 1007-1 Part 18, Appendix A, Criterion 3, states that the ‘prime option’ for disposal of tailings is placement below grade, we believe that Option 1 is more appropriate for this site for the following reasons:

- A balanced cut/fill design will minimize the ground surface area impacted by each facility and will reduce the amount of excavated material to be stockpiled temporarily elsewhere on site. The depth of excavation can be increased as needed to obtain any additional material required to meet future closure cover requirements;
- Improved surface water management, using perimeter berms to divert and control upgradient runoff;
- Potentially less wind disturbance due to the presence of surrounding perimeter berms; and
- Shallow bedrock has been encountered in several areas across site, increasing the difficulty of attaining full below grade tailings disposal.

The regulations clearly state (6 CCR 1007-1 Part 18, Appendix A) that “*flexibility is provided in the criteria to allow achieving an optimum tailings disposal program on a site-specific basis.*”

Criterion 5 (6 CCR 1007-1 Part 18, Appendix A) of the state regulations apply to groundwater protection standards, which refer to 40 CFR Part 192 Subparts D and E. Section 192.32 (of 40 CFR Part 192 Subpart D) states that new surface impoundments must be designed, constructed, and installed in such manner as to conform to the requirements of 264.221 (i.e., 40 CFR Part 264 Subpart K). In paragraph 264.221(c), “*each new surface impoundment unit on which construction commences after January 29, 1992...must install two or more liners and a leachate collection and removal system between such liners.*”

Due to the potentially favorable hydrogeologic regime of the site (i.e., deep groundwater and the possible presence of shallow aquitard strata), the design team believes that the following liner system

(proceeding from bottom to top) is suitable for the tailings storage cells and will meet the intent of the regulations:

- Compacted subgrade soils;
- A bottom geomembrane liner;
- A leak detection system constructed of geonet drainage materials which drains to a gravel sump; and
- An upper geomembrane liner.

A preliminary detail for the proposed liner system for the tailings storage cells is illustrated as Detail 1 on Figure 3.

### ***Evaporation Pond Design***

Because the evaporation ponds are temporary facilities that will be removed during closure, a less stringent liner design than applied to the tailings storage cells may be appropriate, depending on site specific conditions. However, for now we propose that design of the evaporation pond liner system be consistent with that proposed for the tailings cells, as illustrated in Detail 1 on Figure 3. Kleinfelder recently submitted an evaporation pond design for Homestake's Grants, New Mexico Project that specified use of a similar double geomembrane liner with leak detection system. The same design was approved for the project in 1994, so Homestake expects to receive approval for this recent submittal.

### **Ore Stockpile Design**

The regulations are fairly vague with regard to design of liner systems for the ore stockpiles, with Criterion 5H of 6 CCR 1007-1 Part 18, Appendix A, stating that the design shall "*minimize penetration of radionuclides into underlying soils; suitable methods include lining and/or compaction.*" In general, ore stockpiles are temporary in nature, storing uranium ore material for a relatively short period of time. Based on the design team's experience with similar facilities, a number of different systems have been employed in the recent past, including the following: (a) compaction of the subgrade soils with excavation of near-surface soils at closure; (b) construction of a concrete (reinforced or non-reinforced) pad; and (c) relatively thin compacted clay liner (6 to 12 inches) overlying a base of crushed limestone.

The Piñon Mill Project will include a small temporary one-acre ore stockpile and a five-acre ore stockpile. EFRC plans to permit the five-acre ore stockpile separately through DRMS as a permanent facility. Eventually, the five-acre ore stockpile may be rolled into the CDPHE permit, and therefore consensus is required on the liner system design for the five-acre ore stockpile between DRMS and CDPHE. It should be noted that the ore materials anticipated for storage at the Piñon Mill Project are non-acid generating.

At this time, the project team proposes the following design considerations for the permanent five-acre ore stockpile:

- Zero-discharge facility with a single-lined contingency pond due to the low anticipated heads on the pond liner;

- Construction in one or more phases with a single contingency pond designed for the total potential runoff from the ultimate five-acre facility;
- A liner system beneath the ore comprised of (from bottom to top): (1) a low permeability soil liner (or geosynthetic clay liner, GCL); (2) geomembrane; and (3) gravel drainage/liner protection layer, as illustrated in Detail 2 on Figure 3; and
- Closure for the facility would include a closure cover if the ore stockpile is closed in absence of a mill under the DRMS permit. If the pad is incorporated into the mill license at a later date, any remaining ore and the ore pad liners would be disposed of in the tailings cells during facility closure.

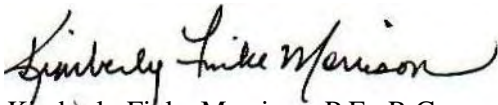
The one-acre ore stockpile will be constructed adjacent to the mill, accessed via loaders on a consistent basis. The design team proposes construction of a reinforced concrete pad as the one-acre ore stockpile liner system. No separate contingency pond is proposed for the one-acre ore stockpile, as any drainage will be designed to drain into the tailings cells or other associated facilities.

## CLOSING

We look forward to meeting with you this Friday, the 9<sup>th</sup> of November, to discuss our proposed design further. If you have any questions or comments in the interim, please contact the undersigned at 303-980-0540.

Sincerely,

### GOLDER ASSOCIATES INC.



Kimberly Finke Morrison, P.E., R.G.  
Project Manager



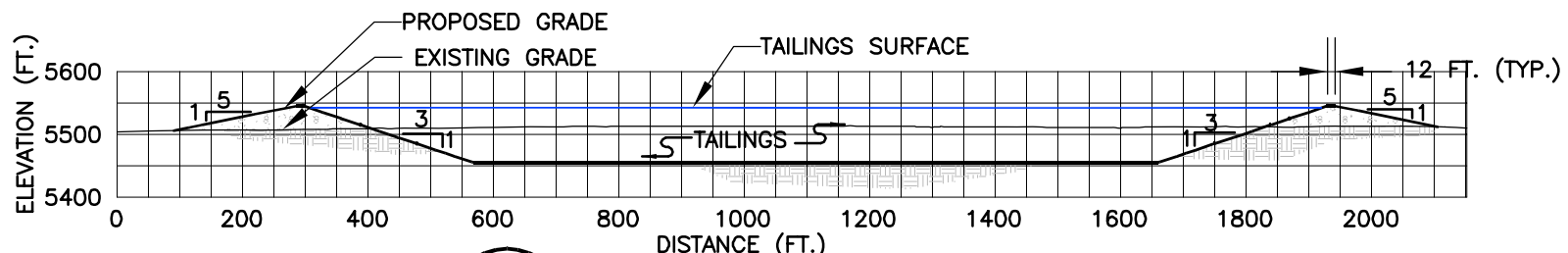
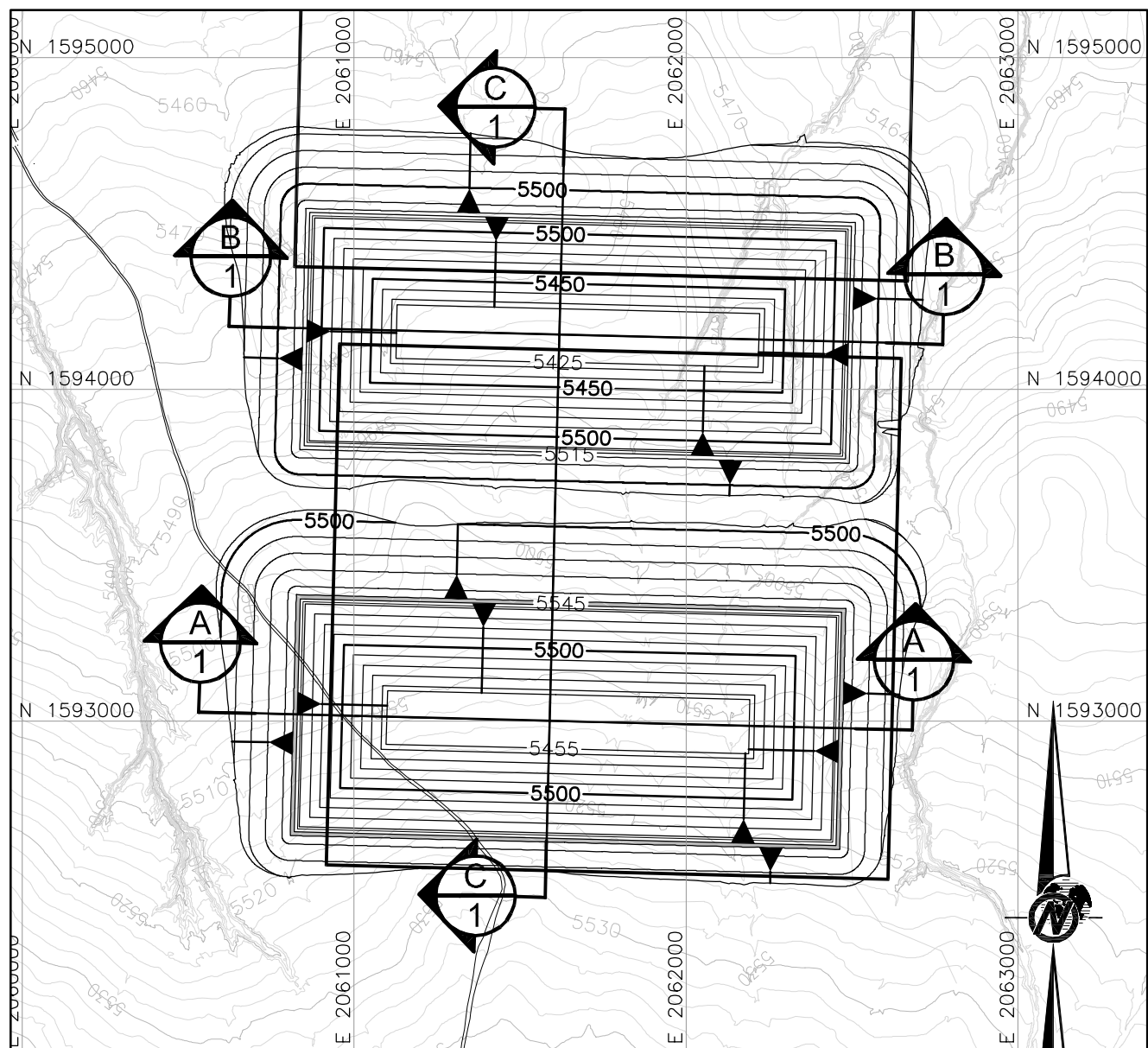
James M. Johnson, P.E.  
Project Director

cc: Bob Monok – Energy Fuels Resources Corporation  
Frank Filas – Energy Fuels Resources Corporation  
Alan Kuhn – Kleinfelder

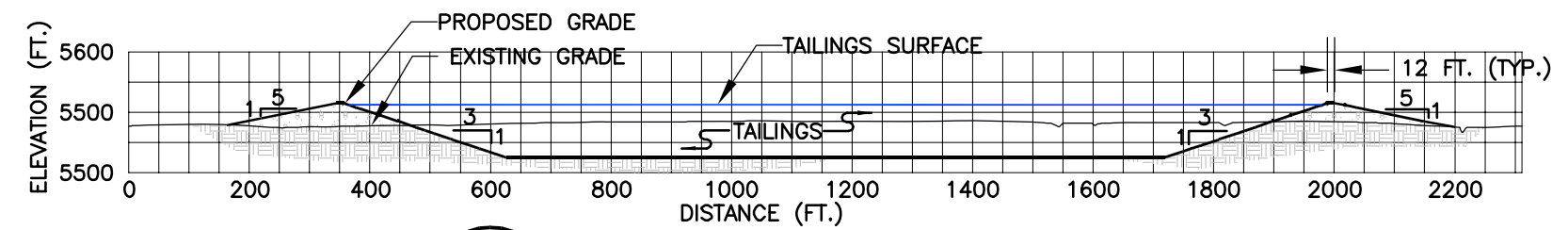
### Attachments:

Figure 1 Tailings Disposal Option 1 – Partial Below Grade Disposal  
Figure 2 Tailings Disposal Option 2 – Fully Below Grade Disposal  
Figure 3 Proposed Liner Systems

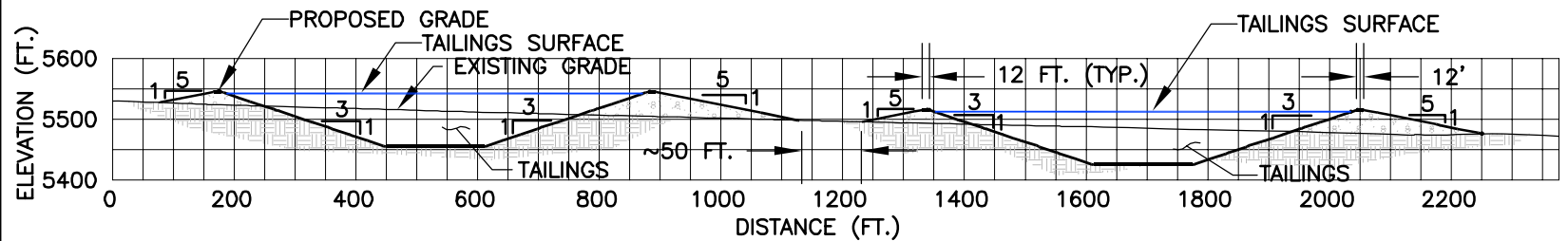
## **FIGURES**



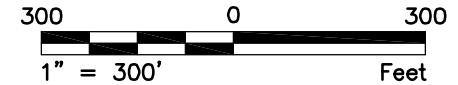
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**B**  
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**C**  
1  
1"=300'

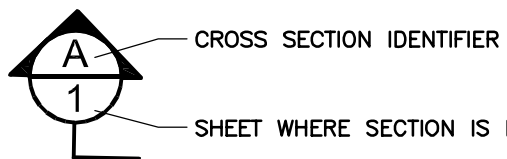


**LEGEND**

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED FINISHED GRADE TOPOGRAPHY

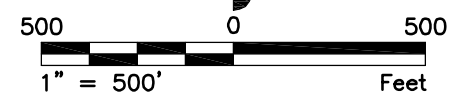


SLOPE DIRECTION



CROSS SECTION IDENTIFIER

SHEET WHERE SECTION IS LOCATED



**GRADING QUANTITIES**

	CUT (CU. YDS.)	FILL (CU. YDS.)
SOUTH CELL	926,000	962,000
NORTH CELL	950,000	900,000

**FOR DISCUSSION  
PURPOSES ONLY**

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Last Update: Nov 08, 2007 07:10 By: jroberts  
Last Plot: Nov 08, 2007 08:24 By: jroberts

**REFERENCES**

1. TWO-FOOT CONTOUR MAP PROVIDED BY KLEINFELDER IN SEPTEMBER 2007.

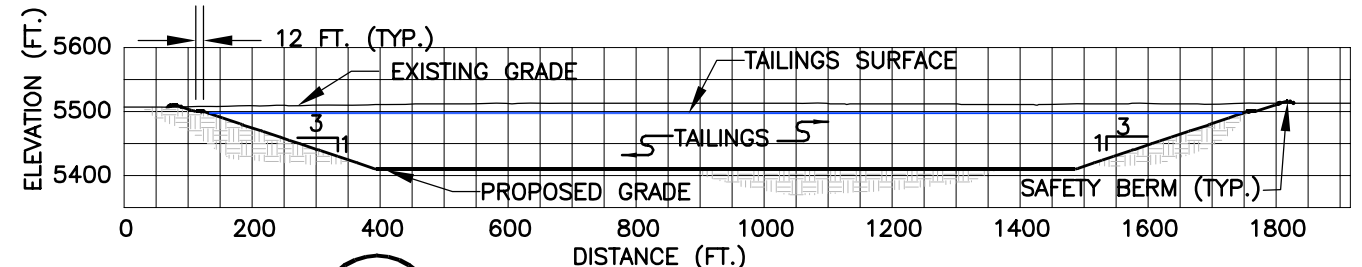
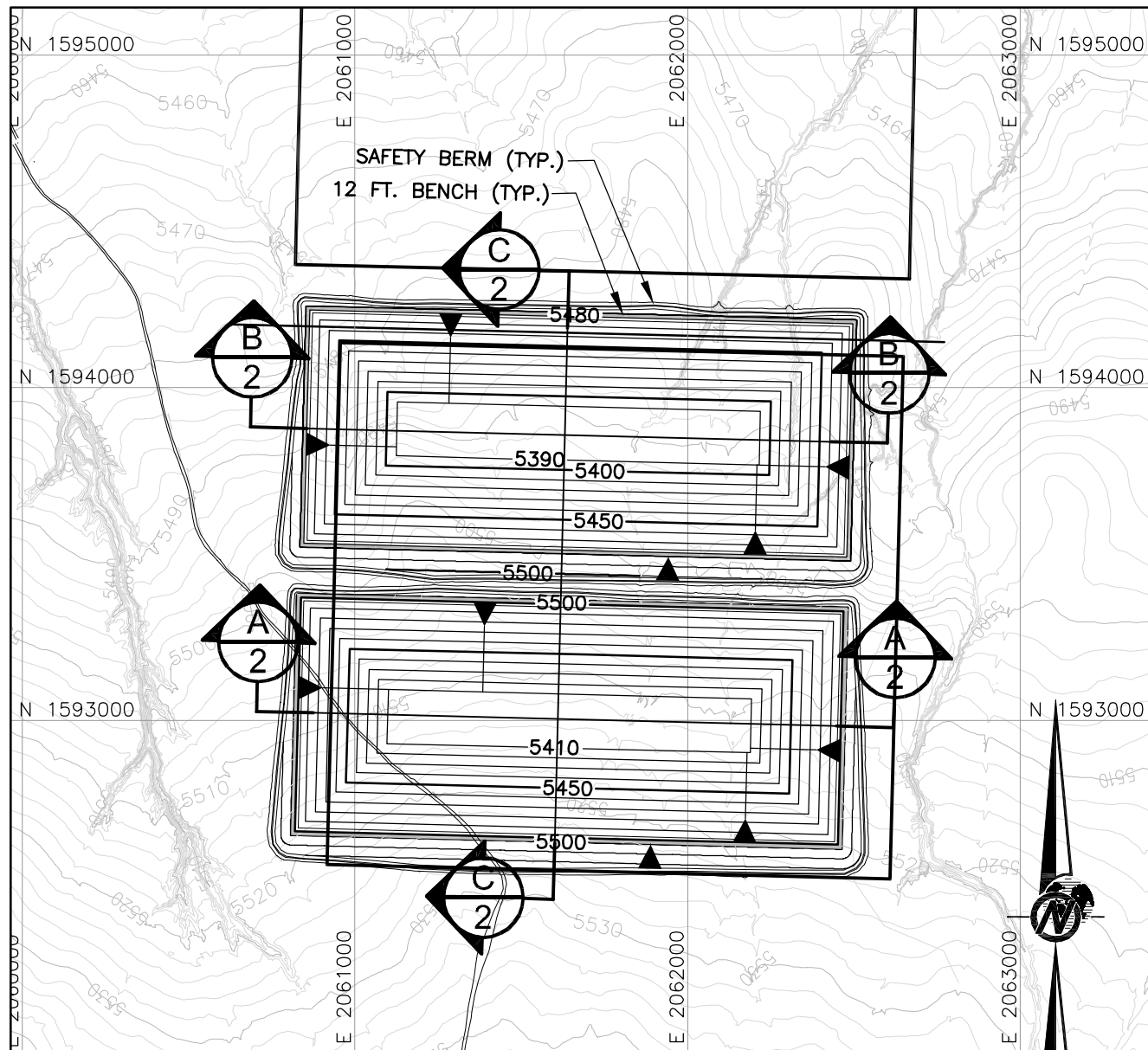
**NOTES**

1. EACH TAILINGS CELL IS DESIGNED FOR A CAPACITY OF 2.45 MILLION TONS ASSUMING A DRY DENSITY OF 95 PCF AND A 6.7 YEAR DESIGN LIFE.

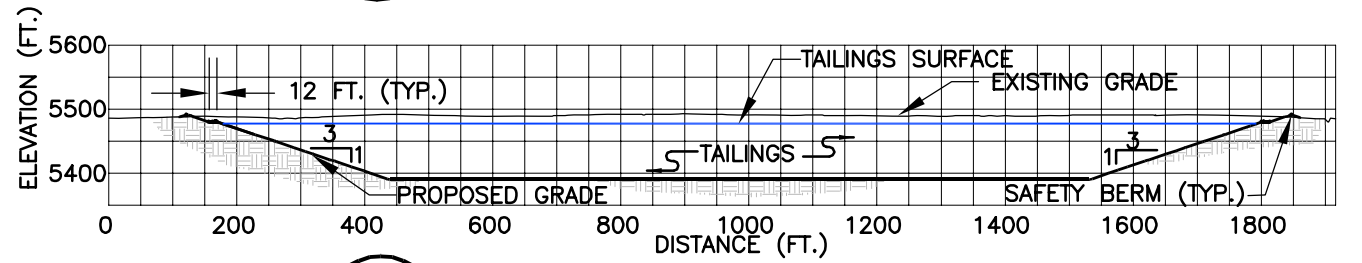
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			REVISION DESCRIPTION	CADD	CHK	RWW
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PROJECT No. 073-81694		FILE No. 07381694A005				
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CHECK	KFM	11/07				
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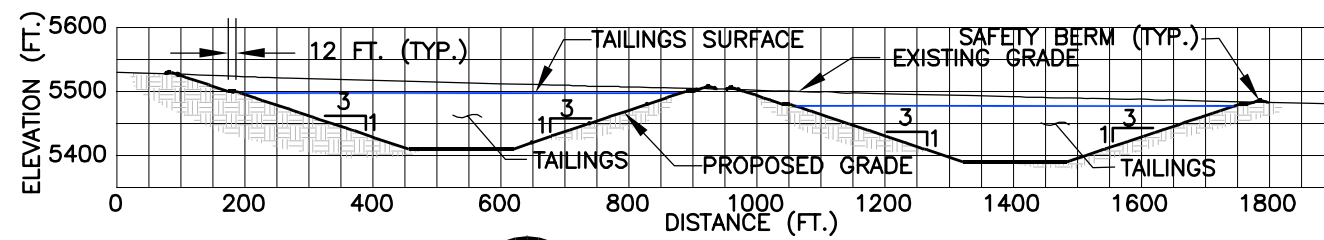
**FIGURE 1**



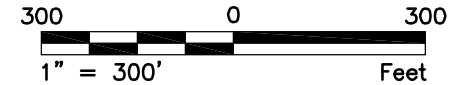
**A**  
2  
1"=300'



**B**  
2  
1"=300'



**C**  
2  
1"=300'



**LEGEND**

- EXISTING GROUND TOPOGRAPHY (SEE REFERENCE 1)
- PROPOSED FINISHED GRADE TOPOGRAPHY

PERIMETER SAFETY BERM

TOE      CREST  
SLOPE DIRECTION

CROSS SECTION IDENTIFIER  
 SHEET WHERE SECTION IS LOCATED



**GRADING QUANTITIES**

	CUT (CU. YDS.)	BERM FILL (CU. YDS.)
SOUTH CELL	2,644,000	7,000
NORTH CELL	2,542,000	9,000

**FOR DISCUSSION**  
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 Last Update: Nov 08, 2007 08:19 By: jroberts  
 Last Plot: Nov 08, 2007 08:24 By: jroberts  
**PURPOSES ONLY**

**REFERENCES**

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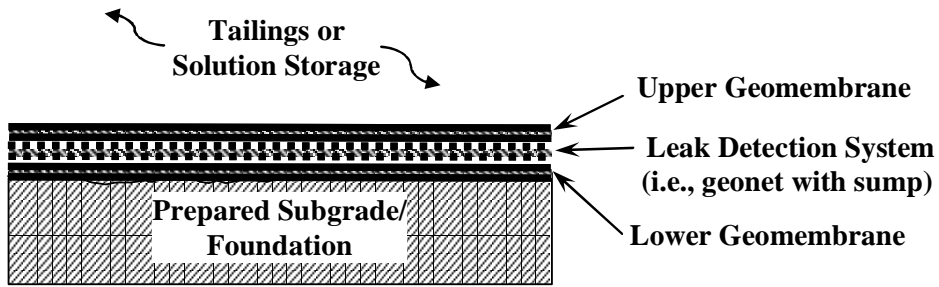
**NOTES**

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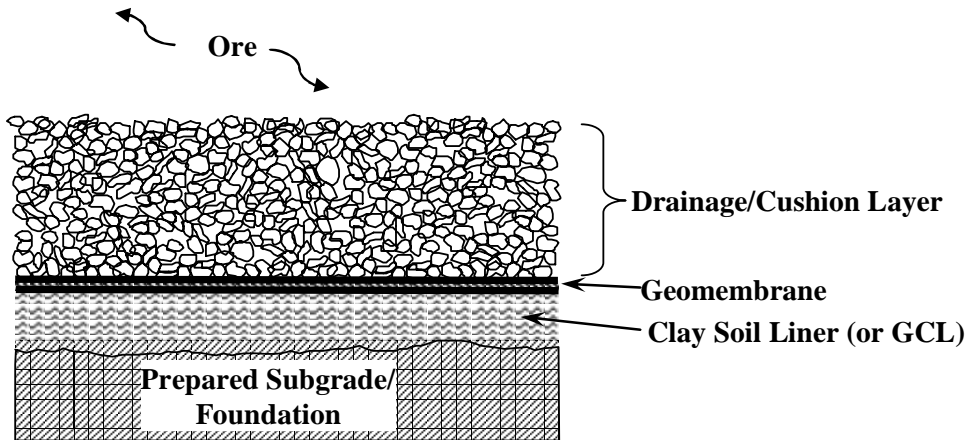
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CADD	JWR	11/07				
CHECK	KFM	11/07				
REVIEW	JMJ	11/07				



**FIGURE 2**



1 Proposed Tailings Cell and Evaporation Pond Liner System  
 3 N.T.S.



2 Proposed 5-Acre Ore Stockpile Liner System  
 3 N.T.S.



CLIENT/PROJECT  
**ENERGY FUELS RESOURCES CORP.**  
**PIÑON RIDGE PROJECT**

TITLE

**PROPOSED LINER SYSTEMS**

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CHECKED	KFM	SCALE	N.T.S.	DWG NO./REV. NO.	N/A
REVIEWED	JMJ	FILE NO.	Figure3.xls	FIGURE NO.	3