

# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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March 9, 2009

TO: Internal File

THRU: Priscilla Burton, Lead *PWB/bms*

FROM: Ingrid Wieser, Environmental Scientist II *IW 4/20/09*

RE: Test Plot Evaluation & Soil Monitoring Reports, West Ridge Resources, West Ridge Mine, C/007/0041, Task # 3111

## SUMMARY:

West Ridge Mine constructed experimental test plots in 1999 to simulate final reclamation of soils that have been buried by fill (rather than removed and stockpiled). In more detail, the topsoil was covered with a geotextile fabric, covered with adjacent fill material and other topsoil material and then seeded with the interim seed mixture for erosion control. This test was a small-scale replication of the mine yard area, where the original streambed and topsoil were covered with geotextile and fill and the pads were constructed on top.

In 2005, the topsoil was unburied and the site was reclaimed to imitate final reclamation of the mine site. Pat Collins of Mt. Nebo Scientific harvested Canyon Sweetvetch seeds from a nearby population and included them in the interim seed mix. This is an attempt to propagate new seeds for final reclamation of the mine area. The Division required the Permittee to monitor the vegetation on the test plots annually to test the success of the experimental practice.

On January 21, 2009, the Division received the first vegetation monitoring report for the experimental test plots. This memo will address the report.

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**TECHNICAL ANALYSIS:**

**REQUIREMENTS FOR PERMITS FOR SPECIAL  
CATEGORIES OF MINING**

**EXPERIMENTAL PRACTICES MINING**

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

**Analysis:**

On August 15, 2008, Patrick Collins of Mt. Nebo Scientific collected qualitative and quantitative data on the experimental test plots.

Cover and Composition were recorded using ocular methods and included species composition, cover by species, and relative frequencies. Woody Species density was not sampled because, "very few or no trees or shrubs were present on the plots". Color photographs were included in the report.

The following are the four test plots, descriptions and sampling results.

**Midfork Cut Plot:** This plot is located in the NE section of the plot area and was created to simulate the cutslopes in the mine yard area. The topsoil was removed and stockpiled on the Midfork stockpile plot. Then the plot was excavated to model a cutslope. The topsoil pile was roughened and seeded with an interim seed mixture to control erosion. Six years later, the soil was replaced, roughened and seeded to replicate reclamation of the cut slopes in the mine yard area.

**2008 Vegetation monitoring results:** The plot vegetation was dominated by stinging nettle (*Urtica dioica*), and thickspike wheatgrass (*Elymus lanceolatus*). Forbs dominated the plot and trees or shrubs were non-existent. The total living cover was 76.5%.

**Midfork Stockpile:** This plot is located in the SE section of the plot area and was created to simulate the experimental practice of burying the midfork topsoil in the mine yard area. The topsoil was left in place, covered with a geotextile material, and then covered with fill from the midfork cut plot. During reclamation, the fill and geotextile were removed, the surface roughened and seeded.

2008 Vegetation monitoring results: The dominant vegetation was thickspike wheatgrass (*Elymus lanceolatus*) and Lewis flax (*Linum lewisii*). The total living cover was 79% and consisted primarily of grasses and no trees or shrubs were present.

**Strych Stockpile:** This plot is located in the SW section of the plot area and was created to simulate the experimental practice of burying the strych topsoil. Strych soil is present in the channel bottom buried beneath the mine yard. The topsoil was left in place, covered with a geotextile material, and then covered with fill from the strych fill plot area. During reclamation, the fill and geotextile were removed, and the surface was roughened and seeded.

2008 Vegetation Monitoring results: The dominant vegetation was Lewis Flax (*Linum lewisii*). The total living cover was 63.5%, which was mostly forbs and no trees or shrubs, existed on the plot.

**Strych Fill:** This plot is located in the NW Section of the plot area and was created in order to provide fill for the strych stockpile plot and act as an example of the traditional topsoil storage technique of removing and stockpiling. No strych topsoil will be removed in the mine yard area, only covered.

2008 Vegetation Monitoring results: The dominant vegetation was Lewis Flax (*Linum lewisii*) and Western wheatgrass (*Elymus smithii*). The total living cover was 65%, which was dominated by forbs and had no trees or shrubs.

**Douglas Fir/ Maple Reference area:** In the 2008 vegetation survey the quantitative data from 1998 was used from this reference area to compare to the test plots. It was also noted that during final vegetation sampling, the reference area would be sampled in the same growing season for comparison. In 1998, big tooth Maple (*Acer grandidentatum*), mountain lover (*Pachistima myrsinites*), and Oregon grape (*Mahonia repens*) dominated the reference area. The total living cover was 63.63%, woody species was 61% of the cover and forbs was 25%.

#### **Analysis:**

The species diversity was much higher in the reference area than in the test plots. The report does not have a quantitative diversity description or calculations for diversity. There was very little difference in the living cover found between the areas where the topsoil was stockpiled and the areas where the topsoil was buried. The other most noticeable factor was the absence of any woody species in the test plot areas. Additionally, no canyon sweetvetch was listed in the report. According to Appendix E of the West Ridge 2005 annual report, Canyon Sweetvetch was included in the reclamation seed mixture.

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In order to analyze the success of the experimental practice, the test plots should be analyzed comparing the vegetation parameters of the buried soil to the stock piled soil. There is very little difference in percent cover between the test plots, with the highest cover on the midfork stockpile (buried soil). The cover on the test plots is higher than the cover on the reference area. The diversity and woody species density is similar on all test plots (low diversity and no woody species). However, the diversity and woody species density is extremely low on the test plots when compared to the reference area. Since these parameters are low on all four test plots, they cannot be attributed to the experimental test of burying the soil. Further analysis is needed on the test plots as the vegetation matures to fully assess the experimental practice.

**Findings:**

The information provided in the report of Vegetation of the Experimental Test Plot 2008 is adequate. In the future, it is recommended that diversity data and an analysis of the absence of woody species and canyon sweetvetch is included in the report.

**RECOMMENDATIONS:**

This report is recommended for approval, in future reports, it is recommended that diversity data and an analysis of the absence of woody species and canyon sweetvetch be included in the report.