

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

June 16, 2005

TO: Internal File

THRU: D. Wayne Hedberg, Permit Supervisor

THRU: Joe Helfrich and Steve Fluke, Team Leads

FROM: Steve Fluke, Reclamation Hydrogeologist

RE: Addition of State Leases ML-47711 and ML-49287, West Ridge Resources, Inc., West Ridge Mine, C/007/0041, Task ID #2187

SUMMARY:

On March 22, 2005, The Division of Oil, Gas and Mining (the Division) received an application to add State Leases ML-47711 and ML-49287 to the Mining and Reclamation Plan (MRP) for West Ridge Resources, Inc. (West Ridge). The Lease areas add 1,682.34 acres to the existing approved permit area of 4,432.55 acres. No new surface disturbance is proposed as a result of the additional lease areas. The application was assigned Task ID #2187 by the Division. This memo addresses the hydrology section of the application review.

Hydrologic information provided in the application does not meet the requirements of the Coal Mining Rules. The proposed amendment should not be approved until the following deficiencies are addressed:

R645-301-728.100, -728.200, -728.310, -728.334, -728.340, -728.350, and 728.400: The Permittee needs to update the Probable Hydrologic Consequences (PHC) Determination to include additional baseline hydrologic monitoring of Spring Canyon, Little Spring Canyon, and Bear Canyon. The baseline data is necessary in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance; what impact the proposed coal mining will have on groundwater and surface water availability; and whether the proposed coal mining will result in contamination, diminution or interruption of groundwater, surface water, or State-appropriated water within the proposed permit or adjacent areas.

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R645-100-200, -301-728.100: The Permittee needs to reassess the ephemeral drainage status of Bear and Spring Canyons based on observations from a site visit of the additional lease areas conducted on June 8 and 9, 2005 that revealed that these watersheds appear to contain intermittent drainages and not ephemeral drainages as reported in the existing PHC. The intermittent status of these streams is based on observed flows at the time of the site visit and riparian vegetation supported along the stream channels. In addition, the Bear Canyon and Spring Canyon watersheds are each greater than one square mile, which would qualify them as intermittent streams as defined in **R645-100-200**, Definitions, "Intermittent Streams".

R645-301-724.100, -731.210: The Permittee needs to update the groundwater monitoring plan to include additional groundwater monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional groundwater monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

R645-301-724.200, -731.220: The Permittee needs to update the surface-water monitoring plan to include additional surface-water monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional surface-water monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

R645-301-724.100, -724.200: The Permittee needs to update Appendix 7-5 with current water rights information. In particular, water rights 91-4513, 91-4682, and 91-4681, all located within the additional State Leases ML-47711 and ML-49287, should show current ownership by the Utah School Institutional Trust and Lands Administration. All other water right information listed in Appendix 7-5 should be checked for accuracy.

R645-301-722.300: The Permittee needs to update Plate 7-7, Operational Monitoring Locations, with additional hydrologic monitoring sites for Bear, Spring, Little Spring Canyons once they have been established.

R645-301-729: The Permittee needs to address the hydrologic deficiencies listed in this technical memo (Task ID #2187) before the Division can update the Book Cliffs Area III, Cumulative Hydrologic Impact Area with information regarding the additional State Leases ML-47711 and ML-49287.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The application meets the hydrology Environmental Description for Climatological Resource Information as provided in **R645-301-724.400**. The Division finds that these standards are met because information on climatic resources representative of the additional lease areas (State Leases ML-47711 and ML-49287) is presented in Chapters 2, 4, and 7 of the MRP.

Findings:

The information provided meets the minimum hydrology requirements of the Environmental Description for Climatological Resource Information of the State regulations.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

The application meets the hydrology Environmental Description for Sampling and Analysis as provided in **R645-301-723**. The Division finds that these standards are met because, as stated on page 7-3, Sampling and Analysis, of the mine's existing MRP, "water quality sampling and analyses have been and will be conducted according to the "Standard Methods for the Examination of Water and Waste Water" or EPA methods listed in 40 CFR parts 136 and 434".

Probable Hydrologic Consequences Determination

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The application does not meet the hydrology Environmental Description for Probable Hydrologic Consequences (PHC) Determination as provided in **R645-301-728**. The PHC was not updated to include the addition of State Leases ML-47711 and ML-49287. Observations from a site visit of the additional lease areas conducted on June 8 and 9, 2005 revealed that the two main watersheds located in the lease areas (Bear Canyon and Spring Canyon) appear to contain intermittent drainages and not ephemeral drainages as reported in the existing PHC. The intermittent status of these streams is based on observed flows at the time of the site visit and riparian vegetation supported along the stream channels. Although it had reportedly not rained in several days and no ice or snow was present in the watersheds at the time of the site visit, the Bear Canyon stream was flowing at approximately 30 gpm and the Spring Canyon stream was flowing at greater than 500 gpm (visual observations only). The Little Spring Canyon stream was also flowing at approximately 30 gpm at the time of the visit. In addition, the Bear Canyon and Spring Canyon watersheds are each greater than one square mile, which would qualify them as intermittent streams as defined in **R645-100-200**, Definitions, "Intermittent Streams".

Before a determination of the PHC of the proposed coal mining on the additional lease areas can be made, additional baseline hydrologic monitoring of Spring Canyon, Little Spring Canyon, and Bear Canyon is required (**R645-301-728.100, -728.200**). Baseline hydrologic data for the Bear Canyon stream is presented in the MRP Appendix 7.1 (Mayo and Associates, Addendum 1, 1998). Monitoring station M-2, located near the mouth of Bear Canyon, is reported as dry for May and August 1988, and September, October, and November 1989, and flowing at one gpm for June 1988. However, based on observation during the recent site visit, it appears that the baseline data for the Bear Canyon stream is not sufficient to demonstrate seasonal variation (**R645-301-724.200**). Bear Canyon stream operational monitoring site ST-4 is probably located too far away from Bear Canyon (approximately one mile downstream of the mouth of Bear Canyon) to sufficiently demonstrate flow within the permit area. No baseline hydrologic data is presented in the MRP for Spring and Little Spring Canyons. The baseline data is necessary in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance (**R645-301-728.310**); what impact the proposed coal mining will have on groundwater and surface water availability (**R645-301-728.334**); and whether the proposed coal mining will result in contamination, diminution or interruption of groundwater, surface water, or State-appropriated water within the proposed permit or adjacent areas (**R645-301-728.340, -728.350**).

Groundwater Monitoring Plan

The application does not meet the hydrology Environmental Description for Groundwater Monitoring Plan as provided in **R645-301-724.100**. The approved groundwater monitoring plan in the MRP was not updated to include additional sites for State Leases ML-47711 and ML-49287. According to Map 7-5, Seep/Spring Survey Map, seeps and springs identified as part of the October 1985 inventory within the additional lease areas include: four in Little Spring Canyon; three in Spring Canyon, seven in the Right Fork of Bear Canyon; and one in the Left

Fork of Bear Canyon. More seeps and springs are scattered within these drainages adjacent to the permit area. No groundwater monitoring is ongoing within or adjacent to the additional lease areas with the exception of one spring in Hanging Rock Canyon (S-80) located southeast and adjacent to Little Spring Canyon. Baseline monitoring data was collected in 1985, 1986, 1988, and 1989 for a spring at the upper reaches of the Right Fork of Bear Canyon (S-22, SP-7) and the Left Fork of Bear Canyon (S-39, SP-5). An attempt to locate spring S-22 in the Right Fork of Bear Canyon during a site visit on June 9, 2005 was unsuccessful.

The Division recommends additional groundwater monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional groundwater monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

Surface-Water Monitoring Plan

The application does not meet the hydrology Environmental Description for Surface-Water Monitoring Plan as provided in **R645-301-724.200**. The approved surface-water monitoring plan in the MRP was not updated to include additional sites for State Leases ML-47711 and ML-49287. Observations from a site visit of the additional lease areas conducted on June 8 and 9, 2005 revealed that the two main watersheds located in the lease areas (Bear Canyon and Spring Canyon) appear to contain intermittent drainages and not ephemeral drainages as reported in the existing PHC. The intermittent status of these streams is based on observed flows at the time of the site visit and riparian vegetation supported along the stream channels. Although it had reportedly not rained in several days and no ice or snow was present in the watersheds at the time of the site visit, the Bear Canyon stream was flowing at approximately 30 gpm and the Spring Canyon stream was flowing at greater than 500 gpm (visual observations only). The Little Spring Canyon stream was also flowing at approximately 30 gpm at the time of the visit. Baseline hydrologic data for the Bear Canyon stream is presented in the MRP Appendix 7.1 (Mayo and Associates, Addendum 1, 1998). Monitoring station M-2, located near the mouth of Bear Canyon, is reported as dry for May and August 1988, and September, October, and November 1989, and flowing at one gpm for June 1988. Bear Canyon stream operational monitoring site ST-4 is probably located too far away from Bear Canyon (approximately one mile downstream of the mouth of Bear Canyon) to sufficiently demonstrate flow within the permit area. No baseline or operational surface-water monitoring is presented in the MRP for Spring or Little Spring Canyons.

The Division recommends additional surface-water monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional surface-water monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

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State Appropriated Water Rights

The application does not meet the hydrology Environmental Description for State Appropriated Water Rights as provided in **R645-301-724.100, -724.200**. The State Appropriated Water Rights for the existing permit area and for State Leases ML-47711 and ML-49287 are shown on Map 7-3, Water Rights, and appears to be accurate. The ownership, description, and usage of the water rights are summarized in Appendix 7-5 of the MRP. The only subsurface water right located in the additional lease areas is Mels Spring (Water Right 91-4513) located at the upper reach of the Right Fork of Bear Canyon. This spring right is appropriated to the Utah School Institutional Trust and Lands Administration (SITLA) for use of stockwatering. There are three surface water rights appropriated within the additional lease areas. All three rights are appropriated to SITLA and include: Water Right 91-4682 is a tributary to Bear Canyon Creek located at the upper reach of the Right Fork of Bear Canyon Creek for use of stockwatering; Water Right 91-4682 includes the entire reach of the Right Fork of Bear Canyon to the east edge of Section 3 for use of stockwatering; and Water Right 91-4681 includes the Left Fork of Bear Canyon to the northwest boundary of the lease area. In the MRP, however, these SITLA water rights are shown to be owned by the USA Bureau of Land Management in Appendix 7-5. The water rights summary needs to be updated with current information. No surface water rights are known for Spring Canyon and Little Spring Canyon within the additional lease areas

Findings:

Hydrologic Resource Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

R645-301-728.100, -728.200, -728.310, -728.334, -728.340, -728.350, and 728.400:

The Permittee needs to update the Probable Hydrologic Consequences (PHC) Determination to include additional baseline hydrologic monitoring of Spring Canyon, Little Spring Canyon, and Bear Canyon. The baseline data is necessary in order for the PHC to make findings on: whether adverse impacts may occur to the hydrologic balance; what impact the proposed coal mining will have on groundwater and surface water availability; and whether the proposed coal mining will result in contamination, diminution or interruption of groundwater, surface water, or State-appropriated water within the proposed permit or adjacent areas.

R645-100-200, -301-728.100: The Permittee needs to reassess the ephemeral drainage status of Bear and Spring Canyons based on observations from a site visit of the additional lease areas conducted on June 8 and 9, 2005 that revealed that these watersheds appear to contain intermittent drainages and not ephemeral drainages

as reported in the existing PHC. The intermittent status of these streams is based on observed flows at the time of the site visit and riparian vegetation supported along the stream channels. In addition, the Bear Canyon and Spring Canyon watersheds are each greater than one square mile, which would qualify them as intermittent streams as defined in **R645-100-200**, Definitions, “Intermittent Streams”.

R645-301-724.100: The Permittee needs to update the groundwater monitoring plan to include additional groundwater monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional groundwater monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

R645-301-724.200: The Permittee needs to update the surface-water monitoring plan to include additional surface-water monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional surface-water monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

R645-301-724.100, -724.200: The Permittee needs to update Appendix 7-5 with current water rights information. In particular, water rights 91-4513, 91-4682, and 91-4681, all located within the additional State Leases ML-47711 and ML-49287, should show current ownership by the Utah School Institutional Trust and Lands Administration. All other water right information listed in Appendix 7-5 should be checked for accuracy.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Monitoring and Sampling Location Maps

The application does not meet the hydrology Maps, Plans, and Cross Sections of Resource Information for Monitoring and Sampling Location Maps as provided in **R645-301-722.300**. Additional surface-water and groundwater monitoring sites are required for Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. The additional hydrologic monitoring sites have not been established because they should be based on the PHC determination, which

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has been found deficient by the Division pending, among other things, additional baseline hydrologic information. Map 7-7, Operational Monitoring Locations, should be updated with the additional monitoring sites once they have been established. Map 7-5, Seep/Spring Survey Map, Map 7-6, Hydrologic Monitoring Map (Historical Monitoring Locations), and Map 7-7, Operational Monitoring Locations, have all been updated to include the boundaries of the State Leases ML-47711 and ML-49287.

Subsurface Water Resource Maps

The application meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Subsurface Water Resource Maps as provided in **R645-301-722.100**. The Division finds that these standards are met because, as described by Mayo and Associates (Appendix 7-1), ground-water systems in the permit and adjacent area have limited aerial and vertical extent due to the heterogeneous lithology of the rock units containing and overlying the coal-bearing strata, which are shown on Map 6-1A. The applicant asserts that no aquifers exist in the permit and adjacent areas so therefore no map has been prepared to show the location and extent of subsurface water. Ground-water resources are generally dismissed as inconsequential because there is no mappable aquifer, and potential impacts from mining treated as non-existent. As noted in previous findings by the Division of the West Ridge permit (March 3, 1999), such light dismissal is questionable. However, because this explanation for not mapping subsurface water resources was found by the Division to be adequate to meet the Coal Mining Rules during past permitting approvals for West Ridge, the logic should stand for the addition of the State Leases ML-47711 and ML-49287 because subsurface water resources remain the same for the additional areas.

Map 7-3, Water Rights, has been updated to include the additional State Leases ML-47711 and ML-49287.

Surface Water Resource Maps

The application meets the hydrology Maps, Plans, and Cross Sections of Resource Information for Surface Water Resource Maps as provided in **R645-301-722.200**. The Division finds that these standards are met because the location of surface-water bodies within and adjacent to the permit area is presented on Map 7-3, Water Rights. Map 7-3 has been updated to include the additional State Leases ML-47711 and ML-49287.

Well Maps

No oil, gas or water wells exist within the additional State Leases ML-47711 and ML-49287.

Findings:

Maps, Plans, and Cross Sections of Resource Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

R645-301-722.300: The Permittee needs to update Plate 7-7, Operational Monitoring Locations, with the additional hydrologic monitoring sites for Bear, Spring, and Little Spring Canyons once they have been established.

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Groundwater Monitoring

The application does not meet the hydrology Operational Plan for Groundwater Monitoring as provided in **R645-301-731.210**. The approved groundwater monitoring plan in the MRP was not updated to include additional sites for State Leases ML-47711 and ML-49287. According to Map 7-5, Seep/Spring Survey Map, seeps and springs identified as part of the October 1985 inventory within the additional lease areas include: four in Little Spring Canyon; three in Spring Canyon, seven in the Right Fork of Bear Canyon; and one in the Left Fork of Bear Canyon. More seeps and springs are scattered within these drainages adjacent to the permit area. No groundwater monitoring is ongoing within or adjacent to the additional lease areas with the exception of one spring in Hanging Rock Canyon (S-80) located southeast and adjacent to Little Spring Canyon. Baseline monitoring data was collected in 1985, 1986, 1988, and 1989 for a spring at the upper reaches of the Right Fork of Bear Canyon (S-22, SP-7) and the Left Fork of Bear Canyon (S-39, SP-5). An attempt to locate spring S-22 in the Right Fork of Bear Canyon during a site visit on June 9, 2005 was unsuccessful.

The Division recommends additional groundwater monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional groundwater monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

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Surface Water Monitoring

The application does not meet the hydrology Operational Plan for Surface-Water Monitoring Plan as provided in **R645-301-731.220**. The approved surface-water monitoring plan in the MRP was not updated to include additional sites for State Leases ML-47711 and ML-49287. Observations from a site visit of the additional lease areas conducted on June 8 and 9, 2005 revealed that the two main watersheds located in the lease areas (Bear Canyon and Spring Canyon) appear to contain intermittent drainages and not ephemeral drainages as reported in the existing PHC. The intermittent status of these streams is based on observed flows at the time of the site visit and riparian vegetation supported along the stream channels. Although it had reportedly not rained in several days and no ice or snow was present in the watersheds at the time of the site visit, the Bear Canyon stream was flowing at approximately 30 gpm and the Spring Canyon stream was flowing at greater than 500 gpm (visual observations only). The Little Spring Canyon stream was also flowing at approximately 30 gpm at the time of the visit. Baseline hydrologic data for the Bear Canyon stream is presented in the MRP Appendix 7.1 (Mayo and Associates, Addendum 1, 1998). Monitoring station M-2, located near the mouth of Bear Canyon, is reported as dry for May and August 1988, and September, October, and November 1989, and flowing at one gpm for June 1988. Bear Canyon stream operational monitoring site ST-4 is probably located too far away from Bear Canyon (approximately one mile downstream of the mouth of Bear Canyon) to sufficiently demonstrate flow within the permit area. No baseline or operational surface-water monitoring is presented in the MRP for Spring or Little Spring Canyons.

The Division recommends additional surface-water monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional surface-water monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

Diversions: Perennial and Intermittent Streams

No diversions of perennial and intermittent streams are proposed for the additional State Leases ML-47711 and ML-49287. No new disturbed surface areas are proposed for the additional lease areas.

Stream Buffer Zones

The application meets the hydrology Operational Plan for Stream Buffer Zones as provided in **R645-301-731.600**. No surface mining within 100 feet of a perennial or intermittent stream is proposed for the additional State Leases ML-47711 and ML-49287.

Findings:

Hydrologic Information of the Operation Plan does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

R645-301-731.210: The Permittee needs to update the groundwater monitoring plan to include additional groundwater monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional groundwater monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

R645-301-731.220: The Permittee needs to update the surface-water monitoring plan to include additional surface-water monitoring in Spring Canyon, Little Spring Canyon, and possibly Bear Canyon. However, the additional surface-water monitoring should be based on the PHC determination, which has been found deficient by the Division pending, among other things, additional baseline hydrologic information.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

The application meets the Reclamation Plan for the Hydrologic Reclamation Plan as provided in **R645-301-731.600**. No update to the existing hydrologic reclamation plan was submitted because no new surface disturbance is planned for the 5 additional State Leases ML-47711 and ML-49287.

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Findings:

The information provided meets the minimum hydrology requirements for the Reclamation Plan of the State regulations.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-729.

Analysis:

The application does not meet the requirements of the Cumulative Hydrologic Impact Assessment (CHIA) as provided in **R645-301-729**. The Division needs to update the Book Cliffs Area – III, CHIA to incorporate the additional State Leases ML-47711 and ML-49287. The hydrologic information provided in the application is not adequate to update the CHIA. The hydrologic deficiencies listed in this technical memo need to be addressed by the Permittee before CHIA can be updated.

Findings:

The Cumulative Hydrologic Impact Assessment Information does not meet the minimum requirements of the Coal Mining Rules. Before the application can be approved, the following deficiencies should be addressed:

R645-301-729: The Permittee needs to address the hydrologic deficiencies listed in this technical memo (Task ID #2187) before the Division can update the Book Cliffs Area III, Cumulative Hydrologic Impact Area with information regarding the additional State Leases ML-47711 and ML-49287.

RECOMMENDATIONS:

Hydrologic information provided in the application does not meet the requirements of the Coal Mining Rules. The proposed amendment should not be approved at this time.