BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

IN THE MATTER OF: THE NOTICE OF APPEAL AND REQUEST FOR HEARING BY MONTANA ENVIRONMENTAL INFORMATION CENTER REGARDING DEQ'S APPROVAL OF COAL MINE PERMIT NO. C1993 017 ISSUED TO SIGNAL PEAK ENERGY LLC FOR BULL MOUNTAIN MINE NO. 1 IN ROUNDUP, MT	**CASE NO. BER 2013-07 SM**

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ORDER

PROCEDURAL HISTORY

On October 5, 2012, Signal Peak Energy (SPE) sought approval for amendment to its mining and reclamation plan from Montana Department of Environmental Quality (DEQ) to increase the amount of coal to its permitted area for its Bull Mountains No. 1 Mine under permit ID SMP C1993017. DEQ notified SPE its application was technically acceptable on September 13, 2013, and on October 18, 2013, DEQ issued its approval of that permit. DEQ based that approval on its Cumulative Hydrologic Impact Assessment (CHIA), an analysis of anticipated hydrologic impacts associated with mining in and adjacent to the proposed permit area.

Administrative Rule of Montana (ARM) 17.24.314(1) requires that DEQ determine that a given proposed mining and reclamation operation has been designed to minimize disturbance to the hydrologic balance on and off the mine plan area, and prevent material damage to the hydrologic balance outside the permit area. In order to evaluate whether the proposed mining and reclamation plan has been designed to

prevent material damage, a CHIA is prepared by DEQ. Prior to making a permitting decision, DEQ makes an assessment of cumulative hydrologic impacts of all existing and anticipated mining operations. The CHIA analysis must be sufficient to determine whether mining impacts to the hydrologic balance on and off the permit area have been minimized and material damage outside the permit area has been prevented [ARM 17.24.314(5)]. DEQ found that the operational and reclamation plans for the Bull Mountains Mine No. 1 were designed to minimize impacts to the hydrologic balance within the permit area and to prevent material damage outside of the permit area.

On November 18, 2013, the Montana Environmental Information Center (MEIC), pursuant to Montana Code Annotated § 82-4-206(1)-(2), and Montana Administrative Code 17.24.425(1), filed its notice of appeal and request for hearing.

MEIC stated that the grounds for this appeal were that DEQ's determination that the proposed mine expansion was designed to prevent material damage to the hydrologic balance outside the permit area was arbitrary and capricious and not in accordance with the law because the assessment employed the incorrect legal standard; and DEQ's determination that the proposed mine expansion was designed to prevent material damage to the hydrologic balance outside the permit area was arbitrary and capricious and not in accordance with the law because the permit application did not affirmatively demonstrate and DEQ could not, therefore, rationally conclude that the proposed mine expansion was designed to prevent material damage to the hydrologic balance. Both of these arguments were based purely on questions of law, and the parties have never disputed the record or the relevant facts or evidence therein.

On April 11, 2014, MEIC filed its Motion for Summary Judgment; on May 30, 2014, SPE filed its Cross-Motion for Summary Judgment. The parties agreed the matter was capable of determination via summary judgment motions. *See* Order Adopting Joint Stipulated Procedural Schedule for Administrative Review (Jan. 6, 2014). For summary judgment to be appropriate, there must be no genuine issue of material fact, and the moving party must be entitled to judgment as a matter of law. *See* Mont. R. Civ. P. 56(c)(3). Each of the parties agreed that there was no genuine issue of material fact. The parties argued the matter before the Board on July 31, 2015, and submitted proposed findings of fact and conclusions of law.

The Board met again on October 16, 2015, to determine whether or not there were sufficient material within these proposed findings of fact and the conclusions of law to allow a decision without any further hearing; and whether it were possible to rule on the facts in the CHIA and the administrative record.

Ultimately, the Board voted to rule on the motions for summary judgment, deeming the proposed findings of fact as undisputed, and disposition available upon adjudicating the issues of law. The Board chose to adopt MEIC's proposed findings of fact and conclusions of law, with amendments.

In accordance with the Board's order, both DEQ and SPE submitted proposed findings of fact. As Mont. Code Ann. § 2-4-623 requires that the decision must include a ruling upon each proposed finding, those findings are set out below in italics, and each is followed by its ruling.

DEQ PROPOSED FINDINGS OF FACT

Appellee DEQ has submitted the following Proposed Findings of Fact, each of which the Board will now address.

Procedural History and Issues Presented for Review

1. *On October 5, 2012, SPE submitted the AM3 Application to DEQ to "increase the mine permit area of [the SPE Mine] by adding 7,161 acres and expanding the mine from five longwall panels . . . to fourteen longwall panels", and "approximately 176 million tons of in-place coal reserves or 110 million tons of mineable coal."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

2. *In the AM3 Application, SPE proposed to continue longwall coal mining beyond the boundaries of the current permit. Accordingly, DEQ reviewed the AM3 Application as a proposed amendment the existing permit.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

3. *On December 14, 2012, DEQ notified SPE that the AM3 Application was complete. After three rounds of notice and response to technical deficiencies, DEQ notified SPE that the Application was technically acceptable on September 13, 2013.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

4. *On October 18, 2013, after public notice and receipt of public comment required by MSUMRA, DEQ approved the Application, and issued an amendment to*

the permit along with the written findings as required by ARM 17.24.405(6). This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

5. *MEIC does not allege that DEQ violated any of the public notice requirements of MSUMRA.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

6. *On November 11, 2013, MEIC timely filed its request for hearing.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

7. *DEQ reviewed the Application for compliance with the requirements of MSUMRA which are set forth in §§ 82-4-201 through 254, Montana Code Annotated ("MCA"), along with its implementing rules in ARM 17.24.301 through 17.24.1826.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

8. *MEIC limits its challenge to the legal sufficiency of the CHIA and the information that DEQ used to prepare the CHIA. MEIC does not challenge findings relating to impact of mining on seeps, springs, and other surface waters. Nor does MEIC argue that DEQ neglected to perform any required determination regarding alluvial valley floors. Furthermore, MEIC does not challenge the statement in the CHIA that drawdown in the Mammoth Coal during mining will not impair any water right in the cumulative impact area.* This proposed finding of fact is an accurate

statement taken from the record, and is not at variance with the Board's Conclusions of Law.

9. *MEIC challenges only the legal sufficiency of the CHIA and the Probable Hydrologic Consequences ("PHC") evaluation, upon which the CHIA is based, relating to possible impacts due to salinity as measured by natural specific conductance[1] in the Mammoth Coal.* This proposed finding of fact is inaccurate, and is at variance with the Board's Conclusions of Law. *See* ¶¶ 94-116. *Although MEIC argues that the CHIA is legally insufficient because it analyzes only one water quality standard for one parameter (MEIC Reply Br. 6), the CHIA does indeed address multiple parameters of concern, including toxic parameters listed in DEQ-7. See DEQ Ex. C-0, CHIA p. 8-3 (DEQ-7[2] standards do not apply to sampling events from stormwater events and on ephemeral streams); p. 9-10 ("arsenic concentrations in overburden are located up gradient from the mine and have declined below detection limits"); 9-11 ("[n]o exceedances of DEQ-7 standards were observed in any of the Mammoth Coal wells"); 9-13 ("[b]ased upon monitoring well information, there is no evidence of any mining related impacts to upper underburden or to the relatively deep upper underburden water quality in the vicinity of the Bull Mountains Mine No. 1 and no exceedances of DEQ-7 water quality standards have been reported in the wells."). No evidence in the record before the Board controverts the baseline information in the*

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[1] "Natural specific conductance," the measure of total dissolved solids used to classify groundwaters in ARM 17.30.1006, is equivalent to "electrical conductivity" as defined in ARM 17.30.602(7). Ex. D (Van Oort Aff. ¶ 13).

[2] DEQ-7 sets forth numeric standards for metals including arsenic and lead and other toxic parameters.

PHC and the analysis in the CHIA eliminating parameters of concern other than salinity, as measured by EC, from the material damage determination. This proposed finding of fact is inaccurate, and is at variance with the Board's Conclusions of Law. *See* ¶¶ 94-116.

The SPE Mine Operation

10. *The AM3 Application proposes that mining continue at the SPE Mine using the current longwall system for an additional 10 years. SPE's proposal does not contemplate adding another longwall or substantially increasing annual production above the capacity of the mine at the time of submittal of the SPE-AM3 Application.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

11. *"Coal at [SPE Mine] is recovered using continuous mining and longwall mining methods. Continuous mining includes cutting parallel entries (main entries) approximately 8 to 10 feet high by about 20 feet wide intersected by regularly spaced tunnels or crosscuts."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

12. *Longwall mining is a mechanical mining method that does not involve blasting.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

13. *"Longwall mining is a method that removes all coal from each longwall panel, effectively achieving 100 percent coal extraction, and causes surface subsidence. Longwall mining uses a series of hydraulic supports, or shields, set up along the*

longwall face that function as temporary supports to protect workers and equipment. A cutting machine or shearer moves back and forth along the coal face and line of shields, cutting the coal in a series of passes. After the shearer completes a pass the entire system (shields, shearer, and face conveyor) advances (perpendicular to the shearer) and unsupported overburden is allowed to collapse into the void formally occupied by coal." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

14. *"[A]ccess to the longwall panels [is] via 'gate roads.' Gate roads are driven roughly perpendicular to the [main entries], and consist of three parallel entries. Besides providing worker access to the longwall panels, gate roads are vital for the installation of longwall equipment, ventilation of the working area, and transportation. Once gate roads have been developed around a panel, the longwall equipment can be installed."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

15. *"Subsidence impacts include those hydrologic impacts introduced as a result of surface subsidence cracks or deformation of overlying strata as the coal is mined. Each longwall panel at the Bull Mountains Mine No. 1 consists of a large block of coal, approximately 1,250 feet in width by 15,000 to 23,300 feet in length. Surface depressions or subsidence troughs are expected to form as the overburden is undermined and coal is extracted. Overburden rocks are allowed to flex downward, fracture (creating a Fractured Zone) and collapse or cave into the void (forming a Caved Zone) causing immediate and progressive surface subsidence as the longwall*

system advances along the length of the panel." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

16. *"No significant changes to the [existing] reclamation plan are proposed since Amendment No. 3 only addresses expansion of the permit area to allow continuation of underground mining."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

The Hydrologic Setting of the SPE Mine

17. *"The Mammoth Coal seam ranges in thickness from 8 to 12 feet in the permit area, so approximately seven to eight feet of surface subsidence is expected."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

18. *"Groundwater flow in [the Mammoth Coal] is toward the north-northwest, following the direction of synclinal plunge. Recharge reaches the Mammoth Coal via exposed outcrops, subcrops, and from infiltration through the overburden." DEQ Ex. C-0, CHIA p. 8-5. "Water levels indicate that the Mammoth Coal aquifer is isolated from overlying overburden aquifers."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

19. *"The geometric mean hydraulic conductivity of the Mammoth Coal is 0.16 ft./day."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

20. *"Although the hydraulic conductivities for the Mammoth Coal are relatively higher than the overburden, they are typically inadequate to provide a*

reliable source of well water and few production wells are completed in the coal." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

21. *No wells located within the cumulative impact area produce water solely from the Mammoth Coal.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

22. *"Water levels in most Mammoth Coal wells showed little natural fluctuation and did not vary more than two feet over the period of baseline monitoring, except in one well near the Mammoth coal outcrop which showed larger fluctuations apparently in response to precipitation."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

23. *"Baseline water quality of the Mammoth Coal aquifer was determined from samples from 10 wells. Generally, sodium and sulfate are the dominant ions in groundwater collected from most Mammoth Coal monitoring wells. SC and sulfate baseline concentrations in the Mammoth Coal tend to be greater than in the overburden. SC ranged from 1,400 µS/cm to 3730 µS/cm with an average of 2,272 µS/cm. Sulfate concentrations ranged from 251 mg/L to 1,690 mg/L, with an average of 798 mg/L."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

24. *"Approximately one-half of the Mammoth Coal wells produce Class II water and one-half produce Class III water. This data is consistent with Mammoth*

Coal baseline water quality (Class II to Class III)." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

25. "*Mammoth Coal groundwater is generally suitable for watering livestock.*" This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

26. "*The baseline water quality of the upper underburden is similar to that of the Mammoth Coal. Sulfate was the dominant anion and sodium tended to be the dominant cation. Underburden groundwater generally fell into Class II and III. Respective SC and sulfate concentrations of the upper underburden aquifer ranged from 1,440 µS/cm to 4,280 µS/cm and 216 mg/L to 2,680 mg/L. Average SC and sulfate concentrations were 2,721 µS/cm and 1,121 mg/L. Upper underburden wells are typically suitable for livestock use, and some are marginally suitable for domestic use.*" *The hydraulic conductivity of the upper underburden is similar to the Mammoth Coal.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

27. "*[T]he relatively deep sandstones of the lower underburden aquifer are hydraulically isolated from the Mammoth Coal and upper underburden aquifers.*" This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

28. "*The hydraulic conductivity of this 50-foot thick sandstone [encountered in the underburden approximately 350 feet below the Mammoth Coal] is relatively high and a pumping test showed that [a test well] is capable of sustaining a yield of more*

than 10 [gallons per minute]." This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

29. *"Water quality analysis of a sample from the [mine] office well completed in the deeper underburden indicated Class I groundwater, and is suitable for the mine public water supply. Most deeper underburden wells are suitable for domestic and livestock use."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

Review of the AM3 Application and Assessment of Material Damage

30. *When DEQ reviewed the SPE application for an amendment to its existing coal mine operating permit, DEQ prepared an assessment of the cumulative impacts of the proposed mine operation on the hydrologic balance outside the permit area by preparing a CHIA. DEQ Ex. C-0, CHIA, p. 1-1. DEQ adopted the CHIA as part of its written findings supporting issuance of the Amendment.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

31. *When it prepared the CHIA, DEQ looked in part to information that MSUMRA requires applicants such as SPE to provide in an application to amend a coal mine operating permit, including the PHC.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

32. *The PHC submitted by SPE is identified as MEIC Exhibit No. 5. The PHC includes a Groundwater Model. See MEIC Ex. 6. The Groundwater Model is described in the CHIA as a "transient flow [particle tracking] model." The material*

damage determination set forth in the CHIA is based in part on the results of the Groundwater Model. This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

33. *The CHIA describes the "cumulative impact area" that is the areal limit for the hydrologic information that it evaluates.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

34. *The cumulative impact area described in the CHIA is based on drawdown in the upper underburden that has a greater areal extent than for the Mammoth Coal.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

35. *The CHIA summarizes MSUMRA's requirements for assessing potential material damage to the hydrologic balance in and adjacent to the SPE Mine site as follows:*

> *Administrative Rule of Montana (ARM) 17.24.314(1) requires that DEQ determine that a given proposed mining and reclamation operation has been designed to minimize disturbance to the hydrologic balance on and off the mine plan area, and prevent material damage to the hydrologic balance outside the permit area. In order to evaluate whether the proposed mining and reclamation plan has been designed to prevent material damage, a Cumulative Hydrologic Impact Assessment (CHIA) is prepared by DEQ. Prior to making a permitting decision, DEQ makes an assessment of cumulative hydrologic impacts of all existing and anticipated mining operations. The CHIA analysis must be sufficient to determine whether mining impacts to the hydrologic balance on and off the permit area have been minimized and material damage outside the permit area has been prevented.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

36. *The CHIA explains the methodology for the material damage assessment of the SPE Mine operation proposed in the AM3 Application:*

> *Following the definition of material damage in [§ 82-4-203(32), MCA], material damage criteria are established for the evaluation of both groundwater and surface water quality and quantity, and are used to determine whether water quality standards and beneficial uses of water, including water rights, outside the permit boundary have been or are expected to be impacted by mining activities. The interruption or diminution of a surface water or groundwater supply to the extent that an existing use is precluded is considered to be material damage. When material damage occurs mitigation is required; mitigation would include dependable, long-term replacement of a resource acceptable for the designated use [ARM 17.24.314(1)(c) and 17.24.648] or treatment to return water quality to state standards. Material damage criteria include applicable numeric and narrative water quality standards, and criteria established to protect existing beneficial uses of water.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

37. *The CHIA described how surface water quality standards inform the material damage determination.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

38. *The CHIA identifies the indicators of material damage to groundwater and the applicable groundwater quality standard:*

> *Groundwater material damage occurs when, as a result of mining, any of the following circumstances occur:*
> *• Groundwater quality standards outside of the permit area are violated*
> *• Land uses or beneficial uses of groundwater outside of the permit area are adversely affected to the extent that an existing use is precluded*
> *• A groundwater right is adversely impacted*
> *Protection of groundwater quality for beneficial uses is based on narrative standards established by ARM 17.30.1006 (Table 2-4) and numeric standards for individual parameters in Circular DEQ-7 (Table 2-2). Water quality guidelines established for livestock use are shown in Table 2-3. Groundwater quality in the area may naturally exceed these*

livestock water quality guidelines. Groundwater released from the mine is not required to be purer than natural, background conditions [75-5-306, MCA and ARM 17.30.629(2)(k)].

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

39. *The groundwater regime assessed in the CHIA, "occurs in the alluvial, overburden, Mammoth Coal, and underburden aquifers. Groundwater flow is generally toward the north-northwest except in the often dry alluvial aquifer system."*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

40. *The CHIA describes sources of groundwater for livestock watering as follows:*

Water quality in surface water, springs, and shallow wells is variable and may change seasonally with the availability and use of the water source. Deeper wells provide a more consistent and reliable water source. DEQ Ex. C-0, CHIA p. 6-1.

60 wells that lie within the groundwater [cumulative impact area] are identified for stockwater use in the [Montana Groundwater Information Center] and [Department of Natural Resources and Conservation] databases. The completion depths listed for stockwater wells indicate that groundwater resources used for supply include alluvium, overburden, coal, and upper and deep underburden aquifers.

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

41. *"Beneficial uses of groundwater outside the permit boundary include livestock and domestic use. Wells completed in the alluvium, overburden, and underburden supply livestock water. Wells for domestic use typically have reported*

completion depths that suggest utilization of groundwater from the underburden." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

42. *"The alluvial hydrographs discussed [in section 9.5.2.2 (Impacts from Dewatering-Alluvium)] indicate that there is no evidence that mining and associated dewatering of the Mammoth Coal have affected water levels of the alluvial aquifer system. Because the alluvial aquifer is typically a perched aquifer supplied by recent precipitation or snow melt, additional mining is not expected to affect water levels in the alluvial aquifer."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

43. *For water resources in the overburden:*

> *The abrupt decline of water levels [in two shallow overburden wells] suggests that the relatively shallow overburden and perched aquifer system in the vicinity of wells was partially drained via subsidence fractures that healed over the period between February and April 2012 leading to the water level rebound as seen in Figure 9-4. Well log data indicates that relatively impermeable gray shale occurs below the respective screened intervals. These rocks may have become fractured, allowing perched groundwater to drain into the mine workings, and then healed due to compression and settling. This data may illustrate that the various perched aquifers within the upper overburden may have become temporarily dewatered by subsidence fractures in the vicinity of BMP-60 and BMP-90 due to mining. . . . Similar temporary overburden dewatering may occur over all longwall mining areas as subsidence occurs, but these effects are expected [to be] limited in spatial and temporal extent. No long term effects on overburden water quantity are expected as a result of mining.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

44. *No exceedances of DEQ-7 standards were observed in any of the Mammoth Coal wells.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

45. *"Domestic or private wells in the area generally produce water under confined conditions from relatively deep underburden sandstones that are hydrologically separated from the upper underburden aquifer and Mammoth Coal, although a few domestic wells are completed in the upper underburden."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

46. *The Groundwater Model:*

> *simulates flow in all aquifers of concern but is focused on the Mammoth Coal and upper underburden, as these aquifers are expected to experience the greatest effects from mining. The groundwater model is calibrated by comparing model results to measured water levels from monitoring wells and adjusting model parameters to achieve the best simulation of groundwater conditions. After calibration the model was run forward in time to predict water levels at the end of mining. In this predictive simulation, the mine tunnels are added to the model according to the proposed mine plan schedule as drains which simulate the dewatering associated with mine development. As mining progresses the material properties of the Mammoth Coal and overburden layers are also modified to simulate the collapse of material into the void left behind by longwall mining, and the subsidence and fracturing that occurs above the mined out areas. The results of this simulation are shown in Figure 9-7, which displays the predicted drawdown in the Mammoth Coal and upper underburden at the end of mining. In the Mammoth Coal, the area of the mine workings is completely dewatered, and an area of drawdown extends primarily to the north of the mine. A drawdown cone of depression is formed in the upper underburden, centered on the northern part of the mine workings and extending throughout the life of mine area and to the north. Drawdown to the south, east, and west in both the Mammoth Coal and the upper underburden is limited by the outcrops of the aquifers in those directions.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

47. *"[P]article tracking [using the Groundwater Model] does not account for potential influence of adsorption/desorption influences for given analytes. Rather, it simply simulates and tracks flow paths. Particle tracking also does not account for effects of dilution as other contributions to groundwater flow occur (e.g., recharge, etc.) In effect, particle tracking serves as a very conservative predictor of the implications of solute transport."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

48. *"The [Groundwater Model] provides a conservative [i.e., overestimates the potential impacts] and consistent basis for comparing the hydrologic response and relative impacts to the ground water associated with mining in the proposed disturbance area."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

49. *"The steady-state calibrated model utilizes hydraulic parameters that are consistent with baseline data."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

50. *"The [Groundwater Model] produces simulated water levels that are in reasonable conformance with water level observations over time. In addition, the same transient simulations that had been conducted demonstrated that the model provided discharge rates reasonably consistent with observations."* This proposed finding of

fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

51. *In its review of the PHC submitted by SPE, DEQ concluded that the Groundwater Model included in the PHC was based on generally accepted methodologies and that it provides a reasonable prediction of groundwater flow in the confined aquifers, such as the Mammoth Coal, at Bull Mountain Coal Mine #1.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

52. *DEQ also concluded that the particle-tracking analysis applied by the Groundwater Model provides a conservative prediction [i.e., overestimates the potential impacts] of the rate that gob water may migrate through the undisturbed Mammoth Coal. MEIC offered no evidence of any other model or methodology.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

53. *DEQ states that it is not aware of a generally accepted groundwater model or modeling methodology capable of predicting, with a reasonable probability of certainty, the concentration of inorganic constituents at any time in a hydrologic unit subject to migration of groundwater from an area mined by underground methods that permit caving of overburden. MEIC did not offer any evidence of the availability of a groundwater model with superior predictive capability to the model provided by SPE.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

54. *The uncontroverted evidence in the record is that the source of recharge water for the Mammoth Coal outside the permit area and the mine pool will be from above rather than from lateral migration through the Mammoth coal.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

55. *The Groundwater Model analyzes two scenarios: Scenario 1, the movement of particles if the gate roads collapse, and Scenario 2, the movement of particles if the gate roads remain open. This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law. Scenario 1 analyzes potential impacts of the SPE Mine as it was designed, while Scenario 2 was established "to 'bound' the range of uncertainty for the simulations."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

56. *"The two post-mine scenario simulations were run to 50 years in the future to evaluate the long-term response to mining at [the SPE Mine]."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law. *"The [Groundwater Model] prediction in the PHC indicates that groundwater associated with the Mammoth Coal and the upper underburden aquifers will recover to near premining levels approximately 50 years after the cessation of mining."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

57. *The uncontroverted evidence in the record is that the results for Scenario 1 of the Groundwater Model, which simulates the resaturation of the Mammoth Coal inside and outside the mined area if the gate roads collapse, predicts recovery to a uniform hydraulic gradient to the northwest across the northern permit boundary within 50 years after mining stops. This condition represents the long-term ground-water level response at the end of mining and for a time period extending up to 50 years after mining.* The Board found this finding of fact to be unpersuasive in light of the findings of fact and conclusions of law set out below at ¶¶ 29-32 and 124-126.

58. *The uncontroverted evidence in the record is that the results for Scenario 2 of the Groundwater Model, which simulates the resaturation of the Mammoth Coal inside and outside the mined area if the gate roads remain open, predicts recovery to steeper hydraulic gradient to the northwest across the northern permit boundary and a constant mine pool elevation of 3850 feet, within 50 years after mining stops. This condition represents the worst-case, long-term ground-water response at the end of mining and for a time period extending up to 50 years after mining.* The Board found this finding of fact to be unpersuasive in light of the findings of fact and conclusions of law set out below at ¶¶ 29-32 and 124-126.

59. *"The particle tracking results for Scenario 1 [gate roads collapse] show that given the limiting assumptions described in the flow modeling effort, and also in accordance with the [described limitations], it is projected that any inorganic constituents emanating from the mine gob will be retained within the mine permit*

boundary." The Board found this finding of fact and conclusions of law to be unpersuasive in light of the findings of fact set out below at ¶¶ 29-32 and 124-126.

60. *The gate roads in the Bull Mountains Mine are designed to collapse over time.* The Board found this finding of fact and conclusions of law to be unpersuasive in light of the findings of fact set out below at ¶¶ 29-32 and 124-126.

61. *The United States Department of Interior, Bureau of Land Management reported in its environmental assessment for the SPE Mine also explained that the gate roads are designed to collapse with time:*

> *[T]the pillars supporting the gateroad openings have been designed to slowly fail as the longwall panel progresses. Failure of the gateroad pillars would result in partial subsidence over the gateroads. In longwall mining, surface subsidence typically occurs as a series of troughs over the longwall panels. But because the gateroads are designed to yield under the stress of the mined-out panels, the expected result is less extreme transitions between each trough. The expected outcome is that the surface subsidence would be uniform and less surface cracking would occur.*

This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

62. *"The particle tracking results for Scenario 2 [gate roads remain intact] shows that with the same limiting/conservative assumptions described heretofore, that it is possible that some flow from the mine gob may flow just outside the permit boundary."* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

63. *The CHIA concludes that the SPE mine as designed will not cause material damage by reducing the quantity of water in the alluvial, overburden, Mammoth Coal, or underburden aquifers:*

> *Mining is not expected to affect the alluvial aquifer beyond the permit boundary. The alluvial section within the boundary is generally dry. Groundwater levels in the overburden, Mammoth Coal and upper underburden near the western permit boundary have been lowered as a result of mining and drawdown in these aquifers will continue as mining advances. Mining proposed in Amendment 3 will result in continued drawdown to the east, south and north of the mine but is expected to remain largely within the mine permit boundary and drawdown will not affect most groundwater users. Mining related drawdown in these aquifers may affect a few domestic wells completed in the upper underburden north of the permit area. Since most domestic and stock wells produce from relatively deep sandstones (deep underburden aquifer) that are hydraulically isolated from mining by a relatively thick section of alternating shales and siltstones, no impact to these deeper wells is expected. SPE is committed to replacing any water supplies affected by mine related drawdown with a comparable permanent supply.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

64. *The CHIA concludes that the SPE mine as designed will not cause material damage to the quality or quantity of surface water:*

> *To date, no material damage to surface waters is evident. Narrative standards for surface waters have not been violated or exceeded, and the quantity of surface waters (springs and ephemeral runoff) has not been impacted due to mining activity, and surface water rights have not been impacted. Accordingly, because current mining activities are proposed throughout the expanded permit area, disturbance of the hydrologic balance on and off the permit area and material damage to surface waters outside the permit area are not expected from continued underground mining.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

65. *The CHIA paraphrases the Groundwater Model and concludes that the SPE mine as designed will not cause material damage to water quality in the Mammoth Coal:*

> *Because mine dewatering produces groundwater flow towards the mine working during mining, no water quality affects [sic] are expected during mining. After mining is completed, some of the mine gob will become saturated. Groundwater quality in the mine gob is expected to be degraded relative to natural water quality, however, due to the small quantity of gob influenced water and the slow water movement in the Mammoth Coal this poor quality water is not expected to migrate outside the permit boundaries within 50 years after mining.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

66. *The CHIA concludes that the SPE mine as designed will not cause material damage by producing acid mine drainage in the mined area:*

> *Post mining groundwater quality within the mined-out area (Caved Zone) is expected to degrade after coming into contact with fresh rock surfaces exposed in subsidence fractures and mineralized rubble or gob. . . . Due to the buffering capacity of the alkaline mineralogy of the overburden and shallow underburden, development of acidic conditions in water present in the gob is extremely unlikely.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

67. *The CHIA concludes that the SPE mine as designed will not cause material damage to water quality in the upper underburden immediately below the Mammoth Coal:*

> *Similar to the Mammoth Coal, water quality in the upper underburden aquifer may be locally affected by poor quality water from the mine gob after mining is completed and water levels in the mine area recover. No water quality effects on the deeper underburden aquifer are expected due to the hydraulic separation between this aquifer and the mine.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

68. *"Based upon monitoring well information, there is no evidence of any mining related impacts to upper underburden or to the relatively deep upper underburden water quality in the vicinity of the Bull Mountains Mine No. 1 and no exceedances of DEQ-7 water quality standards have been reported in the wells."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

69. *"Currently, there is no evidence that local and off permit groundwater quality of any of the hydrologic units has been degraded or impacted by mining. Groundwater quality of shallow and deep aquifers (alluvium, overburden, coal, and underburden) is monitored regularly by a network of 105 monitoring wells to alert DEQ about the potential for material damage during or post mining."* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

70. *The CHIA summarized the obligations that MSUMRA places on the operator to mitigate potential impacts to the environment including impairment of water resources as follows:*

> *Among these measures are requirements and performance standards [that] include requirements and standards for drainage control, pond*

design and maintenance, sediment control, road design and maintenance, reclamation, permitted discharges to surface waters, and protection of undisturbed drainages. In addition, adherence to Best Technology Currently Available (BTCA) and Best Management Practices (BMPs) in the design and implementation of equipment, devices, systems, methods, and techniques is required for the minimization of hydrologic disturbance. These requirements and performance standards established in ARM 17.24 subchapter 5 through subchapter 12 are incorporated into operation and reclamation plans included throughout the Bull Mountains Mine No. 1 surface mining permit (SMP C1993017), and have been reviewed and approved by DEQ.

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

71. *The CHIA recognized and explained measures taken by SPE to minimize adverse impacts to the hydrologic balance as follows:*

a. *measures to convey and treat mine and stormwater runoff within the disturbed area;*

b. *each MPDES-permitted outfall at the facility is associated with a sediment pond designed to contain the runoff from a 10-year, 24-hour rainfall event;*

c. *runoff controls at the waste disposal area;*

d. *minimizing surface impacts to ephemeral watercourses throughout the mine area through best management practices;*

e. *post mining controls for portal discharge;*

f. *documentation of recovery of springs after undermining and subsidence;*

g. *explanation of evidence of recovery of water in wells in overburden after undermining and subsidence.*

This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

72. *The CHIA also considered mitigation measures for water sources:*

> *Impacts to surface water supply and water rights are evaluated with respect to regional and local impacts to surface water resources and natural variations in seasonal and yearly runoff. Mitigation for the loss of a beneficial use of surface water or a water right requires provision of a dependable, long-term replacement water resource of acceptable quality for the designated use and adequate quantity to support the existing and/or planned future use [ARM 17.24.314(1)(c) and 17.24.648].*

In addition:

> *Mitigation of impacts from subsidence generally involves replacement of water supplies lost or diverted by subsidence-related processes with the purpose of maintaining premine land uses. Mitigation plans in the permit include restoring springs, stream reaches, and ponds by opportunistic development of springs where they appear, guzzler emplacements, horizontal wells, vertical wells, pipeline systems, deepening or rehabilitating existing wells, reclamation of stream reaches and function, water treatment where appropriate or necessary, and restoring premine land uses (MDSL, 1993). Detailed monitoring and mitigation plans are provided in Permit C1993017, Vol. 2, Section 313, Appendix 313-2 Spring/Seep Mitigation Plan.*

The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See ¶¶ 130-132.* This is echoed by the permit which provides:

> *The permittee is committed to mitigating hydrologic impacts caused by mining by the measures approved in the permit, or, should these approved measures fall short, by alternative measures to be developed in consultation with the Department. To implement these measures, the permittee has developed a strategy for mitigation of any long-term hydrologic and wetlands impacts that occur due to mine development and operation. The goals of the permittee mitigation strategy are:*
>
> *• No net loss of wetlands (no decrease in total wetland area due to mining); and*
>
> *• Long-term maintenance by the permittee (until bond release) of adequate water supply in regards to quantity, quality and location for existing levels of wildlife and livestock.*

• After bond release, maintenance of the water replacement facilities is expected to be provided for by a trust fund established by Permittee and administered by its Department appointed trustees. -

This strategy uses a phased approach that begins with planning, followed by implementation of the plan, and includes monitoring to ensure success. Successful mitigation is defined as the achievement through replacement or enhancement of resource which provides the potential for postmining land use equal to premine conditions. Success will be measured through appropriate testing and statistical comparison of data collected during baseline and postmining periods (see discussions of resources within the 17.24.313 RECLAMATION PLAN)

The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See* ¶¶ 130-132.

73. *The CHIA addresses mitigation of disruption of surface and groundwater rights:*

Likewise, the rights of present and future groundwater and surface water owners or users will be protected in accordance with ARM 17.24.314(1)(b) and 17.24.648. ARM 17.24.648 states that "the permittee will replace the water supply of any owner of interest in real property who obtains all or part of his supply of water for domestic, agricultural, industrial or other legitimate use from a surface or underground source if such supply has been affected by contamination, diminution, or interruption proximately resulting from strip or underground mining operation by the permittee". To protect uses replacement water must be of a quality and quantity sufficient to satisfy premining consumption requirements.

This statement is supported by specific commitments by SPE, set forth in the permit, to protect water rights:

The rights of present and future groundwater and surface water owners or users will be protected in accordance with Rules 17.24.314(1)(b) and 17.24.648. Existing groundwater and surface water rights within the Bull Mountains Mine No. 1 study area are listed in A,zddendum 1, Table 304 (5)-10 and in Addendum 5, Table 304 (6)-46.

The permittee will replace the water supply of any owner of real property who obtains all or part of his supply of water for domestic,

agricultural, industrial or other legitimate use from a surface or underground source if such supply has been affected by contamination, diminishment, or interruption proximately resulting from the underground mining operation of the permittee. Such replacement water shall be of a quality and quantity sufficient to satisfy premining consumptive requirements. Several possible sources of replacement water are being considered, including overburden and underburden wells, horizontal drains, surface water impoundments, precipitation collection devices, and the opportunistic development of existing unaffected or relocated springs.

The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See ¶¶ 130-132.*

74. *The CHIA describes how the monitoring plan will be revised in the event of potential damage to the hydrologic balance:*

As mining proceeds or potential impacts are anticipated, the monitoring plan is revised to accommodate changes, including replacement of monitoring sites or development of new sites. Monitoring is required to continue through the final phase of bond release.

. . .

As longwall mining approaches monitored springs, the frequency of flow monitoring increases from monthly or quarterly to weekly so that any discernible impacts may be evaluated and mitigated in a timely manner and in accordance with the approved mitigation plan.

. . .

As subsurface strata continues to deform and heal, it is anticipated that water levels will be reestablished at a stratigraphic level equivalent to pre-undermining. Continued monitoring of water levels will inform understanding of short and long-term response of underlying strata and consequent flow paths to undermining and subsequent recovery.

These statements are echoed by the detailed monitoring and mitigation plans described in the permit:

In order to detect potential impacts to springs, weekly monitoring of flow/discharge and pond levels(where applicable) will be will be

conducted for all springs identified in Appendix 314-3, Table 314-3.1. This weekly monitoring will commence two months prior to longwall mining beneath each identified spring and continue for twelve months after longwall undermining the same spring. This weekly monitoring will also be conducted for springs that are within 150 feet of the edge of a panel being mined. This weekly monitoring in addition to the monitoring conducted in accordance with Appendix 314-4 and associated data analysis will detect potential mining impacts.

. . .

Weekly monitoring will be conducted during periods of anticipated potential impact (2 months before and 12 months after undermining).

. . .

As mining progresses, the Permittee will develop tentative mitigation plans for each of the springs that may be impacted by mining, as listed in Table 314-3-1, and the monitoring frequencies specified in Appendix 314-4 (MQAP) will be reviewed annually and necessary revisions will be proposed in conjunction with the Annual Hydrology Report. As the effects of mining approach more distant springs, (e.g., those in the eastern portions of the Permit Area and beyond), monitoring frequencies will be modified as necessary to ensure prompt detection of impacts and address monitoring of springs historically impacted and associated replacement water sources.

The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See ¶¶ 130-132.*

SPE PROPOSED FINDINGS OF FACT

Intervenor SPE explicitly adopted and incorporated the proposed findings of fact submitted by DEQ, and in addition has submitted the following Proposed Findings of Fact, each of which the Board will now address.

1. *MEIC challenges the legal standards used in and the sufficiency of DEQ's written findings supporting approval of Amendment No. 3 to SPE's underground mine operating permit (Permit No. C1993017) (the "Application") for*

SPE's Bull Mountain No. 1 Mine. This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

2. *MEIC challenges the sufficiency of a specific portion of DEQ's approval of SPE's Application: the Cumulative Hydrologic Impact Assessment ("CHIA"). This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law. The CHIA contains DEQ's assessment of whether the proposed mine expansion is designed to minimize disturbance to the hydrologic balance in areas inside and adjacent to the mine area, including whether the proposed amendment is designed to prevent material damage to the hydrologic balance outside the permit area.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

3. *MEIC provided no evidence or facts outside of the CHIA and other parts of the administrative record for the Board's consideration in this matter. In particular, MEIC provided no expert opinion contradicting or otherwise calling into question the conclusions of the Groundwater Model included in the Application. Therefore, the CHIA, including its descriptions of the hydrologic regime and formation of the mine pool, and the factual basis, scientific methodology, and conclusions reached in the Groundwater Model regarding movement of mine pool water away from the mine area, supply all of the undisputed and undisputable facts necessary for the Board's consideration of MEIC's challenge.* This proposed finding of fact is an accurate

statement taken from the record, and is not at variance with the Board's Conclusions of Law.

4. *The CHIA summarizes statutory requirements for assessing whether the Application was designed to prevent material damage to the hydrologic balance in and adjacent to the permit area. The CHIA also includes a Groundwater Model, described as a "transient flow [particle tracking] model." The material damage determination as stated in the CHIA is based in part on the conclusions of the Groundwater Model.* This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

5. *The CHIA explains the methodology DEQ used for its material damage assessment. Specifically, the CHIA discusses changes DEQ observed to the hydrologic balance resulting from the current mining procedures, and it uses the Groundwater Model to evaluate whether the proposed mine expansion was designed to prevent material damage to the hydrologic balance outside the permit area.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

6. *In its material damage assessment, the CHIA notes that a violation of water quality standards would constitute material damage under the statute.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

7. *However, the CHIA concludes that "[t]here is no evidence from monitoring data to suggest a change in predictions made in the PHC with regard to*

potential impacts to water quality and levels." This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

8. *The CHIA notes that the Probable Hydrologic Consequences ("PHC"), including those set forth in the Groundwater Model, predict the proposed expansion will not cause material damage to the quality of the groundwater in various aquifers, including the alluvial, the overburden, the Mammoth Coal, the upper underburden, and the deeper underburden. CHIA, p. 9-9 ("The additional proposed mining is not expected to have any effects on alluvial water quality."); id., p. 9-10 ("Because overburden groundwater does not flow through the mine workings, or come into contact with the mine gob, mining is not expected to affect overburden groundwater quality."); id., p. 9-11 ("Groundwater quality in the mine gob is expected to be degraded relative to natural water quality, however, due to the small quantity of gob influenced water and the slow water movement in the Mammoth Coal this poor quality water is not expected to migrate outside the permit boundaries within 50 years after mining."); id., p. 9-13 ("Similar to the Mammoth Coal, water quality in the upper underburden aquifer may be locally affected by poor quality water from the mine gob after mining is completed and water levels in the mine area recover. No water quality effects on the deeper underburden aquifer are expected due to the hydraulic separation between this aquifer and the mine.").* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself.

9. *DEQ concluded the Groundwater Model was based on generally accepted methodologies and provides a reasonable prediction of groundwater flow in*

the confined aquifers, including the Mammoth Coal. DEQ Ex. D (Van Oort Aff., ¶ 9). DEQ also concluded the particle tracking analysis applied in the Groundwater Model provides a conservative prediction of the rate that gob water may migrate through the undisturbed Mammoth Coal. Id. MEIC has not presented any evidence contradicting the findings and predictions of the Groundwater Model. This proposed finding of fact is an accurate statement taken from the record, and is not at variance with the Board's Conclusions of Law.

10. *The Groundwater Model predicts that particles of mineralized gob water are unlikely to migrate from the mined areas and cross the permit boundary within a period of fifty years after mining ceases, assuming the gate roads collapse.* This is taken from the contents of the CHIA, which is part of the administrative record and as such speaks for itself. The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See* ¶¶29-32, 122-126.

11. *The proposed mine expansion is designed so that the gate roads will collapse over time.* The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See* ¶¶29-32, 122-126.

12. In its Material Damage Assessment, the CHIA concludes the following:

> *Post mining groundwater quality within the mined-out area (Caved Zone) is expected to degrade after coming into contact with fresh rock surfaces exposed in subsidence fractures and mineralized rubble or gob. Oxidizing conditions are anticipated until after mining is complete and resaturation of the collapsed material has occurred. These conditions may result in increased sulfide oxidation, cation exchange, leaching, and weathering, which together may cause an increase in the concentrations of calcium, magnesium, sulfate and sodium ions. Due to the buffering capacity of the alkaline mineralogy of the overburden and shallow underburden, development of acidic conditions in water present*

in the gob is extremely unlikely. As explained above at 9.5.2, any degradation of groundwater quality is not expected to render groundwaters unsuitable for current or anticipated use. Accordingly, because current mining methods are proposed throughout the expanded permit area, material damage to the quality or quantity of groundwater resources outside the proposed permit area is not expected from continued underground mining.

The Board found this finding of fact to be unpersuasive in light of the findings of fact it has adopted. *See* ¶¶29-32, 122-126.

As was stated above, the Board has adopted the following as its findings of fact in this case:

FINDINGS OF FACT

1. In this case, Appellants Montana Environmental Information Center and the Sierra Club (collectively, "MEIC") challenge the Montana Department of Environmental Quality's (DEQ) approval of a large expansion of the Bull Mountain Mine No. 1, alleging inadequate assessment of the proposed expansion's impact to groundwater resources. DEQ Ex. B at 1.

2. The Bull Mountains, where the proposed mine expansion is located, are arid eastern foothills of the Rocky Mountains on the edge of the Great Plains. MEIC Ex. 1 at 3-3 [hereinafter Lease EA]. "Topography varies from uplands, rock outcrops, and ravines forested with ponderosa pine and Rocky Mountain juniper at higher elevations, to adjoining sagebrush and mixed prairie grassland communities on benches, slopes, and drainages where soils are deeper." MEIC Ex. 12 at III-18 [hereinafter 1992 EIS]. From the summit of Dunn Mountain, the highest point in the

Bull Mountains, an observer can view the distant peaks of the Snowy, Big Horn, Pryor, Beartooth, and Crazy Mountains. Lease EA at 3-80.

3. The Bull Mountains form the hydrologic divide between the Musselshell River to the north and the Yellowstone River to the south. MEIC Ex. 10 at 3-3 [hereinafter CHIA]. The area to be undermined by the proposed mine expansion forms the headwaters of numerous tributary streams of both rivers, including Rehder Creek and Fattig Creek, which flow north, and Pompey's Pillar Creek and Railroad Creek, which flow south. *Id.* at 4-1; 1992 EIS at III-11 to -12. These creeks are mostly ephemeral, flowing only in response to precipitation, though there are intermittent portions, fed by springs or seeps associated with base groundwater flow. CHIA 4-1; 1992 EIS at III-11.

4. Approximately 15 acres of wetlands dot the mine area. 1992 EIS at III-22. Because the Bull Mountains are so arid, the limited water resources are extremely important. *See* 1992 EIS at III-19 ("The wetland vegetation community accounts for less than 0.1 percent of the Bull Mountains and surrounding communities but plays an important role in local ecosystems."); *Id.* at III-22 ("All animals found in the mine plan area use the streams, ponds, and springs, and related habitat to a greater or lesser degree."). Wetlands throughout the Bull Mountains are fed by groundwater springs, including springs originating in the Mammoth Coal aquifer. 1992 EIS at III-13, -19 to -20, -23; CHIA tbl. 8-1. The proposed mine expansion would remove the Mammoth Coal aquifer throughout the 7,161-acre mine expansion area of the Bull Mountains. MEIC Ex. 2 at 5 [hereinafter 2013 EA].

5. The varied vegetative communities of the Bull Mountains support a wide variety of wildlife, including elk, deer, antelope, coyotes, cottontails, turkeys, sharp-tailed grouse, bluebirds, wrens, and a great variety of raptors. 1992 EIS at III-20 to -23. Aquatic and semi-aquatic life, including waterfowl, tiger salamanders, chorus frogs, northern leopard frogs, and painted turtles, inhabit the groundwater-fed stream segments and wetlands in the Bull Mountains. *Id.* at III-22 to -23. All wildlife in the Bull Mountains depends on the area's sparse water resources. *Id.* at III-23.

6. The dominant historical land use in the Bull Mountains is ranching. Lease EA at 4-55; 1992 EIS at III-42. The limited water resources in the Bull Mountains, in particular groundwater-fed springs, are critical for stock watering and ranching operations. 1992 EIS at III-19, -42. A small portion of surface water in the general mine area is used for irrigation. CHIA at 5-1, 6-2.

7. The Bull Mountains and Roundup area also have a long history of coal mining. 1992 EIS at III-38; Lease EA at 2-1. This history "has followed a 'boom-and-bust' pattern" with "good economic times followed by economic recession." 1992 EIS at III-38.

8. The Montana Department of State Lands (MDSL) concluded that the development of the Bull Mountains Mine would follow this same historical boom-and-bust pattern. *Id.* at iv. After short-term benefits to public revenue and employment and income in Musselshell County, "over the long term" there would be "major and negative impacts" to public revenues and "moderate and negative impacts" to employment and income due to inevitable mine closure. *Id.*

9. On October 5, 2012, Signal Peak Energy, LLC, (SPE) submitted its Permit Amendment Application No. 3 to DEQ to "increase the mine permit area of their underground coal mine (Bull Mountain Mine No. 1) by adding 7,161 acres and expanding the mine from five longwall panels (approved under Amendment 00187) to fourteen longwall panels." CHIA at 3-1.

10. The expanded mining operation would "add approximately 176 million tons of in-place coal reserves or 110 million tons of mineable coal." 2013 EA at 1.

11. SPE's application included a Probable Hydrologic Consequences assessment (PHC) and a Groundwater Model. MEIC Ex. 5 [hereinafter PHC]; MEIC Ex. 6 [hereinafter Groundwater Model].

12. MEIC submitted public comments on SPE's application. MEIC Ex. 7 [hereinafter MEIC Comments]. Among other issues, MEIC raised concerns that the mine expansion could cause material damage to the hydrologic balance outside the permit area. *Id.* at 4-7.

13. On October 18, 2013, DEQ approved SPE's application. MEIC Ex. 8. Along with the approval, DEQ issued a final Checklist Environmental Assessment (2013 EA) and a Cumulative Hydrologic Impact Assessment or "CHIA." 2013 EA; CHIA.

14. DEQ's CHIA determined that the 7,161-acre mine expansion would not cause material damage to the hydrologic balance outside the mine permit area because "any degradation of groundwater is not expected to render groundwaters unsuitable for current or anticipated use." CHIA at 10-4.

15. On November 18, 2013, MEIC filed its Notice of Appeal and Request for Hearing with the Board of Environmental Review. DEQ Ex. B at 1.

16. The coal seam SPE seeks to remove is saturated with water and functions as an aquifer, the Mammoth Coal aquifer. 2013 EA at 5.

17. The Mammoth Coal aquifer is the water source for domestic wells in the Bull Mountains. PHC at 314-5-12 ("[A] few domestic wells tap the Mammoth Coal as a water supply."); CHIA at 8-5 ("[F]ew production wells are completed in the coal.") & tbl. 6-1 (identifying domestic wells 168805 and 167885 drawing water in part from Mammoth Coal aquifer). The Mammoth Coal aquifer is also a source of wells used for watering livestock. CHIA tbl. 6-1. The "geometric mean hydraulic conductivity of the Mammoth Coal is 0.16 ft/day," which is an order of magnitude higher than the hydraulic conductivity of the overburden or underburden. *Id.* at 8-5 & tbl. 8-5. One of the highest yielding wells in the area is sourced in the Mammoth Coal aquifer, as are some of the highest yielding springs, including one spring (spring 53475) that yields approximately 10 gallons per minute (gpm). *Id.* tbl. 6-1 (well 19944) & tbl. 8-1 (springs 53455, 53485, 53475).

18. The Mammoth Coal aquifer is not isolated. There are "hydraulic connections between the Mammoth Coal aquifer and the upper underburden." *Id.* at 9-12. Some of the highest yielding wells in the area are sourced in the upper underburden. *Id.* tbl. 6-1 (wells 161859, 40C 30009594). Domestic wells are also sourced in the upper underburden. *Id.* (wells 18164, 18167, 18213, 40C 83115 00). Degradation of water quality in the Mammoth Coal aquifer could cause degradation of

water in the upper underburden. *Id.* at 9-12 to -13. Additionally, polluted water from mining may also occur in the "highly fractured zones immediately above the mined out area." PHC at 314-5-47.

19. SPE proposed to remove the 110 million tons of coal from the 7,161-acre expansion using a method known as longwall mining. CHIA at 3-2. Longwall mining "removes all coal from each longwall panel, effectively achieving 100 percent coal extraction, and causes surface subsidence." *Id.* When the coal is removed, the "[u]nsupported overburden rocks flex (subside), fracture (fracture zone), and begin to collapse into the void formerly occupied by the coal. The collapsed material in the mine voids is known as gob." 2013 EA at 5.

20. To mine a longwall panel, the mine operators first excavate a set of parallel entries or "mains" on either side of the panel. CHIA at 3-2. The mains are designed to remain intact and allow access to the coal panel via gate roads. *Id.* "Gate roads are driven roughly perpendicular to the mains and consist of three parallel entries." *Id.* The gate roads allow the mine operator to install their cutting machine, called a "shearer." *Id.* "After the shearer completes a pass the entire system (shields, shearer, and face conveyor) advances (perpendicular to the shearer) and unsupported overburden is allowed to collapse in the void formerly occupied by the coal." *Id.* "Each gate road is designed to stay open for the first panel, but yield as the adjacent panel is mined-out . . . ." *Id.*

21. The proposed mine expansion will "lead to transitions in both groundwater quality and quantity," particularly in the Mammoth Coal aquifer. PHC at

314-5-44. The removal of the coal seam and Mammoth Coal aquifer will create a "cone-of-depression" causing groundwater from areas adjacent to the mine to flow toward and into the mine void. CHIA at 9-10 to -11; PHC at 314-5-63 to -64; Groundwater Model 314-6-22 to -24. This will lead to drawdown, i.e., lowering of groundwater levels, in areas around the mine, including areas up to three miles outside the mine permit boundary. CHIA at 5-2, 9-10 to -11; PHC 314-5-63 to -64; Groundwater Model 314-6-22 to -24. The water draining into the mine during mining operations will be pumped out and discharged via settling ponds into surface waters. 2013 EA at 5.

22. When mining ends, the mine void will begin to fill with water, which will eventually flow out of the mine void and into the drawndown area adjacent to the mine. CHIA at 9-11 ("Following the completion of mining, water levels will begin to recover, and are expected to reach a post-mine equilibrium within 50 years."); *Id.* 9-13 ("Similar to the Mammoth Coal, water quality in the upper underburden may be locally affected by poor quality water from the mine gob after mining is completed and water levels in the mine area recover."); PHC at 314-5-53 ("[A]s this groundwater [in the gob] reaches the native strata at the mine boundary, groundwater will tend to seep very slowly outside the mine area . . . ."); *see* also 2013 EA at 6-8; PHC 314-5-56 to -58, -63 to -64; Groundwater Model 314-6-22 to -24.

23. The water that collects in the mine void after mining "is expected to be degraded relative to natural water quality." CHIA at 9-11; PHC at 314-5-47 ("A general increase in total dissolved solids, sodium, and sulfate concentration is

anticipated in the groundwater that flows through the gob and potentially in the highly fractured zones immediately above the mined out area . . . .").

24. Most of the groundwater in the mine area, including the Mammoth Coal aquifer, is high-quality Class II groundwater. CHIA at 8-5 ("[W]ater from most Mammoth Coal wells is Class II groundwater."); 2013 EA at 7 (indicating that average quality of groundwater in Mammoth Coal aquifer is 2,272 microSiemens/cm or Class II); *see* also CHIA at 9-11 ("[A]pproximately one-half of the Mammoth Coal wells produce Class II water and one-half produce Class III water."); PHC at 314-5-28 ("Generally, groundwater in the vicinity of LOM [life of mine] area is either Class II or Class III."); 1992 EIS at III-18 ("Using State of Montana classification, spring and ground water in the Bull Mountains are Class II waters, suitable for wildlife and livestock use, and marginally suitable for public and private water supplies.").

25. Class II groundwaters "are those ground waters with a natural specific conductance that is greater than 1,000 and less than or equal to 2,500 microSiemens/cm at 25°C." ARM 17.30.1006(2). Class II groundwater is considered "[h]igh quality water[]." Mont. Code Ann. § 75-5-103(13). Beneficial uses of Class II groundwater are: "(i) public and private water supplies; (ii) culinary and food processing purposes; (iii) irrigation of some agricultural crops; (iv) drinking water for most livestock and wildlife; and (v) most commercial and industrial purposes." ARM 17.30.1006(2)(a).

26. Class III groundwaters "are those ground waters with a natural specific conductance that is greater than 2,500 and less than or equal to 15,000 microSiemens/cm at 25°C." ARM 17.30.1006(3)(a). Class III groundwater is not

considered high-quality water. Mont. Code Ann. § 75-3-103(13)(a). Beneficial uses of Class III groundwater are "(i) irrigation of some salt tolerant crops; (ii) some commercial and industrial purposes; (iii) drinking water for some livestock and wildlife; and (iv) drinking, culinary, and food processing purposes where the specific conductance is less than 7,000 microSiemens at 25°C." ARM 17.30.1006(3)(a).

27. DEQ projects that the water that collects in the gob material in the mine void following mining will degrade to Class III groundwater:

> The eventual groundwater quality within the mined-out area or Caved Zone may become similar to the groundwater quality within abandoned coal mines near Roundup, MT where the average TDS, sulfate, and specific conductance concentrations are 2,042 mg/L, 1,106 mg/L and 3,038 µS/cm, respectively. However, the groundwater quality within the Caved Zone may exceed these concentrations since the groundwater in the abandoned mines near Roundup does not come into contact with mineralized gob.

CHIA at 10-2 to -3; accord 2013 EA at 7. SPE also determined that "there is potential that some of this groundwater will change from a Class II to a Class III designation." PHC at 314-5-52; accord. *Id.* 314-5-48 to -50.

28. SPE submitted a Groundwater Model with its application for the mine expansion. *See* generally Groundwater Model. The Groundwater Model partially evaluated the migration of degraded gob water after the cessation of mining. *Id.* at 314-6-23 to -26. The model developed two scenarios to establish bounds for its analysis. *Id.* at 314-6-23. In Scenario 1 the mine's gate roads collapse. *Id.* In Scenario 2 the gate roads remain intact. *Id.*

29. The Groundwater Model explained the significance of whether the gate roads collapse:

> In the event that the gate roads remain intact, they will serve as long term sinks. The gate roads would then convey groundwater northward where it would "pool" in northern portions of the mine. On the other hand, if the gate roads collapse, the fragmentation zone would be more uniform, the groundwater flow would be more uniform, and the tendency to pool would be less significant as well. Presently, the gate roads are remaining intact. However, this does not necessarily confirm that the gate roads will remain intact in the future.

Groundwater Model at 314-6-23.

30. Both DEQ and SPE stated that it was uncertain whether the gate roads would collapse. DEQ wrote: "After the conclusion of mining, the gate roads may remain intact or may collapse, thus each scenario was tested using the groundwater model." CHIA at 10-2. SPE wrote: "It may well be that some gate roads remain intact yet others collapse into the future. It is also possible that gate road collapsing will occur gradually over time." PHC at 314-5-54; *Id.* at 314-5-64 (noting possibility that "gate road integrity [may] persist[] far into the future after the Amendment 3 mining ceases"). "Presently, the mine gate roads have tended to remain intact." *Id.* at 314-5-54; accord Groundwater Model at 314-6-23.

31. The Groundwater Model conducted a particle tracking evaluation for each scenario "using a 50 year time frame simulation." Groundwater Model at 314-6-25. The "particle tracking [did] not account for potential influence of adsorption/desorption influences for given analytes" and it did "not account for effects of dilution as other contributions to groundwater flow occur." *Id.* The particle tracking evaluation only "simulate[d] and track[ed] flow paths." *Id.*

32. In Scenario 2, in which the gate roads remain intact, the gob water would migrate beyond the mine permit boundary in numerous locations within 50 years. *Id.* at

314-6-26 and fig. 14M (bottom frame). In Scenario 1, in which the gate roads collapse, the gob water would migrate away from the mine, but would not move past the mine boundary within 50 years. *Id.* at 314-6-25 and fig. 14M (top frame). Within the 50 year timeframe, the gob water in Scenario 1 would migrate approximately half the distance it would in Scenario 2. 2013 EA at 7-8 (water would migrate approximately 2,000 feet in Scenario 2 and 1,000 feet in Scenario 1).

33. Summarizing the particle tracking analysis from the Groundwater Model, the PHC concluded: "[I]t is considered highly unlikely that groundwater quality will be degraded outside the mine permit boundary within the next 50 years. Any issues that may occur at some time in the distant future are likely to be limited to groundwater in the Mammoth Coal as it is relatively more permeable than either the Overburden or Underburden." PHC at 314-5-57 (emphasis added).

34. While Groundwater Model and PHC limited their analysis of impacts to groundwater quality to 50 years, their analysis of groundwater quantity turned on water levels outside the mine permit boundary recovering "at 50 years," meaning that after 50 years the same quantity of water would be available as was available at the inception of mining. Groundwater Model at 314-6-24; *Id.*at 314-6-26 to -27 ("Much of the drawdown to the north/northwest of the LOM boundary will dissipate with time [i.e., after 50 years]."); PHC at 314-5-63 to-64 (noting that drawdown "is predicted to recede following cessation of mining" and referencing 50-year timeframe from Groundwater Model). SPE discounted drawdown for 50 years because it will only be "temporal." PHC at 314-5-44. The CHIA adopted the same analysis, discounting impacts to water

quantity from drawdown on the basis that water levels will "recover to near pre-mining levels approximately 50 years after the cessation of mining." CHIA at 10-2 (emphasis added); *see* also *Id.* 9-11 (same). Thus, for DEQ and SPE, the relevant time frame for water quality was the short-term, up to 50 years, and the relevant time frame for water quantity was the long-term, 50 years and beyond.

Mitigation

35. DEQ's CHIA states that "SPE is committed to replacing any waters affected by mine-related drawdown with a comparable permanent supply." *Id.* at 10-4. DEQ and SPE identified "relatively deep underburden sandstones" "as a source of replacement water if shallower supplies are impacted and must be replaced." 2013 EA at 6; PHC at 314-5-41 (noting "plans to use [deep Underburden] aquifer as a primary mitigation source").

36. SPE was uncertain whether the deep underburden aquifer has the capacity to support all potential mitigation needs. SPE wrote: "[I]f this aquifer is to be used to serve the existing uses, and also serve potentially as a mitigation sources [sic], a better understanding of its overall capacity to meet existing and potential future demands is necessary." PHC at 314-5-42. SPE further cautioned, "While the evidence to date suggests that the deeper underburden aquifer has the characteristics to meet existing demands, what is not so clear is does that aquifer have the capacity to provide full-scale mitigation water for wetlands and stream reaches." *Id.* at 314-5-35 (emphasis added). Underscoring this uncertainty, SPE concluded, "If significant mitigation flow from the Underburden either evolves, or becomes necessary, additional hydrogeologic

evaluations will be necessary to ensure that existing groundwater users dependent upon the deeper Underburden are not adversely affected." *Id.* at 314-5-66. Accordingly, the PHC suggested a "supplemental investigation to assist in defining the capability of this aquifer to provide sufficient water for the present and future demands that could ensue if significant volumes of water were required for mitigation purposes." *Id.*

37. The Groundwater Model provided additional explanation about the multiple uncertainties that could limit or preclude use of the deep underburden aquifer as the primary source of mitigation water:

> One of the potentially more significant uses that has been proposed is to use this same source as a mitigation source for flowing springs, and for stream reaches in the Bull Mountain area. Some of the springs flow at very significant rates. For instance, spring 52455 (near northeastern corner of LOM) flows at rates commonly exceeding 10 gallons per minute. Such a flow rate exceeds the typical demands at the mine public water supply well (projected at 6 gpm). Given that there are a large overall number of springs, ponds, and identified stream reaches, seasonal flow rates could substantially exceed 100 gpm.
>
> Using the deep Underburden aquifer may have other issues as well, including differences in water quality between native spring/stream sources compared to the water quality of the deeper Underburden. There are likely to be issues related to the Beneficial Use application process of the Montana Department of Natural Resources and Conservation. Demonstration of a beneficial use is required before a permit will be issued by the DNRC. Such applications routinely receive objections so that in the event a permit is issued, the process can be rather lengthy. In the event the aforementioned hurdles could be overcome, it would still be necessary to convince the DNRC that the aquifer system has the capacity to meet all the existing uses plus intended uses before a permit could be obtained.

Groundwater Model, Attachment 3M (pdf. 85). SPE's existing public water supply well sourced in the deep underburden has a daily average pumping rate of 6 gpm. PHC at 314-5-34.

DEQ's Material Damage Assessment and Determination

38. The CHIA explained that by law DEQ must "determine whether . . . material damage outside the permit area has been prevented." CHIA at 2-1. The CHIA further explained that the "CHIA analysis" itself "must be sufficient" to make this determination. *Id.* Citing Mont. Code Ann. § 82-4-203(31), the CHIA acknowledged that "[v]iolation of a water quality standard, whether or not an existing water use is effected, is material damage." CHIA at 2-1 n.1. Thus, "material damage criteria include applicable numeric and narrative water quality standards, and criteria established to protect existing beneficial uses of water." *Id.* at 2-1.

39. The CHIA then laid out the threshold and limits that should guide the material damage analysis and determination. *Id.* tbl. 2-1. The CHIA identified the following threshold indication of potential for material damage:

> Observation of persistent or long-term change in water quality within the permit boundary that is associated with mining and is approaching or commonly exceeds narrative or numeric (Circular DEQ-7) limits, may be expected to extend to areas outside the permit area with time and cannot be mitigated, treated, or replaced by alternate water supply.

Id.

40. The CHIA further established the following limit, at which material damage would occur:

> Degradation or reduction by coal mining and reclamation operations of water quality outside the permit area in a manner or to an extent that land uses or beneficial uses of water are adversely affected, or violation of water quality standard occurs outside the permit area.

Id. (emphasis added).

41. After describing relevant background and hydrology of the area, the CHIA considered probable effects of mining to groundwater, including the Mammoth Coal aquifer and the underburden. *Id.* at 9-10 to -13. The CHIA noted that while groundwater would flow toward the mine during mining, temporarily obviating pollution of groundwater outside the mine area, upon cessation of mining, the mine would fill with water, which would become polluted and begin to migrate away from the mine:

> Because mine dewatering produces groundwater flow toward the mine working during mining, no water quality effects are expected during mining. After mining is completed, some of the mine gob will become saturated. Groundwater quality in the mine gob is expected to be degraded relative to the natural water quality, however, due to the small quantity of gob influenced water and the slow water movement in the Mammoth Coal this poor quality water is not expected to migrate outside the permit boundaries within 50 years after mining.

Id. 9-11. In response to discovery propounded by MEIC, DEQ refused to state how long the degraded gob water would continue to migrate away from the mine area. MEIC Ex. 11 at 20 [hereinafter DEQ Discovery Response].

42. Regarding the underburden, the CHIA found: "Similar to the Mammoth Coal, water quality in the upper underburden aquifer may be locally affected by poor water quality water from the mine gob after mining is completed and water levels in the mine recover." *Id.* 9-13.

43. The CHIA further noted that the decline in groundwater quality in the Mammoth Coal aquifer would be enough to require the water to be reclassified from high-quality Class II water to low-quality Class III groundwater:

> A decline of groundwater quality is expected as longwall mining and subsidence continue to produce additional panels of collapsed and mineralized rubble in the Caved Zone (gob). . . . The eventual groundwater quality within the mined-out or Caved Zone may become similar to the groundwater quality within abandoned coal mines near Roundup, MT where the average TDS, sulfate, and specific conductance concentrations are 2,042 mg/L, 1,106 mg/L, and 3,038 µS/cm, respectively. However, the groundwater quality within the Caved Zone may exceed these concentrations since the groundwater in the abandoned mines near Roundup does not come into contact with mineralized gob.

Id. 10-2; *see* also 2013 EA at 7 (anticipating change in specific conductance that would cause transition from Class II to Class III groundwater).

44. The CHIA did not state how long the degradation of water in the mine void would persist. In its response to discovery from MEIC, DEQ refused to state whether or when the water in the mine void would cease to have elevated levels of total dissolved solids (TDS), sulfate, or specific conductance (SC). DEQ Discovery Response at 21-22.

45. After setting out the relevant information about the effects of the mine expansion on water resources, the CHIA made its material damage assessment and determination:

> Post mining groundwater quality within the mined-out area (Caved Area) is expected to degrade after coming into contact with fresh rock surfaces exposed in subsidence fractures and mineralized rubble or gob. Oxidizing conditions are anticipated until after mining is complete and resaturation of the collapsed material has occurred. These conditions may result in sulfide oxidation, cation exchange, leaching, and weathering, which together may cause an increase in the concentrations of calcium, magnesium, sulfate, and sodium ions. . . . As explained above at 9.5.2, any degradation of groundwater quality is not expected to render groundwaters unsuitable for current or anticipated use. Accordingly, because current mining methods are proposed throughout the expanded permit area, material damage to the quality or quantity of

> groundwater resources outside the proposed permit area is not expected from continued underground mining.

CHIA at 10-4 (emphasis added). The CHIA's material damage assessment and determination did not address the material damage threshold or limit laid out earlier in the CHIA in Table 2-1. Cf. *Id.* tbl. 2-1; *see* supra ¶¶ 39-40. The material damage assessment and determination did not address whether the 7,161-acre mine expansion would cause violations of water quality standards outside the permit area. Cf. *Id.* at 10-4.

46. In its final EA, DEQ presented a different basis for concluding that there would be no degradation of groundwater outside the permit area. DEQ reasoned that various factors that the Groundwater Model expressly did not evaluate would limit the concentration of pollutants in the gob water as it migrates away from the mine:

> Particle tracking was conducted using the groundwater model to estimate the rate of movement of lower quality groundwater away from the mine in the Mammoth coal aquifer after mining ceases. The results of this modeling showed that particles placed near the edge of the mine voids traveled less than 2,000 feet in 50 years for the scenario where the gate roads remained intact forming a mine pool. Particle transport in the scenario where gate roads collapsed was less than 1,000 feet in 50 years. Because the particle tracking model uses conservative assumptions which increase particle transport rates, the actual distance of movement of lower quality water from the mine pool should be less than these estimates. Particle tracking also does not consider dilution or attenuation of lower quality groundwater which would occur during transport away from the mine. Because of these factors, no degradation of groundwater quality outside the permit area is expected to occur after mining.

2013 EA at 7-8.

Administrative Proceedings

47. MEIC appealed DEQ's approval of the mine expansion on two bases: first, DEQ's material damage assessment and determination "employed the incorrect legal standard"; and second, the record before the agency did not "affirmatively demonstrate" that the "mine expansion was designed to prevent material damage to the hydrologic balance." DEQ Ex. B at 1.

48. SPE subsequently moved to intervene in the appeal. On December 9, 2013, the hearing examiner granted SPE's motion to intervene pursuant to Montana Rule of Civil Procedure 24(a). Or. on Mot. to Intervene at 3 (Dec. 9, 2013).

49. On January 6, 2014, pursuant to an agreement among all parties, the hearing examiner adopted a procedural schedule for administrative review of the appeal. Or. Adopting Joint Stipulated Procedural Schedule for Administrative Review (Jan. 6, 2014).

50. The parties engaged in discovery. In its discovery requests, MEIC asked DEQ to "state how long, in years, DEQ anticipates that low-quality water from the mine will continue to migrate away from the mine into downgradient portions of the Mammoth Coal aquifer." DEQ Discovery Resp. at 20.

51. DEQ's response simply directed MEIC to the administrative record and DEQ's decision documents:

> In this appeal, MEIC charges that DEQ's approval of SPE Amendment No. 3 violates the requirements of MSUMRA. The issuance of the permit is supported by the Written Findings, information provided in the application, including the PHC, and other information available to DEQ. All information, analyses, determination and conclusions by DEQ regarding impacts from activities described in the Amendment No. 3

> application on water quality are set forth in those documents. These documents speak for themselves and specifically address the likelihood that groundwater with significantly higher TDS than normal condition will transport outside the life of mine boundary. To the extent that Interrogatory No. 1 calls on DEQ to speculate beyond information, analyses, determinations, and conclusions set forth in the documents described in this Answer, DEQ is unable to do so.

Id.

52. MEIC further asked DEQ to "state whether, regardless of whether the mine gate roads remain intact, groundwater from within the mine will migrate downgradient to areas beyond the mine permit boundary at some point in the future." *Id.* at 21.

53. DEQ again limited its response to the administrative record at the time of its permitting decision, stating that all relevant information was in the permitting documents and that the agency was "unable" to "speculate beyond the information, analyses, determinations, and conclusions" in those documents. *Id.*

54. MEIC asked DEQ to state "when, in DEQ's estimation, water in the mine void will cease to have elevated levels of total dissolved solids, sulfate, and specific conductance." *Id.*

55. DEQ again limited its response to citing information in the administrative record at the time of the agency's permitting decision. DEQ stated that "[a]ll information, analyses, determination, and conclusion by DEQ regarding impacts" from the mine expansion "are set forth in those documents" and that the agency was "unable" to "speculate" beyond that information. *Id.* at 22.

56. On April 1, 2014, MEIC moved to amend its appeal to join the Sierra Club as a co-appellant. Appellant Mont. Envtl. Info. Ctr.'s Mot. to Amend and Join Sierra Club as Co-Appellant and Br. in Spt. (Apr. 1, 2014). DEQ did not oppose the motion, but SPE did. *Id.* at 2. The Board will deny that motion as moot.

57. On April 11, 2014, MEIC moved for summary judgment. DEQ filed a response brief. SPE filed a response and cross-motion for summary judgment. MEIC filed a reply. DEQ filed a surreply. SPE filed a reply in support of its motion for summary judgment. MEIC then filed a surreply.

58. On July 31, 2015, the Board heard oral arguments from the parties on the competing motions for summary judgment and ordered the parties to submit proposed findings of fact and conclusions of law by September 11, 2015. Contested Case Hrg. Or. (July 29, 2015).

59. The Board finds that there are no genuine issues of material fact and that resolution of this matter is appropriate via summary judgment, based on the undisputed record evidence presented by the parties.

CONCLUSIONS OF LAW

Having adopted the findings of fact set out above, the Board makes the following conclusions of law based on the rationale set out in the transcript of proceedings before it on December 4, 2015, a copy of which is attached hereto as Exhibit A, and which is incorporated herein by reference.

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Standard of Review

60. The Board may, in its discretion, rely entirely on the record before it or receive additional evidence on such matters as it may deem appropriate. *Mont. Envtl. Info. Ctr. v. DEQ*, 2005 MT 96, ¶¶ 18, 26, 326 Mont. 502, 112 P.3d 964.

61. Under the Montana Strip and Underground Mine Reclamation Act (MSUMRA), any person adversely affected by DEQ's approval of an application to increase a mine's permit area "may request a hearing before the board." Mont. Code Ann. § 82-4-206(1)(c). "The contested case provisions of the Montana Administrative Procedure Act, Title 2, chapter 4, part 6, apply to a hearing before the board under subsection (1)." *Id.* § 82-4-206(2).

62. Under MSUMRA, DEQ must withhold approval of a permit application unless and until the applicant demonstrates and DEQ finds in writing that the "proposed operation of the mining operation has been designed to prevent material damage to the hydrologic balance outside the permit area." Mont. Code Ann. § 82-4-227(3)(a). This analysis must be set forth in writing in a cumulative hydrologic impact assessment (CHIA). ARM 17.24.314(5). By law, the CHIA, itself, "must be sufficient to determine, for purposes of a permit decision, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area." *Id.*

63. Summary judgment is proper when the available evidence shows that "there is no general issue as to any material fact and that the movant is entitled to judgment as a matter of law." M.R.Civ.P. 56(c)(3). Summary Judgment procedures

may be used in contested cases under MAPA when the case satisfies the requirements of M.R.Civ.P. 56. In re Peila, 249 Mont. 272, 280, 815 P.2d 139, 144-145 (1991).

64. In their briefs and statements at oral argument, the parties agree that there are no disputed issues of fact and that all relevant facts are those compiled in the administrative record when DEQ's approved SPE's application, including the PHC, Groundwater Model, CHIA, and 2013 EA. Consequently, all parties agree that this matter is appropriate for resolution by summary judgment.

65. DEQ and SPE contend that DEQ should be permitted to support the adequacy of its CHIA and permitting decision with extra-record evidence, as well as with arguments and analyses that were never articulated in the CHIA. As support for its position, DEQ cites *Montana Environmental Information Center v. DEQ*, 2005 MT 96, 326 Mont. 502, 112 P.3d 964, and Mont. Code Ann. § 2-4-623(1).

66. Under MSUMRA, DEQ's CHIA alone "must be sufficient to determine, for purposes of a permit decision, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area." ARM 17.24.314(5). Thus, the only relevant analysis is that contained within the four corners of the CHIA and the only relevant facts are those concluded by the agency in the permitting process before the agency makes its permitting decision.

67. Further support for the Board's conclusion is found in ARM 17.24.405(6), which requires DEQ issue written findings based on record evidence to support its permitting decision. The written findings must be shared with the interested public. *Id.* 17.24.405(5). These provisions, which require DEQ to provide specific

reasons for its permitting decision (including those in the CHIA) based on evidence "compiled by the department," would be rendered a dead letter or hollow formality if, in a contested case proceeding, DEQ were permitted to present all new evidence, analysis, and argument to support its permitting decision that was never compiled in the record, articulated in its CHIA, or made available to the public. Mont. Code Ann. § 1-2-101 (laws should not be construed in a way that renders other provisions meaningless); *see* also *NRDC v. OSM*, 89 I.B.L.A. 1, 29 (1985) ("The recitation of statutory findings is insufficient if the permit record does not affirmatively demonstrate that OSM [U.S. Office of Surface Mining] made a [CHIA] of all anticipated mining in the area and the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area."); *Id.* at 32 (stating that only the regulatory authority's CHIA may satisfy the CHIA requirement).

68. Allowing DEQ to present new evidence, analysis, and argument to support its CHIA and permitting decision would also negate MSUMRA's goals of public participation. As noted, DEQ must provide the interested public with written findings based on record evidence demonstrating, among other things, that "cumulative hydrologic impacts will not result in material damage to the hydrologic balance outside the permit area." ARM 17.24.405(5), (6)(c). These provisions allow the public to oversee DEQ's permitting decision and decide, in turn, whether to pursue an appeal and contested case. *Id.* 17.24.425(1). The public's ability to rely on DEQ's express written findings and analysis supporting its permitting decision is for naught if at the contested case stage, the agency is permitted to present extra-record evidence and manufacture

novel analysis and argument. *See Friends of the Wild Swan v. DNRC*, 2000 MT 209, ¶ 35, 301 Mont. 1, 6 P.3d 972 ("The public is not benefited by reviewing an EIS [environmental impact statement] which does not explicitly set forth the actual cumulative impacts analysis and the facts which form the basis for the analysis."); cf. *NRDC*, 89 I.B.L.A. at 96-97 (Frazier, Admin. J, concurring) ("Like an environmental impact statement (and for similar reasons), the [CHIA] must 'explain fully its course of inquiry, analysis, and reasoning,' . . . ." (quoting *Minn. Pub. Interest Research Group v. Butz*, 541 F.2d 1292, 1299-300 (9th Cir. 1976))). In effect, DEQ's position would allow the agency to conceal its actual analysis and evidence until a member of the public makes the significant investment necessary to engage in extensive litigation in a contested case proceeding with the agency.

69. The Board notes that while DEQ asserts the right to provide new evidence, analysis, and argument to support its CHIA, in response to MEIC's discovery requests about the persistence and expected extent of groundwater pollution, DEQ repeatedly stated that the relevant information was limited to the administrative record existing at the time of the permitting decision and that DEQ was "unable" to provide any information about anticipated groundwater pollution impacts beyond that contained in the record documents. DEQ Discovery Resp. at 20-22. If, as DEQ asserted in its discovery responses, the only relevant evidence is that contained in the permitting record, then extra-record evidence and novel analyses are also not relevant to the determination of the validity of DEQ's CHIA.

70. This is not to say that DEQ is limited in its permitting defense to presenting the administrative record to the Board and saying no more. DEQ's counsel may surely present argument to explain and demonstrate that the evidence before the agency at the time of its permitting decision and the analysis within the CHIA satisfy applicable legal standards. What the agency may not do is present newly developed evidence that was not before the agency at the time of its decision or analysis that was not contained within the CHIA. *See* ARM 17.24.314(5) (stating that the CHIA "must be sufficient" for the material damage determination); *Id.* 17.24.405(6)(c) (stating that the permitting decision must be based on findings "on the basis of information set forth in the application or information otherwise available that is compiled by the department").

Statutory and Regulatory Background

71. Strip and underground coal mining is governed nationally by the Surface Mining Control and Reclamation Act (SMCRA), 30 U.S.C. §§ 1201-1328. Congress enacted SMCRA in response to widespread social and environmental abuse from the coal mining industry. *Id.* § 1201(c), (h), (k); e.g., *Hodel v. Va. Surface Mining & Reclamation Ass'n, Inc.*, 452 U.S. 264, 277-80 (1981). Prior to the enactment of SMCRA, individual states had proven unwilling or unable to police the coal mining industry to prevent such abuse. *In re Permanent Surface Mining Regulation Litig. (In re Permanent)*, 653 F.2d 514, 520 (D.C. Cir. 1981); Hodel, 452 U.S. at 280; John D. Edgcomb, Comment, Cooperative Federalism and Environmental Protection: The

Surface Mining Control and Reclamation Act of 1977, 58 Tulane L. Rev. 299, 305-11 (1983).

72. The principal purpose of SMCRA is to "protect society and the environment from the adverse effects of surface coal mining." 30 U.S.C. § 1202(a). Under SMCRA, "[s]urface mining" includes "surface impacts incident to an underground coal mine." *Id.* § 1291(28)(A).

73. SMCRA establishes a system of cooperative-federalism in which states can assume responsibility for day-to-day regulation of coal mining operations, subject to federal oversight. *See In re Permanent*, 653 F.2d at 521 ("[C]ongress was not interested in perpetuating the existing tradition of state mining regulation, and . . . Congress saw the need for both federal standards and federal oversight to guarantee an effective change.").

74. Under SMCRA, the U.S. Secretary of the Interior may grant a state regulatory authority over coal mining if the state establishes and demonstrates that it has the capacity to implement a program that meets minimum federal requirements. 30 U.S.C. § 1253(a)-(b). States are free to develop standards that exceed the minimum requirements of SMCRA. *Id.* § 1255(b). The State of Montana oversees an approved state regulatory program, though it remains subject to continuing federal oversight. *See* generally 30 C.F.R. Part 926.

75. As a safeguard against ineffective state regulation of coal mining operations, SMCRA contains important provisions for federal oversight and citizen participation in permitting decisions and enforcement. *In re Permanent*, 653 F.2d at

520-21; 30 U.S.C. §§ 1254(a)-(b), 1267(a), 1270(a)(2), 1271(a)-(b), 1276(e). Citizens are entitled to inspect permit applications, object to permit applications, administratively appeal permitting decisions, seek judicial review of administrative decisions, and bring citizen suits in state or federal court against state regulatory authorities and mine operators. 30 U.S.C. §§ 1257(e), 1263(b), 1264(c), (f), 1270(a), 1276(a)(2), (e).

76. A central purpose of SMCRA is to protect water resources from coal mine development. *Id.* § 1201(c). Citizens may petition regulators for a blanket prohibition of coal mining that affects "aquifers and aquifer recharge areas" where mining will cause "substantial loss or reduction of long-range productivity of water supply." *Id.* § 1272(a)(3)(C) (emphasis added).

77. On lands where coal mining has not been prohibited outright, multiple provisions of SMCRA assure that mining may not proceed if it will cause undue damage to water resources. Any application for mining must include extensive and detailed information about the "hydrologic regime," including surface and groundwater that may be affected. *Id.* § 1257(b)(10)-(11). This information must be made available for public inspection. *Id.* § 1257(e).

78. The regulatory authority is prohibited from approving any mine permit application unless the "application affirmatively demonstrates" and the "regulatory authority finds in writing" that "the proposed operation . . . has been designed to prevent material damage to [the] hydrologic balance outside [the] permit area." *Id.* 1260(b)(3).

79. Under Montana's delegated program, DEQ regulates coal mining pursuant to the provisions of MSUMRA, Mont. Code Ann. §§ 82-4-201 to -254, and its implementing regulations ARM 17.24.301 to 1309. DEQ's regulation of coal mining is also subject to Montana's constitutional environmental protections. Mont. Code Ann. § 82-4-202(1); Mont. Const. art. II, § 3, art. IX, §§ 1-3.

80. Like SMCRA, MSUMRA requires DEQ to withhold approval of a mining permit application unless the applicant "affirmatively demonstrates" and the agency determines in writing based on record evidence that "the mining operation has been designed to prevent material damage to the hydrologic balance outside the permit area." Mont. Code Ann. § 82-4-227(3)(a); ARM 17.24.405(6) (agency may not issue permit unless and until agency finds in writing based on record evidence that the "cumulative hydrologic impacts will not result in material damage to the hydrologic balance outside the permit area").

81. In making any decision on a permit application, DEQ must prepare a cumulative hydrologic impact assessment, or "CHIA." ARM 17.24.314(5). The CHIA "must be sufficient to determine, for purposes of a permit decision, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area." *Id.*

82. MSUMRA defines "material damage":

> "Material damage" means, with respect to the protection of the hydrologic balance, degradation or reduction by coal mining and reclamation operations of the quality and quantity of water outside of the permit area in a manner or to an extent that land uses or beneficial uses of water are adversely affected, water quality standards are violated, or water rights

> are impacted. Violation of a water quality standard, whether or not an existing use is affected, is material damage.

Mont. Code Ann. § 82-4-203(31) (emphasis added).

83. The U.S. Secretary of the Interior struck down amendments to MSUMRA by the 2003 Montana Legislature that attempted to limit consideration of impacts on water resources to only those impacts that would affect "uses of land and water within the area affected by mining and the adjacent area." 70 Fed. Reg. 8002, 8004-05 (Feb. 16, 2005).

DEQ's CHIA Employed an Incorrect Material Damage Standard

84. As a matter of law, DEQ's CHIA employed an incorrect legal standard in its material damage assessment and determination. Thus, the CHIA was not "sufficient to determine . . . whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area." ARM 17.24.314(5).

85. MSUMRA specifically requires DEQ to assess whether a proposed mining operation has been designed to prevent material damage to the hydrologic balance outside the permit area. Mont. Code Ann. § 82-4-227(3)(a); ARM 17.24.314(5), 405(6)(c). Material damage is statutorily defined to include "[v]iolation of a water quality standard, whether or not an existing use is affected." Mont. Code Ann. § 82-4-203(31).

86. The material damage assessment and determination in DEQ's CHIA failed entirely to assess whether the proposed mining operation will cause violation of water quality standards outside the permit area. Instead, the CHIA determined that no material damage was expected because "any degradation of groundwater quality is not

expected to render groundwaters unsuitable for current or anticipated use." CHIA at 10-4.

87. DEQ's material damage assessment and determination failed to address either the threshold or limit for material damage to groundwater quality that the CHIA itself laid out in Table 2-1. *Id.* tbl. 2-1. The material damage determination failed to assess, as a threshold, whether there may be any "persistent or long-term change in water quality within the permit area" that "is approaching or commonly exceed[ing] narrative or numeric limits" and "may be expected to extend to areas outside the permit area with time." Compare *Id.* tbl. 2-1, with *Id.* at 10-4. The CHIA's material damage assessment did not address the limit of whether "violation of water quality standard [would occur] outside the permit area." Compare *Id.* tbl. 2-1, with *Id.* at 10-4.

88. The CHIA's complete failure to address applicable water quality standards when making the material damage assessment and determination was unlawful and in violation of Mont. Code Ann. §§ 82-4-203(31), 227(3)(a), and ARM 17.24.314(5), 405(6)(c). *See NRDC v. OSM*, 89 I.B.L.A. at 28-33 (finding CHIA unlawful because it failed to adequately address impacts to groundwater).

89. DEQ contends that the standard employed in the material damage assessment and determination in the CHIA—that no material damage is expected because "any degradation of groundwater quality is not expected to render groundwaters unsuitable for current or anticipated use," CHIA at 10-4—is equivalent to applicable narrative and nondegradation standards for salinity, which, DEQ contends, is the "sole parameter of concern." DEQ Resp. Br. at 29-31 (May 30, 2014).

90. DEQ's argument is mistaken. First, DEQ is wrong that MEIC's sole concern is with DEQ's failure to consider potential water quality violations of narrative and nondegradation standards for salinity. MEIC's appeal raised two separate claims: first, that DEQ's material damage assessment "employed the incorrect legal standard" and, second, that record evidence did not support DEQ's conclusion that the mine expansion was "designed to prevent material damage to the hydrologic balance." DEQ Ex. B at 1. While MEIC's second claim focused on salinity pollution, MEIC Opening Br. at 24-30 (Apr. 11, 2014), its first claim addressed DEQ's failure "to address potential violations of water quality standards" in general, *Id.* at 20-24.

91. Second, the material damage standard employed in the CHIA's material damage assessment and determination was not equivalent to any of the water quality standards applicable to Class II groundwater.

92. Administrative Rules of Montana establish three general water quality standards applicable to Class II groundwater:

> Except as provided in ARM 17.30.1005(2), a person may not cause a violation of the following specific water quality standards for Class II ground water:
>
> (i) the human health standards for ground water listed in DEQ-7;
>
> (ii) for concentrations of parameters for which human health standards are not listed in DEQ-7, no increase of a parameter to a level that renders the waters harmful, detrimental, or injurious to the beneficial uses listed for Class II water. . . .
>
> (iii) no increase of a parameter that causes a violation of the nondegradation provisions of 75-5-303, MCA.

ARM 17.30.1006(2)(b).

DEQ's CHIA Failed to Address Numeric Water Quality Standards.

93. The CHIA's material damage assessment and determination failed to address the numeric standard set forth in ARM 17.30.1006(2)(b)(i); that is, whether ground water pollution from the mine would violate the human health standards listed in DEQ-7. Cf. CHIA at 10-4. DEQ attempts to excuse this failure by asserting that numeric standards are not of concern because groundwater monitoring wells have not detected any exceedances of numeric standards. DEQ Surreply at 3-4 (July 30, 2014). The CHIA, however, refutes DEQ's argument: "No exceedances of DEQ-7 standards were observed in any of the Mammoth Coal wells. Because mine dewatering produces groundwater flow towards the mine workings during mining, no water quality effects are expected during mining." CHIA at 9-11 (emphasis added). The absence of exceedances in groundwater monitoring wells is not because there is no potential for such exceedances. Instead, as the CHIA clarifies, it is because at present groundwater is flowing "towards the mine working[s]." Only after mining ceases will "degraded" gob water from the mine workings begin to flow away from the mine. *Id.* at 9-11, -13; PHC 314-5-53, -56 to -58, -63 to -64; Groundwater Model 314-6-22 to -24.

DEQ's CHIA Failed to Address Narrative Water Quality Standards.

94. The standard applied by the CHIA—"not expected to render groundwaters unsuitable for current or anticipated use," CHIA at 10-4—is not equivalent to the narrative standard for Class II groundwater. The narrative standard for Class II groundwater prohibits increases in pollution that "render the waters

harmful, detrimental, or injurious to the beneficial uses of Class II water." ARM 17.30.1006(2)(b)(ii). The beneficial uses of Class II groundwater include:

(i) public and private water supplies;

(ii) culinary and food processing purposes;

(iii) irrigation of some agricultural crops;

(iv) drinking water for most livestock and wildlife; and

(v) most commercial and industrial purposes.

ARM 17.30.1006(2)(a). The CHIA's material damage assessment does not address each beneficial use of Class II water. Cf. CHIA 10-4. The only current and anticipated uses identified by the CHIA were "livestock and domestic use." *Id.* at 2-4. "[C]urrent and anticipated use" is a narrower category than "beneficial uses" and is, therefore, less protective. The standard employed for the CHIA's material damage assessment and determination was not equivalent to the narrative water quality standard applicable to Class II groundwater.

95. The CHIA and record evidence indicate the potential for groundwater outside the permit area to degrade from Class II to Class III. *See* infra Part D. The beneficial uses of Class III groundwater include:

(i) irrigation of some salt tolerant crops;

(ii) some commercial and industrial purposes;

(iii) drinking water for some livestock and wildlife; and

(iv) drinking, culinary, and food processing purposes where the specific conductance is less than 7,000 microSiemens/cm at 25°C.

ARM 17.30.1006(3)(a) (emphasis added). Degradation of groundwater from Class II to Class III either eliminates or limits each designated beneficial use. Compare ARM 17.30.1006(2)(a), with ARM 17.30.1006(3)(a). Pollution that eliminates or curtails a beneficial use is "harmful, detrimental, or injurious" to that beneficial use and therefore violates the narrative standard for Class II groundwater. *See* ARM 17.30.1006(2)(b)(ii).

96. DEQ contends that potential degradation of groundwater from Class II to Class III would not violate the narrative water quality standard because the uses that would be eliminated—water supply and irrigation—are "not feasible" due to the "low transmissivity" of the Mammoth Coal aquifer. DEQ Resp. Br. at 31-32, 35. The Board disagrees.

97. First, DEQ's argument, which focuses exclusively on uses that are eliminated, does not account for those uses of Class II water that, while not eliminated, are limited if the water is degraded to Class III. Class II groundwater may be used as drinking water for "most livestock and wildlife," but Class III groundwater may only be used as drinking water for "some livestock and wildlife." Compare ARM 17.30.1006(2)(a)(iv), with *id.* 17.30.1006(3)(a)(iii). Class II groundwater may be used for "most commercial and industrial purposes," but Class III groundwater may only be used for "some commercial and industrial purposes." Compare *id.* 17.30.1006(2)(a)(v), with *id.* 17.30.1006(3)(a)(ii). Thus, degradation from Class II to Class III may be "harmful, detrimental, or injurious" to some beneficial uses, even when it does not eliminate those uses altogether.

98. Second, DEQ's argument about eliminated uses is unsupported by the law or the facts. As a matter of law, there is no "feasibility" exception to the narrative water quality standards for Class II groundwater. Regulations create a narrow exception to water quality standards for groundwater with low hydraulic conductivity, ARM 17.30.1006(5), but that exception is only for Class III and Class IV groundwater and it is only for groundwater with a hydraulic conductivity of less than 0.1 feet per day. Because most groundwater in the Mammoth Coal aquifer is Class II groundwater with a hydraulic conductivity of 0.16 feet per day, CHIA at 8.5 & tbl. 8-5; 2013 EA at 7, the narrow exception does not apply. The regulations' express recognition of this narrow exception precludes an adjudicative body or court from implying any additional exceptions. *Hillman v. Maretta*, 133 S. Ct. 1943, 1953 (2013); *Omimex Canada, Ltd. v. State*, 2008 MT 403, ¶ 25, 347 Mont. 176, 201 P.3d 3.

99. Further, there is no evidence in the record that groundwater from the Mammoth Coal aquifer is not capable of being used for irrigation or public or private water supply. The only citation offered by DEQ regarding irrigation says nothing about the suitability of the Mammoth Coal aquifer for irrigation. Cf. DEQ Resp. Br. at 31, ¶ 99 (citing CHIA 8-5); *see* CHIA at 8-5 (noting low hydraulic conductivity of Mammoth Coal aquifer and stating that only a "few production wells are completed in the coal").

100. Nor does the record compiled by DEQ demonstrate that the Mammoth Coal aquifer is not suitable for public or private water supplies due to its low hydraulic conductivity. In the arid Bull Mountains, the Mammoth Coal aquifer is an important

source of water. Its geometric mean hydraulic conductivity is an order of magnitude higher than the overburden and the underburden. CHIA 8-5 & tbl. 8-5. Some of the highest yielding wells and springs are sourced in the Mammoth Coal aquifer, including one spring (spring 53475) yielding nearly 10 gpm. *Id.* tbl. 6-1 (well 19944) and tbl. 8-1 (springs 53455, 53485, 53475). Domestic wells also tap the Mammoth Coal aquifer. PHC at 314-5-12 (stating that "a few domestic wells tap the Mammoth Coal as a water supply"); CHIA at 8-5 (noting that a "few production wells are completed in the coal") and tbl. 6-1 (identifying domestic wells 168805 and 167885 drawing water in part from Mammoth Coal aquifer). The Board notes that a pumping rate of 6 gpm is sufficient for SPE's public water supply well (sourced in the deep underburden). PHC at 314-5-34. No evidence shows that the Mammoth Coal aquifer cannot produce a similar yield.

101. While the CHIA states that the hydraulic conductivity of the Mammoth Coal aquifer is "typically inadequate to provide a reliable source of well water," it acknowledges that a "few production wells are completed in the coal." CHIA at 8-5 (emphasis added); accord PHC at 314-5-12. Nor is it significant that no wells produce water solely from the Mammoth Coal aquifer. DEQ Surreply at 5. That does not mean that it is not possible for wells to produce water solely from the Mammoth Coal aquifer. Numerous springs, including high yielding springs, are sourced in the Mammoth Coal aquifer. CHIA tbl. 8-1. While existing wells in the Mammoth Coal aquifer may also draw water from the overburden or the upper underburden, *Id.* tbl. 6-1, post-mining water pollution is expected to affect both the upper underburden and the fractured zone above the mine void, CHIA at 9-12 to -13; PHC at 314-5-47. In sum, no evidence in

the record demonstrates that the Mammoth Coal aquifer could not feasibly be a source of irrigation, or public or private water supplies.

102. DEQ contends that the CHIA's failure to consider all beneficial uses was justified because "the provisions of MSUMRA that protect the hydrologic balance must be construed to require only reasonable and feasible constraints on coal mine operations." DEQ Resp. Br. at 35. At oral argument, counsel for DEQ went further, averring that the hydrologic protections of MSUMRA may not be construed in a manner that would prevent DEQ from permitting a coal mining operation. The Board disagrees.

103. As support for its position, DEQ cites Mont. Code Ann. § 82-4-231(10)(k), and a sentence of SMCRA's legislative history. Montana Code Annotated § 82-4-231(10)(k), establishes a performance standard by which a coal mine operator must "minimize disturbances to the prevailing hydrologic balance at the mine site and in adjacent areas." *Id.* (emphasis added). But an operator's duty to minimize disturbance to the hydrologic balance does not alter DEQ's duty to withhold a permit in the first instance unless and until the applicant demonstrates and the record shows that the "operation has been designed to prevent material damage to the hydrologic balance outside the permit area." *Id.* § 82-4-227(3)(a) (emphasis added). "Prevent" does not mean "minimize." The Board must honor the legislative decision to use "prevent," not "minimize," in Mont Code Ann. § 82-4-227(3)(a). *See* SEC v. McCarthy, 322 F.3d 650, 656 (9th Cir. 2003) ("[T]he use of different words or terms within a statute demonstrates that Congress intended to convey a different meaning to those words.").

This accords with the U.S. Office of Surface Mining's (OSM) original understanding of the identical language from the federal statute, SMCRA. 48 Fed. Reg. 43956, 43965 (Sept. 26, 1983) (stating that the hydrologic protection plan's goal is "to minimize disturbance to the hydrologic balance in the permit area and adjacent area, and to prevent material damage outside the permit area" (emphasis added)).

104. DEQ also cites a sentence of legislative history that reads: "The total prevention of adverse hydrologic effects from mining is impossible and thus the bill sets attainable standards to protect the hydrologic balance of impacted areas within limits of feasibility." H.R. Rep. No. 95-218, at 110 (1977), cited in DEQ Resp. Br. at 33. But the next sentence of the report clarifies that the "imperative" provisions of SMCRA (like 30 U.S.C. § 1260(b)(3) and the Montana equivalent at § 82-4-227(3)(a)) may preclude mining altogether in certain critical and hydrologically fragile areas to prevent irreparable damage: "For most critical areas [and] [in] certain fragile hydrologic settings, the bill sets standards that are imperative to begin to assure that adverse impacts to the hydrologic balance are not irreparable." H.R. Rep. No. 95-218, at 110 (1977) (emphasis added); *see* also 30 U.S.C. § 1272(a)(2) (prohibiting coal mining in areas where full reclamation is not feasible); *Id.* § 1260(b)(5) (prohibiting coal mining in alluvial valley floors); § 1272(a)(3)(C) (allowing blanket prohibition of mining in hydrologically fragile areas, such as aquifer recharge areas).

105. Contrary to DEQ's position, MSUMRA (like SMCRA) requires "the adjustment of [a mining] operation to the environmental protection standards rather than the opposite." H.R. Rep. No. 95-218, at 115. The drafters of SMCRA "rejected

the notion that the standards should be adjusted to what individual mine operators state they can or cannot afford." *Id.*; accord S. Rep. No. 95-128, at 51-52 (1977) (noting that pre-SMCRA laws were "inadequate" because "they [were] tailored to suit ongoing mining practices, rather than requiring modification of mining practices to meet established environmental standards"). If a mining operation cannot meet mandatory legal standards, the DEQ's legal duty is to deny approval of the mining operation unless and until the mining operation can be adjusted to meet the standard. Mont. Code Ann. § 82-4-227(3)(a). DEQ may not adjust the law to allow a mining operation to proceed.

DEQ's CHIA Failed to Address Nondegradation Water Quality Standards.

106. Contrary to DEQ's assertion, the standard applied in the CHIA's material damage assessment and determination was not equivalent to the nondegradation standard for salinity.

107. The nondegradation standard for Class II groundwater prohibits increases in any parameter that would cause "a violation of the nondegradation provisions of 75-5-303, MCA." ARM 17.30.1006(2)(b)(iii). Under the administrative regulations implementing the nondegradation provisions of Mont. Code Ann. § 75-5-303, a change in groundwater quality is deemed insignificant and, therefore, exempt from further nondegradation review if it meets criteria set forth in ARM 17.30.715(1)-(2). Mont. Code Ann. § 75-5-301(5)(c).

108. An increase in concentration of salinity may be deemed insignificant if it satisfies the initial criteria of ARM 17.30.715(1)(h). However, before making any nonsignificance determination, DEQ must also consider whether an increase in salinity

that otherwise satisfies the criteria of ARM 17.30.715(1)(h) should nevertheless be deemed significant and thus subject to further nondegradation review on the basis of various factors set forth in ARM 17.30.715(2). *Clark Fork Coal. v. DEQ*, 2008 MT 407, ¶ 43, 347 Mont. 197, 197 P.3d 482. One relevant consideration under ARM 17.30.715(2) is whether the pollution at issue will continue in perpetuity. Mont. Code Ann. § 75-5-301(5)(c)(iii) (nondegradation must consider "the length of time degradation will occur"); *Clark Fork Coal.*, ¶¶ 43, 49 (holding DEQ violated nondegradation standard when it failed to undertake "an independent examination of the length of time the proposed discharge of polluted water will continue" under ARM 17.30.715(2)).

109. Under ARM 17.30.715(1)(h), an increase in salinity may be deemed insignificant if it "will not have a measurable effect on any existing or anticipated use or cause measurable changes in aquatic life or ecological integrity." ARM 17.30.715(1)(h) (emphasis added). As noted, the CHIA determined that material damage was not expected to occur because "any degradation of groundwater quality is not expected to render groundwaters unsuitable for current or anticipated use." CHIA at 10-4 (emphasis added). The standard employed in the material damage determination of the CHIA is less stringent than the nonsignificance nondegradation standard. Thus, the standard employed in the CHIA was not equivalent to the nondegradation water quality standard for Class II water.

110. Further, even if the standard employed in the CHIA were equivalent to the standard in ARM 17.30.715(1)(h), DEQ would still have been required to consider

the discretionary factors set forth in ARM 17.30.715(2), including the length of time that degradation will occur. Mont. Code Ann. § 75-5-301(5)(c)(iii); *Clark Fork Coal.*, ¶¶ 43, 49. The CHIA nowhere examines the length of time that polluted water will continue to migrate from the mine void after the cessation of mining, beyond the arbitrary 50-year horizon established in the Groundwater Model. Cf. CHIA 9-11, 10-4. Indeed, in its responses to MEIC's specific discovery requests, DEQ asserted that it was "unable" to "speculate" on how long the water in the mine void would continue to degrade or how long the degraded water would continue to migrate away from the mine. DEQ Discovery Resp. at 20-23.

111. The CHIA's material damage assessment and determination was not equivalent to the nondegradation standard for Class II groundwater because it did not assess whether changes in salinity concentrations would have a "measurable effect" on existing and anticipated uses as required by ARM 17.30.715(1)(h) and because the analysis did not consider the discretionary factors of ARM 17.30.715(2), including specifically the length of time that the degraded water would continue to migrate from the mine. *Clark Fork Coal.*, ¶ 49.

112. In sum, the CHIA's material damage assessment and determination failed to address whether the proposed mining operation would cause violation of water quality standards outside the permit boundary. As such, it was insufficient as a matter of law.

Record Evidence Does Not Affirmatively Demonstrate that the Proposed Operation Was Designed to Prevent Material Damage to the Hydrologic Balance Outside the Permit Area.

113. Section 82-4-227(3)(a), MCA, provides:

> The department may not approve an application for a strip- or underground-coal-mining permit or major revision unless the application affirmatively demonstrates that:
>
> (a) the assessment of the probable cumulative impact of all anticipated mining in the area on the hydrologic balance has been made by the department and the proposed operation of the mining operation has been designed to prevent material damage to the hydrologic balance outside the permit area . . . .

114. The implementing regulation, ARM 17.24.405(6)(c), provides:

> The department may not approve an application submitted pursuant to ARM 17.24.401(1) unless the application affirmatively demonstrates and the department's written findings confirm, on the basis of information set forth in the application or information otherwise available that is compiled by the department, that:
>
> . . .
>
> (c) the hydrologic consequences and cumulative hydrologic impacts will not result in material damage to the hydrologic balance outside the permit area; . . . .

115. By law the burden of proof in the permitting process rests with the mine applicant and DEQ to demonstrate with record evidence that material damage will not result. Mont. Code Ann. § 82-4-227(3)(a); ARM 17.24.405(6)(c).

116. Here, SPE's application and the record before DEQ showed only that the proposed operation may or may not be designed to prevent material damage to the hydrologic balance outside the permit area within 50 years after mining. This showing

does not constitute affirmative evidence that the "cumulative hydrologic consequences will not result in material damage to the hydrologic balance outside the permit area." ARM 17.24.405(6)(c) (emphasis added).

117. The record demonstrates that at present the groundwater in the Mammoth Coal aquifer is predominantly high-quality Class II water. 2013 EA at 7 (average specific conductance is 2,272 microSiemens/cm); CHIA at 8-5 ("[W]ater from most Mammoth Coal wells is Class II groundwater."); 1992 EIS at III-18 (groundwater in mine area is Class II). DEQ and SPE agree that after the cessation of mining the gob water in the mine void will degrade from Class II to Class III. CHIA at 10-2 to -3; 2013 EA at 7; PHC at 314-5-52; accord *Id.* 314-5-48 to -50.

118. Because degradation of high-quality Class II groundwater to low-quality Class III groundwater eliminates some beneficial uses and limits others, it violates the narrative water quality standard of ARM 17.30.1006(2)(b)(ii) (prohibiting increase in any parameter that "renders the waters harmful, detrimental, or injurious" to beneficial uses); compare *Id.* 17.30.1006(2)(a) (beneficial uses of Class II groundwater), with *id.* 17.30.1006(3)(a) (beneficial uses of Class III groundwater).

119. The only analysis that considered migration of the plume of polluted gob water beyond the mine permit boundary was the Ground Water Model. The Groundwater Model conducted a particle tracking evaluation under two scenarios, one in which the gate roads collapse and one in which they remain intact. Groundwater Model at 23-26. Neither the Groundwater Model, the PHC, nor the CHIA stated that either scenario was more likely than the other. *See* PHC at 314-5-54 ("Presently, the

mine gate roads have tended to remain relatively intact. . . . It may well be that some gate roads remain intact and yet others collapse into the future."); CHIA at 10-2 ("After the conclusion of mining, the gate roads may remain intact or may collapse . . . ."); Groundwater Model at 314-6-23 (expressing uncertainty about whether gate roads will collapse).

120. Using a 50-year timeframe, the particle tracking evaluation determined that in Scenario 2, in which the gate roads remain intact, the degraded gob water will migrate beyond the mine permit boundary in numerous locations. Groundwater Model at 314-6-26 & fig. 14M (lower frame). In Scenario 1, in which the gate roads collapse, the gob water would migrate more slowly, traveling approximately half the distance it would in Scenario 2. Groundwater Model at 314-6-25 & fig. 14M (upper frame); 2013 EA at 7-8. In Scenario 1, the degrade gob water would migrate towards, but would not pass, the mine permit boundary within 50 years. Groundwater Model at 314-6-25 and fig. 14M (upper frame).

121. The record evidence presented by SPE in the Groundwater Model and the other evidence before DEQ at the time of its decision demonstrated only that it was as likely as not that that degraded water that violates water quality standards would migrate beyond the mine permit boundary within 50 years. The lack of any likelihood or defensible level of confidence that material damage will not result does not constitute an affirmative demonstration of record evidence that the expansion of the Bull Mountain Mine is designed to prevent material damage to the hydrologic balance outside the permit area. Cf. Mont. Code Ann. § 82-4-227(3)(a); ARM 17.24.314(5);

ARM 17.24.405(6)(c). To approve a coal mining permit, the law requires DEQ to determine that "cumulative hydrologic impacts will not result in material damage to the hydrologic balance outside the permit area." ARM 17.24.405(6)(c) (emphasis added).

122. In light of the uncertainty surrounding whether the gate roads will remain intact, DEQ's 2013 EA determined that material damage outside the permit area would not occur because of factors that the Groundwater Model had failed to address:

> Because the particle tracking model uses conservative assumptions which increase particle transport rates, the actual distance of movement of lower quality water from the mine pool should be less than these estimates. Particle tracking also does not consider dilution or attenuation of lower quality groundwater which would occur during transport away from the mine. Because of these factors, no degradation of groundwater quality outside the permit area is expected to occur after mining.

2013 EA at 8; *see* also Groundwater Model at 314-6-25 (noting that "particle tracking does not account for potential influence of adsorption/desorption influence of given analytes" and "does not account for the effects of dilution as other contributions to groundwater flow occur"). This analysis does not meet the standard of Mont. Code Ann. § 82-4-227(3)(a), and ARM 17.24.314(5), 405(6)(c). An analysis that is not conducted and evidence that is not presented does not constitute an "affirmative[] demonstrat[ion]" "on the basis of information set forth in the application or information otherwise available that is compiled by the department." ARM 17.24.405(6).

123. In briefing before this Board, DEQ developed various additional arguments. DEQ contends that the evidence before the agency was sufficient to support permit approval because the gob water is not likely to migrate a great distance beyond the mine permit boundary within 50 years and because the pollution impacts would be

limited to the Mammoth Coal aquifer and upper underburden. DEQ Resp. Br. at 37 ("[G]ob water will migrate no further than a few hundred feet outside the permit boundary fifty years after mining . . . ."); *Id.* at 40 ("Contamination by higher salinity water migrating outside the permit area will only affect, if at all, water in the Mammoth Coal, and possibly the upper underburden . . . ."). This argument fails because it is premised on the mistaken belief that Mont. Code Ann. § 82-4-227(3)(a), does not "establish[] a prohibition" but merely requires DEQ to develop "reasonable and feasible measures . . . to minimize potential impacts." DEQ Resp. Br. at 39. As explained above, *see* supra Part C.2, Mont. Code Ann. § 82-4-227(3)(c), employs the term "prevent" and prevent does not mean "minimize," a term used elsewhere in the statute. The express language of the statute allows no exception for small amounts of material damage that harm only one, potentially two, aquifers.

124. DEQ argues in its briefs that the gob water will not migrate beyond the mine permit boundary because "the gate roads are designed to collapse." DEQ Resp. Br. at 37; DEQ Surreply at 6. DEQ's proposed analysis, however, was not presented in the CHIA or the 2013 EA and, as such, is not properly before the Board. *See* ARM 17.24.314(5) (providing that the CHIA "must be sufficient" for the material damage determination). Both the CHIA and the PHC determined that it was uncertain whether the gate roads would collapse. CHIA at 10-2 (stating that "the gate roads may remain intact or may collapse"); PHC at 314-5-54 (stating that the "mine gate roads have tended to remain intact"); *Id.* at 315-5-64 (acknowledging possibility that the "gate road integrity [may] persist[] far into the future"). As mentioned, the transparency

requirements and the public oversight provisions of MSUMRA would be nullified if, during a contested case proceeding, DEQ could present analyses and arguments that were never articulated in the CHIA or its other written findings. Cf. ARM 17.24.314(5) (CHIA "must be sufficient" for material damage determination); *Id.* 17.24.405(6)(c) (application must "affirmatively demonstrate[]" and DEQ's "written findings" must confirm based on record evidence that "cumulative hydrologic impacts will not result in material damage"); *see* supra Part A.

125. DEQ's argument is also unavailing on the merits. The sole support cited by DEQ is two sentences from an application appendix: "Ground movements should be relatively uniform and subsidence gradual because of the massive sandstone beds. These should concentrate the overburden loads on the gate pillars causing them to crush and lower the surface uniformly." DEQ Ex. K at 3. The CHIA also stated that the gate roads are "designed to . . . yield as the adjacent panel is mine-out." CHIA at 3-2. These statements, however, cannot bear the weight DEQ places on them. First, as SPE pointed out, the actual operation of the mine has disproved the initial engineering prediction: "Presently the gate roads are remaining intact." Groundwater Model at 314-6-23; accord PHC 314-5-54 ("Presently, the mine gate roads have tended to remain intact."). It would be illogical and unreasonable for DEQ to premise its material damage analysis on a design prediction (prompt gate road collapse) that has proven inaccurate. Accordingly, neither SPE's PHC nor DEQ's CHIA premised its material damage analysis on the assumption that the gate roads would promptly collapse and thus prevent degraded water from migrating. Instead, as noted, both SPE and DEQ

stated that the gate roads may or may not collapse and, accordingly, evaluated two scenarios to account for this uncertainty. CHIA at 10-2; PHC at 314-5-54, -64; Groundwater Model 314-6-23 to -26.

126. DEQ's argument about the gate roads also fails because it is premised on the mistaken belief that the material damage determination may be limited to an arbitrary 50-year horizon. The Groundwater Model expressly limits its analysis to 50-years. Groundwater Model at 314-6-25 ("The particle tracking was conducted using a 50 year time frame simulation."). Thus, in the most optimistic scenario in which all gate roads promptly collapse (a scenario that has not happened and that both the CHIA and PHC concluded is uncertain), the Groundwater Model concludes that "groundwater leaving the mine workings is predicted to remain well within the LOM [life of mine] boundary at the end of 50 years." PHC at 314-5-56 (emphasis added). DEQ's CHIA adopted the same temporal limitation, concluding that "this poor quality [gob] water is not expected to migrate outside the permit boundaries within 50 years after mining." CHIA at 9-11. There is no record evidence showing that the degraded gob water will remain within the mine permit boundary over the long term, even if the gate roads promptly collapse. In its discovery responses DEQ refused to "speculate" on whether, in the event of gate road collapse, the gob water would eventually leave the mine permit boundary. DEQ Discovery Resp. at 21.

127. By law, DEQ may not ignore the long-term water pollution impacts of the mine. Montana Code Annotated § 82-4-227(3)(a), does not contain an exception for

material damage outside the permit area that occurs 50 years after mining. The Board declines DEQ's invitation to write such an exception into the law.

128. The legislative history of SMCRA shows that Congress enacted the CHIA provision of the law to prevent "long-term impacts" to water resources. H.R. Rep. No. 95-218, at 113 (1977) ("These specific standards are emphasized at the permit approval stage due to the critical and long-term impacts mining can have on the water resources of the area affected." (emphasis added)); *see* also 30 U.S.C. § 1272(a)(3)(C) (allowing states to prohibit mining in areas if mining could cause "reduction of long-range productivity of water supply" (emphasis added)); accord Mont. Code Ann. § 82-4-228(2)(b)(iii) (same). When OSM promulgated its initial regulations implementing SMCRA's hydrology protections, the federal agency clarified that the time frame for the analysis of impacts to water resources must be coextensive with the time period that such impacts are expected to persist: "[T]he impacts resulting from [mining and reclamation] activities may extend beyond the time required to complete actual mining and reclamation. The predictive analysis in the PHC determination [and, therefore the CHIA] must cover the full extent of such impacts." 48 Fed. Reg. at 43971 (emphasis added). As the Montana Supreme Court has taught and Montana history repeatedly shows, long-term pollution impacts from mining are among the most serious environmental problems, because after a mine closes, "[the mine operator] will be gone, and the polluted discharge will continue and cannot be shut off." *Clark Fork Coal.*, ¶ 44.

129. Indeed, with respect to water quantity, the CHIA determined that the appropriate time frame for analysis was the period 50 years after cessation of mining. The CHIA determined that the impacts of drawdown outside the permit boundary were acceptable because groundwater "will recover to near pre-mining levels approximately 50 years after the cessation of mining." CHIA at 10-2. DEQ cannot have it both ways: if the period after 50 years is appropriate for assessing impacts to water quantity, it must also be appropriate for assessing impacts to water quality. *Nat'l Parks Conservation Ass'n v. EPA*, 788 F.3d 1134, 1145 (9th Cir. 2014) ("inconsistency" of agency analysis is the "hallmark of arbitrary action" (quoting *Sierra Club v. EPA*, 719 F.2d 436, 459 (D.C. Cir. 1983))). In short, there is no basis in law for limiting the material damage assessment and determination to 50 years.

130. DEQ's final argument is that even if the polluted gob water migrates beyond the mine permit boundary, any polluted water could be replaced by water from the deep underburden aquifer. DEQ Resp. Br. at 41-42; DEQ Surreply at 9-10. The Board disagrees.

131. First, DEQ's mitigation argument repeats the CHIA's misunderstanding of material damage to the hydrologic balance. Replacing water supplies polluted by the mining operation only alleviates harm to existing and anticipated water users, but it does not prevent violation of water quality standards. It is violation of water quality standards, regardless of the effect on existing and anticipated water use, that is the standard for material damage. Mont. Code Ann. §§ 82-4-203(31), 227(3)(a); *see* also supra Part C.

132. Second, the proposed mitigation with water from the deep underburden aquifer is illusory, as SPE admitted repeatedly in the record. The Groundwater Model admits that there are multiple physical and legal barriers to the use of the deep underburden aquifer as a source of mitigation water:

> One of the potentially more significant uses that has been proposed is to use this same source [the deep underburden aquifer] as a mitigation source for flowing springs, and or stream reaches in the Bull Mountain area. Some of the springs flow at very significant rates. For instance, spring 52455 (near northeastern corner of LOM) flows at rates commonly exceeding 10 gallons per minute. Such a flow rate exceeds the typical demands at the mine public water supply well (projected at 6 gpm). Given that there are a large overall number of springs, ponds, and identified stream reaches, seasonal flow rates could substantially exceed 100 gpm.
>
> Using the deep Underburden aquifer may have other issues as well, including differences in water quality between native spring/stream sources compared to the water quality of the deeper Underburden. There are likely to be issues related to the Beneficial Use application process of the Montana Department of Natural Resources and Conservation. Demonstration of a beneficial use is required before a permit will be issued by the DNRC. Such applications routinely receive objections so that in the event a permit is issued, the process can be rather lengthy. In the event the aforementioned hurdles could be overcome, it would still be necessary to convince the DNRC that the aquifer system has the capacity to meet all the existing uses plus intended uses before a permit could be obtained.

Groundwater Model, Attachment 3M (pdf. 85). Thus, the PHC concluded that further investigation was required to determine whether the deep underburden aquifer would be suitable to meet all potential mitigation needs. PHC at 314-5-35, -42, -66. The mere possibility of mitigation is not sufficient to meet the standard of Mont. Code Ann. § 82-4-227(3)(c), and ARM 17.24.405(6)(c).

133. DEQ may not approve a permit application unless "the application affirmatively demonstrates and the department's written findings confirm, on the basis of information set forth in the application or otherwise available that is compiled by the department that . . . cumulative hydrologic impacts will not result in material damage to the hydrologic balance outside the permit area." ARM 17.24.405(6)(c); accord Mont. Code Ann. § 82-4-227(3)(a). Here, at most, the record demonstrates that the proposed expansion of the Bull Mountain mine may (or may not) be designed to prevent material damage to the hydrologic balance outside the permit area for 50 years and that there may (or may not) be water available to mitigate the operation's impacts to water quality and quantity. This does not satisfy the legal standard of MSUMRA.

134. The proposed 7,161-acre expansion of the Bull Mountain Mine is a considerable undertaking. It promises sizeable economic benefits in the short-term. 1992 EIS at iv. However, as the Montana Department of State Lands determined years ago, it also threatens significant economic harm in the long-term. *Id.* at iv. The record before the Board suggests that long-term environmental harm may also result. The Bull Mountains are an arid landscape. Existing ranching operations and ecosystems in the Bull Mountains are wholly dependent on the area's limited water resources. *Id.* at III-19, 22-23, 42.

135. MSUMRA prohibits DEQ from approving an application to expand mining operations unless the permit application affirmatively demonstrates and DEQ confirms in writing based on record evidence that the operation is "designed to prevent material damage to the hydrologic balance outside the permit area." Mont. Code Ann.

§ 82-4-227(3)(a), ARM 17.24.405(6)(c); accord 30 U.S.C. § 1260(b)(3). By statute, DEQ's material damage assessment and determination must consider whether the mine expansion will cause violation of water quality standards. Mont. Code Ann. § 82-4-203(31).

136. Here, DEQ's approval of SPE's application committed two errors. First, DEQ material damage determination failed to consider whether the mine expansion would lead to violations of water quality standards. Second, the record evidence did not affirmatively demonstrate that the mine expansion is designed to prevent material damage to the hydrologic balance outside the permit area. Instead, it demonstrated only that the mine expansion, as currently designed, may or may not cause material damage outside the permit area in the next 50 years and that there may or may not be water resources available for mitigation.

ORDER

1. It is HEREBY ORDERED that MEIC's motion for summary judgment is GRANTED, and SPE's cross-motion for summary judgment is DENIED;

2. The Board THEREFORE REMANDS this matter to DEQ for further proceedings consistent with the Consent Decree and Order filed on January 11, 2016 with the Board. That Consent Decree and Order is attached hereto as Exhibit "A" and, by this reference, is incorporated herein.

3. It is FURTHER ORDERED that this case be closed, subject to the Board's continuing authority to assure compliance with this Order.

4. It is FURTHER ORDERED that MEIC's motion to amend its appeal to join the Sierra Club is DENIED as MOOT.

DATED this 14th day of January, 2016.

Joan Miles

JOAN MILES, Chair
Board of Environmental Review
1520 E 6th Avenue
PO Box 200901
Helena, MT 59620-0901

CERTIFICATE OF SERVICE

I hereby certify that I caused a true and accurate copy of the foregoing Findings of Fact, Conclusions of Law, and Order to be mailed to:

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DATED: Jan. 14, 2016 _____

EXHIBIT "A"

BEFORE THE BOARD OF ENVIRONMENTAL REVIEW
OF THE STATE OF MONTANA

IN THE MATTER OF AMENDMENT NO. 3 TO THE MINING PERMIT FOR BULL MOUNTAIN COAL MINE NO. 1 (PERMIT ID: SMP C1993017)	Case No. BER 2013-07 SM **CONSENT DECREE AND ORDER**

Petitioner Montana Environmental Information Center (MEIC), Respondent Montana Department of Environmental Quality (DEQ), and Intervenor Signal Peak Energy, LLC, (SPE) (collectively, the "Parties") respectfully file this Consent Decree and Order with respect to the remedy in the above-captioned matter, requesting that the Montana Board of Environmental Review (Board) approve this Consent Decree and Order, including the terms and conditions by which the Parties agree to resolve this matter, and retain jurisdiction solely to assure that the terms and conditions are implemented. Accordingly, the Parties stipulate and agree as follows:

RECITALS

WHEREAS, DEQ administers the Montana Strip and Underground Mine Reclamation Act, §§ 82-4-201 to -254 (MSUMRA), as an approved regulatory program under the Surface Mining Control and Reclamation Act of 1977, §§ 30

U.S.C. §§ 1201-1328, and is the regulatory authority to approve revisions of mining permits. § 82-4-221(3), MCA;

WHEREAS, on October 5, 2012, SPE sought approval for an amendment, called Amendment No. 3, to its mining and reclamation plan from DEQ under Permit ID SMP C1993017;

WHEREAS, on October 18, 2013, DEQ approved SPE's application for Amendment No. 3 to Permit SMP C1993017;

WHEREAS, on November 18, 2013, MEIC initiated this proceeding by filing its Notice of Appeal and Request for a Hearing on DEQ's approval of Amendment No. 3 to Permit SMP C1993017;

WHEREAS, MEIC moved for summary judgment, and SPE filed a cross-motion for summary judgment;

WHEREAS, on July 31, 2015, the Board heard oral argument on the pending motions for summary judgment;

WHEREAS, on September 11, 2015, the Parties submitted their proposed findings of fact and conclusions of law;

WHEREAS, on October 16, 2015, the Board voted to grant MEIC's motion for summary judgment and adopt MEIC's proposed findings of fact and conclusions of law;

WHEREAS, on December 4, 2015, the Board held a hearing at which it affirmed its decision to grant MEIC summary judgment on the merits of MEIC's appeal with certain changes to MEIC's proposed findings of fact and conclusions of law and directed the Parties to attempt to negotiate an appropriate remedy that would be incorporated into the Final Order of the Board in this matter;

WHEREAS, on December 4, 2015, the Board gave the Parties until January 7, 2016, to enter into an agreement or inform the Board of the failure to reach an agreement;

WHEREAS, on January 7, 2016, the Board's attorney was contacted regarding the status of negotiations and granted an extension to facilitate further negotiations;

WHEREAS, the Parties have negotiated in good faith to reach an amicable settlement of an appropriate remedy in this matter that best meets the interests of each party;

PROVISIONS

NOW, THEREFORE, the Parties hereby stipulate and agree as follows:

1. DEQ shall have one hundred and eighty (180) days from the date of issuance of the Final Order of Board in this matter to undertake, pursuant to the established regulatory process and time frames, the receipt and consideration of additional information, and issue revised written findings including a new Cumulative

Hydrologic Impact Assessment (CHIA) supporting approval or denial of the application for a revised Amendment No. 3 permit. Reasonable extensions may be agreed to by the parties.

2. Nothing herein shall be construed to limit activities authorized under Amendment No. 2.

3. Signal Peak will be authorized to continue mining operations under Amendment No. 3, as it was approved on October 18, 2013, during the time period set forth in Paragraph No. 1, subject to the following conditions:

A. There will be no long-wall mining within the boundaries of the permitted section (Amendment No. 3 - Panels 6 and 7 as depicted on the attached map) during this time period.

B. The only ongoing mining operations authorized by Amendment No. 3 boundary will be the continued development for Panels 6 and 7.

C. The development work for the gate road between Panels 7 and 8, as depicted on the attached map, is authorized to continue from the northwest toward the southeast until it reaches the South East corner of Section 21, Township 6N, Range 27E, at which point development work in Section 27 will not be allowed during the 180 day time period.

D. Development work currently underway at the mine includes construction of entries, which form blocks of coal that remain un-mined and

also includes the construction of the infrastructure needed for future long-wall mining.

E. Development work includes, among other things, the installation of belt conveyors, pumps, electrical systems and ventilation control devices. Development work does not include long-wall mining.

4. The regulatory process for the revised CHIA and permit amendment will follow the normal permitting procedures and include public review and comment as specified under MSUMRA.

5. Any DEQ decision on the revised CHIA and permit amendment will be subject to a new challenge and review under MSUMRA and normal Montana Administrative Procedures Act (MAPA) process.

6. If a revised CHIA and permit amendment is not issued within the time period specified in Paragraph 1, SPE agrees to cease operations authorized under Amendment No. 3, as it was approved on October 18, 2013, until such revised CHIA and permit amendment is issued by DEQ. If for reasons outside the sole control of SPE the time period is not sufficient for such a decision by DEQ, the Parties agree that a reasonable extension of the time period may be obtained through the mutual agreement of the Parties. Agreement on an extension will not be unreasonably withheld.

7. The Parties agree to forebear filing any petition for judicial review of the Final Order of the Board in this contested case over Amendment No. 3, as it was approved on October 18, 2013. This does not preclude or limit any potential challenge over the issuance of a revised Amendment No. 3.

8. The Parties agree that no provision of this Consent Decree and Order, and the Final Order of the Board in this matter, or any other order of the Board addressing the merits of this matter, shall constitute or be construed as grounds for precluding or barring a person or Party from raising any issue or offering any evidence in any administrative review proceeding before the Board or before any reviewing court in any other matter, including any review of DEQ's determination on Amendment No. 3 on remand.

9. The Parties agree that no term of this Consent Decree and Order or the Final Order of the Board in this matter shall preclude or bar a party from asserting a provision of the Final Order of the Board or any findings of fact or conclusion of law of the Board in this matter, for its precedential value as a previous decision of the Board in any administrative review proceeding before the Board or before any reviewing court in any matter.

10. The parties agree that the binding effect of paragraphs 1, 3, and 6 of this Consent Decree and Order shall be limited to the period of remand of the Application for Amendment No. 3 to Bull Mountain Coal Mining Permit No.

C1993017 as set forth in paragraphs 1, 3, and 6 of this Consent Decree and Order, that the binding effect of paragraphs 1, 3, and 6 of this Consent Decree and Order shall terminate upon a decision by DEQ to either approve or deny that application during the period described in paragraphs 1, 3, and 6 of this Consent Decree and Order, and that paragraphs 1, 3, and 6 of this Consent Decree and Order shall have no effect and shall not be used in any other matter, administrative proceeding, or judicial review action.

11. Upon the effective date of the Final Order of the Board in this matter, this contested case will be closed, subject to the Board's continuing authority to assure compliance with the provisions of this Consent Decree and Order and the Final Order of the Board with respect to this contested case over Amendment No. 3, as approved on October 18, 2013.

12. The Parties agree that this Consent Decree and Order cannot be used by any Party in any other matter.

13. MEIC and SPE have reached a separate confidential agreement with other material terms related to this Consent Decree and Order. MEIC does not support confidentiality; however, MEIC acquiesces to the confidentiality of the separate agreement in a good faith effort to amicably settle this matter.

14. The Parties agree that if the Board issues an order that does not incorporate or reference this Consent Decree and Order in its entirety, or includes language in

any order that alters the terms of this Consent Decree and Order, or the separate agreement referenced in paragraph 13, any Party may void this Agreement.

15. All Parties agree to use all reasonable efforts, commencing promptly on the execution of this Consent Decree and Order, to take, or cause to be taken in good faith, all actions, and to do, or cause to be done, all things necessary and proper to consummate and make effective the actions contemplated by this Consent Decree and Order and the separate agreement referenced in paragraph 13.

16. This Consent Decree and Order and the separate agreement between MEIC and SPE referenced in paragraph 13 constitute the entire agreement and understanding among the Parties with respect to its subject matter and supersedes all prior contemporaneous negotiations, representations, or agreements, whether written or oral. None of the parties' respective duties and obligations under this Consent Decree and Order, and the separate agreement referenced in paragraph 13, nor any portion hereof, may be waived, modified, or amended except by a writing executed by the Parties.

17. The validity, construction, and interpretation of this Consent Decree and Order shall be governed by, and construed in accordance with, the substantive laws of the State of Montana. In no event shall any Party to this Consent Decree and Order be entitled to receive any indirect, special, or consequential damages for any breach of this Consent Decree and Order. In an action to enforce the terms of this

Consent Decree and Order, a court is authorized to require specific performance of the terms of this Consent Decree and Order.

18. To the extent any Party to this Consent Decree and Order is an organization or entity, that Party represents and warrants that the terms of this Consent Decree and Order have been approved by the Party's respective governing body, if such approval is necessary, and that the individual executing this Consent Decree and Order on behalf of the Party is duly authorized to enter into this Consent Decree and Order.

19. The effective date of this Consent Decree and Order is the date of issuance of the Final Order of the Board in this matter.

20. This Consent Decree and Order inures to the benefit of, and is binding on, all affiliates, transferees, agents, successors, heirs, representatives, and assigns of the Parties hereto.

21. This Consent Decree and Order and each stipulation or other document contemplated by this Consent Decree and Order may be executed in one or more counterparts. Facsimile signatures shall be considered as original signatures.

22. The Recitals are hereby fully incorporated into this Consent Decree and Order.

23. If any provision of this Consent Decree and Order becomes or is held to be invalid or unenforceable by operation of any applicable law or by decision of a

Court of competent jurisdiction, unless the invalid or unenforceable provision is material to the Party's or Parties' compliance with the Consent Decree and Order, that determination pursuant to the operation of any applicable law or by Court decision, so long as the intent of the Parties is not materially changed, will not affect the validity or enforceability of the rest of the Consent Decree and Order, and this Consent Decree and Order will be considered amended to the extent necessary to remove the non-material cause of the invalidity or unenforceability. If any provision of this Consent Decree and Order which is held to be invalid or unenforceable by operation of applicable law or by a Court of competent jurisdiction is material to the Party's or Parties' compliance with the Consent Decree and Order or if the invalidation or unenforceability of any provision of this Consent Decree and Order results in the remaining provisions of this Consent Decree and Order being contrary to the intent of the Parties in entering into this Consent Decree and Order, the Parties agree to enter into negotiations to amend this Consent Decree and Order to reflect the intent of the Parties in light of the invalidity or unenforceability of the material provision.

24. DEQ shall pay $30,000 to MEIC for attorney's fees and costs in this matter due and payable on June 30, 2016. MEIC asserts that this is a significant reduction of MEIC's fees and costs done as a good faith gesture to reach an amicable settlement. DEQ's agreement to the fees and costs in this matter is for purposes of

this matter only and is in no way to be deemed an admission in any matter with respect to the basis for or the reasonableness of the specific amounts or rates charged.

DATED this 11th day of January, 2016.

By _____
Steven T. Wade
Counsel for Signal Peak Energy, LLC

By _____
Shiloh Hernandez
Counsel for Montana Environmental Information Center

By _____
Dana David
Counsel for Montana Department of Environmental Quality

Pursuant to the above agreement of the Parties, IT IS SO ORDERED

DATED this 12th day of January, 2016

By _____
Joan Miles
Chair
Montana Board of Environmental Review