

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL  
STATE OF WYOMING

**FILED**

FEB 11 2010

IN THE MATTER OF THE APPEAL OF )  
JOHN D. KOLTISKA, AC RANCH, INC. )  
A Wyoming Corporation, PRAIRIE DOG )  
RANCH, INC., a Wyoming Statutory Close )  
Corporation, and PRAIRIE DOG WATER )  
SUPPLY COMPANY, FROM WYPDES )  
PERMIT NO. WY0054364 )

Docket No. 09-3805

Jim Ruby, Executive Secretary  
Environmental Quality Council

PETITIONERS' OBJECTIONS AND PROPOSED FINDINGS OF FACT  
AND CONCLUSIONS OF LAW

At the conclusion of the hearing in this matter on November 18, 2009, the Environmental Quality Council (EQC) directed the Respondents to submit proposed findings of fact and conclusions of law to Petitioners for their review and comment on or before January 11, 2010 and for Petitioners' to submit their objections by February 11, 2010. Pursuant to the EQC's directive, Petitioners John D. Koltiska, AC Ranch, Inc., Prairie Dog Ranch, Inc. and Prairie Dog Water Supply Company submit the following objections: The Facts and Conclusions proposed by Respondents do not correctly set forth the facts presented at the hearing, so Petitioners' submit their PETITIONERS' PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW in the above-captioned contested case.

PROPOSED FINDINGS OF FACT

1. Permit WY0054364 was originally issued to Pennaco on January 29, 2007. Exhibit 3; Tr. 37. Permit WY0054364 was subsequently renewed on January 6, 2009. Exhibit 2. The renewed permit authorized discharges of up to 1.47 million gallons per day (mgd) of treated coal bed methane (CBM) produced water from the "Adams Ranch Treatment Facility" directly to Wildcat Creek (via outfall 001), to the on-channel Paul #3 reservoir in Wildcat Creek (via outfall 002) and directly to Prairie Dog Creek (via outfall 003) in Sheridan County, Wyoming. Exhibit 2; Tr. 56.

2. On March 5, 2009, Petitioners filed their Petition with the EQC appealing the issuance of the renewed permit. Pet.

3. On April 29, 2009 DEQ issued Modified Permit WY0054364 to Pennaco. The Modified Permit authorized Pennaco to discharge up to 1.47 million gallons per day (mgd) of treated coal bed methane (CBM) produced water from the "Adams Ranch Treatment Facility" directly to Prairie Dog Creek (via outfall 003) and to the on-channel Paul #3 reservoir in Wildcat Creek (via outfall 002) in Sheridan County, Wyoming. Tr. 377; Exhibit 1 (SOB, p.1; Mod, p.1).

4. On May 15, Petitioners amended their petition to appeal issuance of the Modified Permit. Petitioners are appealing only the April 2009 Major Modification of WYPDES Permit WY0054364 (Modified Permit). Am. Pet., ¶2.

5. The Modified Permit authorizes discharge from only two outfalls: 002 for discharge to Paul #3 reservoir in Wildcat Creek and 003 for direct discharge to Prairie Dog Creek. Exhibit 1 (SOB, p.2; Mod, p.2); Exhibit 14 (Petrs' Resp 2<sup>nd</sup> RFA#1).

6. Flow in Prairie Dog Creek is derived from Piney Creek via a transbasin diversion located near Story, Wyoming. Tr. 52. Flows in Prairie Dog Creek can be supplemented with water stored in Kearney Lake. Tr. 207-08.

7. Wildcat Creek is a tributary to Prairie Dog Creek. Wildcat Creek has ephemeral flows in its headwaters. 9 Mile Ditch is a man-made irrigation ditch that some of the Petitioners use to convey irrigation water from Prairie Dog Creek into Wildcat Creek. Tr. 102; Exhibit 31 (p. 5).

8. Outfall 002 is located near the end of the treatment unit and approximately two stream miles above the uppermost 9 Mile Ditch *outlet* to Wildcat Creek. Tr. 246-247; Exhibit 32.

9. Outfall 003 to Prairie Dog Creek is located downstream from the *intake* of the 9 Mile Ditch from Prairie Dog Creek, so discharges from outfall 003 do not affect irrigation in Wildcat Creek. Tr. 236-237; Exhibit 32.

10. The Modified Permit authorizes discharge of treated effluent from the treatment unit to outfall 002 for discharge into the existing on-channel Paul #3 reservoir in Wildcat Creek. Tr. 377; Exhibit 1 (SOB, p.2; Mod, p. 1); Exhibit 14 (Petrs' Resp 2<sup>nd</sup> RFA #1).

11. To protect water quality for irrigation use, the water quality parameters of concern for irrigation are salinity measured as electrical conductivity (EC) and sodicity measured as sodium adsorption ratio (SAR). EC is also referred to as Specific Conductance. Exhibit 1 (SOB, p. 5), Tr. 174.

12. In issuing permits to discharge, DEQ has to translate the narrative standard in Chapter 1, Section 20 into numeric effluent limits.

13. DEQ determined that compliance with Chapter 1, Section 20 of DEQ's Water Quality Regulations (protection of agricultural water supply) requires establishing numeric effluent limits for electrical conductivity (EC) and sodium adsorption ratio (SAR). Exhibit 1 (SOB, p. 5). The Modified Permit imposes end of pipe effluent limitations for EC at Outfalls 002 and 003. Exhibit 3 (SOB, pp. 5-6). The Modified Permit imposes an end of pipe limitation for sodium concentration at outfall 003 to control SAR in the receiving stream (Prairie Dog Creek). Exhibit 3 (SOB, p. 5). The Modified Permit imposes no SAR limitation at outfall 003. Exhibit 3 (SOB, p. 5-6).

14. The EC of irrigation water is of concern because salt from irrigation water can buildup in soils and impair crop production and yield. Tr. 72, 301

15. Soil salinity depends on numerous factors apart from the salinity of the irrigation water. These factors include soil characteristics, depth to groundwater, the presence of saline seepages, irrigation management, adequacy of drainage, and leaching fraction. Tr. 72-75.

16. Prairie Dog Water Supply Company (PDWSC) has approximately 90 members / shareholders. Tr. 238.

17. PDWSC shareholders are located mostly in Prairie Dog Creek. Tr. 237, 243-44.

18. Petitioners make agricultural use of waters affected by the Modified Permit by diverting water from Prairie Dog Creek below outfall 003 and from Wildcat Creek below outfall 002 to irrigate crops. Exhibit 5A; Tr. 218; Tr. 237-38; Tr. 274.

19. Two or three PDWSC members also irrigate with CBM water. Tr. 239.

20. Approximately 12 PDWSC members (including those who irrigate with CBM water) are located downstream from, and could be affected by, outfall 003 in Prairie Dog Creek. Tr. 237-238.

21. AC Ranch and Prairie Dog Ranch are cow-calf operations that raise hay for their own cattle and sell the surplus! Tr. 206; Exhibit 14 (Petr's Resp 1<sup>st</sup>Int.#8).

22. Petitioners Prairie Dog Ranch, AC Ranch, and Mr. Koltiska use water from Prairie Dog Creek and Wildcat Creek to irrigate alfalfa and alfalfa/grass mix (orchard grass/timothy). Tr. 214; Exhibit 14 (Petr's Resp 1<sup>st</sup>Int.#7).

23. Mr. Koltiska has historically planted a mix of alfalfa and orchard grass at a 10:1 ratio of 20 pounds of alfalfa to 2 pounds of orchard grass. Tr. 214, 245-246.

24. Mr. Koltiska irrigates a mixture of alfalfa and orchard grass on his ranches (AC Ranch and Prairie Dog Ranch). Tr. 214-15. DEQ was unaware of Mr. Koltiska irrigating orchard grass when it issued the Modified Permit. Tr. 166-68, 193.

25. Petitioners Prairie Dog Ranch, AC Ranch, and Mr. Koltiska do not flood irrigate. Exhibit 14 (Petr's Resp 1<sup>st</sup> Int. #6).

26. All irrigation by Prairie Dog Ranch, AC Ranch, and Mr. Koltiska is done with sprinklers. Tr. 216. AC Ranch is irrigated by pumping out of a small diversion reservoir on Wildcat Creek Tr. 220-21. Prairie Dog Ranch irrigates by diverting water from 9 Mile ditch and by pumping directly from Prairie Dog Creek Tr. 273-74.

27. Irrigation of crops is Petitioners' only agricultural use of water from Prairie Dog Creek and Wildcat Creek that they allege has a reasonable potential to be adversely

impacted by discharges which meet the effluent limits for EC, SAR and dissolved sodium in the Modified Permit. Tr. 235; Am. Pet. ¶3; Exhibit 14 (Petr's Resp 1<sup>st</sup> RFA#2 & 1<sup>st</sup> Int#1 (RFA#5&#7)).

28. DEQ identified alfalfa and pumpkins as the most salt sensitive crops grown in Wildcat Creek. Exhibit 1 (SOB, p. 6).

29. The Modified Permit requires that effluent discharged via outfall 002 into the on-channel Paul #3 Reservoir in Wildcat Creek be contained in the reservoir during "dry" operating conditions and prohibits discharge (release) of effluent from the reservoir except when natural precipitation events cause the reservoir to overtop and spill. Tr. 34-35; Exhibit 1 (SOB, pp.1-2, 4; Mod, p.3).

### **DEQ Permit Issuance - Prairie Dog Creek**

30. Prairie Dog Creek, a tributary to the Tongue River, has regular base flows fed by diversion of flows from Piney Creek, which is a perennial stream. Tr. 39; 235, 247 Exhibit 1 (SOB, p.1).

31. Prairie Dog Creek is a perennial stream due to a trans-basin diversion from Piney Creek via Jenks Creek to the top of Prairie Dog Creek (above outfall 003). Tr. 52, 235, 247. PDWSC has the right to divert approximately 120 cubic feet per second (cfs) from Piney Creek into Prairie Dog Creek. Tr. 247.

32. The Prairie Dog Water Supply Company (PDWSC) normally diverts 50-65 cfs from Piney Creek via Jenks Creek to Prairie Dog Creek above outfall 003. Tr. 248, 254.

33. The Modified Permit authorizes direct discharge from the treatment unit via outfall 003 to Prairie Dog Creek. Tr. 40-41; Exhibit 1 (SOB, p.2); Exhibit 14 (Petr's Resp 2<sup>nd</sup> RFA #1).

34. The maximum total discharge of 1.47 mgd allowed under the Modified Permit equates to approximately 2.27 cfs. Tr. 345. For the Original Permit DEQ determined that the average ambient water quality in Prairie Dog Creek was 1,215  $\mu\text{S}/\text{cm}$  (1.215dS/m). This analysis was conducted by Ms. Kathy Shreve who wrote the Original Permit in 2006. Exhibit 1 (SOB, p5); Tr. 59; Tr. 151.

35. The only irrigation diversions in Prairie Dog Creek relevant to this appeal are those downstream from outfall 003. Exhibit 14 (Petr's Resp. 1<sup>st</sup> Int.#5)

36. DEQ determined average ambient EC for Prairie Dog Creek by calculating the average EC measured in samples collected at three USGS gauging stations located on Prairie Dog Creek: Acme, Wakeley Siding (Wakeley) and Bates Draw. Exhibit 1 (SOB, p. 5); Tr. 174. These calculations were made by Kathy Shreve. Tr. 139-40.

37. The Wakeley station is located approximately 10 stream miles downstream of Outfall 003. The Acme station is located approximately 23 stream miles downstream of Wakeley. Tr. 89-90, 154

38. The USGS data utilized by DEQ to calculate average ambient EC for Prairie Dog Creek consisted of ninety-six (96) field and laboratory measurements in fifty-eight (58) samples. With the exception of EC measured in two samples from the Bates Draw station in 1978, the USGS EC data was collected between January 2001 and April 2006. Tr. 58-59, 141-42, 174-75; Exhibit 8

39. DEQ also calculated the average EC at Wakeley to be 885  $\mu\text{S}/\text{cm}$  and the average at Acme to be 1501  $\mu\text{S}/\text{cm}$ . Tr. 154-55; Exhibit 8. EC increases steadily in Prairie Dog Creek as the water travels downstream. Exhibit 23.

40. The data used by DEQ to calculate average ambient EC for Prairie Dog Creek, consisted of two EC measurements (field and laboratory) for every sample collected at the Acme stations, two EC measurements (field and laboratory) for a portion of the samples collected at the Wakeley station, one EC measurement for each of the remaining samples collected at the Wakeley station, and one EC measurement for each of the two samples collected at the Bates Draw station. Exhibit 8, Tr. 426; Tr. 459-60; Exhibit 30 (Fig.2).

41. Ms. Shreve admitted that using both the field and laboratory samples for the purpose of calculating an average ambient EC value for Prairie Dog Creek is not an appropriate scientific method. Tr. 175-76.

42. In calculating average ambient EC for Prairie Dog Creek in the Original Permit, DEQ used data from both Acme and Wakeley because DEQ considered the Wakeley data to be insufficient on its own to calculate ambient EC in Prairie Dog Creek. Tr. 154-55.

43. DEQ's calculations of average ambient EC in Prairie Dog Creek were not modified nor updated through the renewal and modification of the permit. Tr. 151, Exhibit 1 (SOB, p. 5); Exhibit 2 (SOB, p. 5), Exhibit 3 (SOB, p.3).

44. At the time the permit was renewed and modified EC data from approximately two additional years of USGS monitoring were available to DEQ. With this additional data, EC data from Wakeley alone would have been sufficient to calculate ambient EC in Prairie Dog Creek. Tr. 428-29.

45. The Modified Permit's effluent limits are 1,215  $\mu\text{S}/\text{cm}$  for EC<sub>w</sub> and 300 mg/l for sodium on direct discharges of treated effluent to Prairie Dog Creek from outfall 003. Tr. 58, 68; Exhibit 1 (SOB, p.5; Mod, p.2).

46. DEQ considers 1,215  $\mu\text{S}/\text{cm}$  to be the basin wide average ambient EC for Prairie Dog Creek and established the EC effluent limit for Outfall 003 EC at this value in both the renewed and modified permits. Tr. 91; Exhibit 1 (SOB, p.5); Exhibit 2 (SOB (p. 5).

47. PDWSC shareholders irrigate with Prairie Dog Creek water below Wakeley and all the way down to Acme. Tr. 238-39.

48. DEQ did not know the amount of water each irrigator withdraws from Prairie Dog Creek. Tr. 76

49. DEQ did not know the leaching fraction obtained by any affected irrigators. Tr. 75.

50. DEQ did not know the types of soils irrigated. Tr. 72-73.

51. DEQ did not know the EC of the soils in Prairie Dog Creek. Tr. 72.

52. DEQ did not know the depth to groundwater for any irrigators. Tr. 74-75.

53. DEQ did not require Pennaco to provide nor did DEQ obtain any data regarding the water quality individual irrigators on Prairie Dog Creek receive. DEQ made no effort to determine irrigation water quality at any irrigation diversion. Tr. 75.

54. DEQ established an effluent limit for sodium as a surrogate to control SAR in the receiving water. Tr. 183.

55. At outfall 003, the use of sodium as the effluent limit as opposed to SAR, which is a ratio, will lead to a more predictable effect on the downstream mixture of effluent in a perennial receiving water such as Prairie Dog Creek. Tr. 126-27, 482-83. Establishing a sodium limit at outfall 003 instead of an SAR limit is a reasonable, appropriate method to control SAR in the receiving water. Tr. 63, 482-83.

56. DEQ established an effluent limit for sodium of 429 mg/l in the Original Permit, based on a targeted maximum SAR of 6 in Prairie Dog Creek. The targeted maximum SAR of 6 was based on the 1999 version of the Hanson chart in use by DEQ at that time. Exhibit 3 (SOB, pp. 4-5); Tr. 71.

57. In the Renewed and Modified Permit, DEQ established an effluent limit for sodium of 349 based on a targeted maximum SAR of 5 in Prairie Dog Creek. The targeted maximum SAR of 5 was based on the 2006 revisions to the Hanson chart. Pennaco later volunteered to a sodium effluent limit of 300 mg/l. Exhibit 1 (SOB, p5); Exhibit 2 (SOB p. 5); Tr. 71-72; Tr. 98-99.

58. The sodium effluent limit in the Renewed and Modified Permit was derived by DEQ by extrapolating a correlation between measured sodium concentrations and SAR values in Prairie Dog Creek. Exhibit 1 (SOB, pp. 5, 9); Exhibit 2 (SOB, pp. 5, 9); Tr. 99-101.

59. The highest sodium concentration in the data set used by DEQ to establish the relationship between sodium and SAR was 180 mg/l. Tr. 99-100.

60. The proportion of Prairie Dog Creek water to CBM effluent discharge will determine the overall water quality (including sodium concentration) at any particular time. Tr. 383-84; Exhibit 26, p. 5.

61. Downstream mixing of CBM discharge with natural flow (in Prairie Dog Creek) will determine the quality of irrigation water. Tr. 384. Dr. Schafer testified that it is the chemistry of the resultant mixture that will be applied to crops that is important. Tr. 483-84.

62. DEQ did not consider the quantity of flow for the purpose of establishing effluent limits for EC and sodium (SAR). Tr. 186.

63. In establishing the effluent limit for sodium, DEQ did not consider the effect of effluent discharged under the permit on the relationship between sodium and SAR in Prairie Dog Creek. Tr. 183-84. DEQ did not do a mixing analysis to establish effluent limits. Tr. 164.

64. Petitioners' expert, Jim O'Neill, and Pennaco's expert, Dr. Schafer, agreed that DEQ should not have used this empirical relationship to establish an effluent limit for sodium. Tr. 430-31; Tr. 534; Exhibit 31, p.3.

#### Evidence at Hearing

65. Dr. Schafer, using his own method, opined that CBM discharge with a sodium concentration up to the 300 mg/l effluent limit will not cause an adverse impact on soils or irrigated crops if the resultant sodium concentration of the combined (CBM & natural) waters is acceptable. Tr. 494-99.

66. Dr. Vance was concerned about discharge limits allowing addition of sodium that will increase sodium *concentrations* in Prairie Dog Creek over background *concentrations*, rather than with mass salt load by itself. Tr. 346. Dr. Vance, relying on data used by DEQ, did not have knowledge of Prairie Dog Creek flow data, had not done a mixing analysis, and did not have an opinion on a protective flow to mix with the maximum permitted effluent from outfall 003. Tr. 343-45.

67. In order to evaluate the effect of effluent discharges from Outfall 003 on the EC in Prairie Dog Creek, Dr. Schafer found it necessary to develop a mass load model using Sheridan County Conservation District water quality and flow data for Prairie Dog Creek, Tr. 489-494; Tr. 520-21; Exhibit 31, pp.25-29.

68. Dr. Schafer's mass load model showed that an EC limit of 1,215  $\mu\text{S}/\text{cm}$  for Outfall 003 would not result in mixed CBM effluent and natural water exceeding 1,330  $\mu\text{S}/\text{cm}$  EC in the reaches of Prairie Dog Creek where EC was naturally below 1,330  $\mu\text{S}/\text{cm}$ , and would result in a reduction of EC in downstream reaches of Prairie Dog Creek where EC naturally exceeds 1,330  $\mu\text{S}/\text{cm}$  EC. Tr. 489-494; Exhibits 31, pp. 25-29, 35-37.

69. Dr. Schafer surmised that reductions in EC in downstream reaches of Prairie Dog Creek where EC naturally exceeds 1,330  $\mu\text{S}/\text{cm}$  shown by his model would be due to effluent diluting high salinity baseflow/groundwater contributions in the lower reaches of Prairie Dog Creek. Exhibit 37, Exhibit 31, p. 27.

70. Dr. Schafer modeled these baseflow/groundwater contributions as salinity loads only with no associated water input. Tr. 530-32, Exhibit 43; Tr. 595-96.

71. Dr. Schafer modeled these baseflow/groundwater contributions as having an infinite EC. Tr. 595-96.

72. It takes approximately 24 cfs to irrigate Petitioners' lands below outfall 003 in Prairie Dog Creek. Tr. 255-256. A maximum CBM discharge of less than 2  $\frac{1}{2}$  cfs would be at most 1/10 of the 24 cfs irrigation water. Petitioners do not begin to divert water from Prairie Dog Creek in the spring for irrigation until the flow is about 5 cfs and keep adding to that diversion until the flow is enough for irrigation. Tr. 256-57.

73. If PDWSC normally diverts 50-65 cfs from Piney Creek via Jenks Creek to Prairie Dog Creek above outfall 003, then a maximum CBM discharge of less than 2  $\frac{1}{2}$  cfs would be at most 1/20 of the irrigation water below outfall 003. Tr. 248, 254.

74. Pennaco's expert, Dr. Schafer, demonstrated that a sodium level of 300 mg/L is protective and meets Hanson Diagram EC/SAR ratios at any natural flow of 5 cfs or more in Prairie Dog Creek. Tr. 497-99; Exhibit 39. Dr. Schafer demonstrated that a natural flow of 5 cfs (the minimum irrigation flow) and a maximum permitted flow of 2.27 cfs would result in an EC of 935 and an SAR of 2.6. *Id.* Dr. Schafer also demonstrated that at a harmonic mean flow (a statistical low flow measure) of 6.8 cfs in Prairie Dog Creek, a sodium limit of 518 mg/L is protective and meets Hanson Diagram EC/SAR ratios. Tr. 495-97; Exhibit 31 (pp. 20-21).

### **DEQ Permit Issuance - Wildcat Creek**

75. Wildcat Creek is tributary to Prairie Dog Creek and also receives flows diverted from Prairie Dog Creek via the 9 Mile Ditch. Tr. 217-218; Exhibit 1 (SOB, p.6).

76. Wildcat Creek is an ephemeral stream that does not have a predictable base flow above the outlet from the 9 Mile Ditch. Tr. 218; Exhibit 1 (SOB, pp.1-6).

77. The only irrigation diversions in Wildcat Creek relevant to this appeal are those downstream from outfall 002 in Wildcat Creek. Exhibit 14 (Petr's Resp. 1<sup>st</sup> Int. #5).

78. The 9 Mile Ditch diverts water from Prairie Dog Creek and carries it over to Wildcat Creek above the confluence of Wildcat Creek with Prairie Dog Creek. Tr. 235-236. Mr. Koltiska and his ranches obtain the majority of their irrigation water from the 9 Mile Ditch, which is unaffected by outfall 003. Tr. 249-250.



79. The 9 Mile Ditch can divert up to 22 cfs. Tr. 236.

80. The water diverted into 9 Mile Ditch is not affected by Pennaco's CBM discharges, because the intake for the 9 Mile Ditch in Prairie Dog Creek is above the point of CBM discharge (outfall 003) into Prairie Dog Creek. Tr. 236-237, 250.

81. Petitioners are not concerned about CBM discharges affecting water quality diverted into the 9 Mile Ditch, because the point of CBM discharge (outfall 003) into Prairie Dog Creek is below the intake for the 9 Mile Ditch in Prairie Dog Creek. Tr. 236-237, 250. Petitioner AC Ranch is concerned with the effect of discharges from Outfall 002 on water delivered by the 9 Mile Ditch into Wildcat Creek. Exhibit 5, Tr. 273.

82. DEQ identified alfalfa and pumpkins as the most salt sensitive crops irrigated in Wildcat Creek. Exhibit 1 (SOB, p. 6). The Modified Permit was designed by DEQ to protect alfalfa and pumpkins which DEQ identified as the most salt sensitive irrigated crops. Exhibit 1 (SOB, p. 6). Irrigation of pumpkins was not at issue in the hearing.

83. Mr. Koltiska and his ranches plant a mix of orchardgrass with alfalfa. Tr. 214-215.

84. DEQ did not consider orchardgrass when it drafted the Modified Permit. Exhibit 1 (SOB, pp. 5-6)

85. To establish the "default" numeric EC limit for outfall 002 on Wildcat Creek, DEQ used the USDA salt tolerance database soil salinity tables to determine a soil salinity to provide an adequate level of protection. The salt tolerance database provides soil EC thresholds at which 100% crop yields are achievable. In order to calculate an EC effluent limit, DEQ then divided the target soil salinity derived from the USDA database tables by 1.5 as recommended by *Agricultural Salinity and Drainage, Hanson, et al, 2006 edition*. Exhibit 1 (SOB, p. 6); Exhibit 7. The USDA salt tolerance database soil salinity data tables used by DEQ to set "default" limits for EC is the best database available for that purpose. Tr. 388.

86. The soil salinity tables list recommended soil salinity thresholds for a variety of crops. Exhibit 7.

87. DEQ assumes that using 100% threshold numbers from the soil salinity tables to derive default limits will assure that the quality of water discharged will not negatively affect the production of crops irrigated with that water. Tr. 117; Exhibit 1 (SOB, p. 6); Exhibit 7.

88. DEQ does *not* assume that those default limits will assure 100% of potential yield, because irrigation water quality is not the only factor that can affect crop production. Tr. 77-78.

89. The 1.5 conversion factor to convert soil EC<sub>e</sub> to water EC<sub>w</sub> is a reasonable and commonly used method. Tr. 360-61, 486-88.

90. The 1.5 conversion factor is based on an assumption that leaching fraction is approximately 15%. Tr. 83, 201, 299.

91. DEA had no site specific information regarding the leaching fraction obtained by the affected irrigators when it issued the Modified Permit. Tr. 75-76.

92. The Modified Permit's effluent limit is 1,330  $\mu\text{S}/\text{cm}$  for ECw on effluent piped to outfall 002 for discharge into the Paul #3 reservoir in Wildcat Creek. Exhibit 1 (SOB pp.1-6, Mod p.3); Exhibit 14 (Petr's Resp 2<sup>nd</sup> RFA#2).

93. DEQ used "default" numbers to set the numeric effluent limit for EC on discharges from outfall 002 into Paul #3 Reservoir in Wildcat Creek. Tr. 102; Exhibit 1 (SOB, p.6).

94. DEQ used the USDA soil salinity data table to derive the default limit of 1,330  $\mu\text{S}/\text{cm}$  for ECw to protect irrigation of alfalfa and pumpkins in Wildcat Creek. Exhibit 1 (SOB, p.6); Exhibit 7.

95. 2,000  $\mu\text{S}/\text{cm}$  E<sub>Ce</sub> for soil is protective for alfalfa. Tr. 300-01, 337-38, 487. DEQ determined that 2,250  $\mu\text{S}/\text{cm}$  E<sub>Ce</sub> for soil is protective for pumpkins, Exhibit 1 (SOB, p. 6), and no evidence was offered to contradict this determination.

96. DEQ divided the 100% threshold soil E<sub>Ce</sub> value for alfalfa (2,000  $\mu\text{S}/\text{cm}$ ) by 1.5 to calculate the effluent limit for water ECw (1,330  $\mu\text{S}/\text{cm}$ ) at outfall 002 to protect alfalfa in Wildcat Creek. Exhibit 1 (SOB, p.6); Exhibit 7. DEQ concluded that this effluent limit would also protect pumpkins grown in Wildcat Creek, Exhibit 1 (SOB, p. 6), and no evidence was offered to contradict this determination.

97. A default limit of 1,330  $\mu\text{S}/\text{cm}$  ECw is protective for alfalfa in Wildcat Creek. Tr. 484.

98. DEQ did not consider orchardgrass in setting the ECw for Wildcat Creek. Tr. 168-69.

99. The USDA salt tolerance database soil salinity data tables used by DEQ to set "default" limits for EC, which is the best database available for that purpose, lists the 100% threshold E<sub>Ce</sub> value for orchardgrass of 1,500  $\mu\text{S}/\text{cm}$ . Exhibit 7.

100. Applying the same "default limit" methodology for protection of orchard grass would result in a default limit of 1,000  $\mu\text{S}/\text{cm}$  for ECw.

101. The Modified Permit imposes an irrigation monitoring requirement and a re-opener provision for SAR, making the establishment of an end-of-pipe effluent limit for SAR at outfall 002 "automatic" under the specified conditions. Tr. 34-35, 119; Exhibit 1 (SOB, p.6; Mod, p.9).

102. The SAR and EC thresholds used by DEQ are protective of soil infiltration rates. Exhibit 22 (Hendrickx & Buchanan Report, p.3).

103. At the time the Modified Permit was issued, DEQ was aware that the Paul # 3 Reservoir seeps or leaks into Wildcat Creek below the reservoir dam. Exhibit 12.

104. Water that collects at an existing depression below the seep from the Paul # 3 Reservoir is pumped out and over to the Makayla reservoir via a pump installed by Pennaco. Tr. 36, 40-41. DEQ assumed this water is coming from the Paul #3 reservoir. Tr. 119-121; Exhibit 12. This is consistent with DEQ's belief that water in the Paul # 3 Reservoir infiltrates into the soils on Wildcat Creek. Tr. 110. This depression is referred to as the pumpback point. Exhibit 28.

### Evidence at Hearing

105. The Modified Permit established no SAR limit for the discharges from Outfall 002. Exhibit 1 (SOB p. 5-6). Instead, DEQ required that all discharge from Outfall 002 be contained in the Paul #3 Reservoir during "dry operating conditions." Exhibit 1 (SOB, p.6).

106. Considering all the evidence on whether and how far the Paul #3 Reservoir may be leaking into Wildcat Creek and considering the SAR monitoring provisions in the Modified Permit, DEQ's decision not to impose an SAR limit at outfall 002 was appropriate and reasonable.

107. Petitioners Prairie Dog Ranch's, AC Ranch's, and Mr. Koltiska's hay production (quantity) has fluctuated over the last several years due to temperature. Tr.242.

108. Mr. Koltiska has not noticed any difference in the performance of his alfalfa hay, and the quality (nutritional value) of his hay has stayed constant. Tr. 242.

109. Mr. Koltiska has not yet seen any impact from any untreated CBM water that may escape from the Paul #3 reservoir into Wildcat Creek, because he uses water from Wildcat Creek that includes water from 9 Mile Ditch. Tr. 218, 243-44, 249-50, 262-63, 376.

110. Mr. Koltiska has no knowledge of whether or not PDWSC members irrigating with CBM water have had any detrimental effects from it yet. Tr. 244.

111. Mr. Adams, a rancher in Wildcat Creek, has produced irrigated alfalfa with untreated CBM water discharged into the Paul #3 Reservoir pursuant to another discharge permit since 2006 and has not experienced any negative impacts to his alfalfa or soils. Tr. 576-77, 579. Mr. Adams' irrigation system was purchased for him by Pennaco and he is paid by Pennaco to irrigate with CBM water. Tr. 584-85. Mr. Adams adds amendments to his soils, which are paid for by Pennaco, and his soils are monitored by Pennaco. Tr. 579, 585.

112. Mr. Koltiska has irrigated with water out of Wildcat Creek that upstream of 9 Mile Ditch had an EC of up to 2,800  $\mu$ S/cm ECw and has not yet seen any damage

to his alfalfa from this water quality. Tr. 221, 266-68, 639. Mr. Koltiska relied on dilution by water delivered via 9 Mile Ditch to use this water. Tr. 273.

113. The ambient EC<sub>w</sub> of Wildcat Creek water measured above the outlet from 9 Mile Ditch into Wildcat Creek is 2,200 µS/cm Tr. 246.

114. There is no consensus among the experts and scientists on what EC is protective for alfalfa. Tr. 348, 392-94, 638.

115. Petitioners do not allege what the numeric effluent limits should be. Tr. 638; Exhibit 14 (Petr's Resp<sup>1st</sup> Int.#3).

116. Petitioners' expert, Dr. Vance, did not give an opinion on what the effluent limits in the Modified Permit should be to protect irrigation. Tr. 336-37, 338-39, 638.

117. Petitioners did not demonstrate how more restrictive effluent limits for EC, sodium or SAR would be more protective of irrigated crops or soils than the limits set in the Modified Permit. Tr. 638<sup>1</sup>39, 641.

118. According to Dr. Schafer, There is more than one appropriate scientific method by which to set permit limits to achieve the narrative standard of Chapter 1, Section 20, of the Wyoming Water Quality Rules and Regulations. Tr. 479, 482, 641.

#### **Data Presented at Hearing**

119. The only evidence presented during the hearing regarding actual leaching fractions in the Prairie Dog/Wildcat drainages was presented in Dr. Schafer's Prairie Dog Creek Agronomic Monitoring and Protection Program report. Exhibit 27. This evidence indicated that some irrigators achieve only limited to no leaching. Tr. 304-06; Tr. 526-27.

120. Dr. Schafer provided literature "Soil Salinity, Salt Tolerance, and Growth Potential of Horticultural and Landscape Plants" that categorized orchardgrass as a "moderately sensitive" species. Tr. 485-86; Exhibit 34. This reference divides various major plant groups into general categories of salt sensitivity. Exhibit 34.

121. "Soil Salinity, Salt Tolerance, and Growth Potential of Horticultural and Landscape Plants" states that "The tolerance ratings . . . are to be interpreted only as a guide for making comparison among plants and apply generally from late seedling stage to maturity," and that "For ornamentals, size and appearance are the important criteria for determining salt tolerance. Comparisons based on growth reductions may not be completely applicable. In some cases, tolerances are based on the premise that reduced growth may be acceptable as long as plants appear healthy and attractive. Exhibit 34, p. 2.

122. Orchardgrass is listed in the category of "Ornamentals, grasses, and groundcovers." Exhibit 34, Table 1. Dr. Schafer, citing this literature instead of the

USDA salt tolerance database soil salinity data tables, said that a soil E<sub>Ce</sub> of 3,000  $\mu\text{S}/\text{cm}$  is protective of orchardgrass. T. 485-86.

123. In June of 2009, after the Modified Permit was issued, Pennaco collected samples along Wildcat Creek from locations below the Paul #3 Reservoir. Exhibit 28. These samples were analyzed for several constituents including carbon, hydrogen and oxygen isotopes. Exhibit 29; Exhibit 31, pp. 38-40.

124. Water seeping below the reservoir dam and collecting at the pumpback point is consistent with Dr. Schafer's finding that the shallow groundwater in a monitoring well immediately downstream is derived largely from infiltration from the Paul # 3 Reservoir. Exhibit 31, p. 33. Dr. Schafer, however concluded the Paul #3 Reservoir is not leaking into Wildcat Creek to include this pumpback point. Tr. 503-05.

125. Based on carbon-13 and other isotope data gathered by Dr. Schafer in June 2009 (Exhibit 31, pp. 38-40), Dr. Vance, calculated 16-17% CBM water at IMP-1, which is above the outlet from the 9 Mile Ditch. Dr. Vance concluded there was no trace of CBM water in Wildcat Creek below IMP-1 and above 9 Mile Ditch. Tr. 373, 375, 382; Exhibit 26, p.5.

126. According to Dr. Vance, 60% of the water in Wildcat Creek at the pumpback point below Paul #3 reservoir and 83% at IMP-1 was non-CBM water, based solely on carbon-13 isotope data. Dr. Schafer concluded that all the water chemistry results from June 2009, including the carbon-13 analysis, showed no CBM influence at IMP-1. Dr. Schafer opined that common ion chemistry from Wildcat Creek water samples taken in June 2009 show no evidence of CBM water anywhere in Wildcat Creek, to include IMP-1. Tr. 505-508; Exhibit 40.

127. Based on Dr. Vance's evaluation of Wildcat Creek water quality data, EC<sub>w</sub> increased to 2,500  $\mu\text{S}/\text{cm}$  at IMP-1. Tr. 384-86.

128. Dr. Vance believes that the other (non-CBM) water in Wildcat Creek that mixed with the 40% to 16% CBM water between the pumpback point below Paul #3 reservoir and downstream IMP-1 drove up the EC<sub>w</sub> to 2,500  $\mu\text{S}/\text{cm}$  at IMP-1. Tr.384-86.

129. Dr. Vance accounted for the increase in EC<sub>w</sub> as being due to mixing of CBM effluent with higher-EC non-CBM water in the Wildcat Creek system. Tr. 386.

130. The EC<sub>w</sub> level in Wildcat Creek could have gone up between the pumpback point below Paul #3 reservoir and IMP-1 even without CBM water mixed in. Tr. 386-87.

131. There is no evidence of CBM water in Wildcat Creek below IMP-1. Tr. 168-70, 375-76. Even if there were such evidence, Dr. Schafer demonstrated that CBM water in upper Wildcat Creek could be coming from irrigation return flows and not the Paul #3 Reservoir, that the amount of CBM water at the confluence of Wildcat Creek and 9 Mile Ditch would not be measurable, that CBM water from the Paul #3 would

improve water quality in upper Wildcat Creek, and that CBM water would not have a measurable impact on irrigated crops. Tr. 509-14; Exhibit 41.

132. Dr. Vance's analysis of the carbon 13 data indicated that there has been some CBM water that has contributed to water quality in Wildcat Creek below Paul #3 Reservoir, but such influence of CBM water would have been minor if discharge quality (100% CBM) was at most 1,330  $\mu$ mhos/cm ECw at outfall 002 to Paul #3 reservoir and CBM water was only 40% of the water at the pumpback point below Paul #3 and down to 16-17% of the water further down at IMP-1. Tr. 382-87.

133. According to data downloaded from an NRCS database, the irrigated areas in the Prairie Dog Creek and Wildcat Creek drainages have good soils that are well-drained, have the greatest measured depth to groundwater that NRCS measures have a land capability class III among the best in Wyoming, and are mostly considered prime farmland by NRCS. Tr. 366-67, 487; Exhibit 29.

134. The clay content in the soils is not a concern to Dr. Schafer, and his work with the Prairie Dog Creek Agronomic Monitoring and Protection Program (AMPP) suggests the soils in the Prairie Dog Creek drainage are quite appropriate for irrigation. Tr. 487, 502-03; Exhibit 31 (pp. 5-12).

135. Based on additional data collected by Pennaco after the Modified Permit was issued and analysis of that data by Pennaco's expert, Dr. Schafer, the council believes that the permit limits for outfall 003 in the Modified Permit are protective of soils and irrigated crops in the Prairie Dog Creek and Wildcat Creek drainages. Tr. 474-75, 484-86, 488-99 636-38; Exhibits 31 (pp. 20-29), 35-39; Exhibit 34.

136. Based on additional data collected by Pennaco after the Modified Permit was issued and analysis of that data by Pennaco's expert, Dr. Schafer, the permit limits for outfall 002 in the Modified Permit are protective of soils and irrigated crops in the Prairie Dog Creek and Wildcat Creek drainages. Tr. 474-75, 484-86, 502-14, 637-38; Exhibits 31 (pp. 29-40), 32, 40, 41; Exhibit 34.

### **PROPOSED CONCLUSIONS OF LAW**

1. Pursuant to WYO. STAT. ANN. § 35-11-112(a)(iv), the EQC has jurisdiction over the subject matter and the parties in this contested case.

2. WYO. STAT. ANN. § 35-11-301(a)(i) requires authorization under a permit issued by DEQ for the discharge of any pollution or wastes into the waters of the state. WYO. STAT. ANN. § 35-11-301(a)(i) & (ii) does not prohibit the discharge of pollution into surface waters of the state or the alteration of physical or chemical properties of waters of the state. WYO. STAT. ANN. § 35-11-301(a)(i) & (ii) requires a permit or authorization from DEQ/WQD to discharge pollution into surface waters of the state or to alter the physical or chemical properties of waters of the state. A permit from DEQ/WQD is not

required for discharges unless such discharges put pollution into surface waters of the state or alter the physical or chemical properties of waters of the state.

3. WYO. STAT. ANN. § 35-11-801(a) authorizes the DEQ to impose conditions on permits as necessary to accomplish the purpose of the Wyoming Environmental Quality Act which are “not inconsistent” with existing rules, regulations and standards.

4. Chapter 1, Section 20 of the Wyoming Water Quality Rules & Regulations (WWQRR) is a narrative standard to protect the quality of surface water used for agricultural purposes from degradation to such an extent as to cause a measurable decrease in crop or livestock production.

5. Crop and livestock production are the agricultural uses to be protected under Chapter 1, Section 20 of the WWQRR.

6. Chapter 2, Section 5(c)(iii)(C)(IV) of the WWQR requires that DEQ use appropriate scientific methods when translating the narrative standards of Chapter 1, Section 20 into numeric effluent limits.

7. The burden of persuasion in this case is on the Petitioners. *See, e.g.*, Tr. 7.

8. Petitioners demonstrated by a preponderance of the evidence that DEQ issued the Modified Permit without establishing numeric effluent limits by appropriate scientific methods.

9. Petitioners cannot prevail simply by showing that DEQ did not use appropriate scientific methods to derive numeric effluent limits for EC and SAR.

10. Petitioners are required to show by a preponderance of the evidence that discharges meeting the effluent limits established in the Modified Permit will result in measurable decrease in agricultural production. *See e.g.*, Tr. 641.

11. The Council may consider additional evidence provided in the contested case hearing that was not considered or available to DEQ in issuing the Modified Permit to determine whether Petitioners have met the burden of persuasion. *See e.g.* Exhibit 34.

12. The Council may approve the DEQ permit based on facts and analysis presented at the hearing which were never known to or considered by DEQ.

13. DEQ may continue to issue permits on an invalid scientific basis, so long as:

a) The permittee is able to provide an alternative adequate basis for the permit terms if the permit is appealed, and

b) The Petitioner cannot prove that a measurable decrease in crop or livestock production has or will occur as a result of the permitted discharge.

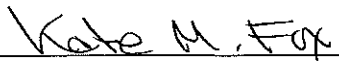
14. A preponderance of the evidence presented by Pennaco at the hearing shows that the contested permit's effluent limits of 1,215  $\mu\text{S}/\text{cm}$  EC and 300 mg/l dissolved sodium for discharges from outfall 003 to Prairie Dog Creek and 1,330  $\mu\text{S}/\text{cm}$  EC with restrictions on SAR at the irrigation monitoring point (IMP) for discharges from outfall 002 into Paul #3 Reservoir in Wildcat Creek to protect water quality for irrigation of alfalfa will not result in a measurable decrease in crop production and are consistent with the narrative standard in WWQRR Chapter 1, Section 20. *See, e.g.*, Tr. 636-37, 641.

15. Even though DEQ did not use appropriate scientific methods to set EC and sodium limits in the Modified Permit under Chapter 2, Section 5(c)(iii)(C)(IV) of the WWQRR, the Modified Permit should nonetheless be affirmed because the limits are protective and will not result in a measurable decrease in crop production. *See, e.g.*, Tr. 636-37, 639, 641.

16. A preponderance of the evidence shows that the default limit of 1,330  $\mu\text{S}/\text{cm}$  for ECw the EQC has previously approved as being protective for irrigation of alfalfa need not be changed to background water quality.

17. The "default" method was a proper method for deriving protective numeric effluent limits for alfalfa and pumpkins in this case. *See, e.g.*, "Findings of Fact, Conclusions of Law and Order," In Re: Willow Creek General Permit, Pumpkin Creek General Permit, and Four Mile Creek General Plan, EQC Consolidated Docket Nos. 06-3815, 06-3816 and 06-3817, Aug. 12, 2008; Tr. 388-91, 636-37, 639. The default method used by DEQ to derive effluent limits for protection of alfalfa and pumpkins is also protective of orchardgrass. *See* Exhibit 34; Tr. 485-86.

DATED this 11th day of February, 2010.

  
Kate M. Fox (Wy. Bar No. 5-2646)  
J. Mark Stewart (Wy. Bar No. 6-4121)  
DAVIS & CANNON, LLP  
Attorneys for Protestants  
422 W. 26<sup>th</sup> St.  
P.O. Box 43  
Cheyenne, WY 82003  
[kate@davisandcannonchey.com](mailto:kate@davisandcannonchey.com)  
[mark@davisandcannonchey.com](mailto:mark@davisandcannonchey.com)



**CERTIFICATE OF SERVICE**

This certifies that a true and correct copy of the foregoing PETITIONERS' OBJECTIONS AND PROPOSED FINDINGS OF FACT & CONCLUSIONS OF LAW was served this 11th day of February, 2010 by email, addressed as follows:

Mark R. Ruppert (WY Bar # 6-3593)  
Jere C. Overdyke (WY Bar #6-4248)  
HOLLAND & HART LLP  
Attorneys for Pennaco Energy, Inc.  
2515 Warren Avenue, Suite 450  
P. O. Box 1347  
Cheyenne, WY 82003  
[mruppert@hollandhart.com](mailto:mruppert@hollandhart.com)  
[jcoverdyke@hollandhart.com](mailto:jcoverdyke@hollandhart.com)

Mike Barrash (WY Bar # 5-2310)  
Luke Esch (WY Bar #6-4155)  
Wyoming Attorney General's Office  
Attorneys for Wyoming DEQ  
123 State Office Building  
Cheyenne, WY 82002  
[mbarra@state.wy.us](mailto:mbarra@state.wy.us)  
[lesch@state.wy.us](mailto:lesch@state.wy.us)

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Kate M. Fox  
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