STATE OF SOUTH DAKOTA

BEFORE THE WATER MANAGEMENT BOARD

IN THE MATTER OF WATER PERMIT APPLICATION No. 7088-3 AND FLOOD CONTROL APPLICATION No. FC -5A	FINDINGS OF FACT, CONCLUSIONS OF LAW AND FINAL DECISION

Hearing was held on October 8 and November 17, 2009. Lake Poinsett Water Project District (Applicant or LPWPD) was represented by Richard J. Helsper and Jeromy J. Pankratz. The DENR Water Rights Program and its Chief Engineer (DENR) was represented by Diane Best. Intervenor Department of Game, Fish, and Parks (GFP) was represented by Richard Neill. Intervenor Richard Smith appeared *pro se.*

Hearing was held before Board members Rodney Freeman, Jr. (Hearing Chairman), Everett Hoyt, Francis Brink, Leo Holzbauer, and Bernita Loucks. Board Chairman Bjork recused himself. Board member James Hutmacher also did not participate, not being available for the October hearing.

The Board, having considered the testimony and exhibits presented and all records and documents on file and having entered its oral decision and rulings on the parties' submissions, now enters the following:

FINDINGS OF FACT

Procedure

1. The Applicant proposes to amend its existing Flood Control Permit FC-5 and also seeks a new water permit, No. 7088-3.

2. The Chief Engineer recommended denial of both proposals.

3. Notice of the Applicant's request was properly advertised in the Hamlin County Republican (June 10 and June 17, 2009), the Arlington Sun (June 11 and 18, 2009), the Hamlin County Herald Enterprise (June 10 and June 17, 2009), the Brookings Register (June 11 and June 18, 2009), the Watertown Public Opinion (June 11 and June 18, 2009), and the Estelline Journal (June 10 and June 17, 2009).

4. The Notice provided that petitions to intervene were to be filed by June 29, 2009. It further provided that hearing would be held on July 9, 2009.

5. The following persons or entities timely filed letters or requests to intervene (postmarked or received on or before June 29): GFP, Earl and Beverly Voeltz; Kathryn A. Hibbert; Dale and Beverly Coughlin; Bernie and Vicki Nissen; Thomas W. Long; Erwin G. Kirkvold; John and Majorie Runia; Francis and Joyce Kelley; Marie and Robert Tietjen; Robert and Margaret Schuldt; Dr. Gerald A. Myers; Bill and Pat Intermill; Ronald and Faye Aaker; Dakota United Methodist Camps; Richard and Janet Sagness; Amy Bourne; Troy and Lisa Belden; Darren and Terril Cain; Joel C. Mohlenhoff; Larry Engeltjes; Paul and Ruby Julson; Richard H. Smith; East Dakota Water Development District; Carol Faragher; Sherry Lura; Jayson Meyer; Scott L. Ross; Mr. and Mrs. Harms; and Donald and Maxine Brown.

6. The publicly noticed July 9, 2009, hearing was continued to October 8 due to the illness of one of Applicant's witnesses.

7. Prior to hearing the Applicant, GFP, and DENR stipulated to file their expert reports or summaries of expert positions with the Board and to send them to all parties, including all other Intervenors.

8. Of the foregoing list of Intervenors, the following appeared at one or both of the two days of hearing: Richard Smith, GFP, Thomas Long, Paul and Ruby Julson, and Becky Holton, Director, Dakota United Methodist Camps (represented by Attorney Tom Lee) and East Dakota Water Development District. The remaining Intervenors did not appear.

9. At hearing on October 8, the Board's counsel informed the Intervenors present that they had the right to testify, to cross examine witnesses and to otherwise participate as a party. TR 10. He also advised them that they could rely on the testimony presented by the Applicant, the DENR, or the GFP rather than formally

participating, but if they did not participate as an Intervenor, they would waive their right to formally protest any decisions. TR 10. During this dialogue Richard Smith indicated that he would participate as a party. The remaining persons chose not to participate as parties.

10. Several persons filed petitions to intervene after June 29: David Aaron, Kevin Smith, Bob Anderson, Chuck and Dorie Sendelbach, Alan Frentz, Dave and Diane Kosbau, Scott and Debra Dominiack, John Nelson, Gerald D. and Carmella Wilson, Mike and Darla Werner, and Ronald Freesemann. None of these individuals appeared at hearing. TR 8, 9. Because they failed to timely intervene and also did not appear, they were not entitled to party status.

11. At hearing George Milldrum appeared and indicated that he wished to participate as a party opposing the applications. TR 12. He did not intervene earlier and, consistent with the Board's ruling to deny late filed interventions, he was told he could not participate as a party. TR 12. The Board finds that Milldrum did not properly intervene and was not entitled to party status.

12. Hearing began on October 8, 2009. A second day of hearing was held on November 17, 2009. The November 17, 2009, date was stipulated by the parties. TR 202.

Summary of Applicant's Position

13. Application FC-5A proposes a change in the operation of outlet gates on the channel between Lake Poinsett and the Big Sioux River (BSR). FC-5A, if approved, would authorize the operation of the gates to allow inflows from the BSR to maintain adequate high lake levels in Lake Poinsett. In particular, the Applicant seeks to amend Qualification Nos. 1 and 2 on FC-5 to read as follows:

> (1) That the gated structure may be open when water is backed up from the BSR and may flow into the lake over the outlet.

(2) That the gates may be used to raise the water level in Lake Poinsett. The gates must remain open when the water level elevation of the lake is higher than the water level downstream of the outlet.

14. Application No. 7088-3 proposes to appropriate water from the BSR into Lake Poinsett through the same gates. The project proposes to allow a maximum volume of 16,000 acre feet (ac ft) of water annually into Lake Poinsett from March 15 to May 15 when the lake level is below 1650.5 feet mean sea level (fmsl) and flow from the BSR is available. The structure authorized by FC-5 would be used to maintain a consistent water level in Lake Poinsett at 1650.5 fmsl. The gates would not be used to raise the water level when Lake Poinsett is at or above 1650.5 fmsl.

15. The Applicant relied on three experts: Patrick Emmons (Emmons); Dr. Suzette Burckhard (Burckhard); and Loyal Messerschmidt (Messerschmidt) as well as several lay witnesses.

16. Emmons, a geologist, testified about the hydrology of the watershed and Lake Poinsett. He also offered the opinion that introduction of additional water into Lake Poinsett would be beneficial from the perspective of preventing shoreline erosion.

17. Burckhard, an engineer, testified that introducing water from the BSR into Lake Poinsett, as proposed, would cause little or no increase in nutrient loading from introduction of phosphorus into Lake Poinsett.

18. Burckhard and Emmons filed a joint report. Applicant's Ex. 22. Although Burckhard and Emmons also purported to make an economic analysis in their report (pages 32-37), neither testified as an expert in economics.

19. Messerschmidt, a realtor, testified that during 2003-2008, the prices obtained for Lake Poinsett homes generally declined but the prices rose at Lake Madison. He also provided fact testimony about his own home and experiences at Poinsett.

20. Fact witnesses Lorin Pankratz, John Neilson, John Bjorkman, and Dave Peterson testified that the introduction of water from the BSR would (a) maintain consistent water levels for recreation, and (b) enhance economic value to the property and business around the lake. They also testified about pondweed on Lake Poinsett and, further, testified about the smell of the exposed bottom sediments or decaying vegetation on the lake. See, e.g. TR 242 (Neilson).

Summary of DENR Position

21. The Chief Engineer recommended denial of Application No. 7088-3 because it contradicts the purposes of Flood Control Permit No. FC-5 (which are to reduce flood damage, bank erosion and nutrient loading to Lake Poinsett), it may impair GFP vested water right claim No. 1576-3 due to increased phosphorus concerns, and is not a beneficial use of water.

22. The Chief Engineer also recommended denial of Application FC-5A because it contradicts the intended purposes of Flood Control Permit No. FC-5 and because the requirements of SDCL 46-2A-11 have not been met: 1) there would be no reduction in damage from flooding or erosion in the area proposed to be benefited; 2) the project may increase the likelihood or the severity of flood damages in the area proposed to be benefited; 3) the project may significantly increase the annual phosphorus load entering Lake Poinsett; and 4) the project may impair the GFP vested water right claim No. 1576-3.

23. The DENR relied on the testimony of Chief Engineer Garland Erbele as well as three DENR experts.

24. Lynn Beck is an engineer with approximately 20 years of experience in Ordinary High Water Mark (OHWM) issues, flooding complaints, and matters involving the hydrology of lakes and the interaction of lakes with rivers and streams. Beck has testified as an expert before the Board in several cases including a previous

declaratory ruling concerning the gates between the BSR and Lake Poinsett as well as a case establishing the OHWM for Lake Albert. DENR Ex. 2. Beck completed her initial report of the LPWPD application in the spring of 2009. DENR Ex. 3. She later updated this report to include not only the analysis in DENR Ex. 3, but also new lake data from the summer of 2009. DENR Ex. 3A. Beck testified that the Applicant's proposals may increase ice damage, shoreline erosion and other shoreline damage, would not constitute a beneficial use, and would not meet the standards in SDCL 46-2A-9, SDCL 46-2A-11, and SDCL 46-2A-12 for granting the requested permits. Beck is a credible witness and used generally accepted engineering and scientific methods and applied them to the data concerning Lake Poinsett.

25. Paul Lorenzen holds a Master's degree in biology, is employed by the DENR, and is involved in water quality issues relating to lakes. He has managed water quality assessments in the Lake Poinsett area including one from nearby Lake Thompson. He conducted a study of the Lake Poinsett watershed (2007-2009) and compiled a comprehensive report of the findings in January 2009 before the LPWPD application was filed. DENR Ex. 6. He made a supplemental expert report in September 2009. DENR Ex. 8. Both reports conclude that introduction of water from the BSR into Lake Poinsett would significantly increase phosphorus loading. Lorenzen is a credible witness and used generally accepted scientific methods and reliably applied them to the data concerning Lake Poinsett.

26. Jeanne Goodman has almost 30 years experience in environmental work and is Administrator of the DENR Surface Water Quality Program. She has many years experience in environmental regulation including the study of water quality issues, establishment of water quality standards, and enforcement of pollution issues. Goodman has appeared before this Board on numerous occasions as an expert in water rights and surface water quality matters. Goodman is a credible and reliable

witness. She testified as to the regulation of pollutants in lakes in South Dakota, particularly phosphorus in the Lake Poinsett area.

Summary of GFP Position

27. The GFP holds vested water right claim No. 1576-3 for public recreation. GFP asserts that if the proposed application was approved, the long-term public recreational uses of the lake, including recreation and fisheries, would be adversely impacted. GFP supports the Chief Engineer's recommendation.

28. The GFP relied on two experts: Leslie Petersen, GFP Aquatic Resource Coordinator, and Mark Ermer, Fisheries Program Manager.

29. Leslie Petersen holds a Master's Degree in Environmental Science. For approximately 10 years she has been responsible for reviewing private and governmental water project proposals pending before federal and state agencies and determining their impacts on fish and wildlife habitat, recreation and GFP lands. She is responsible for preparing and advocating water permit applications filed by the GFP. She also administers the GFP program regarding aquatic nuisances, including aquatic vegetation such as pondweed. Leslie Petersen has appeared before this Board several times regarding various water permit applications and is a credible and reliable witness.

30. Expert Mark Ermer holds a Master's degree in fisheries science and has been employed by the GFP in that capacity since 2004. He is responsible for managing Lake Poinsett and other lakes in a 13-county area in northeast South Dakota. The GFP management of Lake Poinsett is for the beneficial use of all citizens including fisheries and boating. Ermer is credible and reliable.

Summary of Richard Smith Position

31. Richard Smith is the Lake Poinsett Watershed Coordinator and is employed by the Hamlin County Conservation District. He authored one of the reports

relied on by Applicant's expert witnesses. In his letter of intervention (DENR Ex. 13), Smith stated that Applicant's experts draw erroneous conclusions from his report. DENR Ex. 13. Smith also testified about the projects undertaken in the watershed to reduce erosion and nutrient loading to Lake Poinsett and other nearby lakes. Smith also supports the Chief Engineer's recommendation.

Background on FC-5

32. Lake Poinsett Area Development Association (LPADA) applied for FC-5 in 1986. DENR Ex. 14. Poinsett had experienced high lake levels resulting in shoreline erosion and structural damage on several occasions. In 1986 an estimated $2 million in damages resulted from high spring runoff into Lake Poinsett from both the BSR and from the lakes to the west. The 1986 application stated that the project would reduce flood damage, bank erosion, and nutrient loading to Lake Poinsett. DENR Ex. 14.

33. FC-5 was approved by this Board and authorized a gated control structure in the Lake Poinsett outlet channel in the SW¼ NW¼ Section 13 T113N-R52W, Hamlin County. The gates were to keep flows from the BSR from entering the lake via the outlet channel. The Findings of Fact are incorporated herein by reference. The Board decision was not appealed.

34. Emmons testified that FC-5 was not intended to address nutrient loading. TR 81. Emmons was not part of the FC-5 application process. TR 85. The written application, the published notice of hearing, the DENR report reviewing the application (Winterton Report), and the Flood Control Water License for FC-5 all show that an objective for FC-5 was, in fact, to reduce nutrient loading in Lake Poinsett. TR 82-86; DENR Ex. 14. In particular, the license (attached to Emmon's expert report) states that it is a "flood control permit for various purposes including reduction of nutrient loading to the lake." TR 82, 84; Applicant's Ex. 22.

35. FC-5 was granted to LPADA with five qualifications:

1. That the gated structure may be closed only during times when water is backed up from the BSR and may flow into the lake over the outlet.

2. That the gates may not be used to raise the water level in Lake Poinsett. The gates must remain open when the water level elevation of the lake is higher than the water level downstream of the outlet.

3. That the Ordinary High Water Mark (OHWM) elevation 1651.5 feet mean sea level may not be affected by this Flood Control Permit and that the Board may review this permit if it appears that the OHWM is being affected or a new OHWM is being formed above or below the established OHWM.

4. That the construction of the control structure, future maintenance and repair, and gate operation are the responsibility of the Lake Poinsett Area Development Association.

5. That the gates must be capable of being locked in position so unauthorized persons may not operate or tamper with the gates.

36. The FC-5 gates were installed in 1989 and first operated in 1991.

37. FC-5 was transferred to LPWPD in 1992. LPWPD currently holds Flood Control Water License No. FC-5.

Boswell Structures

38. The Boswell structures were constructed in 1929 by GFP before the state regulated pollution and before flood control permits were required. GFP holds appropriative water rights for these structures. Water Right No. 28-3 (1941 priority date) is for diversion of 500 cfs of "flood waters" from the BSR for "natural lake restoration and maintenance of Lake Poinsett and Dry Lake." In 1955 GFP obtained Water Right No. 119-3A to enlarge the project. DENR Ex. 6 at 19.

39. The Boswell structures consisted of a dam on the BSR that diverted water west into a man-made channel rather than flowing downstream in the BSR. Water flowed in a westerly direction through the man-made channel and was then evacuated through a set of gates operated by the GFP. After leaving the gates, the water entered Dry Lake. Dry Lake then flows into Lake Poinsett.

40. The Boswell gates are no longer operational and have not operated since the 1980's except for one day in 1991. Applicant's Ex. 26. The Boswell dam on the BSR was ultimately removed in 2008. TR 139; DENR Ex. 6 at 20. Water flows from the BSR into the old man-made channel only during high water conditions. TR 91-92. The operation and use of the Boswell structures is not directly at issue. The gates involved in this proceeding are south of the Boswell structures. DENR Ex. 4.

41. Although the Boswell structures and the FC-5 structures are different, Emmons testified that they were intended to operate in an interdependent manner. TR 87. He testified that the FC-5 gates prevent flow from the BSR into Poinsett, but the Boswell gates were to be used to replenish flows in Poinsett by channeling BSR water though Dry Lake into Lake Poinsett. TR 87.

42. Since 1929 the Boswell structures have been subject to numerous management changes and have not provided a consistent source of water to Lake Poinsett.

43. There has long been a concern about diverting nutrient rich water from the BSR into Lake Poinsett. DENR Ex. 3A at 7. In 1962 GFP developed a management plan. By 1971 the management plan required that the Boswell gates could not be used unless the water quality in the BSR was equal to or better than water in Lake Poinsett. DENR Ex. 3A at 7.

44. The Poinsett Diversion Committee was formed in 1979 to make recommendations to the Secretary of GFP regarding the operation of Boswell gates. The resulting Operation Plan again stated that water quality in the BSR had to be equal to or better than Lake Poinsett. DENR Ex. 3A at 7.

45. The FC-5 application was considered in 1986-1987. The Winterton Report for the FC-5 hearing (attached to Applicant's Ex. 22) referred to the Boswell diversion, recognizing the diversion was still in place for diverting BSR flood flows into

Lake Poinsett. The Winterton Report, however, cautioned against using FC-5 for diverting flood flows from the BSR into Poinsett as had occurred with Boswell.

46. By 1986 the Boswell gate authority to divert flood flows had been restricted for several years and could only be used when water quality in the BSR was better than Lake Poinsett. TR 89.

47. Nothing in the Board's 1987 Findings of Fact and Conclusions of Law for FC-5 (attached to Applicant's Ex. 22) indicates that FC-5 was to be interdependent with the Boswell Diversion.

48. The last revision of the Operation Plan was in 1991 and still included the water quality condition. Applicant's Ex. 26. Further, GFP's permit had not authorized it to use the gates except for flood flows, meaning that GFP did not operate the Boswell gates unless the flows at a staff gage upstream at Castlewood measured 11 feet. TR 89, 90.

49. By the time the FC-5 structures were completed in the early 1990's and the license was issued in 1996, the Boswell diversion had not been used for years.

50. Emmons also testified that there are conflicts with the operational manual for Boswell and that he really did not understand the management plan. TR 90. However, he also understood the operation manual for the Boswell diversion required a very specific flood flow elevation of 11 feet on the staff gage at Castlewood in order to be used. TR 89.

51. This Board finds that preventing flood flows from entering Lake Poinsett under FC-5 was not dependent on replenishing flows through Boswell and, in any event, would not be sufficient reason to amend FC-5 as requested, given the entirety of evidence presented in this proceeding.

52. It is undisputed that although the Boswell dam has been dismantled, water enters the manmade channel when the stage is sufficiently high in the BSR.

TR 93-95. Further, when the stage in the river is high enough, the water flows through the channel and over the top of the permanently closed Boswell gates. TR 93-95.

Lake Poinsett Background

53. Lake Poinsett is a glacial lake with a surface area of 7,868 acres. This Board previously held that the OHWM for Lake Poinsett is 1651.5 fmsl and the outlet elevation is 1650.5 fmsl. The lake has an average depth of 9.5 feet at 1650.5 fmsl. DENR Ex. 3A at 3.

54. The immediate watershed for Lake Poinsett encompasses approximately 500 square miles. DENR Ex. 3A at 3. Extending the Lake Poinsett watershed to the BSR, as proposed, would add 730 square miles to the drainage area for Lake Poinsett. DENR Ex. 3A at 3.

55. Poinsett receives most of its water from surface water contributions from Dry Lake to the north and from a chain of lakes to the west. DENR Ex. 3A at 3; DENR Ex. 4. The chain of lakes starts with Marsh Lake and then flows into Lake Norden, Lake Mary, Lake St. John, and then Lake Albert, which are west of Lake Poinsett. DENR Ex. 3A (Attachment 1); Applicant's Ex. 6. Lake Albert also receives flows from Badger and Thisted lakes to the south. DENR Ex. 3A at 3. From Lake Albert, water flows through a marsh, under U.S. Highway 81, and into Lake Poinsett.

56. The natural outlet for Lake Poinsett is a linear wetland channel extending from Lake Poinsett to the BSR. DENR Ex. 6 at 1; DENR Ex. 4. This is the location of the FC-5 gates at issue. DENR Ex. 4.

57. Lake Poinsett has a history of lake fluctuation. Water levels have varied as much as 10 feet during the period of record (1965 to 2009). DENR Ex. 3A at 3. The lowest levels were 1646.4 fmsl in 2006 and 1646.8 fmsl in 1976. The highest

measurements were 1656.3 fmsl in 1986 and 1656 fmsl in 1997. Ex. 3A (Attachment 3).

58. The lake has been subject to periodic flooding including the damaging 1986 flooding events that prompted the FC-5 gates as well as damaging flooding in 1997 and flooding again in 2001.

59. Messerschmidt purchased his home on Lake Poinsett after the property had been damaged from the 1997 flood. TR 252. There was a huge hole in the yard and seven trees were tipped over. TR 252.

60. Bjorkman moved into his home on Lake Poinsett on March 20, 1997, and there was 17" of water in the basement. This was during the time ice was breaking up on the lakes. He also testified there was a smaller flood in 2001.

61. Water declined from 2002 through 2006. After the water reached a low in 2006, some recovery occurred through 2007 and 2008 to fall water levels of 1647.5 fmsl in 2008, three feet below the outlet elevation. Ex. 3A at 2.

62. It is undisputed that in the spring of 2009 flows from Lake Albert to Lake Poinsett measured 100 to 150 cfs. TR 99-100. It is also undisputed that Lake Poinsett was filled by May 19, 2009. TR 100. A significant part of the flows into Lake Poinsett in 2009 were from Lake Albert. TR 100.

63. It is also undisputed that during 2009 Lake Poinsett remained full and water was discharged from Lake Poinsett to the BSR. TR 100. It discharged throughout 2009. TR 100. At the time of the final hearing in this matter on November 17, Lake Poinsett was still discharging to the BSR. It was at elevation 1651.8 fmsl (16 inches above the outlet elevation) and was also above the OHWM of 1651.5.

Analysis of Applicant's Proposals

Effects on Lake Levels

64. The Applicant seeks to divert up to 16,000 ac ft annually from the BSR through the FC-5 gates into Lake Poinsett during the period from March 15 through May 15.

65. Emmons' expert report stated that 16,000 ac ft would support a 2.4 foot rise in Lake Poinsett. He testified at hearing, however, that 16,000 ac ft, if released from the FC-5 flood gates, could also be shared with Dry Lake because the two lakes are connected at approximately 1646 fmsl. Accordingly, the expected 2.4 foot rise in Lake Poinsett may be less. TR 109.

66. Emmons stated that introducing BSR water was necessary because Lake Poinsett has become a terminal lake, i.e., a lake with no outlet, since the FC-5 gates were installed. TR 105. He recognizes that Lake Poinsett has actually discharged water to the BSR in 13 out of the 19 years that the gates have been in operation, but asserts those discharges were during the 1990's, an anomalous period in climate in South Dakota. TR 106. He acknowledged on cross-examination, however, that the wet years in the 1990's were only the years 1993-1997. TR 107.

67. Emmons testified that when a water balance is done, Lake Poinsett loses a foot a year. However, there are also years when the gates would be open and water spilling from the lake to the BSR. TR 104-5.

68. This Board finds that Lake Poinsett is not a terminal lake.

69. In analyzing Applicant's proposals, Emmons reviewed average annual precipitation. He did not examine individual precipitation events in the past to analyze whether they were normal or not. TR 130, 131.

70. Emmons did not consider the precipitation in particular months or as correlated to particular events. TR 131. Accordingly, he did not report the average precipitation for the two spring months (March 15 to May 15) when the present application would be in effect.

71. Emmons did not consider seasonal variations in water availability (such as spring runoff) when the pending application would be in effect. Spring runoff occurs when the ground is frozen and impermeable. Runoff is largest when there is a lot of snow pack in the watershed, the ground is still frozen, and warm temperatures occur. TR 129. There is a difference in the way that runoff occurs depending on the season. TR 130.

72. Emmons did not examine a hypothetical scenario where Applicant's proposals would be examined in light of historic lake conditions. TR 102.

73. Beck used known historical stage and flow data, DENR measurements of lake elevations, and hydrologic modeling to analyze the stage, level, and flow of water for March 15 to May 15 and to compare the actual period of record as compared to the stage, level, and flow that would have occurred if the Applicant's proposals had been in place during the same period.

74. Beck obtained data from monitoring sites in Lake Poinsett's immediate and extended watershed which measure stage, flow and water quality. Beck calculated the average potential daily flow volumes from the BSR into Lake Poinsett using 31 years of record (1977 - 2008) from the USGS gaging station near Castlewood, South Dakota. DENR Ex. 3A at 3.

75. Beck relied on Aquarius, a hydrologic software program, which was used to develop rating curves and best fit models to relate stage on the BSR to stage in the Lake Poinsett outlet channel. DENR Ex. 3A at 3.

76. Beck then used elevation data to estimate head over the outlet elevation and to calculate possible volumes of water entering Lake Poinsett using a weir equation. DENR Ex. 3A at 3. These volumes were converted to possible inches of water added to Lake Poinsett (taking into account historic spring lake levels, the Applicant's proposed annual operational dates of March 15 to May 15, and the Applicant's requested maximum volume of water. DENR Ex. 3A at 3 (and Attachment 6).

77. Given the thorough analysis performed by witness Beck, the Board credits the Beck analysis of Applicant's proposals on the lake levels. Accordingly, the Board makes the following findings concerning the affects that the Applicant's proposals would have on lake elevations.

78. Prior to installation of the current FC-5 outlet gates, some inflow from the BSR to Lake Poinsett occurred but it was overtaken by flows from the west chain of lakes. DENR Ex. 3A at 3. Ex. 3A (Attachment 4) shows that many times when initial inflow from the BSR occurred, the overtaking flow from Lake Albert to the west held Lake Poinsett at elevations well above the OHWM of 1651.5 fmsl for extended periods of time. DENR Ex. 3A at 3.

79. For the period before the FC-5 gates were installed there was no inflow or very little inflow from the BSR to Poinsett when the lake levels were at their lowest. DENR Ex. 3A at 3.

80. For the 33 years of record, fall lake level measurements were one foot or more below the outlet elevation during 12 years. DENR Ex. 3A at 3 (and Attachment 6). For these years when lake levels were a foot or greater below the outlet elevation in the fall, runoff the next spring from the BSR would not have provided significant flow except in 1978, 2007, and 2009. DENR Ex. 3A at 4.

81. The existing FC-5 gates were first operated in 1991, and were operated frequently to release water from Poinsett into the BSR due to high precipitation and runoff values in the 1990's. DENR Ex. 3A at 4. The operation of the outlet gates prohibited water from the BSR from entering Lake Poinsett. DENR Ex. 3A at 4. Lake levels remained high due to inflow from the western chain of lakes and inflow from Dry Lake to the north. DENR Ex. 3A at 4.

82. In 2002 lake levels began to drop below the Lake Poinsett outlet elevation. DENR Ex. 3A at 4.

83. Based on Beck's analysis applying Aquarius program results to actual lake level measurements from 2002 to 2007, this Board finds that Lake Poinsett would have been raised from zero to a possible 2" for the five-year period ending in early 2007 if the Applicant's proposals had been in place. DENR Ex. 3A at 4 (and Attachment 6).

84. Actual lake data shows that at the end of 2006, the lakes to the west had filled and were spilling to Lake Albert but did not reach Poinsett. DENR Ex. 3A at 4. Though flow was minimal, Lake Albert began spilling to Lake Poinsett at the end of 2007. Dry Lake also began to contribute flow to Lake Poinsett in 2007. Actual Lake Poinsett water levels for 2007 and 2008 ended at elevation 1647.6, 1.2 feet higher than the low of 1646.4 fmsl in 2006, but still 2.9 feet below the outlet. DENR Ex. 3A at 4.

85. By comparison, flows on the BSR in the spring of 2007 were substantial, and if the requested 16,000 ac ft inflow from the BSR had been allowed, the combined effect with inflow from the currently existing watershed would have caused Lake Poinsett to reach an elevation of 1649.7 fmsl. DENR Ex. 3A at 4.

86. Calendar year 2007 is the only year in the 45 years of lake level measurement records that flow from the BSR would have filled Lake Poinsett without

contributing flow from the western chain of lakes. It was a year where climatic events in the BSR watershed north of Lake Poinsett produced runoff capable of filling Lake Poinsett. DENR Ex. 3A at 4. There was no runoff entering Lake Poinsett from the chain of lakes to the west. Due to the previous five years of drought, the lakes to the west had dropped and required significant runoff from local watersheds to fill in 2007. DENR Ex. 3A at 4. Lake Poinsett received flow from Dry Lake in 2007 and had a spring elevation of 1648.1 fmsl, 0.9 feet higher than the previous fall. DENR Ex. 3A at 4.

87. If Lake Poinsett had filled in 2007 as addressed above, the lake would obviously have still been higher in 2008 as well. This Board finds that the lake elevations would have increased to higher levels and been full or close to full in 2007 and 2008 if the Applicant's proposals had been in place.

Shoreline Effects

88. Lake Poinsett is the second largest natural lake in South Dakota. Emmons testified that the larger the lake, the larger the waves and the more concern with erosion. TR 110.

89. Even with the FC-5 gates closed, Lake Poinsett experienced extreme high water levels due to inflow from the west (through Lake Albert) during the years 1993 through 1998 and again in 2001. DENR Ex. 3A at 4.

90. The existing shoreline erosion design made by Richard Smith (Applicant's Ex. 7) provides for reasonable shoreline stabilization and is a good design. TR 110, 111, 133, 134. This is stabilization that would protect the upland property owned by private parties which starts at the OHWM. TR 111.

91. The Smith report contains several watershed goals and objectives to prevent erosion. Maintaining water levels in Lake Poinsett at 1650.5 fmsl is not one of those goals. TR 119, 120; DENR Ex. 13.

92. Emmons testified that Poinsett water levels should be maintained at 1650.5 fmsl (the outlet elevation) to prevent shoreline erosion below the OHWM. TR 111.

93. Although Emmons testified that soils should consistently be inundated below the OHWM, he was not aware until the first day of hearing that the OHWM is understood to be the place where beach soils end and upland soils begin. TR 112. Under the pending proposals water would consistently cover the entire portion of the area available for public use and provide for no dry beach area along the shoreline. TR 113.

94. Under the Applicant's proposals, the beach area would be covered with water to prevent erosion and the shoreline would start with the private property owner's rip rap. TR 111.

95. Early spring rises in water levels prior to ice going off a lake can increase the potential for ice damage. The early rise creates an open lane of water which allows for the ice to build considerable momentum when the wind moves across a lake. DENR Ex. 3A at 4. If this happens at high water levels and before the ice has deteriorated, damages to shoreline and property increase significantly. DENR Ex. 3A (Attachment 5) shows actual ice damage in the spring of 2009 due to this effect, even without the introduction of water from the BSR, as proposed.

96. It is undisputed that on March 30, 2009, an owner of property on the Lake Poinsett shoreline experienced ice damage to a dwelling when the lake level was at 1649.1 fmsl, 1.4 feet below the outlet elevation. DENR Ex. 3A at 5.

97. Beck testified that if the outlet gates had been opened March 15, 2009, the combined flow from the BSR, Dry Lake, and Lake Albert would have resulted in lake levels of approximately 1650.8 fmsl by March 30, 2009. Ex.3A at 5.

98. Emmons did not calculate the effect that the Applicant's proposal would have had in 2009 if it had been in place. TR 114. He did not dispute that ice came off the lake after March 15, 2009 (TR 114-15), and that if the gates are open as proposed at the same time as ice breakup, the ice has potential to cause damage. TR 115.

99. Maintaining Lake Poinsett at 1650.5 fmsl during the early spring ice breakup, as proposed, would have significantly increased shoreline damages in the early spring at Lake Poinsett given the 2009 scenario.

100. By July 22, 2009, inflow to Lake Poinsett equaled outflow plus evaporation at a lake level of 1651.3 fmsl. DENR Ex. 3A at 5. Had the gates been opened starting March 15 until Poinsett reached the outlet level, the additional inflows could have caused the water to rise as high as 1653 fmsl, DENR Ex. 3A at 5. The Board makes this Finding based on information provided by Beck, which is based on specific lake measurements made during 2009 and the hydrology of the lake watershed.

101. Emmons agreed that if water had entered the lake as of March 15, 2009 (as proposed), and there were other events after that date, such as significant precipitation, the water level could potentially have later risen over the OHWM. TR 116.

102. Emmons testified that the Lake Poinsett flood stage is considered to be 1659 fmsl, so causing flows to rise above the OHWM of 1651.5 fmsl periodically is not a major concern even if water is above the private property owner's property line at the OHWM. TR 115. However, Emmons would not recommend that the Board issue an order that would cause the Applicant to release water into Poinsett that would exceed the OHWM and flood private property. TR 122.

103. If water is released from the BSR into Lake Poinsett on March 15 to allow Lake Poinsett to reach the elevation of 1650.5 fmsl and the gates are then closed,

there would not be anything that could be done about a later event that would cause even more water to enter the lake by natural means through a precipitation event or flows from Lake Albert and Dry Lake. This is based on the Emmons (TR 123), Beck, and Erbele testimony.

104. Emmons characterized the foot between the outlet elevation of 1650.5 fmsl and the OHWM of 1651.5 fmsl as freeboard. TR 124. However he acknowledged that if the FC-5 gates were open, as proposed, to allow water to be at the outlet elevation of 1650.5 fmsl, the lake could still later rise on its own (as a result of flows from Lake Albert or precipitation) to above 1651.5 fmsl. TR 125. It is undisputed that Lake Poinsett rose over 2 feet on its own in 2009 without introduction of water from the BSR. TR 125. Consequently the lake is fully capable of rising above this freeboard level if the present applications are granted.

105. Emmons acknowledges that if water rose above the OHWM as a result of this application (combined with natural events), the private property owner would sustain the additional water on their property until the water evaporates or flows out the inlet/outlet channel. TR 126.

106. Flooding and erosion potential would have increased through out the spring and summer of 2009 due to a higher lake level in Lake Poinsett if the Applicant's proposals had been in place in 2009.

107. Emmons concluded that maintaining the level of Lake Poinsett at 1650.5 fmsl would not increase the chances of substantial flooding or endanger human life. TR 121. Richard Smith, Lake Poinsett Watershed Coordinator with local knowledge of the lake and its potential for erosion, disagrees with that conclusion. Ex. 13. Lynn Beck, long time DENR engineer who examined the proposals in light of historic flows, also disagreed with the Emmons conclusion. This is one of the bases for the Chief Engineer's recommendation of denial.

108. The Board credits the testimony and calculations of Beck and the testimony and local knowledge of Richard Smith and the testimony and the review undertaken by the Chief Engineer in this regard.

109. Maintaining the level of Lake Poinsett at the same elevation as the outlet, as requested, would increase the likelihood of flooding, erosion, and ice damages, especially when considering that water also comes from the west and north into Lake Poinsett through Lake Albert and Dry Lake, not just in 2009 but also in other years.

110. The potential for damage to property from flooding, erosion, and ice, particularly when considered in light of evidence showing there would have been few years when the BSR would have provided sufficient flow to make a different in Lake Poinsett water levels, demonstrates that Applicant's proposals should not be granted, independent from the separate reasons below regarding water quality and impairment of existing water rights held by GFP.

Water Quality

111. The designated uses of Lake Poinsett are warm water semi-permanent fish life propagation, immersion recreation, limited contact recreation, and wildlife propagation and stock watering. These uses were designated by this Board pursuant to its authority to promulgate rules pertaining to water quality. TR 150, 151.

112. Lorenzen and Burckhard relied on some of the same studies, including the 1971 thesis of Jack Skille. Skille studied lake nutrient loading at Lake Poinsett with particular attention to conditions contributing to eutrophication. Skille's major conclusion was that nutrient concentrations in Lake Poinsett were at a state of super-saturation relative to the needs of the aquatic plants in the lake and the lake was experiencing an advanced degree of eutrophication. Applicant's Ex. 22 at 14.

113. Eutrophication in lakes is a natural process by which lakes accumulate silt and organic matter as they age. Applicant's Ex. 22 at 14; TR 155.

114. A young or oligotrophic lake is one in which there is a low level of nutrients and plant growth. Applicant's Ex. 22 at 14. Young lakes acquire nutrients from their drainage basins over their lifetime, potentially thousands of years. As time proceeds, nutrients in the lake result in increased aquatic growth. Applicant's Ex. 22 at 14.

115. Increased biological activity causes the water to become less clear due to the increased numbers of phytoplankton and decaying organic matter contributing to the depletion of dissolved oxygen. Applicant's Ex. 22 at 14, 15.

116. Microscopic algae are phytoplankton. A eutrophic or "well-fed" lake is one in which the nutrient levels are sufficient to support plant and phytoplankton growth. Applicant's Ex. 22 at 15.

117. Eutrophication can be accelerated by the introduction of sediment and nutrients into a lake by human activity. TR 156. The increase in nutrient loading leads to more phytoplankton and plant growth as well as a lessening of depth due to sediment being deposited within the lake. Applicant's Ex. 22 at 15.

118. The most common sources of pollution that contribute to these activities are runoff from agricultural and urban nonpoint sources such as stormwater runoff. Applicant's Ex. 22 at 15. Although nonpoint sources of pollution are a common source of nutrients and sediment, other sources include municipal wastewaters, industrial wastewaters, and sanitary sewer systems. Applicant's Ex. 22 at 15.

119. Factors that affect the production of algae within a lake system include the amount of available sunlight, nutrients, temperature, and oxygen levels. The amount of light available for photosynthesis depends on the clarity of the water and is typically measured by a Secchi disk. Applicant's Ex. 22 at 15.

120. Eutrophic lakes typically are murky and this restricts the production of algae to the upper layer of water as sunlight is not able to penetrate to lower depths.

Applicant's Ex. 22 at 15. Controlling the supply of nutrients is the most common method suggested to control or manage algae growth in a lake. Applicant's Ex. 22 at 15.

121. Algae requires many different nutrients to grow including carbon, nitrogen, phosphorus, sulfur, calcium, magnesium, potassium, sodium, iron, manganese, zinc, copper, boron, and others. Applicant's Ex. 22 at 15. Although all of these nutrients are required, the typical limiting nutrients that control the amount of algae produced are nitrogen and phosphorus. Applicant's Ex. 22 at 15.

122. As lakes eutrophy, the dominant species of algae tends to shift towards Cyanophyta or blue-green algae. Some common blue-green algae have the unusual ability to obtain nitrogen from the atmosphere directly so phosphorus is typically the limiting nutrient for growth. Applicant's Ex. 22 at 15.

Regulation and reduction of phosphorus

123. DENR has been involved in studies and attempted to limit phosphorous in Lake Poinsett for decades.

124. Both DENR and the Applicant relied on a study called Ten-Year Report: Oakwood Lakes-Poinsett, Rural Clean Water Program: Project 20, South Dakota Department of Environment and Natural Resources, 1991. It was a very lengthy, ten-year scientific study of the Lake Poinsett area conducted by state and federal agencies. TR 174. One of the key findings was that while there is phosphorous concentration in the sediment in the lakes, a best management practice implementation system may extend the life of the lakes by reducing additional new phosphorous in the lakes TR 174. DENR witness Goodman was one of the authors.

125. The DENR and the Applicant also relied on the Phase I Diagnostic Feasibility Study Final Report, Lake Poinsett, Hamlin County, South Dakota. 1996. Water Resources Assistance Program. Division of Financial and Technical Assistance.

South Dakota Department of Environment and Natural Resources. The data was gathered in 1993-1994; the report was published in 1996. In this proceeding it was referred to variously as the 1993-1994 diagnostic study, the 1994 assessment study, the 1996 report or the 1996 water quality assessment study. It is referred to herein as the "1996 DENR assessment study."

126. DENR witness Paul Lorenzen works in the Water Resources Assistance Program, the state program that developed the 1996 DENR assessment study.

127. The 1996 DENR assessment study identified a goal of 40% reduction in annual watershed phosphorus loading and a target in lake phosphorus concentration of 0.07 milligrams per liter (mg/L). DENR Ex. 6 at 13. This was to reduce algal biomass and protect the recreational value of Poinsett. DENR Ex. 6 at 5.

128. Considerable resources have been spent at the local, state, and federal level to reach the phosphorus reduction goal in the 1996 DENR assessment study. DENR has awarded nearly $1,000,000 in state and federal grant funds to the Hamlin County Conservation District to conduct the Lake Poinsett Water Quality Improvement project administered by Richard Smith. DENR Ex. 6 at 13. Most of this money was used to provide cost share to local landowners to implement best management practices to reduce phosphorus loading to Lake Poinsett. DENR Ex. 6 at 13. This includes funding for manure management systems, vegetative buffer strips, grazing management, and alternative livestock watering systems to keep livestock out of tributaries. DENR Ex. 6 at 13.

129. The Lake Poinsett project administered by Smith has spent a total of $1.6 million to clean up lakes including Poinsett and the area lakes such as Lake Albert. This includes money from the DENR and also contributions from local landowners in the watershed. The projects include riprap and steel walls to protect the shoreline and providing no till equipment for farmers to use to prevent erosion.

Also, feedlot owners have used these funds, along with substantial sums of their own money, to change operations to keep phosphorus from getting into the lakes. Other projects include restoring wetlands and keeping cattle from grazing on Lakes Albert and Poinsett. There is very little grazing of cattle along the lake shore now; in past years it was pervasive.

130. The DENR has also developed water quality standards. Some are numeric standards. Those include items such as chlorine residuals, nitrogen, dissolved oxygen, and other parameters. It is undisputed that the water quality in Lake Poinsett meets these numeric standards. TR 152-152. The DENR has also developed narrative standards including, for example, prohibiting visible pollutants.

131. The DENR has not developed numeric water quality standards for phosphorus. This is a factor Burckhard relies on in stating that the DENR does not regulate water for phosphorus at all (TR 152) and that DENR does not measure phosphorus (TR 153).

132. Based on the Goodman testimony phosphorus appears naturally in lakes, but when introduced to lakes it is a pollutant and can impair water bodies. The DENR's response to phosphorous loading in lakes is to: (a) encourage and finance best management practices for nonpoint source pollution; (b) to deny any requests for permits for wastewater discharge into lakes; and (c) to enforce water pollution control laws.

133. Based on Goodman, phosphorous in lake basins is often attributable to nonpoint sources such as agricultural runoff and erosion which are not regulated through surface water discharge permits. Surface water discharge permits are required for point sources. Because permits are not used for management of nonpoint sources, direct control through numeric standards is not workable for nonpoint

sources. For nonpoint sources, best management practices are encouraged by the DENR instead and incentives are often provided for BMPs through watershed projects.

134. At the second day of hearing Burckhard testified that Minnesota has a phosphorus standard for regulating point source pollution, i.e. standards for issuance of permits for point source discharges.

135. Based on Goodman, a numeric standard for phosphorous has not been needed because the DENR does not issue discharge permits allowing point sources to discharge to lakes at all. For example, in the area of concern, the city of Lake Norden, the industrial plant at Lake Norden, the city of Hayti, and the Lake Poinsett Sanitary District are all point sources that have "no discharge" permits. They cannot discharge effluent, regardless of whether it contains phosphorous. Because no point source discharge is allowed into lakes, the DENR does not have a numeric standard for introduction of such discharge.

136. Although the City of Watertown discharges wastewater containing phosphorous into the BSR, the discharge is 40 miles upstream from Lake Poinsett. This discharge does not reach Lake Poinsett except maybe during extreme flood flows. This is not considered a discharge into Lake Poinsett.

137. Lake Albert obtains water from a large agriculturally based drainage area. The runoff from the watershed has phosphorus in it. The DENR has not directly prohibited the release of discharge from Lake Albert to Lake Poinsett because it is a natural drainage pattern. Instead, funds to reduce phosphorus in runoff have been spent on Lake Albert and grazing practices have changed so there is little contribution of phosphorus from grazing.

Burckhard Water Quality Analysis

138. Burckhard examined the existing level of phosphorus in Lake Poinsett, relying on STORET, a publicly accessible database using information sent in from

every state to the EPA. TR 160, 166. She did not use additional data gathered by the DENR because she did not want the data to be biased by the current ongoing study of phosphorus levels conducted by DENR. TR 218. Accordingly, she used only the more general information provided in STORET, even though DENR is also the provider of that data as well.

139. According to Burckhard, the majority of the phosphorus in Lake Poinsett is in the sediment and regular lake activity (boating for example) and wave action causes the phosphorus to be re-suspended. TR 161. She testified that if there were higher water levels, as proposed, the phosphorus is still in the sediment, but the disturbance of the sediments would be minimized. TR 162-63, 167.

140. Burckhard testified that at lower levels there is less water in Lake Poinsett, but the lake still contains the same quantity of phosphorus, i.e. a higher phosphorus concentration. TR 210, 220. This is based on her assumption that Lake Poinsett is a terminal lake. TR 188. She also stated that Lake Poinsett is sometimes a terminal lake and sometimes it is not. TR 219.

141. Lake Poinsett was lower in 2006 than in 2007. Applicant's Ex. 4. Yet, according to Applicant's Ex. 12 (prepared by Burckhard), the phosphorus concentration in Lake Poinsett was lower in 2006 than in 2007. This is contrary to the Burckhard testimony that as the lake rises, phosphorous concentrations are lower.

142. Burckhard's characterization of the lake as a terminal lake appears to rely on Emmons. Although Emmons characterized Lake Poinsett as a terminal lake, he does not dispute that Poinsett has discharged water in the last 13 out of 19 years, a factor that is inconsistent with the idea that it is a terminal lake, i.e. a lake with no outlet.

143. Burckhard testified that part of the water that would be diverted into Lake Poinsett would be atmospheric deposition in the immediate channel where the FC-5 gates are located and would not be water from the BSR. Applicant's Ex. 22 at 30, 31; TR 203, 214. Burckhard asserts that this atmospheric deposition would provide only 5 to 200 lbs. of phosphorus per year. Applicant's Ex. 22 at 31. These calculations are based on the National Atmospheric Deposition Program. TR 214. The sum given would be just the phosphorus in the snow and rain, not runoff, sediment, or flow from the BSR channel. TR 214, 215, 217.

144. Burckhard did not analyze the concentration of phosphorus that would be in the BSR and ultimately enter Lake Poinsett if the application was granted. Applicant's Ex. 22 at 30. She does not know what the average concentration of water would be in the BSR. TR 216. She testified that what comes from the BSR depends on the conditions controlling the flow on the BSR at that particular time. TR 216.

145. Burckhard testified on November 17 that the only way to calculate a true phosphorus level at the location where water enters Lake Poinsett is to measure the phosphorus when the gates are open, water has already flowed through the gates, and water is about to enter Lake Poinsett. FC-5 should not, however, be changed to allow for testing in this manner since it would require this Board to authorize opening the gates just to collect more data on whether the gates should, in fact, be open. There is currently sufficient data available.

146. Although Burckhard did not testify as to specific levels, she stated that the flow from the BSR through the channel to Lake Poinsett would not introduce large amounts of phosphorus into Lake Poinsett because the channel contains sufficient vegetation to sequester phosphorus even during the spring snow melt when plants are not growing. TR 203.

147. Burckhard testified that the channel is basically vegetated and in some cases has fairly tall grass, cattails, and wetland type vegetation. TR 195-96. Photographs in the immediate area of the channel, however, show open water. DENR Ex. 18, 19, and 20. Burckhard also testified that she did not look at the depth of water in the channel, did not look at the whole channel, and did not calculate its width. TR 211, 212. She acknowledged that she did see water in the channel even up above the vegetation. TR 211, 212.

148. Beck examined this channel extensively and finds it to be a wide open channel with little obstruction and vegetation only along the sides of the channels, as contrasted with the Lake Albert channel that is very dense with marsh vegetation. Further, Beck found that the bridges in this area were properly sized and not impeding the flows. The Board credits the testimony of Beck and her photos (DENR Exs. 18, 19, and 20); Beck has walked a majority of the length of these channels.

Lorenzen Water Quality Analysis

149. Lorenzen developed two reports. The first, DENR Ex. 6, was completed while LPWPD was considering whether to file the now pending application. LPWPD had made DENR aware that it was considering various proposals, including one that would direct BSR water into Lake Poinsett. DENR Ex. 6 at 2.

150. After the applications were filed and new information was acquired in the spring and summer of 2009, Lorenzen made his supplemental report in September 2009. DENR Ex. 8.

151. Lorenzen obtained long-term BSR phosphorus data (1977-2008) from DENR's Surface Water Quality Program. DENR Ex. 6 at 3. This dataset was monthly samples from ice-free periods (March-October) from the two water quality monitoring stations (water quality monitoring station-WQM 1 South of Watertown and Big Sioux-BS08 near Estelline) closest to Lake Poinsett. DENR Ex. 6 at 3.

152. Lorenzen obtained long-term Lake Poinsett trophic state information (i.e., total phosphorus, Secchi and chlorophyll-a) from Water Resources Assistance Program's Statewide Lakes Assessment Project (1989-2008) and the 1996 DENR assessment study. DENR Ex. 6 at 3.

153. Lorenzen relied on Aquarius flow modeling. DENR Ex. 6 at 3.

154. Lorenzen also relied on actual water level and water flow measurements from the chain of lakes to the west of Lake Poinsett, including Lake Albert, the Lake Albert outlet channel, Lake Poinsett, the Lake Poinsett outlet channel, and the BSR. DENR Ex. 6 at 2.

155. Both Lorenzen reports rely, in addition to other data, on phosphorus samples collected at DENR monitoring sites. The samples were collected during the spring and early summer of 2007, 2008 and 2009 within the immediate watershed of Lake Poinsett and the BSR.

156. Lorenzen's samples were collected pursuant to accepted scientific methods for water sampling. DENR Ex. 6 at 2; DENR Ex. 8 at 3. They were analyzed by the State Health Laboratory. DENR Ex. 6 at 2.

157. Among the sampling sites, Lorenzen used information (2007-2009) from DENR sampling site BSR 18.5. DENR Ex. 6 at 7; DENR Ex. 8 at 1. BSR 18.5 is 4 channel miles from the FC-5 gates. Based on witness Beck this site on the BSR is only about 1 to 1 ½ channel miles upstream of the BSR confluence with the outlet channel. This site is therefore close to where the BSR would enter the outlet channel and representative of the water quality of the flows that would enter Lake Poinsett.

158. While some samples have previously been taken by DENR in the immediate area of the gates, neither party ultimately relied on them. TR 185. This is because the FC-5 gates are currently required to be closed when the BSR would be high enough to flow into Lake Poinsett. Under this current scenario the water slows

down and ponds, allowing particulates, including phosphorous, to settle out. This would not be representative of conditions if the gates were open since that scenario would allow for flows at a greater velocity and, accordingly, differing concentrations of phosphorous. TR 185.

159. Test site BSR 18.5 would be expected to have similar water quality (phosphorus concentrations) as that delivered through the FC-5 gates if they were open. This site is near the confluence of the BSR and the outlet channel and the flow channel between those two places is unimpeded by physical structures (gates or undersized bridges) and is mostly free of dense vegetation.

160. Lorenzen compared phosphorus results from various sites on the BSR to sites in Dry Lake and in the chain of lakes to the west of Lake Poinsett, culminating with Lake Albert. The phosphorus concentrations are much higher at the BSR monitoring sites than at the outflows from Dry Lake and Lake Albert, the two lakes which now directly contribute to Lake Poinsett. DENR Ex. 6 at 4 (chart).

161. Given the thorough analysis performed by Lorenzen, the Board credits the Lorenzen results with respect to the anticipated effects of the current proposals on the phosphorous loading and other nutrient loading that would occur at Lake Poinsett. Accordingly, the Board makes the following findings concerning the effects that the Applicant's proposals would have on lake elevations.

162. The BSR concentrations range widely due to environmental factors associated with a riverine system that flows through a large agricultural landscape. DENR Ex. 6 at 4. Lake outlet concentrations are less variable. DENR 6 at 4.

163. Lake Poinsett itself has lower phosphorus concentrations than Dry Lake and the western chain of lakes. DENR Ex. 6 at 4.

164. Average summer (May-August) phosphorus concentration based on available data from 1989-2008 in Lake Poinsett is 0.13 mg/L. Lake Poinsett's large

volume and downstream position in the watershed are the likely reason for its lower phosphorus levels than the upstream basins. The upstream basins likely retain nutrients and sediment and reduce loading to Lake Poinsett. DENR Ex. 6 at 4.

165. Lake Poinsett received minimal to no phosphorus loading from the immediate watershed (Dry Lake and the chain of lakes to the west) from 2002 through 2008. DENR Ex. 6 at 5.

166. Algae production in Lake Poinsett has decreased significantly in recent years compared to wet years observed in the 1990's. DENR Ex. 6 (Figure 1). Water clarity has also shown similar improvement. DENR Ex. 6 at 5.

167. The average 2008 summer Secchi depth in Lake Poinsett was recorded at 8.5 feet (Figure 2). Secchi depth, water clarity, and algae production are trophic state indicators, i.e. the state of eutrophication. DENR Ex. 6 at 5. The relative improvement of these trophic state indicators in recent years demonstrates Lake Poinsett's sensitivity to annual phosphorus loading. DENR Ex. 6 at 5.

168. Lake Poinsett's sensitivity to annual phosphorus loading is supported by the 1996 DENR assessment study which found relatively high phosphorus loads associated with increased algal biomass and decreased water clarity. DENR Ex. 6 at 5. The lack of watershed phosphorus loading since 2002, coupled with low algae biomass and increased water clarity, triggered a shift in lake primary production. DENR Ex. 6 at 5.

169. Lorenzen analyzed 2007 data to determine the effects BSR flows would have on Lake Poinsett. In 2007 the BSR would have contributed flows to Lake Poinsett (if the Applicant's proposals had been in place), so phosphorus data from year 2007 is suitable for examining the potential phosphorus effects. He also used samples from BSR 18.5 which, as stated above, are representative of conditions at the FC-5 gates (if open). This comparison also uses the parameters of the Applicant's proposals

(March 15 to May 15 with volume sufficient to fill Lake Poinsett up to the outlet level or a volume of 16,000 ac ft whichever is less).

170. In 2007, the BSR was estimated to have been able to fill the entire Lake Poinsett system to outlet elevation over the period March 14 to April 22. DENR 8 at 1. The average phosphorus concentration based on five samples collected at BSR 18.5 during this time period was 0.65 mg/L. DENR 8 at 1. The 2007 BSR phosphorus load as calculated at this location was 42,000 lbs. DENR 8 at 1.

171. The same water volume, when applied to the average concentrations of Dry Lake (0.34 mg/L) and Lake Albert outflow (0.17 mg/L) would result in significantly lower phosphorus loads. DENR 8 at 1. The estimated phosphorus load associated with Lake Albert and Dry Lake is 8,000 and 5,500 lbs, respectively. DENR 8 at 1. The cumulative phosphorus load from both sources is estimated at 13,500 lbs. DENR 8 at 1. The BSR phosphorus load (42,000 lbs) would have been roughly three times higher than that from the existing watershed (13,500 lbs).

172. The 2007 estimated phosphorus loads from the BSR and the existing watershed were ultimately used to simulate an in-lake phosphorus response. DENR 8 at 1. This exercise was done as though the gates were open in the spring of 2007.

173. To simulate an in-lake phosphorus response, lake volumes, phosphorus loads and base-line in-lake phosphorus concentrations are added to a mass balance equation. DENR Ex. 6 at 9.

174. The base-line in-lake phosphorus concentration used for the simulation was 0.13 mg/L, the long-term average concentration of Lake Poinsett. DENR Ex. 6 at 9.

175. When subjected to the estimated phosphorus load from the existing watershed (13,500 lbs.), the in-lake concentration of Lake Poinsett was estimated to increase from 0.13 mg/L to 0.15 mg/L. DENR Ex. 8 at 2. If BSR load (42,000 lbs.) is

used, however, the estimated in-lake phosphorus concentration of Lake Poinsett would increase from 0.13 mg/L to 0.27 mg/L. DENR Ex. 8 at 2. The potential BSR load would have nearly doubled the in-lake concentration of Lake Poinsett.

176. A significant positive linear relationship was observed in 2007-2008 between BSR (18.5) flow and phosphorus concentration. DENR Ex. 6 at 10. As flow volume increases, total phosphorus concentrations increase. DENR Ex. 6 at 10. This is important since BSR flow as measured at BSR (18.5) is often considerable (175 cubic feet per second) before it flows to the point where it could enter the outlet channel of Lake Poinsett. DENR Ex. 6 at 10, 11. The first snowmelt event of 2007 was estimated to have been able to provide significant flow (800 cubic feet per second) to Lake Poinsett at a phosphorus concentration well over 1.0 mg/L. DENR Ex. 6 at 11. As the season progressed, concentrations decreased though still showing a pattern of increase with increasing flow volume following storm events. DENR Ex. 6 at 11. These factors are significant since the Applicants' proposals include the period from March 15 -30 which is a typical snowmelt period.

177. Data from 2009 was also examined, starting with calculating the phosphorus load to Lake Poinsett from the existing watershed. During the early spring of 2009, Lake Poinsett was approximately 2.5 feet below outlet elevation (1648.0 fmsl). DENR Ex 8 at 3. Dry Lake and Lake Albert began to contribute flow to Lake Poinsett on March 15, 2009. By April 7 Lake Poinsett rose 1.6 feet to an elevation of 1649.6 fmsl. DENR Ex. 8 at 3, 4. The volume associated with this rise over 7,900 acres was 12,640 ac ft. DENR Ex. 8 at 4. The average phosphorus concentration from Dry Lake and Lake Albert during the same period was 0.33 mg/L. DENR Ex. 8 at 4. The resulting phosphorus load coming into Lake Poinsett was therefore approximately 11,300 lbs. during the period from March 15-April 7, 2009. DENR Ex. 8 at 4.

178. After April 7, 2009, Lake Poinsett equalized with Dry Lake and the entire surface area increased to approximately 9,875 acres. DENR Ex. 8 at 4. At this time, the water volume required to reach outlet elevation was approximately 8,888 ac ft. DENR Ex. 8 at 4. Dry Lake contributed minimally after April 7 and Lake Albert contributed exclusively to Lake Poinsett between April 7 and May 19, when the lake was filled. DENR Ex. 8 at 4. The average phosphorus concentration for Lake Albert during this period was 0.09 mg/L and the resulting phosphorus load was 2,200 lbs. DENR Ex. 8 at 4.

179. The cumulative phosphorus load for the existing watershed for the period from March 15 to May 19, 2009, was estimated at 13,500 lbs (11,300 lbs. plus 2,200 lbs.). DENR Ex. 8 at 4.

180. The estimated 2009 load was compared to a calculated load designed to simulate the Applicant's proposals under 2009 conditions. DENR Ex. 8 at 4. BSR flood flows were assumed to contribute the proposed 16,000 ac ft of inflow to Lake Poinsett during the period from March 17 to March 26. The average phosphorus concentration collected at BSR 18.5 during this period was 0.7 mg/L. DENR Ex. 8 at 4. The potential phosphorus load contributed by BSR flows was therefore calculated at 30,500 lbs. DENR Ex. 8 at 4.

181. The proposed appropriation of 16,000 ac ft from the BSR would have increased the lake level from 1648.0 fmsl to 1649.6 fmsl. DENR Ex. 8 at 4. The other 0.9 feet of water (8,888 ac ft) required to fill the Lake Poinsett system (including the Dry Lake portion) to outlet elevation would have been contributed by the existing watershed. DENR Ex. 8 at 4. Calculations based on actual 2009 flows show this would have occurred before April 7. DENR Ex. 8 at 4.

182. The average phosphorus concentration for the existing watershed from March 17 to April 3, 2009, was 0.35 mg/L. DENR Ex. 8 at 4. The resulting

phosphorus load was calculated at 8,500 lbs. Adding the phosphorous load from the BSR to that from the existing watershed results in a cumulative phosphorus load of 39,000 lbs. This would have been nearly three times higher than the phosphorus load from the existing watershed alone (13,500 lbs.) for 2009. DENR Ex. 8 at 4 (Figure 4).

183. Based on a mass balance equation, the in-lake phosphorus concentration of Lake Poinsett in 2009 would have potentially doubled with the combined BSR and existing watershed phosphorus load (39,000 lbs.) (Figure 5). DENR Ex. 8 at 5.

184. Phosphorus is not just a short-term nuisance because once this nutrient enters the lake it recycles between the water column and bottom sediments. When conditions are favorable, sediments can release dissolved phosphorus into the water column which becomes available for algae growth. As algae die they return phosphorus back to the bottom sediments. This cycle makes removing phosphorus from the lake difficult, if not impossible. Considerable federal, state, local and private funds have been spent to reduce the phosphorus loading to Lake Poinsett. DENR Ex. 8 at 6.

185. The west chain of lakes allows for some settling and filtering effects that reduce the pollutant concentrations prior to flow from Lake Albert entering Lake Poinsett. DENR Ex. 8 at 6. This settling and filtering effect occurs in the Lake Albert chain of lakes and not the BSR, given the phosphorus data and calculations presented.

186. Increased phosphorus loading from the BSR under the Applicant's proposals would negate the ongoing efforts to reduce phosphorus loading to Lake Poinsett. DENR Ex. 8 at 6.

187. Increased phosphorus loading from the BSR under the Applicant's proposals could increase the risk of frequent and intense algae blooms, including nuisance blue-green algae. DENR Ex. 8 at 6.

188. Increased phosphorus loading from the BSR under the Applicant's proposals would increase the risk of higher concentrations of suspended solids, dissolved solids, bacteria, and nutrients other than phosphorus. DENR Ex. 6 at 15. These additional pollutants would be delivered more directly to Lake Poinsett via the outlet channel if water is allowed to enter the lake.

189. Given the phosphorous loading that could occur from the BSR if the Applicant's plan was approved, the Applicant's proposals would impair the water quality in Lake Poinsett and should not be approved.

Proposed Management Plan

190. Board member Hoyt requested that the Applicant consider proposing a management plan that would allow for flows, but address phosphorus issues. TR 222-24, 236, 237.

191. Witness Burckhard presented a plan on November 17. Ex. 23.

192. The plan would be administered by the Applicant and would provide for up to 12,000 lbs. of phosphorus to be introduced from the BSR to Lake Poinsett every five years. This would be a five-year moving accumulated phosphorus load for flow of water from the BSR through the FC-5 gates and into Lake Poinsett. Ex. 23. The 12,000 lb. cap would be in addition to any other phosphorus entering Lake Poinsett from other sources.

193. The plan also provides for taking daily samples of phosphorous from water after it was allowed to pass through the FC-5 gates. The phosphorus samples would be tested by SDSU and would take 5-10 days to complete. LPWPD would pay for the testing.

194. The Burckhard plan would be subject to continuing jurisdiction of the Board. Witness Burckhard recommended that it would be reviewed by the Board in 10 years time.

195. Under its plan, the LPWPD would cooperate with the state climatologist on installing weather monitoring equipment and with the USGS on installing a water flow monitoring device. The specific type of water flow monitoring device would be determined by the parties after approval of the pending application by this Board.

196. The 12,000 lbs. is based on total load of phosphorus so there is not a limitation on concentrations of phosphorus. Accordingly, the amount of water that would enter Lake Poinsett could vary depending on when the total load of 12,000 lbs. was reached. If flow that enters the lake has a high concentration of phosphorus, then the amount of water allowed to enter the lake would be less than if there is a low concentration of phosphorus.

197. Witness Burckhard testified that the 12,000 lb. cap was based on three factors:

- Her view that the 1996 Assessment Study goal of a 40% reduction in phosphorus had been surpassed, so that an excess allocation of 15,000 lbs. of phosphorus would still meet the anticipated goal. Under this view, there would be room to spare for introduction of up to 15,000 lbs. of phosphorus while still meeting the Assessment Study goal.
- An 8,200 lb. yearly diversion cap that had been developed by GFP in the 1980's, which was in a timeline on one of the exhibits at hearing.
- The 12,000 lbs. is less than the 2007-2009 phosphorus loads estimated to have been delivered to Lake Poinsett from Lake Albert and Dry Lake.

198. Based on Lorenzen, significant reduction of phosphorus is still required and the 1996 Assessment Study goal has not been met. Lake Poinsett has an average phosphorus concentration of 0.13 mg/L and the concentration goal is 0.07 mg/L. Even if the total goal had been surpassed, the reduction efforts were designed to

decrease overall phosphorous, not create an allowance for this project. To do so would be a step backwards in terms of phosphorus control.

199. The reference to the 8,200 lb. cap is apparently based on Applicant's Ex. 26, the 1991 Operating Procedure for the Lake Poinsett Diversion. Along with this 8,200 lb. cap, this Operating Procedure requires that (a) the phosphorus level could not be detrimental to Lake Poinsett, and (b) that the flood gates must be closed during the first 72 hours of flooding in order to avoid excessive nutrient loading in the lake. Ex. 26 at 5. The GFP has not operated the Boswell Diversion since 1991 when it operated for one day. In other words, this number is from an 18-year-old operational plan for another structure that contained other conditions as well and has operated one day in those 18 years.

200. The fact that flows from Lake Albert contributed 13,500 lbs. of phosphorus to Lake Poinsett by natural means is independent from allowing another 12,000 lbs. of phosphorus to flow from the BSR into Lake Poinsett.

201. Even if the 12,000 lb. cap was allowed, it is not workable. DENR Exs. 23, 24. Although daily sampling would occur, the testing of those samples would not be completed for 5-10 days. In the meantime, the flows would still be flowing through the FC-5 gates and would be entering Lake Poinsett.

202. Based on 2007 data, the entire 12,000 lb. cap would have been reached in three days before the test results were available for the first sample. Further, if LPWPD complied with the 12,000 lb. limitation, the plan would produce a lake level gain of only a .5 foot increase in lake elevation. DENR Ex. 23.

203. Using 2009 data, the entire 12,000 lb. cap would have been reached in six days and would have produced a lake level gain of only one foot.

204. Even if the Burckhard plan was workable, it would not address the erosion and ice damage issues associated with introduction of water from the BSR into Lake Poinsett during spring run off flows. DENR Ex. 23.

Analysis of Existing Water Rights

205. The nearest irrigation water right is 5.5 miles downstream of the Lake Poinsett outlet channel confluence with the BSR. It is not expected that Applicant's proposal would affect irrigation water rights on the BSR.

206. GFP holds vested water right claim No. 1576-3 for sufficient water to fill the lake annually to the outlet elevation for public recreation purposes. GFP Ex. 2; DENR Ex. 3A at 6.

207. Leslie Petersen testified that as a state agency charged with the protection of the state's natural resources; GFP would be negligent if it endorsed the Applicant's plan insofar as it allows for pollution of Lake Poinsett for short term recreational benefits at the sacrifice of the long term benefits to the lake for present and future generations of South Dakotans. She testified that this is particularly the case because the poorest water quality in the BSR occurs when the river is in flood stage. When flood stage occurs in the BSR, it is during the spring run off and during the same months the Applicant seeks to divert water from the BSR.

208. Based on the testimony of GFP expert Leslie Petersen and GFP Ex. 2, algae blooms and aquatic weed growth caused by phosphorus loading can adversely impact long term recreational purposes of the lake including aesthetics, swimming, boating, and other recreational uses of the lake.

209. If the proposed application was approved, the long-term public recreational uses of the lake may be adversely impacted by algae blooms and aquatic weed growth. GFP Ex. 2.

210. Based on GFP witnesses Leslie Petersen and Mark Ermer, the diversion of BSR waters during high water events into Lake Poinsett (such as those occurring during the springtime) would have a negative impact on the fisheries resource within the lake. This is based on anticipated dissolved oxygen deficiency, lack of emergent and submergent vegetation needed for fish spawning and nursery habitat, and overall diminishment of the current clear water, aquatic-macrophyte dominated state which is favorable to fisheries. GFP Ex. 2; GFP Ex. 4.

211. Leslie Petersen's testimony and GFP Ex. 2 address the dissolved oxygen deficiency issue. High levels of phosphorus in high water events on the BSR (such as that experienced during spring flows) would contribute to frequent green and blue-green algae blooms. The algal blooms, in turn, create an additional oxygen demand in the water, resulting in dissolved oxygen deficiencies within lakes, so some of the more desirable fish species may have a harder time surviving.

212. Leslie Petersen's testimony and GFP Ex. 2 also address the issues associated with the lack of emergent and submergent vegetation. South Dakota lakes with elevated phosphorous levels and frequent algae blooms have turbid waters which preclude the growth of emergent and submergent aquatic vegetation. Aquatic vegetation is a very important component to a healthy fish community. The vegetation provides critical aquatic habitat needed for fish spawning, nursery habitat for juvenile fish, shoreline erosion control and the production of dissolved oxygen through photosynthesis.

213. Mark Ermer's testimony and GFP Ex. 4 address the desirability of maintaining the current clear water, aquatic-macrophyte dominated state which is favorable to fisheries. In recent years, inflows of surface waters from the BSR to Lake Poinsett have been minimal. As a result of the reduced flows, Lake Poinsett has experienced a shift in its state of equilibrium from a turbid-water, algae-dominated

state to a clear-water, aquatic-macrophyte dominated state. In the clear-water state, water transparency has improved and the majority of the phosphorous currently within the system is contained in the aquatic macrophytes growing in the littoral zone of the lake. Such plant growth at intermediate levels provides many benefits to the lake and its fishery including spawning habitat, nursery cover for juvenile fish, increased macroinvertebrate densities, lake sediment stabilization, shoreline stabilization, removal of suspended solids and nutrients, and oxygen production.

214. Ermer credits scientific literature reviewing the relationship between vegetation and sport fish populations which finds that the optimal condition for sport fish populations is a 10 to 40 percent aquatic macrophyte cover. GFP Ex. 4. Rooted macrophytes are an important component to a healthy fishery, and prior to shifting to a clear-water state, Lake Poinsett contained little to no aquatic macrophytes. GFP Ex. 4. Complete eradication of aquatic vegetation can have serious negative impacts on fisheries resources, shelter, fish spawning and shoreline erosion. The ability to maintain a quality fishery in Lake Poinsett is greatly improved by preserving the current water quality and habitat conditions within the lake. GFP Ex. 4.

215. Based on Ermer's recital of GFP 2009 lake survey data, Lake Poinsett fish populations are responding favorably to the improved water quality and habitat conditions in the last several years. GFP Ex. 4.

216. Ermer's testimony and GFP Ex. 4 also address the potential introduction of Asian carp and other aquatic nuisance species into Lake Poinsett from the BSR. Both bighead and silver carp are known to be present in the lower reaches of the BSR and have shown a tendency in the past few years to expand their range further up watersheds to more northern latitudes not previously occupied. Similar range expansions are occurring in the Missouri, Mississippi, James, and Vermillion River systems. During high flow periods, many otherwise unpassable obstacles or

structures become passable by fish and other organisms, resulting in range expansions. During high flow events, when water from the BSR is proposed to be allowed to flow into Lake Poinsett, there is a potential risk that incoming waters could also transport unwanted Asian carp or other invasive species into the lake. Asian carp can have a very detrimental impact on existing fish populations and recreational uses of waters. GFP Ex. 4.

217. This Board finds, based on the testimony and exhibits of GFP experts Leslie Petersen and Mark Ermer, that introduction of waters from the BSR into Lake Poinsett during spring flow events can adversely impact the fishery in Lake Poinsett and have long term adverse effects on the recreational purposes of the lake including fishing, aesthetics, swimming, boating, and other recreational uses of the lake.

218. The adverse affect of the Applicant's proposals on fisheries and on aesthetics, swimming, boating, and other recreational uses of the lake would be likely to cause an adverse impairment in the ability of GFP to use and maintain its existing vested water right claim No. 1576-3.

219. In addition to the foregoing GFP vested water right, GFP also holds Water Right No. 28-3 and Water Right No. 119-3A. These are the Boswell rights addressed above.

220. Although the Boswell water rights still exist, the Boswell diversion dam has been dismantled and the gates on the diversion channel have remained closed (except for one day) since the mid 1980's. Accordingly, it appears that the question of whether the current project would impair the Boswell rights is arguably moot, at least as a practical matter.

221. Assuming the continued validity of the Boswell water rights, the current or most recent operational plan for the Boswell diversion, as interpreted by GFP, requires BSR water quality to be equal to or better than Lake Poinsett water quality

before diversion can take place. The LPWPD proposals conflict with this management of Boswell. Regardless of the Boswell issue, Board finds that the evidence in this matter independently supports denial of the Applicant's proposals.

Public Interest/Beneficial Use

222. Lake Poinsett is a popular recreational lake located in close proximity to the towns of Lake Norden, Estelline, Arlington, Watertown and Brookings. DENR Ex. 3A at 3.

223. It is undisputed that shoreline development exists around Lake Poinsett with private homes, businesses and public access points. Witness Bjorkman testified that there are between 700-800 structures around the lake. Messerschmidt, a realtor, stated that Lake Poinsett is about 90% developed and there are 500-600 homes around the lake.

224. Messerschmidt testified that he has sold 18-20 homes on Lake Poinsett. TR 252. He testified that from 2003 to 2008, property values declined at Lake Poinsett and that they increased at Lake Madison. For this analysis, he reviewed seven homes sold during this period at Poinsett.

225. When considering lake property values, there are more factors than lake levels. TR 262. The price analysis of property involves using three comparable properties to determine price and making adjustments based off of that comparison. TR 262. Sales are affected by other factors such as whether the property was priced right to start with (TR 263), whether the buyer is looking for a dwelling or a cabin (TR 263-64) and whether the beach or upland area has been eroded (TR 263). Messerschmidt's own lake home was a pretty good buy because of the work he had to put in it due to erosion. TR 263. Sales are also affected by location, a big item on the lake. TR 263. Beach frontage is a factor. TR 264. For older property with small lots,

improvements may require going before a board for approval due to setbacks. TR 264-65.

226. At least one of the properties that Messerschmidt examined on Poinsett had a small amount of frontage in the 50-foot range. TR 266. One had a 30-foot-high bank. TR 267.

227. Messerschmidt did not consider whether or not dwellings at lakes Poinsett and Madison had similar sewer systems. TR 269.

228. Messerschmidt did not compare sales at Lake Poinsett with those at Lake Kampeska. TR 270. He also did not go to the courthouse and look at any sales for lakes Madison or Poinsett. TR 270.

229. Messerschmidt and Dave Peterson also testified as to other economic issues. Testimony was presented that there is only one restaurant at Lake Poinsett (Lakeview) that provides meals five to seven days a week. Since the 1950's and 1960's several restaurants have closed. TR 254. According to Dave Peterson, three or four other restaurants around the lake have closed in more recent times. He attributes the more recent closures to the low water conditions on the lake from 2003 to 2007.

230. Pier 81 (also called Fish Tales) did not close until the summer of 2009, and the lake was full at that time. TR 254. Dave Peterson testified that its competitor only a half mile away (Lakeview) continues in operation and provides excellent food. Based on the bare fact that Pier 81 closed in 2009, this Board is unable to conclude that the closure is attributable to low lake levels alone.

231. Dave Peterson testified about Stone Bridge, a longtime bar and restaurant on the north side of Lake Poinsett. There was first a flood and then a fire at this location. These events were obviously previous to 2002 since no flooding has occurred since then. This closure was not attributable to low water conditions in 2003-2007.

232. Dave Peterson also testified that Siouxland, another business on Lake Poinsett, used to have a restaurant and now is a convenience store.

233. Loyal Messerschmidt testified that there is a new bar open on Arlington Beach. TR 254. Dave Peterson testified that it is closed. The status of this establishment is unclear.

234. This Board is unable to conclude that the change in business operations at these various restaurants is attributable to low lake levels alone.

235. Dave Peterson, who operates Weiland Marine, testified that low water conditions hurt his business.

236. The Burckhard and Emmons report (Applicant's Ex. 22) includes economic analysis at pages 32-37. The Board was told that Applicant's second witness would provide foundation for this portion of Ex. 22 (TR 71-72) and the full report was admitted into evidence. The second witness, Dr. Burckhard, testified on water quality issues only and did not testify on the economics issue. This portion of the report is not expert evidence and must be disregarded as such.

237. Lorin Pankratz, John Neilson, John Bjorkman, and Dave Peterson testified that the introduction of water from the BSR would be favorable in terms of maintaining consistently high water levels for recreational use.

238. Neilson testified that Lake Poinsett was low in 1978 when there was a winter kill. TR 245. Messerschmidt testified that in 1977, water was very low and there was an unbelievable fish kill. TR 254. Others also testified that the lake was low in the mid 1970's (Dave Peterson) and in 1976 (Bjorkman). These conditions were before the FC-5 gates were installed and were natural.

239. Neilson (TR 240-41) and Messerschmidt (TR 255) testified that from 2003 to 2007 they experienced low water conditions which affected their ability to install

boat lifts and use large boats. Messerschmidt had to buy a jet ski for water use instead of a boat. TR 255.

240. The Applicant sent out 684 surveys to property owners around Lake Poinsett. Applicant's Ex. 24. Of the 390 that responded, 269 responded that the outlet permit should be modified, i.e. the present proposal. A letter from the Applicant that accompanied the survey (DENR Ex. 11) indicates that "river water is of lesser quality than the inlet water that has passed through the chain of lakes to the west" so these property owners apparently are willing to accept lower water quality in favor of water quantity, at least at some level.

241. Although enhanced water levels may be desirable for some shoreline property owner's recreational interests and for businesses during drought periods, maintaining water at consistently high levels during the spring when additional water could enter the lake from the west is likely to cause flooding and ice damage to shoreline property owners and businesses in the spring. In particular, the Board notes that there were two periods (1997 and 2009) when ice damage occurred on shoreline property during ice breakup even with the presence of closed gates. Given this scenario, opening the gates would clearly cause more ice damage.

242. The LPWPD Newsletter has already warned residents about the possible need for sandbagging the shorelines during the spring of 2010 since the lake was already full in the fall. TR 248; DENR Ex. 17.

243. Emmons testified that people do not want to swim in algae-infested water and fishing is not real good sometimes in algae-infested water either. TR 128. Dr. Burckhard cites phosphorous as one of the typical limiting nutrients that control the amount of algae produced in lake systems. Applicant's Ex. 22 at 15. Lorenzen has shown that phosphorus and algae have diminished in Lake Poinsett for the last few years when the lake is low and no water has been introduced from the BSR.

Based on this testimony, it is apparent that the algae are likely to increase again if water levels were to be increased by introduction of water from the BSR as proposed.

244. There were algae present in Lake Poinsett for only a day or two in 2009. TR 261.

245. Maintaining water quality is a key element to the enjoyment of a lake for public recreation such as fishing, water and jet skiing, and swimming. TR 127.

246. Maintaining water levels in a manner that is likely to cause pollution (phosphorous loading) is contrary to the public interest.

247. GFP witness Leslie Petersen testified that she has attended meetings about Lake Poinsett that were sponsored by the LPADA. At these meetings, the East Dakota Water Development District (EDWDD), the GFP and the DENR agreed that Applicant's proposals would cause economic and environmental damage in the long term. GFP Ex. 2. Consistent with this testimony, the manager of EDWDD filed a letter with this Board in opposition to the proposal. Although he did not ultimately testify, the filed letter corroborates Ms. Petersen's position that East Dakota agrees with the GFP position. Other professionals including (a) Professional Engineer Edwin Kirkvold, a civil engineer and lake owner, and (b) Dr. Gerald Myers, SDSU Biology Professor emeritus and officer of the South Dakota Lakes and Streams Association filed similar letters.

Pondweed

248. The Applicants presented a pondweed issue. This is arguably both a water quality and a general public interest issue.

249. Lorenzen found that aquatic macrophyte (plants) communities began to establish in 2004 in the littoral zone or shallower shoreline areas of Lake Poinsett. This is caused by the recent decline in algae and resultant improved water clarity allowing favorable photosynthesis for plants in the water. DENR Ex. 6 at 5.

250. Burckhard agrees that this vegetation is caused by situations where shafts of light penetrate the water and provide sunlight to nutrient rich sediments at the lower levels of the lake. TR 158. Burckhard testified that pondweed pulls phosphorus from the sediment and therefore gets phosphorus higher in the water column but it also absorbs phosphorus into the plant matter. TR 164.

251. By contrast, lakes with elevated phosphorous levels and frequent algae blooms have turbid waters which preclude the growth of emergent and submergent aquatic vegetation. GFP Ex. 2.

252. It is undisputed that this aquatic vegetation (pondweed) has been established and that it first arose in the shoreline areas. The extent of this vegetation is, however, disputed.

253. Bjorkman and Lorin Pankratz found the vegetation (pondweed) to be pervasive and a nuisance. Lorenzen observed moderate amounts of pondweed in the lake during his visits. Ermer observed substantial pondweed, but found that the level and nuisance effect claimed by the Applicant's witnesses was overstated, even in taking a boat out on the lake for several hours in August and looking for the worst areas of pondweed.

254. Based on Lorenzen aquatic plant growth signified a change in lake ecology indicative of reduced nutrient loading and decline in algae biomass often related to lake health since it is attributable to improved water clarity.

255. Based on Leslie Petersen aquatic vegetation is a very important component to a healthy fish community. The vegetation provides critical aquatic habitat needed for fish spawning, nursery habitat for juvenile fish, shoreline erosion control and the production of dissolved oxygen through photosynthesis.

256. Based on Ermer pondweed is healthy for fisheries production. Rooted macrophytes are an important component to a healthy fishery. Complete eradication

of aquatic vegetation can have serious negative impacts on fisheries resources, shelter, fish spawning and shoreline erosion.

257. Although GFP considers some vegetation and pondweed to be healthy for the fish, it has also offered a pondweed control program in coordination with a weed control company. Meetings were held and some shoreline owners signed up for the program. The program provides for pondweed control in front of shoreline owners' property if the shoreline owner signs up and pays a fee. DENR Ex. 17; TR 246, 247.

258. Some of the Applicant's witnesses testified that pondweed is not manageable and the GFP plan is not workable. GFP witness Leslie Petersen testified that pondweed can be managed through use of aquatic herbicides. Richard Smith testified that it can also be managed with a wire mesh item that frees up vegetation so it can be pulled away. Pondweed was raked up or pulled up in this way in 2009.

259. Having clear water is in the public interest. It would not be in the public interest to promote making water murky in order to control plant growth.

Decaying Vegetation/Stench

260. The Applicant presented evidence on the stench of decaying vegetation on the shoreline. This is also arguably both a water quality and a general public interest issue.

261. Dave Neilson (TR 243) and others testified about the smell in the lake associated with decaying vegetation. Apparently it arose when the lake was shallow during 2004-2006.

262. Lorin Pankratz associated the stench with plumes of material flowing from Lake Albert through the bridge under Highway 81 and into Lake Poinsett. If this material (and odor) comes into Lake Poinsett from Lake Albert, the present proposals would not solve the stench issue. The present proposals would not prohibit flows (and

floating vegetation) from Lake Albert. Accordingly, that issue does not weigh into the public interest issue or any other element of proof.

263. Others testified that there is a stench associated with decaying vegetation along the shoreline of Poinsett during low water conditions. This is a natural event when shorelines are low. While this stench is obviously a nuisance and apparently occurs only when the lake levels are low, it would not be avoided during years like 2002-2006 since the proposals would not have presented higher water levels in those years. Introducing up to 16,000 ac ft of BSR water to cure an odor problem would increase phosphorus loading into Lake Poinsett in the process. Increase phosphorus loading would favor extensive blue-green algae blooms. Algae decay can produce an equally foul stench. Using water to ameliorate this odor is not a beneficial use, particularly when considering that any benefit would be outweighed by the introduction of phosphorus.

Ultimate Findings

264. Lake Poinsett has a long history of considerable lake fluctuation. The project would not meet the purposes of maintaining higher elevations in Lake Poinsett in very many years, but would have had the potential to provide significant contribution to Lake Poinsett in two years: 2007 and 2009.

265. The Applicant's proposals would not reduce damage from flooding or erosion in the area proposed to be benefited.

266. Keeping Lake Poinsett at 1650.5 fmsl has the potential to increase the severity of flood events, shoreline erosion and ice damage. The project would, therefore, increase the likelihood or the severity of flood damages in the area proposed to be benefited.

267. The Applicant's proposals, if granted, would significantly increase the annual phosphorus load entering Lake Poinsett.

268. The Applicant's proposals contradict the purposes of Flood Control Permit No. FC-5, which are to reduce flood damage, bank erosion and nutrient loading to Lake Poinsett.

269. The Applicant's proposals would impair GFP recognized vested water claim No. 1576-3 due to phosphorus loading and its effects on fisheries and recreational uses.

270. In light of the foregoing Findings of Fact, the Board hereby makes the following:

CONCLUSIONS OF LAW

1. The Board has jurisdiction over this matter.

2. Notice of Hearing was properly made for July 9, 2009, pursuant to SDCL 46-2A-4 and SDCL 1-26-17.

3. On July 8, 2009, the Board received a motion from the Applicant seeking a continuance due to serious health issues associated with a witness. The motion was granted and hearing was re-scheduled for October 8, 2009.

4. Hearing began on October 8, 2009. A second day of hearing was held on November 17, 2009. The November 17, 2009, date was stipulated by the parties. TR 202.

5. Hearing was held before five members of this seven member Board, a sufficient number to constitute a quorum under SDCL 1-40-17. Further, under SDCL 1-40-17, a majority of the Board members present and voting is sufficient to perform official functions of the Board, including granting and denying applications for flood control permits and water permits.

6. Under ARSD 74:02:01:12.04 the deadline for filing petitions to intervene in this matter was June 29, ten days before the date initially set for hearing. This intervention date was published as required by SDCL 46-2A-4.

7. Several persons (listed in the Findings of Fact) filed letters or petitions to intervene after June 29 (the deadline for intervention) and also did not appear at hearing. They failed to timely file for intervention as required by the Notice of Hearing and ARSD 74:02:01:12:04 and also failed to appear at hearing. They were not afforded party status for those reasons.

8. At hearing George Milldrum appeared and indicated that he wished to participate as a party opposing the applications. TR 12. He had not intervened earlier as required by the Notice of Hearing and ARSD 74:02:01:12:04. He was not afforded party status for that reason. TR 12.

9. Several persons or entities intervened, but most did not appear at either the October 8, 2009, or November 17, 2009, hearing. Each of those that did not appear has waived the right to party status as contemplated by SDCL 1-26-17(6) and has waived the right to further notices and other materials as contemplated by ARSD 74:02:01:12.02.

10. Of the parties who timely filed petitions to intervene, the following parties appeared at the October 8 and/or November 17, 2009, hearings: GFP, Richard Smith, East Dakota Water Development District, Thomas Long, Paul and Ruby Julson, and Becky Holten, Director Dakota United Methodist Camp (represented by Attorney Tom Lee). At hearing the Board asked each of these parties to step forward and indicate whether it intended to participate as a party with full party status. Of this group only the GFP and Richard Smith opted to participate. Other than GFP and Mr. Smith, the other parties listed in this Conclusion of Law therefore waived the right to party status. SDCL 1-26-17(6).

11. The GFP and DENR are agencies of the state of South Dakota. The LPWPD is a special project district as contemplated by SDCL ch. 46A-18. Richard

Smith is an employee of the Hamlin County Conservation District, a local government entity authorized under SDCL ch. 38-8 (not a sub-division of Hamlin County).

12. Under *S.D. Wildlife Federation v. Water Mgmt. Bd.*, 382 N.W.2d 26 (1986), Lake Poinsett is a public trust property of the people of South Dakota. The public trust is embodied in statutes and rules this Board must follow. Among these trust responsibilities, this Board must (a) protect the lake itself, including its water quality under SDCL Title 34 (and rules promulgated there under), and (b) regulate the use of the lake so as to provide for the maximum beneficial use of water under SDCL Title 46 (and rules promulgated thereunder) with due regard for existing rights. This Board is also charged with the responsibility to determine the natural boundaries of lakes (OHWM) as required by court decisions and statutes including SDCL ch. 43-17 and SDCL 46-2A-11.

13. Pursuant to SDCL 34A-2-10, 34A-2-11, and 34A-2-93, this Board promulgates rules designating the beneficial uses for lakes. For Lake Poinsett, the designated beneficial uses are warm water semi- permanent fish life propagation, immersion recreation, limited contact recreation, and fish and wildlife propagation, recreation and stock watering. ARSD 74:51:02:31, ARSD 74:51:02:02, ARSD 74:51:02:03(5) and ARSD 74:51:02:01. These rules designate the water quality at which the waters are to be maintained and protected.

14. Pursuant to SDCL 43-17-21 this Board is authorized to determine OHWM and outlet elevations. This Board has previously determined that the OHWM is 1651.5 fmsl for Lake Poinsett and the outlet elevation is 1650.5 fmsl.

15. This Board has recognized vested water claim 1576-3 for 23,604 ac ft annually for GFP with the priority date of 1889 for public recreational purposes. GFP also holds existing water rights for diverting water from the BSR through the Boswell Gates and those rights hold priority dates of 1941 and 1955.

16. The present applications fall within that portion of the Board's responsibility pertaining to water appropriation and regulation in Title 46, more specifically SDCL 46-2A-9, SDCL 46-2A-11, and SDCL 46-2A-12. These three statutes require, among other things, proof of public interest and beneficial use. The public interest and beneficial use elements in this particular case coincide with other public trust obligations of this Board: protection of the lake itself and protection of the natural lake boundaries with due regard for riparian owners.

17. LPWPD bears the burden of proving by a preponderance of the evidence that each of the elements in SDCL 46-2A-9 has been met for permit application 7088-3. The "preponderance of the evidence" burden of proof also applies as to each element in SDCL 46-2A-11 and SDCL 46-2A-12 for Flood Control Application FC-5A.

18. SDCL 46-5-9 applies to permit application 7088-3. One element in SDCL 46-2A-9 is whether the use of water would be a beneficial use. In this context a beneficial use of water is one that is reasonable and useful and beneficial to the appropriator and that is consistent with the interest of the public in the best utilization of water supplies. SDCL 46-1-6(3). As set forth in the following Conclusions, the Applicant has not met its burden to demonstrate that Application No. 7088-3 would be a beneficial use of water under either part of this definition.

19. The use of water, as requested, may be beneficial at times to LPWPD, a group of shoreline land or property owners. LPWPD is interested in maintaining higher lake levels and the proposed use would be beneficial to them for recreational and economic reasons. On the other hand, maintaining an additional volume of up to 16,000 ac ft of water in Lake Poinsett would prevent the lake from accommodating additional natural flows and could inundate private property of shoreline owners and would increase the likelihood of flooding, ice damages and erosion. It would also increase the likelihood of increases in algae, a factor that would not be beneficial to

users of the lake. To the extent that members of LPWPD are shoreline land or property owners affected by flooding, erosion, ice damage and algae, this permit would not be a beneficial use to the appropriator.

20. The other part of the beneficial use test is whether the water use is in the interest of the public in the utilization of water supplies. SDCL 46-1-6(3). The Applicant has clearly not met these criteria. Using 16,000 ac ft of water to provide flows to this lake would not be beneficial because it would increase phosphorus loading and would increase the potential for flooding and ice damage and erosion to the lake shores and shoreline landowners. While the Applicant has submitted a plan that may minimize the phosphorus loading, the plan could still contribute up to 12,000 lbs. of additional phosphorus in the lake over a five-year period and would be difficult, if not wholly impractical, to manage, given the lag time for testing. Further, the phosphorus issue is not the only problem in terms of beneficial use. The use of 16,000 ac ft to fill the lake would keep it artificially high and promote ice damage, erosion and flooding. An appropriation is not a beneficial use of water when it causes or is likely to cause damage to the lake, its shores, and the property of shoreline landowners.

21. As a third element of SDCL 46-2A-9, the appropriator must demonstrate that the proposed use is in the public interest. The public interest element requires weighing of the interests of the LPWPD members and/or property owners around the lake as well as the economic, personal property, recreational, ecological, and other issues involved.

22. The Applicant sent out 684 surveys of property owners around Lake Poinsett. Applicant's Ex. 24. Of the 390 that responded, 269 responded that the outlet permit should be modified, i.e. the present proposal. This survey is entitled to

consideration by this Board as part of the public interest issue. The survey is not dispositive, however, since this Board must also consider all public interest factors.

23. As for economics, Dave Peterson of Weiland Marine and realtor Messerschmidt testified that lake property is less valuable and businesses around the lake suffer when the lake is low like it was in recent years. As such, this testimony indicates that higher water levels would generally be economically favorable for the shoreline property owners (enhancing the value of dwellings) and would be economically favorable to the businesses around the lake.

24. While higher water would be favorable at times to economic interests, expert evidence shows that the likelihood of flooding, erosion to shorelines, and ice damage to property around the lake would almost certainly be increased by the present proposals. Property that is eroded, damaged from ice, and/or damaged from flooding is not as valuable as property that has not incurred such damage. The Applicants own witness Messerschmidt acknowledged that to be the case. There is economic interest in avoiding flooding, ice damage, and erosion. In other words, the economic interest issue cuts both ways in this case.

25. Flooding, erosion, and ice damage are not just economic issues. The flooding, ice damage, and erosion could occur above the OHWM and decrease the enjoyment of property owned by the upland owners.

26. Further, the public use in the shoreline areas is involved. Under *S.D. Wildlife Federation v. Water Mgmt. Bd.*, 382 N.W.2d 26 (1986), the beach area below the OHWM and above the OLWM is held jointly by both the upland owner and the public and is available for public use. The proposals would, at a minimum, diminish the area of the beach available for use by the public for dry beach activities by keeping the water higher. TR 113. Even more importantly, however, maintaining high water levels at Lake Poinsett as requested would promote ice damage, erosion, and flooding

and all of these factors could diminish the ability of the public to use this joint use area.

27. The need for maintaining the lake for recreational use weighs heavily in terms of public interest. The Board credits the testimony of the two GFP witnesses who have shown that the introduction of BSR waters to the lake would be detrimental to recreational and fisheries use. Further, the GFP has itself previously tried to enhance water levels by introducing water from the BSR to Lake Poinsett through the Boswell gates. The Boswell gates were the subject of a series of management plans designed, at least in part, to minimize introduction of nutrients in the lake and this effort has largely failed. GFP acknowledges that the Boswell dam was not workable and has removed the dam. Ex. 26. As manager of this previous effort and as the state agency charged with recreational interests on lakes, the GFP has learned from experience and this experience is entitled to weight in considering the public interest for recreation.

28. The ecological issue also weighs in favor of denial on public interest grounds. Based on the lengthy Findings of Fact set forth above, the proposals would increase nutrient concentrations and nutrient loading in the lake. Erosion would also damage the lake shores and increase sediment in the lake.

29. There was also evidence on weed or aquatic vegetation issues and the Applicant appears to have presented that evidence for public interest review. One of those issues is evidence of a stench that is sometimes present on the west side of the lake and is assumed to come from Lake Albert. That issue does not weigh into the public interest issue or any other element of proof.

30. Others testified that there is a stench associated with decaying vegetation along the shoreline of Poinsett during low water conditions. This is a natural event when shorelines are low. Introducing more water to ameliorate this odor

is not in the public interest, when considering that any benefit would be outweighed by the introduction of phosphorus.

31. Another vegetation issue is pondweed. The Applicant considers the pondweed issue to be a serious nuisance. Although the parties dispute the extent to which pondweed grows on the lake, there is no dispute that some control of this pondweed is desirable. This weed grows when water is clear and photosynthesis occurs as the sunlight reaches plant growth on the bottom of the lake. Having clear water is favorable in terms of public interest. It would not be in the public interest to promote making water murky in order to control plant growth. Testimony was presented that the plant growth can be controlled, at least in part, by application of aquatic herbicides.

32. After considering the many public interest factors and the evidence as a whole, this Board finds that the proposals are not in the public interest.

33. The third element in SDCL 46-2A-9 is whether the proposed water use (diverting 16,000 ac ft into Lake Poinsett for recreational use) would impair existing rights. The proposal here clearly would impair existing water rights, particularly GFP vested water claim 1576-3 for recreational use of the lake. This issue is set forth in detail in the foregoing Findings of Fact.

34. The fourth element in SDCL 46-2A-9 is whether there is water available for the appropriation. Given the fact that the permit cannot be issued in light of the other criteria, it is unnecessary to examine this criteria.

35. Application No. 7088-3 does not meet the standard in SDCL 46-5-9 and must therefore be denied.

36. The statutes governing flood control application FC-5A are SDCL 46-2A-11 and SDCL 46-2A-12.

37. This Board issued FC-5 and determined that FC-5 met the standard for a flood control permit when it was granted. The application proposes to amend FC-5. The proposed amendment would continue to retain some of the flood control benefits of FC-5 insofar as the flood control gates would be closed to prohibit flows from the BSR when the levels of Lake Poinsett are higher than the outlet elevation.

38. The question before this Board is whether FC-5A would still meet the standard for a flood control permit considering the level of flood control that it would continue to provide. For the reasons set forth above, and as detailed at length in the Findings of Fact, FC-5A could not be approved on its own merit even considering that it would still provide some measure of flood control.

39. FC-5A would maintain Lake Poinsett at artificial levels, thereby increasing the likelihood of flooding as a result of natural events (wind, precipitation, ice break up, and entry of flows from other sources) when the lake is already artificially held at the outlet elevation. Due to the likelihood of such events, the proposal would increase, rather than decrease, the likelihood of flooding over and above that which would occur by natural conditions.

40. FC-5A would increase the likelihood of shoreline erosion, ice damage, and flooding to private property. The area above the OHWM is generally owned by private property owners on this lake. If the level of Lake Poinsett is consistently maintained at 1650.5 fmsl, there is the potential for additional water to enter the lake during significant spring runoff or precipitation events and increase the lake above the OHWM and flood private property and could cause ice damage and erosion to such property. Although much of the private property on this lake is protected by rock walls or other erosion control structures, the present proposal would increase the likelihood of flooding, erosion, and ice damage.

41. Approval of this application would allow water from the BSR into Lake Poinsett during springtime flooding and would eviscerate one of the purposes of FC-5, to reduce nutrient loading. As such FC-5A would damage the quality of the lake itself.

42. The present proposal does not meet the flood control standard in SDCL 46-2A-11.

43. The other pertinent statute is SDCL 46-2A-12. This statute is the standard for consideration of all amendments to water permits granted by this board. Under this standard, the Board must consider whether this "other change" would unlawfully impair existing rights, would be a beneficial use, and would be in the public interest.

44. As set forth above with respect to water permit application 7088-3, the Applicant's proposal would impair GFP vested water claim No.1576-3, would not be a beneficial use, and would not be in the public interest. The same analysis applies with respect to the amendment of FC-5A and need not be repeated here.

45. The FC-5 proposal does not meet the standard in SDCL 46-2A-12 for amendment of the flood control application.

46. Both pending applications, if granted, would also be inconsistent with the GFP water rights for the Boswell Diversion WR 28-3, 119-3A. These water rights, although not currently in use, must be considered. They are still valid based on *In re Cancellation of Stabio Ditch Water Right*, 417 NW2d 391 (1987), insofar as no process has been followed to cancel them. The present applications would promote nutrient loading, a matter that has long been of concern with respect to WR 28-3, 119-3A. Operations of WR 28-3 and WR 119-3A have already been curtailed so as to preclude increasing the concentrations of phosphorus in the lakes. Allowing for increased concentrations of phosphorus under the LPWPD would conflict with this current operational requirement for WR 28-3, 119-3A. Regardless of this conclusion regarding

the Boswell system, other independent bases exist to conclude that the Applicant has not met its burden of proof in this matter, including the fact that the proposal would increase the likelihood of damage to property from flooding and erosion and would impair the water quality of the lake itself.

47. Application Nos. FC-5A and 7088-3 are in direct conflict to the intended purposes of FC-5, would impair GFP vested water right claim No. 1576-3, and would conflict with WR 28-3, and 119-3A.

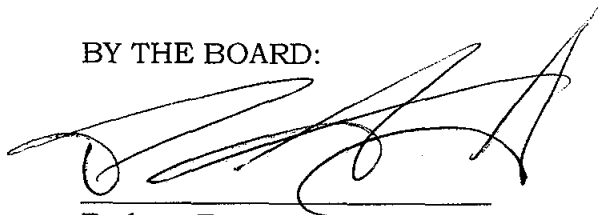
48. Based on the foregoing Findings of Fact and Conclusions of Law, the Board enters the following:

FINAL DECISION AND ORDER

LPWPD Application Nos. FC-5A and 7088-3 are hereby denied.

Dated this 10th day of March, 2010.

BY THE BOARD:



Rodney Freeman, Jr.