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COALITION PROTESTANTS' REQUESTED FINDINGS OF FACT, CONCLUSIONS OF LAW, AND CONDITIONS OF APPROVAL

REQUESTED FINDINGS OF FACT

I. INTRODUCTION

Coalition Members

1. Amigos Bravos is a formal protestant in this proceeding. It is a statewide river conservation organization established in 1988 with approximately 1,600 current dues-paying members. Its mission is to return New Mexico rivers and the Rio Grande watershed to drinkable quality wherever possible and to maintain the river's natural flows and ecosystems. *Shields T. 64.*

2. The Sierra Club is a formal protestant in this proceeding. It has approximately 700,000 members nationwide and 7,000 members in New Mexico. *Barish T. 61.*

3. The Socorro Soil and Water Conservation District represents some 350 members using Middle Rio Grande Conservancy District (MRGCD) facilities for delivery of water to about 21,000 irrigated acres and is a formal protestant in this proceeding. *Carangelo T. 58.*

4. The Assessment Payers Association (APA), is an association open to the 55,000 ratepayers in the MRGCD. It is a formal protestant in this proceeding. *Jarratt T. 59.*

5. Rio Grande Restoration, also a formal protestant in this proceeding, is a basin-wide education and research non-profit organization advocating river and habitat restoration projects and policies for the Rio Grande. It's Bosque Restoration Project is located within the area affected by the Albuquerque Drinking Water Project. *Harris T. 65.*

6. Other Coalition members appearing as formal protestants in this proceeding are John Carangelo, an individual with agricultural water rights on the La Joya Acequia and New Mexico Public Interest Research Group a member-based organization.

7. Generally, the Coalition Protestants contend that if granted, the City's Application will result in the impairment of existing water rights, will be contrary to the conservation of water in New Mexico, and will be detrimental to public welfare.

City's Application and its Jurisdictional Defects

8. The City's Application for Permit to Divert Surface Water from the Rio Grande is a "new type," the "first of its kind," proposing to divert surface water from the river and offsetting the effects of groundwater pumping using San Juan-Chama Project water. *Alb. Ex. No. 2; Ward T.72 r.111, 200; T.73 r.438.*[1]

9. Notwithstanding that the State Engineer takes up consideration of applications in accordance with the "file date order" of the application and other applications pending in the Office of the State Engineer, consideration was given to the City's readiness for hearing and whether other applications of the same type are pending. *WRD Ex. 2 at 7; Ward T.73 r.438.*

10. The City's Application for Permit to Divert Surface Water is a "conjunctive use project" intended to use both surface and groundwater resources in a balanced way. *Hines T. 32 r.655.*

11. Although the City's Application may not refer to the conjunctive use of water it is "a matter of understanding" that it "amounts to a conjunctive use project" *Alb. Ex. No. 2; Hines T. 32 r.705*.

12. On May 31, 2002, the Coalition Protestants filed a motion requesting the State Engineer to dismiss the City's Application No. 4830. The motion asserts the following grounds for dismissal:

    (a) The motion asserts that the State Engineer had no jurisdiction to act on the Application under NMSA 1978, § 72-5-26 (1907).

    (b) The motion asserts that the City's Application should have been filed pursuant to NMSA 1978, § 72-5-1 (1907), because it requests a permit to divert and beneficially use native surface water from the Rio Grande.

    (c) The motion asserts that the City should have filed an application pursuant to NMSA 1978, § 72-5-24 (1907), because it's Drinking Water Project would conjunctively use surface and ground water for municipal purposes. In order to conjunctively use surface and ground water the City had to file an application to change the point of diversion of its San Juan-Chama Project rights from City wells RG-960 et al. to a surface water point of diversion and the right to divert and use project water under Permit No. RG-960 as a supplemental or alternative point of diversion.

[1] "T" refers to the hearing transcription tape number; "r" refers to the tape revolution number as measured by the tape player counter.

(d) The City's Application and published Notice of Application fail to satisfy basic constitutional due process and statutory requirements.

(i) They do not identify the surface water point of diversion it would use;
(ii) They do not quantify or limit the amounts of surface and ground water that could be conjunctively used for municipal purposes.

Protestant Settlements

13. The interests of the MRGCD are not always consistent with those of its ratepayers (APA), especially agricultural interests. For example, the MRGCD is currently considering the transfer of irrigation water outside the District boundaries for municipal uses. These transfers will have a number of very negative impacts:

a. surface irrigation is no longer available to sustain the shallow aquifers, which were previously sustained through seepage loss from the natural meanderings of the river; and
b. land no longer irrigated and in production is often subdivided, resulting in the drilling of domestic wells, which increases water supply shortages. *Jarratt T. 60*.

14. The APA has concerns about the Settlement Agreement executed between the City and the MRGCD in this matter (CP. Ex. No. 7) because:

a. it permits repayment of City of Albuquerque San Juan-Chama Project water provided to the MRGCD through waiver of the offset requirements imposed on the City, the long-term consequences of which are unknown;
b. the MRGCD has agreed to provide a daily minimum flow of 150 cfs through the Albuquerque reach, which appears to place the burden of endangered species requirements solely on downstream water users; and
c. the agreement provides for a "joint powers agreement" between the City and the District, the terms of which are unknown, which has not been through a public process, and which is enforceable whether or not the City's Drinking Water Project goes forward. *Jarratt T. 60*

15. The Water Rights Division is not familiar with the terms of settlement agreements between the City and eleven protestants in this matter. The settlement agreements should be revealed and considered. They could affect State Engineer administration of water rights. *Ward T. 73 r.662, 748.*

II. IMPAIRMENT TO EXISTING WATER RIGHTS

Existing Middle Rio Grande Water Rights and Uses

16. The surface waters of the Rio Grande have been considered fully appropriated since the Rio Grande Compact was signed in 1938. *CP. Ex. 25, finding 33, at 7.*

17. The greater part of the MRGCD lands have been irrigated at one time or another during the period 1700-1929, or have been irrigable from irrigation works constructed prior to 1929. *CP. Ex. 22 at 7.*

18. The Official Plan for the Middle Rio Grande Conservancy District (MRGCD) was approved by the District Court in 1928 (1928 Official Plan). The Plan proposed the irrigation of 123,267 acres of land in the District. This acreage included 73,062 acres downstream from Albuquerque, 57,399 acres in the Belen Division of the District and 15,663 acres in the Socorro Division. *CP. Ex. 23. See also CP. Ex. 22* - the *MRGCD Application for Permit to Change Point of Diversion, State Engineer file No. 0620*.

19. The 1928 Official Plan for the MRGCD stated that the farm delivery requirement for the irrigation of lands in the District was 3.0 acre-feet per acre and that the headgate diversion requirement was 4.5 acre-feet per acre. *CP. Ex. 23.*

20. The 1928 Official Plan for the MRGCD determined that the total diversion requirement within the District downstream from Albuquerque would be 328,779 acre-feet per year: 258,295 acre-feet per year for lands in the Belen Division and 70,484 acre-feet per year for lands in the Socorro Division. *CP. Ex. 23.*

21. The 1928 Official Plan for the MRGCD determined that the peak monthly diversion demand for lands downstream from Albuquerque would be 62,472 acre-feet per month in the months of May through July. In the Belen Division the peak monthly diversion demand would be 49,077 acre-feet and in the Socorro Division the peak monthly demand would be 13,395 acre-feet. These peak monthly diversion demands are equivalent to rates of flow of 825 cfs (49,077 af/month ÷ [1.983 af/cfs * 30 days/month]) for lands in the Belen Division and 225 cfs (13,395 af/month ÷ [1.983 af/cfs * 30 days/month]) for lands in the Socorro Division. *CP. Ex. 23.*

22. The State Engineer's 1953 Manual of Rules and Regulations Governing the Appropriation and Use of Surface Waters, Rule V, states that: "The rate of delivery of water shall not exceed the statutory limit of one cubic foot per

second delivered on each 70 acres of irrigated land, excepting in the case of flood flows, when a higher rate is permissible."

23. Based on the State Engineer's permitted right to irrigate 57,399 acres of land in the Belen Division and the recognized rate of delivery of one cfs per 70 acres, the rate of diversion would be 820 cfs plus the off-farm ditch conveyance loss.

24. Based on the State Engineer's permitted right to irrigate 15,663 acres in the Socorro Division and the recognized rate of delivery of one cfs per 70 acres, the rate of diversion would be 224 cfs plus the off-farm ditch conveyance loss.

25. The Belen Division and the Socorro division receive water that is diverted from the river downstream of the City's Southside Wastewater Reclamation Plant (SWRP) outfall. *Alb. Ex. 23 at 2-2*.

26. The City does not know and did not perform an analysis to quantify the water necessary to meet the needs of existing downstream surface water rights. *Stomp, T.7 r.264.*

27. The Water Rights Division does not know the quantity of water necessary to meet the needs of existing downstream surface water rights. *Ward, T.72, r. 662, 873.*

28. The water supply of the Rio Grande is highly variable. In some years, it is not adequate to supply existing uses. *Hines T. 37, r.299*.

29. The average monthly supply of water available at the San Acacia diversion in the Socorro Division of MRGCD in July during the years 1959-1970 was considerably less than a full supply. *Logan T. 84. r.476.*

30. Many acres of property downstream of Albuquerque have been farmed and irrigated with Rio Grande water since the mid-nineteenth century. For example, the Jarratt family farm/dairy, approximately 150 acres on the west bank of the river just south of Los Lunas, has been farmed and irrigated since at least 1848. It now receives its water through MRGCD surface water deliveries and three wells located on the property. *Jarratt T.59*.

31. Water was used for irrigation purposes on lands in the La Joya area (in Socorro County) prior to the formation of the Middle Rio Grande Conservancy District. *CP. Ex. No. 22, Statement to accompany Applications by MRGCD to State Engineer for Permits, p.16.*

32. Because crop production cycles require that different fields be placed in different stages of production at different times, it is important that there be a consistent supply of water. This is especially true when there are many farms in an area, each with its own schedule of production cycles. Long water

rotations (e.g., 21 to 28 days) are generally not consistent with crop production cycles. *Jarratt T.59.*

33. Fields are also periodically taken out of production. For example, alfalfa fields are "laid out" once every five years. If water is not available when it is time to replant them, the 20% idle acreage becomes 40% idle acreage. Water shortages quickly result in this type of cumulative impact. *Jarratt T.59.*

34. Although the availability of San Juan-Chama Project water has resulted in increased flows in the Rio Grande, it has also resulted in increased uses and demands. The river flood plain that was previously open and grassy is now so thick with overgrowth that walking through it is impossible. This overgrowth—comprised largely of salt cedar, willow and Russian olive—will continue to consume water from the river even after the City's San Juan-Chama Project water is no longer available for lease by MRGCD. Unless removed, these established uses will have an impact on the amount of water available for downstream users. *Jarratt T.59.*

35. The City claims native Rio Grande pre-basin vested groundwater rights totaling 17,875 acre-feet. The City claims an additional 1,827 acre-feet of acquired groundwater rights, as of June, 2002. *Alb. Ex. 11, App. A at 1; Alb. Ex. 23 at 2-7; Hines T.32 r.802.*

36. The City claims acquired Rio Grande consumptive use surface and ground water rights totaling 5,897 acre-feet per year as of June 2002. *Alb. Ex. 23 at 2-7; Hines T.23 r.809.*

37. The City claims a total of 23,772 acre-feet of vested and acquired surface and ground water rights that can be used to offset the effects of groundwater withdrawals on the Rio Grande. The consumptive use of 23,772 acre-feet per year is equivalent to a mean daily flow of 33 cfs-days. *Alb. Ex. 11 at 1; Hines T.32 r.826, 842; Gates T. 41 r.345.*

38. Most of the City's pre-basin water rights and acquired groundwater rights are based on uses initiated after the full development of surface water by irrigation of lands in the middle Rio Grande and after the consummation of the Rio Grande Compact. *Miller T. 57 r.489.*

39. The City did not present evidence that provides a basis for determining how the amount of claimed pre-basin groundwater rights and acquired groundwater rights were determined. The amount of the City's vested ground water right does not appear to be based on a hydrologic model. *Miller T. 57 r.749.* The Water Rights Division's hydrology witnesses did not know how the claimed pre-basin groundwater rights and acquired groundwater rights were quantified. *Logan T. 83 r.52.*

40. The City's existing ground water right under Permit No. RG-960 is 132,000 acre-feet per year. *WRD Ex. 1 at 10.*

41. The City's right to divert water from surface and ground water sources combined if Application No. 4830 is approved cannot exceed 132,000 acre-feet per year.

42. The actual amount of native Rio Grande pre-basin vested and acquired groundwater rights available for offset of impacts on the flow of the Rio Grande resulting from implementation of City's Drinking Water Project must be based on:

    a. Historic groundwater pumping by the City of Albuquerque prior to declaration of the Rio Grande Underground Water Basin in 1956 and
    b. Application of the most current version of the State Engineer Middle Rio Grande Administrative Area Model.

43. The actual amount of native Rio Grande pre-basin vested groundwater water rights and acquired groundwater rights that may be applied as an offset against the impact on the flow of the Rio Grande resulting from the City's Drinking Water Project can be determined by the conjunctive administration criteria described in recommended Conditions of Approval II. 1. through II. 4., below.

44. Groundwater withdrawals by the City began around the year 1900 and totaled less than 2,000 acre-feet per annum in the early 1930s. *CP. Ex. 4 at 12-13; Miller T. 55 r. 580, 870; T. 57 r.738.*

45. The maximum annual amount of water diverted by the City prior to the signing of the Rio Grande Compact was 3,778 acre-feet in 1937 and the maximum amount of water diverted by the City prior to the declaration of the Rio Grande Underground Water Basin in 1956 was 26,747 acre-feet in 1954. *CP. Ex. 21, doc. dated 4-30-59, table 1.*

46. Groundwater withdrawals from the Albuquerque Basin amounted to about 150,000 acre-feet in 1990, with Albuquerque accounting for 77% of the pumping. *Alb. Ex. 4 at 5-11.*

47. The water table in the Albuquerque area has been dropping since groundwater pumping for municipal supplies began to exceed system recharge probably in the 1960s. *Alb. Ex. 4 at 3-2; Hines T. 36 r.463.*

48. There are residual effects from historic ground water pumping that will continue beyond 2016. *Hines T. 34 r.316.*

49. The hydrologic impacts on the Rio Grande resulting from the City's historic groundwater withdrawals will exist for a long time. In 2006 they will be 61,744

acre-feet and in 2045 they will be 14,150 acre-feet. *CP. Ex. 2, Tech. Memo 3 at 5; Sheng T. 52 r. 162.*

50. The total hydrological impacts on the Rio Grande resulting from the City's historic and future DWP groundwater withdrawals, if all uses are limited to permitted diversion amounts, would be 65,092 acre-feet in 2006 and 58,306 acre-feet in 2045. *CP. Ex. 2, Tech. Memo 3, Table 3 at 10; Sheng T. 52 r.200.*

River Channel Distances

51. The Angostura diversion dam is located approximately 19 miles upstream from the City's possible surface and subsurface diversions just above the Paseo del Norte Bridge. *Alb. Ex. 23 at 1-3, 4-12; Hines T. 32 r.763.*

52. The City's Southside Wastewater Reclamation Plant (SWRP) is located about 14 miles downstream from the proposed Paseo del Norte diversion. *Alb. Ex. 23 at 4-4; Hines T. 32 r.773.*

53. The proposed Paseo del Norte diversion is located about 7.5 miles upstream from the Rio Grande at Albuquerque stream gage. *Hines T. 32 r.786.*

54. The Albuquerque stream gage is located about 6.4 miles upstream from the City's SWRP. *Alb. Ex. 23, Fig. A-2; Hines T. 32 r.781.*

55. The City's SWRP is located about 150 miles upstream from the Elephant Butte Dam. *Ward T. 71 r.128.*

Water Rights Division's Impairment Analysis

56. In determining whether an application, if granted, will result in the impairment of existing water rights, the State Engineer typically attempts to identify other persons or entities with water rights in the same stream system or aquifer, to evaluate the possible adverse impacts of granting the application based on a worst-case scenario. *Ward T. 72 r.465.*

57. In this case, the Water Rights Division did not determine specifically other persons or entities with water rights in the same stream system or aquifer. Instead, its objective was "to keep the river whole." *Ward T. 72 r. 662, 873; Logan T.84 r.174,344.*

58. With respect to keeping the river whole, the Water Rights Division considered two concerns: (a) were the San Juan-Chama Project water conveyance loss figures used by the City too low, and (b) what type of accounting would be appropriate - annual, monthly, weekly or daily for City return flows. *Ward T. 72 r.568.*

59. The Water Rights Division evaluated the City's Application assuming only one of three proposed points of diversion – an inflatable dam at Paseo del Norte. Although the Water Rights Division conducted no separate studies of the other points of diversion, it concluded that there were no differences among the three points of diversion in terms of "keeping the river whole." *Ward T. 74 r.242.*

60. The Water Rights Division did not evaluate or make any computations as to whether domestic wells located near the Rio Grande would be adversely impacted by the City's Drinking Water Project groundwater or surface water withdrawals. *Logan T. 84, r.382*.

61. The Water Rights Division did not analyze the impact of the City's Drinking Water Project on domestic wells located near the Rio Grande because the Division assumed that MRGCD's irrigation canals would maintain constant water levels in the shallow aquifer. *Logan T. 84, r.1353*.

62. The Water Rights Division did no know how may domestic wells are located in the Rio Grande valley in the Albuquerque reach. *Logan, T. 84, r.1370*.

San Juan-Chama Project Water Loss Rates

63. Public Law 87-483 requires that the San Juan-Chama Project water transportation loss rates shall be developed through the efforts of the Rio Grande Compact Commission. *Act of June 13, 1962, 76 Stat. 96; CP. Ex. 4 at 6; CP. Ex. 5 at 1.*

64. The evaporation loss rates under the incremental method of determining channel losses could be significantly higher in the months of July through October than in other months. *Hines T. 33 r.786.*

65. The Rio Grande Compact Commission has not approved San Juan-Chama Project water loss rates for the months of July, August, September and October. *Miller T. 55 r.369; Alb. Ex. 23, Table D-5 in App. D.*

66. There could be greater incremental channel losses depending on the ratio of San Juan-Chama water to native water. *Hines T.33 r.786.*

67. In periods of low flow use of the approved incremental loss rates will result in the increase in the loss of native water. *Miller T.55 r.435.*

68. The San Juan-Chama Project water loss rates approved by the Rio Grande Compact Commission and used by the Bureau of Reclamation for accounting of releases of San Juan-Chama Project water during the months of November through June are not valid when the natural flow of the Rio Grande is less than 400 cfs. *Miller T.55 r.331, 351; Alb. Ex. 23, Table D-5, in App. D.*

69. It is not in the public interest of the State of New Mexico to make continuous release and delivery of San Juan-Chama Project water during the months of July through October, and during all months when the natural flow of the Rio Grande is less than 400 cfs, until a study is completed to determine loss rates under these conditions.

70. A study should be undertaken to determine incremental channel losses for the delivery of San Juan-Chama Project water during all times of the year and at all flow levels. *Miller T. 55 r.493.*

71. The Water Rights Division recommends an incremental loss study and the placement of additional gages to better estimate conveyance losses. *WRD Ex. 2, condition of approval 5, at 15; Ward T. 71 r.648; T. 73 r.641; Logan T. 83 r.507.*

72. If conveyance losses are underestimated, there is a risk of impairing downstream water rights. *Ward T. 73 r.662.*

Return Flow Credits

73. The City treats and discharges to the Rio Grande water pumped from non-City wells. Some non-City well users are allowing the City to use their return flow credits. *Gates T.44 r.520, 630, 640.*

74. Using 1993-2001 figures, the Water Rights Division found that the City's return flows to the river ranged from as high as 54% with return flow from non-City well diversions included to a low of 48% with return flow from non-City well diversions excluded. *Ward T. 74 r.574; Logan T. 83 r.818,842; WRD Ex. 1, Table 1, at 7 .*

75. If return flow from non-City wells is deducted from the City's SWRP discharge to the Rio Grande, about 48% of the amount of water pumped by City wells is returned to the Rio Grande. *Ward T. 74 r.574; Logan T. 84 r.39.*

76. The City should not be entitled to return flows from non-City wells. For accurate return flow projections, these amounts of waste water should not be included in the City's return flow numbers in order to ensure that downstream water rights are not adversely affected. *Ward T. 74 r.587; Miller T. 56 r.45.*

77. The actual amount of water pumped by non-City wells that is treated and discharged to the Rio Grande at the City's SWRP, and the bases for the methods employed to determine the amount of return flow from non-City wells, are not clear. *Gates T.44 r.190, 547, 570, 630.*

78. Groundwater pumped from private domestic wells and other self-supplied systems is discharged into the City's sewerage system for treatment at the City's SWRP and then discharged to the Rio Grande. *Witherspoon T.27 r.301.*

79. The City should be allowed return flow credit only for return flow attributable to diversions under its permits. The City should not be allowed a return flow credit for return flow from private domestic wells. *CP. Ex. 25, Condition of Approval 10, at 25; Lieuwen T. 79, r.240; WRD Ex. 4 at 3; CP. Ex. 21, doc. dated 4-30-59, conditions 1 thru 3, at 4-5.*

80. The City should be required to submit a return flow plan acceptable to the State Engineer before it is allowed to use return flows to offset stream depletions caused by diversion if the Application is approved. *CP. Ex. 25, Finding No. 74. Lieuwen T. 79, r.240.*

Hydrologic Baseline Condition

81. The City's hydrologic baseline condition uses the 1971-1998 Rio Grande stream flow records for simulating the City's offset requirements and balances for the 2006-2060 period. *Alb. Ex. 23 at 2.*

82. The City's hydrologic baseline condition under the proposed Drinking Water Project includes the following adjustments to historic Rio Grande flows. *Alb. Ex. 23 at 5-1*:

    a. San Juan-Chama Project flows averaging 73 cfs at the Otowi Bridge stream gage. *Id. at 4-2; Hines T.33 r.93.*
    b. Estimated Rio Grande depletions resulting from continued City groundwater withdrawals under State Engineer Permit RG-960. *Id.*
    c. The City's waste water discharges to the Rio Grande averaging 54% of City diversions. *Id.*

83. If the City's adjusted hydrologic baseline condition is not valid, its comparative analysis of the impacts of the DWP and RG-960 alternatives is also invalid.

84. The City's baseline condition does not include future Rio Grande depletions resulting from State Engineer permitted water rights for City of Rio Rancho and Intel Corporation in the baseline condition. *Gates T.41 r.565.*

85. The City's baseline condition failed to consider the inability to deliver a constant release of San Juan-Chama Project Water from Abiquiu Reservoir due to limited Rio Chama channel capacity during spring runoff flood control operations at Abiquiu Reservoir. *CP. Ex. 5 at 9.*

86. The City's baseline condition failed to include stream flow records for the period from 1943 to 1970, a fairly dry period, when there were lower flows in the Rio Grande. *Hines T.33 r.459.*

87. There was no evidence offered to substantiate the City's assumed drain ditch return flow of 220 cfs to the Rio Grande above the Isleta diversion. There is not a lot of historical data to support this assumption. *Hines T.35 r.418.*

88. During the period 1971 through 1998 the San Juan-Chama Project flows at the Otowi gage in the months of July through October averaged only 32 cfs most of which was diverted by the MRGCD upstream from Albuquerque.

89. The release of the City's San Juan-Chama Project water from upstream storage cannot be effectively utilized because the river does not leak to the Santa Fe Group (deep) aquifer at a rate high enough to require the full amount of project water to be used to offset the State Engineer's calculated effects on the Rio Grande. *Alb. Ex. 23 at 2; Hines T.33 r.954, T.34 r.50.*

90. Water intended for recharge of the deep aquifer is probably flowing downstream and out of the Albuquerque Basin. *Alb. Ex. 4 at 4-3.*

Depleted Reach River Losses

91. In comparing DWP with RG-960 the City asserts that the DWP will reduce Rio Grande flows at the Albuquerque gage by average of about 30 cfs and as much as 45 cfs lower than RG-960 flows. *Alb. Ex. 23 at 8, 9, 5-2, 5-6, 5-25; Hines T. 35 r.595, 699.*

92. In the Drinking Water Project's first year of operation, the City will need to release from storage at least 30 cfs of San Juan-Chama Project water to offset residual depletions from historic groundwater pumping. *Hines T. 35 r.909*.

93. If the average loss of water in the Rio Grande between the Paseo del Norte diversion and the Albuquerque gage resulting from the DWP is about 30 cfs and the distance between these two points is 7.5 miles, the DWP will result in an average river loss of 4 cfs per mile.

94. To account for any channel losses in the 18 mile reach between the Angostura Dam and the proposed Paseo del Norte diversion the City assumes a loss of 50 cfs which is a rate of about 2.8 cfs per mile. *Hines T. 34 r.491*.

95. If the minimum DWP by-pass flow at the Paseo del Norte diversion is 70 cfs and the drain in-flow above the Albuquerque gage is 35 cfs, and if the DWP seepage loss is 30 cfs, the total flow at the Albuquerque gage would not exceed 75 cfs.

96. A majority of the water lost in the Rio Grande channel is picked up in the riverside drains and is either returned to the river or diverted to the irrigation system. In the Albuquerque area only about 10 to 13% of the water lost from the Rio Grande recharges the deep Santa Fe Group aquifer. *Alb. Ex. 4 at 2-12/13, 3-4, 22.*

97. In the 15-mile reach of the Rio Grande from Paseo del Norte and Rio Bravo Bridge seepage from the Rio Grande moves eastward at an average rate of 7 cfs per mile. About 80% of this seepage is intercepted by the riverside drains. *Alb. Ex. 4 at 5-2, 5-3, 21.*

98. If the seepage from Rio Grande in the 15-mile reach between Paseo del Norte and Rio Bravo Bridge is about 105 cfs (7 cfs x 15 miles) and if the City's by-pass of native water at the Paseo del Norte diversion is only 70 cfs and if the drain in-flow above Rio Bravo is 35 cfs, then the DWP will dry-up the river in times of very low flow.

99. With ever increasing municipal pumping has come progressive drying up of the drains at increasing distances from the pumping centers. In many areas pumping of ground water by City wells has lowered the water table below the level of the drains. *Alb. Ex. 4 at 3-3, 3-7.*

100. The interim State Engineer Middle Rio Grande Administrative Area Model simulations only project annual flow; however. Water demands vary seasonally. During a low-flow year, heavy pumping could dry up the Rio Grande. In order to see the true impacts of proposed ground water pumping in the Rio Grande, monthly or even daily model simulations will give better insight into seasonal variations of hydrologic effects of proposed pumping. *CP. Ex. 2, Tech. Memo 2 at 2, 6; Sheng T.52 r.47.*

101. Low flows in turn will cause the water table to drop. The water table is currently approximately 2.5 meters below the surface. Because cottonwood tree roots extend only 3 meters below the ground, a drop in the water table of 0.5 meter or more will kill the cottonwoods in the reach. *Barish T. 62.*

102. The Water Rights Division conducted no studies of conveyance losses in the reach between the proposed point of diversion and the water treatment plant. It did not know how much water would reach the treatment plant. Even if the river ran dry, Water Rights Division saw no problem because there are no diverters of surface water in this reach. *Ward T. 74 r.425, 482, 505.*

City's Curtailment Strategy

103. The City acknowledges that localized drawdowns in the critical bosque and riverside drain areas along the Rio Grande are difficult to model. *Alb. Ex. 23 at 9; Hines T. 34 r.68, 170, T.35 r.90.*

104. The mean monthly low flow at the Albuquerque gage during the period 1971 through 1998 was 492 cfs. *Alb. Ex. 23 at 5-2, 5-26.*

105. The City asserts that the "low flow thresholds" for Rio Grande are 105 cfs at the Albuquerque gage and 500 cfs at the Isleta diversion dam. *Alb. Ex. 23 at 8.* A flow of 170 cfs at the Albuquerque gage is a "severe low flow." *Alb. Ex. 23 at 8, 5-26; Hines T. 34, r.579.*

106. The City asserts that during dry years the historic MRGCD diversion at the Isleta diversion dam was 500 cfs and that under the DWP a mean monthly flow of less than 500 cfs at the Isleta diversion would occur about 12% of the time. *Alb. Ex. 4 at 8.*

107. The City did not know whether the diversion of 500 cfs would be adequate for the irrigation of lands served by the Isleta diversion dam. *Hines T. 34 r.898*.

108. The City's curtailment strategy for DWP diversions is intended to ensure that diversions do not dry up or otherwise adversely affect the riverine ecology between the diversion and the return flow points. *Alb. Ex. 23 at 4-4; Hines T.35 r.145.*

109. The City's hydrologic analysis assumed an average return of 35 cfs from a MRGCD drain above the Albuquerque gage. *Alb. Ex. 23 at 4-4; Hines T.33 r.350, T.35 r.390, 415.* There is not a lot of historical data to support this assumption. *Hines T.35 r.418.*

110. The City will shut down its diversion of water from the Angostura Dam if there is less than 250 cfs that could be diverted for use by the Middle Rio Grande Conservancy District. *Hines T. 34 r.439.*

111. The City looked at MRGCD data for fairly dry periods to estimate what might be within the operation range of the District. *Hines T. 34 r. 612.*

112. The City will not divert San Juan-Chama Project water if there is no native Rio Grande. *Hines T. 34 r.488*.

113. The City's curtailment strategy assumes that DWP diversions will be shut down when flow at the Albuquerque gage reaches 105 cfs. *Alb. Ex. 23 at 5-6; Hines T.34 r.630, 677 T.35 r.489, 503.*

114. It is not the intention of the City to dry up the Rio Grande. *Hines T. 35 r.145*.

115. Farmers in Albuquerque's South Valley as well as downstream of Albuquerque receiving MRGCD deliveries of water have experienced periods of water shortage. During the 2002 growing season, diversions for irrigation purposes

were reduced or stopped in August, September and October due to insufficient supply of water in the Rio Grande. *Carangelo T. 58.*

116. Farmers south of Albuquerque have experienced water shortages; irrigation water was cut off to the Jarratt family farm/dairy in September, 2002, requiring the purchase of 300 tons of hay and 1000 tons of silage through New Mexico's drought relief program. *Jarratt T. 59*.

117. The Water Rights Division recommends that the City's proposed minimum flow of 70 cfs be measured by a gage at the lowest flow point between the point of diversion and the water treatment plant outfall. The 70 cfs minimum flow should not include any inflows that might be added to the river below the City's diversion. *WRD Ex. 2, Conditions of Approval 8, at 16*; *Ward T. 74 r.403.*

City's Faulty Analysis of Future Impacts

118. The City's RG-960 alternative assumes groundwater pumping in excess of its existing permitted right of 132,000 acre-feet per year. *Miller T. 56 r.97.*

119. If the RG-960 analysis were limited to the permitted maximum diversion right, the surface water impacts under that alternative would be significantly less than the DWP alternative. *Miller T.56 r.97.*

120. If the City were limited to a diversion of 132,000 acre-feet under the RG-960 alternative, the difference in Rio Grande flow in the month of July in a low flow year (1977 historically and 2040 in the future use scenario) would be 70-80 cfs less under the DWP alternative than under the RG-960 alternative. *CP Ex. 4, Figure 1, at A-1; Miller T.56 r.172.*

121. If the City were limited to a diversion of 132,000 acre-feet under the RG-960 alternative, the difference in Rio Grande flow in a normal year (1988 historically and 2023 in the future scenario) would be 10,000 acre-feet less under the DWP alternative than under the RG-960 alternative. *CP Ex. 4, Figure 2, at A-2; Miller T.56 r.212.*

122. If the City uses mean monthly average flows as a basis for managing its surface water diversions, it may mask potential low flow periods to the detriment of downstream surface water users. *Miller T.56 r.741.*

123. The water supply of the Rio Grande is highly variable. In some years it is not adequate to supply exiting uses. *Hines T. 37 r. 299*.

Active Water Rights Administration

124. The Water Rights Division recommends monthly accounting of the City's water diversions and return flows based on the assumption that the City will

monitor its water usage on daily basis and make necessary adjustments in diversions immediately and on a daily basis. *Ward T. 71 r.471; Logan t. 84 r.519,544.*.

125. If the City daily deficits are not repaid immediately, the City will consumptively use native Rio Grande water at least until the deficits are repaid. *Ward T. 71 r.471.*

126. The State Engineer should understand and reflect on historic, current, and future impacts created by urbanization, agriculture, and other emerging needs before making water resource decisions. *Alb. Ex. 4, Forward.*

127. Based on water supply investigations prepared by the City, the projected net depletion impact on the flow of the Rio Grande that might result from the implementation of the City's Drinking Water Project after application of the offsets for return flow credit (54%) and all of the City's vested and acquired groundwater rights would be about 132,400 acre-feet over the 2006-2016 period. *Alb. Ex. 23 at Table E-2; CP. Ex. 4 at A-4.*

128. The actual future depletion impact on the Rio Grande that might result from implementation of the City's Drinking Water Project will depend on:

    a. The results and conclusions of a study of San Juan-Chama Project transportation loss rates required to determine the amount of San Juan-Chama Project water available for diversion by the City;
    b. The actual amount of return flow of water to the Rio Grande from City wells;
    c. The amount and applicability of acquired and vested groundwater right offsets;
    d. The source and availability of water that has been loaned by the City to the Bureau of Reclamation and the Middle Rio Grande Conservancy District that must be paid back to the City;
    e. Results of model simulations using the then-current State Engineer Middle Rio Grande Administrative Area Model.

129. Because it is not possible to make reliable long-term predictions of the factors outlined in requested finding immediately above, it is necessary to implement the conjunctive administration criteria described in Requested Conditions of Approval II. 1. through II. 4 in order to protect existing water rights.

130. The operating rules for the Middle Rio Grande Project Flood Control Reservoirs prescribed in Public Law 86-645 provide that flood control storage in Abiquiu and Cochiti Reservoirs must be retained in storage when the natural inflow to Cochiti Reservoir (measured at Otowi gage) is less than 1,500 cfs. This is to ensure that carry-over flood storage, that but for storage in these reservoirs would have flowed to Elephant Butte Reservoir, is eventually

delivered to Elephant Butte Reservoir undiminished by summertime depletions in the middle valley. *Act of July 14, 1960, 74 Stat. 480, 493.*

131. The natural inflow to Cochiti Reservoir (measured at Otowi gage) of 1,500 cfs is equivalent to the nominal maximum depletion of the flow of the Rio Grande between Cochiti Dam and Elephant Butte Dam.

132. During periods of time when the natural inflow to Cochiti Reservoir is greater than or equal to 1,500 cfs, the depletion impacts of implementation of the City's Drinking Water Project would be on the water supply of Elephant Butte Reservoir.

133. During periods of time when the natural inflow to Cochiti Reservoir is less than 1,500 cfs, the depletion impacts of implementation of the City's Drinking Water Project would be on the water supply of surface water users in the middle Rio Grande valley.

134. The existing surface water measurement network is inadequate to accurately isolate or account for water uses in the Albuquerque Basin. Monitoring networks should be established to gather more data. *Alb. Ex. at 7-6; Hines T.36 r.921.*

135. The United States Geological Survey groundwater model of the Albuquerque Basin can be improved to provide better simulation of river losses, effects of riverside and interior drains, and canal seepage. *Alb. Ex. 4 at 7-5, 6.*

136. Regulatory agencies, including the Office of the State Engineer, should be open to new data, scientific advancements, and innovative management proposals. *Alb. Ex. 4 at 7-4.*

137. Under pending Applications RG-960 and 4830 the City seeks to maximize its discretion to conjunctively manage the use of surface and groundwater rights with minimum State Engineer administration of its rights. *Alb. Ex. 11 at 2, 5.*

138. The City's proposed water management strategy does not quantify a drought reserve in the Albuquerque Basin aquifer. *Hines T.36 r.400.*

139. The City's water management strategy does not provide for an aquifer storage and recovery program (ASR) using City wells to recharge underground storage and recovery of treated surface water.

III. CONSERVATION OF WATER WITHIN THE STATE

Introduction

140. Water conservation should be considered in water plans as an alternative source of water to meet future demands. *WRD Ex. 4 at p.1; Alb. Ex. 17, Att. 2 at 1, lines 12-13.*

141. Enlargement of a water right is not justified if conservation measures will produce sufficient water to meet projected increases in demand over a forty-year period. *WRD Ex. 4, at 7.*

142. Conservation of water can help a city meet both present and future demands. *Lieuwen T. 78 r.31.*

Forty-year plan

143. Applications to Office of the State Engineer are required to be supported by a 40-year plan that demonstrates the need for the new permit and for the water rights that are the subject of the application. *Alb. Ex. 11 at 2.*

144. Forty-year plans submitted to the Office of the State Engineer are to be based on a reasonable projection of future demands. *Lieuwen, T. 76, r.482.*

145. Forty-year plans are based on forecasted population growth and associated water use. *WRD Ex. 2 at 13.*

146. Population projections used in urban and regional planning projects are typically derived using economic, demographic, and migration trends. *WRD Ex. 2 at 13; Lieuwen, T. 76, r.414-416.*

147. The Middle Rio Grande Council of Governments ("MRCOG") has developed population projections based on economic, demographic and migration trends for use in regional water planning by the tri-county water planning region that includes Bernalillo County, Sandoval County and Valencia County. *Lieuwen, T. 79, r.100-113, 122.*

148. The population projection method used by the City does not use economic, demographic and migration trends, but rather is based on past water use and number of water utility accounts. *WRD Ex. 2 at 13; Stomp, T. 6; Lieuwen, T. 76, r.366-392.*

149. Population projections developed by the MRGCOG are more plausible than those used by the City in its 40-year plan. *Lieuwen, T. 76 r.436-452.*

150. The City population projections are higher than those projected by MRCOG for the years 2000-2010. *Alb. Ex. 11 at 12; Lieuwen, T. 76, r.436; T. 79 r. 130.*

151. About 15% of the City's water service area is outside of the Albuquerque City limits, but is within Bernalillo County. *Stomp, T.5, T.6.; Witherspoon T. 27, r.110.*

152. Past population growth and MRCOG population projections show that growth in Bernalillo County is slower than in Sandoval and Bernalillo Counties. *Lieuwen*.

153. The year 2000 population figure of 495,000 used by the City in its 40-Year Water Development Plan is incorrect; there were actually 476,285 people served by the City's water utility in 2000. *Stomp, T. 5; CP Ex. 26 at 150; Witherspoon, T. 27 r.380-385*.

154. The initial error in the City's population figure is exponentially magnified through the 40-year planning time, regardless of which population projection rate is used. *Lieuwen, T. 79 r.164-166.*

155. The Bureau of Business and Economic Research (BBER) Medium Growth population projection projects "annual increases" in population that are higher than the MRCOG projections and lower than the City projections. *Alb. Ex. 11 at 12.*

156. Applying the annual growth rates used by the BBER Medium Growth scenario shown in Alb. Ex. 11, Table 2, p.12, to the year 2000 City service area population of around 480,000 results in a projected population in the water utility service area of about 673,390 in 2040.

157. The City's projected service area population of 868,800 in 2040 is 29% higher than that projected in the finding immediately above, a difference of 195,410 people.

158. Water demand projections based on past high water use result in unreasonably high demand projections. *Lieuwen, T. 76, r.482; T 79, r.141-143.*

159. Population growth projections used by City in its 40-year plan are unreasonably high and unreasonably high growth rate projections increase the magnitude of error projected into the future. *Lieuwen, T. 79 r.164-181; WRD Ex. 2 at 13; Lieuwen, T. 76 r.482.*

City's Water Conservation Goals

160. Although in 1950 the City water use averaged 148 gallons per capita per day ("gpcd"), water use had ballooned to 267 gpcd by 1989. *Alb. Ex. 17 at 3*.

161. The large increase in per capita water use was due both to large increases in the outdoor irrigation of turf and the fact that although indoor fixtures have become more efficient (toilets in the 1950's used between 5 to 10 gallons each flush as opposed to 1.5 gal currently) the use of modern fixtures featuring multiple showerheads and spas has impeded reduction in quantity of water used for indoor purposes. *Witherspoon, T. 28 r.137, 188-190.*

162. Prior to 1992, there was much water waste particularly relative to irrigation usage. *Witherspoon T. 25 r.323.*

163. The City's baseline figure of 250 gpcd, from which the City measures the progress of its water conservation efforts, is based on water use in the years 1987-1993, and was chosen because it was easy to remember and easy to work with. *Witherspoon, T. 25 r.482.*

164. In 1995, cities in the southwest comparable in size and climate to Albuquerque had reduced water use to between 155-180 gpcd while Albuquerque's use averaged 250 gpcd, a figure approximately 40% higher than that used in those cities. *Alb. Ex. 17, Att. 2 at 1, lines 24-26; CP. Ex. 26 at 11.*

165. The City's 2005 conservation goal of 175 gpcd is roughly equivalent to what the actual water use was in comparable sized cities in the 1995.

166. El Paso, Texas and Tucson, Arizona are cities comparable in size to Albuquerque. *Lieuwen, T.78 r.344.*

167. In 2000, water use in Tucson was 158 gpcd. Water use in El Paso in 2000 was 163 gpcd, including unaccounted for water. *Alb. Ex. 17 at. 2; CP Ex. 26 at 11. Sheng T. 52, r.132.*

168. In 2001, El Paso, Texas achieved a water use rate of 159 gpcd, including unaccounted for water, and has set a goal of 140 gpcd for the year 2010. *Sheng T. 52, r.132.*

169. Water requirements for irrigation are greater in both El Paso, Texas and in Tucson, Arizona than in Albuquerque. *Lieuwen, T. 77, r.378-407; WRD Ex. 4 at App. D; CP. Ex. 26 at 86.*

170. State Engineer Water Conservation Guidelines project that 124.3 gpcd is a reasonable goal for residential use in Bernalillo County, including both indoor uses and outdoor uses of turf irrigation of 800 sq. ft. of high water using species and evaporative cooling. *WRD Ex. 4, App. C at 2,4; Lieuwen, T. 79 r.5-44.*

171. In 2000, City residential use averaged between 144 and 154 gpcd. *Alb. Ex. 17 at 20.*

172. Given actual water usage in cities of comparable size situated in hotter and drier climates, the City's goal of 175 gpcd is unreasonably high.

173. A water use goal of 150 gpcd for water users in the City is both reasonable and achievable. *Witherspoon, T. 29 r.216-232; Lieuwen, T. 28, r.282; Hibbard*, *T.63, r.404*.

174. It is reasonable to assume that, if advanced water conservation measures were implemented, the City could reduce it per capita water use from 175 gpcd to 138.4 gpcd. *CP. Ex. 2, Tech. Memo 3 at 6; Sheng T.52 r.188*.

175. The City, through Council Bill No. O-02-39 has already begun evaluating changing its conservation goal to 150 gpcd. *WRD Ex. 2 at 12; Lieuwen, T. 78, r.277; Hibbard, T.63 r.50.*

176. The City could achieve a water use that is as low or that is lower that both El Paso and Tucson. *Lieuwen, T.78, r.353*.

177. If the City achieved a water use of 150 gpcd, instead of 175 gpcd, it would reduce its annual demand by an additional 14,000 acre-feet per annum for a population of 500,000. *Lieuwen, T.28, r.458.*

178. If the projected population is 673,390 in 2042, as calculated using BBER project growth rates, and per capita water use at 150 gpcd, the City's demand in the year 2040 will be about 113,100 acre-feet per annum.

179. Water conservation is the least expensive way to increase the available water supply. *Witherspoon, T.26, r.513; Lieuwen, T.78, r.12.*

180. Conservation measures will produce sufficient water to meet a significant portion of projected increases in demand in Albuquerque over a forty-year period.

City's Water Conservation Program

181. The City did not have any water conservation program prior to 1992 when the City Council passed Resolution 49-1992, instructing City staff to go forward with a water conservation plan. *Witherspoon, T. 25 r.297.*

182. A 1994 News Report issued by the City after it filed its 1993 Application stated that: "Conservation has the potential to reduce city water pumping to the extent that the city should be able to live within its current permit limit of 132,000 acre feet." *CP. Ex. 21, doc. dated 4-28-94.*

183. There has been no organized opposition to the conservation program, and in fact, the public has supported a more aggressive conservation program than has the City staff. *Witherspoon, T. 25 r.342-360; Alb. Ex. 17 at 7.*

184. The City water conservation program is largely voluntary. *Witherspoon, T. 29, r.201*.

185. City Resolution 49-1992 provided that "Water rates shall be modified to encourage conservation". *Alb. Ex. 17, Att. 1 at 3, 5.*

186. Raising the price of water is the most effective method for reducing use and a surcharge program is a measure that could be implemented to achieve conservation goals as higher surcharges lead to reduced use. *Alb Ex. 17, Att. 2 at 2; Witherspoon, T. 26 r.253; T. 29 r.38-42, 129, 157.*

187. The City has not only failed to implement a surcharge program, but repealed one implemented during the early 2002 summer months. *Witherspoon, T. 25, r.391-393; T. 26, r.256-257.*

188. City residents pay $18.79 to use 11,968 gallons of water in the summer, before additional any surcharges apply. *Witherspoon, T. 29, r.6-34*.

189. The City has one of the lowest water rates and one of the highest water use averages in the Southwest United States. *Hibbard, T. 63, r. 110*.

190. Water conservation goals should be measured in targets for outdoor uses and in targets for indoor uses. *Lieuwen, T. 77, r.280-288.*

191. The greatest potential for water conservation savings is in restrictions on outdoor uses and enforcement on landscaping restrictions, as there is much water waste associated with turf irrigation. *Witherspoon, T. 25 r. 447-454, 547; Witherspoon, T. 26 r.74; Lieuwen, T. 77 r.239.*

192. Thirty-five percent (35%) to forty percent (40 %) of City's water is used for outdoor use. *Witherspoon, T. 28 r.287.*

193. The City pumped 117,000 acre-feet of potable groundwater in 2001, of which 40,900 acre-feet was for outside uses. *Witherspoon, T. 27 r.253; T. 29 r.258-270*.

194. The Landscaping and Water Waste Ordinance, O-18-1995, restrictions on the use of high water use plants pertains to new developments only and does not apply to existing turf and landscaping. *Alb. Ex. 17 at 9; Hibbard, T. 63 r.363.*

195. Restrictions on high-water use turf imposed by the 1995 landscape ordinance were loosened in 1998 with passage of Ordinance 24-1998, which reduced the number of kinds of high water use plants restricted. *Alb. Ex. 17 at 11; Witherspoon, T.25 r.581*

196. Although the City initiated a xeriscape program with Resolution R-89-1996 in September 1996 to replace existing turf, the program has resulted in xeriscaping of only about 1,410,820 sq. ft. or about 32.38 acres. *Alb. Ex 17 at 14, 25.*

197. One large potential for water savings can be found in large water users, who are those users who use more than 50,000 gallons daily and that are not golf courses or parks. *Witherspoon, T. 26, r.166-171; Alb. Ex. 17 at 17.*

198. Although the City has a "large users ordinance" requiring water conservation plans and significant reductions, including changes to low flow toilets, etc, there are no enforcement provisions in the ordinance. *Witherspoon, T. 26 r. 173-184.*

199. By late 2002, 33 of 109 large users in the City had failed to file a water conservation plan and were not in compliance with the ordinance and only 21 of the large water users that had filed conservation plans had met their water conservation goals. *Witherspoon, T. 26 r.184, T. 28 r. 457; Alb. Ex. 17 at 18.*

200. Residential use is the vast majority of water use in the City, and is about 56% of billed sales. *Witherspoon, T. 26, r.460; T. 29, r.201.*

201. Water use has increased in 33,982, or 29% of the 118,500 residential accounts that existed in 1994. *Alb. Ex. 17 at 24.*

202. The City program has resulted in replacement of only 42,881 toilets out of the estimated total of 300,000 residential toilets in 1994. *Alb. Ex. 17 at 25; Witherspoon, T.28, r.375.*

203. Another large potential source of water savings is installation of cooling towers that reuse water. *Alb. Ex. 17 at 17; Witherspoon, T. 26, r.162.*

204. The City has not pursued water conservation through efficient cooling towers due to a staff shortage. *Witherspoon, T. 26, r.162.*

205. Although the City government has made some improvements in the City's own water use, it is unlikely the City will ever achieve a 30% reduction in the City government's use from the 1995 baseline. *Witherspoon, T. 26 r.34-35.*

206. There has been little or no reduction in the amount of unaccounted for water, much of which is lost because of inaccurate metering and water line breaks. *Witherspoon, T. 26, 148-162; T. 28 r.032.*

207. Prior to 2002, the City of Albuquerque did not meter water supplied by fire hydrants for construction purposes. *Witherspoon, T. 27, r.322.*

208. Unaccounted water loss due to inaccurate metering and water line breaks is entirely within control of City government. *Witherspoon, T. 26 r.151-162*.

209. Through time, the City has cut water conservation budget and staff, including enforcement staff and staff that oversaw pro-active water line leak detection, as well as irrigation specialists who worked in the landscape program. *Witherspoon, T. 28, r.335-344, 418. Hibbard, T. 63, r.76.*

210. Many measures called for in the 1995 long-term water conservation strategy remain unimplemented and/or not enforced. *Witherspoon, T. 183, r.183; Hibbard T. 63, r.304, 391.*

211. The City has failed to aggressively reduce its reliance on groundwater by implementing water conservation measures.

City's Water Conservation Plan

212. A water conservation plan should be reviewed using the criteria contained in, "Water Conservation Guidelines for Public Water Supply Systems" by Brian Wilson. *WRD Ex. 4; Lieuwen, T. 78, r.319.*

213. The City of Albuquerque Water Conservation Program Overview lacks at least seven major elements required by the Guidelines, including:

    a. A complete and thorough description of the system,
    b. A description of its wastewater treatment system,
    c. A summary of historical annual water levels and yields of City wells,
    d. A detailed description of plans to reduce unaccounted water through leak detection and repair,
    e. A description of new water conservation measures under consideration and how they will be implemented,
    f. A drought management plan, and
    g. Identification of the number of self-supplied entities that discharge to the wastewater system and the quantity of water discharged. *Lieuwen, T. 76 r.332-345, T. 79 r.229-268.*

214. Although State Engineer guidelines require a drought management plan, the City does not have one. *WRD Ex. 4 at 12, C.P. Ex. 26 at 133-38; Witherspoon. T. 30 r. 066; Lieuwen, T. 76 r.345.*

215. State Engineer guidelines for water conservation plans require that a water supplier identify self-supplied entities that discharge into the supplier's

wastewater system and the quantities discharged in order to accurately calculate return flow credits. *WRD Ex. 4, at 3; Lieuwen, T. 79, r.229-268.*

216. The City has not identified the number and identity of self-supplied entities that discharge to the wastewater system and the quantity of water discharged. *Lieuwen, T. 79, r.229-268.*

217. State Engineer guidelines require that water suppliers establish a means of implementation and enforcement of their water conservation plans. *WRD Ex. 4 at 6.*

218. The City has not sufficiently described how existing conservation measures have been implemented or how they are being enforced. *Lieuwen, T. 78, r. 253*.

219. The City has failed to identify new measures under consideration that will result in additional conservation. *Lieuwen, T. 78, r. 255*.

220. The City of Albuquerque does not have a comprehensive Water Conservation Plan on file with the State Engineer that complies with State Engineer Guidelines. *WRD Ex. 2, at 12; Lieuwen, T. 76, r.332-345.*

IV. PUBLIC WELFARE OF THE STATE OF NEW MEXICO

General

221. In approving appropriations of water, the State Engineer has a statutory obligation to consider whether the proposed appropriation is "detrimental to the public welfare of the state." *NMSA 1978, §72-5-6 (1985).*

222. The Interstate Stream Commission is charged with the development of regional water plans. *NMSA 1978, §72-14-44 (C) (1987).*

223. The Interstate Stream Commission has charged regional water planning entities with providing adequate review of the effects of the regional water plan on the public welfare. *NMSA 1978, §72-14-44 (C) (1987).*

224. The Middle Rio Grande Water Assembly is the Interstate Stream Commission funded regional water planning entity for Sandoval, Bernalillo and Valencia counties, within which the Albuquerque Drinking Water Project is located. *Harris T. 65 r.657-67*.

225. The Middle Rio Grande Water Assembly has established goals for the region which amount to a determination of the public welfare criteria which must be considered in the administrative process for approval of the City's Drinking Water Project Application. These were adopted on January 10, 2001. *Harris T. 65 r.657-67*.

226. Of the nine goals, the first three are:
    a. Preserve water for a healthy native Rio Grande ecosystem;
    b. Preserve waster for the region's agricultural and historical values;
    c. Preserve water for economic and urban vitality. *Harris T. 65 r.657-67*.

227. The Drinking Water Project in general is contrary to the mission of Amigos Bravos. It will further disrupt the natural flows of the river and it will degrade water quality. Studies and experience have shown that rivers and the life they support are negatively impacted by (i) reduction and alteration of river flows, (ii) loss of riverine habitat, (iii) declines in water quality, and (iv) man-made barriers to the upstream movement of fish, all of which will result from approval of the City's Application. *Shields T. 64.*

228. The members of Amigos Bravos, as well as the public in general, will be negatively impacted by approval of the City's Application. Decreased water quantity and quality will affect the use of the river and the Bosque as an open space were people can go to relax and reconnect with nature, they will affect the public's ability to recreate—e.g. canoe and fish—on or near the river, and the Bosque's use for such activities as photography, painting and meditation could also be impacted. *Shields T. 64.*

229. People today place a far higher value on preservation of the natural world in general and the Rio Grande in particular than they did previously. Studies have shown that right behind their concerns for drinking water are their concerns for water for environmental purposes. *Barish T. 62*.

230. Consideration of public welfare requires consideration of declines in water quantity and water quality and their impacts on river flows, riverine habitat, flora and fauna, agriculture, recreational opportunities, and the value people place generally on preservation of the natural world.

Drinking Water Project Draft Environmental Impact Statement

231. The City's Application describes its proposed diversion system as follows:

> There are three possible diversion alternatives under consideration for the DWP—a new surface diversion north of the Paseo del Norte Bridge, a new subsurface diversion in the vicinity (upstream and downstream) of the Paseo del Norte Bridge, and a surface diversion at the existing Angostura Diversion Dam north of Bernalillo. The new surface diversion facility is likely to be the preferred alternative for the DWP based on the current status of studies going forward under an Environmental Impact Statement (EIS) being conducted by the City. *Alb. Ex. 2 at 2*.

232. The National Environmental Policy Act (NEPA) requires *federal agencies* to analyze, "to the fullest extent possible," the potential environmental impact of "major federal actions significantly affecting the quality of the human environment." 42 U.S.C. §4332(2) (C). An environmental impact statement (EIS) "ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts." ***Robertson v. Methow Valley Citizen Council***, 490 U.S. 332, 349, 109 S.Ct. 1835, 1845 (1989).

233. The Draft Environmental Impact Statement (DEIS) prepared by the U.S. Department of the Interior, Bureau of Reclamation, and the City in connection with the City's Drinking Water Project (DWP) explains as follows:

> The federal actions which may be undertaken in connection with the project which require NEPA compliance are: (1) issuance of a license by Reclamation to the City for the location of project facilities on Reclamation-owned property or right-of-way, or approval of a license between the City and the Middle Rio Grande Conservancy District for the location of facilities on the right-of-way held by Reclamation over property owned by the Middle Rio Grande Conservancy District; (2) execution of a water carriage contract authorizing use of federal irrigation canals to convey non-project water. . . ; and (3) Clean Water Act Section 404 permitting from the U.S. Army Corps of Engineers in conjunction with construction of project facilities in waters of the United States. The U.S. Fish and Wildlife Service and the Environmental Protection Agency will provide consultation and review pursuant to their respective statutory authority under the Endangered Species Act, Clean Water Act, and NEPA. *CP Ex. 9 at 1-1.*

234. The DEIS was issued by the federal agencies on June 14, 2002. As of the close of the record hearings in this matter (February 28, 2003), the federal agencies had not issued a final EIS.

235. The NEPA process selected four alternatives for detailed analysis:

a. A no action alternative, "which would involve continued reliance on ground water for current and future drinking-water demand";
b. The Angostura Diversion alternative, "which would involve diversion of the City's San Juan-Chama Project water at the existing Angostura Diversion, with conveyance of raw water to a new water treatment plant via two existing Middle Rio Grande Project facilities, pump station and conveyance pipeline";
c. The Paseo del Norte Diversion alternative, which would involve diversion of the City's San Juan-Chama Project water at a new diversion to be constructed north of Paseo del Norte, with conveyance of raw water to a new treatment plant via a new pipeline"; and

d. The Subsurface Diversion alternative, "which would involve diversion of the City's San Juan-Chama Project water via new subsurface collectors to be constructed near Paseo del Norte, with conveyance of raw water to a new treatment plant via a new pipeline." *CP Ex. 9 at 2-1 – 2-2.*

236. Only after the NEPA process is complete—that is, only after the federal agencies issue a final EIS, which, among other things, responds to all comments submitted—do the federal agencies weigh the risks and benefits of the proposal at hand and reflect it in a Record of Decision (ROD). 51 Fed. Reg. 15,621 (April 25, 1986).

237. In the present case, a final EIS and ROD are necessary in order to permit the City's DWP to go forward. The NEPA process will determine which *if any* of the City's proposed diversion points will be permitted by the federal government.

238. Comments submitted in response to the DEIS, to which the final EIS must still respond, include:

a. The DEIS assumes that implementation of the DWP is the sole economically viable method for the City to comply with the new arsenic standard but does not provide data to support this conclusion.
b. The DEIS fails to explain how construction of a new diversion dam across the Rio Grande became one of the three final alternatives considered, when the City's earlier evaluations specifically excluded a new diversion dam spanning the channel of the Rio Grande.
c. The DEIS improperly bases the no action alternative on the inability to reliably predict a future use of the City's San Juan-Chama Project water in the event that one of the alternatives is not constructed. The no action alternative must be based on the City's current plan for use of San Juan-Chama Project water, which is the continuation of the leases of San Juan-Chama Project water to the existing subcontractors for beneficial uses in the Rio Grande basin.
d. The DEIS eliminates use of recycled water as a sustainable water supply alternative based on serious concerns about public health and costs associated with the treatment of injected water. The DEIS does not adequately consider this alternative, and provides no basis for not fully analyzing this alternative. Major metropolitan areas in California and Arizona have developed and implemented projects involving the recycling and recharge of treated effluent.
e. The DEIS states that there will be no loss of Rio Grande silvery minnow habitat or river connectivity attributable to the operation of the DWP. Because the final studies and design of the proposed fish passage have not been completed, this statement is unfounded.
f. The DEIS limits discussion to treatment of river water for drinking water purposes, and does not discuss the impact of increased concentrations of

endocrine disruptors and pharmaceuticals in the river water diverted and returned to the river, and the impact of these increased concentrations on aquatic species and irrigated agricultural acreage downstream. In general, the DEIS fails to discuss the concentrating effects (increased pollutant loads) of implementation of the DWP. *CP. Ex. 5*.

239. Until the federal agencies determine which *if any* of the City's proposed diversion points will be permitted for operation, neither the parties nor the Hearing Examiner nor the State Engineer can fully and fairly determine whether granting the City's Application complies with state law. Given the different effects that the four different alternatives will have on aquatic life, floodplains, hydrology, etc., designation of a specific point of diversion is necessary in order to determine whether the Application, if granted, will result in the impairment of existing water rights, will be contrary to the conservation of water in New Mexico, or will be detrimental to public welfare.

Water Rights Division's Public Welfare Analysis

240. The State Engineer has no guidelines by which to determine whether an application, if granted, will be detrimental to public welfare. *Ward T. 73 r.165.*

241. The Water Rights Division did not review the City's Application to determine whether it, if granted, will be detrimental to public welfare. The Water Rights Division considered only the alternatives if the City's Application is *not* granted. *Ward T. 73 r.192.*

Rio Grande Compact Compliance

242. If the City demonstrates that the granting of the Application will not impair the state's ability to comply with the Rio Grande Compact, then granting of the Application may not be contrary to the public welfare of the state.

243. The September 22, 2000, Office of the State Engineer Middle Rio Grande Administrative Area Guidelines for Review of Water Right Applications is intended to help ensure New Mexico's compliance with the Rio Grande Compact. *WRD Ex. 3*.

244. Offsetting the effects of groundwater diversions on surface flow is critical to the conjunctive management of the water resources within the Rio Grande stream system and to ensure New Mexico's ability to meet its obligations under the Rio Grande Compact.

245. It could adversely impact New Mexico's ability to meet its obligations under the Rio Grande Compact if diversions under the City's DWP were not limited by the valid offset rights (determined by Conjunctive Administration Criteria)

plus the amount of water City returns directly to the Rio Grande under a revised return flow plan acceptable to the State Engineer.

Monitoring Plan

246. The interim State Engineer Middle Rio Grande Administrative Area Model is capable of representing surface water features, but data are sparse and not sufficient to calibrate the surface water/groundwater interactions in a regional model. There is a large uncertainty associated with the use of the current version of this model to simulate the surface water/groundwater interactions in the Middle Rio Grande valley. *CP. Ex. 4 at 7.*

247. The State Engineer Middle Rio Grande Administrative Area Model should be used with great caution because:

    a. A limited flow data se for surface water/groundwater interaction was used to calibrate the model;
    b. The limited data se covered only part of the Rio Grande, canal and drain systems; and
    c. Limited seepage loss data were used to configure interaction of the surface water and ground water. *CP. Ex. 2, Tech. Memo 2, at 6; Sheng T. 51 r.673.*

248. An appropriate data collection and monitoring plan would improve the reliability of the surface water/groundwater interaction simulated by the interim State Engineer Middle Rio Grande Administrative Area Model. *C P. Ex. 4 at 8.*

249. To ensure that depletions of the flow of the Rio Grande resulting from groundwater pumping by the City under the DWP application are reliably simulated, water surface gradients of the shallow groundwater aquifer should be monitored in accordance with a plan designed to monitor the effects on the surface flow of the Rio Grande of groundwater pumping in the middle Rio Grande.

250. Actual monitoring and recording of changes in the water surface gradient between the river and the shallow aquifer and then comparing those changes to the water level gradient changes simulated by the interim State Engineer Middle Rio Grande Administrative Area Model for the same time period would provide a method for determining whether simulated surface water effects due to groundwater pumping by the City under the proposed permit are reliable.

251. The uncertainty as to the actual effects of historic and future groundwater pumping on the flow of the Rio Grande justifies the need for on-going monitoring of the groundwater/surface water interaction in order to measure the impact on the flow of the Rio Grande resulting from City's pumping under the DWP application.

Water Quality – Discharge Permit

252. Above Albuquerque, there are at least six discharges into the river pursuant to National Pollution Discharge Elimination System (NPDES) permits; in Albuquerque there are an additional five. These discharges will either accumulate in the pool above the City's proposed dam or be dewatered with less and less native water below the dam, resulting in higher concentrations of effluent that will impact all downstream water users. Because regulatory standards permit certain levels of pollution, a water user like the City can meet water quality standards and still degrade water quality. *Shields T. 64*.

253. The City's Authorization to Discharge under NPDES Permit No. NM0022250 expired May 31, 1988. *Alb. Ex. 31.*

254. Public concern has been expressed over pharmacologically active compounds in the Rio Grande that could cause disruption of the human endocrine system. *CP. Ex. 29 at 3-286.*

255. Pharmacologically active compounds are not natural and the sources of such compounds are likely discharges from wastewater treatment plants.

256. The City presented no evidence of the impacts of increased concentrations of these substances discharged from the Albuquerque Southside Wastewater Reclamation Plant (SWRP) on aquatic species in the river or on irrigated agriculture downstream of the plant.

257. It is not in the public interest to allow the City to discharge treated effluent to the Rio Grande under an expired NPDES permit.

258. Crop yield and quality are also affected by the differences between native water and treated water, or effluent. Treated water is not the equivalent of native water for agricultural purposes. Treated water lacks the nutrients and silt that are so beneficial to crop growth in areas downstream of Albuquerque. Farmers in this area have already observed decreases in the quality of Rio Grande water over the past decade—water color has changed, water smell is often unpleasant, and crops are often yellowed and yields reduced. *Carangelo T. 58.*

259. Approval of the City's Application, in which the City seeks to divert 47,000 acre-feet of native water and return 47,000 acre-feet of treated water, will exacerbate the decreases in water quality that have already been observed in the Rio Grande. *Carangelo T. 58*.

260. City's permit, if granted, should contain provisions requiring that the diversion of water be contingent upon approval of all other permits required by state and federal agencies. *WRD Ex. 1 at 4.*

Impacts on Rio Grande Silvery Minnow

261. While the Silvery Minnow captive breeding program participated in by the City may contribute to recovery of the minnow, it will not be a solution. This captive breeding program is not wholly effective and does not provide adequate genetic diversity. *Barish T. 61*.

262. Forty-three percent of the native fish species in Bernalillo County have already been lost. Eleven fish species have been extirpated from the County and some of these species are extinct (no longer found anywhere in the world). *Shields T. 64*.

263. The City's proposed diversion dam at Paseo del Norte is located in the habitat of the federally listed endangered Rio Grande silvery minnow. *C P. Ex. 9.*

264. The City proposes to construct and operate a fishway associated with the City's diversion dam so the diversion dam would not interfere with the movement of the Rio Grande silvery minnow. *C P. Ex. 9.*

265. The City did not present any evidence on published data on upstream passage technologies related to the Rio Grande silvery minnow.

266. There are no fishways at existing diversion dams on the Rio Grande.

267. No model or prototypes of the diversion dam and fish by-pass structures that would demonstrate that these structures would safely pass all life stages of Rio Grande silvery minnow have been developed. *Alb. Ex. 38.*

268. The design velocity of flow of water through the proposed fishway is too great to allow for Rio Grande silvery minnow to swim upstream of the diversion dam. *CP. Ex. 5 at 7,8.*

269. The Water Rights Division did not evaluate whether the City's proposed minimum flow of 70 cfs will be sufficient for proper operation of the proposed fishway and sluiceway. Nor did the Water Rights Division evaluate whether the design criteria are adequate to insure that at minimum flows of 70 cfs, 50 cfs will find their way to the fishway and 20 cfs will find their way to the sluiceway, as required by the City's proposal. *Ward T. 74 r.438.*

270. It is not in the public interest of the State of New Mexico to allow the construction and operation of a diversion dam and fishway that would be detrimental to the conservation of the Rio Grande silvery minnow.

REQUESTED CONCLUSIONS OF LAW

I. Jurisdiction

1. The State Engineer lacks jurisdiction over the City's Application, which is entitled "Application for Permit to Divert Surface Water from the Rio Grande for Municipal, Industrial, and Related Purposes for the City of Albuquerque's Drinking Water Project."

2. In New Mexico, the statutory method of acquiring water rights is exclusive. ***Harkey v. Smith***, 31 N.M. 521, 526, 247 P. 550, 551 (1926). The State Engineer's authority is limited to that granted by the Legislature, either expressly or by necessary implication. ***Application of Brown***, 65 N.M. 74, 77 332 P.2d 475, 477 (1958).

3. Article 5 of Chapter 72 of the New Mexico Statutes, NMSA 1978, governs the appropriation and use of surface water in New Mexico. Only two provisions--§72-5-1 and §72-5-24—vest the State Engineer with authority to approve applications for surface water diversions. Section 72-5-1 provides that:

   > Any person, association or corporation . . . intending to acquire the right to the beneficial use of any waters, shall . . . make an application to the state engineer for a permit to appropriate, in the form required by the rules and regulations established by him.

   Section 72-5-24 provides that:

   > An appropriator of water may, with the approval of the state engineer… change the place of diversion, storage or use in the manner and under the conditions prescribed in Sections 72-5-3 and 72-5-23 NMSA 1978.

   There are no provisions in Chapter 72 for a "permit to divert surface water."

4. The City's Application does not specify the statutory authority pursuant to which the City seeks a permit. However, the City has sought to invoke State Engineer jurisdiction pursuant to NMSA 1978, §72-5-26. Section 72-5-26 provides that:

   > Whenever the owner of a ditch, canal, pipeline, reservoir or other works shall turn or deliver water from one stream or drainage into another stream or drainage, such owner may take and use the same quantity of water, less a reasonable deduction for evaporation and seepage to be determined by the state engineer …

5. Section 72-5-26 does not apply to this case because the City's Application does not request diversion and conveyance of water from one stream system to another, and because the City is not the "owner" of the San Juan-Chama Project trans-basin diversion and conveyance facilities.

6. Section 72-5-26 also does not grant to the State Engineer independent permitting authority. There is no express or necessarily implied authority under this section to grant water right permits for transbasin diversions.

7. Because the City failed to file its Application pursuant to and in conformity with the requirements of Sections 72-5-1 and 72-5-24, the State Engineer lacks jurisdiction over the Application.

8. NMSA 1978, §72-5-4 states that:

> Upon the filing of an application which complies with the provisions of this article and the rules and regulations established thereunder … the state engineer shall instruct the applicant to publish notice thereof, in a form prescribed by him … Such notice shall give all essential facts as the proposed appropriation; among them, the places of appropriation and of use, amount of water …..

9. The City's Application fails to provide all essential facts. It fails to specify the intended point of diversion, and it fails to specify the amounts of surface and ground water that will be conjunctively used for municipal purposes.

10. New Mexico law also requires that the published notice of an application give "all essential facts" concerning the proposed appropriation, including the place of appropriation or diversion and the amount of water. NMSA 1978, §72-5-4. Having failed to provide these essential facts, the published notice of the City's Application is defective and violates due process. Failure to give proper notice renders subsequent acts of an administrative agency void. ***Nesbit v. City of Albuquerque***, 91 N.M. 455, 575 P.2d 1340 (1977); ***Application of Northeastern New Mexico Regional Landfill***, 2003-NMCA-043.

II. Merits of City's Application

11. Applications filed pursuant to Sections 72-5-1 and 72-5-24 may be approved by the State Engineer if the changes requested in the application will not be detrimental to existing water rights, will not be contrary to conservation of water within the state, and will not be detrimental to the public welfare of the state. NMSA 1978, §§72-5-23 and 72-5-24.

12. The City has failed to carry its burden of establishing that granting its Application will not be detrimental to existing water rights. The City's analysis

of the Drinking Water Project is based on hypothetical future demands that are not realistic and the use of San Juan-Chama Project water loss rates that are not valid. The impacts of implementation of the Drinking Water Project on the surface flow of the Rio Grande are based on the use of a groundwater model that was not built for the purpose of determining the surface water/groundwater interaction. The studies made in support of the City's Application are based on the use of average monthly flows which cannot reliably demonstrate the impact of a surface water diversion project that is proposed to be operated on instantaneous flow rate. The impacts of residual and projected groundwater pumping by the City of Albuquerque on the flow of the Rio Grande will be significant. The City's vested, acquired and dedicated groundwater rights will not be suitable for use in offsetting these impacts under all hydrologic conditions.

Unless the City's surface water rights, if any permitted under Application No. 4830, and its groundwater rights under Permit No. RG-960 are conjunctively administered pursuant to the requested conditions of approval set forth below, it is more likely than not that in time of low flow at the Albuquerque gage, 500 cubic feet per second or less, surface water diversions by the City of Albuquerque will result in shortage to downstream water users and Rio Grande Compact delivery shortfalls.

13. The City has failed to carry its burden of establishing that granting its Application will not be contrary to conservation of water within the state. The City can supply a significant portion of its projected future demand through improved conservation measures. The City has failed to fully implement and enforce its current water conservation strategy, continues to use more water than comparable cities, and has failed to submit a water conservation plan that complies with State Engineer Guidelines.

14. The City has failed to carry its burden of establishing that granting its Application will not be contrary to the public welfare of the state. Public welfare includes consideration of a wide range of factors, including not only the provision of water by municipal utilities for the use of local residents, businesses and industries for sanitary, domestic and firefighting purposes, but also potential impacts on interstate water Compact deliveries, water quantity, water quality, river flows, riverine habitat, flora and fauna, agriculture, recreational opportunities and preservation of the natural world. The City has failed to establish that there are not other better, more efficient ways of meeting its future water needs, and Coalition Protestants have shown that granting the present Application will have potential impacts on water quantity and water quality, which in turn will impact river flows, riverine habitat, flora and fauna, downstream agriculture, recreational opportunities, and preservation of the natural environment.

REQUESTED CONDITIONS OF APPROVAL

I. Conditions of Approval for Permit No. 4380.

1. Prior to diverting water from the Rio Grande under this permit, City will undertake a study, approved by the State Engineer, of incremental San Juan-Chama Project loss rates for delivery of San Juan-Chama Project water to Albuquerque based on existing and anticipated Rio Grande channel conditions, for each month of the year and for all levels of native streamflow.

2. Flows returned directly to the Rio Grande by the City shall be measured with a totalizing meter, or meters, of a type and at a location(s) approved by and installed in a manner acceptable to the State Engineer.

3. The City shall submit a revised return flow plan acceptable to the State Engineer before any return flow is credited as an offset of diversion under this permit. The return flow plan must include a means for projecting return flow for use in conjunctive administration of this permit.

4. The City shall apply for return flow approval and provide details on the methods and data used to determine the amount of return flow from non-city wells and private domestic wells.

5. Actual return flows credited as an offset of diversion under this permit shall be submitted to the State Engineer on or before the 10^{th} day of each month for the preceding calendar month.

6. Prior to any diversion of water from the Rio Grande the City shall enter into cooperative agreements with the appropriate entities and be responsible for providing a proportional share of the cost of implementing and maintaining the monitoring program described in C. P. Ex. No. 6.

7. The State Engineer retains jurisdiction over this permit to evaluate the results of the monitoring and data collection plan to ensure compliance with these Conditions of Approval.

8. Based on the results of the monitoring Program, the State Engineer may place additional conditions on the permit. If, as a result of data obtained from the monitoring plan, revisions to the interim State Engineer Middle Rio Grande Administrative Area Model are determined to be necessary, impacts of groundwater diversion by the City on the flow of the Rio Grande will be determined by the revised State Engineer Middle Rio Grande Administrative Area Model.

9. The City shall be in compliance with an operative NPDES Permit prior to the diversion of water from the Rio Grande under this Permit.

10. The City shall not construct and operate a diversion dam and related facilities required for diversion of water under this permit until construction and operation of a prototype fishway for Rio Grande silvery minnow demonstrates that a diversion dam and fishway will not impair the conservation of the Rio Grande silvery minnow.

11. The State Engineer may establish a Water District and appoint a Water Master pursuant to NMSA 1978, § 72-3-1 thru 72-3-5 (1907), to administer the diversions and use of surface and ground water within the Middle Rio Grande valley to ensure the City's lawful and permitted use of water and to assess against the City its fair portion of the costs of the District.

12. The amount of San Juan-Chama Project water diverted by the City shall be based on the amount of water released from upstream storage less transportation loss rates as determined by the results of a study required under Condition of Approval No. 1.

13. The amount of native Rio Grande flow diverted by the City at its diversion shall not exceed 50% of the total amount of water diverted.

14. The City's total mean daily surface water diversion shall not exceed 130 cfs.

15. The total diversion of surface water shall be measured with a totalizing meter, or meters, of a type and at a location(s) approved by and installed in a manner acceptable to the State Engineer.

16. The City shall operate its surface water diversion to maintain a minimum flow in the channel of the Rio Grande at the following three locations in the Albuquerque reach of the Rio Grande:

    a. Point A: Rio Grande located immediately below the City's point of diversion,
    b. Point B: Rio Grande located immediately above the point where the Albuquerque Riverside Drain discharges to the Rio Grande (about 0.7 miles above the Central Avenue Bridge, and
    c. Point C: Rio Grande at Rio Bravo Bridge.

17. The City shall operate its surface water diversion to maintain, in so far as natural flow is available, a minimum flow in the channel of the Rio Grande at the three locations of no less than 105 cfs, or such other higher flow as be required by Federal permits.

18. The City shall, at its own expense or in cooperation with other agencies, install and maintain stream gaging stations to measure the flow of the Rio Grande at Point A and Point C. The flow of the Rio Grande at Point B may be determined by summing the discharge of the Albuquerque Riverside Drain and the discharge of the Rio Grande at the Albuquerque gage.

19. During periods of low flow, the State Engineer shall monitor the flow through the Albuquerque reach each day to ensure that the minimum mean daily flow at the three locations is maintained. On each day when the streamflow falls below the minimum flow requirement, the State Engineer shall notify the City that the streamflow at the three locations has dropped below the minimum flow requirement, and the City shall take steps to ensure that the minimum flow is restored within 24 hours.

20. The City shall, at its own expense or in cooperation with other agencies, install and maintain a network of water quality monitoring stations to evaluate the impact of implementation of the Drinking Water Project on the chemical, physical and biological characteristics of the waters of the Rio Grande. The nature of the location and monitoring stations shall be made in consultation with the New Mexico Environment Department.

21. If the water quality data collected by the monitoring network indicate that the City's Drinking Water Project has caused the water quality of the Rio Grande to exceed existing water quality standards or to adversely impact aquatic or riparian species, the City will promptly take steps to eliminate the water quality violation or adverse impact, including curtailment of surface water diversions.

II. Conditions of Approval for the Conjunctive Administration of Permit No. 4380 and Permit No. RG-960 et al.

Adoption of these conditions will help ensure that the implementation of the City's Drinking Water Project will not impair existing water rights between Cochiti Dam and Elephant Butte Dam by determining and offsetting impacts of implementation of this permit on a concurrent basis.

1. By the first day of each of the periods March through June, July through October, and November through February, City will submit to the State Engineer the following information for determining City's impacts on the flow of the Rio Grande for the forthcoming period:

    a. Projected average daily total surface water diversion, and
    b. Projected total ground water pumping by City's wells.

2. By the first day of each of the periods March through June, July through October, and November through February, the City will submit to the State

Engineer the following information for determining City's offset credits for the forthcoming period:

a. Projected return flows from City's wells and surface water diversion discharged to the Rio Grande as treated effluent,
b. Projected deliveries of City's San Juan-Chama Project water,
c. Current amount of City's acquired Rio Grande surface water rights,
d. Current amount of City's vested and acquired groundwater rights and the current amount of City's dedicated surface water rights,
e. Projected amount of MRGCD or Bureau of Reclamation water in storage available for repayment to City, if any.

Any adjustments required to correct differences between projected and actual depletion impacts or credits will be applied as soon as possible.

3. By the first day of each of the periods March through June, July through October, and November through February, the State Engineer will estimate the supply of water in storage available for non-Indian surface water uses between Cochiti Dam and Elephant Butte Dam for each period based on:

   a. The amount of San Juan-Chama Project water available and the amount of native water in storage available for release from El Vado Reservoir to meet non-Indian demands during the forthcoming period, and
   b. The projected amount of Usable Water in Project Storage (as defined by Rio Grande Compact) during the forthcoming period and the projected New Mexico Rio Grande Compact accrued delivery status.

4. The State Engineer will conjunctively administer water use under Permit Nos. RG-960 et al. and 4830 for each period as described below. The State Engineer will use the most current version of the State Engineer Middle Rio Grande Administrative Area Model to determine the impacts of historic and current pumping by the City's wells on the flow of the Rio Grande.

   a. During the March through June period when the projected average daily natural flow of the Rio Grande at Otowi is less than 1,500 cfs and during the July through October period:

      IF:
      The City's projected depletion impact minus projected offset credit is greater than zero and greater than the available storage, a shortage exists;

      THEN:
      City's vested and acquired groundwater rights and dedicated surface water rights would not be available for offset of depletion impacts, and to the extent required to offset the remaining shortage, San Juan-Chama Project

water must be by-passed at the City's diversion or additional San Juan-Chama Project water must be released from upstream storage;

OTHERWISE:
So long as the City's projected depletion impact minus projected offset credit is less than the available storage a shortage does not exist and use of vested and acquired groundwater rights and dedicated surface water rights would be available for offset of projected depletion impacts.

b. During the March through June period when the projected average daily natural flow at Otowi gage is greater than or equal to 1,500 cfs and during the November through February period:

IF:
The City's projected depletion impact minus projected offset credit is greater than zero and the amount of Usable Water in Project Storage is projected to be less than 400,000 acre-feet, and/or the New Mexico is projected to have an accrued debit under the Rio Grande Compact, a shortage exists;

THEN:
City's vested and acquired groundwater rights and dedicated surface water rights would not be available for offset of depletion impacts, and to the extent required to offset the remaining shortage, San Juan-Chama Project water must be by-passed at the City's diversion or additional San Juan-Chama Project water must be released from upstream storage, provided that the amount of Usable Water in Project Storage remains below 400,000 acre-feet.

OTHERWISE:
So long as the City's projected depletion impact minus projected offset credit is less than zero a shortage does not exist and use of vested and acquired groundwater rights and dedicated surface water rights would be available for offset of projected depletion impacts.

5. The City shall not divert or use water from the Rio Grande unless and until:

a. It has reduced its annual water use to 175 gallons per capita per day, including unaccounted for water, and
b. It has reduced its annual water use to 150 gallons per capita per day, including unaccounted for water, by 2011.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that copies of the Coalition Protestants' Requested findings of Fact, Conclusions of Law, and Recommended Conditions of Approval were mailed to the following counsel of record on April 25, 2003.

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