

## **V. Background of the Rules Governing New Withdrawals of Groundwater in Water Division 3 Affecting the Rate or Direction of Movement of Water in the Confined Aquifer System**

### **A. House Bill 98-1011**

119. In 1998, the General Assembly enacted House Bill 98-1011 (“HB 98-1011”) to address concerns regarding groundwater use in the San Luis Valley, and in particular, new uses from the confined aquifer. HB 98-1011 recognized that, at that time, there was insufficient comprehensive data and knowledge of the relationship between the surface streams and the Confined Aquifer System to permit a full understanding of the effect of the groundwater withdrawals upon the natural stream and aquifer system within Water Division 3. Ch. 231, sec. 1, 1998 Colo. Sess. Laws 852, section 37-90-102(3)(a), C.R.S. (2005). HB 98-1011 directed the State Engineer to promulgate rules governing new withdrawals of groundwater affecting the Confined Aquifer System, based upon a specific study of the Confined Aquifer System. *Id.* sec. 2; section 37-90-137(12)(b)(I), C.R.S. (2003). Subsection (12)(b)(I), provided that any well permit in Water Division 3 that involves a new withdrawal of groundwater that will affect the rate or direction of movement of water in the Confined Aquifer System, referenced in section 37-90-102(3), shall be permitted pursuant to a judicially approved plan for augmentation that, in addition to all other lawful requirements for such plans, shall be subject to the requirements of rules for the withdrawal of such groundwater that are promulgated by the State Engineer pursuant to the procedures of section 37-92-501(2). Subsection (12)(b)(I) required that those rules be promulgated by July 1, 2001, which date was later extended several times to July 1, 2004. Ch. 67, sec. 2, 2001 Colo. Sess. Laws 158, 159; Ch. 239, sec. 3, 2003 Colo. Sess. Laws 1595, 1597.

120. Section 37-90-137(12)(b)(I) stated that in promulgating the Rules, the State Engineer “shall recognize that unappropriated water is not made available and injury is not prevented as a result of the reduction of water consumption by nonirrigated native vegetation.” Finally, it provided that the Rules must:

permit the development of the water resources of water division 3 in a manner that will protect Colorado’s ability to meet its interstate compact obligations and to prevent injury to senior appropriators in the order of their priorities, and with due regard for daily, seasonal, and longer demands on the water supply. . . .The state engineer and the Colorado Water Conservation Board shall proceed with diligence to complete needed studies.

Section 37-90-137(12)(b)(I) was repealed by section 37-90-137(12)(b)(II) on July 1, 2004. That repeal does not affect the validity of the Rules. Section 37-90-137(12)(b)(II), C.R.S. (2005).

121. HB 98-1011 also added section 37-92-305(6)(c), C.R.S. (2005), which requires a plan for augmentation for any application in Water Division 3 that involves new withdrawals of groundwater that will affect the rate or direction of movement of water in the Confined Aquifer System. In addition to all other lawful requirements for such plans, it requires the augmentation plan to “recognize that unappropriated water is not made available and injury is not prevented as the result of the reduction of water consumption by nonirrigated native vegetation.” Finally, it requires that “in any such augmentation plan decree, the court shall also retain jurisdiction for the purpose of revising such decree to comply with the rules and regulations promulgated by the state engineer pursuant to section 37-90-137(12)(b)(I).”

### **B. HB 98-1011 Study**

122. Pursuant to the legislative direction in HB 98-1011, the State Engineer and the Colorado Water Conservation Board performed a specific study of the aquifer systems, the RGDSS Study. As discussed in greater detail below, this study involved collection and evaluation of existing data, supplementation of the existing data with new studies, development of several models and the organization of the data and models into an accessible format. The RGDSS Study was carried out in phases from 1998 through 2004 and cost some \$5 million of state funds, together with significant monetary and in-kind resources from water users. The evidence before the Court shows that the RGDSS Study is one of the most comprehensive studies of the Valley’s geology and hydrology that has ever been undertaken. In addition to his own professional knowledge and experience, the State Engineer has relied upon the data and conclusions of the RGDSS Study in promulgating the Rules.

### **C. Senate Bill 04-222**

123. In 2004, the General Assembly enacted SB 04-222. Ch. 235, 2004 Colo. Sess. Laws 777-79. SB 04-222 added a new subsection (4) to section 37-92-501, which is applicable to rules and regulations governing the use of “underground water” in Water Division 3. This new subsection provides, in relevant part, as follows:

- (4) (a) In addition to the provisions of subsection (2) of this section, when adopting rules governing the use of underground water in division 3, and in recognition of the unique geologic and hydrologic conditions and the conjunctive use practices prevailing in division 3, the state engineer shall have wide discretion to permit the continued use of underground water consistent with preventing material injury to senior surface water rights . . . In regulating an aquifer or system of aquifers in division 3, the state engineer shall apply the following principles:
  - (I) Use of the confined and unconfined aquifers shall be regulated so as to maintain a sustainable water supply in each aquifer system, with due regard for the

daily, seasonal, and long-term demand for underground water;

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(III) Fluctuations in the artesian pressure in the confined aquifer system have occurred and will continue to occur in response to climatic conditions, water supply, and water demands. Subject to subparagraph (IV) of this paragraph (a), such pressure fluctuations shall be allowed with the ranges that occurred during the period of 1978 through 2000. Artesian pressures shall be allowed to increase in periods of greater water supply and shall be allowed to decline in periods of lower water supply in much the same manner and within the same ranges of fluctuation as occurred during the period of 1978 through 2000, while maintaining average levels similar to those that occurred in 1978 through 2000.

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(V) Underground water use shall not unreasonably interfere with the state's ability to fulfill its obligations under the Rio Grande compact, codified in article 66 of this title, with due regard for the right to accrue credits and debits under the compact.

124. SB 04-222 went on to provide for additional requirements for the Rules to be promulgated pursuant to HB 98-1011. Those requirements include:

(b) In adopting rules pursuant to paragraph (a) of this subsection (4), the state engineer shall:

(I) Recognize contractual arrangements among water users, water user associations, water conservancy districts, ground water management subdistricts, and the Rio Grande water conservation district, pursuant to which:

(A) Water is added to the stream system to assist in meeting the Rio Grande compact delivery schedules or to replace depletions to stream flows resulting from the use of underground water; or

\* \* \*

(III) not recognize the reduction of water consumption by phreatophytes as a source of replacement water for new water users or to replace existing depletions, or as a means to prevent injury from new water uses.

Section 37-92-501(4)(b)(I), (III), C.R.S. (2005). Finally, SB 222 provided that the State Engineer was not to curtail pumping from wells in Division 3 that are included in a groundwater management subdistrict with a judicially approved management plan that meets the requirements of paragraphs (a) and (b) of section 37-92-501(4). Section 37-92-501(4)(c), C.R.S. (2005). The evidence indicates that water users in the San Luis Valley are proceeding diligently to form subdistricts<sup>17</sup> to address the issue of the sustainability of the unconfined aquifer in the Closed Basin, the alluvium of the Rio Grande, and of the confined aquifer. See *Transcript (Vandiver) Vol. XVII* at p. 1263, ln. 1 – 19; *Transcript (Wright) Vol. XVII* at p. 1290, ln. 18 – p. 1295, ln. 21; *Transcript (Simpson) Vol. XVII* at p. 3103, ln. 22 – p. 3105, ln. 16; p. 3191, ln. 14 – p. 3192, ln. 6.

125. The Protestors claimed that incorrect or misleading testimony was given to the General Assembly when it considered SB 04-222. See Protestors' Exhibit P-1, *Lytle Water Solutions Expert Report in Case No. 04CW24* (“*Lytle Report*”) at p. 20. The Court finds, however, that while expressed in layman's terms rather than scientific or technical terms, the testimony given to the General Assembly during the committee hearings was neither incorrect nor misleading. The Court finds that Mr. Harmon's testimony concerning the stream-aquifer relationships, described by others to the General Assembly, is correct and establishes that the testimony given by the representatives of the Valley's water users was fundamentally correct. *Transcript (Harmon) Vol. XXV* at p. 4815, ln. 9 - p. 4821, ln. 20; State's Exhibit 126; State's Exhibit No. 127, *Harmon Rebuttal C.R.C.P. 26(a)(1) Disclosure* at pp. 1-5.

## **VI. The Rules**

126. HB 98-1011 and SB 04-222 specifically directed the State Engineer to promulgate rules for new withdrawals of groundwater that will affect the rate and direction of movement of water in the Confined Aquifer System based upon a study of the Confined Aquifer System and to apply certain principles that reflect the unique conditions in Water Division No. 3. HB 98-1011 established a specific deadline for the State Engineer to promulgate such rules. The Court finds that the State Engineer fulfilled the intentions of the General Assembly as expressed in HB 98-1011 and SB 04-222 in enacting the Rules. See generally *Transcript (Simpson) Vol. XVII* at p. 3197, ln. 20 – p. 3209, ln. 18.

127. On June 30, 2004, the State Engineer adopted the Rules. Joint Ex.1, Rules. The title of the Rules and the authority for the Rules are set forth in Rules 1 and 2. The scope and purpose of the Rules are set forth in Rules 3.A through 3.F. Definitions of terms are set forth in Rules 4.A and 4.B. The principles that guided the State Engineer in adopting the Rules and the findings made by the State Engineer on which the Rules are based are set forth in Rules 5.A through 5.G. The requirements for new withdrawals of groundwater in Division 3 affecting the Confined Aquifer System are set forth in Rules 6.A and 6.B. The effect of the Rules on well permits issued pursuant to the Rules,

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<sup>17</sup> The formation of one subdistrict (Special District 1) was completed July 19, 2006, in action 2006 CV 64. Formation of the subdistrict is only the first step in the process envisioned by the legislature.

severability, and the effective date of the Rules are set forth in Rules 7, 8, and 9. Joint Ex. 1. In general terms the Rules require full replacement of all new or increased withdrawals from the Confined Aquifer System and require the maintenance of artesian pressure in the ranges required by section 37-92-501(4)(a)(III), C.R.S.

128. Rule 4 defines key terms used in the Rules. Central to the Rules are the definitions of the “confined aquifer,” Rule 4.A.1; “Confined Aquifer System,” Rule 4.A.2; “Nonirrigated native vegetation,” Rule 4.A.4; and “RGDSS groundwater model,” Rule 4.A.7. The Rules define “confined aquifer” to mean:

the formations, groups of formations, or parts of formations underlying portions of Water Division 3 consisting in part of unconsolidated clays, silts, sands, gravels, and interbedded volcanic rock and containing saturated permeable material that yields water under artesian pressure that is or may be extracted and applied to a beneficial use. The Confined Aquifer includes any formation, group of formations, or part of a formation containing saturated permeable material that yielded water under artesian pressure during the period 1978-2000, whether or not the water level in the formation, group of formations, or part of a formation is under artesian pressure conditions at the time of the proposed new withdrawal of ground water.

129. Rule 4.A.2 defines “Confined Aquifer System” to mean the confined aquifer and those areas in Water Division 3 *not overlying a confining layer*, but which provide inflow to the confined aquifer. This definition therefore includes those portions of the unconfined aquifer in the area known as the “recharge zone” because that portion of the unconfined aquifer does not overlie a confining layer. New or increased withdrawals of water from the recharge zone will affect the rate and direction of movement of water in the confined aquifer.

130. The Rules define “RGDSS groundwater model” to be:

the finite difference model and its associated modular computer programs developed by the U.S. Geological Survey to simulate, among other things, the flow of ground water (commonly known as “MODFLOW”), *as adapted and applied* by the Office of the State Engineer to simulate the unconfined aquifer and the Confined Aquifer System. The RGDSS ground water model means the model as it currently exists *and as it may be revised from time to time* as new data or knowledge of the relationship between the unconfined aquifer, the Confined Aquifer System, and surface streams becomes available. The current exterior boundaries of the RGDSS ground water model are shown on the attached Exhibit 1.

Rule 4.A.7 (emphasis supplied). This rule makes clear that the State Engineer intends to use the then current version of the model when evaluating an application that is subject to the Rules.

131. The Rules define “nonirrigated native vegetation” to mean native grasses, sedges, rushes, shrubs, trees, or other plants that rely upon precipitation or shallow groundwater for their water supply, including, without limitation, rabbit brush, greasewood, creosote, cottonwoods, and willows. Rule 4.A.4. As the Court’s Findings below make clear, the plant communities in the Valley that derive their water supply, in whole or in part, from groundwater are called phreatophytes. Not all native plants are phreatophytes, as some derive their water supply from precipitation only. The RGDSS groundwater model quantifies the amount of groundwater consumed by phreatophytes.

132. The Protestors’ challenges to the Rules focused primarily on the RGDSS groundwater model and the requirements of Rule 5.G and Rule 6.B.2.

133. Rule 5.A restates the principles set out in section 37-92-501(2)(a), C.R.S. that rules specific to one aquifer need not apply to another kind of aquifer.

A. In adopting these rules, the State Engineer has been guided by the recognition that the Rio Grande Basin is a separate entity, that aquifers are geologic entities and that different aquifers possess different hydraulic characteristics even though such aquifers underlie the same river in the same water division, that there exists a shallow unconfined aquifer and a Confined Aquifer System underlying portions of Water Division 3, that rules applicable to one type of aquifer need not apply to another type, and that the hydrology and geology of the shallow unconfined aquifer and the Confined Aquifer System and their relationship to surface streams in Water Division 3 are unique and among the most complex in the state.

Protestors objected to the adoption of these Rules specific to new withdrawals from the confined aquifer on the basis that they violate the equal protection clause.

134. Rule 5.D. affirms the general need for a groundwater model to understand the Confined Aquifer System and for the specific evaluation of any new withdrawal that is proposed.

D. A ground water model is necessary to consider all the particular qualities and conditions of the Confined Aquifer System and to determine whether new withdrawals of ground water from the Confined Aquifer System will affect the rate or direction of movement of water in the Confined Aquifer System, as well as the effects of such withdrawals on the unconfined aquifer, fluctuations in artesian pressures in the Confined Aquifer, and the flows of natural streams.

135. While Rule 5.D. suggests that whether a new withdrawal would affect the rate or direction of movement of water in the Confined Aquifer System is an open

question, Rule 5.E. begins with an important acknowledgment that the investigation of the Rio Grande Basin and our understanding of it are incomplete and require an ongoing, persistent study.

E. While there remains some uncertainty about the effect of ground water withdrawals affecting the Confined Aquifer System upon the natural stream and aquifer systems in Water Division 3, RGDSS provides a basis for understanding the relationship between surface streams and the Confined Aquifer System and the effect of ground water withdrawals from the Confined Aquifer on fluctuations in the artesian pressures in the aquifer....

136. Rule 5.F. states the undisputed fact that the unconfined and Confined Aquifer System are overappropriated. It then states the also uncontested fact that new withdrawals from the Confined Aquifer System will cause changes in the artesian pressure. The Protestors did dispute the State's interpretation of material injury in connection with this Rule and this is discussed at length in the section of the opinion which relates to sustainability of the aquifers. Rule 5.F. also affirms that any withdrawal of water from the confined aquifer will affect the rate and direction of movement of groundwater.

F. The Rio Grande Basin in the State of Colorado, including the unconfined aquifer and the Confined Aquifer System, is over-appropriated. New withdrawals of ground water from the Confined Aquifer System will cause changes in the artesian pressures in the Confined Aquifer and will affect the rate and direction of movement of ground water in the Confined Aquifer System. Unless properly augmented, new withdrawals of ground water within the scope of these rules that will affect the rate or direction of movement of water in the Confined Aquifer System will materially injure vested water rights and increase the burden of Colorado's scheduled deliveries under the Rio Grande Compact.

137. Rule 5.G. restates the statutory requirement that artesian pressure in the confined aquifer be maintained in the range that occurred in the period 1978-2000. The Protestors' objections to this Rule are discussed at length in another section of the opinion.

G. In adopting these rules, the State Engineer has recognized that new withdrawals of ground water from the Confined Aquifer System shall not be allowed to cause fluctuations in the artesian pressures in the Confined Aquifer to fall outside of the ranges that occurred during the period of 1978 through 2000, while maintaining average artesian pressure levels similar to those that occurred in 1978 through 2000.

138. Rule 6.B.4 makes clear that new withdrawals from the confined aquifer are subject to this requirement.

139. Rule 6 establishes requirements for new withdrawals of groundwater that is subject to the Rules. Under this Rule the State Engineer will use the RGDSS groundwater model to determine if the proposed new withdrawal will affect the rate or direction of movement of water in the Confined Aquifer System. Under Rule 6.B.2, in order to prevent injury, an applicant for a new withdrawal of groundwater from the confined aquifer must change the point of diversion of or permanently retire an existing vested water right or rights to withdraw groundwater from the confined aquifer with historical withdrawals from the confined aquifer equal to the new, increased or additional supply of groundwater to be withdrawn from the confined aquifer. Rule 6.B.2.d also allows an applicant to recharge the confined aquifer or inject water to assist in maintaining the artesian pressure up to within the ranges that occurred during the period 1978 to 2000, in order to allow a new or increased withdrawal of water.

140. Rule 6.A.2 provides:

A.2 In determining whether a new withdrawal of ground water from the Confined Aquifer System will affect the rate or direction of movement of water in the Confined Aquifer System, it shall be recognized that unappropriated water is not made available and injury is not prevented as a result of the reduction of water consumption by nonirrigated native vegetation.

This language is directly from section 37-90-137 (12)(a), C.R.S. (H.B. 98-1011), and the Protestors' objection to the rule is thus an objection to the statutory framework of this rule. Protestors' colorful characterization of this is that it gives nonirrigated native vegetation the status of a vested water right. The Court rejects this characterization for reasons set out elsewhere in the opinion. The General Assembly did not "vest" plants with a water right, but it clearly did intend to prevent the creation of a moonscape.

141. Rule 6.B.2 provides in part:

B. Any new withdrawal of ground water within the scope of these rules must prevent injury to the vested water rights of others that would be caused by the new withdrawal. In addition to all other lawful requirements, the following requirements shall apply to any new withdrawal of ground water within the scope of these rules:

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2. Except as provided in Rule 6.B.2.d, to prevent injury to the vested water rights of others, the applicant for a new withdrawal of ground water from the Confined Aquifer must change the point of diversion of or permanently retire an existing vested water right or rights to withdraw ground water from the Confined Aquifer with historical

withdrawals from the Confined Aquifer equal to the new, increased, or additional supply of ground water to be withdrawn from the Confined Aquifer.

a. The vested water right or rights to be changed or permanently retired must be at a location such that the water to be made available by permanently retiring the right or rights will prevent injury to the vested water rights of others from a new withdrawal. There shall be a rebuttable presumption that any vested water right to be changed or retired that (1) is located in a different hydrologic zone, as shown on the map attached as Exhibit 1, than the point of diversion of the new withdrawal, or (2) withdraws from a different layer in the Confined Aquifer, as defined in the RGDSS ground water model, than the new withdrawal, is not in a location that will be sufficient to prevent such injury.

b. The historical withdrawals of the vested water right or rights to be changed or permanently retired must be supported by records of totalizing flow meter(s), power records, aerial photographs or other evidence from which the historical withdrawals can be determined.

c. If the point of diversion of the vested water right or rights to be permanently changed or retired is a well that will no longer be used, the well must be plugged and sealed in accordance with the Water Well Construction Rules adopted by the Board of Examiners of Water Well Construction and Pump Installation Contractors before a new well permit will be issued involving any new withdrawal of ground water from the Confined Aquifer.

d. Nothing in this Rule 6.B.2 shall preclude an applicant for a new withdrawal of ground water from the Confined Aquifer from proposing and demonstrating that injury to the vested water rights of others that would be caused by the new withdrawal, including fluctuations in the artesian pressures in the Confined Aquifer that would fall outside the ranges that occurred during the period of 1978 through 2000, can be prevented through recharge or injection of water into the Confined Aquifer System.

3. For any new well to withdraw ground water from the Confined Aquifer System, and if the point of diversion of the vested water right or rights to be changed or permanently retired is a well that will continue to be used, a totalizing flow meter or meters must be properly installed and maintained by the applicant in accordance with the manufacturer's specifications at the applicant's expense, properly calibrated at the applicant's expense, and records of withdrawals from the well(s) must be provided to the State Engineer at least annually. The Division

Engineer must approve totalizing flow meters in advance of their use and shall establish a list of approved meters. The totalizing flow meter(s) must be calibrated at the applicant's expense every four (4) years by a tester certified by the State Engineer; however, the Division Engineer may require the meter(s) to be calibrated more often due to changed circumstances. The State Engineer may approve alternative means of measuring withdrawals if the applicant can establish that the alternative means are at least as accurate as measurement by a totalizing flow meter.

4. A new withdrawal of ground water from the Confined Aquifer System shall not be allowed to cause fluctuations in artesian pressures in the Confined Aquifer to fall outside of the ranges that occurred during the period of 1978 through 2000, and average artesian pressure levels similar to those that occurred in 1978 through 2000 shall be maintained.

5. Because there are only limited times when depletions to the flows of natural streams in the Rio Grande Basin in Water Division 3 will not cause injury to senior appropriators or impair Colorado's ability to meet its interstate compact obligations under the Rio Grande Compact, the applicant must demonstrate that replacement water necessary to meet the lawful requirements of a senior appropriator at the time and location and to the extent the senior would be deprived of his or her lawful entitlement, and to meet Colorado's interstate compact obligations under the Rio Grande Compact, will be available to replace all depletions to the flows of natural streams, including a natural stream defined in section 37-82-101(2) and 37-92-102(1)(b), caused by a new withdrawal of ground water from the Confined Aquifer System.

6. The RGDSS ground water model shall be used by the State Engineer to determine the amount, time, and location of depletions and fluctuations in artesian pressures that would be caused by any new withdrawal of ground water from the Confined Aquifer System. There shall be a rebuttable presumption that the version of the RGDSS ground water model in use at the time an application for a plan for augmentation is filed accurately determines the amount, time, and location of depletions and fluctuations in artesian pressures that would be caused by a new withdrawal of ground water from the Confined Aquifer System.

7. In determining the amount, timing, and location of depletions that would be caused by any new withdrawal of ground water from the Confined Aquifer System, it shall be recognized that unappropriated water is not made available and injury is not prevented as a result of reduction of water consumption by nonirrigated native vegetation. In

particular, the reduction of water consumption resulting from the eradication of phreatophytes or the reduction of water consumption by nonirrigated native vegetation may not be used either: (a) to offset depletions caused by a new withdrawal of ground water from the Confined Aquifer System; or (b) as a source of unappropriated water available for new ground water withdrawals that will affect the rate or direction of movement of water in the Confined Aquifer System.

142. Rule 6.B.5 recognizes that unappropriated water is only very rarely available for diversion in Water Division 3 because of the operation of the Compact and, therefore, the applicant must demonstrate that replacement water will be made available to replace depletions at the proper time and location to prevent injury and to avoid interfering with Colorado's Compact obligations. The State Engineer will use the RGDSS groundwater model to determine the presumptive amount, time, and location of depletions and fluctuations in artesian pressures that would be caused by any new withdrawal. Under this rule an applicant may present additional site-specific information to allow the State Engineer to make a different analysis, consider a different model's results, or to otherwise rebut the results of the RGDSS groundwater model. See generally *Transcript (Simpson) Vol. XVII* at p. 3197 – p. 3209.

143. Mr. Simpson testified that to comply with the requirements of HB 98-1011 and SB 04-222 and to protect existing rights, there must be one-for-one replacement of new withdrawals from the Confined Aquifer System either by retirement of existing uses or by other means. *Transcript (Simpson) Vol. XVII* at p. 3210 – p. 3211. Protestors characterized this as the elimination of any opportunity for new withdrawals supported by a traditional augmentation plan. This provision is discussed below.

144. Chief Deputy State Engineer, Dr. Kenneth Knox, and the State Engineer, Hal Simpson, both explained how the Rules will be applied to a new application. In this process, the State Engineer's Office will, if necessary, first use the RGDSS groundwater model to determine if the proposed withdrawal will affect the rate or direction of movement of water in the Confined Aquifer System. If it does, then the State Engineer's Office will make three additional model runs and compare the results. The State Engineer's Office will use these runs to determine the amount of stream depletions, if any, that must be replaced. The State Engineer's Office will also use a comparison between these runs to determine the effect on artesian pressures and what, if anything, will be required of the applicant to mitigate the changes. See *Transcript (Knox) Vol. XVI* at p. 2950 - 2962, p. 3141, ln. 9 – 24; *Transcript (Simpson) Vol. XVII* at p. 3206 and pp. 3217 – 3218, ln. 13 - 16; State's Exhibit 119a – 119e.

145. The Court finds that the manner in which the State Engineer's Office proposes to use the RGDSS groundwater model to apply the Rules and the Rules themselves are consistent with the intent and purpose of the applicable provisions of HB 98-1011 and SB 04-222. The Court further understands, and the testimony of Mr. Simpson confirms, that the RGDSS groundwater model will be used as one tool available to the State Engineer's Office in evaluating applications subject to the Rules. In this process the State Engineer will consider additional evidence available to the office that will supplement the model's

results. Further, the results of the RGDSS groundwater model establish a rebuttable presumption of what augmentation and other mitigation is required, but those results may be rebutted by other competent evidence provided by the applicant.

146. Protestors' experts described the issues raised by the Rules in a series of questions:

- (a) Is the maintenance of artesian pressure in the confined aquifer between the range that occurred during 1978 to 2000 necessary to prevent injury to vested water rights?
- (b) Is the maintenance of artesian pressure in the confined aquifer between the range that occurred during 1978 to 2000 necessary to sustain the confined aquifer?
- (c) Is one-for-one augmentation necessary to prevent material injury to vested water rights?
- (d) Is one-for-one augmentation necessary to sustain the confined aquifer?
- (e) Is any new withdrawal from the confined aquifer going to affect sustainability of the aquifer regardless of the location, layer, or quantity of that new withdrawal?
- (f) What is the extent of injury, if any, from any new withdrawal from the confined aquifer?
- (g) Does Colorado law treat evaporation and transpiration by non-irrigated native vegetation as a "vested water right" entitled to augmentation if injured?

See generally B. Lytle; Protestors' Exhibit P-1, *Expert Report of Lytle Water Solutions*, October 2005. The constitutional arguments of the Protestors are suggested by these questions. In addition, Protestors challenged the reliability of the RGDSS groundwater model.

147. Before addressing the Protestors' objections to the Rules, the model and the constitutional issues raised, the Court will review the development of the Rio Grande Decision Support System (RGDSS) and the groundwater model which is a part of the RGDSS.