

**BEFORE THE OKLAHOMA WATER RESOURCES BOARD
STATE OF OKLAHOMA**

IN THE MATTER of Determining the Maximum)
Annual Yield for the Arbuckle-Simpson)
Groundwater Basin underlying parts of Murray,)
Pontotoc, Johnston, Garvin, Coal and Carter)
Counties)

**PROTESTANTS' POST-HEARING BRIEF IN OPPOSITION TO
THE ARBUCKLE-SIMPSON TENTATIVE MAXIMUM ANNUAL YIELD/EQUAL
PROPORTIONATE SHARE**

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Protestants Oklahoma Farm Bureau Legal Foundation, Pontotoc County Farm Bureau, Oklahoma Independent Petroleum Association, Environmental Federation of Oklahoma, Oklahoma Aggregates Association and Oklahoma Cattlemen's Association (collectively "Protestants" hereinafter) submit this Post-Hearing Brief. For the reasons discussed below, Protestants submit that the Arbuckle-Simpson Tentative Maximum Annual Yield and Equal Proportionate Share are not based upon sound science, but rather are the result of arbitrary agency decisions and, therefore, they should not be approved. Protestants also join in and urge the adoption of the proposed Findings of Facts and Conclusions of Law submitted by Mr. Michael Wofford on behalf of the Oklahoma Aggregates Association and TXI.

I. Sole Source Aquifer Designation

The sole justification given in S.B. 288 for treating the Arbuckle-Simpson ("A-S") groundwater basin ("aquifer" hereinafter) different from all of the other aquifers in the State is its designation by EPA as a sole source aquifer. The evidence at the hearing (Julie Cunningham testimony; CPASA Ex. 1) confirmed that an EPA sole source aquifer designation means that the aquifer is the sole source of drinking water in the area, that there are no alternative water sources available and that, therefore, it is essential to protect the aquifer from contamination in order to

ensure its availability for **use**. In other words, because a sole source aquifer is the only available groundwater source in the area and, therefore, must be used for drinking water, it is important to protect the groundwater from contamination so that it will always be available for use. The sole source aquifer designation was never intended to restrict the ability to use the groundwater, rather it was intended to do just the opposite.

In *Jacob's Ranch, L.L.C. v. O.W.R.B.*, 2006 OK 34, 148 P.3d 842, 854, the Oklahoma Supreme Court made clear that, under S.B. 288, the maximum annual yield ("MAY") for the A-S was to be set so that it, "ensures the withdrawal of water will not interfere with the in-basin drinking water supply." It is notable that the Court stated in the opinion not once, but three times, that the purpose of the S.B. 288 MAY determination is to ensure use of the groundwater for drinking water.¹ The *Jacob's Ranch* Court went to great lengths to explain that the purpose of S.B. 288 was to ensure that this sole source of water would be available for in-basin use - not to restrict its use:

The in-basin area relies solely on the aquifer for drinking water. The bases for the EPA designation are that the drinking water in the designated sole source aquifer area is provided by the Arbuckle-Simpson aquifer and that there are no existing alternative drinking water sources nor cost-effective sources capable of supplying the drinking water demands for the designated area...We conclude that the classification of groundwater basins by the EPA as "Sole Source Aquifers" is rationally related to the conservation of safe drinking water for use in the overlying area. *Id.* at 853-854 (emphasis added).

The Tentative MAY proposed by the Board does not ensure the use of the sole source groundwater for in-basin use. Instead, it severely limits and practically prohibits the use of this

¹ *Id.*; *Id.* at 854, "we conclude the classification of groundwater basins designated by the EPA as Sole Source Aquifers' is rationally related to the conservation of safe drinking water for use in the overlying are"; *Id.* at 855, "the challenged legislation is to conserve the sole source of safe drinking water for in-basin use until a hydrological study is completed and a maximum annual yield is determined that ensures the withdrawal of water will not interfere with the in-basin drinking water supply. Obviously, § 10 20. 9B was intended to serve that legislative purpose."

sole source of drinking water. The Tentative Order states that there are 11,000,000 acre feet of groundwater currently in storage in the aquifer. To that amount there is added the average annual recharge of 182,288 acre feet, for a total of 11, 182,288 acre feet. However, the proposed MAY is limited to the paltry amount of 78,404 acre feet. This is less than one percent of the amount of available groundwater. It is one-tenth of the 784,040 acre feet that would normally be allowed at 2 acre feet per year. Instead of ensuring the availability of groundwater for use, the proposed MAY essentially eliminates its use. This is contrary to not only the purpose and intent of the sole source designation, but also the purpose of the S.B. 288 MAY determination as stated in *Jacob's Ranch*. The effect of the proposed MAY is to forever condemn the use of 11,000,000 acre feet of groundwater - the only source of drinking water in the area.

The fact that the proposed MAY does not achieve the purpose of ensuring the use for drinking water was amply demonstrated by the evidence submitted by Mr. Dave Roberson on behalf of the Murray County Rural Water District # 1. Mr. Roberson boiled it all down to one sentence - "If our temporary right of withdrawal of 2 acre feet of water per surface acre is reduced to .2 acre feet of water per surface acre (i.e. the proposed MAY) **we will not be able to meet our members needs for water.**" Mr. Roberson went on to explain how the proposed MAY would impose severe hardship upon the Rural Water District, forcing its members to purchase or lease over 2900 acres of land at an estimated minimum cost of \$1,100,000, and to possibly drill new wells costing up to \$2,000,000, simply to provide its members the same amount of water that they currently need and use. These are small plot farmers, ranchers and rural residents who rely upon the rural water district for their survival. To again quote Mr. Roberson, if the proposed MAY is approved, "the very existence of Murray County Rural Water

District # 1 is in doubt." The proposed MAY is contrary to both the purpose of the sole source designation and the Court's ruling in *Jacob's Ranch*.

II. A. Natural Flow

In recommending the proposed MAY to the Board members, the staff advised the Board that the meaning of the term "natural flow", as used in S.B. 288, is unclear and "open for interpretation" (Julie Cunningham PowerPoint, OWRB Ex. 4, and her testimony at the hearing). It was this alleged uncertainty about the meaning of the term "natural flow" which supposedly justified the OWRB staff (sometimes referred to as "Agency" hereinafter) ultimately deciding that "natural flow" means an amount of water that protects fish. The entire premise for the Agency deciding that "natural flow" is all about fish, rather than people, is the remarkable claim that no one at the Agency had a clue what the S.B. 288 term "natural flow" meant.

It was pointed out at the hearing that there are other water statutes which the Board administers every day that also use the identical term "natural flow", for example 60 O.S. § 60. These statutes have been on the books since 1910. Ms. Cunningham testified that she was unaware of any efforts by the OWRB to consult the Board's understanding of the term "natural flow" as used in these other water laws to try to interpret "natural flow" as used in S.B. 288. She was unable to identify any meetings or discussions where this rather simple idea was ever raised or discussed. There is nothing in the record that shows the OWRB ever considered the notion of applying its interpretation of the term "natural flow" as used in the other water laws that it administers to the same term "natural flow" as used in S.B. 288, thus ensuring consistency.

In *Franco-American Charolaise, Ltd. v. OWRB*, 1990 OK 44, 855 P. 2d 568, the meaning of the term "natural flow" as used in 60 O.S. § 60 was at issue, specifically the provision that riparian landowners can use stream water but not prevent the natural flow of springs and streams.

In its opinion, the Court told the OWRB what "natural flow" means, and it was not a flow that protects fish. Rather it is a flow that allows reasonable use by people. It remains a mystery why the Board decided to construct an entirely new and heretofore unknown definition of the term "natural flow" as used in S.B. 288 without consulting or applying this definition of "natural flow". However, the record is clear that the Board failed to do so, instead defining "natural flow" based on fish on the perception that the meaning of the term "natural flow" in S.B. 288 is unclear and open to interpretation.

In choosing to define "natural flow" so as to protect fish, rather than people and their need to use this sole source groundwater, the Board embarked on a course that led it far away from the underlying purpose and intent of S.B. 288. In doing so, the Board "jumped the tracks", if you will, leading it to places the law was never intended to go.

B. Fish Versus People

Based upon its claim that it did not know or understand what the term "natural flow" meant, the OWRB set about to make up a definition. Although the OWRB witnesses all testified that MAY and Equal Proportionate Share ("EPS") are water quantity terms, instead a water quality person, Mr. Derek Smithee, was selected as the OWRB staff member to come up with the definition of "natural flow". Mr. Smithee then hand selected the committee which later came up with the definition of "natural flow" that now forms the basis for the Tentative MAY which, if approved, will severely curtail the landowners' right to use the groundwater underlying their land. Mr. Smithee had complete discretion in selecting the committee members, and it should not go without notice that the committee was heavily composed of fish, wildlife conservation and environmental interest group members. Of the entire 18 person committee, there was only

one landowner member who had input into this critical decision which so greatly impacts the ability of all landowners to use their own groundwater.

Because the term natural flow was supposedly unclear and "open to interpretation", Mr. Smithee's committee felt unconstrained in how it went about defining reduction in natural flow as used in S.B. 288. Mr. Smithee testified and his Ada PowerPoint presentation (OWRB Ex. 9) reflects the number of different ways that the committee considered defining reduction in natural flow. These included: (1) recreation; (2) water supply; (3) fishing; and (4) ecological integrity. The committee's idea was to pick an activity as the criteria to measure natural flow, look at a range of percentage reductions in stream flow, measure the corresponding adverse impact upon the selected criteria, and then decide what level of adverse impact upon the selected criteria was deemed to be acceptable/unacceptable. Again, the committee apparently felt free to select any criteria it wanted to define reduction in natural flow.

The committee ultimately selected "ecological integrity", more specifically the protection of selected fish populations, as the all important criteria by which to define "natural flow". However, as discussed above, the purpose of a sole source aquifer designation is to ensure the use of the water as a drinking water supply, and the *Jacob's Ranch* Court specifically stated that the MAY must ensure - not interfere - with the in-basin drinking water supply. Although the Smithee committee considered "water supply" as one of the possible ways in which to define natural flow, inexplicably and arbitrarily it chose to reject water supply as the criteria to measure reduction in natural flow. This is where the train first "jumped the tracks", and so began its long and irreversible course away from the underlying purpose and intent of the sole source aquifer designation and the MAY described in *Jacob's Ranch*. It is why the tentative MAY condemns the use of groundwater for water supply in preference to fish population. There is nothing in the

language of S.B. 288 which remotely suggests that the right of landowners to use their own groundwater was to be defined and determined by fish. The Smithee committee's determination of the meaning of the term "natural flow" also constituted agency rulemaking which did not comply with the APA rulemaking requirements.

III. A. Science Versus Arbitrary Agency Decisions

The Tentative MAY has been touted by its supporters as being based upon sound science. Ms. Julie Cunningham testified that, in recommending the proposed MAY to the Board members and seeking their approval of same, staff represented that the MAY is based upon science, which she testified was good science. Certainly the image that the OWRB has portrayed to the public is that the MAY is based strictly upon good science.

The mantra that the proposed MAY is the result of a 5 year/\$5 million study has oft been repeated as if this by itself proves that the MAY is based upon good science. Similarly, the statement that this is the most extensive aquifer study in state history has been bandied about as if this somehow proves the MAY is based upon good science. But merely stating that a lot of time and money was spent does not prove anything with regard to the legitimacy of the science underlying the MAY.

Pursuant to 82 O.S. § 1020.6, this is an individual proceeding under the APA. The OWRB had the burden of proving by substantial evidence that the proposed MAY is supported by good science and is not the result of arbitrary agency decision. This it failed to do. Notably, the only witness the OWRB called in its case-in-chief to support the MAY was Ms. Julie Cunningham. She admitted she was not a scientist and, therefore, she was unable to answer any questions regarding the underlying science. Because of this, the Protestants demurred to the OWRB's evidence. The OWRB failed to meet its burden of proof.

One of the basic principles of science and the scientific method is transparency. Included within this concept is the requirement that the data and methodology be fully documented, archived and made available for public review and scrutiny. Without documenting the data and methodology and making them available for review and scrutiny, as a practical matter it is impossible for other scientists or parties to verify and reproduce the alleged "scientific" results. As was shown by the evidence at the hearing, the A-S study failed to satisfy this scientific requirement.

At many junctures in the process of ultimately determining the MAY, there were decisions and determinations that were made by the OWRB and which were critical to the MAY determination which were not documented, which cannot now be explained by the OWRB, and which accordingly prevent others such as protestants from looking behind the alleged "science". Because these decisions cannot be documented or explained, they represent "arbitrary" decisions by the OWRB. This by itself disqualifies the MAY as being based upon "science". Moreover, the evidence at the hearing showed that, with regard to the "science" that was documented and made available to the public, there were serious mistakes, flaws and errors made which disqualify the use of such "science" to support the MAY. This was particularly true with respect to the computer model results.

The bottom line is that, not only did the OWRB fail to satisfy its burden to prove that the proposed MAY is based upon good science, but the evidence that was presented affirmatively proved that the proposed MAY is based upon arbitrary agency decision and not sound science.

B. The Amount of Water in Storage

In her presentation to the Board recommending that it adopt the Tentative MAY, Ms. Cunningham explained to the Board that one of the critical determinations it must make in

deciding the MAY is the amount of aquifer water in storage. OWRB Ex. 4. This requirement comes straight from the MAY statute, 82. O.S. § 1020.5, and is an essential finding to every MAY determination.

As was explained by Mr. Scott Christianson in his testimony and in the A-S study report (OWRB Ex. 1), only the eastern portion of the A-S aquifer was studied and modeled. Because of this, in the study report, only the volume of water in storage in the eastern portion of the A-S aquifer was quantified, determining that there is 7,111,000 acre-feet in storage in the eastern portion. However, in her presentation to the Board seeking its approval of the proposed MAY, Ms. Cunningham represented to the Board that there is 9,403,461 acre-feet in storage throughout the entire aquifer, inclusive of the central and western portions. This amount in storage was consistent with the report (OKAA Ex. 2) submitted by Dr. Kyle Murray (hydrologist for the Oklahoma Geological Survey ("OGS")), which showed the exact same number of 9,403,461 acre-feet in storage. However, the Tentative MAY Order states that there is "about 11,000,000" acre-feet in storage, a difference of 1,596,539 acre-feet.

It is noteworthy that, when Ms. Cunningham made the representation to the Board on February 13, 2012, that there was 9,403,461 acre-feet in storage, the A-S study had been completed for over 3 years. There certainly had been more than ample time to make this critical determination of water in storage. When asked why the amount of A-S water in storage drastically changed from 9,403,461 acre-feet in February to 11,000,000 acre-feet in March 2012, Ms. Cunningham simply stated that certain corrections were made and that the scientists would have to explain the change. However, she was not aware of any studies, reports or documents which explain the basis for this significant change at the twelfth hour, and certainly none were

produced by the OWRB at the hearing nor was any testimony given by the OWRB to explain this significant discrepancy.

Once again, it is not science to make a significant change to a scientific finding at the last hour without providing any explanation or justification for such change. Why after 5 years of study the OWRB thought there was 9.4 million acre-feet in storage in February of this year, but found there is 11 million acre-feet in storage one month later remains unexplained. Even when the issue was brought to the OWRB's attention at the hearing, the OWRB declined to offer any explanation. This is not science - it is not transparent - rather it is evidence of an arbitrary agency determination. If the OWRB can simply make unilateral changes and determinations like this without explanation, it certainly cannot be said that the proposed MAY is based on good science.

C. Fish Population Versus Fish Habitat

In his testimony at the hearing, Mr. Smithee explained how 4 different fishes were selected as the criteria to define "natural flow" and to measure reductions in natural flow. This was also explained in Mr. Smithee's Ada PowerPoint (OWRB Ex. 9) and in Ms. Cunningham's PowerPoint presentation to the Board members (OWRB Ex. 4). As Mr. Smithee explained, the specific fish were selected because they were the "most sensitive" to reductions in stream flow. By doing this, the process began as one which would ensure the least amount of groundwater withdrawal possible, rather than ensure the use of the sole source groundwater for water supply. This was done even though none of the 4 fish are endangered or threatened species.

Mr. Smithee testified that the purpose of selecting fish as the criteria was to protect **fish population**. Next an Instream Flow Assessment ("ISA") was performed to determine the effect of reductions in stream flow on the 4 fish in question. However, rather than study and measure

the effect of flow reductions on the fish population itself, which was the thing desired to be protected, instead the study measured the impact of reduced flows on the fish habitat. Mr. Smithee testified that a study could have been done to measure the direct impact of reduced flows on the fish population itself, however, this was not done.

It might be acceptable to use the fish habitat study as a proxy to measure the fish population if the correlation between fish habitat and fish population was known. However, both the ISA itself and Mr. Smithee candidly conceded that the correlation between reductions in fish habitat and fish population is unknown. Therefore, Mr. Smithee could not say whether setting a maximum annual yield that would result in, say, a 10% reduction in the habitat of the orange throat darter, would result in a reduction of one fish or one thousand fish. In other words, it is impossible to use the fish habitat information to accurately predict the impact upon the fish population itself.

Mr. Smithee explained, as does the ISA, that the fish have various adaptive mechanisms that allow them to survive and prosper even when their habitat is reduced. For example, several of the spring fed streams in question periodically dry up, and when this occurs the fish retreat to the rivers. Moreover, the habitat for some of the 4 fishes actually improves with reduced flows, allowing for the opportunity for increased fish population during reduced flows. For these many reasons, it is impossible to use changes in fish habitat as an accurate predictor of fish population.

Because, as Mr. Smithee admitted, the underlying intent of his committee was to help set a MAY that would protect fish population - not fish habitat - it was improper for the committee to ultimately base its recommendations strictly on a fish habitat study, especially when it was acknowledged that a fish population study could have been performed. Because it was candidly admitted that the correlation between reductions in fish habitat and fish population is not known,

it makes no sense to base the very important decision of how much of their own groundwater that landowners will be allowed to use based upon a criteria, i.e. fish habitat, which does not even measure the very thing the committee sought to protect, i.e. fish population. Once again the track is jumped, and science is supplanted by an arbitrary agency decision.

**D. The Proposed MAY Is Not Based
Upon The Criteria Proposed By Smithee's Committee**

To understand how horribly the "science" got off track, one must first understand the scientific methodology which was supposed to underlie the proposed MAY. The "science" was supposed to be as follows:

- (1) Derek Smithee's committee selected 4 fish as the criteria to define and measure reduction in stream flow;
- (2) The ISA was then supposed to identify and associate various levels of reduction in stream flow to the corresponding reductions in fish habitat;
- (3) Smithee's committee was then to pick the maximum reduction in fish habitat it determined was acceptable, which would then (per the ISA) serve to determine the corresponding maximum acceptable reduction in stream flow;
- (4) This maximum acceptable reduction in stream flow was to be communicated to the computer modeler (Scott Christianson), who was then to run the model to determine the amount of groundwater that could be withdrawn without reducing the stream flow by more than the maximum acceptable reduction in stream flow as determined by Smithee's committee; and, lastly
- (5) The proposed MAY was supposed to be based upon this "scientifically" derived number.

Although this is the scientific method which has been portrayed to the public and upon which the claim has been made that the proposed MAY is based upon good science, as the evidence at the hearing demonstrated, this is not what actually happened. As previously mentioned, the intent of Smithee's committee was to protect fish population - not fish habitat - but the study only looked at fish habitat. Because it was admitted that no one knows the

correlation between fish habitat and fish population, the study got off to a bad start. After 5 years and \$5 million, no one knows what protection, if any, the ultra-restrictive .2 acre-feet will provide to the 4 fish. But, as shown below, this is not the only place where the study veered off track. There were several subsequent junctures in the study where arbitrary rather than scientific determinations were made such that, at the end of the day, it is impossible to say that the proposed MAY achieves the result it was intended to achieve.

i. Different Stream Flow Criteria to Measure Impact on Fish

In order to fully appreciate how badly the scientific method got off track, it is also necessary to understand that there are different ways to measure and express stream flow. The ISA looked at stream flow over a specific time frame which was expressed as the "baseline". The ISA then looked at three different flow regimes during the baseline - seasonal flows which it expressed as "Baseline Low Flow", and "Baseline High Flow", and an average flow referred to as "Baseline Annual Average Flow". The ISA then looked at the impact upon fish habitat as these 3 different flow regimes were reduced. It is important to remember that these are completely different flow regimes and that, therefore, the impact upon fish habitat will be drastically different depending upon which of the 3 flow regimes is selected as the determinative criteria. For example, the ISA reflects that, for Blue River, a 20% reduction in the Baseline Low Flow resulted in a 0.3% reduction in least darter habitat, whereas a 20% reduction in the Baseline Average Annual Flow resulted in a 2.7% increase in least darter habitat, and whereas a 20% reduction in Baseline High Flow resulted in a 7.2% increase in least darter habitat. OWRB Ex. 1, Table 9 at p.30. And the results varied, sometimes the Baseline Low Flow resulted in the most reduction in fish habitat and sometimes the other flow regimes did. E.g., OWRB Ex. 1, Table 8,

p.29, 50% baseline flow reduction for the orange throat darter. Bottom line - it matters what stream flow regime you look at when predicting impact on fish habitat.

However, there are also other ways to measure and express stream flow regimes. One way is to take stream flow measurements over a longer period of time, say 5 years, and then average the measurements to come up with the "average flow" over the 5 year period, referred to as the "5 Year Average Flow". Yet another way would be to identify a stream flow rate which exceeds the average flow rate a certain percentage of time over the measured time period. If the selected percentage was 75%, this would be referred to as the "75th Percentile Flow". Again, each of these flow regimes is different and unique. Therefore, the impact upon fish habitat caused by reductions in one stream flow regime does not predict the impact upon fish habitat from the reduction in a different stream flow regime. The ISA clearly demonstrates this principle.

ii. Baseline Low Flow Versus 75th Percentile Flow

Mr. Smithee made clear that, of the 3 different flow regimes studied and reported in the ISA, his committee selected "Baseline Low Flow" as the flow regime to analyze the impact on fish habitat and ultimately in making its recommendation that stream flow not be reduced by more than 25%. One can easily look at the ISA and determine what a 25% reduction in "Baseline Low Flow" means in terms of reduction in fish habitat. OWRB Ex.1, Tables 6-9 at pp.27-30. And had the model been run on the same flow regime that Mr. Smithee's committee selected to evaluate impact on fish habitat, i.e. "Baseline Low Flow", then there might be some validity to the scientific method employed. As we shall see, the flow regime upon which Smithee's committee made its 25% recommendation is not the same flow regime that was modeled, nor is it the flow regime upon which the proposed MAY is now based. As a result, no

one has any idea what the proposed MAY means in terms of protection to fish habitat, because it is impossible to correlate the modeled results back to the ISA fish habitat results.

Even though the Smithee committee clearly based its 25% reduction criteria on the ISA Baseline Low Flow regime, for some unexplained reason, the committee chose to advise the computer modeler, Mr. Christianson, to model the results of a 25% reduction in the 75th Percentile Flow - not the Baseline Low Flow upon which the committee based its recommendation. Mr. Smithee acknowledged that, in order to attempt to compare and correlate reductions in the 75th Percentile Flow back to flow regimes used in the ISA to determine the impact on fish habitat, it is necessary to make a conversion from the 75th Percentile flow to Baseline Low Flow. Although Mr. Smithee said his committee attempted to make such a conversion, he could not explain how it did it, he could not provide the conversion factor, and he acknowledged that there are no reports, studies or other documents which explain how the conversion was made. Bottom line - no one can explain what a 25% reduction in 75th Percentile Flow means in terms of reduction in fish habitat, because the ISA report did not study the affect of 75th Percentile flow on fish habitat. Therefore, no one can explain what level of protection to fish population or fish habitat is afforded by the specific criteria which Mr. Smithee's committee asked the computer modeler to model. This, by itself was a critical flaw in the science but, as explained below, it was compounded exponentially when the computer model looked at yet a completely different flow regime - 5 Year Average Flow - the flow regime upon which the proposed MAY is now based.

iii. 75th Percentile Flow Versus 5 Year Average Flow

Contrary to Mr. Smithee's testimony, Mr. Christianson testified that the Smithee committee (of which Mr. Christianson was a member) did not ask Mr. Christianson to model the

75th Percentile Flow. Instead Mr. Christianson testified that he was asked to model the impact of groundwater withdrawal upon the 5 Year Average Flow as reflected in the study report (OWRB Ex. 1). Mr. Christianson's testimony was contradicted by Protestants' Ex. 13, which was an email from Derek Smithee to the committee, including Scott Christianson, advising that it was the 75th Percentile Flow that the committee instructed Mr. Christianson to model.

Of course, the 5 Year Average Flow that Mr. Christianson modeled is not the stream flow regime that was evaluated in the ISA Report, therefore, it is not the stream flow regime upon which Smithee's committee made its recommendation to protect fish. No one knows or can say what impact reductions in the 5 Year Average Flow will have on fish population or fish habitat, as there is no study or other document that has ever correlated the relationship between the two. The ISA made no such correlation.

It was the modeled results of the 5 Year Average Flow, not the 75th Percentile Flow, that ultimately formed the basis for the MAY now proposed. There is no report, study, or other scientific document which identifies or explains how restricting groundwater withdrawal so as not to reduce the 5 Year Average Flow by more than 25% will impact fish population or habitat. The relationship between 5 Year Average Flow and fish population/fish habitat has never been studied or determined.

iv. The OWRB Ignored The Model Results

Even though the model was fraught with all of the problems described above, namely that it did not model the stream flow regime that correlated with the fish habitat study and the Smithee committee recommendation, ultimately the computer model generated an answer - that restricting groundwater withdrawal to approximately .125 acre-feet equal proportionate share (EPS") correlated to a 25% reduction in the 5 Year Average Flow (again, not the 75th Percentile

Flow). However, the OWRB ignored its own "science", rejecting the model results and instead adopting the .2 acre-feet now proposed. This, again, is a perfect example of how the proposed MAY and EPS are not based upon science, but are rather a culmination of numerous arbitrary decisions by the OWRB.

The only faint explanation given by the OWRB to attempt to justify its ignoring the computer model results was contained in Ms. Cunningham's PowerPoint presentation to the Board (OWRB Ex. 4). In this presentation, Ms. Cunningham advised the Board that, "considering model variability, conservative assumptions", and concerns about reasonable use, "staff concludes that simulated pumping of all lands with an EPS of 0.20 af/a/yr (2.4 in.) will not reduce base flow by 75%." However, when asked about the specifics regarding the alleged model variability, conservative assumptions and other parameters which supposedly justified changing the model results, and exactly how the adjustments were made, Ms. Cunningham testified that those were scientific questions that would have to be addressed by the scientists. She admitted that there are no studies, reports or other documents which explain how the adjustment from the model result to the .2 acre-feet EPS was actually made, or which otherwise show the alleged "science" behind the changes made to the model results. Although several of the scientists who participated in the A-S study testified at the hearing, the OWRB never produced any testimony or evidence which explained how or why the adjustments were made to the model results. As such, the proposed MAY stands as an unsupported and arbitrary decision by the Agency.

Most importantly, because the model results were based upon the 5 Year Average Flow instead of the Baseline Low Flow addressed in the ISA Report, and because the OWRB then tinkered with the model results in deciding upon the proposed .2 acre-feet EPS, it is impossible

to know what level of protection the .2 acre-feet provides to the very thing sought to be protected, that is, the fish population or fish habitat. No one can correlate the .2 acre-feet EPS to reduction in fish population or habitat because the model and the ISA Report are based upon entirely different flow regimes. This problem was compounded when the OWRB tinkered with the model results without showing its work, making it now completely impossible to correlate the proposed MAY back to the fish habitat study.

The bottom line is that this entire "science" project was premised upon the notion of protecting fish population or fish habitat. However, at the end of the study, no one has shown, because they cannot, whether the proposed severe restriction upon landowners' right to use groundwater will save one fish, one hundred fish or one thousand fish, and whether the severe restriction on groundwater use will protect one percent of the fish habitat, ten percent or fifty percent. As shown above, having jumped the tracks at several junctures, the flow regime that was modeled and upon which the proposed MAY is now based is different from the flow regime studied in the ISA and upon which Mr. Smithee's committee made its recommendation. Therefore, it is now impossible to ascertain what level of protection the proposed MAY provides to fish population or fish habitat. As such, the proposed MAY is arbitrary, and could just as easily have been plucked from thin air without any ISA study, computer modeling or "science". When it comes to the very important issue of determining landowners' right to use their own groundwater, this is not good science.

IV. Major Modeling Mistakes

In his public presentation made in Ada on August 18, 2009, Mr. Christianson explained the importance of aquifer storage coefficient in predicting groundwater level drawdown from pumping and hence impact upon springs and streams. OWRB Ex. 10. In a very short series of

slides in his PowerPoint presentation, Mr. Christianson explained that there are different types of aquifer rocks, that each has its own unique storage coefficient, and that drawing down the water level one foot from an aquifer with the higher storage coefficient of 0.2 would result in the production of 1.5 gallons of water, whereas the same one foot drawdown from an aquifer with the lower storage coefficient of 0.008 would only produce one cup of water. *Id.* This is because there is more water in storage in each foot of rock in the aquifer with the higher storage coefficient.

The culmination of Mr. Christianson's public presentation regarding the importance of storage coefficient was demonstrated by the PowerPoint slide which is attached hereto as Exhibit "A" (which is a slide from OWRB Ex. 10). In this slide, Mr. Christianson demonstrates that the removal of one foot of groundwater from an aquifer with the higher storage coefficient of 0.2 will only draw the water level down five feet, whereas the removal of one foot of water from an aquifer with the lower storage coefficient of 0.008 results in 125 feet of drawdown. Mr. Christianson's slide demonstrates the impact of these two different drawdowns on the related streams, with the 125 foot drawdown from the aquifer with the 0.008 storage coefficient obviously having a greater impact upon streams than the 5 foot drawdown associated with the aquifer with the higher storage coefficient of 0.2. The point is that the aquifer storage coefficient matters - it is critical in predicting drawdown and the impact upon associated springs and streams. Shockingly, Mr. Christianson testified at the hearing that he did not remember what he was trying to show the public with this slide.

At the hearing, there were seven hydrologists who testified: Jennifer Back (NPS); Peter Burke (USFW); Dr. Kyle Murray (OGS); Scott Christianson (USGS); Dr. Eileen Poeter (independent); Dr. Blaine Reely (independent); and Noel Osborn (USGS - formerly OWRB).

All of these hydrologists acknowledged and agreed that there is an unconfined A-S zone that feeds the associated streams, and this means that the storage coefficient for this unconfined zone should be at least ten times greater than the storage coefficient for the confined portion of the A-S. Simple translation - when we are looking at the drawdown effect from pumping one foot of groundwater and the corresponding impact upon springs and streams, we must remember that this unconfined layer exists and that it readily gives up water without much corresponding drawdown.

The Tentative MAY recognizes that there are 3 distinct rock groups associated with the A-S, namely the Simpson Group, the Arbuckle Group and the Timbered Hills Group. The A-S study report (OWRB Ex. 1) acknowledges that the A-S aquifer is comprised of an unconfined zone, a semi-confined zone, and a confined zone, meaning the zones will have different storage coefficients.

In his computer model, Mr. Christianson used the same storage coefficient - 0.008 - for all zones and portions of the A-S, both the confined, semi-confined and unconfined zones. He did not differentiate storage coefficients between the admittedly different rocks and layers. The storage coefficient which he used was only potentially representative of the confined and semi-confined portions of the aquifer. This is demonstrated by the report prepared by Dr. Rahi and Dr. Halihan. CPASA Ex. 21 As part of the A-S study, these scientists were commissioned to determine the hydraulic properties of the A-S aquifer, including storage coefficient. Their report makes clear that the 0.008 storage coefficient value that Mr. Christianson used in his report is strictly associated with the confined and semi-confined portions of the aquifer - not the unconfined portion. In fact, the Rahi/Halihan report determined that the average storage coefficient for the entire confined/semi-confined portion of the aquifer was 0.011, which is 30%

greater than the 0.008 storage coefficient that Mr. Christianson used in the model. Had this value been used in the model, the model would have shown that more groundwater could be pumped with less impact on the springs and streams. Instead, Mr. Christianson used the lower storage coefficient value of 0.008, which guaranteed a model result that predicted a greater adverse impact on springs and streams. As Dr. Poeter explained, the presence of this unconfined zone serves to dampen or lessen the impact on springs and streams from pumping groundwater and, therefore, it is critical to account for this unconfined zone in the computer model. This was not done.

Dr. Eileen Poeter is a nationally and internationally recognized hydrologist and groundwater modeler. She was named Darcy Lecturer by the National Groundwater Association ("NGA") for 2006. Each year a panel of scientists from the 70,000 member NGA selects one groundwater professional to lecture on some aspect of groundwater science. As Dr. Poeter testified, she traveled around the world in 2006 lecturing on her specialty - groundwater modeling. There have been 26 Darcy Lectures since the series began. Dr. Poeter is a former professor at the Colorado School of Mines and past director of the International Ground Water Modeling Center. Of interest, she taught groundwater modeling and/or hydrology to two of the other hydrologists who testified at the hearing, Ms. Jennifer Back and Dr. Kyle Murray. Dr. Poeter's credentials are beyond reproach.

As Dr. Poeter testified at the hearing, Mr. Christianson failed to include the unconfined portion of the A-S in his model. *See* Dr. Poeter's PowerPoint presentation, Protestants' Ex. 10. Instead, he treated the unconfined zone as a confined zone. Dr. Poeter testified that this was acceptable, but only if two things were done. First, the zone should be assigned the proper storage coefficient for the unconfined zone, which all of the hydrologists recognized should be at

least ten times higher than the storage coefficient for the confined zone. Mr. Christianson failed to do this, instead assigning the unconfined zone the same and much smaller coefficient of the confined zone. Second, if you are going to model an unconfined zone as a confined one, the storage coefficient for the unconfined zone must be divided by the thickness of the unconfined zone, not the thickness of the entire aquifer, and the resulting value utilized in the model for the unconfined zone. Mr. Christianson failed to do this as well, resulting in a significant error in the modeling results.

The first modeling mistake was the failure to use the proper storage coefficient for the unconfined zone. Dr. Poeter re-ran Mr. Christianson's exact computer model (which she downloaded from the USGS Water Science Center website) but used an actual storage coefficient value for the unconfined zone. Out of all of the wells tested, there was only one well, Well No. 85182, that was completed exclusively in the unconfined zone. The depth of this well was 53 feet, which corresponds to the unconfined zone utilized in the model which had a thickness of 65.6 feet. The storage coefficient for the unconfined zone as measured in Well No. 85182 was 0.07475 which, as all of the hydrologists predicted, was approximately ten times higher than the 0.008 storage coefficient for the confined zone. When Dr. Poeter properly accounted for this unconfined zone, the model predicted that the impact on stream flow from groundwater pumping was five times (500 percent) less than what the model predicted when the unconfined zone was treated as a confined zone (as Mr. Christianson did). *Id.*

Stated differently, when the unconfined zone was improperly treated as a confined zone, as Mr. Christianson did, the model predicted that groundwater pumping would reduce the stream flow to 2.5 cubic feet per second. *Id.* However, when the unconfined zone was properly treated as an unconfined zone, as Dr. Poeter did, the model predicted that groundwater pumping would

only reduce the stream flow to 13.2 cubic feet per second. *Id.* This is over a five-fold or 500 percent difference. This demonstrates that, when the unconfined zone is properly accounted for in the model, much more groundwater withdrawal can be permitted with much less adverse impact upon springs and streams. It is highly suggestive that the proposed MAY would be much higher, possibly 5 times higher, if the model had been properly run.

Dr. Poeter explained why the unconfined zone is so important in predicting the impact of groundwater withdrawal on springs and streams. *Id.* As Mr. Christianson's PowerPoint so clearly demonstrates, an aquifer with a smaller storage coefficient will result in a larger drawdown in the water level for every foot of water withdrawn, hence a bigger adverse impact upon springs and streams. Thus, using only the lower 0.008 storage coefficient representative of the confined lower portion of the A-S aquifer, as Mr. Christianson did, the model will predict a much larger water level drawdown and, therefore, more adverse impact upon springs and streams. As Mr. Christianson's PowerPoint showed, with a 0.008 storage coefficient, a foot of water withdrawal will draw down the water level by 125 feet.

However, where, as here, the upper portion of the aquifer is unconfined, as water is withdrawn the unconfined zone gives up a huge amount of water which much less draw down in the water level as would result from pumping a confined aquifer. Dr. Poeter explained that the reason for this is the different mechanisms for producing water from unconfined and confined zones. When the water level is drawn down in an unconfined zone, the water freely drains from the pore space, meaning it gives up a lot of water with less drawdown in the water level. This is not the case with the confined portion of the aquifer in which the water does not drain from the pore space, rather a small amount of water is released as a result of the pressure differential caused by the pumping. In layman's terms, small amounts of water are squeezed out of the

confined portion of the aquifer, whereas the unconfined zone gives up a large amount of water freely with much less comparable drawdown. Dr. Poeter testified that, when properly accounted for, the presence of the unconfined zone dampens the water level drawdown predicted by the computer model, meaning the unconfined zone lessens drawdown from the confined zone and, therefore, lessens the predicted adverse impact on springs and streams. Mr. Christianson failed to account for this unconfined zone, which again, all seven of the hydrologists, including Mr. Christianson, agreed was present in the A-S.

Mr. Christianson testified that he ran a number of model simulations in which he used different storage coefficients and that this allegedly did not make any difference in the model results. When asked if he had made such information publicly available, Mr. Christianson testified that he had not - that the results were sitting at home on his computer hard drive. This is hardly consistent with transparency and the scientific method, where results are made publicly available so they can be subjected to scientific review and scrutiny. Moreover, his testimony that using different storage coefficients did not matter was belied by Dr. Poeter's model results, and she did bring her model simulation results to the hearing for public scrutiny (Protestants' Ex. 11). Mr. Christianson's allegation that differences in storage coefficient do not affect the model results must be rejected as he failed to provide any backup information to support such contention.

The second mistake that was made, as identified by Dr. Poeter, was that Mr. Christianson failed to divide the storage coefficient of the unconfined zone by the thickness of the unconfined zone. As Dr. Poeter testified, this resulted in a specific storage value for the unconfined zone being input into the model that was fifty times different than what it should have been. While it is not known what effect this error had on the model result, as Dr. Poeter did not run a model

stimulation with the corrected value, it is clearly a substantial mistake which should be corrected before making the important decision of severely restricting landowners' right to use their own groundwater.

Dr. Poeter summarized her opinions about the model as follows:

The model is not ready for use in making policy decisions.

There are simply too many significant errors that need to be corrected. And there is no legitimate reason why the OWRB should be opposed to making such corrections. Rather than defending a flawed model and severely restricting landowners' rights based thereon, the OWRB should welcome the opportunity to correct these errors. It is insufficient, as CPASA and others have attempted to do, to justify the model as the "best science we have" when it is known to contain serious errors that can be corrected.

**V. The Tentative MAY Improperly Applies
The Model Results Applicable Only To The Eastern
Portion To The Entire Aquifer**

Pursuant to 82 O.S. § 1020.4 where, as here, the OWRB is proposing a MAY on a basin-wide basis, the OWRB is required to make a hydrologic investigation of the entire basin. In spite of this, when it came to the important computer modeling which ultimately formed the basis for the OWRB's proposed MAY, the OWRB did not examine the entire basin. Instead it only modeled one of the 3 major portions of the basin - the eastern portion - and then improperly applied the model results to the entire basin.

The hearing testimony of Dr. Kyle Murray (OGS), as did his report (OKAA Ex. 2), challenged the reasonableness of applying the monitoring and modeling data from the eastern portion only to the entire aquifer. Dr. Murray pointed out that the monitoring and modeling of the eastern portion only does not constitute a basin-wide study. He noted the "hydrologic conditions in the western and central segments were not monitored or modeled prior to proposing

the MAY or EPS." OKAA Ex. 2 at p. 7. Therefore, he questioned the appropriateness of applying the study results of the eastern portion to the central and western portions.

Dr. Murray observed that, "it is imperative to base regulation on thorough scientific studies." *Id.* at p. 7. Because the central and western portions of the aquifer were not thoroughly studied or modeled, Dr. Murray concluded,

Because of the far reaching impacts of the proposed and developing regulation on the citizens, municipalities, and industry in Oklahoma, it is imperative to extend the ASMS and fill existing gaps in our understanding of the Arbuckle-Simpson Groundwater Basin prior to establishing regulatory mandates. *Id.* (emphasis added)

Dr. Murray's testimony and report make clear that the proposed MAY is not the result of sound science.

Dr. Murray is an independent scientist who was not hired or solicited by any of the Protestants. Dr. Murray is the only hydrogeologist on staff at the OGS, and his emphasis is "water studies". Therefore his opinions should not be lightly discounted.

Casting an unfortunate pale upon the entire process, and contrary to openness and transparency, it now appears that political pressure was brought to bear on Dr. Murray to attempt to silence his views. Because of this it became necessary for Protestants to subpoena Dr. Murray to testify at the hearing, rather than him voluntarily attending as he originally indicated he wanted to do. Nevertheless, Dr. Murray's boss, Dr. Randy Keller, who is the Director of the OGS, testified that he is supportive of Dr. Murray and his views, including his proposal that additional study is necessary before the MAY is established.

Dr. Poeter testified that it is not reasonable to apply the modeled results on the eastern portion of the aquifer to the central and western parts of the aquifer. As she explained, there are significant differences between the eastern, central and western portions of the aquifer which

make it unreasonable to conclude that the impact from groundwater pumping on the springs and streams in the eastern portion is representative of the impact on springs and streams in the other two portions of the aquifer.

The eastern portion is predominated by 5 major streams which traverse major portions of that outcrop. However, the western portion only has one major stream (Honey Creek) which traverses a much more limited portion of that outcrop. Similarly, the central portion only has one major stream (Oil Creek) which traverses a somewhat limited portion of that outcrop (with the exception of Mill Creek which barely traverses the southern tip of the central outcrop). Because of the number of streams associated with the eastern part, it is expected that groundwater pumping would have a greater impact on the springs and streams. This is not true with regard to the central and western parts.

There was also evidence presented at the hearing that showed that the composition of the 3 major rock groups (Simpson Group, Arbuckle Group and Timbered Hills Group) is significantly different between the 3 portions of the aquifer, both in terms of the percentage of each rock group present and the amount of each rock group that outcrops at the surface. As such, there is no scientific basis to say that the modeled impact of groundwater withdrawal on springs and streams in the eastern portion is representative of the impact of groundwater withdrawal on the springs and streams in the other two parts of the aquifer.

The evidence at the hearing also showed that, in the past, where the OWRB has been confronted with several distinct major parts of the same aquifer, it has treated each part as a separate sub-basin and established separate MAY's for each sub-basin. This ensures that each portion of the aquifer is treated fairly in terms of the amount of groundwater that can be withdrawn based upon the facts and science applicable to each separate part. This was not done

here. Instead it was assumed that the modeled result for the eastern part would automatically apply to the central and western parts with no science to prove same. This is not fair to the landowners in the central and western parts of the aquifer, who likely could withdraw more groundwater without impacting the very limited streams in those areas if the required basin-wide study was actually performed.

VI. The Proposed MAY Constitutes An Unconstitutional Taking Without Compensation

Several of the OWRB witnesses who testified at the hearing stated that the term "natural flow" means spring and stream flow which has not been impacted by manmade activities (Smithee; Osborn). In other words, according to these witnesses, "natural flow" means the flow of the springs and streams as it would occur in nature without any anthropogenic impact. Had the OWRB simply accepted this apparently ordinary and common meaning of the term "natural flow", everyone seems to agree that this would mean that the landowners would not be able to take or use any groundwater. If this were the interpretation, it is clear that S.B. 288 would constitute an impermissible taking without compensation, in which event it would clearly be unconstitutional.

Apparently to avoid this result, as we have seen, the OWRB decided that "natural flow" could not be given the ordinary meaning. Nevertheless, the result obtained by the OWRB's effort to redefine the term is still tantamount to a taking without compensation, as the MAY is so small that the irrigation farmers (Sparks), Rural Water Districts and other landowners all testified that it is too small to support their beneficial uses. However, now the MAY is defended as a constitutional "reasonable regulation" rather than a taking, as the right to take groundwater was not completely eliminated. However, as explained below, it still constitutes an unconstitutional taking without compensation.

As interpreted by the OWRB, S.B. 288 and the proposed MAY severely restricts the landowners' right to take their groundwater in order to ensure that such groundwater will continue to feed the springs and streams. Under 60 O.S. § 60, stream flow is clearly public water, with the state then having the right to decide who can withdraw and use such water under the stream water appropriation process. Thus, S.B. 288 takes private groundwater for public use. Pursuant to the Oklahoma Supreme Court's decision in *Franco-American, supra*, this constitutes an unconstitutional taking without compensation.

At issue in *Franco-American* was the amendment to 60 O.S. § 60 which purported to limit a riparian owner's right to use stream water to domestic use only, and requiring the riparian owner to obtain an appropriation permit from the state for all other uses. The *Franco-American* Court held that under long-existing state law the riparian owner had a vested right to make reasonable use of the stream water, and that such reasonable use was not restricted to domestic use. While the court acknowledged that the riparian owner's right to use stream water was subject to reasonable regulation under the state's police power, and that reasonable regulation does not constitute an unconstitutional taking without compensation, the Court observed that the effect of restricting the riparian owner's right to use the stream water was to take such water for public use. That is to say that the water the riparian owner was no longer permitted to take then became public stream water available for public use. It was this conversion of the private water to public water that rendered the statute unconstitutional. This holding has equal application here.

The fact that groundwater rights are being severely restricted in order to protect stream water use was made abundantly clear at the hearing. The NPS wants the ground water to flow in the streams to facilitate its park activities and services. The USFW wants the groundwater in the

streams to operate its downstream fish hatchery. CPASA's President, Ms. Amy Ford, wants the groundwater in the streams so she can use it at her downstream ranch near Durant which is outside the A-S basin by some 50 miles. As she testified, every downstream riparian owner to the Gulf of Mexico that uses stream water has an interest in limiting the use of A-S groundwater.

Interestingly, Christopher Patton, Manager of the Tishomingo National Wildlife Refuge, testified that the Refuge has now applied for a stream water permit to appropriate all of the remaining appropriatable water in Pennington Creek, which he said was 11,000 acre-feet, so that the water will be available for the Refuge. Thus, it is clear that everyone wants to restrict the landowners' right to use groundwater so that they can take the same water as public stream water for their downstream uses. While the purposes of the downstream users may be laudable, to take groundwater from the landowners so that the same water can be used by others as public stream water still constitutes an impermissible taking without compensation.

Ms. Cunningham also testified to one other fatal flaw in S.B. 288 and the MAY. While all of this effort is being made under S.B. 288 to restrict groundwater withdrawal in order to protect fish population or fish habitat, the same water then becomes stream water available for appropriation, and there is absolutely nothing contained in the stream water laws that limits the withdrawal of stream water to the same level now demanded of the groundwater users in order to protect fish population or fish habitat. Therefore, it does no good to limit groundwater use in order to allegedly protect fish population and/or fish habitat when the same water can then be withdrawn from the streams essentially without limit and without regard to protecting fish population and fish habitat. Ms. Cunningham acknowledged this is a problem, but said the OWRB was simply following S.B. 288.

For the reasons explained above, S.B. 288, as interpreted and applied by the OWRB, and the OWRB proposed MAY constitute an unconstitutional taking without compensation.

VII. A Balancing Act?

According to the OWRB, because the application of the ordinary meaning of "natural flow" would result in "zero use" of A-S groundwater, and because the groundwater laws normally support utilization and reasonable use, the OWRB decided to come up with a MAY that allegedly "balances" the competing interests of stream protection and groundwater use. OWRB Ex. 4. Ms. Cunningham's PowerPoint presentation to the Board members states that the issue became, "what number (MAY) is protective yet still considers private property?" *Id.* Ms. Cunningham testified that the OWRB attempted to balance the competing interests in determining the MAY.

If the OWRB's intent was to establish a MAY which properly "balanced" the competing interests, it has failed to prove that it properly did so. In order to "balance" competing interests one must first quantify both of the interests and then determine whether the benefits obtained outweigh the costs incurred. This was not done.

There is nothing in the record which establishes how many fish will be saved by restricting groundwater to .2 acre-feet - whether it will be 1, 10 or 10,000 fish. Nor was there then any attempt to then quantify the value of such fish in a way that could be meaningfully compared to the costs imposed by severely restricting groundwater use. There was no meaningful attempt to quantify the social and economic costs resulting from the restriction of the rights of landowners, farmers, ranchers, rural water districts, mining companies and others to use groundwater. What are the number of jobs, business opportunities, revenues and taxes that will be lost as a result of the restrictive MAY? This was never quantified. Therefore, it is impossible

to say whether the proposed MAY strikes a reasonable balance between the competing interests. The items on both sides of the scale were never fully weighed. Thus, the MAY stands as an arbitrary decision by the Board without any way to evaluate the reasonableness of its decision.

If the OWRB was truly attempting to balance the competing interests, why weren't more landowners, ranchers, farmers and industry representatives placed on Mr. Smithee's committee? One out of 18 committee seats hardly seems to strike a fair balance. That one landowner, Mr. Bill Clark, testified that he never agreed to the criteria selected by the committee to determine "natural flow". But of course he was vastly outnumbered and, therefore, out-voted by the other members who represented the fish and environmental interest groups. Had there been a more balanced representation between the competing interests the result might have been radically different.

In the context of most environmental laws, where a balance between competing interests is deemed appropriate in making a determination, a Cost Benefit Analysis ("CBA") is normally prepared so that the costs and benefits can be openly quantified, evaluated and compared. Only by doing so can the balancing factors that result in the final agency decision be known to everyone and subjected to scientific and legal scrutiny. Ms. Cunningham testified that a CBA was never performed. There are no studies, reports or documents which reflect or explain how the OWRB "balanced" the competing interests or how its MAY represents a reasonable balancing of such competing interests. Once again, this is not science, and it cannot be considered anything other than an arbitrary agency action.

VIII. Conclusion

The OWRB has contended throughout the A-S study and MAY process that the MAY is based upon sound science. Although the OWRB had the burden to prove this at the hearing, it

chose not to call any scientists in its case-in-chief. Instead, the only witness the OWRB called in its case-in-chief was a non-scientist, Ms. Julie Cunningham, who was unable to answer any questions about the underlying science.

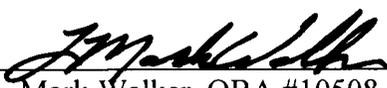
On the other hand, Protestants did call scientists as witnesses who affirmatively demonstrated that the MAY is not the product of good science. As discussed above, the MAY process quickly became disconnected from the science. The "disconnects" occurred at numerous different junctures in the study, including the following (1) the Smithee committee intended to protect fish population but only studied fish habitat without knowing the correlation between the two; (2) the Smithee committee made its 25% reduction in flow recommendation based upon Baseline Low Flow, but then recommended the modeling be run on the 75th Percentile Flow, without being able to explain how to convert or correlate the different flows to one another and, therefore, without the ability to correlate the 75th Percentile Flow to the fish habitat study; (3) the proposed MAY is actually based upon the modeled 5 Year Average Flow rather than the flow regime that Smithee's committee requested be modeled, without any explanation for the divergence and without the ability to correlate the 5 Year Average Flow to the fish habitat study; (4) the OWRB staff ignored the modeled results and came up with a proposed MAY different than what the model results showed, without any explanation whatsoever as to how "science" supposedly supported the divergence; and (5) the model itself was fundamentally flawed because of the failure to account for the unconfined zone which everyone admitted is present and which flaw materially affected the model results as shown by Dr. Poeter's work. At each of the "disconnects", the study and the process diverged farther and farther away from science, resulting in a proposed MAY that is the product of arbitrary decision making - not science.

The Tentative MAY was not approved by the Board until mid-March of this year and the Protestants had two months to respond thereto. Through their evidence, the Protestants showed that the proposed MAY is fundamentally flawed. Because of the significance of the issue, i.e. restricting landowners' rights to take and use their own groundwater, the OWRB should welcome the opportunity to fix these real flaws and problems as identified in the hearing. If the OWRB really wants, as it contends, the MAY to be the product of good science, it will address the numerous problems before it makes this important determination that critically affects so many.

Because of the number of "disconnects" from the science, attempting to correct any one particular issue will not fix the overall problem. All of the problems must be addressed so that the end result is based upon sound science - not arbitrary agency decisions. The starting point is to recognize that the purpose of the sole source aquifer designation and the MAY ruling in *Jacob's Ranch* is to preserve the use of A-S groundwater for people - not to prevent its use to protect fish. Approval of the proposed MAY should be denied.

Dated this 31st day May, 2012.

Respectfully submitted,


L. Mark Walker, OBA #10508
Scott A. Butcher, OBA #22513

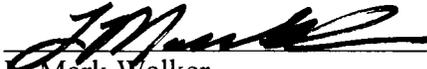
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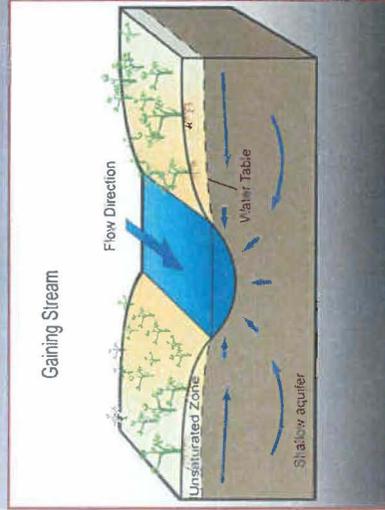
CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the 31st day of May, 2012, he emailed a copy of the above and foregoing Protestants' Brief in Opposition to the Tentative Maximum Annual Yield to the email addresses shown on Exhibit B, attached hereto and made a part hereof. The undersigned further certifies that on the 31st day of May, 2012, he mailed a copy of said Protestants' Brief in Opposition to the Tentative Maximum Annual Yield to the parties named on Exhibit C, attached hereto and made a part hereof.

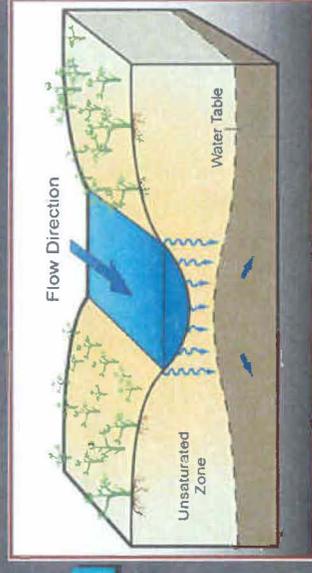


E. Mark Walker

Alluvial aquifer
Storage coefficient 0.2
Withdraw 1.0 foot
5 feet of drawdown



Arbuckle-Simpson aquifer
Storage coefficient 0.008
Withdraw 1.0 foot



125 feet of drawdown

Exhibit A

EXHIBIT B

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