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DEPARTMENT OF
WATER RESOURCES

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF THE REQUEST FOR ADMINISTRATION IN WATER DISTRICT 120 AND THE REQUEST FOR DELIVERY OF WATER TO SENIOR SURFACE WATER RIGHTS BY A & B IRRIGATION DISTRICT, AMERICAN FALLS RESERVOIR DISTRICT #2, BURLEY IRRIGATION DISTRICT, MILNER IRRIGATION DISTRICT, MINIDOKA IRRIGATION DISTRICT, NORTH SIDE CANAL COMPANY, and TWIN FALLS CANAL COMPANY	**AFFIDAVIT OF JOHN CHURCH**

STATE OF IDAHO)
) ss.
County of Ada)

John S. Church, duly sworn and of his own knowledge hereby states:

1. I am president of Idaho Economics, an economic consulting firm located in Boise, Idaho. The firm's mailing address s P.O. 45694, Boise, Idaho 83711. I am an independent economic consultant and a visiting assistant professor in the Economics Department at Boise

State University. I have a Bachelor of Science degree in civil engineering from the University of Washington, a Bachelor of Business Administration degree from Boise State University, and Master of Science degree in economics from the University of Idaho. Prior to becoming an economic consultant I was corporate economist for Idaho Power Company in Boise, Idaho.

2. I have 17 years of professional experience at Idaho Power Company as corporate economist and 8 years experience as an independent economic consultant. I have experience in building economic models and performing economic impact analysis studies. I have constructed and maintain a long-term economic forecasting model for the purpose of forecasting economic activity and demographic characteristics of the State of Idaho and each of Idaho's forty-four counties. The output of this economic forecasting model is regularly used by various clients around the state of Idaho for their long-term business and resource planning needs. In addition, I have experience in the economic valuation of long-term resource purchase contracts, the economic evaluation of decision alternatives, economic modeling of local area impacts resulting from transportation improvement projects, and the economic modeling and forecasting of long-term demand and supply for elementary and secondary education teachers.

3. I have prepared economic impact studies for the Idaho National Engineering and Environmental Laboratory (now the Idaho National Laboratory), resorts, planned communities, location decisions by manufacturing, utility, and service industry firms, expansion decisions by manufacturing firms. For many economic impact studies I have also prepared fiscal impact studies for site or regulatory approval. I have prepared and presented sworn testimony before state regulatory authorities, legislative committees, and to state and federal courts.

4. I have reviewed numerous materials pertaining to the current controversies between holders of surface water rights for irrigation and other purposes diverted from the

Eastern Snake Plain Aquifer ("ESPA") in areas that are tributary to the Snake River upstream from Milner Dam. These materials include, among others:

- The January 14, 2005 letter to the Director, Idaho Department of Water Resources ("IDWR") from the Surface Water Coalition ("Coalition") initiating the Delivery Call action in which this Affidavit is being submitted;

- The Director's February 14, 2005 Order in this case;

- Dr. Charles Brendecke's affidavit and accompanying materials in this case;

- Three economic studies (discussed below) evaluating the effects of shutting off ground water wells as generally requested by the Surface Water Coalition, as well as several sources of data concerning income, jobs, local and state tax collection, and Idaho's agricultural economy;

- The September 15, 2004 *ESPA Conceptual Settlement Framework*, a/k/a the "Strawman Proposal" pertaining to various aquifer management measures;

- The proposed *Ground Water Districts' Mitigation Plan for the American Falls Reach of the Snake River* dated February 8, 2005 and submitted by six ground water districts and one irrigation district whose members rely on ESPA ground water (the "Ground Water Districts"); and

- The Coalition's *Joint Response to Director's February 14, 2005 Request for Information* dated March 15, 2005.

5. I have read and evaluated the three economic reports or studies that have been written recently concerning this controversy.

- Donald L. Snyder, Ph.D. and Roger H. Coupal, Ph.D., *Assessment of Relative Economic Consequences of Curtailment of Eastern Snake Plain Aquifer Ground Water Irrigation Rights* (January 14, 2005) ("the "Snyder Study").

- Wm. F. Hazen and Robert M. Ohlensehlen, Twin Falls County Extension Educators, University of Idaho Extension, *Economic Implication of Curtailing Groundwater Pumping* (undated) (the "Hazen Report").

- Joel R. Hamilton, Ph.D. *Economic Importance of ESRPA-Dependent Springflow to the Economy of Idaho* (December 2, 2004) (the "Hamilton Study").

6. I also conducted, on behalf of the Idaho State Attorney General's Office, an additional study on the implications, in terms of state and local tax receipts, of the 1949 and 1961 ground water curtailment scenarios discussed in the Snyder and Hamilton Studies.

The Hazen Report.

7. The Hazen Report does not make clear who commissioned this effort. It is not a peer-reviewed analysis. The report offers an analysis of the economic impacts of two scenarios of groundwater curtailment in the Water District 130 area, which is the groundwater region to the west (downgradient) from the site of the present Delivery Call, which is Water District 120. The Hazen Report focuses primarily on the costs incurred in securing, through groundwater curtailments, enhanced spring flows that modeling indicates would accrue to the aquaculture industry located between the ESPA and the Snake River in the Thousand Springs Reach. The Hazen Report's results essentially establish a high and low range to the potential economic impacts of a widespread groundwater curtailment in Water District 130, including in one scenario the curtailments of wells serving the area's numerous dairies. I have not attempted to evaluate the accuracy of the data on which the Hazen Report was based, and therefore have not relied on the report in evaluating the economic impact and full economic development issues in question in this matter.

The Hamilton Study.

8. The Hamilton Study was compiled on behalf of surface irrigation organizations, an aquaculture firm, an aquaculture industry association, a spring water users group, and the City of Twin Falls. It is not a peer-reviewed analysis.

9. The Hamilton Study attempts to describe: 1) the economic value of ESPA spring outflows, both in the Thousand Springs reach (Water District 130) and in the American Falls

Reach (Basin 120), and 2) the economic damage that has occurred as a result of reduced spring flows in these areas. The Hamilton Study also focuses significant attention on the economic benefits, in the form of hydroelectric generation, that additional spring flows would create assuming they flow instream through the hydropower system on the Snake River.

10. The Hamilton Study asserts that the economic impact of shutting off post-1961 or post-1949 groundwater rights would be minimal. The reasoning is that the economic damage that would result from a curtailment of junior groundwater rights is already accounted for in the economy by what Hamilton assumes to be an essentially equivalent economic harm already being surface water irrigators through reduced water flows. In my opinion, this assumption is unsupported by facts. Nothing in the Coalition's *Joint Response to Director's February 14, 2005 Request for Information* dated March 15, 2005 that I have reviewed would corroborate this assumption..

11. In making its calculations, the Hamilton Study assumes that ESPA groundwater withdrawals have had a direct effect on the availability of surface water supplies and have caused surface water users to forego production (and thus income) and to dry up irrigated lands. Hamilton Study at p. 2. The Hamilton Study's central premise, which it describes as "a theme . . . repeated several times," is that "senior water right holders already are experiencing the economic effect of a curtailed water supply." Hamilton Study at p.18. Again, the Hamilton Study provides no data to support this position. There is no suggestion of which I am aware that surface water users receiving their water supply from the Coalition members actually have dried up any acreage, even during the recent drought years. I also am not aware of any information, contained in the Hamilton Study, provided by the Coalition in support of its Delivery Call or elsewhere, indicating that they are likely to do so in amounts even remotely approaching the

level of irrigation dry-up that would be involved with a curtailment of either all post-1961 or all post-1949 ground water rights.

12. Similarly, Hamilton claims that the surface water users have had to adapt and be creative to deal with what Hamilton infers are groundwater pumping-induced water shortages, and as a result they have incurred a significant expense to install sprinkler systems to make more efficient use of water. Hamilton then concludes that this is a cost already borne by the economy that is somehow balanced or offset by shutting down groundwater-irrigated acres. This is illogical. A rational economic view is that each water user would take, and has taken, those economically-appropriate measures to increase efficient use of the water resource, and thereby maximize his own economic output per unit of water. Doing so would tend to maximize economic outputs from all those dependent on the resource. If an irrigator can make his diversion or delivery system more efficient, doing so presumably provides its own economic benefits to that farmer, and in any event was not done in the context of a counterbalancing requirement that ground water rights be curtailed. Furthermore, it would in no way "repay" the surface irrigators for their investment to have the ground water users suffer curtailments.

13. The study also asserts that dairies relying on ground water will suffer little reduction in milk production because "many dairies can transfer water rights from crop use to dairy use." Hamilton Study at p. 4. There is no factual basis offered for this statement.

14. Theoretical hydroelectric and instream flow benefits accruing to other economic sectors are unsubstantiated, and, in any event, are not properly included in the evaluation of a Delivery Call for the benefit of surface water irrigators. Hamilton also counts as a benefit of ground water curtailment the assumed environmental benefits and hydroelectric power

generation (by Idaho Power Company and others) that would result from an increase in spring flows into the Snake River.

15. Presumably, the reason for the Delivery Call is that the surface water irrigators believe they actually will divert and use any additional water available to them from a curtailment of ground water rights on the ESPA. If this were a true assumption, then little (perhaps no more than half) of the curtailed amount (once it shows up as increased reach gains) would actually be available in the river to provide additional environmental benefits and hydropower generation. However, the Hamilton Study does not attempt to describe what portion of the reach gains that might result from ground water curtailments actually would escape consumption by the canal companies who seek the curtailments and thereafter show up as instream flows in the Snake River. Nor does it attempt to quantify or place an economic value on the environmental or recreational benefits of predicted increases in instream flows. In my opinion, these are significant flaws in this portion of the Hamilton Study that make its estimates of instream economic benefits unreliable.

16. The Hamilton Study's discussion does recognize that nearly 43 percent of the assumed additional hydroelectric power generation (nearly $104 million) would accrue to power users outside of Idaho, most likely in Washington, Oregon, and California. Hamilton Study at p. 30. The Hamilton Study does not mention that additional spring flows will occur not only during the summer season when electricity generation can be quite valuable, but also during the spring and fall when excess electric power produced on the Idaho Power system is often sold to utilities in other states.

17. The Hamilton Study states that it is limited by the lack of an economic model of the State of Idaho to provide accurate economic impact estimates. However, several such tools

exist. These include input-output models that could be used with parameters already calibrated for South-Central Idaho, such as the United States Bureau of Economic Analysis' REEPS Model and the Minnesota Modeling Group's IMPLAN model. In addition, Dr. Hank Robison, formerly of the University of Idaho and a colleague of Dr. Hamilton's, has for many years developed and adapted input-output models to estimate various kinds of economic impacts throughout Idaho and the Western states.

18. In conclusion, in my opinion, the Hamilton Study fails to incorporate the use of appropriate and available economic modeling and analysis methodologies, and is based on significant unsupported factual assumptions. Consequently, in my opinion the Hamilton Study does not offer meaningful estimates of the probable economic impact on the Idaho economy of a curtailment of groundwater supplies to ESPA irrigators. Its flaws make it of little relevance in this matter, and I could not rely on it as an accurate depiction of the economic costs or benefits of the proposed curtailment of ground water rights on the ESPA.

The Snyder Study.

19. The Snyder Study was commissioned by the Expanded Natural Resources Interim Committee of the Idaho Legislature. The preliminary results of the analysis were subjected to a peer review and adjustments were made as a result of that process.

20. The Snyder Study evaluated both the post-1961 and post-1949 shut-off scenarios, and specifically examined the economic impacts upon three major constituencies that would either receive economic benefit or endure economic damage from groundwater curtailment. These were: a) the ESPA groundwater irrigators, b) the surface water users, and c) the aquaculture water. Accordingly, although the present controversy in Water District 120 concerns only the ground water users and the Surface Water Coalition's irrigation users, the Snyder Study

evaluated impacts to all ESPA ground water users with rights junior to the dates indicated, and also considered benefits accruing to both the surface water irrigators and the aquaculture industry in the Thousand Springs Reach of the Snake River.

21. Professors Snyder and Coupal used IMPLAN, a well-known economic impact model to examine the relative economic gains and losses that would occur in Idaho's economy due to a curtailment of groundwater supplies to irrigators in the ESPA, with the resultant dry-up of irrigated farmland. [Need description of the IMPLAN model and its appropriateness for this analysis. (I.e., IMPLAN is an economic model that has widespread acceptance by economists or the kind of regional economic impact analysis performed by Snyder and Coupal. The data used by Snyder and Coupal are readily available and the analysis is subject to replication and confirmation. The IMPLAN model also has an established protocol for its use that appears to have been employed by Snyder and Coupal. I agree with their use of the model in this instance and with the data they used to run the model.

22. Snyder and Coupal were charged with examining the relative economic impacts of these two curtailment scenarios at a point in the future where the effects of curtailment are calculated, based on what I understand to be peer-reviewed hydrologic model, to have reached a "steady state" in augmenting spring flows into the Snake River. When focused on that single future point, an economic input output model such as IMPLAN is quite useful for predicting the relative economic impacts of the curtailment scenarios.

23. An economic input-output model is a static analysis model capable of modeling existing economic conditions and possible economic sector interactions. It can predict potential changes in the economy at one point in time (hence the term "static"). It is a widely-used tool for the type of economic impact evaluations the Snyder Study addresses.

24. Because the input-output model employed by the Snyder Study is static, there is always a question as to what time period should be examined to determine relative costs and benefits. In most cases the answer is "today," and that is what the model used by Snyder calculates. Such as: what would be the economic impact if today we had a new manufacturing plant operating in Twin Falls with 500 employees and an annual payroll of $20 million? By using the economy today as a base for measuring a change in economic conditions, an input-output model might predict, for example, that the new manufacturing plant would produce 500 new jobs directly, carrying a certain payroll, and another 700 secondary jobs with an additional $14 million in payroll in the local economy.

25. In this case, a curtailment of a large number of ESPA junior groundwater right holders beginning spring 2005 would have a near-immediate economic impact this year, and follow-on impacts in future years. To the extent that such a curtailment actually puts farms or other enterprises out of business permanently, the near-term impact also would become a long-term impact.

26. However, the economic changes that would be realized by the surface water users and the aquaculture industry are predicted to accumulate over time. That is, I understand it will take months or years (depending on the location) for the shut-off of groundwater pumping to result insubstantially increased surface water availability and spring water flows. I also understand that such increases, when they are felt, will begin with relatively small amounts in year one and, provided the wells remain shut off, increase toward a steady-state over a relatively long time period (i.e., thirty years or more). Finally, I understand that the locations of these augmented reach gains can be predicted only to river reaches, not to individual springs. This difference in "immediate negative impact vs. gradual and dispersed positive benefit" is a

problem with any economic evaluation of this situation. The Snyder Study recognizes this, and simply assumes that all increased flow benefits would be delivered by the end of year one (i.e., at the same time that the negative impacts of curtailment begin. This of course overstates the actual first-year benefit, and ignores the implications of wet years in the future. The Snyder Study acknowledges this. However, in my opinion, given the complexity of attempting to calculate a yearly or gradual benefit, and recognizing this limitation, the Snyder Study's approach provides a reasonable basis for comparison.

27. In my opinion, the Snyder Study is a competent and professionally-executed analysis with data inputs from many experts knowledgeable of the hydrology, agricultural practices, and industries in the ESPA area. With the above qualification as to the "immediate vs. gradual" issue, the Snyder Study is reliable and is the type of analysis upon which I would rely in making judgments about economic impacts resulting from such ground water curtailments. The Snyder Study presents the best economic analysis performed to date concerning the relative economic impacts that such groundwater curtailment actions could have on the Idaho economy. I have attached the complete Snyder Study as Appendix A of my affidavit.

28. In the 1949 and 1961 curtailment scenarios (and, again, assuming the steady-state benefits are achieved today), the Snyder report found that the economic gains, measured in terms of the dollar value added to increased economic output, would be nearly $20.1 million annually in the sixteen counties within the ESPA area and nearly $23.1 million annually statewide.

29. The study predicts that increased production by the aquaculture industry would add nearly $4 million to product value added in the ESPA area under the 1961 curtailment scenario and $6.2 million to value added under the conditions of the 1949 curtailment scenario. Total value added statewide due to the potential increased level of output from the aquaculture

industry is estimated in the study to be $4.5 million and $6.9 million, under the assumption of the 1961 and 1949 curtailment scenarios, respectively.

30. In making these predictions, the Snyder Study's authors point out that these numbers assume that economic benefits are fully delivered today when in fact they are modeled to occur at a future hydrological "steady state." The Snyder report makes a special note of this on page xviii of the executive summary of the report:

> "The initial benefits of curtailment to the senior surface/spring water right holders will be much less than the amount predicted to occur at steady state. For example, as shown in Appendix A, the economic benefits in the form of gross sales to all senior surface/spring water rights holders is estimated to be only $0.9 million in the first year of curtailment. The total value of output impact on ground water right holders, however, remains constant at a -$211 million. Thus, in the first year of curtailment, the relative net economic impact is estimated to be in excess of -$210 million."

31. On the other hand, the Snyder Study's predicted economic damages to the curtailed groundwater users under either of the two scenarios would be in the first ten years, when measured in terms of the nominal dollar value of economic output, nearly 23 times larger than the predicted economic gains. In my opinion, this is a reasonable prediction of the magnitude of the difference in economic cost-benefit.

32. For example (and setting aside the "immediate vs. gradual" issue), the Snyder study assumes that the ESPA lands currently irrigated by groundwater would, if curtailed, convert to a dry land crop if practical, and assumes that 70 percent of the curtailed acreages would be capable of producing a dry land crop. Based on my experience with agricultural economics in Idaho, I believe it unlikely that all of these acres, even if this is an accurate assumption, would come into effective economic use as dryland, particularly in the first year of curtailment. Nonetheless, considering them is not unreasonable if one is attempting to be conservative as to the amount of net negative economic impact.

33. Under the 1961 curtailment scenario, Snyder and Coupal predict that the annual decrease in economic output, again measured in dollars of value added to production, would be nearly $143.1 million in the ESPA counties and $157.7 million statewide. Under the broader 1949 curtailment scenario, the Snyder Study predicted negative economic impacts to be a loss of nearly $212.7 million annually in the ESPA area and $234.4 million annually across the state as a whole. In my opinion, these numbers are reasonable if the intent is to provide a very conservative prediction of economic losses, again with the caveat that as such, they probably are understated.

The Predicted Steady State versus The Real Economic Losses of Today and Tomorrow.

34. The economic impact analysis presented in the Snyder Study provides a useful tool for examining the relative economic impacts upon the directly affected parties for the two curtailment scenarios. However, this analysis predicts relative economic impacts at a future hydrologic "steady state," a time in the future that will only come about as a result of many years of curtailment of ESPA groundwater withdrawals.

35. The economic impact analysis presented in the Snyder Study understates the near-term net economic harm to Idaho's economy by somewhat understating the damage to the groundwater users and significantly overstating the near-term benefits to the surface/spring water users. These relative economic impacts are visually depicted in two graphs (Figures A-1, and A-2 of the Snyder Study) entitled "Comparison of Gain and Loss Flows over 10 Years" in Appendix A, page 56, of the Snyder report. In Figures A-1 and A-2 the Snyder Study compares the predicted <u>loss</u> of gross economic output by groundwater users resulting from a curtailment of groundwater supplies to the predicted <u>gain</u> in gross economic output that would be realized by

the surface irrigators and TSR spring water users over the first 10 years of both the 1949 and 1961 curtailment scenarios.

36. I have recreated these two graphs, with a minor modification, in Appendix B of this affidavit. I use the Snyder Study's numbers, but have modified the graphs to make them easier to read. Appendix B shows the projected losses to Idaho's gross output as negative numbers below the horizontal access, and the predicted additions as positive figures above that axis. Therefore, the upper portion of the graph shows predicted additions to Idaho's Gross State Product totals; the lower portion shows deletions.

37. This depiction makes it clear that the difference between the economic gains projected for the surface/spring water users and the economic losses projected for the groundwater users is not just a one-year event. The economic gains from curtailment will be very small in the first few years of either curtailment scenario, although these projected gains are predicted to increase over time. Nevertheless, the highest predicted annual economic gain—which will accrue at steady-state—amounts to only about one-seventh of the estimated annual economic damage from a groundwater curtailment that begins in year one and increases gradually each year after that.

38. Another problem that these graphs illustrate is the problem of predictability—really, the imbalance in predictability demonstrated here. While we can predict with relative certainty the negative impacts of shutting off a farmer's irrigation water supply, because of the hydrological delays in delivering the projected benefits, prediction is much more difficult on the other side of the equation. In other words, while I am comfortable predicting the severe negative consequences of shut-off (and I believe the Snyder Study is reasonable in this regard), I am far less comfortable predicting that the modeled economic benefits actually will occur, or in what

amounts, or when. In any event, the fact that they will occur a substantial distance into the future should lead us to evaluate their likelihood, and their value, with great caution.

39. I have assembled the table included as Appendix B to demonstrate the first year through the thirtieth year of the economic gains and damages, as measured by the change in Idaho gross output, are predicted for the 1961 and 1949 curtailment scenarios in the Snyder Study. In this same table, I have discounted the streams of gains or losses in Idaho Gross Output for the two scenarios to ascertain their present value. The discount rate chosen for this analysis is a forecasted yield for the standard index of 20-Municipals and as forecasted by Global Insight, the nation's largest macroeconomic forecasting firm. This is the type of data routinely relied upon and used by professionals in my field. The 20-municipal series is usually considered to provide a conservative discount rate, but I have made it more conservative by using only the average forecasted yield (5.4 percent per year) from the first five years of Global Insight's long-term forecast, thus not considering the higher interest rate this service uses for later years.

40. The present value of the projected reduction in Idaho's annual gross state product (GSP) over the next thirty years due to a curtailment of groundwater supplies is $3.4458 billion in today's dollars in the 1961 curtailment scenario and $8.1284 billion in the 1949 curtailment scenario. A significant portion of this cumulative loss will occur regardless of whether a curtailment is imposed for one year or multiple years since most ground water irrigated farm operations would not be able to remain in business following the first year of full curtailment. The present value of the projected economic gain to the Idaho GSP assumed to accrue to the surface and aquaculture water users is $167.2 million in the 1961 curtailment scenario and $423.6 million in the 1949 curtailment scenario. Another way to look at these economic trade-offs is to consider that, even assuming the "steady state" annual output of benefits, for every

dollar that the state's economy may gain in output from the surface/spring water users by ground water curtailment, it loses nearly $20 in output because of the lost agricultural production from groundwater.

41. The two graphs in Appendix B demonstrate that the first few years of either the 1949 and 1961 curtailment scenarios do not bring significant economic gains to either the surface water users or the spring water users. These figures also show that the overall economic impact of this effort will be to impose very significant economic damage, annually, to the State's economy as a whole.

Another View of The Predicted Steady State versus The Real Economic Losses of Today and Tomorrow.

42. Dr. Brendecke's observations that the volumes of surface waters that may be available above Milner may increase at a more rapid pace in the first few years any groundwater curtailment scenario. This is the basis for another examination of the potential economic costs and benefits to the Idaho economy. In this second examination of future costs and benefits I have assumed that a greater proportion of the projected increase in surface waters above Milner would be available in the first few years of either curtailment scenario. In turn, this would imply that the potential additions to Idaho's gross output from the surface water users would likewise accrue more rapidly at first and then increase toward a maximum additional amount of gross output that would be reached at that future "steady state".

43. Therefore, I have restructured the Snyder Study graphs that visually depicted the relative economic impacts over time. (Figures A-1, and A-2 of the Snyder Study) entitled "Comparison of Gain and Loss Flows over 10 Years" in Appendix A, page 56, of the Snyder report). However, in this case I assumed a nonlinear response in surface water availability, and consequently a nonlinear increase in the additions to Idaho's gross economic output originating

from the surface/spring water users. Dr. Brendecke's analysis predicts that the availability of additional waters to the spring water users in the Thousand Springs reach would occur somewhat later than the gains that would be realized above Milner, nevertheless, I have assumed in this comparison that the spring water users would contribute to gains in Idaho's gross output as if they were experiencing the above Milner surface water gains. This is a conservative assumption that increases the near-term additions to Idaho's gross output.

44. This new comparison finds that surface/spring water users have greater near-term water availability, with a proportionately greater increase in near-term gross product output. Nevertheless, in the first year of curtailment under the 1961 curtailment scenario the assumption of increased water availability produces only a $4.2 million gain in Idaho Gross State Product while the value of lost output from the groundwater users reduces Idaho's Gross State Product by nearly $211.0 million, a net change in Idaho's output of negative $206.8 million. Using the assumptions of the 1949 curtailment scenario the surface/spring water users add nearly $11.1 million to Idaho's Gross State Product in the first year while the lost production from the curtailed groundwater users subtracts nearly $500.0 million. In total, Idaho's Gross State Product changed by nearly -$488.9 million in the first year alone.

45. Using the assumptions of a nonlinear response in the amount of water available to surface/spring water users, I have assembled the table included as Appendix C to demonstrate the first year through the thirtieth year of the economic gains and damages, as measured by the change in Idaho gross output at a "steady state as are predicted for the 1961 and 1949 curtailment scenarios in the Snyder Study. In this same table, I again have discounted the streams of gains or losses in Idaho Gross Output for the two scenarios to ascertain their present value. The discount rate chosen for this analysis is a forecasted yield for the standard index of 20-Municipals and as

forecasted by Global Insight, the nation's largest macroeconomic forecasting firm. This is the type of data routinely relied upon and used by professionals in my field. The 20-municipal series is usually considered to provide a conservative discount rate, but I have made it more conservative by using only the average forecasted yield (5.4 percent per year) from the first five years of Global Insight's long-term forecast, thus not considering the higher interest rate this service uses for later years.

46. The present value of the projected reduction in Idaho's annual gross state product (GSP) over the next thirty years due to a curtailment of groundwater supplies, and an accelerated rate of accumulated gains by the surface/spring water users is $3.446 billion in today's dollars in the 1961 curtailment scenario and $8.128 billion in the 1949 curtailment scenario. A significant portion of this cumulative loss will occur regardless of whether a curtailment is imposed for one year or multiple years since most ground water irrigated farm operations would not be able to remain in business following the first year of full curtailment.

47. The present value of the projected economic gain to Idaho's GSP assumed to accrue to the surface and aquaculture water users is $283.7 million in the 1961 curtailment scenario and $716.3 million in the 1949 curtailment scenario. Another way to look at these economic trade-offs is to consider that, even assuming the "steady state" annual output of benefits, for every dollar that the state's economy may gain in output from the surface/spring water users by ground water curtailment, it loses nearly $12 in output because of the lost agricultural production from groundwater.

48. The inclusion of assumptions that are more conservative in evaluating the potential economic gains that may be realized by the surface/spring water users does not appreciably change the economic realities. This is demonstrated in the two graphs in Appendix

C, showing that the economic harm to Idaho's economy from either the 1949 and 1961 curtailment scenarios is not offset by the potential economic gain to the surface/spring water users. Again, these revisions also demonstrate that the overall, negative, economic impact of this effort will be to impose significant economic damage, annually, to Idaho's economy as a whole.

49. The Hamilton study asserts, without citing to any facts or studies, that the surface water irrigators have had to shoulder the burden of increased capital expenditures to conserve water due to "junior groundwater users, who continue to pump unimpeded." Aside from citing no factual basis or studies, this assertion does not square with what data I have researched on this subject.

50. A review of Idaho farmer's responses to the U.S. Department of Agriculture's 2003 Farm and Ranch Irrigation Survey reveals other motives for the installation of sprinkler equipment. Out of the 5,135 Idaho farms (representing 1.85 million acres of irrigated land) that had implemented irrigation system improvements in the previous 5 years 62.3 percent of them found that it reduced water requirements. But, 57.6 percent found that the improvements improved crop yield – a measure that would improve the surface water users profitability; 34.3 percent found that irrigation system improvements reduced labor costs – another measure that would improve the surface water users profitability; 34.6 percent found that irrigation system improvements reduced energy costs – another measure that improves profitability; and 15.8 percent found that irrigation system improvements reduced fertilizer and pesticide losses – another measure that would improve profitability. In other words, the actual facts available on this subject suggests that surface irrigators for many years have been acting in an economically rational way to make their operations more efficient for a variety of familiar reasons related to profitability. None of the responses indicate that these farmers have been responding in any

measurable way to alleged concerns about ground water pumping. The data recorded below provides an example of this phenomenon.

2002 Cenus of Agriculture
2003 Farm and Ranch Irrigation Survey
Summary of Idaho data Table 39: Energy and Water Conservation Improvements

		Effect of Improvements						
	Implemented Improvements in the Last 5 Years	Improved Crop Yields	Decreased Energy Costs	Reduced Water Requirements	Reduced Labor Costs	Reduced Fertilizer & Pesticide Losses	Reduced Soil Erosion	Reduced Tailwater
Farms	5,135	2,957	1,776	3,201	1,762	812	1,861	1,391
		57.6%	34.6%	62.3%	34.3%	15.8%	36.2%	27.1%
Acres Irrigated	1,848,829	1,358,599	966,737	1,295,152	1,201,724	434,492	876,956	373,422
		73.5%	52.3%	70.1%	65.0%	23.5%	47.4%	20.2%

2002 Cenus of Agriculture
2003 Farm and Ranch Irrigation Survey
Idaho data: Table 40: Barriers to Making Improvements to Reduce Energy Use or Conserve Water

		Barriers to Improvements						
	Total	Improve-ments not a Priority	Field Conditions Limit System Improv.	Risk of Reduced Yield or Poor Crop Quality	Improvements will not reduce costs enough to cover installation	Cannot Finance Improve-ments	Landlord will not share in the costs	Uncertain about future availability of water
Farms	9,168	1,023	355	519	1,600	1,973	393	1,251
		11.2%	3.9%	5.7%	17.5%	21.5%	4.3%	13.6%
Acres Irrigated	1,378,028	142,135	377,343	351,859	814,695	770,392	432,283	485,641
		10.3%	27.4%	25.5%	59.1%	55.9%	31.4%	35.2%

51. Based on the foregoing, in my opinion, full economic development of Idaho's water resource would be thwarted from a curtailment of ESPA groundwater users during periodic periods of severe drought. A groundwater curtailment program implemented today would not result in a turnaround in the availability of surface or spring waters tomorrow, or next year. However, the turn-off of groundwater irrigation sources will result in a nearly-immediate, and largely permanent net loss of annual economic output in southern Idaho, including a loss of nearly 3,500 jobs, at least a $160 million near-term decrease in the area's annual personal

income, and a loss of between $4.4 to 7.0 million in annual local property tax revenues. Furthermore, it will impose an economic cost on the rest of Idaho.

52. Curtailment of junior ground water rights to produce relatively small short-term benefits to senior surface water supplies will unavoidably put ground water irrigators out of the irrigated farming business. Capital equipment will be idled. It is difficult to see how, given such a curtailment and the likelihood that it would be continued or repeated, these idled farms would return to production. I believe the most likely result will be that such a curtailment will spell the end of much of the agricultural economy dependent upon ESPA ground water.

53. In my opinion, the concept of pursuing full economic development of Idaho's groundwater resources is wholly inconsistent with any alternative that regulates the use of the state's water resources to cause the state's economy to lose a present value of close to $8.1 billion in gross output during the next thirty years to gain a present value of $423.5 million. Whether or not, in the near-term, a curtailment of ESPA groundwater users would be considered a "futile call," it is quite evident that, in both the near and long terms, it would cause substantial and likely permanent, harm to Idaho's economy that, in its first year alone, would overwhelm any possible long-term gain.

54. An approach that is consistent with state policies of optimizing or maximizing beneficial uses of the State's water resources consistent with full economic development of ground water within the ESPA would be to implement measures that can maximize economic benefits while phasing in any improvements in aquifer water levels that are designed to improve surface water supplies and minimize the effects of future droughts without causing the disruptions of groundwater curtailment and loss of farm-dependent economies. In my opinion,

for any such program to adhere to the principal of maximizing economic development, it would have to keep ground water pumpers in business as irrigators.

John S Church

John S. Church

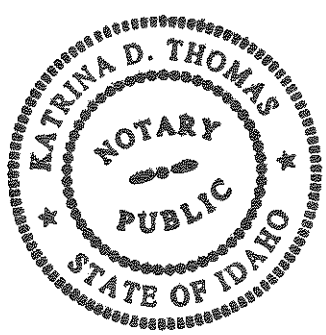
STATE OF IDAHO)
) ss.
County of Ada)

On this 22d day of March 2005, before me, a notary public in and for the State of Idaho, personally appeared John S. Church, known or identified to me to be the person who executed the above Affidavit, and acknowledged to me that he executed the same and that its contents are true to the best of his knowledge and belief.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above written.

Katrina Thomas

NOTARY PUBLIC FOR IDAHO
Residing at: Boise
My commission expires: 4-10-06



CERTIFICATE OF SERVICE

I hereby certify that on this 23 day of March 2005, I served a true and correct copy of the foregoing by delivering the same to each of the following individuals by the method indicated below, addressed as follows:

Mr. Karl J. Dreher Director Idaho Department of Water Resources 322 East Front Street P.O. Box 83720 Boise, ID 83720-0098	____ U.S. Mail ____ Facsimile ____ Overnight Mail ✓ Hand Delivery
C. Tom Arkoosh, Esq. Arkoosh Law Offices, Chtd. 301 Main Street P.O Box 32 Gooding, ID 83330	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
W. Kent Fletcher, Esq. Fletcher Law Office P.O. Box 248 Burley, ID 83318-0248	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
Roger D. Ling, Esq. Ling, Robinson & Walker 615 H St. P.O. Box 396 Rupert, ID 83350-0396	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
John A. Rosholt, Esq. John K. Simpson, Esq. Travis L. Thompson, Esq. Barker, Rosholt & Simpson 113 Main Avenue West, Ste. 303 Twin Falls, ID 83301-6167	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
James C. Tucker, Esq. Idaho Power Company 1221 West Idaho P.O. Box 70 Boise, ID 83707	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery

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Kathleen Marion Carr, Esq. Office of the Field Solicitor U.S. Department of the Interior 550 West Fort Street, MSC 020 Boise, ID 83724-0020	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
E. Gail McGarry, P.E. Program Manager Water Rights & Acquisitions PN-3100 U.S. Bureau of Reclamation Pacific Northwest Region 1150 N. Curtis Road Boise, ID 83706-1234	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
Scott L. Campbell, Esq. Moffatt Thomas Barrett Rock & Fields, Chtd. 101 S. Capitol Blvd., 10th Floor P.O. Box 829 Boise, ID 83701-0829	✓ U.S. Mail ____ Facsimile ____ Overnight Mail ____ Hand Delivery
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Michael C. Creamer