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DEPARTMENT OF  
WATER RESOURCES

*Attorneys for Idaho Ground Water Appropriators, Inc.*

**BEFORE THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF IDAHO**

IN THE MATTER OF DISTRIBUTION OF  
WATER TO VARIOUS WATER RIGHTS  
HELD BY OR FOR THE BENEFIT OF 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 CHARLES M.  
BRENDHECKE IN SUPPORT OF  
IGWA'S AND POCATELLO'S  
RESPONSE TO MOTION FOR  
PARTIAL SUMMARY JUDGMENT**

STATE OF COLORADO            )  
  ) ss.  
COUNTY OF BOULDER         )

Charles M. Brendecke, being first duly sworn on oath, deposes and hereby states as follows:

1. I am President of Hydrosphere Resource Consultants, 1002 Walnut, Suite 200, Boulder, Colorado 80302. I am a licensed professional engineer in Idaho, Colorado, Wyoming and Oklahoma. I have a Bachelor of Science degree in civil engineering from the University of

Colorado and Master of Science and Doctor of Philosophy degrees in civil engineering from Stanford University.

2. My educational and professional experience is set forth in the *Affidavit of Charles M. Brendecke* filed with the Department in this matter on March 23, 2005, and in Exhibit A thereof, and incorporated herein by this reference.

3. I have been retained to provide expert analysis on behalf of Idaho Ground Water Appropriators ("IGWA") with respect to relevant issues of hydrology and water use on the Eastern Snake River Plain ("ESRP") related to the Delivery Call made in January of 2005 by the Surface Water Coalition ("SWC").

4. In the course of my work for IGWA I have had cause to examine various documents and data sets describing historical hydrology and water uses on the ESRP. Among these documents are the following: a) Geology and Ground-Water Resources of the Snake River Plain in Southeastern Idaho, Water Supply Paper 774, by the U.S. Geological Survey, dated 1938 (the "1938 USGS Report"); b) Water Supply for the Palisades Reservoir Project, Project Planning Report 1-5.17-1, by the U.S. Bureau of Reclamation, dated 1946 (the "1946 Planning Report"); and c) Compilation of Records of Surface Water of the United States through September 1950, Part 13. Snake River Basin, Water Supply Paper 1317, by the U.S. Geological Survey, dated 1956 (the "1956 USGS Report").

5. The 1956 USGS Report contains records of flow at the Montgomery Ferry gage on the Snake River for the period 1896-1910. In 1910 this gage was replaced by the "near Minidoka" gage a short distance upstream. The Montgomery Ferry record was substantially unaffected by upstream reservoir operations or by other diversions below Blackfoot until November 1906. Thus the record from 1896 to 1906 is a reflection of the natural flow supply available to the SWC entities during that period. The monthly irrigation season flow at

Montgomery Ferry over this period ranged from more than 38,000 cfs in June of 1896 to less than 2,000 cfs in August of 1905. This demonstrates that the natural flow available to the SWC entities has always been highly variable, and that at times it is insufficient to fill even the most senior of the natural flow rights held by any of the SWC entities, the October 11, 1900, natural flow rights for 3,000 cfs held by the Twin Falls Canal Company ("TFCC") and 400 cfs held by the North Side Canal Company.

6. The 1938 USGS Report contains early historical records of the reach gains accruing to the Snake River between the near Blackfoot gage and Milner Dam. In dry years, these reach gains represent the *entire natural flow available to the SWC entities during the irrigation season*. These records show that the August 1905 reach gain in this reach was 1,830 cfs and that the average reach gain in July and August over the 1912-1927 period was 2,410 cfs. These amounts are substantially less than the senior 3,000 cfs natural flow right held by the TFCC. This demonstrates that the TFCC has never been assured that its senior natural flow right would be filled throughout the irrigation season, even in the period before any ground water development on the ESRP.

7. The record of reach gains for the period 1912-1927 contained in the 1938 USGS Report shows substantial variability in annual reach gains from year to year, ranging from 2,670 cfs in 1912 to 2,170 cfs in 1915. Monthly irrigation season reach gains ranged from 1,750 cfs to 3,050 cfs over this same period. This demonstrates that the need for storage to provide reliable water supplies was evident to the SWC entities long before any ground water development on the ESRP. Indeed, historical documents are replete with evidence that the need for water storage was recognized very early on in the development of the upper Snake River Basin. Stored water has always been viewed as an essential part of the water supply of irrigation entities in the basin.

8. The 1946 Planning Report describes an evaluation of the proposed Palisades Reservoir Project and includes an operations study of the anticipated ability of Palisades, Jackson Lake and American Falls Reservoirs to supply irrigation water to the SWC entities (among others) over a 1919-1942 hydrologic study period (well before any significant ground water development on the ESRP). This operations study showed that in 1934 the entities diverting irrigation water between Neeley and Milner Dam would have obtained a total of 2,847,000 acre-feet, suffering shortages of more than 800,000 acre-feet. In 1935 they would have suffered shortages of more than 150,000 acre-feet. The operations study also showed that the three reservoirs would have been empty at the end of 1934. This demonstrates that the SWC entities, including the TFCC, have never been assured that they would have a full water supply throughout the irrigation season even when using all of the combined natural flow and storage supplies available to them.

9. In the Second Supplemental Order Amending Replacement Water Requirements issued on December 27, 2005 ("Second Supplemental Order"), the Director found that the SWC entities had diverted a total of 2,837,000 acre-feet in 2005. This is essentially the same amount of total diversion that was anticipated for the entities below Neeley in the 1946 Planning Report for the year 1934.

10. I have examined the preliminary accounting of natural flow and storage diversions of the SWC entities for 2005. This preliminary accounting shows that between April 12 and June 22, the TFCC Canal Company was diverting natural flow under its senior (October 11, 1900) natural flow water right, but not at a rate that fully utilized that water right. During the same period, other SWC entities were diverting natural flow under water rights junior to the senior TFCC right; this demonstrates that the amount of natural flow available during this period exceeded that actually diverted by the TFCC. From this I would conclude that the natural flow

diversions of the TFCC during this period were sufficient to meet the water demands of its shareholders without shortage. This conclusion is consistent with the fact that precipitation in the Twin Falls area in the first part of the 2005 irrigation season was well above average and that irrigation requirements were well below average.

11. The preliminary accounting data show that the TFCC was diverting natural flow under its more junior (December 22, 1915) natural flow water right between June 22 and July 8, but not at a rate that fully utilized that water right. During the same period, natural flow was being diverted by other SWC entities under rights junior to this junior TFCC right; this demonstrates the amount of natural flow available during this period exceeded that actually diverted by TFCC. From this I would conclude that the natural flow diversions of the TFCC during this period were sufficient to meet the water demands of its shareholders without shortage.

12. The preliminary accounting data show that the TFCC was diverting natural flow under its more senior (October 11, 1900) natural flow right between July 8 and July 17, but not at a rate that fully utilized that water right. During the same period, natural flow was being diverted by other SWC entities under rights junior to this senior TFCC right; this demonstrates the amount of natural flow available during this period exceeded that actually diverted by the TFCC. From this I would conclude that the natural flow diversions of the TFCC during this period were sufficient to meet the water demands of its shareholders without shortage.

13. The preliminary accounting data also show that between September 20 and October 22, the TFCC was diverting natural flow under its senior natural flow water right, but again not at a rate that fully utilized that water right. During this same period, other SWC entities were diverting natural flow under more junior water rights, thus demonstrating the availability of natural flow in excess of the TFCC diversion. From this I would conclude that the

natural flow diversions of the TFCC during this period were sufficient to meet the water demands of its shareholders without shortage.

14. The preliminary accounting shows that from July 18 to September 19 only the TFCC and North Side Canal Company were diverting natural flow under their senior (October 11, 1900) natural flow water rights. Between them they were diverting all the natural flow available. Their combined natural flow diversion over this period averaged 2,089 cfs. This is essentially the same as the amount of natural flow that was estimated, in the 1938 and 1956 USGS Reports, to have been available in the late season of dry years before any significant ground water development on the ESRP.

15. During the periods prior to July 18 and after September 19, natural flow rights junior to the TFCC diverted more than 518,000 acre-feet of natural flow. Of this, 179,000 acre-feet could have been diverted under the more senior TFCC rights, but was not. This amount of natural flow diversion foregone by the TFCC in 2005 exceeds the amount of injury to TFCC found in the Second Supplemental Order.

16. Over the course of my involvement in this matter, I have become familiar with the water accounting procedures used in Water District 01. It is my understanding that water distribution in Water District 01 is done largely on the basis of demand. Total diversions are monitored on a daily basis and segregated into natural flow and storage after the fact. A diversion is not curtailed unless this segregation shows that storage is being used in excess of the diverting entity's storage entitlement and the diverting entity does not wish to be charged with an excess storage diversion that would have to be paid for at the end of the year.

DATED this 26th day of April, 2006.



Charles M. Bredecke

SUBSCRIBED AND SWORN TO before me this 26<sup>th</sup> day of April, 2006.



Carol McAnis  
Notary Public for Colorado  
Residing at 7966 Marshall St., Aurora, CO 80003  
My commission expires 12/2/08