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DISTRICT COURT-SRBA
TWIN FALLS CO., IDAHO
FILED _____

REPORT REGARDING CLAIM TO WATER RIGHT NO. 36-00108B

In Re SRBA

Twin Falls County Civil Case No. 39576

Sub-Case No. 36-00108B

Report to the SRBA District Court

Prepared by the Idaho Department of Water Resources

Karl J. Dreher, Director

David B. Shaw, Adjudication Bureau Chief

David R. Tuthill Jr., Acting Adjudication Bureau Chief

July 1, 1996

COPY

REPORT REGARDING CLAIM TO WATER RIGHT NO. 36-00108B

The Director of the Idaho Department of Water Resources (IDWR) submits this report regarding claim to water right no. 36-00108B in response to the request of Special Master Haemmerle, pursuant to Idaho Code §42-1412(4) and the court's Order Re: Contested Claims for Amounts Claimed in Excess of .02 CFS. This report was prepared under the supervision of Karl J. Dreher, Director, David B. Shaw, Adjudication Bureau Chief, and David R. Tuthill Jr., Acting Adjudication Bureau Chief for IDWR. The following persons assisted in the preparation of the following portions of this report:

David B. Shaw, Adjudication Bureau Chief, reviewed and verified this Report Regarding Claim to Water Right No. 36-00108B. The Affidavit of David B. Shaw describes Mr. Shaw's education and work experience, and is incorporated by reference herein. Mr. Shaw also reviewed IDWR's Report Regarding Evaluation of Irrigation Diversion Rates, described below.

Jeff Peppersack, Adjudication Engineer, prepared and verified IDWR's Report Regarding Evaluation of Irrigation Diversion Rates, which is incorporated by reference herein. The Affidavit of Jeff Peppersack describes Mr. Peppersack's education and work experience, and is incorporated by reference herein. Mr. Peppersack also reviewed IDWR's Report Regarding Consumptive Use for Irrigation in the Hagerman Area, described below.

David R. Tuthill Jr., Acting Adjudication Bureau Chief, prepared IDWR's Report Regarding Consumptive Use for Irrigation in the Hagerman Area, which is incorporated by reference herein. Mr. Tuthill also reviewed this Report Regarding Claim To Water Right No. 36-00108B. The Affidavit of David R. Tuthill Jr. describes Mr. Tuthill's education and work experience, and is incorporated by reference herein.

Marci S. Sterling, Adjudication Engineer, prepared and verified Appendix B, which describes the application of IDWR's methodology for evaluation of irrigation diversion rates to claim no. A36-00108B. Appendix B is attached hereto and incorporated by reference herein. The Affidavit of Marci S. Sterling describes Ms. Sterling's education and work experience, and is incorporated by reference herein.

Steven C. Clelland, Senior Water Resource Agent, investigated and prepared the preliminary recommendation for claim no. 36-00108B, and prepared Appendix C, which is attached hereto and incorporated herein by reference. The Affidavit of Steven C. Clelland describes Mr. Clelland's education and work experience, and is incorporated by reference herein. The affidavit also includes a general description of his investigation of claims in the Hagerman area. The Affidavit of Steven C. Clelland

Regarding Claim No. 36-00108B describes Mr. Clelland's investigation of the quantity and place of use of this water right; it is attached hereto and incorporated by reference herein.

Helen L. Harrington-Thornton, formerly Senior Water Resource Agent and currently Hydrogeologist, participated in the field examination for claim no. 36-00108B. The Affidavit of Helen L. Harrington-Thornton describes Ms. Thornton's education and work experience, and is incorporated by reference herein. The Affidavit of Helen L. Harrington-Thornton Regarding Claim No. 36-00108B describes her investigation of the quantity and place of use of this water right, and is attached hereto and incorporated by reference herein.

I. INVESTIGATION AND RECOMMENDATION OF CLAIMS GENERALLY

IDWR's general methodology for the investigation and recommendation of claims is described in Appendix A, which is incorporated herein by reference.

II. WATER RIGHT NO. 36-00108B

A. Basis of Claim

Claim no. 36-00108B was filed with IDWR by Alma Blackstock June 20, 1988.¹ The claim is to a portion of a right decreed to T.E. and Mabel Thompson in the *New International Mortgage* decree, entered in 1932.² The water right decreed to the Thompsons is numbered in IDWR's files as water right no. 36-00108. This right was decreed, along with numerous others, for "irrigation, domestic, power and other purposes thereon." Portions of right no. 36-00108 were claimed by and recommended to various claimants and are further described below.

B. Name and Address of Claimant

The name and address of the claimant set forth in the claimant's motion for summary judgment is different than recommended in the director's report. No notice of change in ownership has been filed with IDWR, and to IDWR's knowledge no Standard Form 3 has been filed with IDWR. The deed attached to the claimant's

¹ The original notice of claim is currently located in the files of the SRBA District Court, attached to IDWR's response to the claimant's objection.

² *New International Mortgage Bank v. Idaho Power Co., et al.*, Equity No. 1602 (D.S.Id. 1932), at pp. 3-4.

motion for summary judgment indicates that ownership of the claim has been transferred to Walter J. Bonning II and Judy L. Bonning, as stated in the motion for summary judgment.

C. Source of Water

The source of water set forth in the claimant's motion for summary judgment is Billingsley Creek. The source of water is described in the director's report as Billingsley Creek tributary to Snake River.

The director's report includes the body of water to which the source of the right is tributary for each water right in the director's report, except for rights to ground water. IDWR adopted this standard for the description of the source of water rights because there are so many instances, sometimes in the same administrative basin, where different surface water sources bear the same name.³

D. Date of Priority

The priority date set forth in the claimant's motion for summary judgment is the same as recommended in the director's report.

E. Point of Diversion

The point of diversion set forth in the claimant's motion for summary judgment is the same as recommended in the director's report.

F. Purpose of Use

The purposes of use stated on the notice of claim and recommended in the director's report is irrigation. The objection seeks to add stockwater. The claimant's motion for summary judgment now seeks to add wildlife, recreation, aesthetics, and "diversion system maintenance" in addition to stockwater.⁴

³ IDWR relied upon the following in reaching its conclusion: Idaho Code §42-1411(2) (which provides that the director shall determine the source of the right to the extent the director deems appropriate and proper to define and administer water rights acquired under state law).

⁴ The filing fees for claims other than small domestic and stockwater claims consists of a \$50.00 flat fee, plus a variable fee of \$1.00 per acre for any claimed irrigation use, plus a per cfs variable fee for other claimed purposes of use. The filing fee paid for this claim was limited to the purposes of use claimed in the notice of claim. Filing fees are set forth in Idaho Code §42-1414 and IDWR's Adjudication Rules, IDAPA 37.03.01 *et seq.*

The description of the purposes of use of this right in the decree is ambiguous in that it describes the purposes of use for the Thompson right and others in the same list collectively as "irrigation, domestic, power and other purposes," rather than specifically identifying each purpose of use for each right.⁵ IDWR's investigation confirmed the use of water for irrigation, as further described below in the sections addressing quantity and place of use. Neither the claimant nor IDWR's investigation has yielded information that would confirm the beneficial use of water for the other purposes not listed in the claim, either pursuant to the right as originally appropriated or as currently used.⁶ Such information is necessary not only to confirm the use but to quantify the amount of water beneficially used for that purpose.

G. Quantity of Water Used

The notice of claim states a quantity of 1.0 cfs for irrigation. The quantity recommended in the director's report is 0.51 cfs for irrigation. The objection does not state the quantity claimed. The claimant's motion for summary judgment states a quantity of 1.0 cfs.

1. Splits of Water Right No. 36-00108

As noted above, various portions of right no. 36-00108 were claimed by and recommended to various claimants. The splits are listed below. The first column shows the quantity claimed; the second column shows the quantity recommended in the director's report. 36-00108B is the only portion that is contested.

⁵ IDWR relied upon the following in reaching its conclusion: *Morgan v. Udy*, 58 Idaho 670, 79 P.2d 295 (1938) (a water right decree that omitted the description of the point of diversion necessarily determined the point of diversion but was ambiguous as to its location).

⁶ IDWR relies upon the following in reaching this conclusion: Idaho Code §42-1427 (which allows an ambiguity in a prior decree or license to be resolved based on current beneficial use); the statement of the Presiding Judge that this section "cannot change or exceed the previously decreed or recorded element of the decreed or licensed right" nor "be used to claim an expansion of use beyond the beneficial use existing at the time the right was originally memorialized in a decree or license," Revised Memorandum Decision and Order on Basin-Wide Issue 4, dated May 17, 1995, at page 9; and the statement of the Presiding Judge that, "the purpose of use is defined by the intentional application of water to an intended beneficial use of water," Memorandum Decision and Order Re: Basin-Wide Issue 5, dated April 26, 1996, at page 8.

REPORT REGARDING CLAIM TO WATER RIGHT NO. 36-00108B

<u>Right no.</u>	<u>Claim</u>	<u>Report</u>
36-00108A	0.30	0.30
36-00108B*	1.0	0.51
36-00108C	0.30	0.07
36-00108D	0.14	0.14
36-00108E	4.50	3.28
36-00108G	0.02	0.02
36-00108H	0.12	0.12
36-00108J	0.50	0.50
Total	6.88	4.94

The quantity decreed for right no. 36-00108 in the *New International Mortgage* decree is 5.4 cfs. The total quantity of water claimed in all claims based on the decree is 6.88 cfs, which exceeds the decreed amount of the water right by 1.44 cfs. IDWR recommended a total of 4.94 cfs. If claim number 34-00108B were decreed at 1 cfs, the total pursuant to all claims to portions of right no. 36-00108 would be 5.43 cfs, which would exceed the decreed amount of right no. 36-00108 by 0.03 cfs.

The decreed place of use of this right contains 107.56 acres. Using the decreed rate of diversion and the decreed place of use, the per acre rate of diversion is approximately 0.046 cfs per acre. The claimant's lands as described in the deed attached to the motion for summary judgment contain 12.45 acres. Applying the decreed duty of water, the claimant's proportionate share of right no. 36-00108 is 0.57 cfs. The claimant's lands as described in the deed, however, are outside the decreed place of use for water right no. 36-00108.⁷ IDWR does not have information indicating whether or how any portion of right no. 36-00108 came to be appurtenant to the claimant's lands. IDWR did not previously request this information from the claimants of the portions of right no. 36-00108 because the total amount IDWR found to be beneficially used under all the claimed portions of right no. 36-00108 did not exceed the decreed 5.4 cfs.⁸

⁷ IDWR relied on the following in reaching its conclusion: Koon v. Empey, 40 Idaho 6, 231 P. 1097 (1924) (a conveyance of land conveys the appurtenant right absent express provision to the contrary); Crow v. Carlson, 107 Idaho 461, 690 P.2d 916 (1984) (division of tract of land to which water is appurtenant works a division of the water right in the same proportion as the land is divided, absent express provision to the contrary.)

⁸ IDWR does not require all claimants to submit information showing a "chain of title" demonstrating ownership of all or part of a previously decreed or licensed right in its investigation of the claims. Generally, IDWR requires information as to ownership as part of the investigation of claims only where there are competing claims to the same water right.

2. Quantity for irrigation

As noted above, the director's report recommended a quantity of 0.51 cfs for irrigation. This includes 0.50 cfs (approximately 0.045 cfs per acre) for the on-farm diversion requirement (the amount of water needed at the place of use), and 0.01 cfs for conveyance losses (an additional amount of water needed at the point of diversion to deliver the amount needed at the place of use). IDWR has conducted further analysis of the quantity for irrigation due to further information IDWR received subsequent to its original analysis. Based on this further analysis, IDWR recommends a quantity of 0.31 cfs for irrigation. This includes 0.30 cfs for the on-farm diversion requirement (0.027 cfs per acre) and 0.01 cfs for conveyance losses.

IDWR's methodology for investigating and recommending claims to water for irrigation in excess of 0.02 cfs per acre is described in IDWR's Report Regarding Evaluation of Irrigation Diversion Rates.⁹ The application of that methodology to this claim is described in Appendix B. Neither the claimant nor IDWR's investigation has yielded information which would confirm beneficial use of a greater quantity for irrigation.

As described in Appendix B, the application of IDWR's methodology for evaluation of irrigation diversion rates resulted in the recommendation of an additional 0.01 cfs for conveyance losses. IDWR determined the total conveyance losses for the ditch, and allocated that total among the various rights to water from the same ditch. Further information as to the other rights delivered through the ditch is described in subsection 4 below.

3. Quantity for other purposes

As to the quantity for other purposes of use stated in the claimant's motion for summary judgment, neither the claimant nor IDWR's investigation has yielded information that would confirm the beneficial use of water for other purposes, as noted in section F above. Therefore, IDWR does not have information that would confirm the quantity used for the other purposes.

⁹ IDWR relied upon the following in reaching its conclusions: Idaho Code §42-220 (which provides that no license or decree will be issued confirming a right to more than 0.02 cfs per acre for irrigation unless it can be shown that a greater amount is necessary) and Idaho Code §42-1402 (which limits the amount of water allotted by a decree to the amount of water beneficially used).

4. Other rights delivered through same ditch

As noted in Appendix B, IDWR determined the total conveyance losses for the ditch through which this right is diverted, and allocated that total among the various rights to water delivered through the same ditch. For this reason, IDWR previously proposed that contested water rights in the Hagerman area be grouped by ditch for scheduling purposes to facilitate resolution of quantity issues for those rights. Water right 36-00108 is delivered through the Buckeye ditch. Appendix C is a schematic which shows the water rights delivered through the Buckeye ditch, and which includes a variety of information as to the water rights listed.

H. Period of Year Water is Used for Each Purpose of Use

The notice of claim states of period of use of 04/01 to 11/01 for irrigation. The director's report recommends a period of use of 3/15 to 11/15 for irrigation. The claimant's objection states a period of use of 1/1 to 12/31. The claimant's motion for summary judgment states the period of use as "the irrigation season." The *New International Mortgage* decree does not state a period of use for irrigation.

The recommended season of use is consistent with season of use standards for irrigation developed by IDWR for various climatic regions throughout the state, which are based on a 75% chance of a 24 degree Fahrenheit frost. In addition, the director's report included general provision 12b, which allowed use of water for irrigation outside the season of use stated in the description of the individual right subject to certain conditions. In the Memorandum Decision and Order Re: Basin-Wide Issue 5, the Presiding Judge concluded that general provision 12 is not necessary and would not be decreed. This decision further provided that "all decrees for irrigation in the SRBA shall set the period of use as the "irrigation season." Order, pp. 15-16. The district court denied a subsequent motion for permission to appeal the decision. Pending any further proceedings on the decision, any further statement of the basis for IDWR's recommendation as to the season of use for irrigation appears to be unnecessary.

As to the season of use for other purposes of use stated in the claimant's motion for summary judgment, neither the claimant nor IDWR's investigation has yielded information that would confirm the beneficial use of water for other purposes, as noted in section F above. Therefore, IDWR does not have information that would confirm the season of use for the other purposes.

I. Legal Description of the Place of Use

The legal description of the place of use in both the notice of claim and IDWR's report is the SWNW, S14, T07S R14E. The notice of claim states the number of irrigated acres as 20; the director's report recommends 11. The objection does not contest the place of use. The claimant's motion for summary judgment lists 14 acres. However, the claimant's motion for summary judgment states the legal description as the SESENE S11. This quarter-quarter-quarter section only contains 10 acres, and corresponds to the recommended point of diversion. The legal description therefore appears to be a typographical error, and should instead list the SWNW.

IDWR Senior Water Resource Agents Steve Clelland and Helen Thornton confirmed the irrigation of no more than 11 acres by personal observation. The 11 irrigated acres are at the western and lower end of the property. As to the higher, eastern end of the property, the land was not irrigated at the time of the field exam and contained buildings, equipment, storage areas, and contained no lawn or garden. The examination of the place of use for this claim is described in the Affidavit of Steven C. Clelland Regarding Claim No. 36-00108B and the Affidavit of Helen L. Harrington-Thornton Regarding Claim No. 36 -00108B.

As to the legal description of the place of use for other purposes of use stated in the claimant's motion for summary judgment, neither the claimant nor IDWR's investigation has yielded information that would confirm the beneficial use of water for other purposes, as noted in section F above. Therefore, IDWR does not have information that would confirm the place of use for the other purposes.

J. Annual Volume of Consumptive Use

The notice of claim states an annual volume of consumptive use of 180 AFY, or 9.0 AFY per acre. The annual volume of consumptive use recommended in the director's report is 33 AFY, or 3 AFY per acre. The claimant's objection contests the recommended consumptive use, but does not state an amount. The claimant's motion for summary judgment states an amount of 63 AFY, or 4.5 AFY per acre. The Affidavit of Charles E. Brockway, submitted by the claimant in support of the motion for summary judgment, states "that 3.75 acre feet per acre per annum is the amount of consumptive use that is reasonable [in the Hagerman area] based upon a yield of ten tones per acre." Applying this standard, the total annual consumptive use volume would be 52.5 AFY for the 14 acres listed in the claimant's motion for summary judgment, or 41.25 AFY for the 11 recommended acres.

IDWR developed standards for annual volume of consumptive use for the various climatic areas throughout the state. The standard for the area in which the claimant's place of use is located is 3.0 AFY. IDWR's recommendation is based on this standard. The development of IDWR's standards for annual volume of consumptive use is described in IDWR's Report Regarding Evaluation of Irrigation Diversion Rates. IDWR has conducted further analysis of the annual volume of consumptive use based on further information IDWR received subsequent to its original analysis. The further analysis is described in IDWR's Report Regarding Consumptive use for Irrigation in the Hagerman Area. Based on this further analysis, IDWR recommends an annual volume of consumptive use of 3.5 AFY per acre, for a total of 38.5 AFY for the recommended 11 acres.

K. Conditions on the Exercise of the Right and Other Necessary Matters

The recommendation of this right in the director's report includes the following remarks:

WATER IS DELIVERED THROUGH THE BUCKEYE DITCH.
A DIVERSION RATE OF 0.50 CFS AT THE FIELD HEADGATE IS
RECOMMENDED FOR THE PLACE OF USE DESCRIBED ABOVE.
0.01 CFS OF THIS RIGHT IS LIMITED TO USE FOR CONVEYANCE LOSSES IN
DELIVERY OF THIS RIGHT.

The claimant's objection seeks deletion of the last two remarks. The claimant's motion for summary judgment seeks deletion of all three remarks.

In response to the request of the Presiding Judge, the director filed an Amended Director's Report for Reporting Area 3 (Basin 36), which substantially reduced the number of general provisions in the director's report. Attachment 2 to the amended report explains the changes made to the general provisions, and further explains changes to the list of recommended rights necessitated by the changes to the general provisions. The amended report deleted General Provision 16, which set forth certain provisions as to conveyance losses. The conveyance loss remark in the description of the individual right was a corollary to the general provision. As a result, the remark in the description of this right as to conveyance losses is no longer necessary. (Deletion of the remark does not change IDWR's recommendation as to the quantity for this right.)

In response to the request of the Presiding Judge, IDWR submitted IDWR's Report for September 19, 1995 Status Conference. In this report, IDWR indicated that it had reviewed its use of remarks in the description of the individual water right,

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both to address concerns identified by the court, and to separate explanatory material from material the Director recommends be included in the decree of water rights pursuant to the 1994 amendments to the adjudication statute.¹⁰ The two remaining remarks are explanatory material.

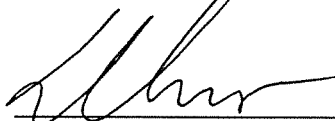
¹⁰ See Idaho Code §42-1411 (which addresses the form and content of director's reports).

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State of Idaho)
) ss.
County of Ada)

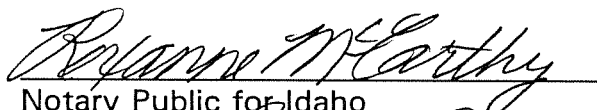
David B. Shaw, being first duly sworn, upon oath, deposes and says:

That I am the Adjudication Bureau Chief for IDWR, that I have read the foregoing report, know its contents, and that the statements contained therein are true to the best of my knowledge and belief.



David B. Shaw

Subscribed and sworn to before me this 15th day of July, 1996.



Notary Public for Idaho

Residing at: Base 3D

My commission expires: 5-16-2007

Certificate of Service

I certify that on the 15th day of July, 1996, I hand-delivered copies of the foregoing document, including all attachments, to the following:

Patrick D. Brown
133 Shoshone St North
Twin Falls, ID 83303



Person mailing document(s)

APPENDIX A

A. INVESTIGATION AND RECOMMENDATION OF CLAIMS GENERALLY

To promote the accuracy and consistency of water right decrees, and to minimize the burden on the court and the claimants in a water right adjudication, the state has made the specialized expertise of IDWR available through IDWR's investigation and reporting function.¹

The resources the state has made available for this function, however, are limited. IDWR has the duty to conduct a reasonable investigation within the spending authority granted by legislative appropriation. Those resources are not sufficient for IDWR to exhaustively investigate each and every potentially relevant fact regarding each and every claim and to make a conclusive determination of the water right. Rather, IDWR reviews the claim and the information already available to IDWR, and conducts such further investigation as is reasonable to determine whether there is sufficient information to support recommendation of the water right to be decreed.

To make the most efficient use of the available resources, IDWR must make determinations as to what is a reasonable level of investigation for various classes of claims prior to making a recommendation to the court regarding any particular claim. IDWR has employed two primary mechanisms to identify a reasonable level of investigation. First, the statutes set criteria and IDWR has developed standards for various types of uses, requiring less information to support a claim to water within those standards and more information to support a claim outside those standards. Second, IDWR has adopted a "tier" approach, identifying classes of claims which for various reasons merit further investigation.

Generally, with claims based on beneficial use², IDWR conducts a "licensing type" field exam, which includes confirmation of the source, point(s) of diversion, purpose(s) of use, place(s) of use, and an examination of the water delivery system and the quantity of water beneficially used. IDWR also contacts the claimant to obtain information supporting the priority date claimed. This level of examination is conducted because there has been no prior administrative or judicial

¹ Idaho Code §§ 42-1410 and 42-1411.

² Water rights based on beneficial use are sometimes referred to as constitutional rights or grandfather rights.

confirmation of the existence and extent of a water right based on beneficial use.³

Generally, for water rights that have been previously confirmed by license or decree, IDWR begins its examination by comparing the claim to information already available to IDWR. Other information includes, for example, IDWR's decree files; license, permit and transfer files; remotely sensed data, including Landsat imagery of irrigated acres and aerial photography; watermaster reports; applicable laws and IDWR's interpretation of those laws in light of the water resource policies of the state; etc. If there are discrepancies between the claim and information already available to IDWR, IDWR conducts further investigation to resolve the discrepancy, which generally includes a field exam and/or contacting the claimant for further information. Thus, where there has been a prior judicial or administrative confirmation of the existence and extent of a water right, IDWR uses information already available to IDWR to limit its review to issues identified by its discrepancy analysis.

Finally, IDWR uses both the court-ordered notice of error process⁴ and the statutory objection process to identify claims which merit further review. If this further review yields new information that supports a different description of the water right, then IDWR will revise its recommendation (in the case of a notice of error) or submit a supplemental director's report or offer a standard form 5 (in the case of an objection), consistent with the new information.⁵

Further information as to IDWR's standards and procedures for the investigation and recommendation is set forth in IDWR's Claim Investigation Manual, Field Examiner's Handbook, Administrative Memorandums, and

³ IDWR conducts a more summary investigation of beneficial use claims limited to domestic and/or stockwater use up to 0.24 cfs.

⁴ The notice of error process, as originally conceived and implemented, was limited to disagreements between the claimant and IDWR as to fairly straight-forward "errors", such as clerical errors or other readily verifiable matters. Based on its experience in the test basins, IDWR has subsequently recommended that the notice of error process be expanded to address any type of perceived error, as well as to address disagreements between claimants.

⁵ This "tiered" approach to determining a reasonable level of investigation is embodied in the statutory framework for water right adjudications. See §42-1410 (which provides for the discretion of the director in determining the level of IDWR's investigation, and allows but does not require the agency to conduct hearings), and §42-1412 (which authorizes IDWR to submit supplemental reports, and authorizes the court or the parties to request further investigation by IDWR in contested subcases). The tiered approach embodied in the statutory framework promotes efficiency and minimizes the burden on the court and the claimants by providing a report/objection process to identify disputed matters, and reserving the highest level of investigation for disputed matters.

B. METHODOLOGY TO DETERMINE IRRIGATED ACREAGE

The area of irrigated acreage can be determined by information obtained from scaled and non-scaled photographs of the place of use supplied by one of several U.S. government agencies. The use of aerial photography by the U.S. government dates back to 1937, when the U.S. Department of Agriculture, Agricultural Stabilization and Conservation Service (ASCS, now known as the Farm Service Agency, or FSA) began photographing selected counties of the United States on a repetitive basis. This coverage continues today and aerial photos are used by the ASCS (FSA) to figure acreage planted on farms for purposes of managing farm programs. Photos used by IDWR typically include: ASCS photos and 35 mm color slides⁷; NAPP photos⁸; ortho-photoquads⁹; and U2

⁶ These documents set forth general standards and procedures and do not address all possible exceptions to the general standards and procedures. In addition, as a result of its experience in the test basins, statutory changes, judicial decisions, etc., IDWR has identified refinements and revisions to its standards and procedures for the investigation and recommendation of claims that have not yet been included in these documents.

⁷ Both the photos and slides are high oblique and vertical aerial photography. The ASCS photos are scaled and have selected features, such as roads, section lines, ditches, and field acreage superimposed on them by the ASCS. The color slides are simply color slides frequently taken with hand-held 35mm equipment. IDWR staff typically obtain copies (which are not scaled) of maps for lands claimed as the place of use during the investigation of the claims, either from the claimant or from the local ASCS office. Color slides may also be checked-out from the local ASCS office as needed; IDWR sometimes obtains the color slides as they are discarded by the local ASCS office.

⁸ NAPP (National Aerial Photography Program) photos are all color-infrared aerial photography. IDWR obtained coverage for most of the Snake River Basin, including all of the test basins; the photos are primarily from flights during 1987 and 1988, though some are from 1986 or 1989. The date of the flight is shown on the photo. NAPP photography is available from the U.S. Geological Survey Earth Resources Observation Systems (EROS) data center in Sioux Falls, South Dakota.

⁹ The full name for an ortho-photoquad is "orthographic photograph quadrangle." These are black and white photoimages prepared from aerial photographs that have been rectified to eliminate image displacement due to terrain relief that cover a systematically subdivided area of latitude and longitude. IDWR obtained coverage for most of the Snake River Basin, including all the test basins; the photos are primarily from flights during the 1970's. The date of the flight is shown on the quad sheet. Most of the orthophotos were obtained from the U.S. Geological Survey National Cartographic Information Center (NCIC) in Menlo Park, California. In some areas, maps were not available from U.S.G.S. but were available from other agencies, such as the United States Department of Agriculture, Forest Service.

aerial photos¹⁰.

A photographic "scale," like a map scale, is an expression that states that one unit of distance on a photograph represents a specific number of units of actual ground distance.

$$S = \text{Photo scale} = \frac{\text{Photo distance}}{\text{Ground distance}} = \frac{d}{D}$$

The scale may be expressed as unit equivalents, representative fractions, or ratios. For example, if 1 mm on a photo represents 25 m on the ground, the scale of the photo can be expressed as 1 mm = 25 m (unit equivalents), or 1/25,000 (representative fraction), or 1:25,000 (ratio).

The photo(s) used by IDWR personnel have varying scales. The ASCS photographs have map features drawn in by the ASCS. These photos are stated to be "not to scale," but do include the field acreage as determined by ASCS written on the places of use. NAPP photography is at a nominal scale of 1:40,000; U2 aerial photography is at a nominal scale of 1:120,000; and ortho-photoquads have a scale of 1:24,000.

To determine the area used, IDWR staff employed various transparent overlays, known as grid templates. These templates are available at most blueprint supply stores. One type consists of lines forming rectangles or squares of known area in the same scale that is utilized in the scaled photograph. The grid is placed over a scaled photograph and the area of a ground unit is estimated by counting grid units that fall within the unit to be measured.

Another commonly used grid is the dot grid, which is composed of uniformly spaced dots on a transparent overlay. The grid is placed over the photograph and the dots falling within the region to be measured are counted. The value assigned to each dot is dependent on the scale of the photograph. First, the number of acres per centimeter (or other measuring unit) is computed. This figure is then divided by the number of dots per measuring unit on the grid to obtain the acreage represented by each dot. For instance, a square 3.4 cm on each side containing 640 dots will cover 160 acres on a photo with a nominal

¹⁰ These photos are color-infrared aerial photography obtained by the National Aeronautics and Space Administration (NASA) Airborne Instrumentation Research Project, and available from EROS. IDWR obtained coverage of most of the southern portion of the Snake River Basin, most of which was flown in 1977. In addition, because the State of Idaho was part of an ongoing project with NASA to photograph selected areas, photography from various areas in various years is also available. The date of the flight is shown on the photo.

scale of 1:24000; 640 dots divided by 160 acres equals 4 dots to the acre, thus 1 dot equals 0.25 acres.

Because of its simplicity, the grid system is a practical method to determine the size of irrigated areas; it nonetheless requires some training and experience to be used effectively.

For non-scaled photos, such as the ASCS 35 mm photos, IDWR did not directly make acreage determinations. Instead, these photos were used to confirm whether the place of use and amount of irrigated acreage had changed for that year according to common landmarks visible in the photographs.

APPENDIX B

EVALUATION OF IRRIGATION DIVERSION RATE

WATER RIGHT NUMBER: 36-00108B

INTRODUCTION

This water right was recommended in the Director's Report with a diversion rate of 0.51 cfs. A portion of that total amount was recognized as the on-farm diversion requirement, and the remaining amount as conveyance loss. Based on IDWR's methodology to evaluate irrigation diversion rates, the quantity required on-farm was recommended as 0.50 cfs, or approximately 0.045 cfs per acre for 11.0 acres, with an additional 0.01 cfs for conveyance loss. The total, 0.51 cfs, is equivalent to a total per acre rate of diversion of approximately 0.046 cfs per acre.

Because IDWR has received new information and has refined the methodology since the time of the original analysis of irrigation diversion requirement, a revised analysis has been completed. The revised analysis is based upon information already contained in the claim file and the new information detailed in this report. An expanded explanation of the methodology used is contained in the report entitled Report Regarding Evaluation of Irrigation Diversion Rates, dated July, 1996. Hereinafter, that report will be referred to as IDWR's Methodology Report.

Several factors must be considered when determining the necessity of an irrigation diversion rate greater than 0.02 cfs per acre. Those factors are crop types, irrigated acres, types of irrigation systems used, evapotranspiration estimates, field application efficiencies, and conveyance loss. These items are discussed in the following paragraphs, along with the results of the analysis.

IRRIGATED ACRES/CROPS

The property described on the claim as the place of use was found to have 11 acres of irrigated land. The 11 irrigated acres are planted in pasture. As shown in Figure 1 of the Attachments, the land in question consists of two fields: an 8.5 acre rectangular field on the west side of the property (Field 1) and a 2.5 acre rectangular field directly to the east of Field 1 (Field 2).

Field 1 is irrigated using corrugations.¹ Field 2 is irrigated by wild flooding method. In general, IDWR does not consider irrigation by wild flooding method to be an acceptable irrigation practice. For cases such as those, analysis of systems is based on the use of furrow irrigation (corrugations) as a standard to determine the necessity of a diversion rate greater than 0.02 cfs per acre. Therefore, the entire place of use was analyzed as if corrugations were used throughout.

EVAPOTRANSPIRATION

Evapotranspiration is the amount of water evaporated from the soil plus the amount used by a crop during crop growth. IDWR's estimate used for evapotranspiration (ET) for the Hagerman area has been refined since the original analysis of required diversion rate was completed. Originally, the monthly consumptive irrigation requirements for the Bliss weather station were used, based on consumptive irrigation data estimated by Allen and Brockway². IDWR has since obtained information allowing adjustments to the values that more accurately represent conditions in the Hagerman area. This process is outlined in the section of IDWR's Methodology Report titled EVAPOTRANSPIRATION (CROP CONSUMPTIVE USE) and the resulting ET values are summarized in Table 1 of the Attachments.

The ET values used in calculations for pasture are shown under the column titled PAST in the table. For each month of the irrigation season, the values in the row titled 80PCT ET are used. This represents the 80th percentile value for ET. The reasoning behind the use of these particular ET numbers is further explained in the EVAPOTRANSPIRATION section of IDWR's Methodology Report.

FIELD APPLICATION EFFICIENCY

In order to calculate the field application efficiency, several elements must first be considered. Among these elements are the slope, approximate furrow lengths, furrow spacings, and set time for each field. Additionally, the soil information described below is necessary.

Soil Information

Some data unique to each soil type are required for the analysis, including the management allowed deficit (MAD) and intake family. The MAD is based on the maximum soil moisture deficit which will not cause the crop to exceed its stress point. Intake family is a classification of soils with similar water intake rate characteristics.

¹Information as to crop types and irrigation method was verbally provided by Mr. Butch Bonning to IDWR Senior Agent Steve Clelland on July 17, 1992. The claimant, Alma Blastock, had recommended that Mr. Clelland speak to him concerning the irrigation practices on her land.

²Allen, R.G. and C.E. Brockway, Appendix E (unpublished)

The Natural Resources Conservation Service (NRCS), formerly Soil Conservation Service (SCS), compiles soil surveys describing the various soil types within the state and the locations where those soils may be found. The procedure used to determine the value of MAD and intake family using SCS data is described in the sections of IDWR's Methodology Report titled NET IRRIGATION APPLICATION and IRRIGATION APPLICATION SYSTEMS. In order to use the correct values for MAD and intake family, it is necessary to determine the worst-case significant soil for each field if more than one soil type is present in that field.

There are two different soil types on the property described as the place of use for this water right: Fathom Loamy Fine Sand (FAB) and Starbuck-Lava Flows Complex (394). Field 1 consists of soil types FAB and 394. Soil type FAB, however, accounts for more than 90% of the soil found in this field. Field 2 consists entirely of soil type FAB. Thus, FAB was used for purposes of this analysis for both Field 1 and Field 2. Figure 1 shows the layout of the soil types as they relate to the location of the fields described by this claim.

The MAD values for pasture were found in Table 2 of the Attachments for soil type FAB. That table was created using a spreadsheet developed by IDWR to simplify calculations to determine MAD and intake family. The MAD for soil type FAB was calculated to be 1.71 inches.

There are two procedures described in the section of IDWR's Methodology Report entitled IRRIGATION APPLICATION SYSTEMS for determining intake family. The alternative procedure is considered a refinement for some soil conditions and is used where available. The furrow intake family for FAB was found by both procedures to be 0.70. This intake family is also shown in Table 2.

Field Slope

Field slopes were determined based on USGS topographic maps. An estimate of the average slope from top end to bottom end of furrows was calculated for each field. To calculate these slopes, it was necessary to make a determination as to the direction of furrows. Those determinations were based on the available aerial photography³ and information in the claim file, where available. The field slope of

³Photos used are all color-infrared aerial photography. They were obtained through projects coordinated by the federal government, including the National Aerial Photography Program (NAPP) and the National Aeronautics and Space Administration (NASA) Airborne Instrumentation Research Project.

NAPP photos used are: Photo No. 439-43, dated 8/1/1988; Photo No. 419-59, dated 6/25/1987; and Photo No. 419-61, dated 6/25/1987.

NASA photos used are: Photo No. 6134, Flight No. 75-131, FSR 706, dated 6/8/1975; Photo No. 2471, Flight No. 77-134, FSR 1049, dated 10/8/1977; Photo No. 3472, Flight No. 80-152, FSR 1462, dated 9/17/1980; and Photo No. 2314, Flight No. 83-095, FSR 1760, dated 6/7/1983.

Field 1 was estimated to be 0.5 percent and the slope of Field 2 was estimated at 1.0 percent.

Furrow Lengths

The furrow lengths were determined using the same topographic maps and aerial photos. Field 1 and Field 2 both appear to have rectangular shapes, so an average length was used for those fields. Those lengths were 650 feet and 300 feet, respectively.

Use of cross-ditches or gated pipe to reduce the furrow length is an alternative irrigation practice which will improve the efficiencies of fields with high intake rate soils if set times and inflow rates are adjusted appropriately. This alternative is not considered reasonable if it would result in furrow lengths less than 300 feet. A length of 300 feet is considered by IDWR to be a minimum practical length for farm cultivation practices.

Furrow Spacing/Set Times

When the system efficiencies were calculated, 30 inch furrow spacings were used. In addition, 8 hour, 12 hour, and 24 hour set times were analyzed and compared.⁴ Although the actual practice for these fields is to use 24 hour set times, 8 hour and 12 hour set times were also examined to determine whether those changes would significantly increase the overall efficiency of the system. Eight hour and 12 hour set times are considered acceptable irrigation practices which can be used during the peak water use period to improve application efficiencies.

Results

Field application efficiencies are estimated using a computer program developed by SCS for use with furrow irrigation and provided with the Hubble Report⁵. Efficiencies less than 15 percent or greater than 70 percent are outside the practical limits of the program. In cases where efficiency is estimated to be greater than 70 percent, an efficiency of 70 percent is used. In addition, the program does not recognize erosive flows or furrow carrying capacities. The limiting erosive flow is dependent on the slope of a particular field and must be calculated for each field. In this case, the limiting erosive flow for Field 1 would be 80 gpm and the limiting erosive flow for Field 2 would be 40 gpm. The practical carrying capacity limit of corrugations is 10 gpm. The term identified in the program as design application is equivalent to the MAD, as determined above. Refer to the section FIELD

⁴Mr. Bonning reported the use of 28-30 inch furrow spacings and 24 hour set times in his 1992 conversation with Steve Clelland.

⁵The Hubble Report is a common name given to a pair of reports developed for IDWR in July, 1990 by Hubble Engineering, Inc. and Associated Earth Sciences, Inc. entitled "Guidelines for the Evaluation of Irrigation Diversion Rates" and "Evaluation Workbook for Irrigation Diversion Rates".

APPLICATION EFFICIENCY in IDWR's Methodology Report for more information regarding the methodology used in determining field application efficiency.

For Field 1, efficiency estimates were made for full furrow lengths of 650 feet and also for 325 foot lengths, to determine which of those alternatives produced a more reasonable efficiency. In addition, set times of 8, 12 and 24 hours, with appropriate inflow rates, were all considered. Eight hour set times using appropriate inflow rates resulted in better efficiencies than 12 or 24 hour set times, regardless of whether 650 foot or 325 foot lengths were used. The optimum field application efficiency estimated for 8 hour set times was 52 percent with 325 foot furrow lengths. A value of 52 percent was used. The results of these calculations are shown in Table 3 of the Attachments, which is computer output generated by the SCS program.

The furrows for Field 2 are less than 600 feet in length. Splitting this field for analysis purposes would result in furrow lengths less than 300 feet. Therefore, the full furrow lengths were considered for this field. Set times of 8, 12 and 24 hours were considered, and an irrigation method using 8 hour set times provided a higher efficiency. The SCS program computed an efficiency of 56 percent for the 8 hour set time. Therefore, an efficiency of 56 percent was used. See Table 3 for results.

ON-FARM IRRIGATION DIVERSION REQUIREMENT

The on-farm irrigation diversion requirement is the amount of water needed on the farm itself to provide adequate water to the crop(s) being grown. The procedure used to determine that amount is described in detail in the section of IDWR's Methodology Report titled ON-FARM IRRIGATION REQUIREMENT. The results of that procedure are provided in Table 4 of the Attachments. Table 4 was created using a spreadsheet developed by IDWR which utilizes the information detailed above and calculates the irrigation diversion requirement. The resulting maximum diversion rate requirement for the entire 11 acres was determined to be 0.30 cfs, or 0.027 cfs per acre.

CONVEYANCE LOSS

When water is conveyed through an earthen delivery ditch, a certain portion of the total flow is lost through seepage into the ground. The method used to estimate seepage losses is referred to as the Worstall method, which is further explained in the CONVEYANCE LOSS section of IDWR's Methodology Report. The Worstall method relies on the characteristics of the soil, the ditch width, and the ditch length to estimate the actual seepage losses of the ditch. IDWR has developed a spreadsheet which calculates the total conveyance loss estimate on a ditch and prorates that loss among the reaches of the ditch based on the total amount of water removed from each reach of the ditch and the location of each reach.

In the original analysis of conveyance loss for the Buckeye Ditch, delivery locations were identified along the entire ditch. In some cases, more than one right is supplied from a single reach of the ditch. The total conveyance loss estimate for all water use from that reach of the ditch was calculated using the spreadsheet based upon the Worstall method. If there were found to be multiple users removing water from the same reach of the ditch, the conveyance loss estimate for that reach was divided equally among those users. This approach was used along the entire length of the Buckeye Ditch.

It would not be practical or meaningful for IDWR to re-evaluate the conveyance loss attributable to this right for two primary reasons. First, because the Worstall method does not depend on total flow in a ditch, but rather the top width of the water surface and the ditch length, the total conveyance loss estimate for the ditch would not change even if the determinations of individual water rights were to vary from IDWR's recommendations. The only change might be the allocation of the total conveyance loss among the individual water rights. However, not all of the water rights on the ditch are contested, and of those that are contested, not all are presently before the special master. In addition, no historical method for allocation of conveyance loss exists to use as a basis for distribution of conveyance losses for water rights along this ditch. For all these reasons, the recommended conveyance loss amount remains at 0.01 cfs.

IRRIGATION DIVERSION REQUIREMENT

The total irrigation diversion requirement is the sum of the on-farm irrigation diversion requirement and the conveyance loss. For this right, the total amount is 0.30 cfs + 0.01 cfs, or 0.31 cfs.

REFERENCES

- Allen, R.G., and C.E. Brockway, 1983, Estimating Consumptive Irrigation Requirements for Crops in Idaho, Idaho Water and Energy Resources Research Institute, University of Idaho, Appendix E (unpublished).
- Hubble Engineering, Inc. and Associated Earth Sciences, Inc., 1991, Guidelines for the Evaluation of Irrigation Diversion Rates, Idaho Department of Water Resources.
- Hubble Engineering, Inc. and Associated Earth Sciences, Inc., 1991, Evaluation Workbook for Irrigation Diversion Rates, Idaho Department of Water Resources.
- Idaho Department of Water Resources, 1996, Report Regarding Evaluation of Irrigation Diversion Rates, also referred to as IDWR's Methodology Report.
- National Aerial Photography Program, Color-infrared aerial photography, Flight dates June 25, 1987, August 1, 1988.
- Soil Conservation Service (now Natural Resources Conservation Service) - Gooding, Idaho office, 1992, Unpublished soil survey data.

ATTACHMENTS

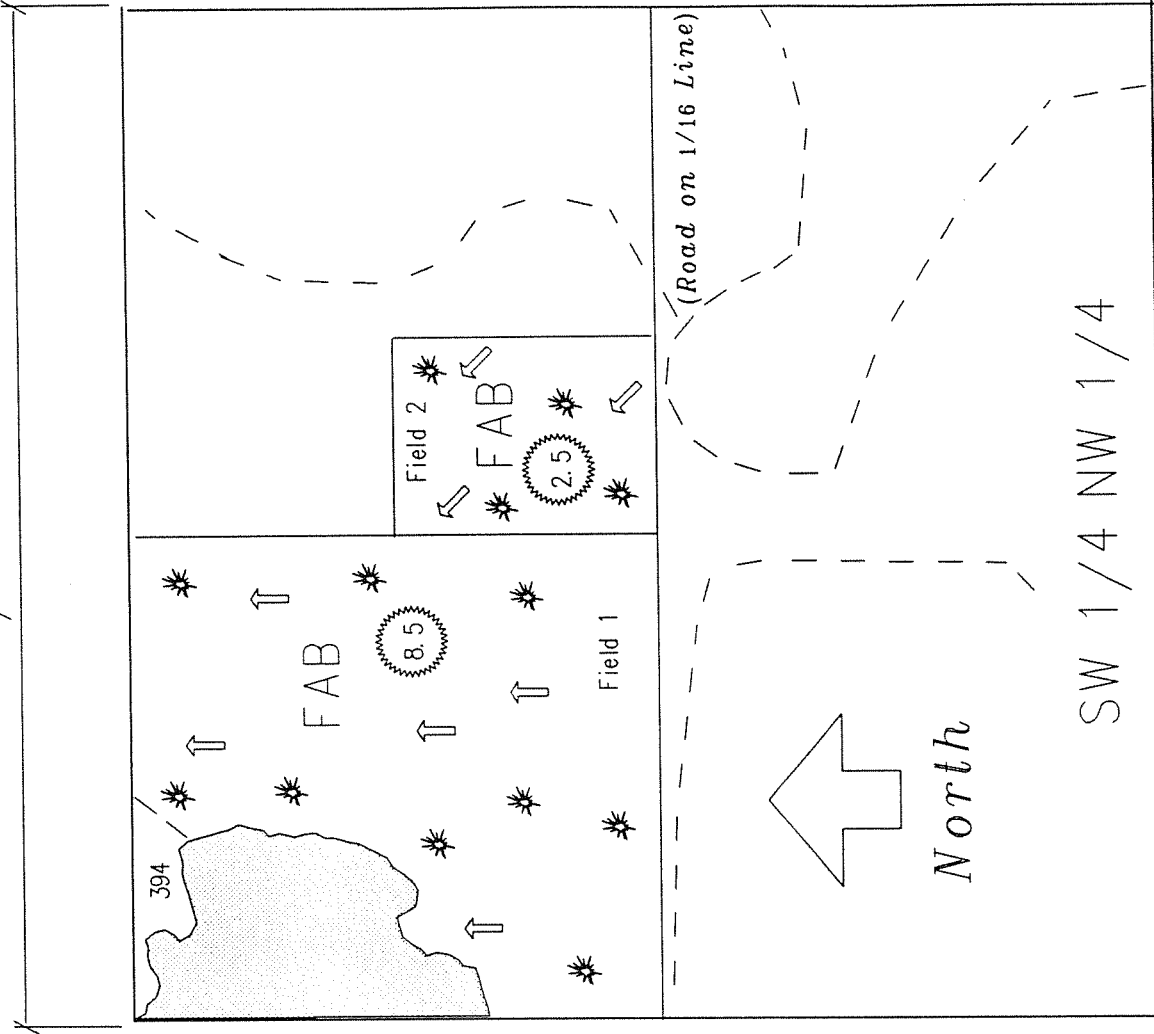
T.7 S., R.13 E.
 Section 14
 Gooding County

FIGURE 1

1/4 MILE

Legend:

- ↔ Furrow Direction
- FAB Soil Type
- - - Soil Type Division Line
- 1/4 1/4 Line
- 8 Irrigated Acres
- * Pasture
- Not Included



Water Right No. 36-00108B

Table 1

80th Percentile values of monthly ET estimated for
the Hagerman Valley adjusted from the Bliss Station
(mm/day)

	MO	ETR	ALFH.	BEANS	F.CRN	SILGE	S.CRN	PEAS	POTAT	SBEET	SGRAN	WGRAN	PAST.	VEGES
AVE ET	4	5.28	3.30					1.60	1.58	1.58	1.65	4.82	3.27	
TMP ADJ	4	5.68	3.55					1.72	1.70	1.70	1.77	5.18	3.52	
ALT ADJ	4	5.75	3.59					1.74	1.72	1.72	1.80	5.25	3.56	
STDD ET	4	0.47	0.29					0.14	0.14	0.14	0.15	0.43	0.29	
ADJ STDD	4	0.80	0.49					0.24	0.24	0.24	0.26	0.73	0.49	
80PCT ET	4	6.42	4.01					1.94	1.92	1.92	2.01	5.86	3.97	
AVE ET	5	6.79	6.29	2.04	2.04	2.04	2.04	3.85	2.19	2.04	5.11	6.79	5.23	2.07
TMP ADJ	5	7.18	6.65	2.16	2.16	2.16	2.16	4.07	2.31	2.16	5.40	7.18	5.53	2.19
ALT ADJ	5	7.27	6.73	2.18	2.18	2.18	2.18	4.12	2.34	2.18	5.47	7.27	5.60	2.21
STDD ET	5	0.49	0.46	0.15	0.15	0.15	0.15	0.28	0.16	0.15	0.37	0.49	0.38	0.15
ADJ STDD	5	0.80	0.75	0.25	0.25	0.25	0.25	0.46	0.26	0.25	0.61	0.80	0.62	0.25
80PCT ET	5	7.94	7.37	2.39	2.39	2.39	2.39	4.51	2.56	2.39	5.98	7.94	6.12	2.42
AVE ET	6	8.41	7.32	3.26	3.66	3.66	3.53	6.82	5.77	3.91	8.39	8.41	6.47	4.40
TMP ADJ	6	8.82	7.68	3.42	3.84	3.84	3.70	7.15	6.05	4.10	8.80	8.82	6.79	4.62
ALT ADJ	6	8.93	7.77	3.46	3.89	3.89	3.75	7.24	6.13	4.15	8.91	8.93	6.87	4.67
STDD ET	6	0.47	0.41	0.18	0.21	0.21	0.20	0.38	0.32	0.22	0.47	0.47	0.36	0.25
ADJ STDD	6	1.27	1.11	0.49	0.57	0.57	0.54	1.03	0.86	0.59	1.27	1.27	0.97	0.68
80PCT ET	6	10.00	8.71	3.87	4.36	4.36	4.20	8.11	6.85	4.65	9.98	10.00	7.69	5.24
AVE ET	7	8.54	6.94	7.37	7.68	7.68	7.47	2.99	7.17	8.14	7.05	6.80	6.57	6.57
TMP ADJ	7	8.89	7.22	7.67	7.99	7.99	7.78	3.11	7.46	8.47	7.34	7.08	6.84	6.84
ALT ADJ	7	9.00	7.31	7.77	8.09	8.09	7.87	3.15	7.56	8.58	7.43	7.17	6.92	6.92
STDD ET	7	0.26	0.21	0.23	0.24	0.24	0.23	0.09	0.22	0.25	0.22	0.21	0.20	0.20
ADJ STDD	7	0.58	0.47	0.51	0.53	0.53	0.51	0.20	0.49	0.56	0.49	0.47	0.44	0.44
80PCT ET	7	9.49	7.71	8.20	8.54	8.54	8.30	3.32	7.97	9.05	7.84	7.56	7.30	7.30
AVE ET	8	7.18	5.41	4.97	6.63	6.63	6.38		5.57	7.06	1.47	1.32	5.53	5.72
TMP ADJ	8	7.50	5.65	5.19	6.92	6.92	6.66		5.82	7.37	1.53	1.38	5.77	5.97
ALT ADJ	8	7.59	5.72	5.25	7.01	7.01	6.74		5.89	7.46	1.55	1.40	5.84	6.05
STDD ET	8	0.33	0.25	0.23	0.30	0.30	0.29		0.26	0.32	0.07	0.06	0.25	0.26
ADJ STDD	8	0.70	0.53	0.49	0.64	0.64	0.62		0.55	0.68	0.15	0.13	0.53	0.55
80PCT ET	8	8.18	6.17	5.66	7.54	7.54	7.26		6.35	8.04	1.68	1.50	6.29	6.51
AVE ET	9	5.60	3.67	0.77	4.19	4.19			3.29	4.86			4.32	3.83
TMP ADJ	9	5.90	3.87	0.81	4.42	4.42			3.47	5.12			4.55	4.04
ALT ADJ	9	5.97	3.92	0.82	4.47	4.47			3.51	5.19			4.61	4.09
STDD ET	9	0.41	0.27	0.06	0.31	0.31			0.24	0.36			0.32	0.28
ADJ STDD	9	0.66	0.43	0.10	0.50	0.50			0.39	0.58			0.52	0.45
80PCT ET	9	6.53	4.28	0.90	4.89	4.89			3.84	5.67			5.04	4.47
AVE ET	10	3.73	1.26		1.04					2.48			2.88	
TMP ADJ	10	4.02	1.36		1.12					2.67			3.10	
ALT ADJ	10	4.07	1.37		1.13					2.70			3.14	
STDD ET	10	0.35	0.12		0.10					0.24			0.27	
ADJ STDD	10	0.47	0.16		0.14					0.32			0.36	
80PCT ET	10	4.46	1.51		1.25					2.98			3.45	

ET and standard deviation data (AVE ET and STDD ET) for Bliss weather station taken from Appendix E (unpublished) of Brockway, C.E., and R.G. Allen, 1983, Estimating Consumptive Irrigation Requirements for Crops in Idaho, Idaho Water and Energy Resources Research Institute.

Adjustments to standard deviation (ADJ STDD) based on Allen & Brockway Report, pp. 18, and Allen, R.G., and J.L. Wright, 1983, Variation Within Measured and Estimated Consumptive Use Requirements, Proceedings of the Irrigation and Drainage Specialty Conference of the American Society of Agricultural Engineers, Jackson Hole, Wyoming, July 20-22, 1983, pp. 1-12.

Temperature adjustment (TMP ADJ) based on temperature differences between Bliss and Hagerman and temperature sensitivity of ET estimates given in Brockway, C.E., G.S. Johnson, J.L. Wright, and A.L. Coiner, 1985, Remote Sensing for Irrigated Crop Water Use - Phase 1, Water Resources Research Institute, pp. 101-107.

Altitude adjustment (ALT ADJ) based on Doorenbos, J., and W.O. Pruitt, 1977, Crop Water Requirements, Food and Agriculture Organization of the United Nations, p. 59.

80th percentile ET values (80PCT ET) calculated based on Walpole, R.E., and R.H. Meyers, 1985, third edition, PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS, New York: Macmillan Publishing Company, pp. 132-144 and 574.

Table 2

SOIL CHARACTERISTICS initials: JP

date: 11/20/92

Soil Type = FAB + FAC + FKE-1
Source of Soils Data = SCS - GOODING

LFS

soil depth (inches)		AWC (in/in)		PH		organic (%)		soil depth (ft)	AWC (inches)	intake family	
lower	upper	lower	upper	lower	upper	lower	upper			flood	furrow
0	7	0.09	0.1	7.9	8.4	0.6	0.9	1	1.14	3	0.7
7	61	0.09	0.1					2	2.28		
								3	3.42		
								4	4.56	alternate	
								5	5.70	method	
										3	0.7

Management Allowed Deficit (MAD)

crop	root depth (ft)	stress point	MAD (inches)
alfalfa (hay or seed)	5	0.5	2.85
corn (field or silage)	4	0.5	2.28
grain (winter or spring)	4	0.5	2.28
pasture (or grass hay)	3	0.5	1.71
other (enter below)			
beets	5	0.5	2.85
mint	3	0.5	1.71
beans	2	0.4	0.91
potatoes	3	0.35	1.20

For definition of terms, refer to the sections called NET IRRIGATION APPLICATION and IRRIGATION APPLICATION SYSTEMS of the IDWR report titled Report Regarding Evaluation of Irrigation Diversion Rates, dated July, 1996.

Table 3

	INTAKE FAMILY	DESIGN APPLIC. Inches	FURROW SLOPE Ft/Ft	FURROW SPACING Feet	FURROW LENGTH Feet	INFLOW RATE Gpm	APPROXIMATE INFLOW TIME Hours	ADVANCE TIME Minutes	GROSS	NET	DEEP PERC. In.	IRRIGATION EFFICIENCY %	
									IRRIGATION	IRRIGATION			
									APPLICATION Inches	APPLICATION Inches			RUNOFF Inches
Id 1	0.70	1.71	.005	2.50	650	8.0	8	141.3	3.79	3.11	0.04	2.04	45.11
	0.70	1.71	.005	2.50	650	7.5	12	159.1	5.33	4.44	0.25	3.37	32.08
	0.70	1.71	.005	2.50	650	6.0	24	255.9	8.53	7.39	0.27	6.55	20.05
	0.70	1.71	.005	2.50	325	3.5	8	91.1	3.32	2.93	0.04	1.57	51.56 *
	0.70	1.71	.005	2.50	325	3.5	12	91.1	4.98	4.17	0.49	2.77	34.37
	0.70	1.71	.005	2.50	325	3.0	24	127.9	8.53	7.02	1.13	5.69	20.05
Id 2	0.70	1.71	.010	2.50	300	3.0	8	51.8	3.08	2.89	0.02	1.35	55.52 *
	0.70	1.71	.010	2.50	300	3.0	12	51.8	4.62	4.01	0.45	2.46	37.01
	0.70	1.71	.010	2.50	300	2.5	24	70.6	7.70	6.67	0.85	5.14	22.21

Use of this program and input requirements are described in the FIELD APPLICATION EFFICIENCY section of the IDWR report titled Report Regarding Evaluation of Irrigation Diversion Rates, dated July, 1996.

FIELD IRRIGATION REQUIREMENT

initials: MS Claimant = Blastock
 date: 06/30/96 Weather Station = Bliss/Hagerman

crop	acres	irrig. system (%)	eff. (%)	Monthly ET (mm/day)												net irrig. app. (in)	ET ratio	irrig. freq. (days)	Gross Irrigation Application (peak period ET/eff. in mm/day)	season (mm/yr)		
				mar	apr	may	jun	jul	aug	sep	oct	AVE IR season (mm/yr)	mar	apr	may						jun	jul
past	8.5	cor	52		3.97	6.12	7.69	7.3	6.29	5.04	3.45		1.71	1.12	5.0	8.55	13.18	16.56	15.72	13.55	10.86	7.43
past	2.5	cor	56		3.97	6.12	7.69	7.3	6.29	5.04	3.45		1.71	1.12	5.0	7.94	12.24	15.38	14.60	12.58	10.08	6.90

Summary 11

8.41 12.97 16.29 15.47 13.33 10.68 7.31

Peak Gross Irrigation Application (mm/day) = 16.29
 On-Farm Irrigation Requirement (cfs/acre) = 0.027
 Total On-Farm Irrigation Requirement (cfs) = 0.30
 Irrigation Diversion Volume (ft/yr) = 0.00
 Total Irrigation Diversion Volume (ac-ft/yr) = 0

State of Idaho)
) ss.
County of Ada)

Marci S. Sterling, being first duly sworn, upon oath, deposes and says:

That I am an Engineer for the Adjudication Bureau of IDWR, that I prepared the foregoing appendix, know its contents, and that the statements contained therein are true to the best of my knowledge and belief.

Marci S. Sterling
Marci S. Sterling

Subscribed and sworn to before me this 1st day of July, 1996.

A. Sherman

Notary Public for Idaho

Residing at: Boise ID

My commission expires: 11-14-1998

Brown.
 claimed- irr.- 4.52 for 31 ac.
 stock- accidental
 rec'd- irr.- 0.72 for 19 ac.
 D.R. = 0.56
 C.L. = 0.16

3E- OBJ.- Vargo- 9/10/1884

HUBBLE
 (Brown, atty.)
 claimed- irr.- 0.20 for 10 ac.
 rec'd- irr.- 0.20 for 5 ac.
 D.R. = 0.20

BUCKEY DITCH

(cat'd from above)
 (lower)

HUBBLE
 claim- irr.- 0.64 for 16 ac.
 rec'd- irr.- 0.64 for 12 ac.
 D.R. = 0.64

91B- no obj. (Fobes)- 9/10/1884

HUBBLE
 claimed- irr.- 0.16 for 4 ac.
 rec'd- irr.- 0.16 for 4 ac.
 D.R. = 0.13
 C.L. = 0.03

108M- Messersmith/Bothwell- 9/10/1884

HUBBLE
 claimed- no records found
 rec'd- irr.- 2.95 for 53.2
 D.R. = 2.81
 C.L. = 0.41

108N- Brooks- 9/10/1884

HUBBLE
 claimed- irr.- 0.06 for 2.3
 rec'd- irr.- 0.16 for 2.3
 D.R. = 0.15
 C.L. = 0.01

108L- Gridlev- 9/10/1884

HUBBLE
 claimed- irr.- 1.46 for 5 ac.
 rec'd- irr.- 0.17 for 3 ac.
 D.R. = 0.16
 C.L. = 0.01

BJ- Lord- 9/10/1884

Brown, atty.)
 claimed- irr.- 0.40 for 20 ac.
 stock- irr.- 0.12 for 3 ac.
 rec'd- irr.- 0.12 for 3 ac.
 C.L. = 0.03

SJ- OBJ.- Simcoe- 9/10/1884

Brown, atty.)
 claimed- no record found
 stock- irr.- 0.40 for 9 ac.
 rec'd- irr.- 0.34
 D.R. = 0.34
 C.L. = 0.06

6- OBJ.- Brown- 3/30/1884

HUBBLE
 claimed- irr.- 2.40 for 40 ac.
 stock- 0.05 (125 range)
 rec'd- irr.- 1.05 for 40 ac.
 stock- 0.05 summer
 0.24 winter
 C.L. = 0.19
 D.R. = 0.86

- no obj. (Peterson)- 3/30/1884

claimed- irr.- 2.40 for 34 ac.
 rec'd- irr.- 0.87 for 34 ac.
 C.L. = 0.19

C- OBJ.- Babington- 9/10/1884

Brown, atty.)
 claimed- irr.- 0.30 for 10 ac.
 rec'd- irr.- 0.30 for 10 ac.
 C.L. = 0.10

OBJ.- Simcoe- 9/10/1884

Brown, atty.)
 claimed- irr.- 0.80 for 40 ac.
 rec'd- irr.- 0.80 for 40 ac.

35E- OBJ.- Brown- 9/10/1884

AMNESTY
 claimed- 3/8/1902
 irr.- 0.24 for 8 ac.
 rec'd- irr.- 0.10 for 3 ac.
 C.L. = 0.04
 (combined with 34E)
 (8 ac. place of use)

35C- no obj. (Vargo)- 9/10/1884

claimed- 3/8/1902
 irr.- 0.02 for 0.5 ac.
 rec'd- dom.- 0.02

35C- no obj. (Hoffman)- 9/10/1884

claimed- 9/4/1884
 dom.- 0.02
 rec'd- dom.- 0.02

35H- no obj. (Drage)- 9/10/1884

claimed- records not found
 rec'd- irr.- 0.20 for 5 ac.
 C.L. = 0.10

87- no obj. (Peterson)- 3/30/1884

HUBBLE
 claimed- irr.- 2.40 for 31 ac.
 rec'd- irr.- 2.40 for 31 ac.
 D.R. = 1.55
 C.L. = 0.85

3A- OBJ.- Rea- 9/10/1884

(Brown, atty.)
 claimed- irr.- 1.60 for 13 ac.
 stock- 0.04 (19 range)
 rec'd- irr.- 0.41 for 13 ac.
 stock- 0.02 summer
 0.17 winter
 C.L. = 0.15

35B- OBJ.- Sturtevant- 9/10/1884

claimed- irr.- 0.60 for 13 ac.
 rec'd- irr.- 0.30 for 13 ac.
 C.L. = 0.04

3B- OBJ.- Kingston- 9/10/1884

(Brown)
 claimed- irr.- 7.16 for 129 ac.
 stock- 0.05 (200 range)
 fish- 7.16
 rec'd- irr.- 5.00 for 129 ac.
 stock- 0.05 summer
 1.80 winter
 D.R. = 3.25
 C.L. = 1.75

3K- no obj. (Gardner)- 9/10/1884

(Brown, atty.)
 claimed- irr.- 0.71 for 10 ac.
 rec'd- record not found

3L- no obj. (Babington)- 9/10/1884

(Brown, atty.)
 claimed- irr.- 1.97 for 27.5 ac.
 stock- 0.04
 fish- 4.00
 rec'd- record not found

3M- no obj. (Simcoe)- 9/10/1884

(Brown, atty.)
 claimed- irr.- 1.32 for 18.5 ac.
 rec'd- record not found

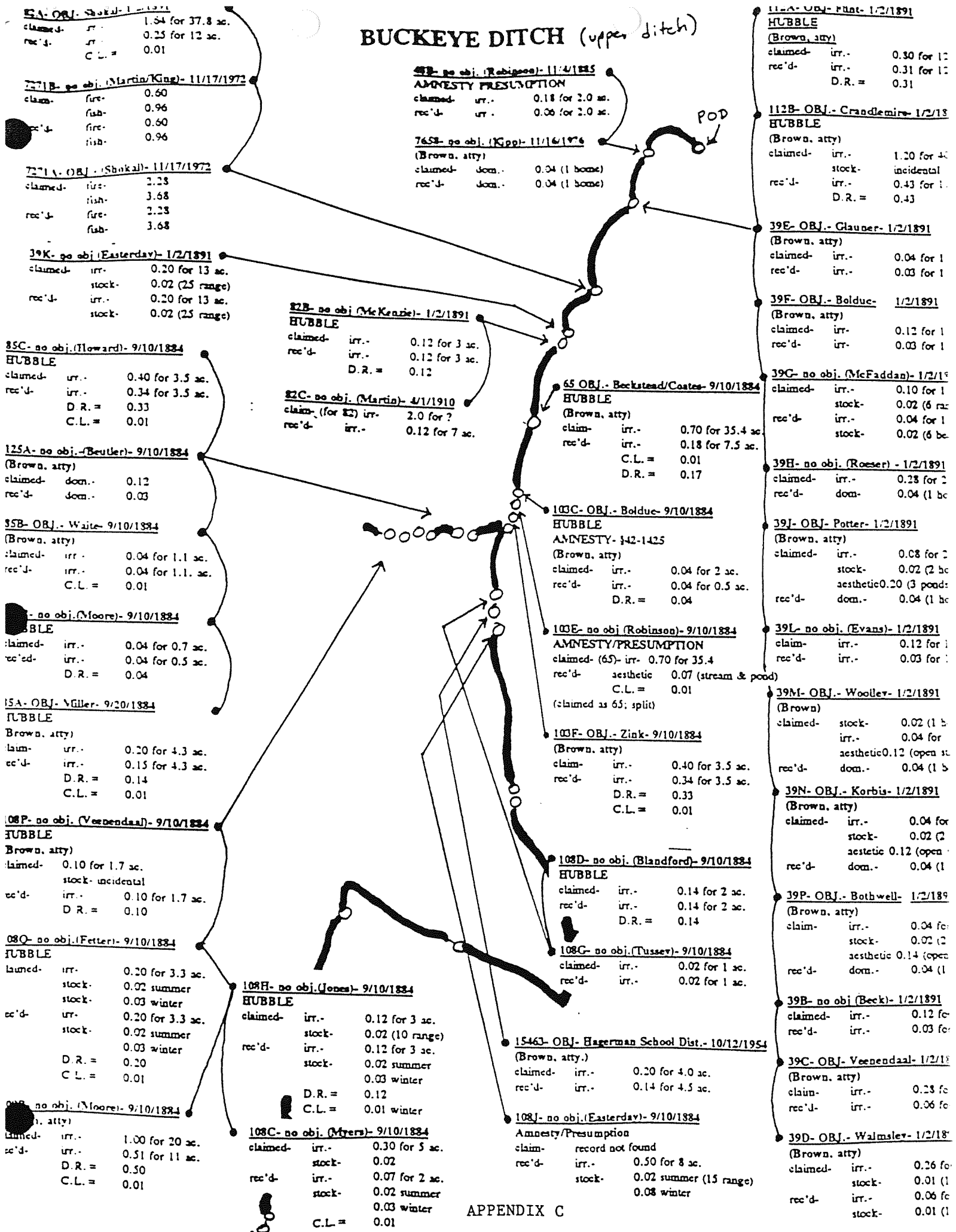
3D- no obj. (Harrison)- 9/10/1884

HUBBLE
 claimed- irr.- 0.24 for 10 ac.
 rec'd- irr.- 0.24 for 2 ac.
 D.R. = 0.24

3H- OBJ.- Buckeye Farms- 9/10/1884

(Rosholt, atty.)
 claimed- irr.- 12.0 for 445
 rec'd- irr.- 3.37 for 224
 C.L. = 3.89
 (combined with I)

BUCKEYE DITCH (upper ditch)



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IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT
OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA	)	Subcase No. 36-00108B
	)	
Case No. 39576	)	AFFIDAVIT OF STEVE CLELLAND
	)	REGARDING CLAIM NO. 36-00108B
	)	

STATE OF IDAHO	)
	) ss.
County of Twin Falls	)

I, STEVE CLELLAND, being first duly sworn on oath, depose and state as follows:

1. I am a Senior Water Resource Agent with the Idaho Department of Water Resources (IDWR).
2. My work address is Idaho Department of Water Resources (IDWR), Southern Regional Office, 222 Shoshone St. East, Twin Falls, ID 83301-6105. I reside in Twin

Falls, Idaho.

3. My educational background and work history both outside and within IDWR are detailed in my Affidavit of Steve Clelland as to the Investigation of Claims in the Hagerman Area.

4. As part of my duties as a senior water agent, I investigated the acreage claimed as irrigated pursuant to claim no. 36-00108B. The pertinent details of that investigation are as follows:

A On July 26, 1990, IDWR water agent Helen Thornton and I conducted a field examination for the purpose of determining the irrigated acreage claimed pursuant to claim no. 36-00108B.

B. During that field examination, I observed that within the claimant's property boundary there were three parcels. The two westernmost and lower parcels were irrigated. However, I observed that the easternmost and upper parcel was not irrigated and that no system existed to deliver water to that parcel. This easternmost parcel contained buildings, equipment, storage areas, and rocky areas and did not contain a lawn or garden.

C. I observed that the ASCS map from 1977 showed the two westernmost and lower parcels as irrigated. That ASCS map showed the total irrigated acreage of those two parcels to be 10.2 acres.

D. I observed that the ASCS map from 1987 showed the two westernmost and lower parcels as irrigated. That ASCS map showed the total irrigated acreage of those two parcels to be 9.5 acres.

E. I observed that both the ASCS map from 1977 and the ASCS map from 1987 did show a portion of the easternmost, upper parcel as irrigated. However, as stated above, during the field examination I had observed that this easternmost parcel was not irrigated and had not been irrigated for some time.

F. Using an orthophoto quad from 1974 and the grid system described in Appendix A to IDWR's Report Regarding Claim to Water Right No. 36-00108B, I estimated the acreage of the two irrigated westernmost and lower parcels to be 11 acres.

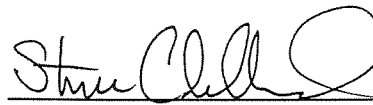
5. As part of my duties as a senior water agent, I investigated the quantity of water delivered pursuant to claim no. 36-00108B. The pertinent details of that investigation are as follows:

A. On July 17, 1992, I contacted the claimant, Ms. Alma Blastock to discuss irrigation methods and types of crops grown on the claimed place of use. During that conversation, she indicated that Mr. Walter "Butch" Bonning irrigated her property and suggested that I contact him.

B. On July 21, 1992 I spoke with Mr. Bonning. He indicated that the lower westernmost parcel of the three earlier described was irrigated by corrugations. He indicated that the upper middle parcel of those three was irrigated by flood.

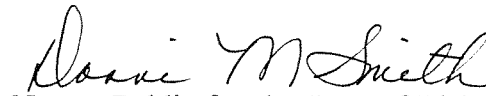
C. During that conversation, Mr. Bonning also indicated that both irrigated tracts were planted with pasture.

DATED this 1st day of July, 1996.



STEVE CLELLAND

SUBSCRIBED AND SWORN to before me this 1st day of July, 1996.


Notary Public for the State of Idaho
Residing at: 725 S. Boise
My commission expires: 12-5-2000

CLIVE J. STRONG
Deputy Attorney General
Chief, Natural Resources Division

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IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT
OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF TWIN FALLS

In Re SRBA	)	Subcase No. 36-00108B
	)	
Case No. 39576	)	AFFIDAVIT OF HELEN THORNTON
	)	REGARDING CLAIM NO. 36-00108B
	)	
STATE OF IDAHO	)	
	) ss.	
County of Ada	)	

I, HELEN THORNTON, being first duly sworn on oath, depose and state as follows:

1. I am currently a Hydrogeologist with the Idaho Department of Water Resources (IDWR). At the relevant time for purposes of this affidavit, I was employed as a Senior Water Resource Agent with IDWR.

2. My work address is Idaho Department of Water Resources (IDWR), 1301 N. Orchard, Boise, ID 83706. I reside in Boise, Idaho.

3. My educational background and work history both outside and within IDWR are detailed in my Affidavit of Helen Thornton as to the Investigation of Claims in the

Hagerman Area.

4. As part of my duties as a senior water agent, I investigated the acreage claimed as irrigated pursuant to claim no. 36-00108B. The pertinent details of that investigation are as follows:

A. On July 26, 1990, IDWR water agent Steve Clelland and I conducted a field examination for the purpose of determining the irrigated acreage claimed pursuant to claim no. 36-00108B.

B. During that field examination, I observed that within the claimant's property boundary there were three parcels. The two westernmost and lower parcels were irrigated. However, I observed that the easternmost and upper parcel was not irrigated and that no system existed to deliver water to that parcel. This easternmost parcel contained buildings, equipment, storage areas, and rocky areas and did not contain a lawn or garden.

DATED this 1st day of July, 1996.

Helen L. Harrington-Thornton
HELEN L. HARRINGTON-THORNTON

SUBSCRIBED AND SWORN to before me this 1st day of July, 1996.

Bernie McCarthy
Notary Public for the State of Idaho
Residing at: Boise ID
My commission expires: 5-16-2007