

**SUPPLEMENTAL DIRECTOR'S REPORT REGARDING
SUBCASE NO. 63-5073**

In RE SRBA
Twin Falls County Civil Case No. 39576

Report to the SRBA District Court

Prepared by the Idaho Department of Water Resources
David R. Tuthill, Jr., Director
Donald V. Shaff, Adjudication Bureau Chief

March 31, 2008

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I. INTRODUCTION

In accordance with Idaho Code § 42-1412(4), Administrative Order 1, and Special Master Booth's February 28, 2008, *Order Requesting 706 Report from IDWR and Amended Trial Scheduling Order*, the Director of the Idaho Department of Water Resources ("IDWR" or "Department") submits this Supplemental Director's Report ("Report") regarding subcase number 63-5073, setting forth the basis for the Department's recommendation for this water right. The Report was prepared under the supervision of David R. Tuthill, Jr., Director, and Donald V. Shaff, Adjudication Bureau Chief.

The following employees have knowledge of the information contained in the Report: Jan Shurte, Water Rights Supervisor; David R. Tuthill, Director, has information concerning IDWR's policy concerning limitations on the number of connections on multi-unit diversion systems.

II. SUMMARY OF THE ISSUES

At issue is the Department's recommendation for a heating and domestic right currently owned by Boise Warm Springs Water District. In its Director's Report for Irrigation and Other Uses in Basin 63, Part 2 filed on December 15, 2005, the Department recommended water right number 63-5073. This recommendation was based on a beneficial use claim. The major issues in dispute concerning this subcase involve the quantity and place of use elements.

III. DISCUSSION

Claim number 63-5073 was originally filed by the Boise Warm Springs Water District as a statutory claim, pursuant to Idaho Code §42-243, on April 22, 1983. See

Exhibit 1. The statutory claim was based upon a posted notice, dated November 24th, 1899¹, by the Artesian Hot & Cold Water Company, Ltd., giving notice of the appropriation of 4.273 cfs of water from each of three wells, for domestic, bathing, heating and irrigation and sprinkling purposes. See Exhibits 2 and 3. The posted notice asserted a priority date of November 5, 1894. The asserted diversion rate of the three wells specified on the posted notice together totaled 12.819 cfs (3 wells @ 4.273 cfs per well = 12.819 cfs). This total diversion rate is what was claimed on the statutory claim.

The original SRBA Claim for water right 63-5073 was filed on July 14th, 1989. See Exhibit 4. Like the statutory claim, it identified three wells, but unlike the statutory claim, it specified one well was inactive at the time. While it broke the heating and domestic quantities claimed into two separate components, it claimed the same total diversion rate of 12.819 cfs asserted in the statutory claim. It also specified that there were a total of 266 domestic and residential connections on the delivery system.

An amended SRBA Claim was filed on March 17, 1995. See Exhibit 5. Its description of the diversion works listed three wells and pipeline.² Rather than specifying

¹ It appears that there were two posted notices that actually were filed, one on November 24th, and the second one on the following day. See Exhibits 2 and 3. However, the two notices appear to be essentially identical, the one on the 24th merely attesting that it was a duplicate of the actual notice posted on the property where the points of diversion are located.

² At pp. 9 and 19 of his June, 1998, report entitled "Production, Temperature, and Water Level Data for the Four Heating Systems in the Boise Front Low Temperature Geothermal Resource Area, 1977 – 1997," Ken Neely clarifies the situation with regard to how many production wells are actually used by the Boise Warm Springs Water District. He notes that two wells were originally drilled, in 1890 and 1891, respectively, but that a third well was not drilled until 1981. The third well is used only for monitoring water levels and not for production. See Exhibit 6. Thus it appears that the posted notice discussed above, even though it refers to three wells, only covers the two wells that were already drilled at the time the notice was posted and recorded in 1899. Since the third well was not drilled until 1981, IDWR thinks it is unlikely that the posted notice reference to a third well is sufficient to bootstrap the third well onto an 1894 priority date, particularly since the statutory method for perfecting water rights has changed several times since 1899. Since the posted notice specifies a diversion rate of 4.273 cfs for each of the wells, and only two wells had been contemporaneously developed, the posted notice appears to limit coverage of the 1894 priority date to only a total diversion rate of 8.546 cfs (2 wells @ 4.273 cfs each). If the diversion rate of either of the wells has exceeded 4.273 cfs, the quantity developed about that diversion rate likely would be subject to a junior priority date as of the date the additional capacity was developed. In any event IDWR

a number of commercial and residential connections, it simply stated “Low temperature geothermal use for customers in the district.” It recombined the separate domestic and heating components into a single listing claiming a total of 12.819 cfs for both uses together.

Upon his investigation of the claim, Senior Water Resource Agent Mel Schulte recommended a total diversion rate of 3.75 cfs, a total diversion volume of 958 AFY, and a limitation of 266 residential or commercial hook-ups. See Exhibit 7. Anticipating an objection by the claimant, Mr. Schulte summarized his rationale for recommending each of these items in a June 28, 2005, memorandum to the claim file. See Exhibit 8.

Since it is IDWR’s understanding that only these three items have been objected to by claimant Boise Warm Springs Water District, it will discuss below the basis for its recommendation of only those three items, and will not address the uncontested elements of the right.

A. Diversion Rate

Mr. Schulte determined the diversion rate based upon information provided by the claimant. By memorandum dated March 8, 2005, Mr. Bob Sutter, a member of the Board of Directors of the Boise Warm Springs Water District, outlined information contained in a 1989 report by Mr. Robert Griffiths, P.E., entitled “Boise Warm Springs Water District Geothermal Production 1977-1989,” attaching to the memo a portion of the report. See Exhibit 9. The memo and the attached portion of the report address pumping rate data. The five highest daily pumping rates, in gallons per minute, listed in the report were identified. These all occurred during the months of December through February, during

has yet received no information indicating that Boise Warm Springs Water District has ever diverted 8.546 cfs, let alone the 12.819 cfs that has been claimed.

periods of very cold weather, since it was logical that the system would divert the most water during periods of time when demand for space heating would be the highest. In the memo, these five highest daily readings were then averaged, resulting in a diversion rate of 3.75 cfs. This is the diversion rate recommended by Mr. Schulte.

B. Diversion Volume

To determine the annual diversion volume, Mr. Schulte relied on annual diversion volume data for the Boise Warm Springs Water District listed in Ken Neely's 1998 report. See Exhibit 6 at p. 16. The largest annual diversion volume contained in the data analyzed by Mr. Neely was 312.2 million gallons in 1979. This was the volume recommended by Mr. Schulte, who converted the measurement unit to acre feet (312.2 million gallons per year = 958 AFY).

C. Limitation on Number of Hook-ups

In the "explanatory material" section³ of the recommendation of this right Mr. Schulte included a remark in effect putting a cap of 266 on the number of residential and commercial connections to the system.

The genesis of including this remark on the water right description lies in IDWR's policy of listing the number of residential units on a multi-unit domestic right. See IDWR's electronic Claims Investigation Handbook, Chapter 6, Section IIE, at 5. (Exhibit 10). IDWR developed this approach because in a multiple household system a volumetric limiter may not be precise enough to define the quantity with sufficient specificity to prevent enlargement of the use. Since an increase in the number of users on

³ Because this remark is in the explanatory material section of the water right description, it is in a data field that is retained by IDWR as a depository for additional information it may need in administering the right. Remarks in the explanatory material section of the water right description are not included on the partial decree. IDWR understands that the claimant objects to the inclusion of this remark even in the explanatory material section of the recommendation.

a domestic system typically increases the total quantity of the use, IDWR has found that an enumeration of the number of households or hook-ups is an indicator of enlargement that is easy to understand and apply.

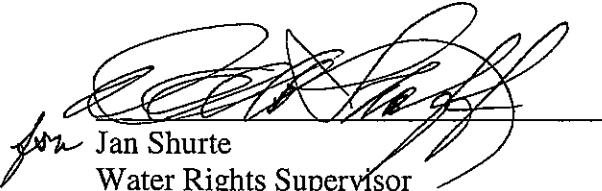
In determining the number of connections the agent had information from three sources. First, the statutory claim filed in 1983 specified that the system served the State of Idaho Department of Health and Department of Agriculture laboratories, 238 households for space heating, and 207 households for domestic supplies. See Exhibit 1. Second, the original SRBA claim filed in 1989 specified 266 service connections. See Exhibit 4. Third, at p. 10 of his report, Ken Neely listed 226 homes and 36 commercial buildings, for a total of 262 connections in 1998. See Exhibit 6. Fourth, in an undated memo received by IDWR on March 29, 2005, Bob Sutter enumerated a total of 351 service connections, but this number included connections that had been shut off or disconnected. See Exhibit 11. In comparing and contrasting these numbers the agent concluded that the 266 connections specified in the 1989 SRBA claim was likely the best descriptor of the number of connections in use on the date of commencement of the adjudication in 1987. See Exhibit 8. Therefore he recommended that number.

IV. CONCLUSION

The data used by Mr. Schulte in recommending the contested elements of this right was provided by, or recorded by, the claimant. That data in general dates only from the 1970s forward since it is the relatively recent data that is readily available for review. In utilizing this data Mr. Schulte recommended what the data showed to be representative of the peak diversion rate and volume produced by the system during the years for which the data was available, as well as what he believed to be a reasonable estimate of the

number of service connections being used in 1987. IDWR understands that Boise Warm Springs Water District has older data in its possession, and that data has been represented to IDWR as demonstrating that a larger quantity of water historically has been diverted. At such time as it should be provided this data, IDWR will review it carefully to determine if it justifies an amendment to the current recommendation.

Submitted this 31st day of March, 2008.


for Jan Shurte
Water Rights Supervisor

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I served a true and correct copy of the following described document on the persons listed below by United States mail with the correct postage affixed thereto on this 31st day of March, 2008

Document Served: **SUPPLEMENTAL DIRECTOR'S REPORT REGARDING
WATER RIGHT NUMBER 63-5073**

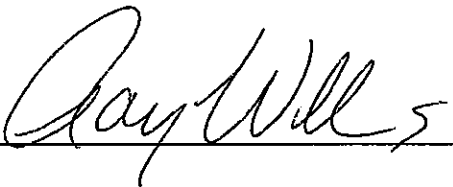
BOISE WARM SPRINGS WATER DIST

Represented by:
BRUCE M. SMITH
950 W BANNOCK STE 520
BOISE, ID 83702

CITY OF BOISE

Represented by:
ROBERT A. MAYNARD
PERKINS COIE LLP
251 E FRONT ST, STE 400
BOISE, ID 83702-7310

DIRECTOR OF IDWR
PO BOX 83720
BOISE, ID 83720-0098



A handwritten signature in cursive script, appearing to read "Ray Williams", is written over a horizontal line.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

CLAIM TO A WATER RIGHT



Under the provisions of Section 42-243, Idaho Code, any person using or claiming rights to the public waters of Idaho established by diversion and application to a beneficial use must file a claim with the Department of Water Resources on or before June 30, 1983. Exempted from this filing are single family domestic uses as defined in Section 42-230(d), Idaho Code. Also exempted are rights represented by a permit, license, decree, adjudicated right, or a previously filed claim.

The filing of this claim does not confirm the water right claimed but failure to file may result in forfeiture of a water right.

Notice is hereby given that Boise Warm Springs Water District
(Name of Claimant)
P.O. Box 114, Boise, Idaho 83701 Telephone No. 342-3162
(Mailing Address) (Zip Code)

claims a right to the diversion and beneficial use of the surface or ground water. The extent and nature of said claim is as follows:

- (1) Date of priority: (When was the water first applied to a beneficial use) 05 November 1894

A claim is not acceptable on a ground water source with a priority later than March 25, 1963 or on a surface water source with a priority later than May 20, 1971. An exception is that a claim may be filed on single family domestic use from a ground water source.

- (2) Describe the source of water: (Name of stream, lake, spring, etc., or ground water)

Groundwater tributary to _____

- (3) Describe the purpose for which the water has been used and the time during the year when you have used the right claimed:

	(cfs, gpd, AFA)	(Domestic, Irrigation, Stock, Etc.)	(Both dates inclusive) (Mo., Day) (Mo., Day)	
Quantity	Use	Period of Use	From	To
Quantity <u>12,819 c.f.s.</u>	Use <u>Heating & Domestic</u>	Period of Use	From <u>01 JAN</u>	To <u>31 DEC</u>
Quantity <u>4,273 c.f.s.</u>	Use _____	Period of Use	From _____	To _____
Quantity <u>from each of</u>	Use _____	Period of Use	From _____	To _____
Quantity <u>three wells</u>	Use _____	Period of Use	From _____	To _____
(4) <u>2,664 MGD OR</u>	TOTAL QUANTITY USED.			
(cfs, gpd, AFA) <u>12.8 cfs - TOTAL</u>				

- (5) A) Point of diversion: (Location of point where water is diverted from its source)

SE 1/4 SW 1/4, Sec. 12 Twp. 3 N Rge. 2 E B.M., County of Ada

Additional points of diversion: _____

B) Describe means of diversion of water: (Pump and pipeline, well, diversion dam, reservoir, length of ditch and field, etc.). Give sizes and capacities: be as specific as possible. Describe any changes in the system and give the date of the change. THREE Hot Wells & Pumps and Pipeline.

- (6) A) Describe location of use by listing number of irrigated acres within each 40-acre tract in appropriate box. If use is not for irrigation, place an "X" in appropriate box to show location.

T	R	SEC.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				TOTAL
			NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	NE 1/4	NW 1/4	SW 1/4	SE 1/4	
3N	2E	10	X		X	X									X				
		11							X	X	X	X	X	X	X	X	X	X	
		12											X				X		
		13					X	X											
		14	X																

No. of acres _____

B) If water is used for other than irrigation, fully describe that use, being as specific as possible: State of Idaho Department of Health & Agriculture Laboratories, 238 Households for Space Heating; 207 Households for Domestic Supplies

NOTE: Include here the type and number of stock watered: _____

- (7) If you are claiming water as a member of an organization, list name of organization: _____

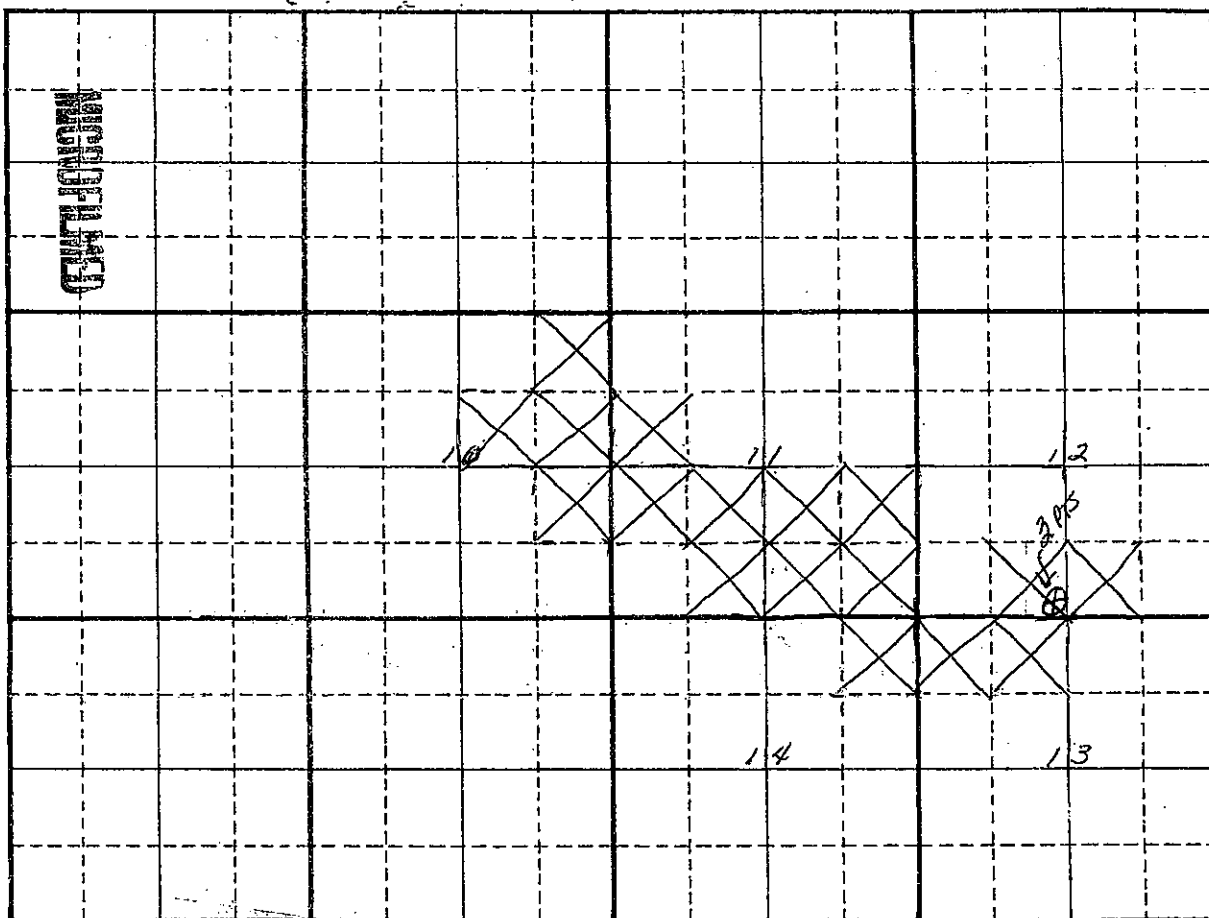
SCANNED

OCT 18 2002

EXHIBIT

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(8) Remarks



Scale: 2 inches equal 1 mile

Map should show the location of the point of diversion and the place of use of the water by 40-acre subdivisions, section, township and range of the public land survey system.

State of Idaho)
County of Ada) ss.

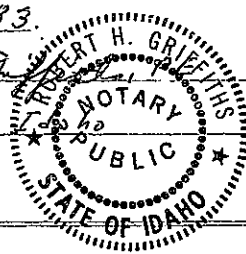
Be it known that the undersigned, being duly sworn, deposes and says that he, she, they subscribed the foregoing claim to a water right, together with all attached information, and that the matters and facts therein are true to the best of the affiant's knowledge.

Terence O'Rourke
Boise Warm Springs Water District

(Claimant)

Sworn to before me this 22nd day of April, 19 83.

Robert H. Grieths
Notary Public
Residing at Boise, Idaho



My commission expires _____

FOR DEPARTMENT USE ONLY

Received by mm Date 5-12-83 Exception filed by: _____ Date _____
Prelim. check by jo Date 6-14-83 # 4-19-84
Published in Idaho Statesman Date 5-12-83 # 28823
Dates 6/30, 7/7/83

30-

ARTESIAN WELLS
APPROPRIATED BY
A.H. & C. WATER CO. #

NOTICE OF WATER RIGHT
LOCATION.

TO WHOM IT MAY CONCERN:
Notice is hereby given that the ARTESIAN HOT AND COLD WATER COMPANY, Limited, a corporation organized under the laws of the State of Idaho, with its principal place of business at Boise City, in Ada County, in said State, has appropriated and does hereby claim the waters flowing from three artesian wells near which this notice is posted, and each and every of said wells, to the extent of four and two hundred and seventy-three one thousandths cubic foot per second of time, which said wells through and by means of which said water is diverted and appropriated are situated in the South-east quarter of the South-east quarter of the South-west quarter of Section Twelve (12) in Township Three (3) North, Range Two (2) East of Boise Meridian, in Ada County, State of Idaho.

That the purposes for which said water is claimed are for domestic uses and for bathing and heating purposes and to warm the waters of a large plunge or swimming bath at a place of public resort, belonging to said Company, known as the "Natatorium," situated about three thousand feet in a South-westerly direction from said wells; and also for sale for domestic uses and for bathing and heating purposes; and all other purposes for which hot water may be used, and for irrigation and sprinkling in Boise City, in said County and along or near the line of conduit of pipes used in conveying said water from said wells to and through the streets and alleys of Boise City.

That the place or locality of the intended use of said water is at said Natatorium and the grounds surrounding the same, and in said Boise City and along and near the line of the or the conduit and pipes used, or that may be used in conveying said water as hereinafter described.

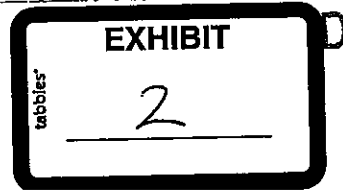
That the general course, length and destination of the conduit or pipes by which it is proposed to divert said water is as follows: Commencing at each of said wells and running North of West about one hundred and sixty feet through separate pipes to a common main pipe; thence South 70 degrees 15 minutes West, 2514 feet to the South side of the public road, known as Warm Springs Avenue; thence Westerly along said Avenue, 300 feet to a Tee in said pipes by which a part of said water is diverted and runs in a South-easterly direction 302 feet to said Natatorium building; and from said Tee running in a Westerly direction along said Warm Springs Avenue 5608 feet to the junction of Idaho Street in Boise City; thence Westerly along Idaho Street 5363 feet to a point 120 feet East of the East line of Thirteenth Street and about 1345 feet from said wells; together with all the lateral pipes and conduits connecting said main conduit with the buildings and premises where said water is or may be used.

Posted or near the point of intended diversion, on the 23d day of November, 1899.
Attest: B.S. Howe
Secretary
Artesian Hot & Cold Water Company, Limited,
Appropriator and Claimant,
By C.W. Moore President.

State of Idaho,)
County of Ada.) ss. Benjamin S. Howe, of Boise City, Ada County, State of Idaho, being first duly sworn, deposes and says; that he of lawful age and is the Secretary of the Artesian Hot and Cold Water Company, Limited, a corporation, and the appropriator and claimant of the water right described in the foregoing notice. That the statements in said notice are true, and that the original notice, of which the foregoing is a true copy was posted in a conspicuous place near the artesian wells of said company, the point of diversion of said water, at five o'clock P.M. of the twenty-third day of November, 1899.

Subscribed and sworn to before me
this twenty-fourth day of November, 1899.
Richard H. Johnson
Notary Public
(SEAL)
B.S. Howe
(U.S.I.R.S.)
(B.S.H.)
(11-24-99)
(10¢ cancelled)

Recorded at the request of B.S. Howe at 2.30 P.M., November 24, 1899.
By (C. K. Higgins) deputy.
Recorder,



ARTESIAN WELLS #
 APPROPRIATED BY #
 A. H. & C. WATER CO. #

NOTICE OF WATER RIGHT LOCATION

TO WHOM IT MAY CONCERN:

Notice is hereby given that the Artesian Hot and Cold Water Company, Limited, a corporation created and existing under the laws of the State of Idaho, with its principal place of business at Boise City, Ada County, in said State heretofore on the 5th day of November, 1899, appropriated and is the owner and claimant of the following described water rights, to-wit: The waters flowing from three artesian wells and each and every of said wells; to the extent of four and two hundred and seventy-three one thousandths cubic feet per second of time; which said wells through and by means of which said water is diverted and appropriated are situated in the South-east quarter of the South-east quarter of the South-west quarter of Section Twelve (12) in Township Three (3) North, Range Two (2) East of Boise Meridian, in Ada County, State of Idaho.

That the location and specific uses for which said water is claimed are for domestic and for bathing and heating purposes and to warm the waters of a large plunge or swimming bath at a place of public resort, belonging to said company, known as the "Natatorium", situated about three thousand feet in a South-westerly direction from said wells; and also for sale for domestic uses and for bathing and heating purposes, and for all other purposes for which hot water may be used, and for irrigating and sprinkling, in Boise City in said County and along or near the line of the conduit or pipes used in conveying said water from said wells to and through the streets and alleys of Boise City, commencing at each of said wells and running North or West about one hundred and sixty feet through separate pipes to a common pipe; thence South 70 degrees 15 minutes West 2514 feet to the South-west corner of the public road known as Warm Springs Avenue; thence Westerly along said Avenue, 300 feet to a tee in said pipe by which a part of said water is diverted and runs in a South-westerly direction, 300 feet to said Natatorium building; and from said tee running in a Westerly direction along said Warm Springs Avenue, 5608 feet to the junction of Idaho Street in Boise City; thence West along Idaho Street, 5362 feet to a point 120 feet East of the east line of Thirteenth Street and about 13945 feet from said wells; together with all the lateral and distributing pipes and conduits connecting said main conduit with the buildings and premises where said water is or may be used.

Dated November 24th, 1899.

Artesian Hot & Cold Water Company,
 Limited,

Attest: H. H. Howe,

Secretary.

Owner and Claimant.
 By C. W. Moore, President.

State of Idaho,)

:- ss.

County of Ada.)

Benjamin S. Howe, of Boise City, Ada County, State of Idaho, being first duly sworn deposes and says: That he is of lawful age and is the Secretary of the Artesian Hot and Cold Water Company, Limited, the corporation named in the foregoing notice and the owner and claimant of the water right described in said notice; and that the statements in said notice are true.

Benjamin S. Howe

Subscribed and sworn to before me this twenty-fifth day of November, 1899.

(SEAL)

Richard H. Johnson
 Notary Public

(U.S.I.R.S.)
 ()
 (Nov. 25, 1899)
 (10¢ cancelled)

MICROFILMED

AUG 20 1992

Recorded at the request of Walter Keefe at 2 P.M., November 25, 1899

By Walter Keefe Recorder, By Walter Keefe Deputy.

EXHIBIT

3

Boise Warm Springs Water District
 2440 OLD PENITENTIARY ROAD
 BOISE IDAHO 83712

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

IN RE THE GENERAL ADJUDICATION
OF RIGHTS TO THE USE OF WATER FROM
THE SNAKE RIVER BASIN WATER SYSTEM

CIVIL CASE NUMBER: 39576
Ident. Number A63-05073
Date Received 7/14/89
Receipt Number C008280 of

NOTICE OF CLAIM
TO A
WATER RIGHT
ACQUIRED UNDER STATE LAW

Please type or print clearly

1. Name of Claimant (s) Boise Warm Springs Water District Phone (208) 342-3162

Mailing Address 2440 Old Penitentiary Road Zip 83712

2. Date of Priority (Only one (1) per claim) 05 November 1894 Boise, Idaho

3. Source of water supply (a) Boise Geothermal Aquifer
which is tributary to (b) _____

4. a. Location of existing point of diversion is: Township 3 N Range 2 E Section 12,
SE 1/4 of SE 1/4 of SW 1/4, Govt. Lot, _____ B.M., County of Ada

Additional points of diversion if any: _____

b. If instream flow, beginning point of claimed instream flow is:

Township _____ Range _____ Section _____, _____ 1/4 of _____ 1/4 of _____ 1/4,

Govt. Lot _____ B.M., County of _____

ending point is: Township _____ Range _____ Section _____, _____ 1/4 of _____ 1/4 of _____

_____ 1/4, Govt. Lot _____ B.M., County of _____

5. Description of existing diversion works (Dams, Reservoirs, Ditches, Wells, Pumps, Pipelines, Headgates, Etc),
including the dates of any changes or enlargements in use, the dimensions of the diversion works as
constructed and as enlarged and the depth of each well. 3 Wells @ 400' x 12"

2 Pumps, 16000' ± Transmission & Distribution
System, 266 Service Connections
One Well Inactive at Present Time

EXHIBIT

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4

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AUG 20 1992

6. Water is claimed for the following purposes:

(both dates are inclusive)

(cfs) 8,819 (acre feet)

For Heating purposes from 01 JAN to 31 DEC amount 12,819 or 4,600

For Domestic purposes from 01 JAN to 31 DEC amount 12,819 or 4,600

For _____ purposes from _____ to _____ amount _____ or _____

For _____ purposes from _____ to _____ amount _____ or _____

7. Total quantity claimed (a) 12,819 (cfs) and/or (b) _____ (acre feet)

8. Total consumptive use claimed is 155 acre feet per annum.

9. Non-irrigation uses; describe fully (eg. Domestic: Give number of households served; Stockwater: Type and number of livestock Etc.) Heat & Domestic - 266 Residence & Commercial

10. Description of place of use:

a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.

b. If water is used for other purposes, place a symbol of use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RNG	SEC	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	NE1/4	NW1/4	SW1/4	SE1/4	
<u>3N</u>	<u>2E</u>	<u>10</u>	X		X	X									X				<u>100</u>
		<u>11</u>							X		X	X		X	X	X	X	X	<u>320</u>
		<u>12</u>											X	X			X	X	<u>80</u>
		<u>13</u>					X	X											<u>80</u>
		<u>14</u>	X																<u>40</u>

Total number of acres irrigated 680

11. In which county (ies) are lands listed above as place of use located? Heat & Dom Ada

12. Do you own the property listed above as place of use? Yes _____ No X

If your answer is No, describe in Remarks below the authority you have to claim this water right.

13. Describe any other water rights used at the same place and for the same purposes as described above.

63-9160

or None ()

14. Remarks: District owns well site. Citizens in District own individual parcels.

District provides service to State of Idaho Health & Agriculture, Corrections as well as Residences and Commercial office.

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AUG 20 1992

Boise Warm Springs Water District

Last Name 2440 OLD PENITENTIARY ROAD

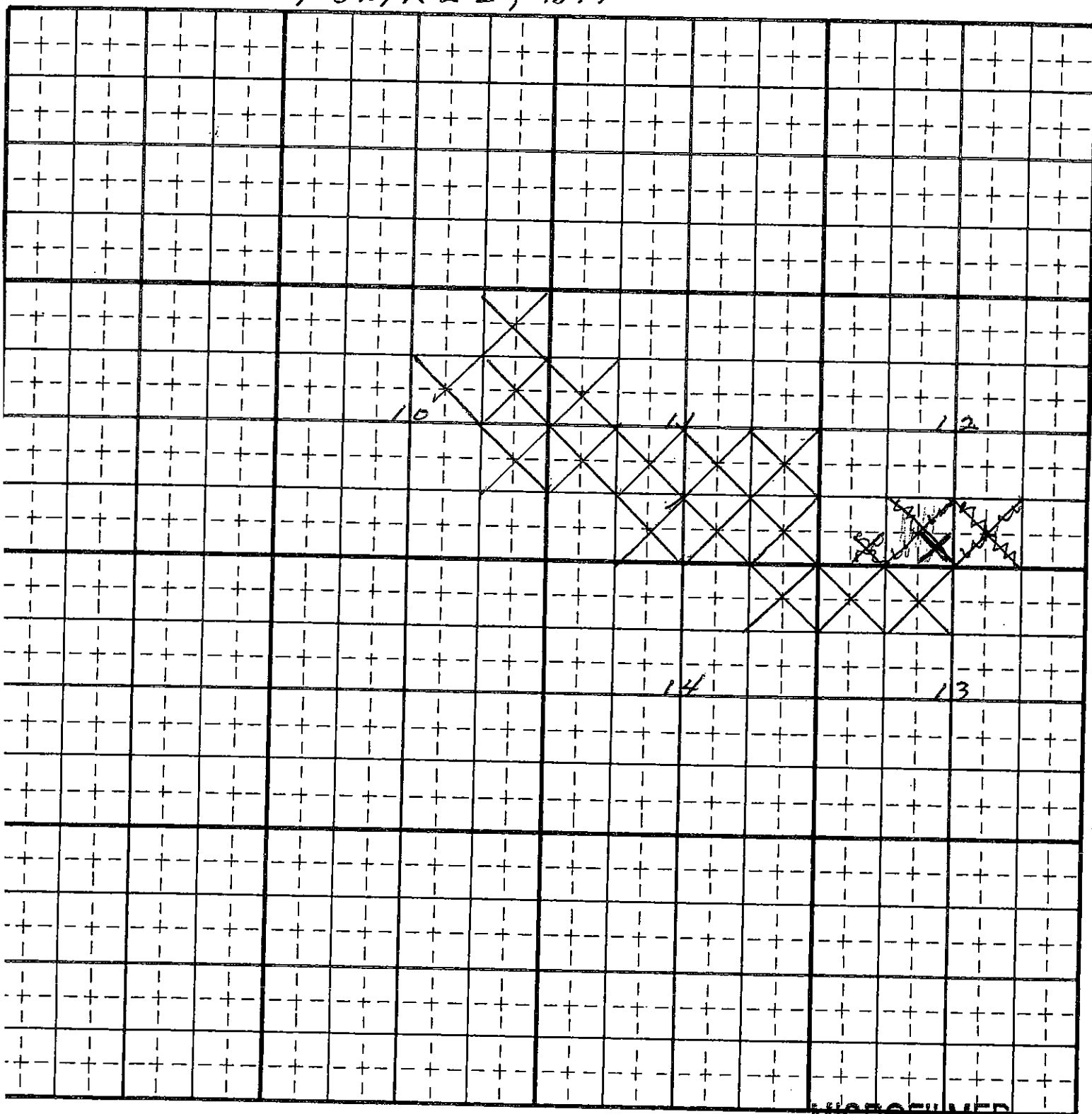
Ident No. A63-05073

Copies: White -State, Yellow-Claimant

Map of Project: show clearly the point of diversion, place of use, section number, township, and range number.

Scale: 2 inches equals 1 mile

T 3 N, R 2 E, B M



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AUG 20 1992

Last Name **Boise Warm Springs Water District**
2440 OLD PENITENTIARY ROAD
BOISE IDAHO 83712

Ident No.

A63-05073

Copies: White-State, Yellow-Claimant

15. Basis of Claim (check one) Beneficial Use ☒ Posted Notice ☒ License ☒ Permit ☒
Decree _____
If applicable provide IDWR Water Right Number 63-5073 & 63-9162
Court _____ Case Number _____ Decree Date _____
Plaintiff vs Defendant _____

16. Signature (s)
(a.) By signing below, I/We acknowledge that I/We have received, read, and understand the form entitled "How you will receive notice in the Snake River Basin Adjudication." (b.) I/We do ☒ do not ☒ wish to receive and pay a small annual fee for monthly copies of the docket sheet.
Number of attachments 16

For Individuals: I do solemnly swear or affirm that the statements contained in the foregoing document are true and correct.

Signature of Claimant (s) _____ Date _____
_____ Date _____

For Organizations: I do solemnly swear or affirm that I am Secretary Title
of Boise Warm Springs Water District Organization, that I have signed the foregoing
document in the space below as Secretary Title of Boise Warm Springs Organization
and that the statements contained in the foregoing document are true and correct. Water District

Signature of Authorized Agent Robert H. Griffiths
Title and Organization Boise Warm Springs Date 24 July 1989
Water District

State of Idaho/or _____)
County of ADA) SS.

Subscribed and sworn (or affirmed) before me this 6TH day of JULY 19 89

SEAL

Notary Public Jeff Pappan

Residing at BOISE, IDAHO

My Commission Expires 11/8/1994

Please Print Name

17. Notice of Appearance:

Notice is hereby given that I, _____ will be acting as attorney at law on behalf of the claimant signing above, and that all notices required by law to be mailed by the director to the claimant signing above should be mailed to me at the address listed below.

Signature _____

Address _____

Date _____

MICROFILMED
AUG 20 1992

Boise Warm Springs Water District
Last Name 2440 OLD PENITENTIARY ROAD Ident. Number A63-05073
BOISE, IDAHO 83712

Copies White-State, Yellow-Claimant

RECEIVED

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

MAR 17 2005

WATER RESOURCES
WESTERN REGION

IN RE GENERAL ADJUDICATION
OF RIGHTS TO THE USE OF WATER FROM
THE SNAKE RIVER BASIN WATER SYSTEM

CIVIL CASE NO. 39576

Indent. No. 63-5073

Date Received 3-17-05

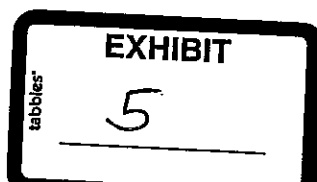
Receipt No. _____

**NOTICE OF CLAIM
TO A WATER RIGHT
ACQUIRED UNDER STATE LAW**

AMENDED

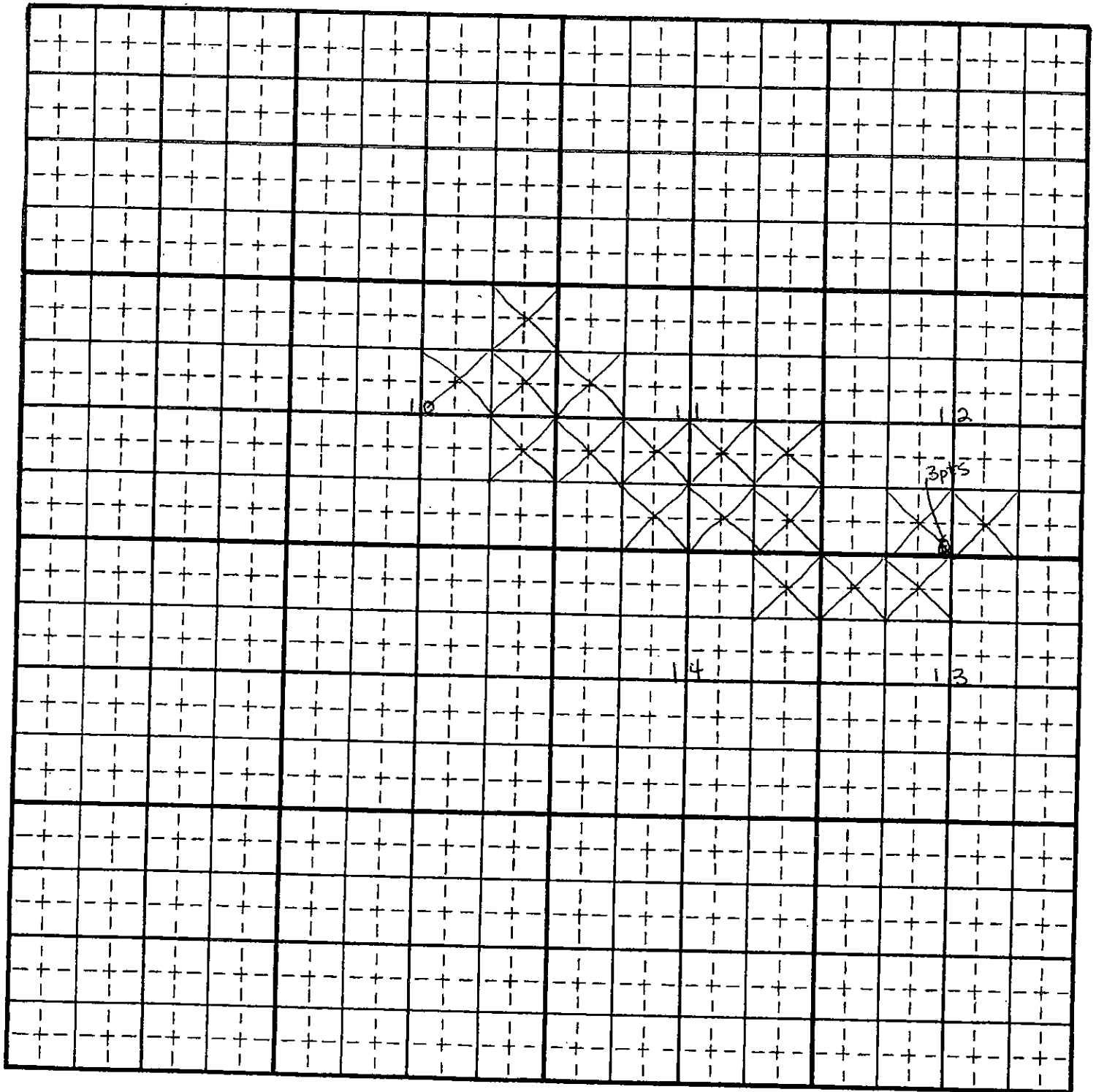
AMENDED

1. Name of Claimant(s): Boise Warm Springs Water District Phone (208) 342-3162
Mailing Address: 2440 Old Penitentiary Road Zip 83712
2. Date of Priority (Only one (1) per claim) 11-05-1894
3. Source of water supply (a) Groundwater
which is tributary to (b) _____
4. a. Location of existing point of diversion is: Township 03N Range 02E Section 12
SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of SW $\frac{1}{4}$, Govt. Lot, _____ B.M., County of Ada
Additional points of diversion if any: _____
b. If instream flow, beginning of point of claimed instream flow is: N/A
Township _____ Range _____ Section _____, _____ $\frac{1}{4}$ of _____ $\frac{1}{4}$ of _____ $\frac{1}{4}$,
Govt. Lot, _____ B.M., County of _____
ending point is: Township _____ Range _____ Section _____, _____ $\frac{1}{4}$ of _____ $\frac{1}{4}$
of _____ $\frac{1}{4}$, Govt. Lot, _____ B.M., County of _____
5. Description of existing diversion works (Dams, Reservoirs, Ditches, Wells, Pumps,
Pipelines, Headgates, Etc), including the dates of any changes or enlargements in use, the
diversion works as constructed and as enlarged and the depth of each well.
Three (3) wells and pipeline



Map of Project: show clearly the point of diversion, place of use, section number, township, and range number.

Scale: 2 inches equals 1 mile



Last Name _____ Ident No. _____

6. Water is claimed for the following purposes:

(both dates are inclusive)

(cfs)

(acre feet)

For heating & domestic purposes from 1/01 to 12/31 amount 12.819 or _____

For _____ purposes from _____ to _____ amount _____ or _____

For _____ purposes from _____ to _____ amount _____ or _____

For _____ purposes from _____ to _____ amount _____ or _____

7. Total quantity claimed (a) 12.819 (cfs) and/or (b) N/A (acre feet)

8. Total consumptive use claimed is N/A acre per annum.

9. Non-irrigation uses; describe fully (eg. Domestic: Give number of households served; Stockwater: Type and number of livestock, etc.) Low temperature geothermal use for customers in district

10. Description of place of use:

a. If water is for irrigation, indicate acreage in each subdivision in the tabulation below.

b. If water is used for other purposes, place a symbol of use (example: D for Domestic) in the corresponding place of use below. See instructions for standard symbols.

TWP	RNG	SEC	NE ¼				NW ¼				SW ¼				SE ¼				Totals
			NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	NE ¼	NW ¼	SW ¼	SE ¼	
3N	2E	10	X		X	X									X				
		11							X		X	X		X	X	X	X	X	
		12											X				X		
		13					X	X											
		14	X																

Total number of acres irrigated _____ *

* Place of use also includes all annexed properties as added from time to time.

11. In which county (ies) are lands listed above as place of use located? Ada

12. Do you own the property listed above a place of use? Yes _____ No X
If your answer is No, describe in Remarks below the authority you have to claim this water right.

13. Describe any other water rights used at the same place and for the same purposes as described above. _____

14. Remarks:

District owns wells and distribution system. Customers own individual buildings and homes.
District provides service to State Health and Agriculture Department.

15. Basis of claim (check one) Beneficial Use ___ Posted Notice ___ License ___ Permit ___
Decree ___ Statutory X

If applicable provide IDWR Water Right Number 63-5073

Court _____ Case No. _____ Decree Date _____

Plaintiff v. Defendant _____

16. Signature(s)

(a) By signing below, I/We acknowledge that I/We have received, read, and understand the form entitled "How you will receive notice in the Snake River Basin Adjudication." (b) I/We do X do not ___ wish to receive and pay a small annual fee for monthly copies of the docket sheet.

Number of attachments _____

For Individuals: I do solemnly swear or affirm that the statements contained in the foregoing document are true and correct.

Signature of Claimant(s) _____ Date _____
_____ Date _____

For Organizations: I do solemnly swear or affirm that I am CHAIRMAN
of BOISE WARM SPRINGS WATER DIST that I have signed the foregoing
document in the space below as CHAIRMAN of DISTRICT
and that the statements contained in the foregoing document are true and correct.

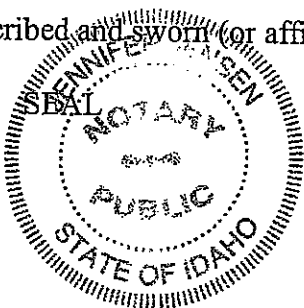
Signature of Authorized Agent D. Douglas Lindley

Title and Organization CHAIRMAN BWSWD Date 3/16/05

State of Idaho/or _____)

County of ADA)

Subscribed and sworn (or affirmed) before me this 16th day of March, 2005.



Notary Public Jennifer Jensen

Residing at Boise ID

My Commission Expires 6/5/06

17. Notice of Appearance:

Notice is hereby given that I, Bruce M. Smith will be acting as attorney as law on behalf of the claimant signing above, and that all notices required by law to be mailed by the director to the claimant signing above should be mailed to me at the address listed below.

Signature

Address

225 N. 9th, Ste. 420, Boise ID 83702

Date

3/16/05

**PRODUCTION, TEMPERATURE AND WATER
LEVEL DATA FOR THE FOUR HEATING SYSTEMS
IN THE BOISE FRONT LOW TEMPERATURE
GEOTHERMAL RESOURCE AREA, 1977-1997**

by

Kenneth W. Neely
Hydrogeologist

Open File Report
June, 1998

Idaho Department of Water Resources
Planning and Policy Division
Technical Services Bureau
Ground Water Monitoring Section
1301 N. Orchard
Boise, ID 83706
208-327-7900

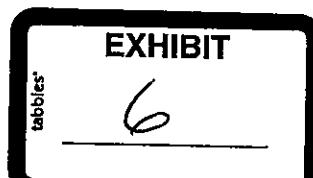


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PRODUCTION, TEMPERATURE AND WATER LEVEL DATA FOR THE FOUR HEATING SYSTEMS IN THE BOISE FRONT LOW TEMPERATURE GEOTHERMAL RESOURCE AREA, 1977-1997

By Kenneth W Neely

ABSTRACT

Water level declines in the Boise Front Low Temperature (85 to 212° Fahrenheit) Geothermal Resources Area (Boise Front geothermal area) prompted the Idaho Department of Water Resources (IDWR) to create a Ground Water Management Area in 1987 to discontinue the routine issuances of permits for geothermal development. Further restrictions were added to the Boise Front geothermal area in 1988 when the IDWR issued a five-year moratorium. The moratorium was extended for another five years in 1993. The moratorium is due to be reviewed in June, 1998.

Water level declines in the Boise Front geothermal area began to occur when the State of Idaho and City of Boise heating systems came on line in the mid-1980's. Prior to 1983, the Boise Warm Springs Water District was the only geothermal district heating system in the Boise area. The Veterans Administration Regional Hospital was permitted to begin withdrawing geothermal water in 1988 because substantial development of their system had been completed when the moratorium was issued. Production from the Boise Front geothermal system has increased from about 300 million gallons in water year 1984 to the current level of about 670 millions gallons per water year.

Currently, discharge does not appear to be exceeding recharge in this part of the Boise Front geothermal area based on water level data from the Bureau of Land Management (BLM) observation well and production data from the four heating systems. Water levels in the BLM well for the past 10 years indicate that the geothermal system has probably reached a new equilibrium, despite some minor fluctuations. The reasons for the new equilibrium are not fully understood but are probably related to: 1) stabilized withdrawal rates since the rapid increases of the 1980's, and 2) induced recharge which can occur when withdrawals from an aquifer increase.

The City of Boise's new injection well, which is scheduled to be operational for the 1998-1999 heating season, is expected to cause positive pressure effects in the geothermal aquifer. A modeling scenario by Montgomery Watson (1994) predicted that injection of spent

geothermal water near the new injection well location would result in no net changes to the water level at the BLM well assuming a 20 percent increase in production at the City and Boise Warm Springs Water District well fields.

Based on the current data, it is unknown whether production increases, if allowed by the IDWR, will adversely impact the water levels in this part of the Boise Front geothermal system, especially in combination with the new injection well. The historic data show that water level declines did occur after the State and City systems came on line. However, there were no observable water level declines with the addition of the VA production in the late 1980's.

INTRODUCTION

The four geothermal district heating systems in the Boise Front Low Temperature (85 to 212° Fahrenheit) Geothermal Resources Area (Boise Front geothermal area) are the: 1) Boise Warm Springs Water District (BWSWD), 2) State of Idaho Capitol Mall (State), 3) City of Boise (City), and 4) Veterans Administration Regional Hospital (VA). The BWSWD, which is the oldest heating district in the United States, has been supplying hot water to customers for space heating since 1892 (Rafferty, 1992). The State and City systems began producing geothermal water to heat public buildings in 1983. The VA system came on line in 1988 to heat the buildings on the VA complex. Combined, these systems provide clean and cost-efficient heat for several hundred private and public buildings. The cost savings of geothermal heat over conventional fossil fuel or hydropower electric heating for the four systems is at least one million dollars per year.

Water level declines in the Bureau of Land Management (BLM) observation well in the mid 1980's suggested that discharge may have been exceeding recharge in the Boise Front geothermal area. The Idaho Department of Water Resources (IDWR) created the Boise Front Low Temperature Geothermal Resource Ground Water Management Area (Boise Front GWMA) in 1987. The conditions of the Boise Front GWMA curtailed additional development of the geothermal resource in the Boise area. In 1988, a five-year moratorium was put in place by IDWR to further restrict withdrawals from the geothermal system. The moratorium was extended in 1993 for five more years. The moratorium is scheduled for review in June, 1998.

PURPOSE OF REPORT

The purpose of this report is to publish a summary of the production, temperature and water level data for the four heating systems in the Boise Front geothermal area for the years 1977 through 1997. The data in this report include: 1) annual production totals for each system by water year (October 1 of the previous year through September 30 of the designated water year), 2) cumulative annual production totals for the four systems, 3) monthly production graphs for each system, 4) cumulative monthly production totals for the four systems, 5) water level records, 6) water supply and return temperatures for the State of Idaho Capitol Mall system, 7) precipitation records for the Boise Airport rain gauge, and 8) heating day records for the Boise area. This report was written so that the Idaho Department of Water Resources, with input from the four major users and other interested parties, could determine whether the moratorium should be extended, modified or canceled in 1998.

WELL-NUMBERING SYSTEM

The well-numbering system used in this report is identical to the system used by the USGS in Idaho (Figure 1). The system indicates the location of wells within the official rectangular subdivision of the Public Land Survey System (PLSS) with reference to the Boise baseline and meridian. The first two segments of the number designate the township and range. The third segment gives the section number followed by three or four letters and a number. The letters indicate the $\frac{1}{4}$ section (160 acre tract), $\frac{1}{4}$ - $\frac{1}{4}$ section (40 acre tract), $\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$ section (10 acre tract), $\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$ - $\frac{1}{4}$ section (2.5 acre tract), and the serial number of the well within the tract. Quarter sections are lettered A, B, C, and D in counterclockwise order beginning in the northeast quarter of the section. Successively smaller tracts are lettered in the same manner. For example, well 01N 01E 11DBA1 corresponds to the PLSS location: NE $\frac{1}{4}$, NW $\frac{1}{4}$, SE $\frac{1}{4}$, Section 11, Township 1 North, Range 1 East, and it was the first well inventoried by the USGS in that tract.

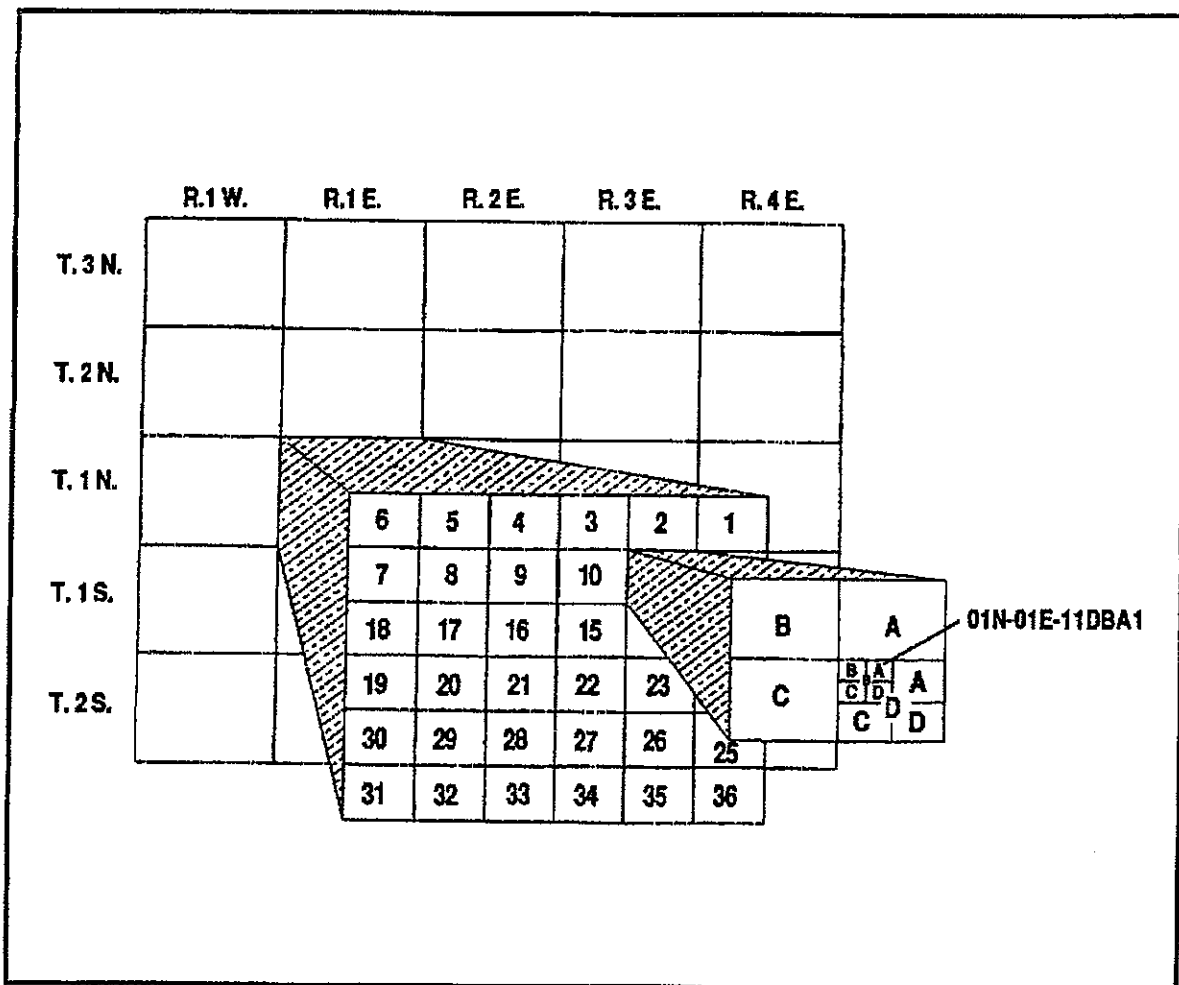


Figure 1. Well-numbering system

STUDY AREA

The Boise Front geothermal area is located along the northern edge of the Treasure Valley in the western part of the Snake River Plain of southwestern Idaho. The Treasure Valley trends northwest-southeast with the Boise Mountains located to the northeast. The Boise and Snake Rivers dissect the Treasure Valley as they flow to the northwest. A band of hills known as the Boise Front Foothills lie between the Boise Mountains and the valley floor. The Boise Front geothermal area occurs in Ada county primarily along the toe of the Boise Front Foothills and extends a short distance into the Treasure Valley (Figure 2). Part of the Boise Front geothermal area is within the Boise City limits; the remainder of the area is located north, northeast and east of the city limits. The study area for this report is the relatively small portion of the Boise Front geothermal area that contains the four district heating systems.

PREVIOUS STUDIES

Numerous papers and reports have either described the geologic setting for the Boise Front geothermal system, documented the development of the four district heating systems or chronicled the production, water level and temperature data. Reports that provided overviews of geothermal resources in Idaho, including the Boise Front geothermal area, are Mitchell and others (1980) and Dansart and others (1994).

Mink and Graham (1977) described the geothermal potential in the western part of the Boise Front geothermal area. Anderson and Kelly (1983) evaluated the ground water flow conditions for the Boise Front geothermal aquifer. Waag and Wood (1987a and 1987b) discussed in detail the physical setting of the Boise geothermal hydrogeologic system, the chemical data and the analysis of drawdown and production data. Wood and Burnham (1987) described the geological framework of the Boise Front geothermal system and developed a conceptual model.

Reports and articles that provided information about the exploration and development history of the Boise Front geothermal resources included Stoker and others (1977), Nelson and others (1980), Worbois (1982), Higginson and Barnett (1987), and Neely (1996). Lithologic, hydrologic and chemical data were documented in reports by Young and others (1988), and Parlman and Young (1992). Burnham and Wood (1983) provided a field trip guidebook and road log for the Boise Front geothermal area.

A detailed aquifer study in the area of the four heating systems was conducted by the Berkeley Group, Inc. (1990). A two-part study was conducted by the City and the BWSWD in the early 1990's. The first part developed a conceptual model of the geothermal system (Montgomery, 1992). The second part described the hydraulic modeling of the aquifer which used the USGS MODFLOW and TST3D flow models (Montgomery Watson, 1994). A follow-up study used the numerical modeling results to evaluate potential sites for the City system's injection well (Montgomery Watson, 1996).

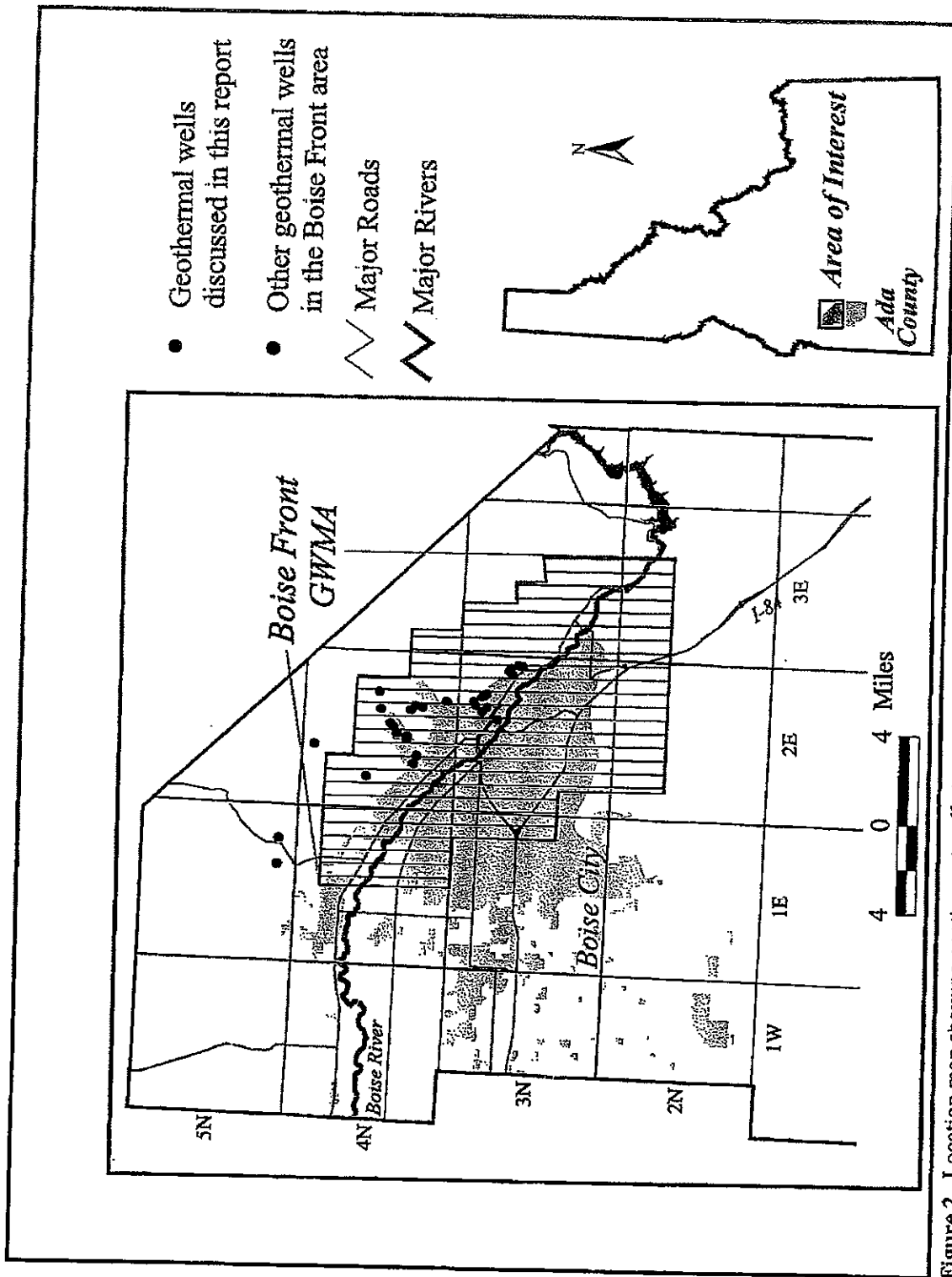


Figure 2. Location map showing geothermal wells in the Boise Front area and the Boise Front Low Temperature Geothermal Resource Ground Water Management Area (Boise Front GWMA).

Some reports have been written specifically about one of the systems. The geothermal production for the BWSWD from 1977 through 1989 was documented by Robert Griffiths (Boise Warm Springs Water District, 1989). Rafferty (1992) presented the history of the BWSWD system. Mink (1976) summarized the testing of the Statehouse well which is located beside the State Capitol building. Austin (1978) described a demonstration project for the State of Idaho which used geothermal water from the BWSWD to heat three buildings in the State Laboratory complex. Anderson and Kelly (1981) reported the drilling and testing of the State Capitol Mall #2 well. Neely (1995) reported production and temperature data for the State system for 1983 through 1994.

CLIMATE AND HEATING DATA

The 30-year average precipitation (water years 1968 through 1997) for the Boise Airport rain gauge station was 12.19 inches (National Oceanic and Atmospheric Administration) (Figure 3). The data for the last 20 water years, which is the time period that we have monitoring data for the Boise Front geothermal system, show that: 1) water years 1978 through 1986 were

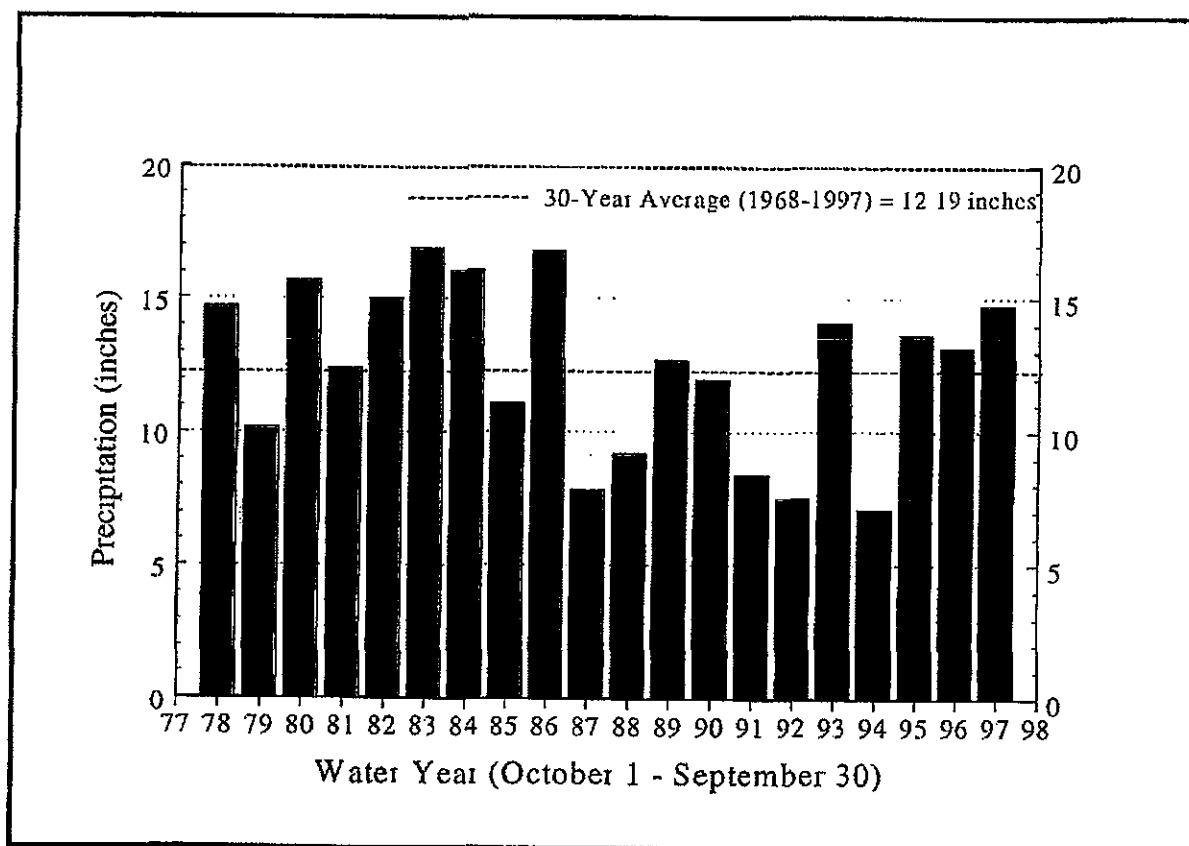


Figure 3. Precipitation records for the Boise Airport rain gauge station for water years 1978 through 1997

generally wetter than average, 2) water years 1987 through 1994 were generally dryer than average, and 3) water years 1995 through 1997 were slightly wetter than average (Figure 3).

The 30-year heating degree day average (heating years 1968 through 1997) for Boise was 5757 heating degree days (National Oceanic and Atmospheric Administration). The data for the last 20 years show that: 1) annual heating degree days were generally less than the 30-year average for heating years 1978 through 1983, 2) annual heating degree days were significantly more than the 30-year average for heating years 1984 through 1986, and 3) annual heating degree days were generally less than the 30-year average for heating years 1987 through 1997 (Figure 4).

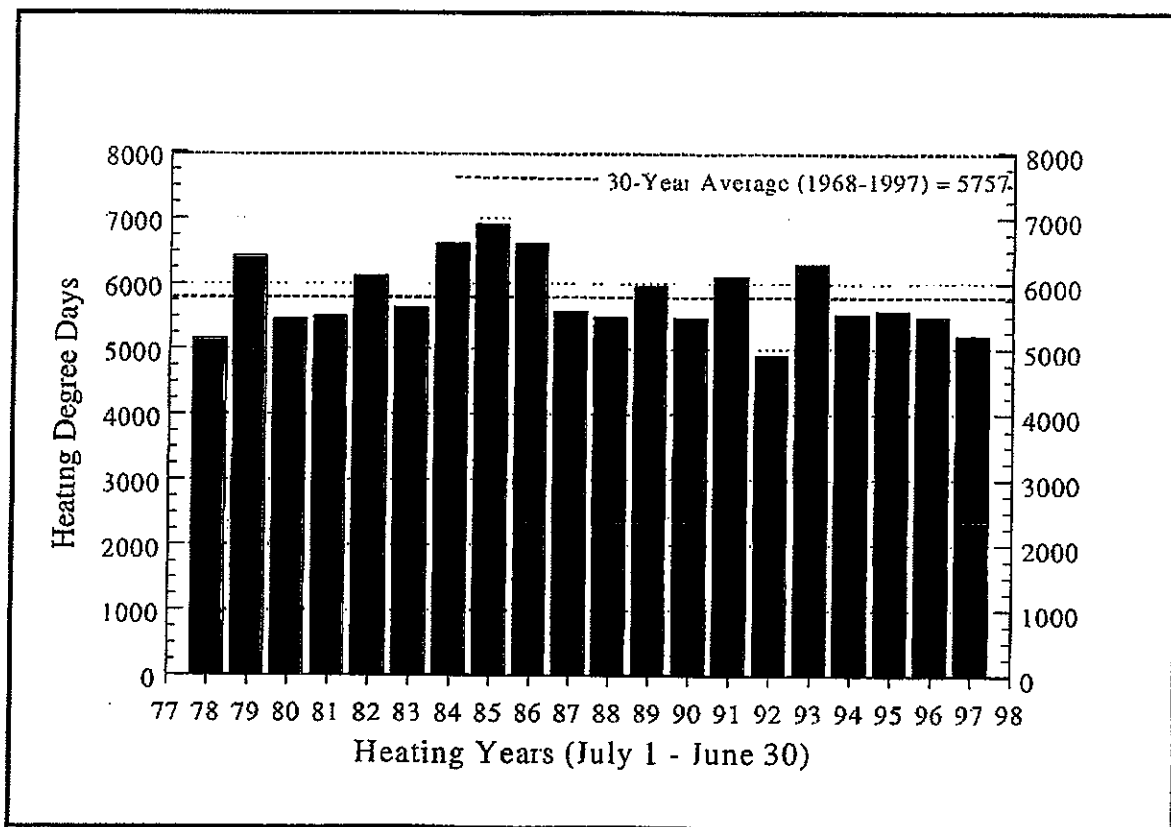


Figure 4. Heating degree day data for Boise for heating years 1978 through 1997

GEOHERMAL DEVELOPMENT IN THE BOISE AREA

The first two geothermal wells in the United States were drilled near Boise, Idaho, in 1890 and 1891 (Boise City Public Works, 1993). The wells were completed near some thermal springs located about two miles east of Boise (Figure 5). Both wells were drilled to depths of 400 feet (Table 1). Although there are no well driller's reports for the two wells, it is assumed that the wells were completed in the rhyolite rocks of the Idavada Group. The wells are believed to have been drilled through a major down-to-the-southwest normal fault that trends northwest/southeast along the toe of the Boise Front Foothills. This fault and other associated faulting are interpreted to be the conduits for upward migration of geothermal water along the Boise Front.



Figure 5. Original well house for the Boise Warm Springs Water District's two geothermal production wells (from Burnham and Wood, 1983).

By 1892, the water from the wells was being used to heat homes, businesses and a 15,000 square foot Natatorium in east Boise. The Natatorium no longer exists but the

geothermal water is still being used to heat 226 homes and 36 commercial buildings on and near Warm Springs Avenue and in part of the downtown Boise area (Figure 6). Today, the Boise Warm Springs Water District (BWSWD) maintains the production wells and delivers the water to the customers. The used geothermal water is discharged to the Boise River through the city sewer system (Berkeley Group, Inc., 1990). BWSWD drilled a third well in 1981 about 650 feet northwest of the two production wells. The well, which is believed to be on the upthrown side of the fault, did not encounter sufficient quantities of geothermal water for production. The well is being used for monitoring water levels.

Table 1. Selected wells in the Boise Front geothermal area.

System	Well Name	Location	Reported Depth (feet below land surface)	Year Drilled	Use ¹
Boise Warm Springs Water District (BWSWD)	BWSWD West	3N 2E 12CDDD1	400	1891	A
	BWSWD East	3N 2E 12CDDD2	400	1891	A
	BWSWD #3	3N 2E 12CDDC1	587	1981	U,M
State of Idaho Capitol Mall (State or CM)	CM #1	3N 2E 10AADA1	2,152	1981	I
	CM #2	3N 2E 10AABB1	3,030	1981	A
City of Boise (previously owned by Boise Geothermal Limited (BGL))	BGL #1	3N 2E 11ABCA1	2,008	1981	U
	BGL #2	3N 2E 11ABBC1	880	1981	A
	BGL #3	3N 2E 11BAAA1	1,897	1981	A
	BGL #4	3N 2E 11ABCB2	1,103	1981	A
Veterans Administration Regional Hospital (VA)	VA #1	3N 2E 02CDCD1	1,666	1983	A
	VA #2	3N 2E 02CBCC2	1,840	1983	U
	VA #3	3N 2E 02CBCC3	2,300	1987	I
Other	BLM	3N 2E 11BABD1	1,222	1976	M

¹ Use codes: A = heating; I = injection; M = monitoring; U = unused

In the mid-1970's, the increasing cost of heating created new interests in alternate heat sources such as geothermal. In 1976, EGG/INEL drilled the Bureau of Land Management (BLM) and Beard exploration wells, along with three geothermal test holes, in the downtown Boise area. At about the same time, the State of Idaho Capitol Mall complex was expanding. This development prompted then-Governor Andrus to request a federal study to determine the feasibility of geothermal heat for the State's building in downtown Boise (Austin, 1978).

The State Health Laboratory was retrofitted for geothermal heat as a pilot project in 1977. The success of the State Health Laboratory project motivated the State of Idaho to drill

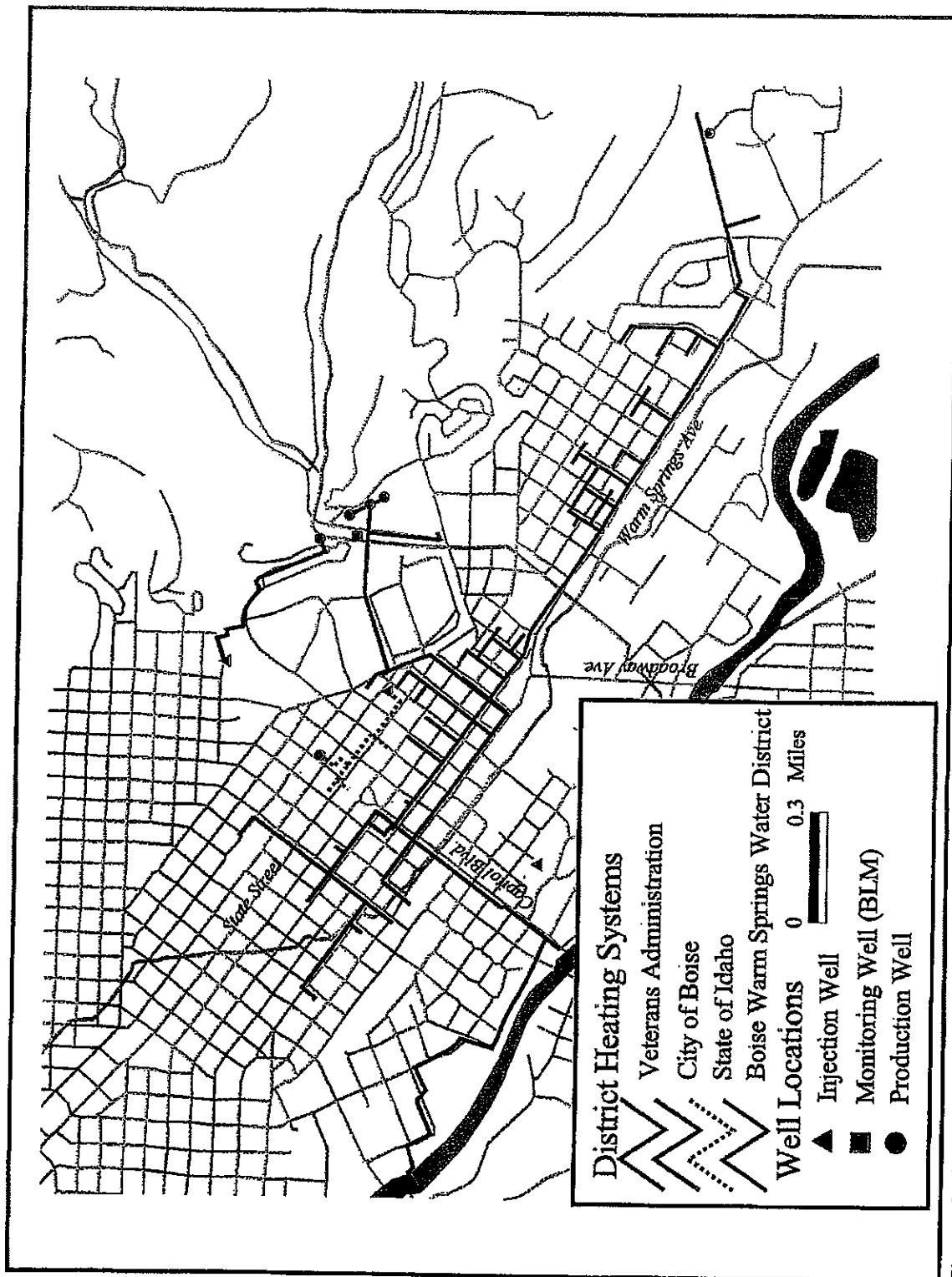


Figure 6. Geothermal well locations and distribution lines for the four district heating systems in the Boise area (This map was modified from a map received from the City of Boise Public Works Department in 1996).

the Capitol Mall #1 exploration well about three blocks from the State Capitol in 1981. Capitol Mall #2 was drilled about two blocks north of the Capitol (Figure 7). Capitol Mall #2, which is 3,030 feet deep, is being used as the production well; Capitol Mall #1 is 2,150 feet deep and is used as the injection well (Figure 6). The wells were completed in volcanic rock and sand (Idavada Group) according to the well driller's reports. By 1982, the State of Idaho geothermal system was supplying heat to eight building in the Capitol Mall complex, including the State Capitol. The Alexander House was added to the system in about 1992. Currently, the system is used to heat about 1,500,000 square feet.

In 1981, a company named Boise Geothermal Limited (BGL) had four geothermal wells drilled an area northeast of downtown Boise and along the edge of the Boise Front Foothills (Figure 6). The well names and well depths are: 1) BGL-1, 2,008 feet, 2) BGL-2, 880 feet, 3) BGL-3, 1,897 feet (Figure 8), and 4) BGL-4, 1,103 feet. The wells were completed in the rhyolite and interbedded sandstones of the Idavada Group.

BGL began supplying geothermal water for space heating to downtown Boise customers in 1983 (Berkeley Group, Inc., 1990). In 1988, the City of Boise purchased BGL. Today, the City geothermal system is used to heat about 1.8 million square feet which includes the City

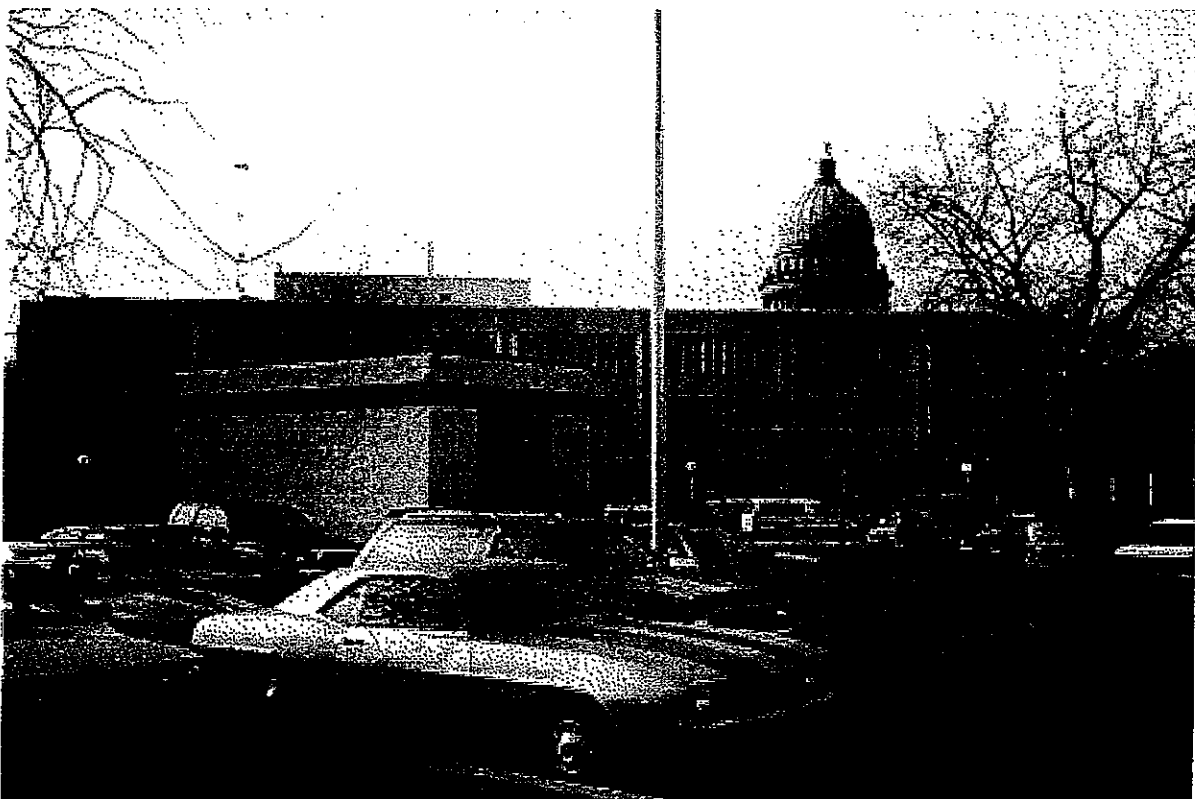


Figure 7. Well house for the State of Idaho Capitol Mall #2 geothermal production well. The top of the State Capitol building is in the background

Hall and 42 customers (Tensen, 1996, personal communication). Used geothermal water is currently disposed of in the Boise River. However, the City of Boise has recently completed a 3,200-foot well in Julia Davis Park which will be used for injecting spent geothermal water (Figure 9). The well is to be operational by the beginning of the 1998-1999 heating season.

Two geothermal wells were drilled for the Veterans Administration (VA) Regional Hospital on their properties in 1983. A third geothermal well was drilled for the VA in 1986. The production well, which was the first well drilled for the VA, is 1,666 feet deep (Figures 6 and 10). The injection well, which was the third well drilled for the VA, is 2,300 feet deep (Figure 6). The second well, which was drilled primarily for exploration, is currently unused. The wells were completed in rhyolite, tuff, basalt and sand (Idavada Group) according to the well driller's report. The VA geothermal system provides heat to about 400,000 square feet in 22 buildings on the hospital grounds which include patient care, clinical support, outpatient and ancillary support facilities.

Several other deep geothermal wells have been drilled in the Boise Front geothermal area (Berkeley Group, Inc., 1990; Neely, 1995). The names of the wells located nearest to the four

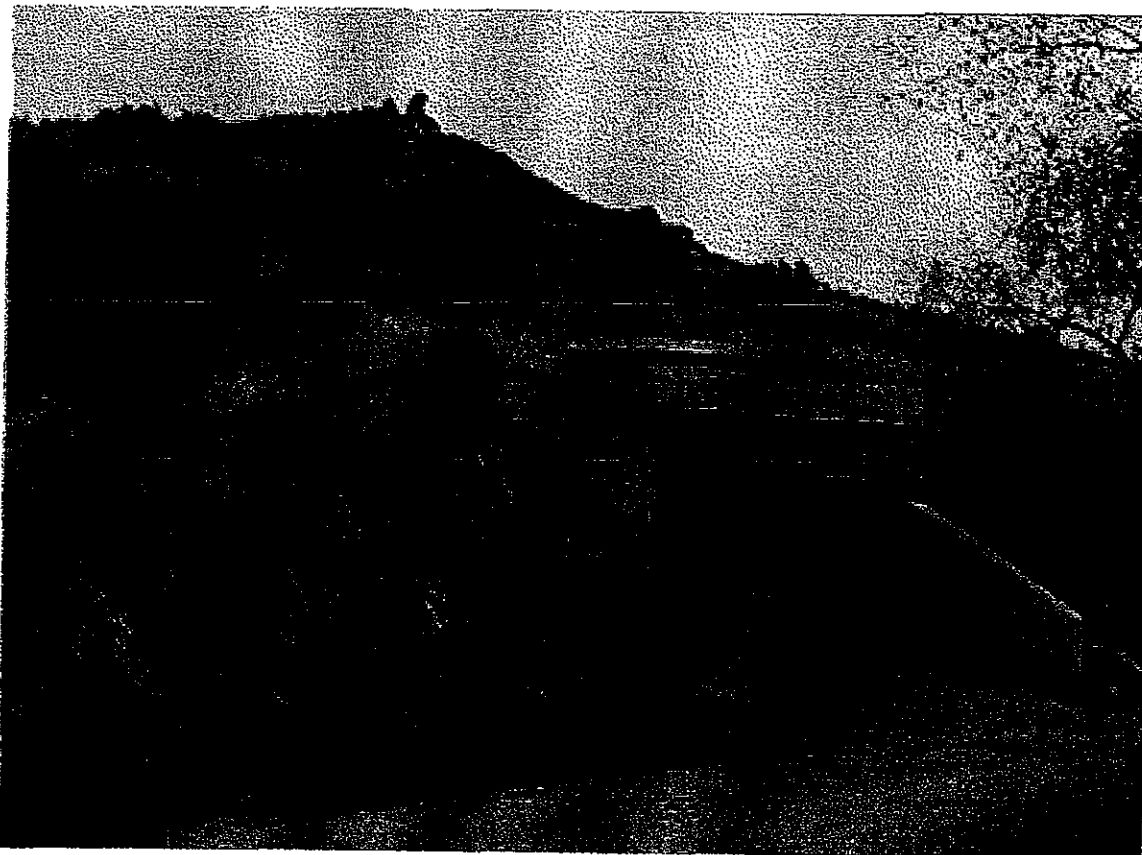


Figure 8. Well house for the City of Boise's BGL #3 geothermal production well



Figure 9. Drilling the injection well for the City of Boise, April 1998

heating systems are: Behrman, BLM, Fort Boise Park, Kanta, Koch, Old Penitentiary (Botanical Gardens) and Quarry View. The Fort Boise Park and Koch wells produce small quantities of geothermal water; the other wells are not being used for withdrawals. The BLM well, located close to the VA and City of Boise production wells, is the primary observation well for the Boise geothermal system

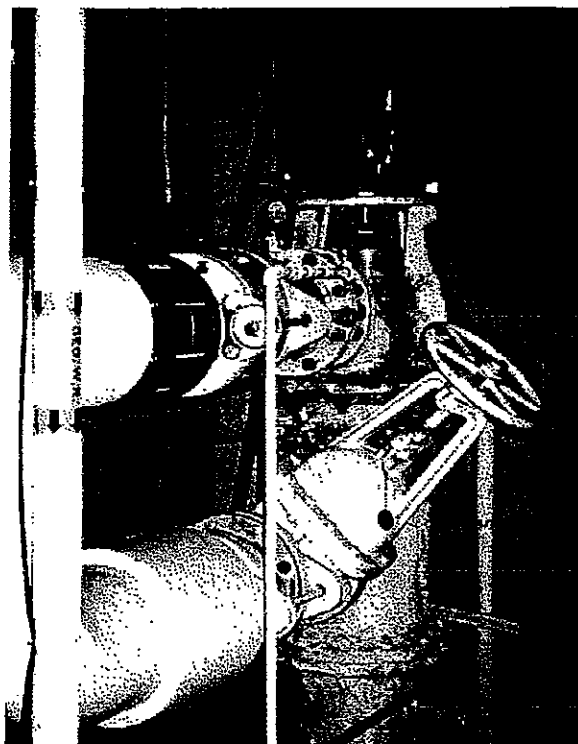


Figure 10. Production well for the Veterans Administration Regional Hospital.

GEOTHERMAL MONITORING DATA

Data collection for the four systems is accomplished through manual readings and computer data loggers. The BWSWD and the State systems currently use electronic devices to capture monitoring data. Automation of data collection using data loggers has been discussed for the City and Va systems but has not been implemented yet.

The BWSWD began recording production data in September, 1977 (Boise Warm Springs Water District, 1989). Production data are currently being recorded using two methods: 1) hand-written daily logs, and 2) a data logger. The BWSWD submits a summary of the hand-written logs to IDWR that lists production by month and by year. The data logger captures a production value once every 10 minutes. IDWR downloads the datalogger every three months.

Maximum monthly production for the BWSWD has decreased over the past 20 years from almost 50 million gallons per month to about 30 million gallons (Figure 11). Annual production by water year for the BWSWD has decreased from a peak of over 300 million gallons to about 220 million gallons (Table 2; Figure 12). The reasons for the decline are: 1) better heating efficiencies because of the addition of new pipe insulation on main and service

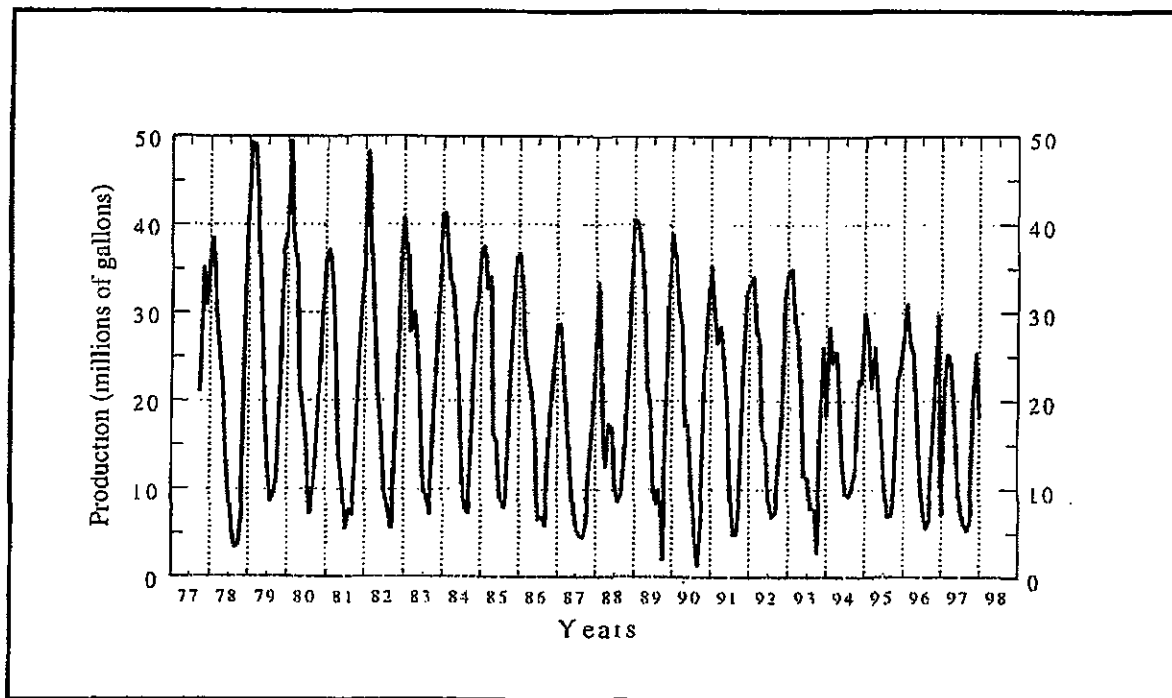


Figure 11. Monthly production for the Boise Warm Springs Water District heating system, 1977-1997.

Table 2. Production By Water Year¹ For The Four Heating Systems In The Boise Front Geothermal Area.

PRODUCTION IN MILLIONS OF GALLONS					
Water Year	BWSWD	State	City	VA	Total
1978	256.0				256.0
1979	312.2				312.2
1780	308.1				308.1
1981	239.4				239.4
1982	276.0				276.0
1983	283.5				283.5
1984	300.1	162.9	166.7		629.7
1985	281.1	175.4	121.4		577.9
1986	253.2	192.0	176.8		622.0
1987	183.3	169.1	188.9		541.3
1988	199.4	138.8	123.8		462.0
1989	278.0	120.0	158.0		556.0
1990	244.6	68.3	122.3	118.2	553.4
1991	245.7	177.6	121.3	115.4	660.0
1992	243.3	139.0	123.3	116.7	622.3
1993	239.3	177.6	156.0	137.0	709.9
1994	214.7	179.6	122.5	137.4	654.2
1995	221.2	150.8	129.9	151.4	653.3
1996	226.6	119.6	132.1	186.2	664.5
1997	212.8	112.2	130.7	203.6	659.3
Average production	250.9 (1978-1997)	155.0 (1984-1997, minus 1990)	141.0 (1984-1997)	145.7 (1990-1997)	660.5 (1991-1997)

¹Water year runs from October 1 to September 30. For example, water year 1978 started on October 1, 1977 and ended on September 30, 1978.

lines, 2) reduced demand by some of the service units, and 3) reduction in the number of service units. The addition of new pipe insulation is considered the primary factor for the reduction in withdrawals. Water supply temperatures have remained constant at about 175° Fahrenheit (F)

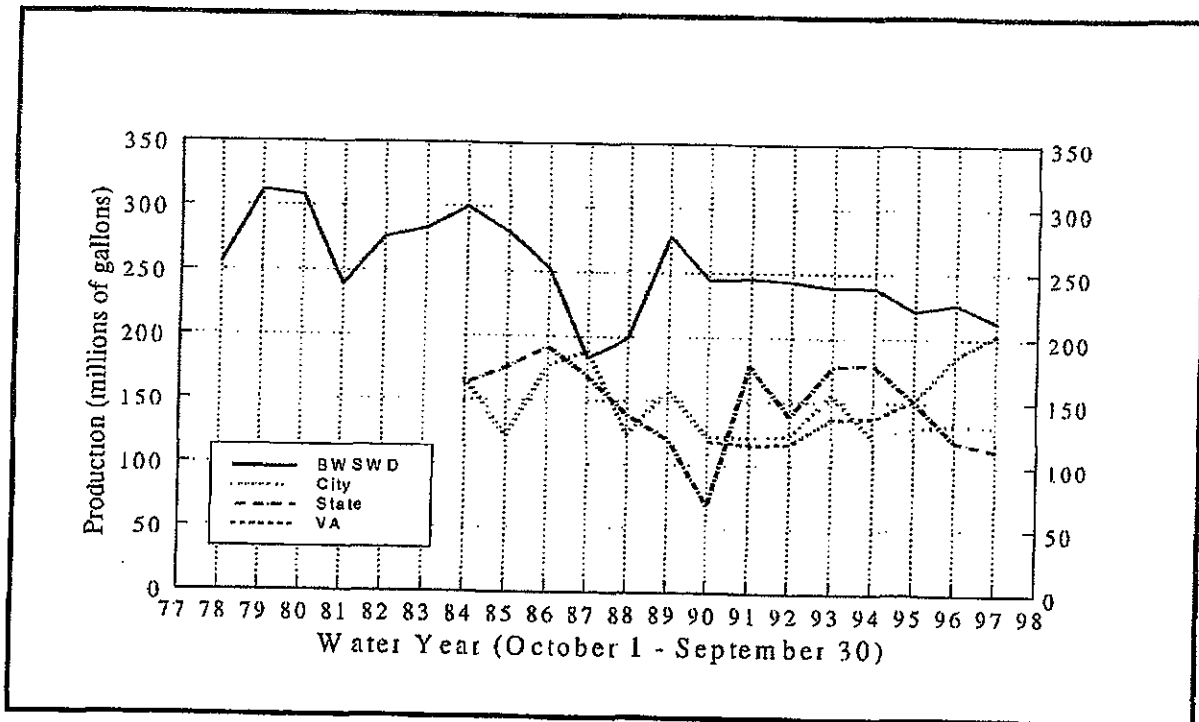


Figure 12. Geothermal production by water year for the Boise Warm Springs Water District (BWSWD), City of Boise (City), State of Idaho Capitol Mall (State) and Veterans Administration Regional Hospital (VA) heating systems

The State of Idaho geothermal system went on line in November, 1982. The first production data recorded for the system were from May, 1983. Monitoring data were initially recorded by hand on daily logs with only one entry for each day. Data were usually recorded in the mornings (between 5:00 and 8:00 am). The Berkeley Group, Inc., (1990) reported that the daily logs reflect higher than average discharges because the readings were taken during peak flow times. Data have been recorded on computer trend logs since 1991. Data were initially recorded once every six hours; since 1995, data have been recorded once every two hours.

Maximum monthly production for the State of Idaho geothermal system was about 30 million gallons in 1985, 1986 and 1993 (Figure 13). Production data for half of water year 1990 was missing; therefore, the total of 68.3 million gallons is considerably too low.

Production appears to have declined in 1996 and 1997 (Table 2; Figures 12 and 13). However, there are missing data intervals in the computer trend logs during those years due to equipment failure and data capture errors. To minimize data loss in the future, the State Department of Administration is now submitting data updates to IDWR once every three

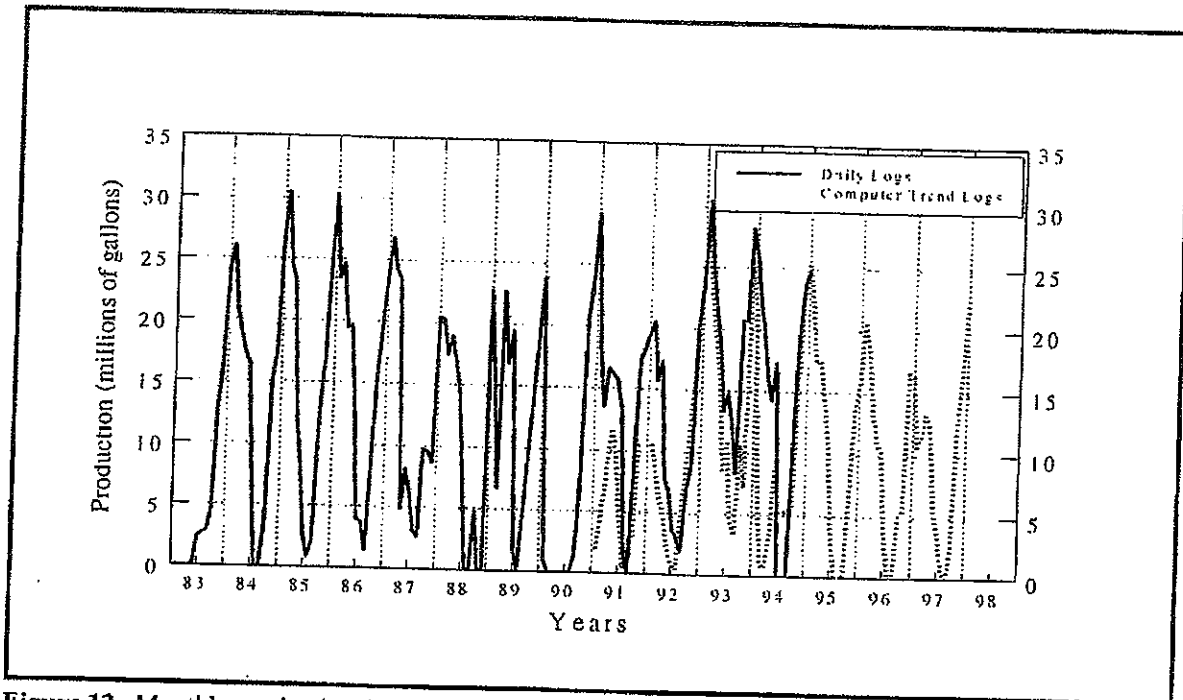


Figure 13. Monthly production for the State of Idaho Capitol Mall heating system, 1983-1997

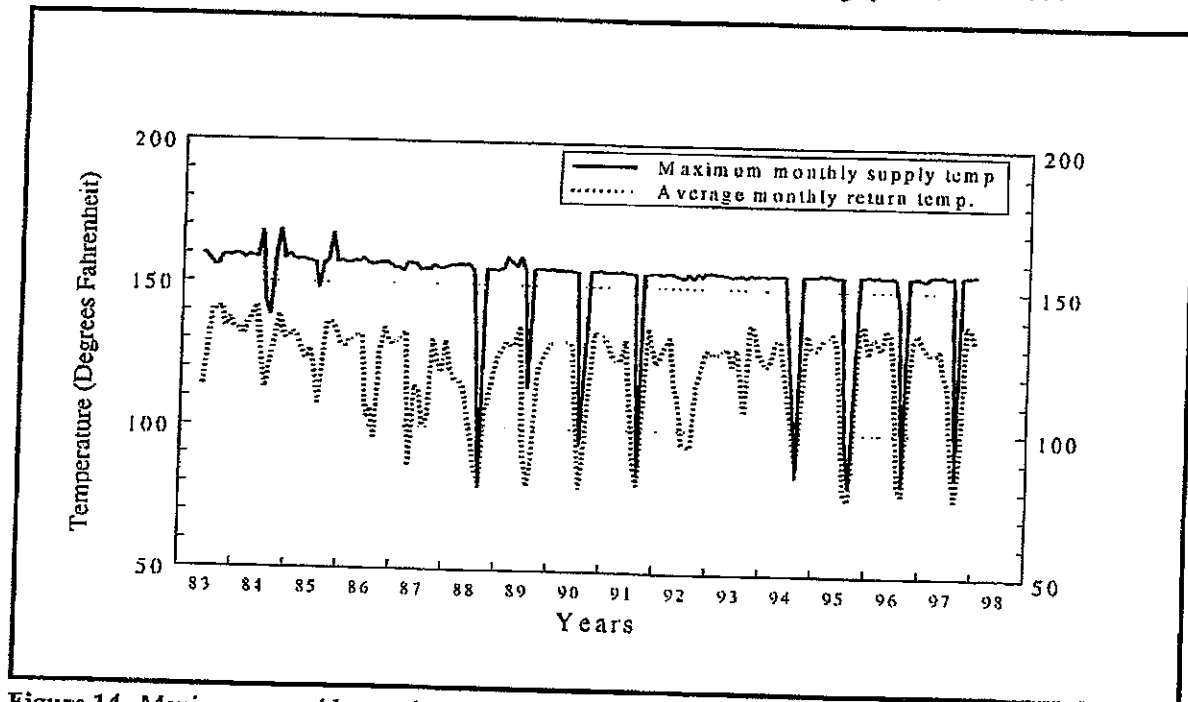


Figure 14. Maximum monthly supply and average monthly return temperatures for the State of Idaho Capitol Mall heating system, 1983-1997

months. Maximum monthly supply temperatures decreased from about 160° F in 1983 to about 155° F in 1992 and have since risen slightly (Figure 14).

The City of Boise records monitoring data using flow rate and temperature charts. The City also has a totalizer meter that is read weekly. Since 1988, the City has supplied the IDWR with a production total for each month. Production data prior to 1988 were documented in the Berkeley Group, Inc., (1990) and Montgomery (1992) reports.

Production for the City of Boise geothermal system was variable from water years 1984 through 1989 (Table 2; Figure 12). Beginning in water year 1990, production has been consistently in the 121-130 million of gallons per year range with the exception of a slight

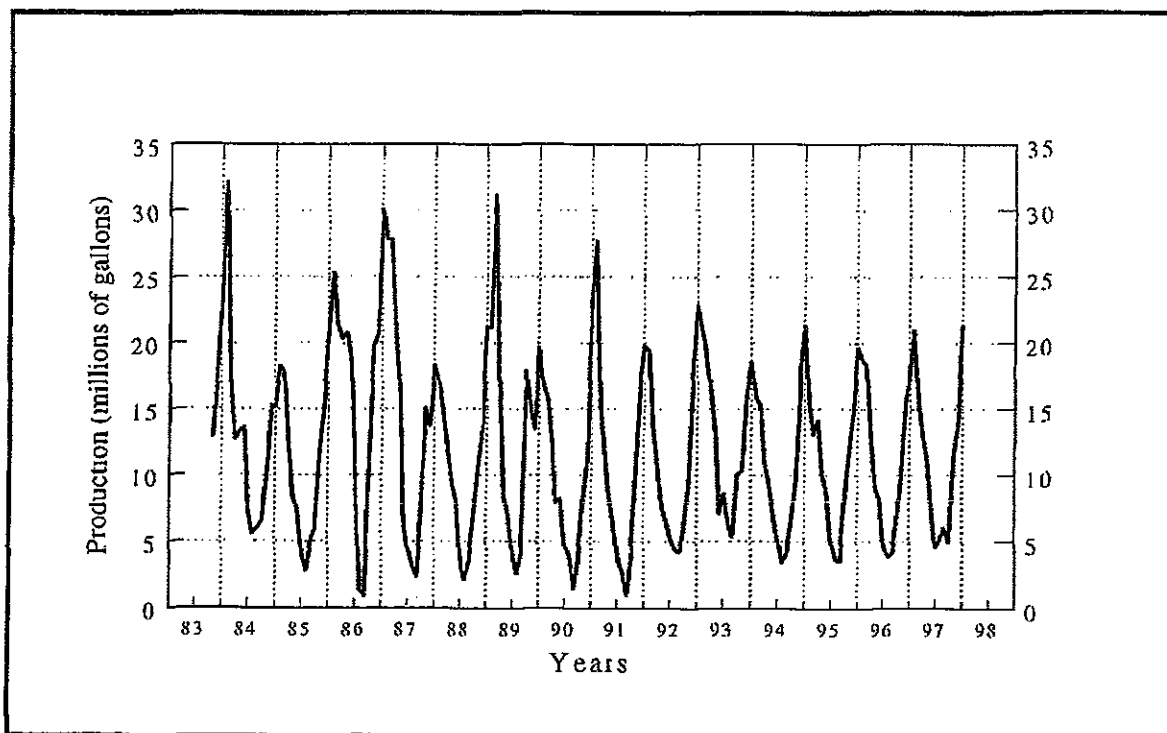


Figure 15. Monthly production for the City of Boise heating system, 1983-1997.

increase in water year 1993 (Figure 12). Maximum monthly production was generally higher during the 1980's than it was in the 1990's (Figure 15). Supply temperatures have remained constant at about 175° F.

VA technicians record totalizer, instantaneous discharge, temperature and water level data daily (except for weekend days and holidays) on handwritten log sheets. Production has increased steadily from water years 1990 through 1997 (Table 2; Figure 12). Maximum monthly production has increased during this time period from about 16 million gallons to about

25 million gallons (Figure 16). The reason(s) for the increase is unknown (Doug Lamb, VA; personal communication) Supply temperatures have remained constant at about 162° F

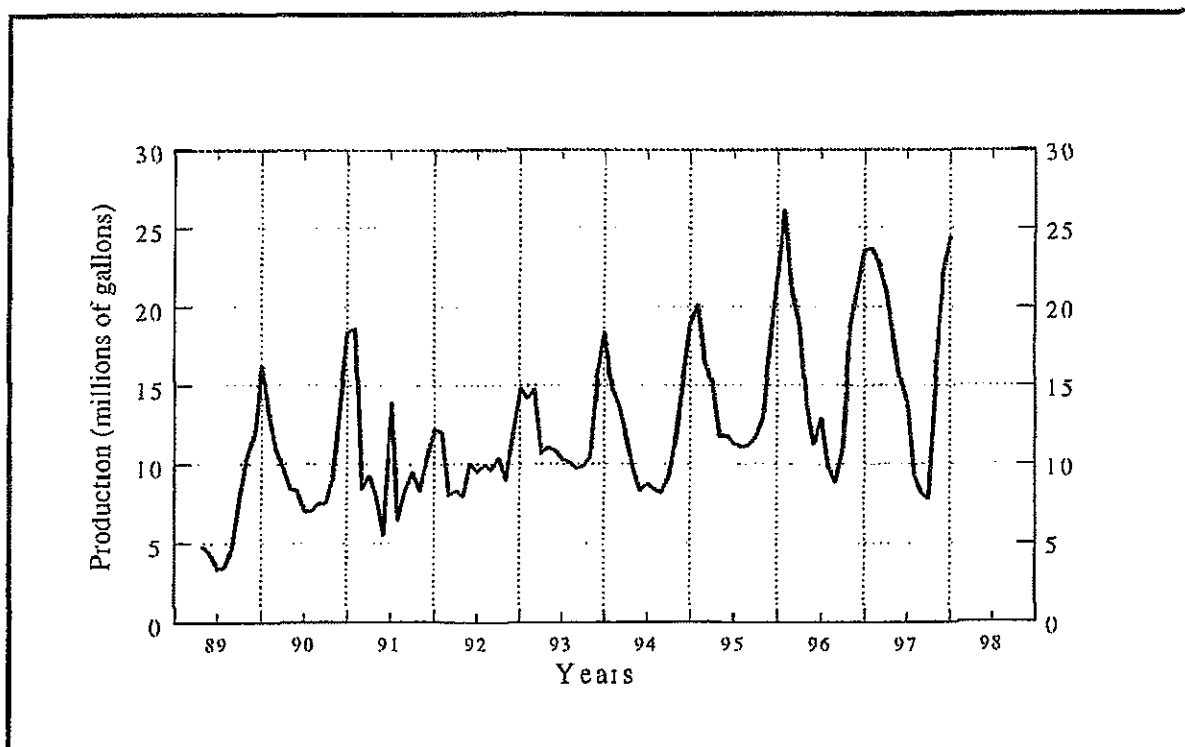


Figure 16. Monthly production for the Veterans Administration Regional Hospital heating system, 1989-1997

Figure 17 shows that total production for the four geothermal heating systems jumped dramatically in water year 1984 when the State and City systems came on line. The average annual production for water years 1978 through 1983, when the BWSWD was the only system withdrawing geothermal water, was 279 million gallons. The average annual production for water years 1984 through 1989 was 565 million gallons. A second but smaller increase occurred in the early 1990's water years when the VA began production. The average annual production for water years 1991 through 1997, when all four systems were on line, was 661 million gallons (Calculations did not include 1990 because a considerable amount of data were not available for the State system that year). The average for 1991-1997 is estimated to be 670 million gallons after adding in the estimated amount of withdrawals that are missing from the State system in 1996 and 1997.

Overall, production has more than doubled since the time when only the BWSWD was withdrawing geothermal water. Maximum monthly production, which occurs in January, for the

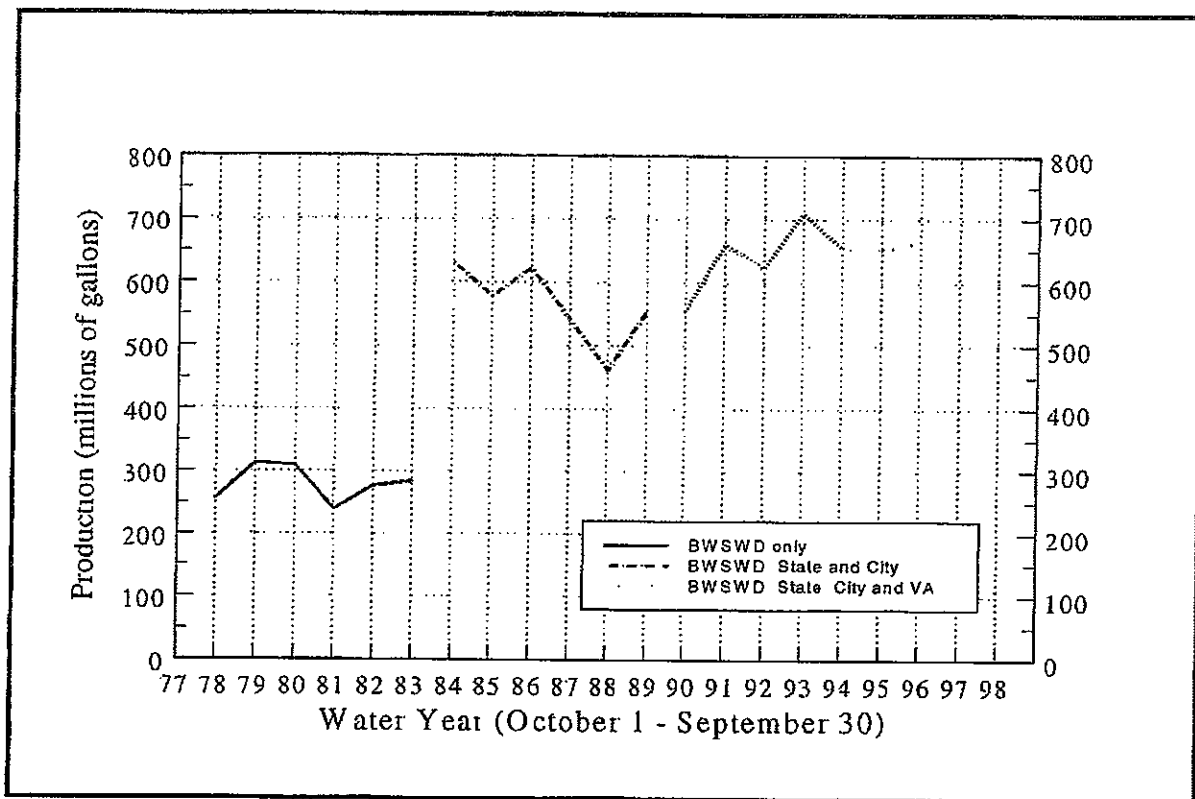


Figure 17. Total production by water year for the four heating systems in the Boise Front geothermal area, 1978-1997

four systems, has been as much as 106 million gallons (Figure 18) Figure 19 shows the average annual production and percentage of total for each heating system for water years 1991-1997.

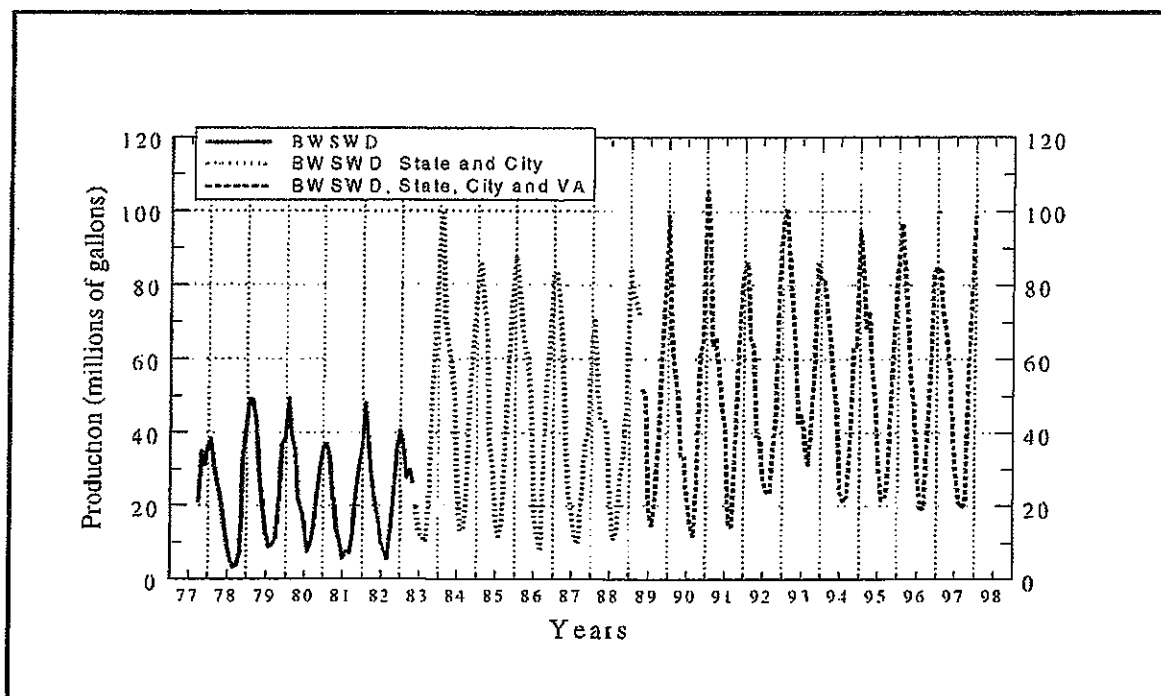


Figure 18. Monthly production for the four heating systems in the Boise Front geothermal area, 1977-1997

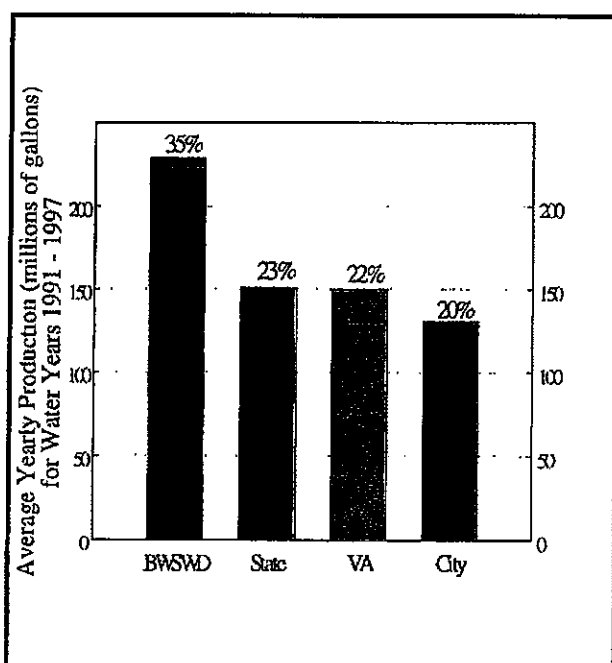


Figure 19. Average yearly geothermal production for the four heating systems in the Boise area for water years 1991 through 1997. Individual percentages of the total production are given for each system.

GROUND WATER MANAGEMENT AREA AND MORATORIUM

Water levels in the BLM well, which is the primary monitoring well for the Boise Front geothermal area, declined about 25 feet from 1984 to 1989 (Figure 20). Comparing Figures 17 and 18 to Figure 20 shows that the plummeting levels in the mid to late 1980's were related to new production from the State and City heating systems. Geothermal production in this portion of the Boise Front geothermal area increased about 100 percent when these two systems went on line. The addition of the VA system in 1989 did not cause observable declines in the BLM well despite a 15 percent increase in total production. The VA production well and the BLM well are believed to be in the same fault zone based on similar water level responses (Berkeley Group, 1990).

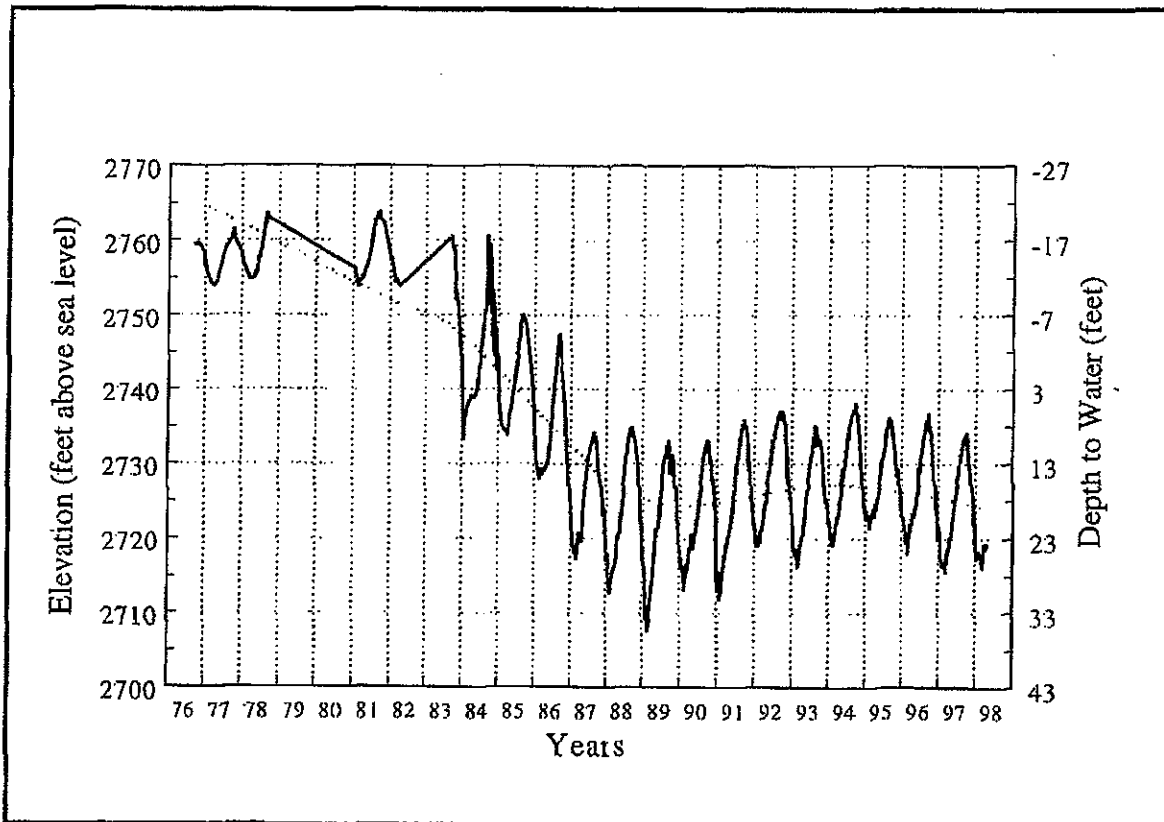


Figure 20. Hydrograph for the BLM observation well, 1976-1998. The solid line connects actual data points. The dotted line was added using the locally weighted scatterplot smoothing (LOWESS) method to show the general middle trend of the data (Helsel and Hirsch, 1992)

On June 15, 1987, the IDWR designated the Boise Front Low Temperature Geothermal Resource Ground Water Management Area (Boise Front GWMA) which stopped routine issuances of permits for geothermal development in the designated area (Figure 2) The description of the Boise Front GWMA is:

From a point of beginning at the Northeast corner of Sec. 8, T4N, R2E; thence southerly 1 mile to the southeast corner of Sec. 8; thence easterly approximately 3 miles to the northeast corner of Sec. 14; then southerly 2 miles to the southeast corner of Sec. 23; then easterly 2 miles to the northeast corner of Sec. 30, T4N, R3E; thence southerly 2 miles to the southeast corner of Sec. 31; thence easterly approximately 1 mile to the southeast corner of Sec. 32; thence southerly approximately 2 miles to the northwest corner of Sec. 16, T3N, R3E, thence easterly 1 mile to the northeast corner of Sec. 16; thence southerly 1 mile to the southeast corner of Sec. 16, thence easterly 1 mile to the southeast corner of Sec. 15; thence southerly approximately 5 miles to the southeast corner of Sec. 10, T2N, R3E; thence westerly approximately 9 miles to the southwest corner of Sec. 8, T2N, R2E; thence northerly 4 miles to the southwest corner of Sec. 20, T3N, R2E; thence westerly approximately 2 miles to the southwest corner of Sec. 24, T3N, R1E; thence northerly approximately 4 miles to the southwest corner of Sec. 36, T4N, R1E; thence westerly 2 miles to the southwest corner of Sec. 34; thence northerly approximately 5 miles to the northwest corner of Sec. 10; thence easterly approximately 5 miles to the point of beginning (Idaho Department of Water Resources, 1987)

On June 10, 1988, the IDWR issued a five-year moratorium for the Boise Front GWMA whose main conditions were: 1) the prohibition of further development or additional use pursuant to undeveloped or partially developed permits (unless certain information is provided), and 2) the rejection of pending and future applications (unless certain information is provided)(Idaho Department of Water Resources, 1998) The Veterans Administration Regional Hospital was allowed to bring their system on line in 1988 because substantial development had been completed when the moratorium was issued In 1993, the IDWR extended the moratorium for another five years (Idaho Department of Water Resources, 1993). The moratorium is due to be reviewed in June, 1998. The dramatic water level declines in the BLM well ceased in 1989 Water levels rose slightly from 1989 to 1994 and have decreased a small amount since 1994 (Figure 20).

DATA ANALYSES

The following observations are based on reviewing and analyzing the geothermal monitoring data and other ancillary data for the Boise Front GWMA:

- 1 The rapid water level declines that occurred in the BLM well in the mid-1980's ceased after early 1989. Water levels increased in the BLM well from 1989 through 1994 (Figure 20). Since 1994, water levels have declined slightly.
- 2 Average annual total production for the four heating systems for water years 1991-1997 was 661 million gallons (Figure 17). The data from 1990 were not used because much of the State data for that year was missing. Some data were also missing from the State records for 1996 and 1997. The adjusted average total production for 1991-1997 was estimated to be 670 million gallons after the State records were modified with estimated values for the missing data intervals in 1996 and 1997.
- 3 Some correlations occurred between heating degree days and production data during water years 1991 through 1997 (Figures 4 and 17). For example, the number of heating degree days for water year 1993 was slightly higher than both the preceding and succeeding years. Total production was also higher in 1993. Both the number of heating degree days and the total production have remained fairly constant since 1994. However, missing State data for 1996 and 1997 make these correlations less reliable.
4. Correlations between water levels in the BLM well and total production are not clear. Water levels increased from 1990 through 1992 despite total production increases during these years. Water levels declined slightly in 1993 when heating degree days and total production were at their highest in the last 10 years. Water levels in the BLM well declined 3-4 feet from 1994 through 1997 despite the apparent flat trend in total production. However, if we assume that total production was slightly higher in 1996 and 1997 than shown in Figure 17 (based on the adjustments for missing data), then water level declines may be related to production increases for those years. In any event, fluctuations in water levels and total production have been minor in the last five years.
5. The average precipitation at the Boise Airport rain gauge station for water years 1987 through 1997 was about 10 percent lower than the 30 year average for water years 1968 through 1997 (Figure 3). These data suggest that recharge from precipitation to the ground water systems in the Boise area has been slightly less than average during the last decade. However, it is uncertain how fluctuations in precipitation affect water levels in the deep geothermal aquifer. Water levels in the BLM well did not respond immediately to precipitation fluctuations. For example, water levels in the BLM well increased slightly from 1990 through 1992.

despite below average precipitation during these years. Water levels declined slightly in the BLM well from 1994 through 1997 despite above average precipitation in water years 1995-1997. Presently, it cannot be determined if the water level declines in the 1994-1997 interval were related to below average precipitation in some of the mid 1980's and early 1990's water years or to slight increases in total production.

In conclusion, discharge does not appear to be exceeding recharge based on the water level data in the BLM well and the production data from the four geothermal heating systems. Water levels in the BLM observation well for the past 10 years indicate that the geothermal system has probably reached a new water level equilibrium, despite some minor fluctuations. The reason(s) for the new equilibrium is not fully understood but it is probably caused by: 1) stabilized withdrawal rates since the rapid increases of the 1980's, and/or 2) induced recharge related to the increase in production from the geothermal system.

A model developed by Montgomery Watson (1994) predicted that water levels will decline if production is increased at the City and Boise Warm Springs well fields. However, the City of Boise recently completed an injection well that is expected to reduce or completely offset the predicted water declines caused by increased withdrawals. The new well will inject most of the City's spent geothermal water that is currently being disposed in the Boise River. This well, which is to be operational for the 1998-1999 heating season, is predicted to cause positive pressure effects assuming there is hydraulic connectivity between it and the geothermal aquifer (Montgomery Watson, 1996). A modeling scenario by Montgomery Watson (1994) predicted that injection of spent geothermal water near the new injection well location would result in no net changes to the water level at the BLM well assuming a 20 percent increase in production at the City and Boise Warm Springs Water District well fields.

Based on the current data, it is uncertain how production increases, if allowed by the IDWR, will adversely impact the water levels in this part of the Boise Front geothermal system, especially in combination with the new injection well. The historic data show that water level declines did occur after the State and City systems came on line. However, there were no observable water level declines with the addition of the VA production.

ACKNOWLEDGMENTS

The author would like to thank the following people who have faithfully recorded monitoring data for the four district heating system over the years: Rod Baldwin and Robert Giffiths (Boise Warm Springs Water District); Bill Hudson and Monty Leinberger (State of Idaho Capitol Mall System); Kent Johnson, Neal Oldemeyer and Dave Turner (City of Boise System); and Larry Post (Veterans Administration Regional Hospital)

The persons who provided technical reviews for this report were: Hal Anderson, Paul Castelin, Wayne Haas, Glen Saxton and Norman Young who are all employed at the Idaho Department of Water Resources. Thank you for taking the time to add valuable comments to this effort. Appreciation is also extended to Jessica Larson who helped with some of the graphics.

Parameter	Estimate	Standard Error	95% CI	P-value
Intercept	1.00	0.00	1.00	0.00
Age	0.02	0.01	0.01, 0.03	0.00
Gender	0.05	0.02	0.01, 0.10	0.01
Education	0.01	0.01	-0.01, 0.03	0.10
Income	0.01	0.01	-0.01, 0.03	0.10
Health	0.01	0.01	-0.01, 0.03	0.10
Marriage	0.01	0.01	-0.01, 0.03	0.10
Children	0.01	0.01	-0.01, 0.03	0.10
Religion	0.01	0.01	-0.01, 0.03	0.10
Politics	0.01	0.01	-0.01, 0.03	0.10
Environment	0.01	0.01	-0.01, 0.03	0.10
Technology	0.01	0.01	-0.01, 0.03	0.10
Art	0.01	0.01	-0.01, 0.03	0.10
Science	0.01	0.01	-0.01, 0.03	0.10
History	0.01	0.01	-0.01, 0.03	0.10
Geography	0.01	0.01	-0.01, 0.03	0.10
Language	0.01	0.01	-0.01, 0.03	0.10
Music	0.01	0.01	-0.01, 0.03	0.10
Dance	0.01	0.01	-0.01, 0.03	0.10
Theater	0.01	0.01	-0.01, 0.03	0.10
Cinema	0.01	0.01	-0.01, 0.03	0.10
Television	0.01	0.01	-0.01, 0.03	0.10
Radio	0.01	0.01	-0.01, 0.03	0.10
Internet	0.01	0.01	-0.01, 0.03	0.10
Mobile	0.01	0.01	-0.01, 0.03	0.10
Smartphone	0.01	0.01	-0.01, 0.03	0.10
Tablet	0.01	0.01	-0.01, 0.03	0.10
Laptop	0.01	0.01	-0.01, 0.03	0.10
Desktop	0.01	0.01	-0.01, 0.03	0.10
Server	0.01	0.01	-0.01, 0.03	0.10
Cloud	0.01	0.01	-0.01, 0.03	0.10
Blockchain	0.01	0.01	-0.01, 0.03	0.10
Quantum	0.01	0.01	-0.01, 0.03	0.10
Nanotechnology	0.01	0.01	-0.01, 0.03	0.10
Biotechnology	0.01	0.01	-0.01, 0.03	0.10
Space	0.01	0.01	-0.01, 0.03	0.10
Outer Space	0.01	0.01	-0.01, 0.03	0.10
Deep Space	0.01	0.01	-0.01, 0.03	0.10
Interstellar	0.01	0.01	-0.01, 0.03	0.10
Galaxy	0.01	0.01	-0.01, 0.03	0.10
Universe	0.01	0.01	-0.01, 0.03	0.10
Cosmos	0.01	0.01	-0.01, 0.03	0.10
Star	0.01	0.01	-0.01, 0.03	0.10
Solar System	0.01	0.01	-0.01, 0.03	0.10
Planet	0.01	0.01	-0.01, 0.03	0.10
Moon	0.01	0.01	-0.01, 0.03	0.10
Comet	0.01	0.01	-0.01, 0.03	0.10
Asteroid	0.01	0.01	-0.01, 0.03	0.10
Meteor	0.01	0.01	-0.01, 0.03	0.10
Shooting Star	0.01	0.01	-0.01, 0.03	0.10
Supernova	0.01	0.01	-0.01, 0.03	0.10
Black Hole	0.01	0.01	-0.01, 0.03	0.10
White Dwarf	0.01	0.01	-0.01, 0.03	0.10
Neutron Star	0.01	0.01	-0.01, 0.03	0.10
Pulsar	0.01	0.01	-0.01, 0.03	0.10
Quasar	0.01	0.01	-0.01, 0.03	0.10
Gamma Ray Burst	0.01	0.01	-0.01, 0.03	0.10
Dark Matter	0.01	0.01	-0.01, 0.03	0.10
Dark Energy	0.01	0.01	-0.01, 0.03	0.10
Big Bang	0.01	0.01	-0.01, 0.03	0.10
Primordial Soup	0.01	0.01	-0.01, 0.03	0.10
Abiogenesis	0.01	0.01	-0.01, 0.03	0.10
Evolution	0.01	0.01	-0.01, 0.03	0.10
Speciation	0.01	0.01	-0.01, 0.03	0.10
Extinction	0.01	0.01	-0.01, 0.03	0.10
Adaptation	0.01	0.01	-0.01, 0.03	0.10
Natural Selection	0.01	0.01	-0.01, 0.03	0.10

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12/12/2005

IDAHO DEPARTMENT OF WATER RESOURCES
RECOMMENDED WATER RIGHTS ACQUIRED UNDER STATE LAW

RIGHT NUMBER: 63-5073

NAME AND ADDRESS: BOISE WARM SPRINGS WATER DIST
2440 OLD PENITENTIARY RD
BOISE ID 83712

SOURCE: GROUND WATER

TRIBUTARY:

QUANTITY: 3.750 CFS
958.00 AFY

PRIORITY DATE: 11/05/1894

POINT OF
DIVERSION: T03N R02E S12 SESESW Within ADA County

PURPOSE AND
PERIOD OF USE:

<u>PURPOSE OF USE</u>	<u>PERIOD OF USE</u>	<u>QUANTITY</u>
DOMESTIC	01/01 12/31	3.750 CFS
HEATING	01/01 12/31	3.750 CFS

PLACE OF USE: HEATING Within ADA County

T03N R02E S10	NENE	T03N R02E S10 Lot 3	SWNE
T03N R02E S10 Lot 1	SENE	T03N R02E S10 Lot 2	NESE
T03N R02E S11 Lot 4	SWNW	T03N R02E S11	NESW
T03N R02E S11	NWSW	T03N R02E S11 Lot 6	SESW
T03N R02E S11	NESE	T03N R02E S11	NWSE
T03N R02E S11	SWSE	T03N R02E S11	SESE
T03N R02E S12	SESW	T03N R02E S13	NENW
T03N R02E S13	NWNW	T03N R02E S14	NENE

DOMESTIC Within ADA County

T03N R02E S10	NENE	T03N R02E S10 Lot 3	SWNE
T03N R02E S10 Lot 1	SENE	T03N R02E S10 Lot 2	NESE
T03N R02E S11 Lot 4	SWNW	T03N R02E S11	NESW
T03N R02E S11	NWSW	T03N R02E S11 Lot 6	SESW
T03N R02E S11	NESE	T03N R02E S11	NWSE
T03N R02E S11	SWSE	T03N R02E S11	SESE
T03N R02E S12	SESW	T03N R02E S13	NENW
T03N R02E S13	NWNW	T03N R02E S14	NENE

PLACE OF USE IS WITHIN THE SERVICE AREA OF THE BOISE WARM SPRINGS WATER DISTRICT

The boundary encompassing the place of use for this water right is described with a digital boundary as defined by I.C. Section 42-202B(2) and authorized pursuant to I.C. Section 42-1411(2)(h). The data comprising the digital boundary are incorporated herein by reference and are stored on a CD-ROM disk issued in duplicate originals on file with the SRBA District Court and the Idaho Department of Water Resources. A map depicting the place of use is attached hereto to illustrate the place of use described by the digital boundary.

OTHER PROVISIONS NECESSARY FOR DEFINITION OR ADMINISTRATION OF THIS WATER RIGHT:
This partial decree is subject to such general provisions necessary for the definition of the rights or for the efficient administration of the water rights as may be ultimately determined by the Court at a point in time no later than the entry of a final unified decree. Section 42-1412(6), Idaho Code.

EXPLANATORY MATERIAL: BASIS OF CLAIM - Beneficial Use

THE USE IS LIMITED TO 266 RESIDENTIAL AND COMMERCIAL SERVICES WITH THE BOUNDARY OF THE BOISE WARM SPRINGS WATER DISTRICT.

WATER IS LOW TEMPERATURE GEOTHERMAL WATER.

WATER TEMPERATURE MEASURED AT 172 DEGREES F.

BOISE WARM SPRINGS WATER DISTRICT

ADDITIONAL INFORMATION

DATE: JUNE 28, 2005

BY: MEL SCHULTE

The principal contact during the review and field exam was Rodney Baldwin, P.E. (343-4135). The company attorney is Bruce Smith. The most recent contact is Bob Sutter, a new addition to the board of directors. (345-3599)

The claim is based on a Statutory Claim for Domestic and Heating uses in the downtown and Eastern parts of Boise City. The claim specifies a diversion rate of 12.819 cfs from three low temp geothermal wells located behind the old State Penitentiary in East Boise.

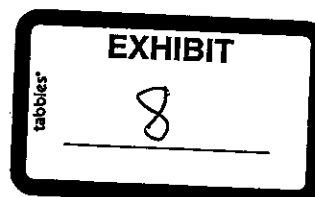
The primary issue associated with this claim is the diversion rate. The Statutory claim and SRBA claim are based on posted notices that indicate the intention of developing 4.273 cfs from three artesian wells. ($3 \times 4.273 = 12.819$ cfs) Three wells were never put into production. Two wells have been historically pumped and used but the third well never met diversion standards and is currently use as a monitoring well.

The three wells are included in the Boise Front Low Temperature Geothermal Resource Area and are also in the ground water management area established in 1987. There is an abundance of data concerning the wells on file with Ken Neely at the State Office, IDWR.

The recommended diversion rate of 3.75 cfs and the annual volume of 958 AF are based on information provided by Bob Sutter that he obtained in the company's production records from 1977 to 1989. (See the memo dated 3/5/2005 prepared by Bob Sutter) The information provided by Bob changed our initial recommended diversion rate of 2.45 cfs and annual volume of 770 AF to 3.75 cfs and 958 AF. Bruce Smith will most likely challenge the recommended rate and volume numbers mentioned above. He is interpreting a section of Idaho Code to mean that the diversion rate claimed in a statutory claim is the diversion rate guaranteed by the Code.

There is concern by the district that the limitation of 266 residential and commercial services is too restrictive to their future growth. The number 266 is the number they provided in their original claim filed in 1989. Their statutory claim filed in 1983 indicates they service the Idaho Dept of Health & Agriculture labs, 238 households for heating and 207 households for domestic. It appears the total number of services described in the statutory claims is 239 so the number we recommended, 266, is the larger of the two. Bob Sutter searched their records to find out how many of the services not in use in the mid-1980's still had pipes attached to their main lines but "valved-off". He arrived at the number 351 that includes current users and non-users with "valved-off" lines. The district wants us to use the "stubbed-in" policy used in licensing as a determination as to how many service units we recommend. After a discussion with Dave Tuthill and Nick Spencer it is our opinion the "stubbed-in" policy does not apply in determining the number of uses in a beneficial use claim. Therefore, we will leave the number of service units at 266.

The POD was established by GPS and USGS topo map Boise South, Idaho.



The notice of error filing by Bruce Smith indicates disagreement with our entire recommendation but no changes were made. He did not provide any additional evidence to support his notice of error filing so it is apparent that he wants to take the recommendation to the objection period.

MTS

Historic Recorded Maximum Water Use of Boise Warm Springs Water District

In 1989 Robert Griffiths, manager of the Boise Warm Springs Water District (BWSWD), prepared a report titled "Geothermal Production 1977-1989." He used a Lotus program to summarize the daily rates of diversion by using the total recorded volume for each day and the time between meter readings.

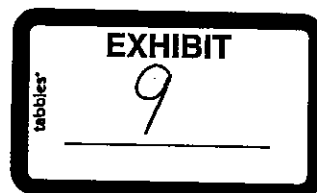
Inspection of the average daily pumping rates calculated in the report shows that there were 18 occurrences of rates above 1600 gallons per minute (gpm). Some occurrences were not used because they appeared to be anomalies due to questionable readings. Comparing these occurrences with dates and daily temperature records indicate these maximum rates of diversion occurred during the months of December through February when temperatures were near 0 degrees Fahrenheit or below for extended periods.

By averaging the five highest values observed, a reasonable estimate can be made of the maximum historic recorded diversion by the (BWSWD) wells. In late January of 1979 temperatures were very cold reaching 13 below zero. On January 25, 1693 gpm was recorded, and on January 29, 1651 gpm. Again in late January 1980 a cold spell occurred with temperatures reaching 7 below zero. On January 21, 1980 an average rate of 1737 gpm was recorded and on January 28, 1980 a rate of 1659 gpm was calculated. On February 5th of 1982, a rate of 1699 gpm was recorded when temperatures fell to zero. In all the above cases, temperatures were low for an extended period and pumping rates were frequently above 1600 gpm. The average of the above five readings is 1688 gpm or about 3.75 cfs.

Neely reported maximum annual volume diverted by the BWSWD as 312.2 million gallons in 1979. This is equivalent to 958 acre-feet per year.

Bob Sutter
Boise Warm Springs Water District

March 8, 2005



BOISE WARM SPRINGS WATER DISTRICT

**GEOHERMAL
PRODUCTION
1977 - 1989**

BOISE WARM SPRINGS WATER DISTRICT

GEOHERMAL PRODUCTION

1977 - 1989

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QJAN79

BOISE WARM SPRINGS WATER DISTRICT

DAILY PRODUCTION FOR MONTH OF JANUARY 1979

PAGE 6 OF 13

DATE	TIME	ELAPSE TIME	RATE OBSER	METER READING	QUANTITY M GAL	AVE. RATE	ADJUSTED QUANTITY
------	------	----------------	---------------	------------------	-------------------	--------------	----------------------

01JAN79	10			499712			
02	8.5	1350	800	500770	1058	783.70	
03	8	1410	790	501933	1163	824.82	
04	8.5	1470	800	503077	1144	778.23	
05	8.5	1440	800	504265	1188	825	
06	9	1470	800	505437	1172	797.27	
07	9.5	1470	800	506666	1229	836.05	
08	7	1290	820	507709	1043	808.52	
09	8.5	1530	820	508974	1265	826.79	
10JAN79	9.5	1500	1000	510540	1566	1044	
11	8.75	1395	850	511724	1184	848.74	
12	6.25	1290	800	512796	1072	831.00	
13	6.5	1455	800	514035	1239	851.54	
14	8.75	1575	820	515455	1420	901.58	
15	8.5	1425	910	516758	1303	914.38	
16	8.5	1440	950	517880	1122	779.16	
17	8	1410	1000	519208	1328	941.84	
18	8.5	1470	1000	520620	1412	960.54	
19	8.25	1425	920	522005	1385	971.92	
20JAN79	8	1425	1100	523400	1395	978.94	
21	8	1440	1050	524737	1337	928.47	
22	9	1500	1000	526190	1453	968.66	
23	9	1440	1100	528034	1844	1280.5	
24	8.5	1410	1110	530316	2282	1618.4	
25	8.5	1440	1100	532694	2378	1651.3	
26	8.5	1440	1120		2337	1622.9	
27	9	1470	1120		2337	1589.7	
28	9.5	1470	800		2337	1589.7	
29	8.5	1380	1180		2337	1693.4	
30JAN79	9	1470	1660	544381	2339	1591.1	
31JAN79	8	1380	1530	546656	2275	1648.5	
01FEB79	8.75	1485	1500	549030	2374	1598.6	

800

TOTAL MINUTES 44565
 SUBTOTAL M GAL
 TOTAL ADJ M GAL
 TOTAL M GAL
 AVE. RATE
 QJAN79

49318

49318

1106.6

0

QJAN80

BOISE WARM SPRINGS WATER DISTRICT

DAILY PRODUCTION FOR MONTH OF JANUARY 1980

PAGE 6 OF 13

DATE	TIME	ELAPSE TIME	RATE OBSER	METER READING	QUANTITY M GAL	AVE. RATE	ADJUSTED QUANTITY
01JAN80		7		827894			
02	9.5	1590	900	829257	1363	857.23	
03	9	1410	850	830500	1243	881.56	
04	9	1440	850	831710	1210	840.27	
05	9	1440	900	832949	1239	860.41	
06	7	1320	1000	834046	1097	831.06	
07	9	1560	1600	835700	1654	1060.2	
08	8.5	1410	1250	837115	1415	1003.5	
09	8.5	1440	950	839067	1952	1355.5	
10JAN80	8.75	1455	925	840278	1211	832.30	
11	8.5	1425	950	841544	1266	888.42	
12	9	1470	900	842720	1176	800	
13	9	1440	900	843860	1140	791.66	
14	8.5	1410	800	844959	1099	779.43	
15	9	1470	800	846080	1121	762.58	
16	8.5	1410	820	847144	1064	754.60	
17	8.5	1440	800	848410	1266	879.16	
18	8.5	1440	950	849616	1206	837.5	
19	8.5	1440	980	850881	1265	878.47	
20JAN80	9	1470	1600	852121	1240	843.53	
21	8.5	1410	1100	854570	2449	1736.8	
22	8.5	1440	1650	856931	2361	1639.5	
23	8.5	1440	1600	859255	2324	1613.8	
24	8.5	1440	1600	860830	1575	1093.7	
25	8.5	1440	1650	863095	2265	1572.9	
26	10	1530	1650	864670	1575	1029.4	
27	9.5	1410	1700	866930	2260	1602.8	
28	8.5	1380	1750	869220	2290	1659.4	
29	8.5	1440	1600	871468	2248	1561.1	
30JAN80	7.75	1395	1700	873600	2132	1528.3	
31JAN80	9	1515	1700	876010	2410	1590.7	
01FEB80	7.5	1350	1650	877412	1402	1038.5	

TOTAL MINUTES 44670

SUBTOTAL M GAL

49518

TOTAL ADJ M GAL

TOTAL M GAL

49518

AVE. RATE

1108.5

QJAN80

0

QFEB82

BOISE WARM SPRINGS WATER DISTRICT

DAILY PRODUCTION FOR MONTH OF FEBRUARY 1982

PAGE 7 OF 13

DATE	TIME	ELAPSE TIME	RATE OBSER	METER READING	QUANTITY M GAL	AVE. RATE	ADJUSTED QUANTITY
01FEB82	9.5		1200	405823			
02	9.5	1440	1200	407840	2017	1400.6	
03	9	1410	1400	409100	1260	893.61	
04	9.5	1470	1400	410110	1010	687.07	
05	9	1410	1400	412506	2396	1699.2	
06	9.5	1470	1500	414475	1969	1339.4	
07	9.5	1440	1450	416666	2191	1521.5	
08	9	1410	1150	417940	1274	903.54	
09	8.5	1410	1000	419204	1264	896.45	
10FEB82	8.5	1440	1100	420500	1296	900	
11	8.5	1440	900	421750	1250	868.05	
12	9.25	1485	1150	423066	1316	886.19	
13	8.5	1395	1100	424722	1656	1187.0	
14	10	1530	1000	426147	1425	931.37	
15	9	1380	700	427250	1103	799.27	
16	9	1440	650	428397	1147	796.52	
17	9.5	1470	1000	429550	1153	784.35	
18	8	1350	960	430660	1110	822.22	
19	8	1440	900	431770	1110	770.83	
20FEB82	9.5	1530	750	432860	1090	712.41	
21	8.5	1380	500	433683	823	596.37	
22	8	1410	650	434678	995	705.67	
23	8.75	1485	850	435842	1164	783.83	
24	8.5	1425	800	437060	1218	854.73	
25	9.5	1500	750	438255	1195	796.66	
26	8.75	1395	550	439300	1045	749.10	
27	9	1455	550	440360	1060	728.52	
28FEB82	9.5	1470	550	441500	1140	775.51	
01MAR82	8.75	1395	500	442423	923	661.64	

TOTAL MINUTES 40275
 SUBTOTAL M GAL
 TOTAL ADJ M GAL
 TOTAL M GAL
 AVE. RATE
 QFEB82

36600

36600

908.75

0

By
Kenneth W. Neely

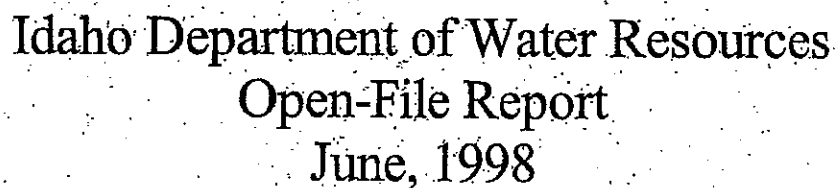


Table 2. Production By Water Year¹ For The Four Heating Systems In The Boise Front Geothermal Area.

PRODUCTION IN MILLIONS OF GALLONS					
Water Year	BWSWD	State	City	VA	Total
1978	256.0				256.0
1979	312.2				312.2
1780	308.1				308.1
1981	239.4				239.4
1982	276.0				276.0
1983	283.5				283.5
1984	300.1	162.9	166.7		629.7
1985	281.1	175.4	121.4		577.9
1986	253.2	192.0	176.8		622.0
1987	183.3	169.1	188.9		541.3
1988	199.4	138.8	123.8		462.0
1989	278.0	120.0	158.0		556.0
1990	244.6	68.3	122.3	118.2	553.4
1991	245.7	177.6	121.3	115.4	660.0
1992	243.3	139.0	123.3	116.7	622.3
1993	239.3	177.6	156.0	137.0	709.9
1994	214.7	179.6	122.5	137.4	654.2
1995	221.2	150.8	129.9	151.4	653.3
1996	226.6	119.6	132.1	186.2	664.5
1997	212.8	112.2	130.7	203.6	659.3
Average production	250.9 (1978-1997)	155.0 (1984-1997, minus 1990)	141.0 (1984-1997)	145.7 (1990-1997)	660.5 (1991-1997)

¹Water year runs from October 1 to September 30. For example, water year 1978 started on October 1, 1977 and ended on September 30, 1978.

$$250.9 \text{ mg} \div 325,850 = 770 \text{ AF}$$

$$312.2 \text{ mg} \div 325,850 = 958 \text{ AF}$$

CHAPTER 6

PURPOSE OF USE, QUANTITY FOR EACH PURPOSE, AND TOTAL QUANTITY

I. INTRODUCTION

The purpose and quantity elements of a water right lie at the heart of the description of water use under a water right. The agent must be familiar with how to describe the various uses of water the investigation uncovers. Further, the method by which the water right was established determines to a large extent what evidence is relevant to the purpose of use and quantity to be recommended.

II. PURPOSES OF USE AND QUANTITY

Any use of water can be recommended for a water right so long as the use is for a beneficial purpose. The following subsections describe various beneficial uses, how they should be reported, and the quantity to recommend for each.

Adjudication Memo #32 sets forth standard remarks to describe the following:

- a. right measured at point other than point of diversion (D01),
- b. portion of right solely for conveyance loss (D02 - D04),
- c. storage capacity (D05),
- d. facility volume (D06).

The agent's recommendation on quantity must include the rate and volume of diversion for each use, and the total rate and volume of diversion. See Adjudication Memo #31 as to measurement of flow for ground water claims that require field exam; see Adjudication Memo #34 as to which rights require determination of diversion volume. Application Processing Memo 14 discusses the determination as to the amount for rights that include storage purposes.

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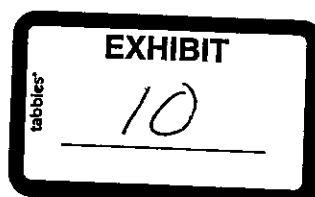
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For a claimed quantity to be recommended, the full amount must be beneficially used and the amount must be reasonable. Otherwise the amount recommended will be limited to a reasonable amount. In determining whether the amount used is reasonable, the following factors should be taken into account: the nature of use, the purpose of use, transmission losses, quantities used for the same purpose by others in the area, and amount of return flows. The fact that water is returned to the stream does not automatically make the diversion unreasonable. A determination that the quantity diverted for a long-standing use is not reasonable is a decision that should be made only after consultation with legal staff and the bureau chief.

There may be instances in which the total quantity may appropriately be less than the sum of the amounts for each purpose, such as where all or part of the amount for one purpose may also be used for another purpose. (For example, if an appropriator diverts 10



cfs for irrigation, and runs that same 10 cfs through a small hydropower facility, the total rate of diversion would be 10 cfs, not 20.)

A. Irrigation.

"Irrigation" is the spreading of water on land to materially increase the productiveness of the land for raising crops. The particular crop to be raised does not need to be identified in the recommendation, but may be necessary to conduct a Hubble analysis. The number of acres irrigated needs to be identified in the recommendation.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for irrigation. Idaho Code § 42-220 provides that no more than an inch per acre may be decreed under a water right unless it is shown that a greater amount of water is necessary. The quantity, alone or as combined, to be recommended for most irrigation rights is an inch per acre. Claims to flows in excess of the statutory standard of an inch per acre have been referred to generally as "excessive flow" claims. Excessive flow claims can be of two types - a single water right for more than an inch per acre, or multiple rights that total more than an inch per acre.

The agent should complete the excess irrigation requirement worksheet to determine if more than an inch per acre is reasonably required. The agent should use the Hubble analysis to determine if the excess amount is necessary due to field requirements. If so the claim should include a remark identifying the per acre rate of diversion at the field headgate. It may be that the excess flow is required for conveyance loss, which is discussed in subsection Q of this section.

The quantity to be recommended should, in the first instance, be the quantity based upon the irrigation system used at the time the adjudication commenced. However, if the water user demonstrates that in the past a reasonable water system used more water to accomplish the same purpose, the agent should recommend a quantity consistent with the needs under the historic system. Use the Hubble analysis to calculate this quantity.

Adjudication Memo #32 sets forth standard remarks for claims to be recommended with excessive flows for irrigation (D02, D03, D04, D08).

The agent should not recommend less than an inch per acre unless (1) the claim is for less than an inch per acre, or (2) historic use has always been less than an inch per acre. When a claimant claims much less water than would appear to be reasonably necessary to irrigate the number of acres claimed the agent should make further inquiry to ensure that the water use is beneficial.

2. Annual Volume.

The agent should recommend an annual volume for all groundwater irrigation rights. Use the "Field Headgate Requirement" map for this determination if the information is not otherwise determined in a license, transfer or reasonable decree.

Deleted: otherwise

Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water and should be recommended if contained in a license, transfer or reasonable decree.

B. Municipal.

Municipal use is defined by statute:

"Municipal purposes" refers to water for residential, commercial, industrial, irrigation of parks and open space, and related purposes, excluding use of water from geothermal sources for heating, which a municipal provider is entitled or obligated to supply to all those users within a service area, including those located outside the boundaries of a municipality served by a municipal provider.

Idaho Code § 42-202B(4). Further relevant definitions are also contained in this section .

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose.

The amount of water to be recommended for a municipal water right should be at least the amount actually diverted by the municipal provider, and should not exceed the full constructed capacity of the municipal system. The total amount recommended should equal the amount that is reasonably necessary to provide for the existing uses plus the reasonably anticipated future needs of the municipality.

2. Annual Volume.

Municipal water rights should not be recommended with an annual volume unless contained in a license, transfer or reasonable decree.

C. Stockwatering.

Stockwatering use refers to the diversion of water for drinking by domestic livestock or wildlife. This use can be either instream (or "in situ"), in which case the diversion is made by the animal itself, or out-of-stream stock watering use. In the case of wildlife there must be some type of human intent to divert the water to create a water right. Thus, drinking from a natural source by natural wildlife does not constitute stockwatering.

Where the purpose to be recommended is stockwatering the use should be further described in "explanatory material." The number and type of stock should be described if known.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose.

For small instream stock watering claims the amount to be recommended is .02 cfs with a limit of 13,000 gallons per day. For small diverted stockwatering claims the amount to be recommended is the claimed cfs, if reasonable, with a limit of 13,000 gallons per day. For large stock watering claims the amount to be recommended is the amount actually used at the time the appropriation commenced. This is dependent upon the number of stock. See Adjudication Memo 36.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

D. Mining.

Mining use refers to the use of water for the exploration for, and extraction and reduction of, raw mineral ore. Generally, mining use should occur at the future or present mine site. The extraction of sand and gravel where there is no effort to recover mineral ore does not constitute mining use. Where the purpose to be recommended is mining, the use should be further described in "other uses."

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose.

The quantity to be recommended is that amount actually used at the time the appropriation commenced. If the agent believes an amount claimed is unreasonable or wasteful, this issue should be referred to the Bureau Chief.

2. Annual Volume.

Groundwater rights for mining should be recommended with an annual volume based on historic annual use. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water and should be recommended if contained in a license, transfer or reasonable decree.

E. Domestic.

Idaho Code § 42-111 defines de minimis domestic water rights for purposes of the exemption from the mandatory groundwater permit requirements and filing fee determinations. Generically, domestic use is defined in Adjudication Memorandum 4.

Where the purpose to be recommended is domestic the use should be further described in the "non-irrigation uses" field. "" For instance, with domestic use for households, the number of households should be described under this field. For domestic uses pursuant to part B of the statutory definition, the facility in which the water is used should be described. A USE remark should be used if the length of the description is longer than 17 characters, including spaces.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The amount to be recommended for rights established under Part A of the statutory definition is the claimed cfs, if reasonable, with a limit of 13,000 gallons per day. The amount to be recommended for rights established under Part B of the statutory definition is the claimed cfs, if reasonable, with a limit of .04 cfs and 2,500 gallons per day. For other domestic claims the amount to be recommended is the amount actually used at the time the appropriation commenced.

2. Annual Volume.

Non-de minimis groundwater rights should be recommended with an annual volume. Annual volume may also be recommended for any domestic water right if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

F. Industrial/Commercial.

There is no clear distinction between industrial and commercial uses. Generally, industrial use refers to the use of water in the manufacturing, refining or other processing of a product. It can also be applied to washing agricultural products, food processing and sand and gravel washing. Diverting water with which to create steam at a power generating plant is an industrial use. Commercial uses, generally, are those that use water in a involving service or sales to the general public, other than a production context. Car washes, greenhouses and laundries are examples of commercial use.

Where the purpose to be recommended is industrial or commercial the use should be further described in the "non-irrigation uses" field. A USE remark should be used if the length of the description is longer than 17 characters, including spaces. The facility in which the water is used should be described.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. Actual beneficial use at the time of commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

G. Fish Propagation.

Fish propagation refers to the use of water to raise fish for commercial or public purposes. The recommendation should include a description of the volume of the raceways or other facilities in which the fish are raised.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. Actual beneficial use at the time of commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

H. Power.

Power use refers to the use of water to create electrical or mechanical power. When investigating water use at a hydropower plant information regarding the power generated in kilowatt capacity and the head should be collected and noted in the claim file. Since the 1940's IDWR has imposed a subordination condition on most licenses for hydropower uses. The agent should be sure to carry forward that subordination condition in recommendations for power, power storage or power from storage if contained in a license or subordination agreement. ~~If no subordination condition exists the agent should contact the attorney assigned to the basin to initiate a subordination condition investigation prior to preparing the Director's Report recommendation for the water right.~~

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Deleted: not recommend such a condition.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

I. Recreation.

Recreation use refers to water use for private, non-commercial sports and entertainment. Examples of recreation use include swimming pools, fishing ponds and water skiing facilities. The recommendation should describe the facilities used and include facility volume, if any.

1. Instantaneous Amount.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

J. Aesthetics.

Aesthetic use refers to the use of water for artistic or landscape purposes. Examples of aesthetic use includes fountains, artificial streams and ponds. The recommendation should describe the facilities used and include facility volume, if any.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

K. Wildlife.

Wildlife use refers to the use of water for wildlife habitat and watering. Because wildlife uses natural water bodies without any human intervention or intent, only that use that results from actual diversion of water qualifies for this purpose of use.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

L. Heating.

Heating use refers to the use of water temperature to warm structures and equipment.

Beneficial use of geothermal water generally requires beneficial use of the heat resource. An agent reviewing a claim to geothermal water should review Idaho Code § 42-233.

Field exams for rights to ground water and springs should include an examination of water temperature. For purposes of preparing the report, a temperature measurement is not usually required. In most cases, it will be readily apparent or the agent will already know that the source is something other than cold water. In such cases, a temperature measurement should be made where it would not be unreasonably difficult. Reasonable attempts should also be made to obtain information as to well depth. The temperature, and well depth data should be noted in the water right claim files.

Adjudication Memo #32 sets forth standard remarks to be used to identify rights to geothermal water (B05 - B08).

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

M. Cooling.

Cooling use refers to the use of water temperature to absorb heat and by doing so, cool structures and equipment.

1. Instantaneous Quantity.

If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The actual amount beneficially used at the commencement of the appropriation is the standard measure.

2. Annual Volume.

Groundwater rights should be recommended with an annual volume. Annual volume may also be recommended if there is a need to protect junior priority rights on a stream, spring or other source with limited quantities of water.

N. Instream Flow.

The Water Resource Board has filed claims for instream flow purposes. These claims are based upon approved applications for minimum stream flows issued pursuant to Chapter 15, Title 42, Idaho Code. These claims should be recommended consistently with IDWR's approval in the permit or license. A quantity is set forth in the approval.

Other claims for instream flow purposes should be referred to the Bureau Chief for review.

O. Fire Protection.

Fire protection use refers to the diversion of water to maintain a fire suppression system. Actual suppression of a fire is not necessary to complete an appropriation for this purpose.

1. Instantaneous Quantity.

The capacity of the fire suppression system at the commencement of the appropriation should be recommended, so long as some amount was actually diverted when the system was developed.

2. Annual Volume.

Annual volume of diversion need not be recommended for fire protection rights.

P. Storage.

Storage alone is not an appropriate purpose of use for water. Storing the water itself should be identified with some eventual use of the water. This storage should be recommended as "storage for (purpose)". Additionally, a purpose of use may be claimed for water released from storage. This use should be recommended by the particular use as follows: "(purpose) from storage".

1. Instantaneous Quantity.

Storage rights are usually not recommended with an instantaneous quantity. However, if the storage right diverts from the stream into a storage facility an instantaneous quantity should be recommended. If not otherwise determined by a license or reasonable decree the agent must determine an instantaneous quantity for this purpose. The capacity of the diversion works at the commencement of the appropriation is the standard measure.

2. Annual Volume.

A storage right should be recommended as an annual volume of storage. The agent should consider whether the storage facility has historically filled more than once per year. Generally, storage rights are limited to one fill per year.

Q. Quantity for Conveyance Loss.

Idaho Code § 42-110 provides that water users are entitled to the quantity of water which they are decreed measured at their point of diversion. Likewise, the Idaho Supreme Court has indicated that water rights are to be measured at their point of diversion. *Glenn Dale Ranches, Inc. v. Shaub*, 94 Idaho 585 (1972). As a consequence, some additional amount of water may be required to compensate for conveyance loss between the point of diversion and the field headgate, if the quantity is not established by a license or decree. The agent should use the Worstell method to calculate this conveyance loss if no other information is available.

If an excess amount (more than 0.02 cfs/acre) is necessary due to conveyance losses, then the right should be recommended with a remark limiting (explanatory material describing?) that portion of the right to use for conveyance losses in delivery of the right. Careful attention should be paid where there are multiple rights and all or part of one or more of the rights is limited to use for conveyance losses. EACH of the rights should contain a conveyance loss remark of some form.

EXAMPLE: Claimant has two rights to surface water from the same point of diversion, which total 1.2 cfs for 50 acres, and one right to 1 cfs of groundwater for the same 50 acres. 0.2 cfs of the surface water rights is in excess of an inch per acre; it is to be recommended due to actual, reasonable conveyance losses. The three

rights will contain a combined use remark limiting the three rights to 1.2 cfs for irrigation of 50 acres.

III. EVIDENCE OF PURPOSE OF USE AND QUANTITY.

A water right's purpose of use and quantity is first determined at the time of establishment of the right, and then as it may have been changed. Although determining the purpose of use and quantity is not dependent upon the legal method by which the water right was established, the evidence available to the agent differs based upon the legal method. This section is concerned primarily with claimed purposes of use and quantities where there is little evidence regarding historic use, such as with beneficial use rights, and accomplished transfers that have not been approved by IDWR.

There are five different methods of obtaining a water right, each with different amounts of evidence regarding the purpose for which water is used by the appropriator:

- ▶ Beneficial Use Method.
- ▶ Posted Notice Method.
- ▶ Permit Method.
- ▶ 42-1426 Enlargement Method.
- ▶ 42-1416B Expansion Method.

A. BENEFICIAL USE WATER RIGHTS

The purpose of use and quantity for a beneficial use water right is based on the use when water is first appropriated by application to beneficial use. As a general matter IDWR will have little evidence of the original purpose of use and quantity for beneficial use water rights.

With the passage of the accomplished transfer statute, Idaho Code § 42-1425, the purpose of use to be recommended for most beneficial use rights is the purpose of use as of the commencement of the adjudication on November 19, 1987. The agent's initial investigation of the purpose of use claimed should consist of an evaluation of whether the purpose of use claimed under a beneficial use claim is that purpose of use of water being used on the commencement date.

IDWR will start with the 1987 information because of the accomplished transfer statute. Idaho Code § ~~42-1425~~. The accomplished transfer statute was a legislative attempt to protect the pattern of water use as of the date of commencement of the SRBA. Therefore, IDWR generally will recommend beneficial use water rights as they exist as of commencement. IDWR will allow the objection process provided in Idaho Code § 42-1425(2)(a) to raise issues of injury and will not do so in its investigation.

Where the evidence supports a finding that a change occurred after commencement, then the original purpose of use should be recommended.

The agent should look at available evidence to determine whether the 1987 purpose of use is an enlargement from the use when the right was initiated. Available evidence includes: aerial and other photography in IDWR's possession, county assessors records regarding irrigated land, interviews with the claimant, and interviews with neighbors or other old timers. If the agent believes that an enlargement has occurred the claimant should be contacted to submit an enlargement claim.

The quantity element for beneficial use rights is more problematic. The accomplished transfer statute does not provide a legal basis to look solely to 1987 information. The agent will need to use claimant contacts, measurements and other research to determine whether the claimed quantity was the amount diverted and put to beneficial use at the time the right was initiated. It is fair that the agent assume that the water user has followed the law and has not enlarged the quantity used in the absence of evidence to the contrary.

If the agent discovers evidence that the quantity used has enlarged over time, the claimant should be notified that the claimant must submit evidence showing that the amount currently used was the amount originally appropriated. The claimant may be urged to file an additional claim for the additional amount with a priority as of the date of the increase and submit some evidence in support of the priority date claimed, or to file an application for permit, depending on when use of the additional amount was initiated. Absent evidence to the contrary, the additional amount should not be recommended because it appears to be a beneficial use in violation of the mandatory permit statutes.

B. CLAIM BASED ON DECREE, POSTED NOTICE OR LICENSE

If the claimed purpose of use is the same as the purpose of use shown on a decree, posted notice or license (as amended by any approved transfers) then no further review of this item generally is required. If the agent's review reveals that the claimed purpose of use is inaccurate, the agent may wish to contact the claimant to verify the purpose of use information.

The total amount decreed or licensed should be recommended as long as reasonable; the original purpose(s) and amounts for each purpose should be recommended to the extent claimed as long as reasonable; and the recommendation should include other claimed purpose(s) and amounts for each purpose that may be recommended as a change in use pursuant to the analysis below. A total amount greater than the total amount decreed or licensed may not be recommended.

Purpose of use is the central element of a water right. The failure of a decree to include purpose of use in the listing of rights renders the decree ineffective. Claims based on such a decree should be examined as beneficial use claims.

There are some decrees in the files which list the name, source, amount, priority, and property to which the water right is appurtenant, but contain only general language as to purpose, such as: "The following rights are decreed for irrigation, culinary, livestock,

milling, mining, and other beneficial purposes." This does not mean every water right listed is decreed for any purpose at all and the purpose may be changed whenever the owner feels like changing it. In these circumstances, the general rule is to first look to the decree, or other documents from the case that are already available in IDWR files. The decree should be interpreted as including any claimed purpose for which there is some specific support in these documents. For example, if a right is decreed to a party in an amount that is consistent with IDWR's irrigation standard or the duty of water set forth in the decree (i.e. 40 inches for use on forty acres), then this is some specific support for an irrigation purpose. If a right is decreed to a power and light company, this is some specific support for a hydropower purpose; similarly, if a right is decreed to a city or town, this is some support for a municipal purpose.

C. CLAIM BASED ON PERMIT

1. Permits for which a proof due notice was filed prior to commencement

If the claim is based on a permit for which a proof due notice was submitted prior to commencement, then contact water allocations staff in the state office before proceeding with review of this claim. See Introduction for a general discussion of claims in this category.

2. Purpose of use claimed different than purpose of use on permit

If the purpose of use claimed is different than the purpose of use shown on the permit (as amended by any approved amendments to the permit), then the purpose of use shown on the permit (as amended by any approved amendments to the permit) should be recommended.

A change in purpose of use may not be recommended for a claim based on a permit, because the accomplished transfer statute does not apply to permits. The only way to change the purpose of use on a permit is to file an application to amend the permit with IDWR.

D. CLAIM BASED ON 42-1426 ENLARGEMENT OR 42-1416B EXPANSION

The evaluation of the purpose of use of an Idaho Code § 42-1426 enlargement or 42-1416B expansion claim should parallel the analysis used for beneficial use rights. The purpose of use should be that purpose as of 1987. Remember that a 42-1416B expansion claim cannot include an increase in volume of use. See Adjudication Memorandum 16C (Completion Pending) for further explanation of how these claims should be investigated and recommended.

If a claim includes both the original purpose and an enlargement purpose, then the claimant should be contacted to allow the claimant the opportunity to file a separate claim

based on Idaho Code § 42-1426 or beneficial use for the additional purpose. The agent should consult with legal counsel when investigating such an enlargement.

E. RECOGNITION OF ACCOMPLISHED TRANSFER STATUTE.

A water right's purpose of use is transferred to an alternate purpose when the original purpose of use ceases, in whole or in part, and the water is instead used, in whole or in part, for a new purpose. Further information on this complex topic is available. **[Insert link to administrators memo]** An accomplished transferred purpose of use is a change in use that may be recommended with its original priority pursuant to Idaho Code § 42-1425. The agent should consult with legal counsel when investigating such a transfer. By way of contrast, an enlargement occurs when the original use continues without an increase in the diversion rate, and (1) the water is reused for a different purpose, (2) when the new use is made possible by conservation methods employed in making the original use, or (3) a new, non-consumptive use can be added to the original delivery system. Enlargements must be claimed separately.

A change in use may include an expansion in the number of acres irrigated with stored water pursuant to Idaho Code §42-222. In addition, a change to an alternative nature of use of stored water is a change in use that will generally not result in injury to other water rights because the water, once lawfully stored, is not part of the natural flow to which junior appropriators hold rights. Therefore, the review of expansions in irrigated acreage and changes to an alternative nature of use of stored water is the same.

If IDWR recommends an accomplished change in purpose of use, then the recommendation should include the following condition: "RIGHT INCLUDES ACCOMPLISHED CHANGE IN PURPOSE OF USE PURSUANT TO IDAHO CODE 42-1425."

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Historic Service Connections of Boise Warm Springs Water District

WATER RESOURCES
WESTERN REGION

In 1989 Robert Griffiths, manager of the Boise Warm Springs Water District (BWSWD), analyzed the total number of service connections that existed after 1952. Griffiths prepared two lists. The first was a listing of the Boise Water Corporation accounts dating from 1952 to 1973 and the second was a list of the BWSWD accounts that existed in 1989.

Between 1952 and 1989 some of the service connections were shut off at the delivery point adjacent to the property being served. The main reason for this was that in the period from 1952 to 1970, relatively cheap alternative energy such as hydropower and natural gas caused some homeowners to opt for more "modern" and possibly convenient forms of energy. The service valve at the point of delivery adjacent to the property was not removed but simply shut off. Had the homeowner desired to reconnect, it would have been an easy task to reactivate the service since the service connection remained in place and supply lines served adjacent properties.

Between 1970 and 1989 the increasing cost of other forms of energy caused other homeowners to connect to the BWSWD geothermal system as a cheaper alternative. These service connections are included in the BWSWD list of active accounts in the 1989.

The maximum historic recorded water use by the BWSWD occurred in the early 1980's during periods of extremely cold weather. The total number of service connections that existed concurrently with this period of maximum use can be found by comparing the two lists and eliminating duplicate connections between the two lists. Using this method, a total of 351 service connections can be identified as being present in the BWSWD in the mid-1980's.

Bob Sutter
Boise Warm Springs Water District



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	Acct No.	Street
1	0010	Warm Springs Avenue
2	0020	Warm Springs Avenue
3	0030	Warm Springs Avenue
4	0040	Warm Springs Avenue
5	0050	Warm Springs Avenue
6	0060	Warm Springs Avenue
7	0070	Warm Springs Avenue
8	0071	Warm Springs Avenue
9	0080	Warm Springs Avenue
10	0090	Warm Springs Avenue
11	0100	Warm Springs Avenue
12	0110	Warm Springs Avenue
13	0120	Warm Springs Avenue
14	0130	Warm Springs Avenue
15	0140	Warm Springs Avenue
16	0141	Warm Springs Avenue
17	0142	Warm Springs Avenue
18	0150	Warm Springs Avenue
19	0160	Warm Springs Avenue
20	0170	Warm Springs Avenue
21	0180	Warm Springs Avenue
22	0190	Warm Springs Avenue
23	0200	Warm Springs Avenue
24	0210	Warm Springs Avenue
25	0220	Warm Springs Avenue
26	0221	Warm Springs Avenue
27	0230	Warm Springs Avenue
28	0240	Warm Springs Avenue
29	0250	Warm Springs Avenue
30	0251	Warm Springs Avenue
31	0252	Warm Springs Avenue
32	0254	Warm Springs Avenue
33	0257	Warm Springs Avenue
34	0260	Warm Springs Avenue
35	0270	Warm Springs Avenue
36	0280	Warm Springs Avenue
37	0290	Warm Springs Avenue
38	0300	Warm Springs Avenue
39	0310	Warm Springs Avenue
40	0320	Warm Springs Avenue
41	0330	Warm Springs Avenue
42	0340	Warm Springs Avenue
43	0350	Warm Springs Avenue
44	0360	Warm Springs Avenue
45	0370	Warm Springs Avenue
46	0380	Warm Springs Avenue
47	0390	Warm Springs Avenue
48	0400	Warm Springs Avenue
49	0410	Warm Springs Avenue
50	0420	Warm Springs Avenue

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103	0900	Warm Springs Avenue
104	0910	Warm Springs Avenue
105	0911	Warm Springs Avenue
106	0912	Jantoni Drive
107	0913	Warm Springs Avenue
108	0920	Warm Springs Avenue
109	0921	Warm Springs Avenue
110	0922	Warm Springs Avenue
111	0929	Louisa
112	0930	East Idaho
113	0940	East Idaho
114	0950	East Idaho
115	0960	East Idaho
116	0970	East Idaho
117	0980	East Idaho
118	0990	East Idaho
119	1000	East Idaho
120	1010	East Idaho
121	1020	East Idaho
122	1030	East Idaho
123	1040	East Idaho
124	1050	East Idaho
125	1060	East Idaho
126	1070	East Bannock
127	1080	East Bannock
128	1090	East Bannock
129	1100	East Bannock
130	1110	East Bannock
131	1111	East Bannock
132	1114	East Bannock
133	1116	East Bannock
134	1120	East Bannock
135	1130	East Bannock
136	1140	East Bannock
137	1150	East Bannock
138	1160	East Bannock
139	1161	East Bannock
140	1170	East Bannock
141	1180	East Bannock
142	1190	East Bannock
143	1200	East Bannock
144	1210	East Bannock
145	1220	East Bannock
146	1230	East Bannock
147	1240	East Bannock
148	1250	East Bannock
149	1260	East Bannock
150	1270	East Bannock
151	1280	East Bannock
152	1290	East Idaho
153	1300	East Idaho
154	1310	East Idaho

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WATER RESOURCES
WESTERN REGION

207	1800	West Bannock
208	1810	West Bannock
209	1820	West Bannock
210	1825	West Bannock
211	1830	West Bannock
212	1840	West Bannock
213	1841	West Bannock
214	1850	West Bannock
215	1860	West Bannock
216	1870	West Bannock
217	1880	West Bannock
218	1890	West Bannock
219	1900	West Bannock
220	1910	West Jefferson
221	1920	West Jefferson
222	1930	West Jefferson
223	1931	West Jefferson
224	1940	West Jefferson
225	1950	West Jefferson
226	1960	West Jefferson
227	1965	West Jefferson
228	1967	West Washington
229	1970	West Jefferson
230	1980	West Jefferson
231	1990	West Jefferson
232	2000	West Jefferson
233	2010	West Jefferson
234	2011	West State
235	2020	West State
236	2030	Locust Street
237	2040	Locust Street
238	2050	North Walnut Avenue
239	2060	North Walnut Avenue
240	2070	North Walnut Avenue
241	2080	North Walnut Avenue
242	2085	North Maple Avenue
243	2090	North Maple Avenue
244	2100	North Elm Avenue
245	2110	North 1st
246	2120	North 4th Street
247	2130	North 5th Street
248	2140	North 6th Street
249	2150	North 7th Street
250	2160	North 8th Street
251	2170	North 8th Street
252	2180	North 8th Street
253	2190	North 8th Street
254	2200	West Bannock
255	2210	North 12th Street
256	2211	North 12th Street
257	3000	Warm Springs Avenue
258	3020	Warm Springs Avenue

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311	3990	Lenz Lane
312	4000	Lenz Lane
313	4010	Lenz Lane
314	4020	Lenz Lane
315	4030	Lenz Lane
316	4040	Lenz Lane
317	4050	Lenz Lane
318	4060	Lenz Lane
319	4070	Lenz Lane
320	4080	Lenz Lane
321	4090	Lenz Lane
322	4100	Lenz Lane
323	4110	Lenz Lane
324	4120	South Mobley Drive
325	4130	South Mobley Drive
326	4140	South Mobley Drive
327	4150	South Mobley Drive
328	4160	South Mobley Drive
329	4170	South Mobley Drive
330	4180	South Mobley Drive
331	4190	South Mobley Drive
332	4200	South Mobley Drive
333	4210	South Mobley Drive
334	4220	South Mobley Drive
335	4230	South Mobley Drive
336	4240	South Mobley Drive
337	4250	Lewis Street
338	4260	Lewis Street
339	4270	Lewis Street
340	4280	Lewis Street
341	4290	Lewis Street
342	4300	Lewis Street
343	4310	Lewis Street
344	4320	McGuffin Lane
345	4330	McGuffin Lane
346	4340	McGuffin Lane
347	4360	McGuffin Lane
348	4380	McGuffin Lane
349	4400	McGuffin Lane
350	4410	McGuffin Lane
351	4420	McGuffin Lane