

RECEIVED

MAR 03 2008

DEPARTMENT OF
WATER RESOURCES

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

In Re SRBA

) Subcase 45-14083

) (Insert water right number)

Case 39576

) STANDARD FORM 4

) MOTION TO FILE:

) ☒ LATE NOTICE OF CLAIM

) AMENDED NOTICE OF CLAIM

INSTRUCTIONS

This form is used to file a late Notice of Claim or an amendment to a Notice of Claim in a reporting area where the Director's Report has been filed. Forms may be obtained from the SRBA Court, the Idaho Department of Water Resources (IDWR), or you may copy or reproduce this blank form. If you copy or reproduce this form, please copy on both sides with the even-number pages upside down.

The water right number for your late or amended claim must be indicated above in the blank space following "Subcase." You must use a **separate form for each** late or amended Notice of Claim.

This form has been adopted by the court in *SRBA Administrative Order 1, Rules of Procedure* (amended Sept. 30, 1996), Section 4, which may be consulted for further information.

By filing a *Motion to File a Late Notice of Claim* or a *Motion to File an Amended Notice of Claim*, you certify that it is well-grounded in fact; is warranted by existing law or a good-faith argument for the extension, modification or reversal of existing law; and is not filed for any improper purpose, such as to harass, cause unnecessary delay, or needlessly increase the cost of litigation.

☐ I have read **SRBA Administrative Order 1, Rules of Procedure** (amended Sept. 30, 1996).

My name is the City of Burley

My address is 1401 Overland Avenue, Burley/P.O. Box 1090, Burley, Idaho 83318

My phone number is: Work (208) 878-2103 Home

I am an attorney representing the City of Burley

My name is R.C. Stone

My address is 137 West 13th St./P.O. Box 910, Burley, Idaho 83318

My phone number is (208) 878-8382

MOTION TO FILE A LATE NOTICE OF CLAIM

A *Motion to File a Late Notice of Claim* will require a hearing before the Presiding Judge.

☒ I did not file a Notice of claim to the use of water in the SRBA because:
This use was included in 45-4095. IDWR has concluded it needs to be
split because use increased in 1939 and requested that 45-4095 be
amended and this claim filed to cover all use.

☐ I filed a Notice of Claim and elected to defer judicial proceedings on my domestic or stock watering use. I desire to reinstate my Notice of Claim for domestic or stock watering use.

☒ I am providing legal and factual documentation for my claimed use of water. You must describe these documents and attach a readable copy. (You do not need to fill this out if you are reinstating a Notice of Claim for domestic or stock watering use, but you **must** attach a copy of your Notice of Claim.)

water report

I have attached:

- ☒ A fully completed Notice of Claim (available from IDWR).
- ☐ A claim filing fee for a domestic and stock watering use. IDWR may charge this fee pursuant to I.C. § 42-1414. To determine this amount, contact IDWR at (800) 451-4129. I have enclosed a check payable to: State of Idaho Department of Water Resources in the amount of \$ _____.
- ☒ A claim filing fee and a late claim fee for those claims other than a domestic or stock watering use for which a notice of claim was not filed. To determine this amount, contact IDWR at (800) 451-4129. I have enclosed a check payable to: State of Idaho Department of Water Resources in the amount of \$ 468.00 _____.

Follow these instructions regarding the hearing on this motion.

1. Contact the Clerk of the SRBA Court (208-736-3011) to request a hearing date and time.
2. Fill in the following information:

This motion will be heard on July 15, 2008, 1:30 pm
(Insert Date and Time)
at the SRBA courthouse, 253 Third Avenue North, Twin Falls, Idaho.

MOTION TO FILE AN AMENDED NOTICE OF CLAIM

A *Motion to File an Amended Notice of Claim* may require a hearing before the Presiding Judge or Special Master or may be granted by leave of the court or by written consent of the parties and the Idaho Department of Water Resources. Leave to amend a claim shall be freely given when justice so requires.

- ☐ I must amend my Notice of Claim to the use of water in the SRBA because:

- ☐ I am providing legal and factual documentation to support my amended Notice of Claim.
You must describe these documents and attach a readable copy.

I have attached:

- ☐ An amended Notice of Claim (available from IDWR).

- ☐ Payment of the following additional fees required by IDWR:

VERIFICATION (Must be completed)

State of Idaho

County of Cassia

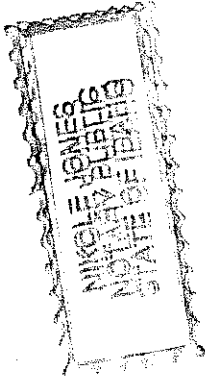
R.C. Stone, being first duly sworn, upon oath, deposes and says:
(Insert name of person filing form)

That I am the party/claimant filing this motion for late or amended claim (as listed on Page 2) as defined by I.C. §§ 42-1401A(1) and (7) or that I am the attorney for the party/claimant filing this motion for late or amended claim and that I have read this motion, know its contents, and believe that the statements are true to the best of my knowledge.

Signature of person filing motion

Attorney signing in representative capacity

Subscribed and sworn to before me on February 28, 2010
(Insert Date)



Notary Public for Idaho
Residing at: 211 Wey St
My Commission expires: 6/3/2010

INSTRUCTIONS FOR MAILING

You must mail this form, including all attachments, to the Clerk of the SRBA Court. **FAX filings will not be accepted by the SRBA Clerk of the Court.** You must also send a copy to all the parties listed below in the Certificate of Mailing.

CERTIFICATE OF MAILING

I certify that on Feb. 29, 2008, I mailed the original and copies of this form, including all attachments, to the following persons by mailing the original and/or copies, postage prepaid and addressed as follows:

1. Original to:

Clerk of the District Court
Snake River Basin Adjudication
253 Third Avenue North
PO Box 2707
Twin Falls, ID 83303-2707

2. Copies to:

IDWR Document Depository
PO Box 83720
Boise, ID 83720-0098

Chief, Natural Resources Division
Office of the Attorney General
State of Idaho
PO Box 44449
Boise, ID 83711-4449

United States Department of Justice
Environment and Natural Resource Division
550 West Fort Street, MSC 033
Boise, ID 83724

3. If you are filing an amended Notice of Claim in a subcase being heard before the Presiding Judge or a Special Master, you must serve a copy on all parties to that subcase.

(Insert Names/address of parties)



Signature of person or attorney mailing the form

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 45-14083

Date Received: _____

Receipt No: _____

Received By: _____

NOTICE OF CLAIM

TO A

WATER RIGHT

ACQUIRED UNDER STATE LAW

Please type or print clearly

1. Name of Claimant (s) _____ City of Burley _____ Phone (208) 878-2103

Mailing Address _____ P.O. Box 1090 _____ Burley Idaho ZIP 83318
Street or Box City State

2. Date of Priority (Only one (1) per claim) _____ 3/31/1939 _____
Month Day Year (YYY)

3. Source of water supply (Check one) Ground Water (X) or Other () (a) _____
which is tributary to (b) _____

4. a. Location of Point of Diversion is: Township _____, Range _____, Section _____,
_____, 1/4 of _____, 1/4 of _____, 1/4 Govt. Lot _____, BM., County of _____

Additional points of diversion if any: see attached _____

If available, GPS Coordinates _____

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

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

Govt. Lot _____, BM., County of _____

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

_____, 1/4 Govt. Lot _____, BM., 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. _____ wells, pumps, pipeline _____

Last Name Burley _____ Ident No. 45-14083 _____

14. Basis of Claim (Check One) Beneficial Use ☒ Posted Notice ☐ License ☐ Permit ☐ Decree ☐

Court _____ Decree Date _____ Plaintiff v. Defendant _____

If applicable provide IDWR Water Right Number _____

15. 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: 2

For Individuals: I/We do solemnly swear or affirm under penalty of perjury 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 under penalty of perjury that I am _____ of _____ the City of Burley.

_____ Title _____ Organization _____
that I have signed the foregoing document in the space below as _____ of _____ the City of Burley.

_____ Title _____ Organization _____
and that the statements contained in the foregoing document are true and correct.

Signature of Authorized Agent _____ Date 9-20-07

Title and Organization Mayor, City of Burley

Please Print Name

16. Notice of Appearance:
Notice is hereby given that I, R.C. Stone, 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 [Signature]

Address P.O. Box 910, Burley, Idaho 83318

Date 9/20/07

Last Name Burley Ident No. 45-14083

Attachment to (Amended) Notice of Claim

4. Additional Points of Diversion

City of Burley 2007 Newly Assigned Point of Diversion Number	IDWR Site Metal Tag Number	Previously Known as Well Number (If Any)	Reference Name	Address	Township	Range
1	E0007518	IRR-12	Pumphouse #12 - 100 HP (Old Culinary Well #1)	16th and Albion/Normal (Water Dept)	10S	2E
2	E0007520	2	Culinary Well #2	14th and Albion	10S	2E
3	E0007519	3	Culinary Well #3	19th and Park (Service Center)	10S	2E
5	E0007521	5	Culinary Well #5	Around 33rd, West of Hiland	10S	2E
6	E0007827	6	Culinary Well #6	Around 31st and Hiland	10S	2E
7		7	Culinary Well #7	Around 11th and Hiland	10S	2E
8	A0002618	IRR-1	Pumphouse #1 (15 HP)	16th and Albion/Normal (Water Dept)	10S	2E
9	A0002617	IRR-2	Hogan (Old Culinary Well #2)	16th and Hansen/Normal	10S	2E
10	A0002613	IRR-3	Almo	19th and Almo	10S	2E
11	A0002614	IRR-4	Carlson	19th and Occidental	10S	2E
12	A0002616	IRR-5	Keller	16th/17th and Burton/Conant	10S	2E
13	A0007810	IRR-6	Drake	11th and Occidental/Park	10S	2E
14	A0007809	IRR-7	Larson	8th and Burton/Schodde	10S	2E
15	A0007808	IRR-8	North Park	9th/10th and Oakley/Miller	10S	2E
16	A0007806	IRR-15	Pleasant View Cemetery - West of Building	Irrigation #15 and Culinary #16	10S	2E
17	A0007807	IRR-9	Snow	9th and Normal	10S	2E
18	A0002619	IRR-10	Fairgrounds	10th and Elba (NW corner of fairgrounds)	10S	2E
19	A0002615	IRR-11	Salmon Park	18th/19th and Park	10S	2E
20	A0007804	IRR-13	Golf Course (South of Road)	Golf Course (South of Road)	10S	2E
21	A0007803	IRR-14	Pleasant View Cemetery - East of Building	Pleasant View Cemetery - East of Building	10S	2E
27			Dutchmen Manufacturing	325 West and State Highway 30	10S	2E
28			Golf Course	Golf Course - At the end of the chainlink fence on hole #1	10S	2E
29			Airport	North side of the airport near the train bridge	10S	2E

Attachment to (Amended) Notice of Claim

12. Describe any other water rights used at the same place and for the same purposes.

Right Nos.

1-4058
1-7082
1-01010
1-7099
1-10243
36-4080
45-2179
45-2719
45-4085
45-4086
45-4087
45-4088
45-4089
45-4090
45-4091
45-4092
45-4093
45-4094
45-4095
45-4096
45-4097
45-4098
45-4099
45-7002
45-7092
45-7114
45-7269
45-7436
45-7686
45-7735
45-11133
45-11847
45-13411
45-13895

OFFICE OF
CITY CLERK
BURLEY, IDAHO

A REPORT ON THE
MUNICIPAL WATER SUPPLY
OF THE
CITY OF BURLEY
CASSIA COUNTY, IDAHO

LEE R. COOKE
ENGINEER

1932
The
Library
of
Congress
Washington
D.C.

A REPORT UPON THE

MUNICIPAL WATER SUPPLY OF THE CITY OF BURLEY,

CASSIA COUNTY, IDAHO.

XXXXXXXXXX

The following report covers the results of investigations made during the months of October and November, 1922, at the request of the Mayor and Council of the City of Burley, Idaho, with a view to determining what sources of water supply, suitable for domestic consumption, were available, and the conditions surrounding each. At the later request of the Mayor and Council, the scope of the investigation has been enlarged to cover the distribution system in the City and the system of charges for domestic water as they now exist.

The present water supply of the City comes from three shallow wells. Water is pumped directly into the City mains, and a 100,000 gallon storage tank is installed as a reservoir and stand-pipe on the system. The distribution system consists of 12 1/2 miles of wood stave pipe, running from 12" down to 3", with appropriate valves and fittings, and serving practically the entire City.

The three wells, and the equipment of each, are as follows:-

WELL NO. 1. Located in the City Pump House, on the corner of South St. and Albion Ave. It is a dug well, 30' in diameter, 50' deep, concrete lined, and is driven

Well No. 1.

1. Continued.

The water ranges from 10 feet below the level of the ground (Elevation 4303.7) to a depth of 34 feet below the ground (Elevation 4189.7). This well is equipped with a Rumsey Triplex Plunger pump, 3" x 12", having a capacity of 400 gallons per minute, and driven by a 35 H. P. Wagner Type B-R Motor, running at 1140 R. P. M., thru gears connected with a Morse chain.

WELL NO. 2

2. Located in the same building, and about 30 feet East of Well No. 1, is also a dug well, 6' inside diameter, concrete lined, and with a short extension casing driven thru the concrete floor. Due to the breaking down of the earth between these two wells, this well and No. 1 are practically one well, and the level of the water in this well maintains the same elevations as in Well No. 1.

Well No. 2 is equipped with a Deane "Glendora" type triple action deep well or mine pump, Model Fig. 2137, No. 50, 18" stroke, and presumed to be of 500 gallons per minute capacity. This pump is belt driven from a 40 H. P. motor.

Both pumps discharge thru 8" lines into a 12" main, from which water is distributed to the City mains, the 100,000 tank acting as a reserve and relief on the system. Both pumps are equipped and operating under automatic control, set to maintain a working head of 143 feet in the tank, or a main pressure of practically 62 pounds at this point.

WELL NO. 3.

3. Known as the "Miller Well", is a bored well, located one block East of the City Pump house, on the North side of East South St., between Hansen and Normal Streets, on Block No. 175. It is a 12" well, cased, 73' deep, and the water is pumped by a No. 2 Byron-Jackson 7-stage deep well type centrifugal pump, direct driven by a 50 H. P. vertical motor, having a capacity of 500 gallons per minute under a 900 foot head. Suction and discharge are both 8", and the discharge is directly into an 8" main, thru which it is connected to the 12" main and stand-pipe opposite the pump house.

Except for a small amount of lateral distribution, the entire output of the three pumps, or whatever ones may be in operation, is centralized into the 12" main mentioned.

It is evident, from copies of analyses in the files of the State Chemist, that the water is soft. I have not originally much doubt that it is soft water, for the purpose of comparison,

the results of the typical analyses of water, both taken from the city mains at the pump house, is given herewith:-

Sample No. 4836 Sample No. 9318
May 7, 1917 Oct. 5, 1922.

Color.	None	None
Odor.	None	None
Turbidity.	None	None
Sediment.	None	None
Nitrogen as Free Ammonia.	None	Slight
Nitrogen as Albuminoid Ammonia.	.002	.01
Nitrogen as Nitrites.	.005	.014
Nitrogen as Nitrates.	.004	None
Chlorine.	3.000	.75
Total Solids.	3.57	156.
Alkalinity as Bi-Carbonates.	388.	760.
On Ignition: Odor	181.6	250.
Charring	None	Chlorine odor.
Fumes	None	None
	None	Slightly
		chlorine.

It is probable that at the time these wells were dug, the surface water was cut off by the thin layer of clay lying near the surface. At the present time, the City is using a purely surface water supply. On Nov. 7, 1922, the level of the water in Snake River opposite the City was 4196.2. After the pumps had been idle for an hour, the water stood at an elevation of 4203.7, or 7.5 ft. above the level of the river, and the lowest point to which it was possible to draw the water by pumping was an elevation of 4189.7, or 3.5 feet below the river level, which is about the amount of difference caused by the friction of the intervening ground.

In this connection, I beg to quote from a report prepared by Mr. V. A. Swerdlow, present Commissioner of Reclamation, in which he says with reference to this water supply:

"The existing maps of underground water contours in the Snake River Valley of the U. S. A. indicate that there are large areas some miles of thickly settled agricultural land, and some of the irrigations of the Snake River Valley."

Quotation from Mr. Swenenden,; Continued.

"and underground water contours, must find it's way directly into the underground water from which Burley pump's it's city supply. The fact that the water is becoming steadily harder would sustain the contention that each year water is coming more directly and in a shorter interval of time from the surface to the wells."

The physical characteristics of the water as it is at present are too well known to the water users of Burley to require any further comment. It is a fact that in no results of analyses either in the State Chemist's office, or in the reports from samples submitted to Mr. Dooley at Twin Falls, bacterial contamination appears. But I wish to emphasize the further fact that the conditions which exist are such that infection can be introduced into the water supply at any time, and that this danger constitutes a grave menace to the health of the water users.

Hereafter, in this report, I shall take up the subject of bacterial purification of the water supply, but I do not want to leave the question of the quality of the present supply without urging upon the officials responsible for the water system, and for the public health and safety, that it is their duty to take far greater measures of protection of the present water supply than are now being taken. While no infection of the City supply has occurred, infection in the Oregon Short Line Well has occurred in at least two instances, and the supplies are drawn from the same water course, and the results of the infection of the water supply of any community are not a pleasing thing to contemplate.

In dealing a new course of water supply for the City, I do not believe that any source of water now developing at least 1000 gallons of water should be considered, unless reservoir

storage is provided, provision must be made for a supply which will deliver not only the average demand of the maximum day, but the peak load on that day.

The metered water consumption of the City for the past four years is shown by the City records to be as follows;—

	<u>1919</u>	<u>1920</u>	<u>1921</u>	<u>1922</u>
January (Gallons)	3,585,000	2,341,340	5,265,130	4,113,936
February	3,358,140	3,831,780	4,583,260	3,946,147
March	2,858,040	5,869,200	4,014,300	3,755,548
April	4,068,010	4,783,770	4,510,630	4,506,075
May	7,423,700	8,088,080	6,320,200	6,525,750
June	9,784,190	11,648,970	7,468,513	9,310,980
July	13,139,650	10,499,940	12,143,440	12,767,943
August	10,745,630	13,627,540	11,496,870	7,646,420
September	8,764,430	9,193,490	7,242,010	7,233,340
October	5,581,670	6,846,620	7,427,090	5,582,236
November	5,919,790	6,364,940	6,376,220	
December	4,906,530	5,211,780	5,311,730	

From the above figures, it is evident that the summer months develop an excessive peak load, compared with the balance of the year. In addition to the metered water consumption, unmetered water is used for street sprinkling, drinking fountain supply, park purposes, sewer flush tanks, and in and around the pump house and grounds. It will be apparent that the unmetered water consumption will be heaviest during the summer months, and at the same time as the peak metered load. Any estimate of the amount of water supply required must therefore consider this factor.

An estimate prepared by Mr. Eucllin, Water Sup't. of the City, of the total amount of water used during July, 1922, which month shows the heaviest metered water consumption of the year, is as follows;—

Water used during July, continued:-

Metered Water.	13,000,000 gallons.
Street Sprinkling.	1,000,000
Parks, Sprinkling ect.	600,000
Sewer Flush Tanks. (30)	2,600,000
Drinking Fountains and Water Troughs	500,000
Pump House and Grounds.	100,000

Total Estimated Consumption for July, 1922. . . . 18,300,000 gals.

The normal hourly maximum consumption of water will be slightly over one-sixteenth of the daily consumption, it having been found that substantially one-half of the total daily consumption is pumped in eight hours, and the other one-half in the remaining sixteen hours. With a maximum daily delivery of 500,000 gallons, a maximum delivery of one-sixteenth of that amount, or 31,250 gallons per hour can be expected. Of the remaining 5,300,000 gallons of water delivered, and not metered, the maximum hourly delivery can be quite accurately predicted as follows:-

Sprinkling; 1,000,000 gals. per month, delivered
in 27 days, 8 hours per day, or per hr. . . 4630 gals.

Sewer Flushing;
2,600,000 gals per month, constant flow
or per hour. 3500

Parks; 600,000 gals. per month, delivered
in 27 days, 8 hrs. per day, or per hr. . . 3800

Drinking Fountains;
500,000 gals. per month, constant flow
or per hour. 675

Pump House and Grounds;
100,000 gals. per month, delivered
in 30 days, 8 hrs. per day, or per hr., . . 405

Maximum hourly delivery of metered water. 33250
Maximum hourly delivery. 43260 gals.,
or a delivery of 700 gallons per minute.

The amount of power consumed in pumping water during the month of July, 1922, was 27, 370 H. P. H., equivalent to 1

continuous output of 40 H. P., would indicate that during this month, at least one-fifth of the water pumped was unaccounted for. The quality of the water being delivered from the City wells is such that it attacks the gear trains in the meters very quickly, and it is reasonable to assume that the eating away of these gears has a tendency to reduce the readings on the water which passes thru them. Just what percentage of this loss is due to this cause and what percentage is due to leakage it is impossible to say, but the fact remains that of the water delivered, only slightly over one-half was recorded thru the meters. The question of water mains will be taken up hereafter in this report.

It is upon the showing of the foregoing conditions that I am basing my statement that at least 1000 gallons per minute should be available in any source of water which the City may have under consideration. One thousand gallons of water per minute is equivalent to 130 miner's inches of water, or 3.2 second feet. As a further comment upon the use of this figure I am assuming that as the City grows, up to the time when it has a population of between 10,500 and 11,000, steps will be taken to remove the present irrigation peak load, and to cut down or completely cut out the main leakage which now exists, and upon this assumption, a supply of 1000 gallons per minute will take care of this population.

POSSIBLE SOURCES OF SUPPLY.

In the development of a new source of water for domestic use in the City, there are four possible sources of supply available:-

1. The construction of new wells, extending to a strata of water deep enough to be safe from surface pollution.
2. Springs on Willow Creek, located approximately at the South-east corner of T. 13 S., R. 23 E., B. M., about 15 miles from the City.
3. Land Spring, located in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of Section 8, T. 13 S., R. 23 E., B. M., about 16 miles from the City.
4. Snake River, at some point to be determined.

Each of these sources apparently yields sufficient water for the City Requirements. and the quality of water and approximate cost of the development of each follows.

SNAKE RIVER.

A sample of water from Snake River, taken at Heyburn Bridge on Sept. 12, 1932, and submitted to the State Chemist for analysis shows the chemical composition of the water in Snake River to rank third in comparison with the other sources above mentioned. This analysis and others will be found tabulated on sheets attached to the end of this report. The water shows a high turbidity and sediment content, and in common with samples from Snake River at all times shows a bacterial infection. If it were adopted as a source of water supply, it would be necessary both to filter the water and to employ chlorination or similar treatment before the water could be considered as a safe water for potable use.

Owing to the fact of the location of the cities of Paul and Heyburn and Rupert, and the sewage effluent from the latter

point, it is probable that the place of diversion from Snake River would have to be at least six miles distant from the City of Burley. The cost of the installation of pumps, filtration plant, automatic chlorination apparatus and delivery main, connected to the present City system, excluding cost of power to the site of diversion and costs of right of way, if any, between the site of diversion and the City, I would estimate at \$212,000. This, as well as succeeding estimates, are based upon a delivery to the City of a minimum of 1000 gallons of Water per minute.

Assuming 10 year bonds at 6%, the cost of providing interest charges and sinking fund would be \$29,680 per year. The probable cost of power, at the present rates, would approach \$300 per month, or \$3600 per year. Without allowing for maintenance and depreciation, or for the additional labor required, this means a yearly expense of \$33,280. per year to cover fixed charges, still excluding cost of right of way and construction of power line. Including maintenance, labor, cost of purification reagents, and incidental expense, I estimate the yearly expense as \$40,000, on the 10 year basis above mentioned.

It is a pertinent fact in connection with the consideration of Snake River as a source of water supply that successive analyses of the water in the River have shown constantly increasing pollution during succeeding years. The large areas of arable land which can safely be predicted as coming under irrigation in the near future, and from which the seepage water will eventually find its way into the River, spell a still further pollution as time goes on. In view of the cost, and of

the increasing pollution, coupled with the fact that the experience of practically every town on Snake River which is using its water as a domestic water has been unfavorable, it is my judgment that the Snake River is not of sufficient value as a water source to warrant its consideration, except as a last resort.

LAND SPRING.

Land Spring, located 16 miles from Burley, and nearly due South, has an almost constant flow of in excess of 225 inches. The analysis of the water as appended hereto, shows the water to be superior to the Snake River water, except in hardness, and there is no record of any bacterial pollution. The water is clear, colorless, and of pleasant taste, and while carrying a rather heavy degree of alkalinity as carbonates, is chiefly remarkable for the excess of chloring shown. This is probably an indication of the fact that it is a deep sourced spring, and that the underground stratas which furnish the water supply for it come in contact with deep salt beds. The excess of chlorine is a characteristic of all deep waters in this territory.

There are two points of view from which this supply must be studied. There is on file with the City Clerk of Burley, a proposition from Messrs. John O. Lowe and H. H. Sessions, of Burley, to furnish the water of Land Spring, and deliver it thru a pipe line to be constructed by themselves to the City at the City Limits, under sufficient head to force the water into the distribution system with an operating head equal to that now used. As a consideration for this undertaking, the City is to

pay the sum of ten cents (\$.10) per thousand gallons of water delivered, with a minimum delivery of 20,000,000 gallons per month, amounting to \$2000.00, and to enter into an agreement with these men for a period of thirty years, upon this basis.

This agreement carries with it no agreement covering the purchase of the water and is strictly a rental proposition. I am advised by Attorney General Roy L. Black of Idaho, under date of Nov. 17, 1922;-

"As to your second proposition, to wit, the lease of the water by the city for city purposes for a period of thirty years at \$2,000 a month, the matter involved would require very extensive legal research, but I am inclined to think now that such a contract would not be legal. The matter is one that the City Attorney would have to give considerable time to, before any proceedings in connection with it would be taken".

Without going further into this phase of the question, I assume that the parties making this proposition to the City have satisfied themselves that such a contract might pass the legal requirements necessary. In the execution of such a contract by the City, no initial expense would be entailed on the part of the City, other than the construction of a line from the end of the contractors delivery line into the City mains. This would involve an expenditure of approximately \$4000. for such connection, The saving of power which would be effected would amount to probably \$1500 per year, and would soon take up this latter expenditure.

I am advised by Mr. Lowe that in order to carry out the proposition submitted, it would be necessary for them to acquire the water rights which are now appurtenant to certain lands located near the Ladd Spring, and that it would be their

idea to use the excess of water, over and above what the City required, in the irrigation of these lands. To accomplish this, it would be necessary for them to conduct the entire flow of the Spring to some point of distribution, run this water into a sump, and carry the water required by the city in a gravity line to such a point as would give them sufficient head to deliver the water with the necessary pressure. While the spring is some 600 or 700 feet higher than the City, it is apparent from the countour information available that the pressure line would have to be between eleven and twelve miles long.

The minimum delivery as stated in the proposal submitted to the City is 20,000,000 gallons per month. From the delivery figures as given heretofore, this would be considerably in excess of the demand, with the possible exception of one or two months during the summer. Assuming that the delivery did not exceed the amounts shown heretofore, the payment of \$2000. per month, or \$24,000 per year, would be a sufficient amount to retire a 30 year bond issue, at 6% annual interest, and on the assumption that sinking funds can be invested to yield 4% annual interest, of practically \$300,000, and the City would have paid in that length of time the sum of at least \$720,000. without any property having been acquired during the 30 year period, and would at the expiration of that period be confronted with the question of again seeking a new source of supply.

Upon the assumption that it would be possible for the Mayor and Council to enter into a contract such as that submitted, without direct approval by the property owners of the City, it would distinctly and decidedly advise against such a course of

action, as a matter of public policy, until definite approval had been given to such action by the tax payers of the City, and then only after a thorough investigation had been made of every phase of the proposed contract.

With reference to the proposed contract, I do not find that any time limit was placed upon the acceptance of the same by the City. Non mention is made therein as to the title to the water which it is proposed to deliver, and in checking up the records, I do not find any agreement or assignment of the water or of the lands running to either Messrs. Lowe or Sessions. I assume therefor that their agreement is an informal one with the present owners of the lands, or in the nature of an option to purchase which is as yet unrecorded.

The water supply of Land Spring is considerably in excess of the amount required by the City, and if Messrs Lowe and Sessions should be willing to waive any rights they may have acquired in the land or the water appurtenant thereto, or to assign these rights to the City, the development of the City in it's own behalf of these rights might create an entirely different condition from that of a service contract only.

I would estimate the cost of the construction of a gravity concrete pipe line, running from the Spring $1\frac{1}{2}$ miles to the Land Ranch, the construction of a sump there, and the construction of a gravity line for a distance of some five miles, and the construction of a wood stave line for a distance of some 10 $\frac{1}{2}$ miles, and connection to the city distribution system, as being approximately \$170,000. To this figure must be added the cost of securing water rights sufficient to care for the City's

requirements, which I am assuming to be \$75,000. If it should be decided to bring the water into the City entirely in a gravity line, the cost of this line can be reduced approximately \$30,000. The annual interest on this reduction, amounting to \$1800. at 6%, would more than take care of the cost of pumping the water into the mains. This latter method would be the one which I would recommend, inasmuch as the concrete pipe would afford a more permanent installation, and in case it became advisable to increase the operating head on the City supply, this could be quickly and easily done by a change of the pumping installation.

Under the Idaho Statutes, bonds may be issued for a term of twenty years, payable after ten years. In case the bond issues for the carrying on of this work were made in such a way that the bonds were retired in a lump, sinking funds having been established for this purpose, the annual cost under each plan would be as follows:

	10 Year Bonds	20 Year Bonds
Annual Interest on capital investment of \$210,000 at 6% per annum,	\$12,600.	\$12,600.
Approximate annual pumping cost	- 1,200.	- 1,200.
Annual payment upon sinking fund to retire bond issue of \$210,000, it being assumed that trust funds can be invested to yield 4% per annum, and that bonds are retired en bloc.	19,089.	7,297.
Total annual payments which would be required for interest, power and fixed charges.	\$32,889.	\$21,197.

To this figure must be added the cost of maintenance, repairs and renewal during the 10 or 20 year period. If properly designed and constructed the maintenance item should be

a nominal item. From this amount will be deducted whatever profit is derived from the sale or lease value of lands not required by the City, and the rental of any water in excess of the amount of water required for domestic purposes. Any estimate of these amounts would be in the nature of a surmise and the Mayor and Council are much more competent to estimate the probable value of these lease rights than the writer.

Very little effort would be required to preserve the quality of the Water from Land Spring, from pollution in a bacterial way. The location of the Spring, and the adjoining formations, is such that it receives practically no run-off of surface water, and the cost of protecting it from pollution will be a small item. In this respect, it is far superior to the Willow Creek diversion, which does present a real problem in this particular.

In common with the waters of Willow Creek, the question of the title to the water, and the acquiring of that title on the part of the City or the Contractors presents a considerable legal problem. There is no reason why a City can not obtain a decreed water right for municipal purposes, granted, of course, that they have put themselves in a position to establish their right, and that no conflicting decrees have already been handed down which are in conflict with the City's interests. It is my opinion that no Court will decree a right to water until the City is actually using the water and is prepared to show such use. In the case of the Willow Creek diversion, and I believe in the case of the Land Spring also, prior decrees of the water of such have been made. In the case of Willow Creek, and probably also in the case of Land Spring, these decrees authorized the

time when water became appurtenant to the lands on which it was or could be used for beneficial purposes. The records of these old decrees would have to be thoroughly gone into, and it would appear from a casual examination of the records of the County that it will be difficult to establish any chain of title from the date of the decrees to the present. Under the existing conditions, I would anticipate an action being required to quiet title to this water, or a re-decree of the waters involved.

WILLOW CREEK.

The waters of Willow Creek, taken from immediately below the springs which are its source, would come from a point 15 miles South-east of the City, near the South-east corner of Sec. 36, T. 12 S., R. 23 E., B. M., and either within or immediately adjoining the boundary lines of the Albion Mountain Division of the Minidoka National Forest.

Chemical analyses of the waters of Willow Creek show it to be chemically far superior to any other source of water that is available, with the exception of the fact that it carries sediment in suspension in the water to a marked degree. Bacterial examination, however, discloses in all samples pollution apparently coming from the stock which range over this watershed, and one of the first steps to be undertaken would be the protection of this watershed from this class of pollution.

Fortunately, due to the Proclamation of President Harding, under date of May 18 of this year, the limits of this Division of the Minidoka Forest were extended to embrace all of the lands on this watershed, not already privately owned. The protection

of this watershed becomes thereafter a matter which can be taken up with the Forestry Service, who have the power of direct action over the lands in the National Forest. As mentioned heretofore, the right to the water can only be obtained by the purchase of the lands to which this water is appurtenant, unless assignment of sufficient of the old decrees could be secured, which I very much doubt. The title conveyed by assignment of these old decreed rights, in cases where the water was not made appurtenant to any lands, would in my judgment be subject to question, and prior to the consideration of either this or the Land Spring diversion, would have to be established beyond any reasonable doubt.

The plans worked out for the City some years ago by Mr. Frank Beach, then City Engineer, in so far as I have been able to secure the details thereof, seem to have been strictly in line with the best suggestions which the writer could make. Except in that I believe the saving of cost which would be effected thru the construction of a gravity line the entire distance into the City, would warrant the arrangement of the line in this way, I would recommend this plan as the one which should be considered. It would be necessary to filter the water of Willow Creek, and to provide for chlorination to guard against bacterial pollution, both of which were contemplated in the plans mentioned. I would estimate the cost of a concrete gravity section line from the point of diversion, with the necessary stillways, filter bed, and relief sumps, and leading to within pumping distance of the pump house at \$185,000, including in this cost filters for from 500 to 1000 gallons per minute and automatic chlorination apparatus. To this figure

would have to be added the cost of securing the title to the water by purchase of the lands to which this water is appurtenant, the cost of right of way for a pipe line, and the cost of the pumping installations. It is my impression that the cost of securing the property rights would probably be about the same as in the case of the Land Spring, and for the purposes of comparison I am assuming such to be the case. The cost of right of way should not exceed \$10000, and the pump equipment \$4,000.

These figures resolve themselves, upon the same 10 and 20

year bases previously considered, into annual fixed charges of the following amounts:

	10 Year Bonds	20 Year Bonds
Annual interest on capital investment of 284,000 at 6% per annum.	\$17,040.	\$17,040.
Approximate annual pumping cost.	1,200.	1,200.
Annual payments upon sinking fund to retire bond issue of \$284,000 it being assumed that trust funds can be invested to yield 4% per annum and that bonds are retired en bloc	<u>26,815.</u>	<u>9,869.</u>

Total annual payments which would be required for interest, power and fixed charges. . . .

\$45,055. \$38,009.

To these figures would also have to be added the cost of maintenance and repairs and renewals, and the cost of care of the filter beds, as well as the cost of chemicals for purification treatment. As in the case of the Land Spring development, the maintenance cost should be low, and it is probable that from \$1000. to \$1100 per year would care for the other items mentioned. As in the case of the Land Spring development, there would be a possible revenue from water and land rentals, which I do not attempt to estimate.

DEAN WALKER

DEEP WELLS.

Definite information regarding the possibilities of deep wells immediately within the limits of the City of Burley is not obtainable. In considering deep wells as a source of potable water for a municipal supply, the questions which must be answered are relative to the amount, quality, depth of the water bearing strata, the geological conditions and the nature of the water bearing strata, especially as to the protection which is afforded against surface pollution, and the probable costs of development and operation.

It is pertinent to the discussion of the deep well conditions which can reasonably be expected to review the experiences which have been had with wells in this vicinity. Formerly, it was only necessary to pierce the layer of clay which is found usually quite close to the surface, and wells from 60 to 75 feet deep, such as the City's present wells, produced soft water. This layer of clay has ceased to be a barrier to the percolation of surface water, and later, wells were driven to and into the upper lava strata, a distance usually of something like 150 feet. This strata yielded a soft water flow, but there was no protectional layer above it except the clay layer close to the surface, and there was no apparent flow within this strata. As soon as the reservoir of water within this rock was exhausted, water commenced to percolate thru from the surface, and these wells almost from the beginning grew gradually harder until they became of the same quality as the surface wells.

Beneath the upper lava flow, which according to such testimony as is obtainable varied from 100 to 120 feet in thickness,

The burden of the testimony obtainable is that there is a layer of clay, varying in thickness from 20 to 100 feet in thickness, and immediately under this clay, either a second strata of lava or a bed of coarse gravel, which seem to be alternatives, and in each of which the lower water strata is found. The depth of this lower water strata varies from 290 feet to 360 feet below the surface, but from such information as I can get, it exists at an elevation of substantially 3865, which would be 345 feet below the level of the ground at the pump house. The Burton Well, analysis of the water from which is given hereafter, is reported to have been driven thru 60 feet of earth, sand and clay, 150 feet thru the upper lava flow, 3 feet thru coarse gravel, 96 feet thru clay, and 20 feet into coarse gravel, in which this water was encountered. In practically every case, the water in the lower levels is reported to be without especial pressure, and does not rise in the casings, but in every case it is reported that continuous pumping does not seem to be able to lower the water level to any extent.

Assuming these conditions to represent that which would be encountered in driving a well for City purposes, the height to which the water would have to be raised, a distance of 500 feet to the upper tank level, presents a problem in pump design which would require special pump design in order to obtain economical operation. It is the judgment of the various pump manufacturers with whom the writer has taken this matter up that it would be advisable to make the lift in two stages; the first one from the water strata to the surface of the ground,

discharging to the suction of a second or booster pump, to provide the required City pressure. Under conditions which will be mentioned hereafter, it will probably be desirable to provide for the increasing of the pressure carried on the City mains especially for fire protection, and the booster unit which is employed can be made to accomplish this purpose.

It seems reasonable to expect that a flow of 500 gallons per well and that the City demands can be handled nicely by two deep wells. My recommendations regarding the design of these wells, upon which estimates of cost are based, would be as follows:-

That two wells be sunk, one on the site of the present No. 2 well, and one on the site of the present Miller well. That these wells be bored and cased with 15" casing to the top of the upper strata of lava rock, and that a second string of 10" standard pipe be driven within this 15", and extending to the depth required to reach water. That the upper 15" string of casing be left in the ground, to protect the main 10" casing from the action of the ground water, and that the space between the two be concrete filled. That the wells be equipped with a deep well multistage turbine pump, of similar design to that now in use on the "Miller" well, and that the discharge from these pumps be connected to the city mains in substantially the same manner as these respective wells are now connected, but that in the discharge line of each pump, an auxiliary booster pump be placed, so designed as to permit of an increase in the City pressure of at least 25 pounds more than is at present obtainable when it becomes advisable so to do.

I would estimate the cost of such wells, conforming to these

specifications, would be in the vicinity of \$8000 each, and the cost of remodeling buildings, as mentioned hereafter, would be perhaps \$1000., or \$17,000 for the two. The power consumption would amount to some \$3200. per year. Depreciation should be figured on the basis of 5%, and the cost of repairs and renewals should not be in excess of \$300 per year.

Upon these expenditures, the annual cost (which should not be charged against bonds running over 10 years) would be as follows:-

Annual interest on capital investment of \$17,000 at 6% per annum.	
Annual Power Charge.	\$1020.
Annual payments for sinking fund to retire bond issue of \$17,000 it being assumed that trust funds can be invested to yield 4% per annum, and that bonds are retired en bloc.	3200.
Annual Depreciation Charge, 5% of \$17,000.	1545.30
Repairs and Renewals.	850.
	<u>300.</u>

Total annual operation charge. . . . \$6915.30

There are several phases of the deep well proposition which are worth your attention. There is the element of a gamble in the issuance of bonds for the sinking and equipping of such wells until definite data has been secured. This could be accomplished by sinking a test well near the site of the present wells, and the installation of a cylinder type deep well pump, which could be operated by one of the extra City motors, and a thorough investigation made of conditions which developed. I would estimate the probable cost of such a test well as from \$1200 to \$1500. and it appears to me that the expenditure of such a sum, in view of the tremendous saving in expense which would be accomplished were the wells to prove satisfactory, would

be amply justified.

It would be my suggestion to the City that the present Ramsey pump and Well No. 1 be left as they are, and that the new wells be sunk on the present locations of Wells Nos. 2 and 3. This would involve the removal of one of the pumps now installed at a time, and it would be advisable to continue, for instance, the Byron-Jackson pump in Well No. 3 until the new installation in Well No. 2 was in first class working condition. This would keep two pumps always available on the City load. The Deane "Glendora" pump I consider to be of practically no value from a sale standpoint. It is probable that the Byron-Jackson pump represents a sale value of from \$1000 to \$1500.

CONCLUSIONS.

Eased upon the foregoing conditions, I would unhesitatingly recommend the deep well installation as being the most feasible for the development of a water supply for the City. Should a test well prove that this source of supply was not feasible, the second choice would be the Land Spring, under City development, and the third choice would be the Willow Creek development. The use of Snake River or the adoption of the lease proposition for the waters of Land Spring I should recommend against.

CITY DISTRIBUTION SYSTEM.

The present distribution system of the City presents, in my judgment, fully as serious a problem for the consideration of the City as does the water supply. The City has practically 104 miles of wire-bound wood stave pipe, of which some 64 miles were laid in 1914-15, and have accordingly seen nearly ten years

of service, and of which 4 miles were laid in 1920, and are entering on their third year of service. There are 68 fire hydrants, and the pressure is in the vicinity of 60 pounds per sq. in. thruout the major portion of the City.

Mention has already been made of the leakage which exists, and which has increased to such an extent that Mr. Bucklin, the Water Superintendent, informs me that it is requiring the time of one man nearly constantly to look after leaks. Unfortunately, two of the three pumps in use at present are of the plunger type, and water is being delivered under constantly changing pressure conditions. The surge created in the mains by the stroke of these pumps is hammering the pipe to pieces and in it's weakened condition, the destructive effect of this action is very marked. (It would seem to be wise to use the Byron-Jackson pump on the No. 3 well as much as possible, and in my judgment, provided the present system is to operate for any considerable length of time, to cut the discharge of the Rumsey and Deane pumps off from the mains and discharge directly into the tank thru an independent line.

Aside from the cost of repairs and renewals and the waste of power, the condition of the mains presents it's worst menace in the lack of adequate fire protection. In this connection, I beg to quote from a letter dated Nov 24, 1923, from Mr. J. H. Branscomb, District Secretary of the Board of Fire Underwriters at Salt Lake City. Mr. Branscomb's letter is as follows:-

"With reference to the water supply situation at Burley, our surveyors have just completed the complete re-laid of the water supply and fire-distribution.

"Our report shows the most serious deficiencies in the distribution system, and would recommend that the present

Letter from Mr. Burley, continued.

"Cave mains be replaced with standard mains of adequate size in the mercantile section, and not less than 8" mains in the dwelling section.

"If it is not possible to install standard mains thruout the City at this time, I would suggest that standard mains be installed in the mercantile section with sufficient gate valves so that in case of fire, the water could be entirely cut off from the wood mains, throwing the entire supply into the standard mains.

"With reference to your suggestion regarding the installation of an auxiliary gasoline engine driven pump, will state that our fire and water report includes charge for lack of duplicate pumping system, but on account of the size of the town and the infrequency of fires I think it hardly probable that both sources of power would be off at the same time.

"If standard mains are installed I would suggest that a by-pass with sufficient number of gate and relief valves be installed between the pump house and the supply main, so that direct pressure could be put on the mains from the pumps. It would be fatal to the entire system to do this under the present conditions.

"I would suggest the immediate purchase of a motorized pumper of at least 600 g. p. m. capacity (with thenecessary minor equipment) on account of the low water pressure and the impossibility of increasing on the wood stave mains.

"Our fire and water report will be returned from the printer within the next few weeks, which will include a complete list of our recommendations, a copy of which will be mailed you, altho the ones outlined in this letter appear to be the most important.

"If the City of Burley decides to make part or all of the suggested improvements, I will be pleased to recommend a decrease in the fire insurance rates in proportion to the improvements made".

It would probably be impossible for the City to undertake the replacement of it's entire wood distribution system at once, and especially so in view of the possible sanction of a bond issue being asked for the construction of the water development in the near future. It would appear from the map of the city distribution system that the system is already adequately supplied with valves, so that the replacement of the "in" and "out" mains with standard cast iron pipe would mean not only the securing of the mains, but of these valves also.

As an matter of example, to replace the district bounded by the alley between Conant and Miller Avenues, the alley between Hansen and Normal Avenues, by South St and by the South easterly line of the Oregon Short Line R. R. Right of Way with Standard Cast Iron Water pipe, designed to operate under 35# pressure, with the necessary special fittings and valves to enable this section to be isolated entirely from the surrounding wood pipe lines would mean an expenditure for material and labor of substantially \$40,000. Smaller units than this could be selected, and the expenditure could be accordingly reduced. My recommendation to the City would be the inclusion of a small portion of this District within a bond issue for the construction of the water system, and the establishment of a program of development to be followed as funds were available. I believe from the experience of other Cities that it is possible to revise the present charges for water, so that sufficient revenue can be returned to build up a small surplus each year, to be applied in this way.

Closely allied to the construction of better mains is the question of emergency power in case of the failure of the electrical equipment. Assuming that it is the intention to proceed with and construct the deep well installation, the present Ramsey pump in Well No. 1 could be remodelled at a cost of not to exceed \$100 so that it could be driven by a gasoline automobile type engine, and remain so piped as to permit of its being changed into the City mains in case of an emergency. The present No. 1, engine would be moved to one side and a short well installed serving several fire hydrants. A No. 2, 3, six cylinder engine would be installed to one of

these clutches and the present operating motor to the other. It is a fact that might be mentioned that with the Runney pump operating directly onto a restricted area of standard pipe, it is probable that the pressure could be raised to safely take care of a severe fire situation.

From the figures heretofore tabulated of the water consumption of the City, it is apparent that during the summer months a large amount of water is used for irrigation and sprinkling of lawns, ect. I am advised that the irrigation system of the City does not permit of a gravity irrigation in the form it exists at present. The re-construction of the larger wood mains and their replacement with iron would place at the disposal of the City several thousand feet of wood pipe, which could be adapted to a low pressure irrigation system, and could be supplied at a low cost from shallow wells or from irrigation water from the U. S. R. S. canals. It would appear that the cost of pumping would be lower than the cost of irrigation water delivered thru ditch. It is quite possible that in some instances the old city pressure systems could be converted into a low head irrigation system without removing from the ground. Countours of the city apparently were not available from which any study of the method of design which would be advisable, and this would require a systematic survey of that portion of the town in which the low pressure system would be installed.

EXPLANATION OF WATER SUPPLY.

In the estimation of the development of water from local sources River and Willow Creek, provision is made for the installation

of chlorination apparatus. Should it appear that the City is unable to proceed within a reasonable time upon the acquisition of a new source of domestic water, it is my best judgment that it would be the part of wisdom for steps to be taken to protect the present supply against contamination of a bacterial nature.

It is the common practise to introduce chlorine directly into the water supply in the suction lines of the pumps. It is impossible to accomplish this in the case of the pump in Well No. 3, and it would appear that the most effective means of chlorinating the present supply would be to introduce the chemical into the pressure main at or near the pump house. It is necessary, in order to secure the proper results that pressure at least equal to three times the pressure on the mains. This would require a small motor-pump set, and the cost of this unit, with manually controlled chlorine machine, installed by the manufacturer in place and operating would be \$1335.00. If it were possible to bring the water from Well No. 3 directly to the point of inlet of the discharges from the pumps in Wells 2 and 1, a very effective chlorination of the entire supply can be secured in this way. Chlorine treatment, properly manipulated, is not objectionable to the water users, and in fact can not be detected by anyone not equipped with a vivid imagination.

In considering the question of temporary protective measures it should be borne in mind that even were it possible to commence immediately upon the installation of the deep well development, which would be started thru to completion were

rapidly than could any of the other developments, it is extremely doubtful if delivery of the overload of saving required could be accomplished under from $5\frac{1}{2}$ to 4 months after the date of order in the present market. It would be impossible to accomplish the completion of any one of the developments under consideration before well into the coming summer or early fall.

WATER CHARGES.

The present system of charges for water in the city are made as follows: a minimum monthly charge of \$1.50 per meter entitles the holder to 8000 gallons of water, and all water in excess of that amount is charged to him at the rate of 15¢ per 1000 gallons.

It would seem to the writer that the revenue from this scale of water charges would be insufficient to take care of much more than the operating charges, with the waste of water which exists. It is a difficult matter to so adjust the charges made that they are satisfactory and reasonable from the standpoint of the water user and at the same time will produce the necessary revenue. The most commonly adopted theory of water charges in recent years is based on a minimum charge for water which will take care of the fixed charges against the system and the cost of pumping the amount of water required for the average family of three persons. As a matter of example: The present fixed charges against the water department amount to \$3000.00 per year. Whether this amount includes the collection of sinking fund, I am not advised, but assuming that it does, and that the proposed wells are installed, the charges for

interest, sinking fund, depreciation and repairs and renewals on the new system is estimated at \$3715.30, which would make a total fixed annual charge of \$7705. per year. I am advised by Mr. Bucklin that your present system is connected to about 825 meters, which would make an annual charge per meter of \$9.33 per year, or 78¢ per month.

From May 1921 to May 1922, the total cost of operating the water system, excluding the items of interest and sinking funds, was \$14,028.85, according to figures furnished me by the Water Department, and during that period there was metered to consumers 86,533,500 gallons of water, and operating cost of slightly over 16.3 ¢ per 1000 gallons.

It will be found that the average family of four persons will use for domestic purposes about 1890 gallons of water per month. Assuming this to be 2000 gallons per month, the cost of the water delivered to this family will be 32.5¢ per month.

This water is entitled to yield at least a sufficient margin of profit to assure of it's being profit. If we fix the minimum amount for which charge is made at 2000 gallons, and allow a profit of 10%, the minimum charge per meter becomes \$1.13 7/10 ¢ per month, or such an approximate figure as may be determined upon, --\$1.15 for instance.

The excess of water delivered over and above the minimum delivery should be upon a graduated scale, the larger water users being entitled to a lower aggregate rate than the smaller users, on the theory that the cost of pumping water to each is inversely proportional to the amount of water used, when figured in terms of gallons of water used. I believe that your water system should have a profit return of at least 1.00 per

meter per year, and from this figure to \$8.00. If each of your 300 meters consumed the full 2000 gallons to which it would be entitled under the minimum charge, the maximum consumption would be 19,200,000 gallons of water. As a matter of fact, the consumption of water entering into the minimum charges will be considerably less than this amount, as there are numerous users of water who will not consume the full 2000 gallons in each month. Allowing the figure to stand, there remains 67,333,500 gallons of water to be sold which costs 13.2¢ per 1000 gallons to deliver. A predetermined profit showing of \$4.80 per year on 800 meters, or \$3840. per year, divided in the water delivered would require a profit of 5.8¢ per 1000 gallons. This amount added to 13.2¢, the cost of delivery, would mean a rate per thousand gallons averaging 22¢ per 1000 gallons.

The fixed charges in the above discussion are lower than is usual, and it is not at all uncommon to find these fixed charges as high as \$1.50 per month per meter. The conditions covered are assumed merely as an example of the method of arriving at the proper return for water deliveries, and it is evident that if the return do not provide for all fixed charges and operating costs, and provide a fund for extensions, these extensions will have to be made thru bond issues, and the payment is made under some other guise.

CONCLUSION.

Entirely foreign to the subject matter of the foregoing report is the matter which I wish to call to your attention before concluding this report. In common with every municipality, Burley elects its municipal officers every two years.

It is the writer's understanding that the present administration will be succeeded either wholly or in part by a new administration within the next few months.

I would urge upon the present administration that they make every effort to develop a consistent municipal policy for the City which they serve, and that every effort is likewise made to bring the pertinent facts of this policy before the tax payers, so that your successors and their successors may have an established policy upon which to act.

It will probably not be possible for the present administration to do more than get any new water supply development well started, and it will become their duty to deliver to their successors in office a statement of the plans and policies which they have adopted with their reasons for so doing. I feel sure that an intelligent analysis of the decisions arrived at by the present administration can not fail to carry with it the approval of succeeding administrations.

WATER ANALYSIS OF WATER SUPPLY

Sample No.	0012	0016	0017
Location	Luna	Snake River	Snake River
Sampled by	Spring	Snake River	Snake River
Date Taken	Oct. 4	Sept. 12	Oct. 12
Water	Spring	Snake River	Snake River

Examination:

Average bacteria

per c.c. on Agar
at 37 degs., 24

hours. 3

Presumptive Tests

for E-coli. Negative

No. of Positive

Fermentations:

In 5-10cc tubes Negative

In 1-5cc tube Negative

In 1-100 tube Negative

Confirmatory tests

for E-coli. O. K.

B-coli Positive.

Chemical Analysis

Parts per Million

Color	Nil	Nil	Nil
Odor	Nil	Nil	Nil
Turbidity	Nil	Nil	Nil
Sediment	Nil	Nil	Nil
Nitrogen as Free			
Ammonia	.003	.010	.024
Nitrogen as Alb.			
Ammonia	.003	.092	.044
Nitrogen as Nitrites	Nil	.003	Nil
Nitrogen as Nitrates	.40	Nil	.020
Chlorine	47.5	33.0	6.8
Total Solids	301	390	214
Loss on Ignition	102	50	76
Alkalinity as			
Calcium carbonate	170		
Alkalinity as			
Calcium carbonate			
Calcium carbonate			
Calcium carbonate			

Calcium carbonate

Calcium carbonate

The above sample was analyzed by the method of the American Public Health Association.

The above sample was analyzed by the method of the American Public Health Association.

The above sample was analyzed by the method of the American Public Health Association.

The above sample was analyzed by the method of the American Public Health Association.

