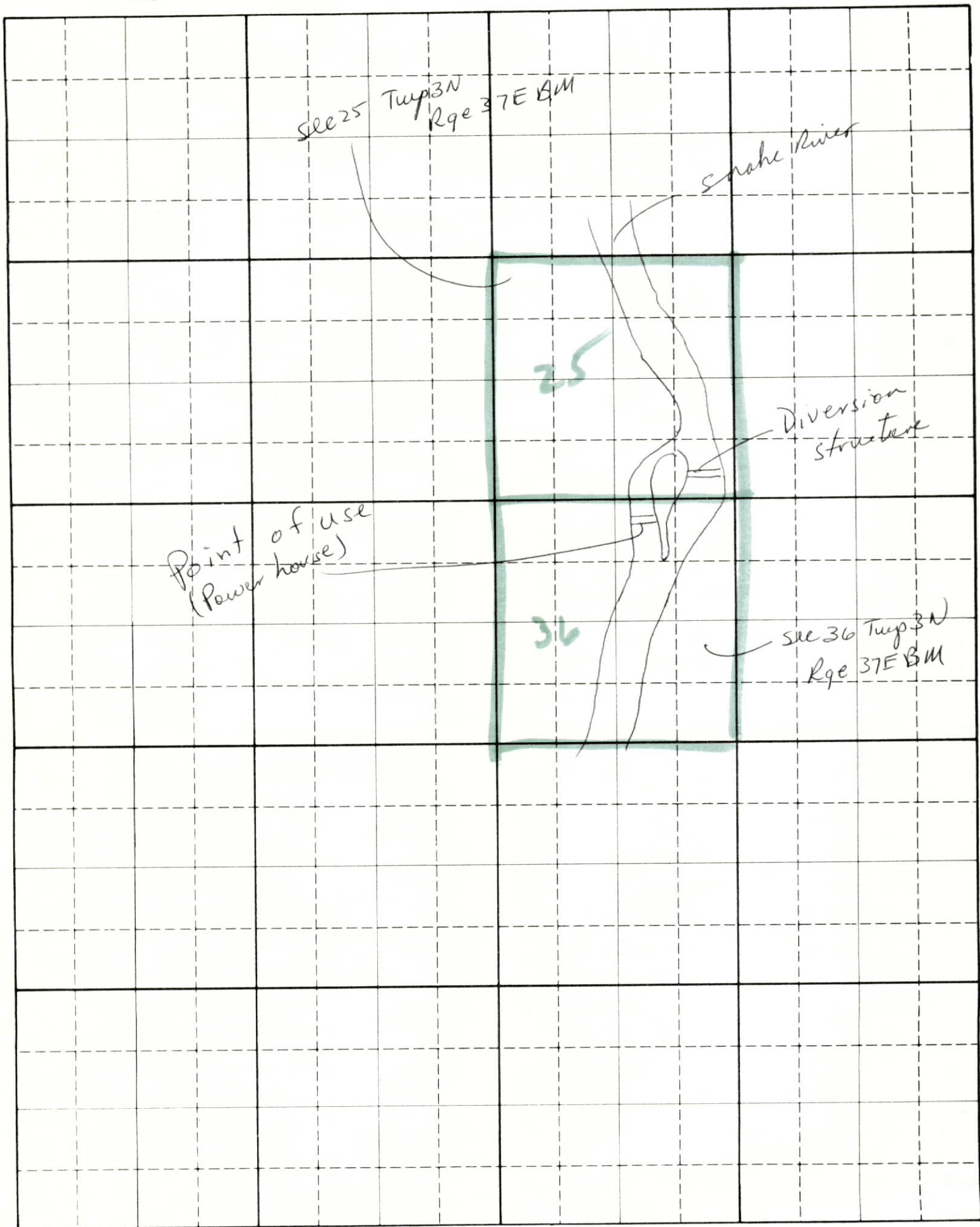


11. Map of proposed project: show clearly the proposed point of diversion, place of use, section number, township and range number.



Scale: 2 inches equal 1 mile

BE IT KNOWN that the undersigned hereby makes application for permit to appropriate the public waters of the State of Idaho as herein set forth.

John Redman
(Applicant) MAYOR

MICROFILMED

● Proof of Publication ●
The Post-Register

RECEIVED

NOV 30 1977

Department of Water Resources
Eastern District Office

State of Idaho, }
County of Bonneville } ss.

I, J. Robb Brady, first being duly sworn, depose and say: That I am the Principal Clerk of The Post Company, a corporation of Idaho Falls, Bonneville County, Idaho, publishers of The Post-Register, a newspaper of general circulation, published daily, except Saturday, at Idaho Falls, Idaho; said Post-Register being a consolidation of the Idaho Falls Times, established in the year 1890, The Idaho Register, established in the year 1880 and the Idaho Falls Post, established in 1903, such consolidation being made on the 1st day of November, 1931, and each of said newspapers having been published continuously and uninterruptedly, prior to consolidation, for more than seventy-eighty (78) weeks and said Post-Register having been published continuously and uninterruptedly from the date of such consolidation, up to and including the last publication of notice hereinafter referred to.

That the notice, of which a copy is hereto attached and made a part of this affidavit, was published in said Post-Register for two consecutive weeks, first publication having been made on the 17th day of November, 19 77, last publication having been made on the 24th day of November, 19 77, and that the said notice was published in the regular and entire issue of said paper on the respective dates of publication, and that such notice was published in the newspaper and not in a supplement.

Subscribed and sworn to before me, this 28th day of November, 19 77

Karels Huer
Notary Public

My commission expires April 5, 19 79

B10, 1M

**NOTICE OF APPLICATION
FOR WATER PERMIT**
Notice is hereby given that the City of Idaho Falls, Idaho Falls, Idaho has on 11-09-77 submitted Application No. 01-7013 for a permit to appropriate 2600 cubic feet per second of water from the Snake River tributary to Columbia River by means of a dam within the SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 25, T. 3N, R. 37E, B.M., Bonneville County; to be used from Jan. 1 to Dec. 31 for power generation within the NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 36, T. 3N, R. 37E, B.M.
If issued, this permit will be subject to all prior water rights. Protests against the granting of the permit must be filed with the Idaho Department of Water Resources, 1515 Lincoln Road, Idaho Falls, Idaho, 83401 on or before December 5, 1977.
C STEPHEN ALLRED
Director
Pub.: Nov. 17 & 24, 1977.

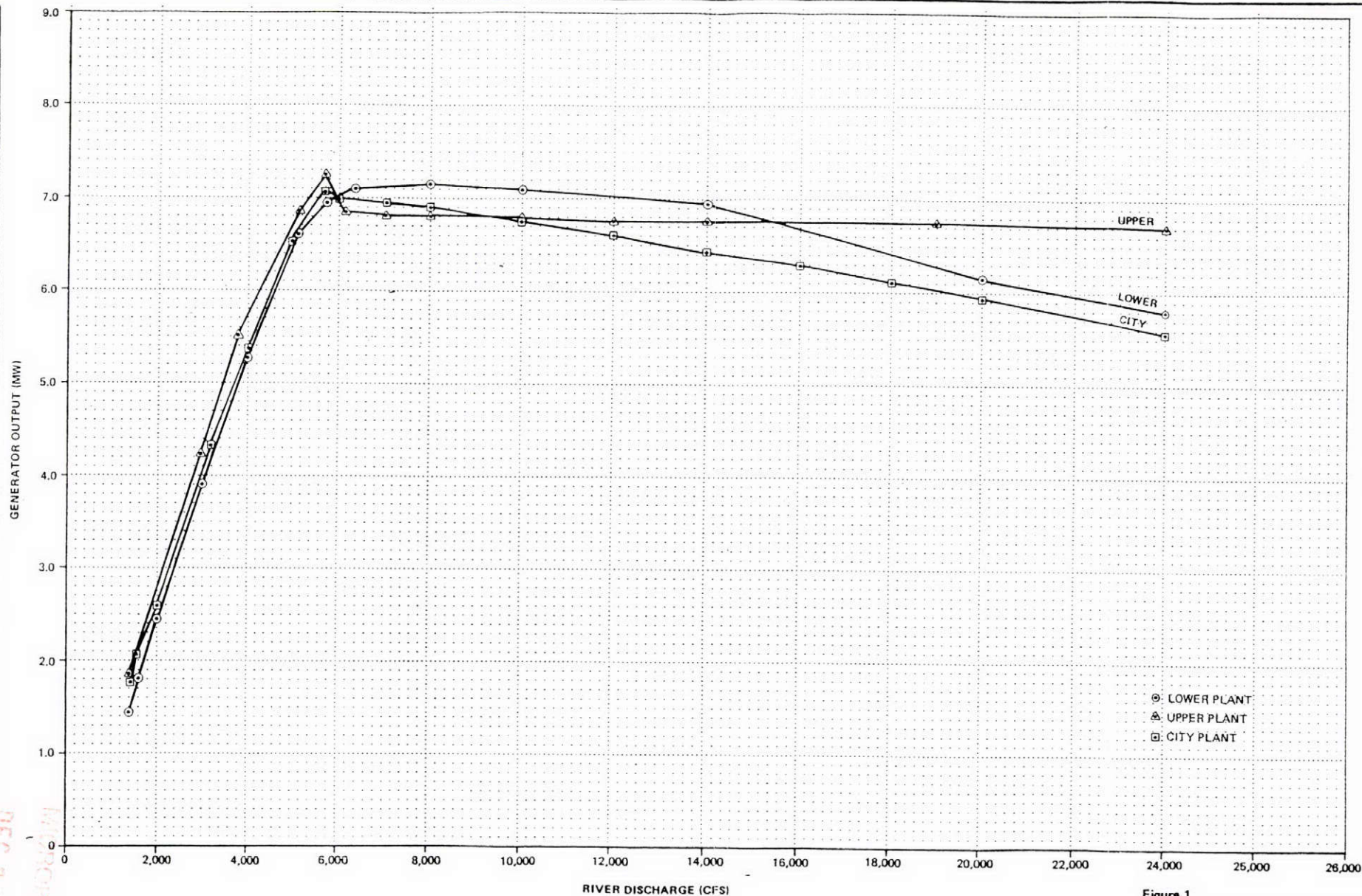
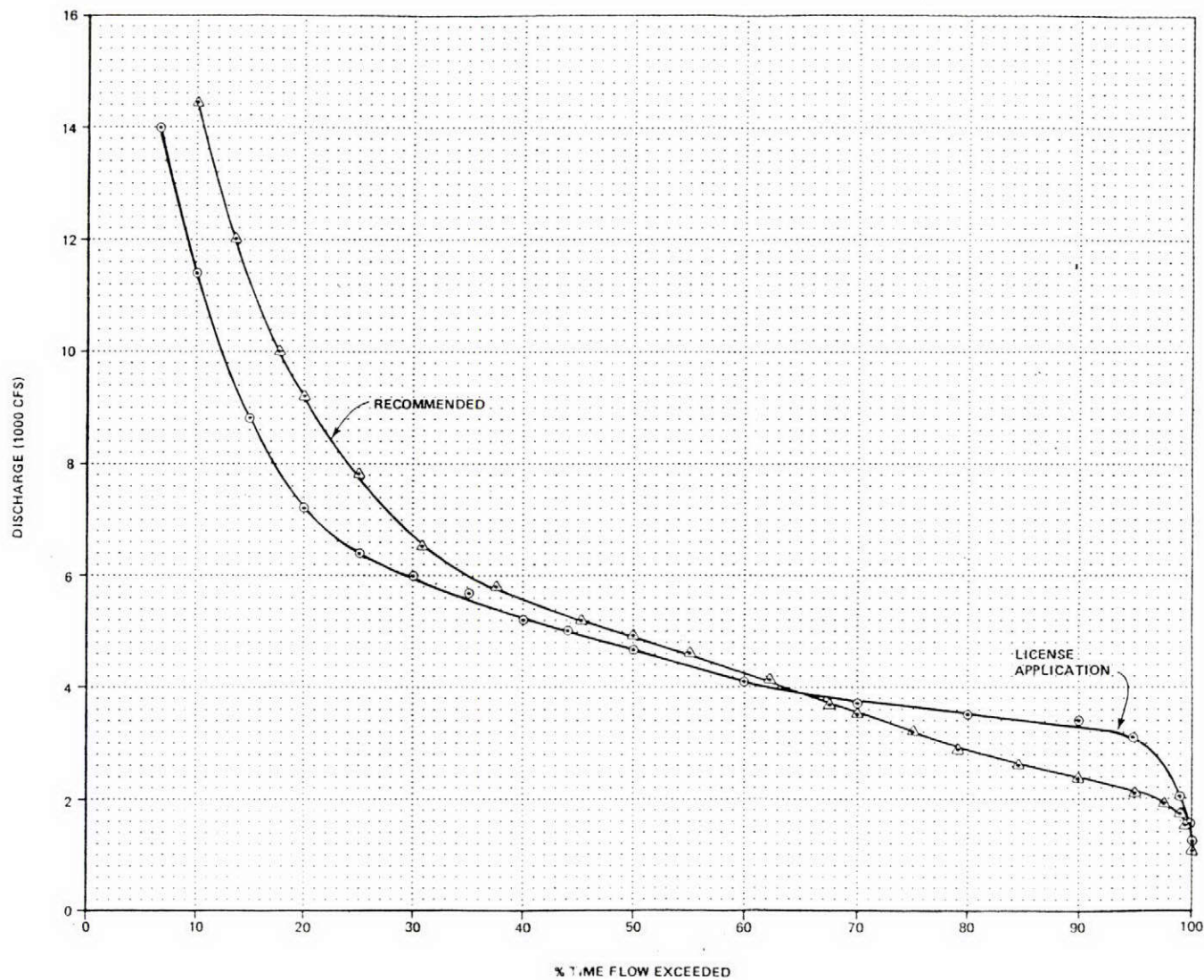


Figure 1
 RIVER DISCHARGE VS. OUTPUT
 IDAHO FALLS BULB TURBINE EVALUATION
 CITY OF IDAHO FALLS, IDAHO



B12261.00

DEC 04 1987
 IDAHO FALLS BULB TURBINE EVALUATION



- △ DAILY Q SHELLEY GAGE 1960 - 1985
- 1975 DEVELOPMENT MONTHLY 1928 - 1972

Figure 2
DAILY FLOW DURATION
SHELLEY GAGE (USGS)
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



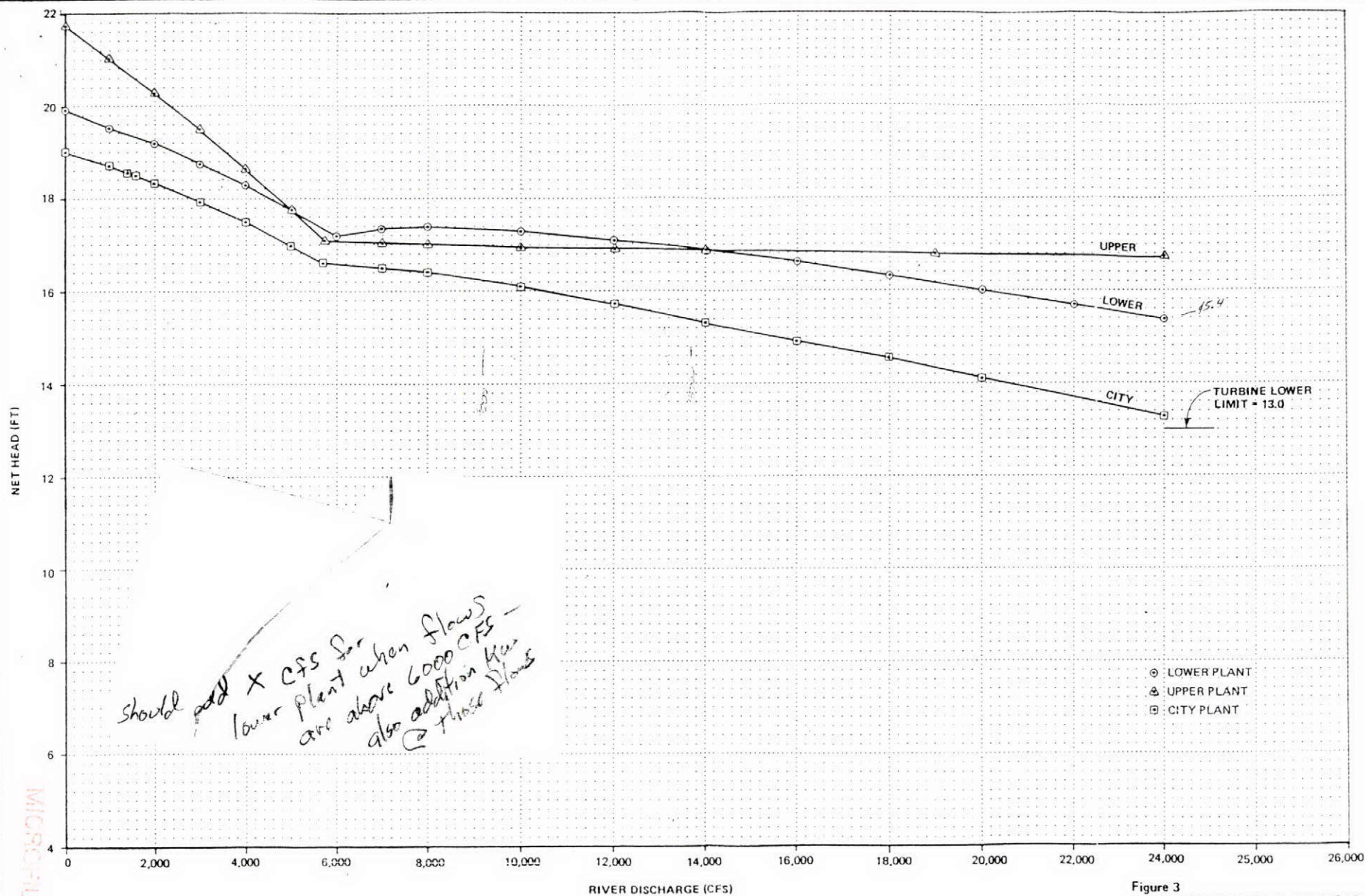


Figure 3
RIVER DISCHARGE VS. NET HEAD
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



SOURCE: Hill diagram from Voest Alpine
Index Test Report, Dec. 1983.

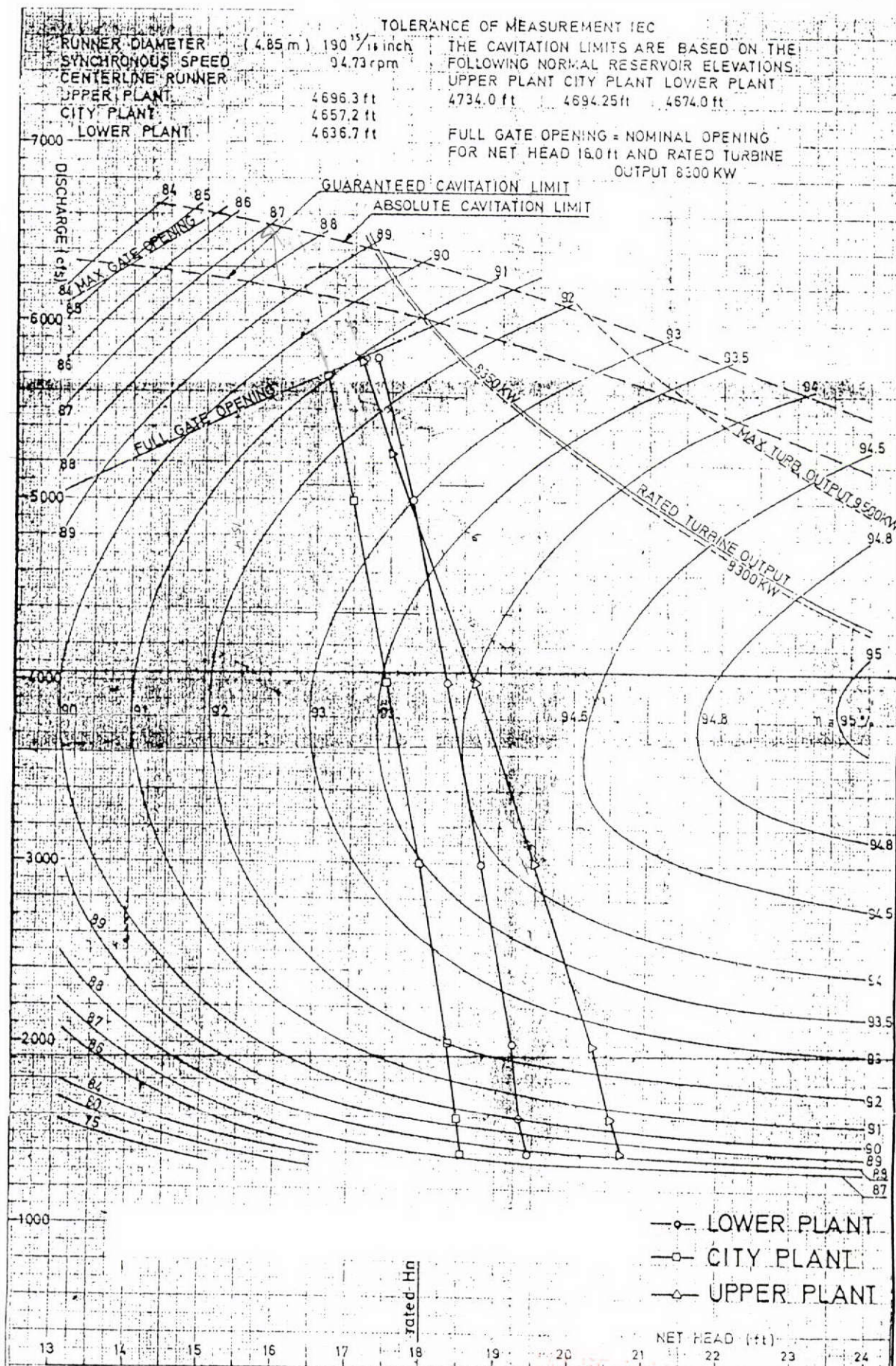
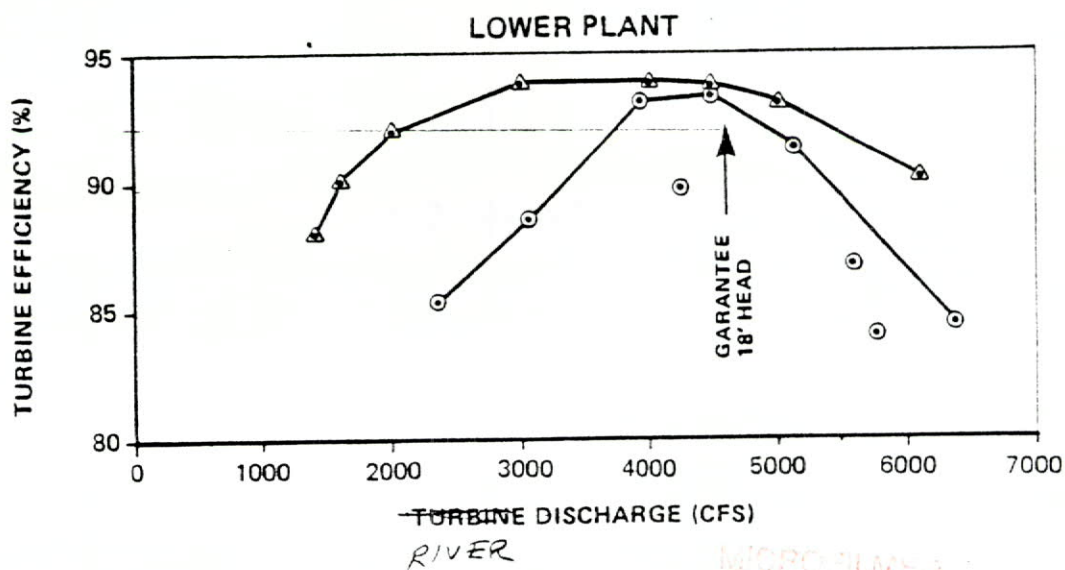
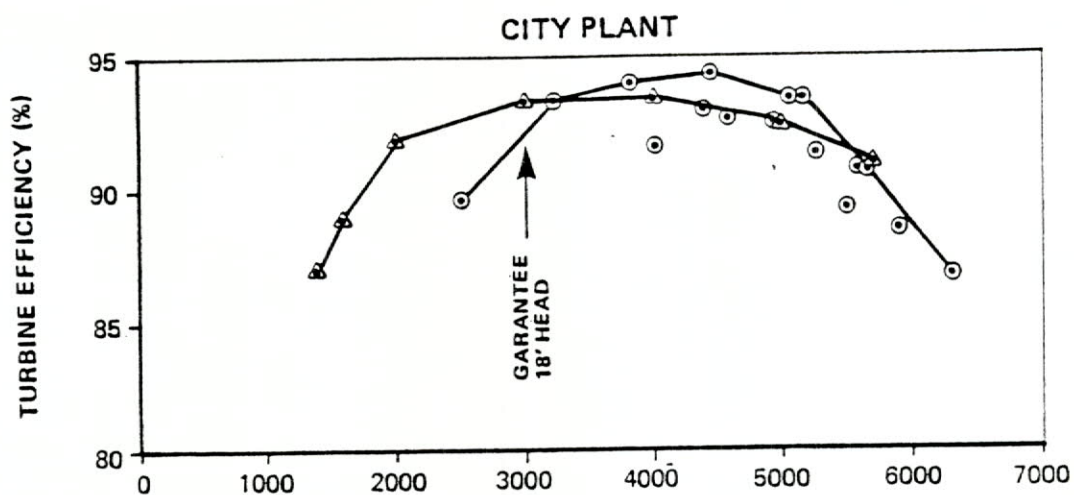
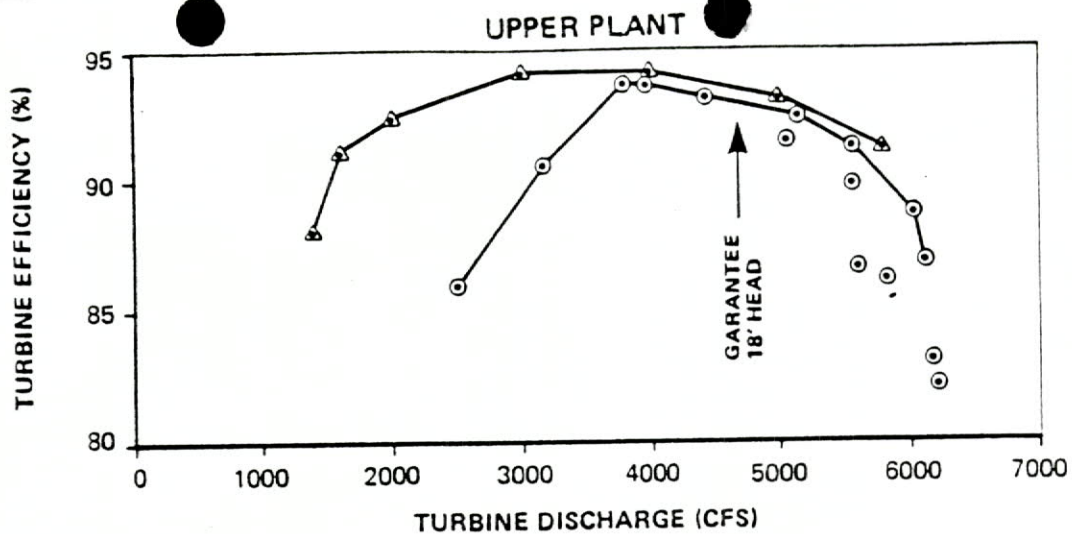


Figure 4
OPERATING CONDITIONS
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



DEC 04 1987



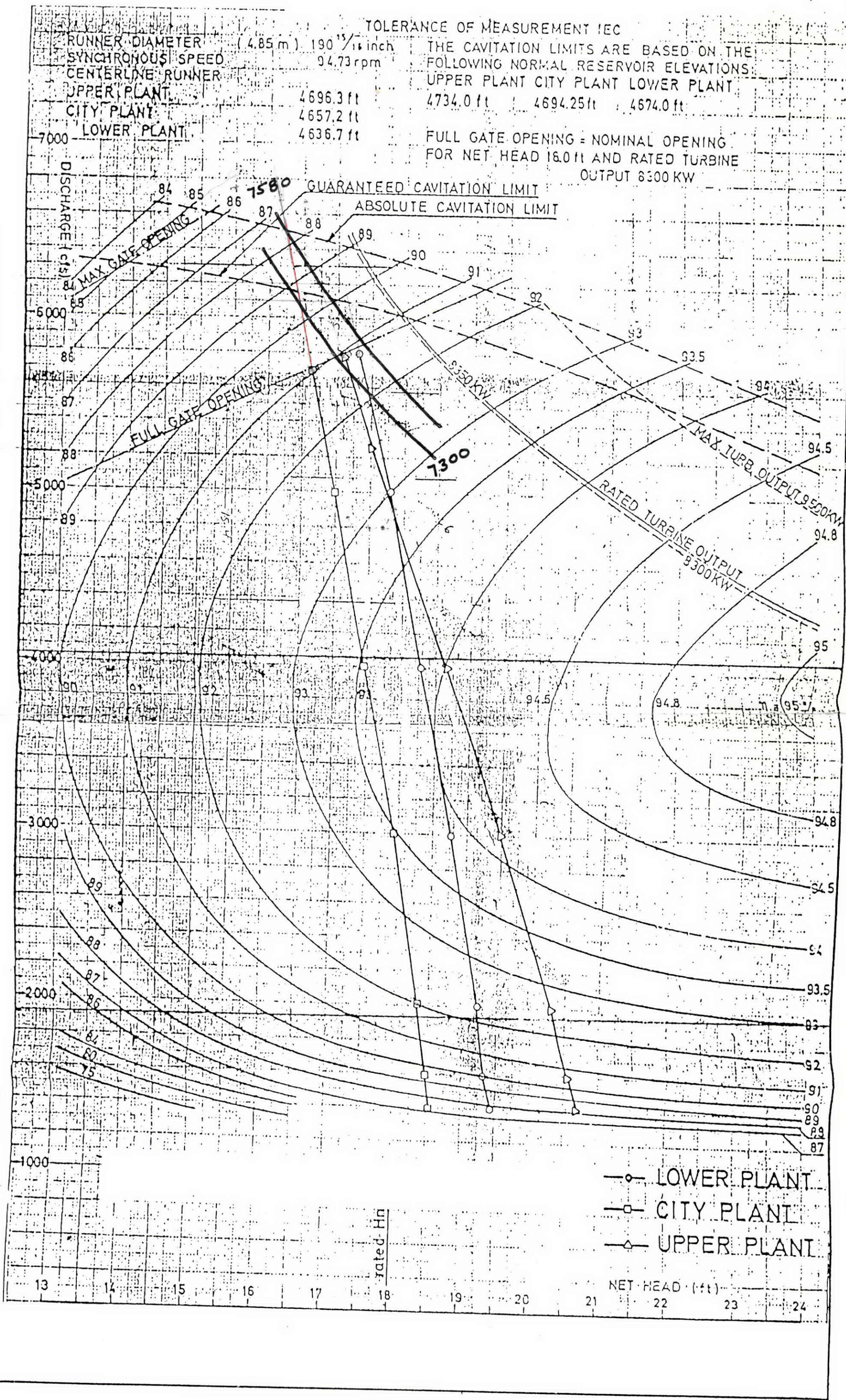
FROM INDEX TEST
 FROM GUARANTEED HILL DIAGRAM

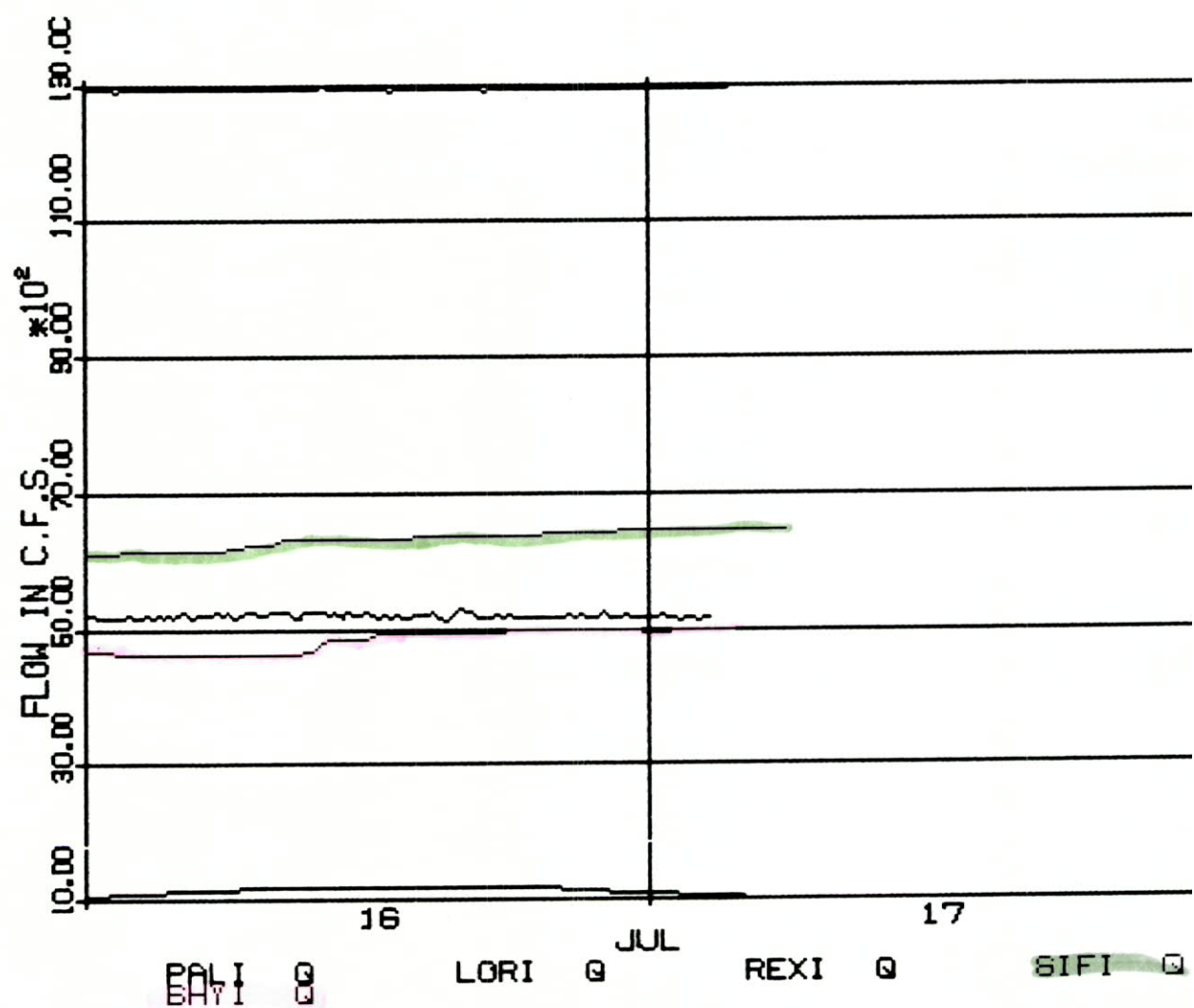
Figure 5
EFFICIENCY COMPARISON

IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

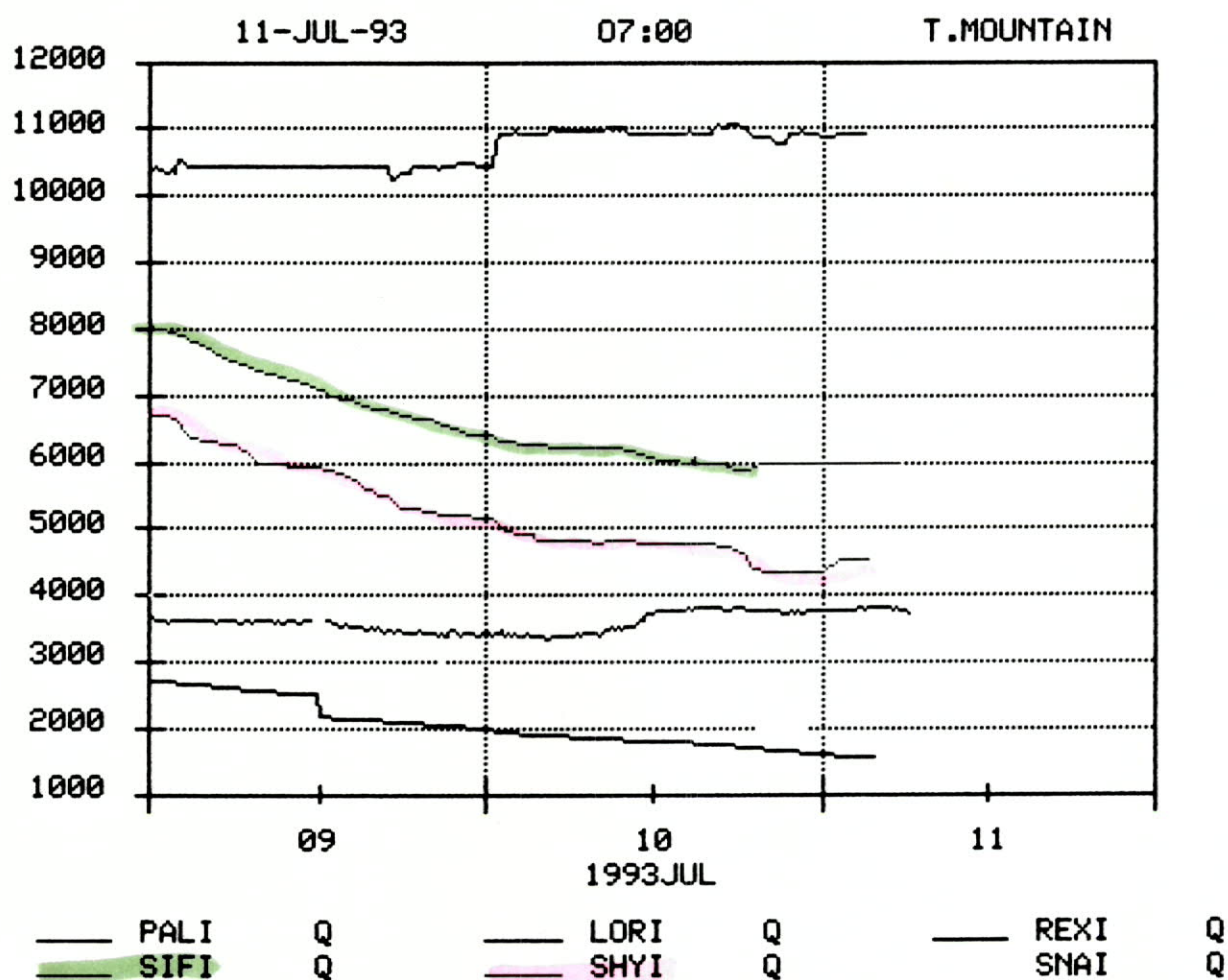
MICROFILMED
DEC 8 4 1987

SOURCE: Hill diagram from Voest Alpine
Index Test Report, Dec. 1983.





MICROFILMED
DEC 04 1967



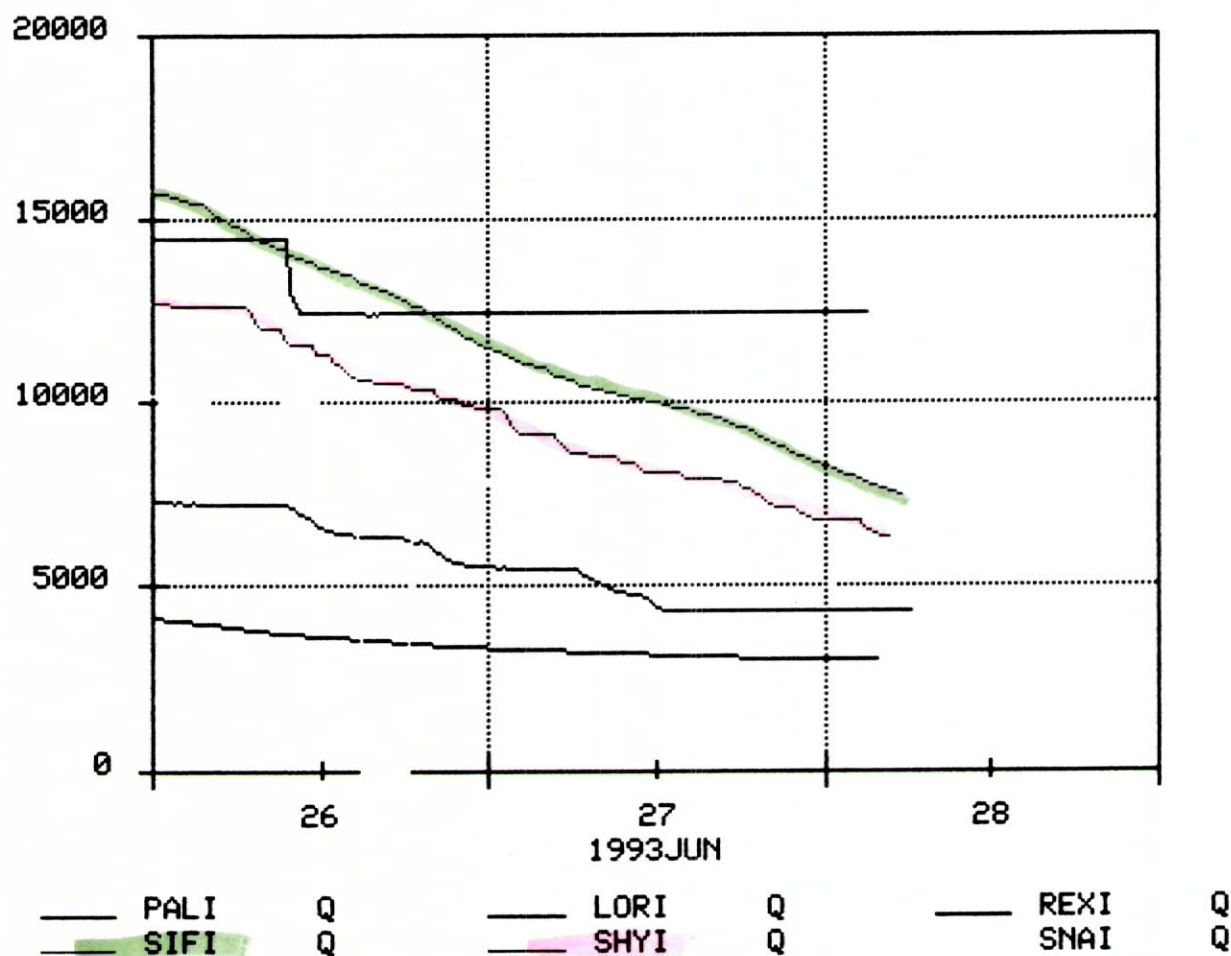
MICROFILM

DEC 04 1997

J.LINGER

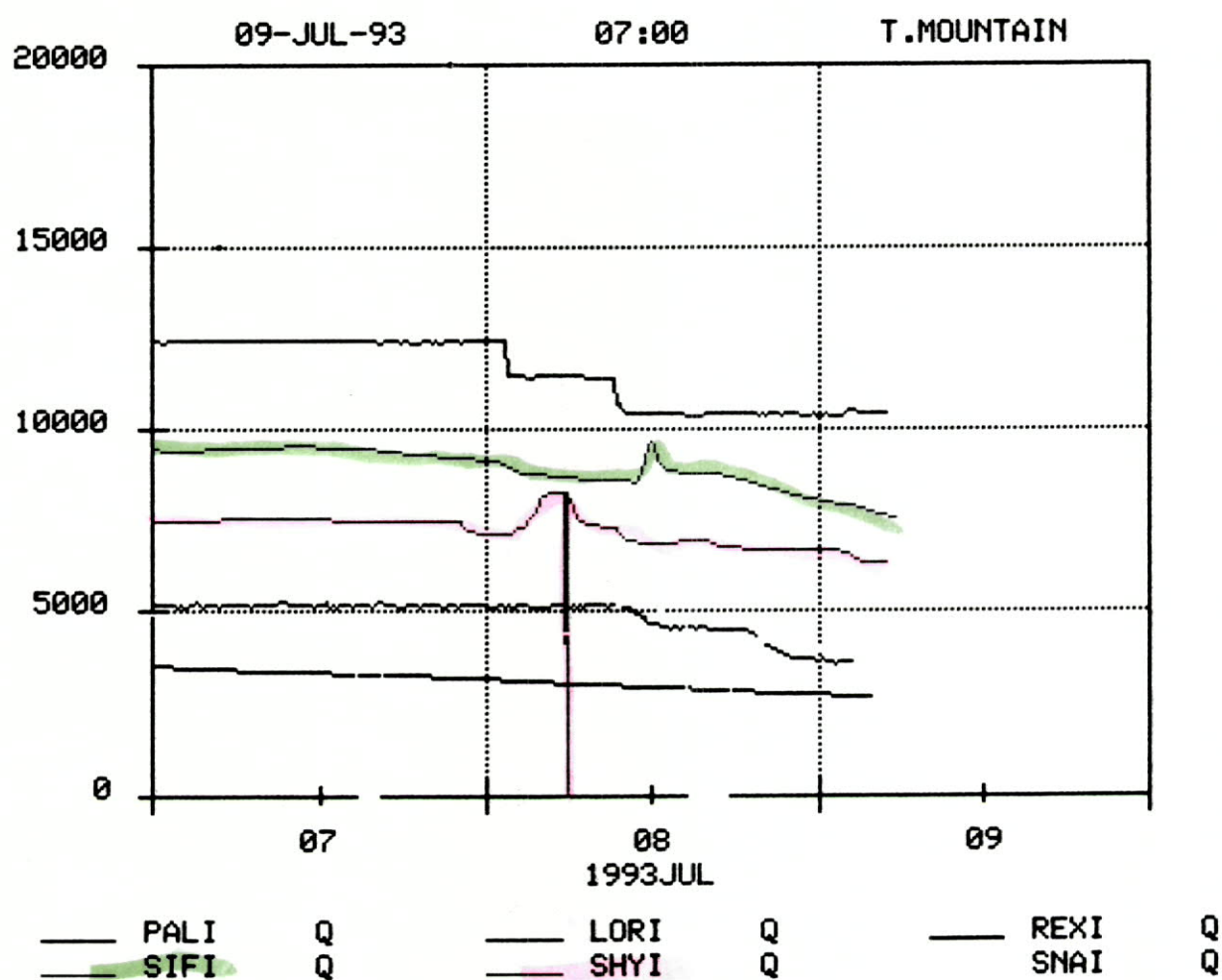
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28-JUN-93



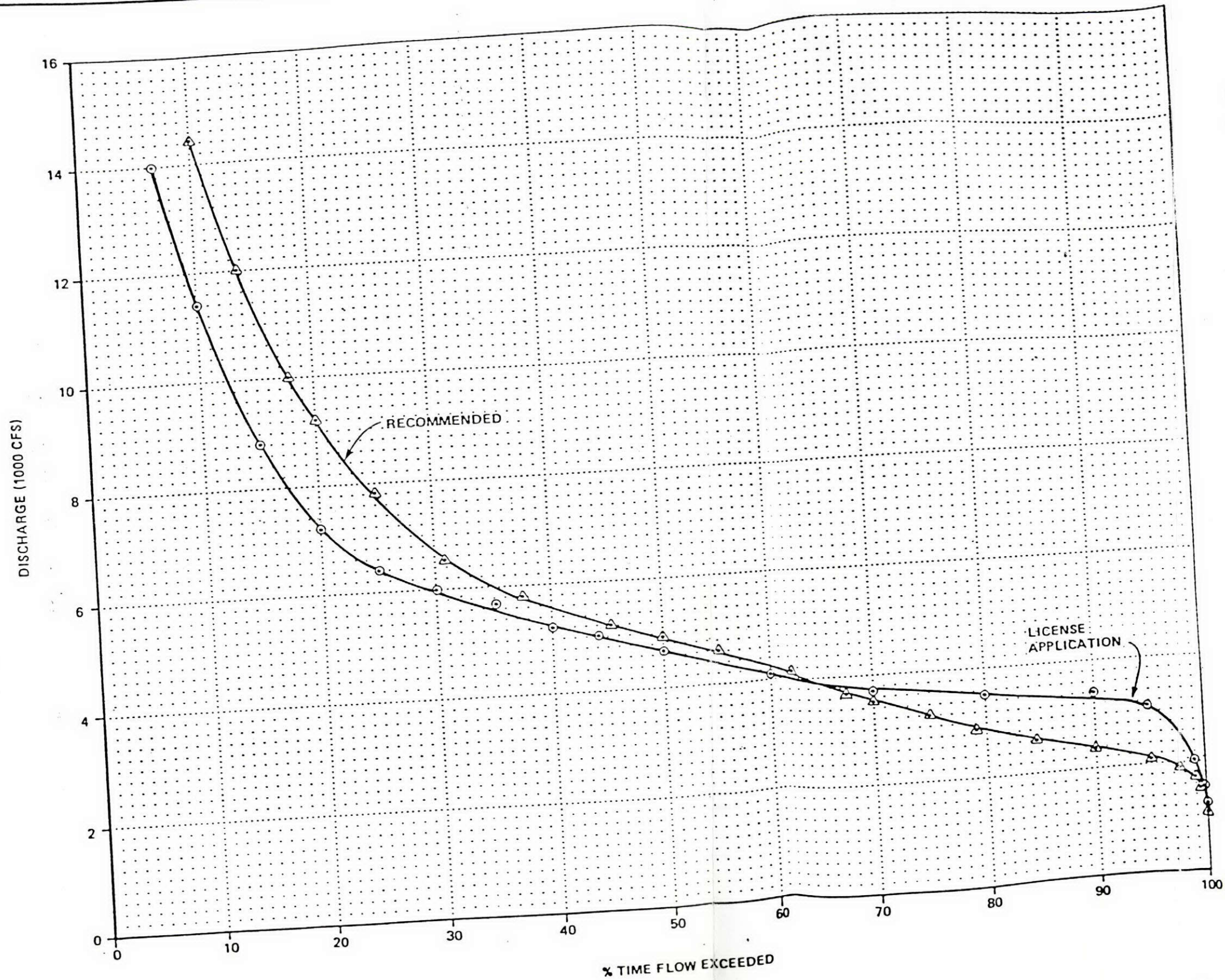
MICROFILMED

DEC 0 4 1997



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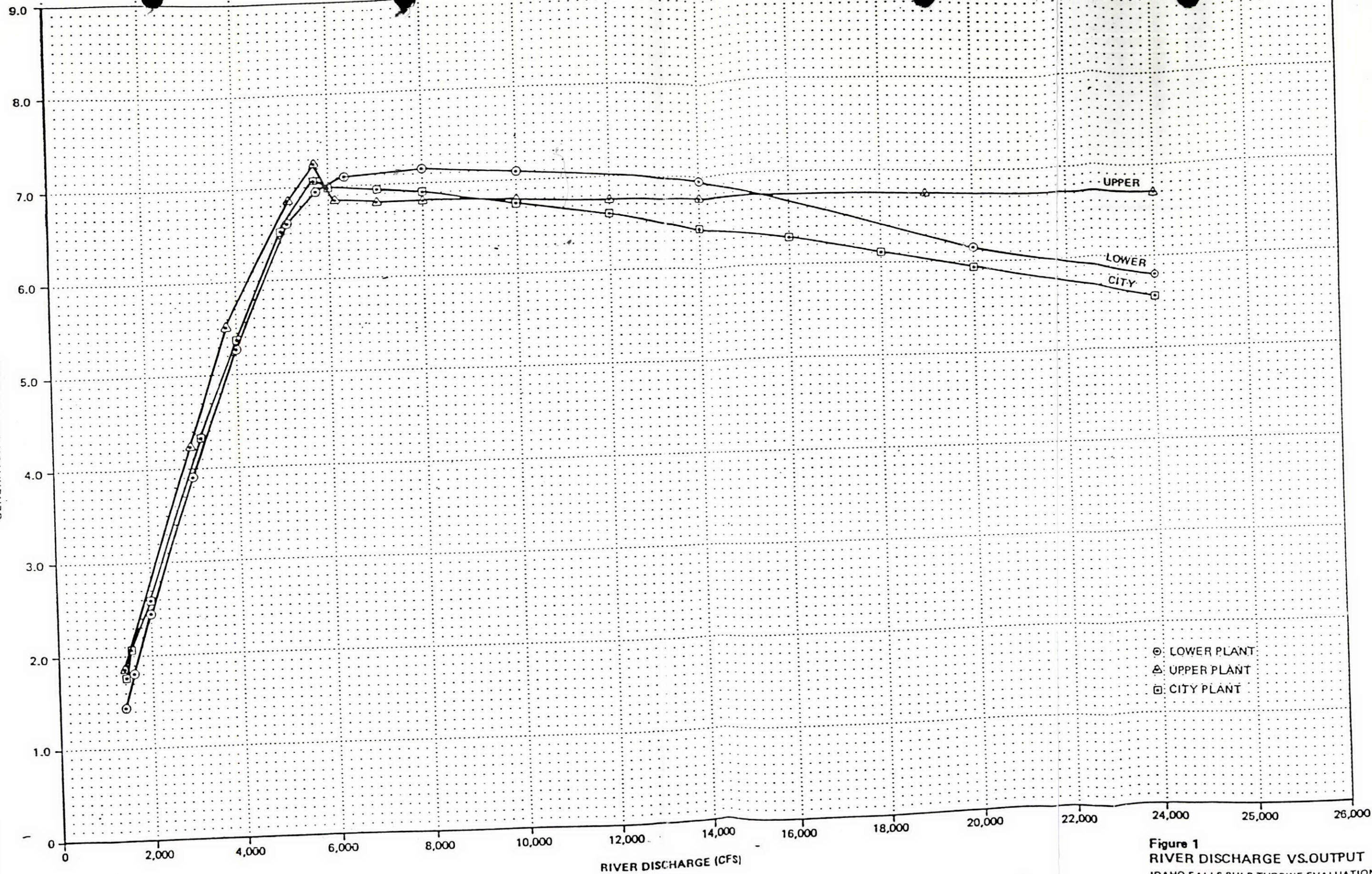
DEC 0 4 1987



- △ DAILY Q SHELLEY GAGE 1960 - 1985
- 1975 DEVELOPMENT MONTHLY 1972 - 1977

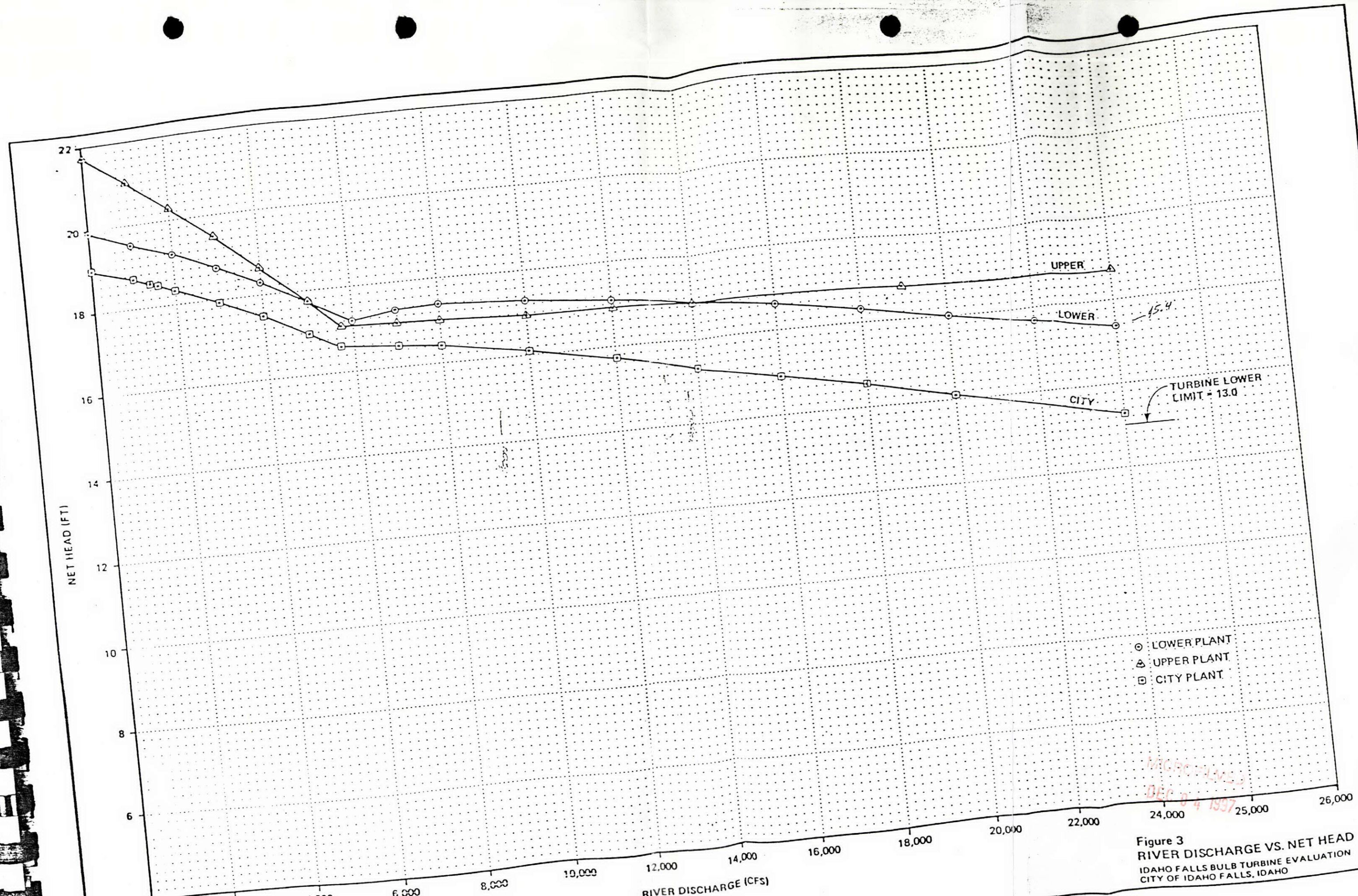
Figure 2
DAILY FLOW DURATION
SHELLEY GAGE (USGS)
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

GENERATOR OUTPUT (MW)



○ LOWER PLANT
△ UPPER PLANT
□ CITY PLANT

Figure 1
RIVER DISCHARGE VS. OUTPUT
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



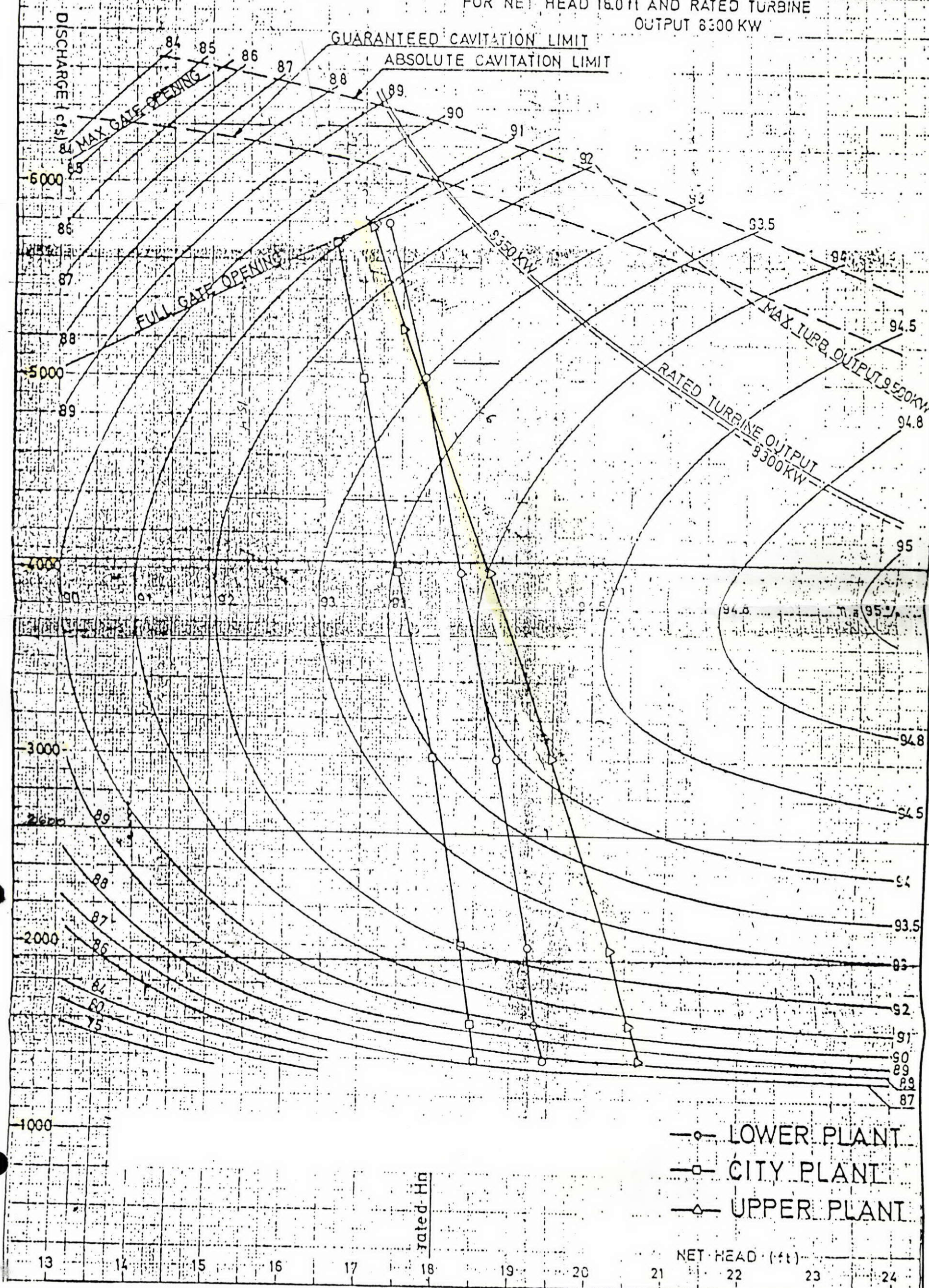
RUNNER DIAMETER (4.85 m) 190 1/16 inch
 SYNCHRONOUS SPEED 94.73 rpm
 CENTERLINE RUNNER
 UPPER PLANT 4696.3 ft
 CITY PLANT 4657.2 ft
 LOWER PLANT 4636.7 ft

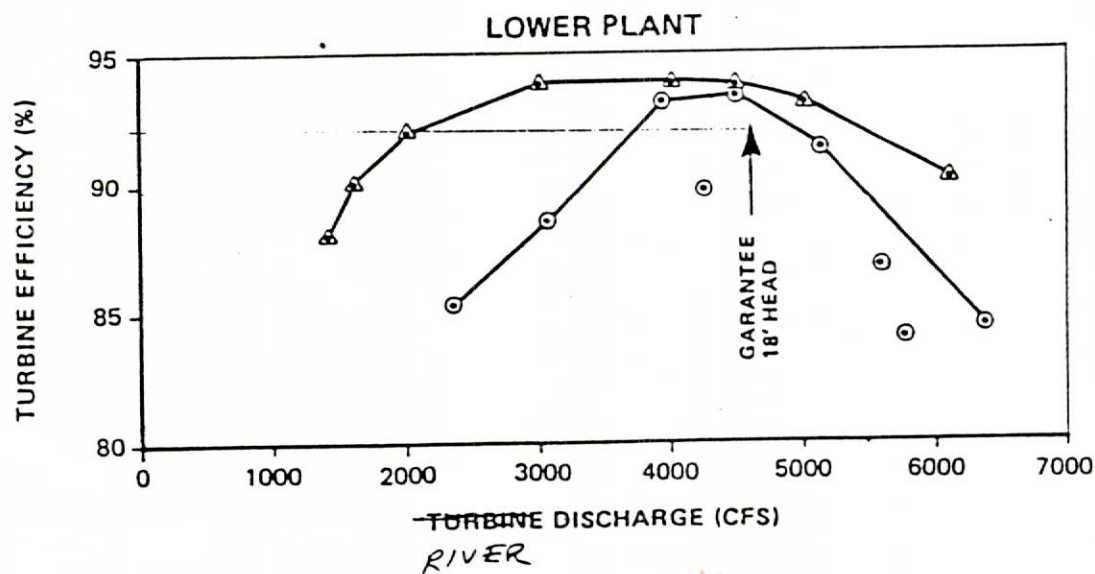
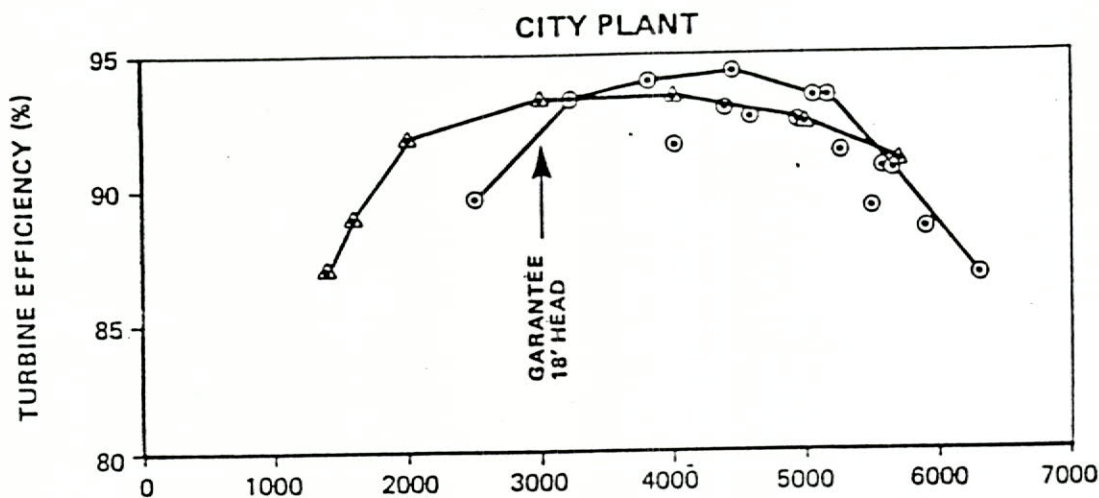
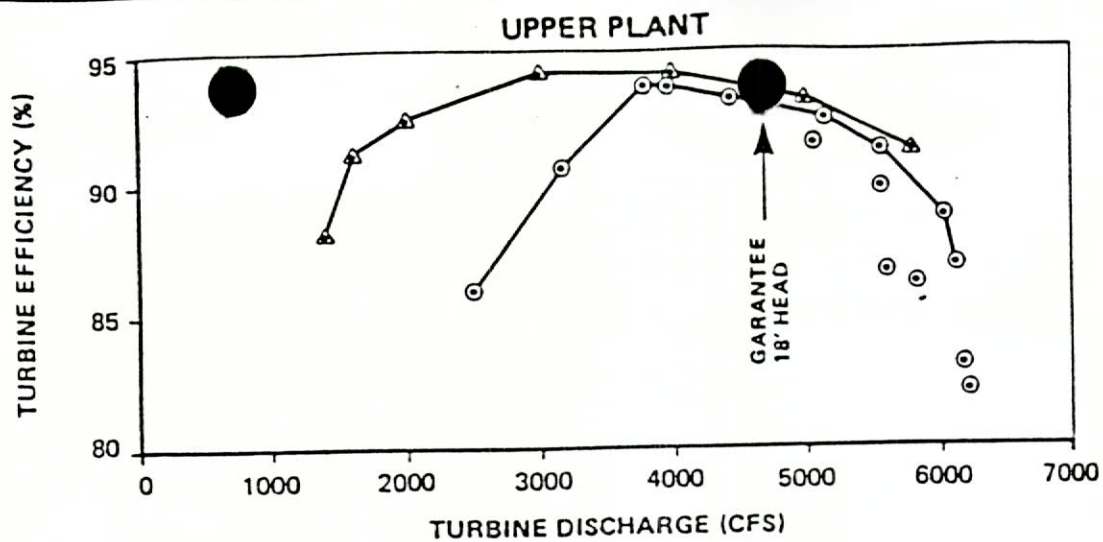
TOLERANCE OF MEASUREMENT IEC

THE CAVITATION LIMITS ARE BASED ON THE
 FOLLOWING NORMAL RESERVOIR ELEVATIONS:

UPPER PLANT CITY PLANT LOWER PLANT
 4734.0 ft 4694.25 ft 4674.0 ft

FULL GATE OPENING = NOMINAL OPENING
 FOR NET HEAD 18.0 ft AND RATED TURBINE
 OUTPUT 8300 KW



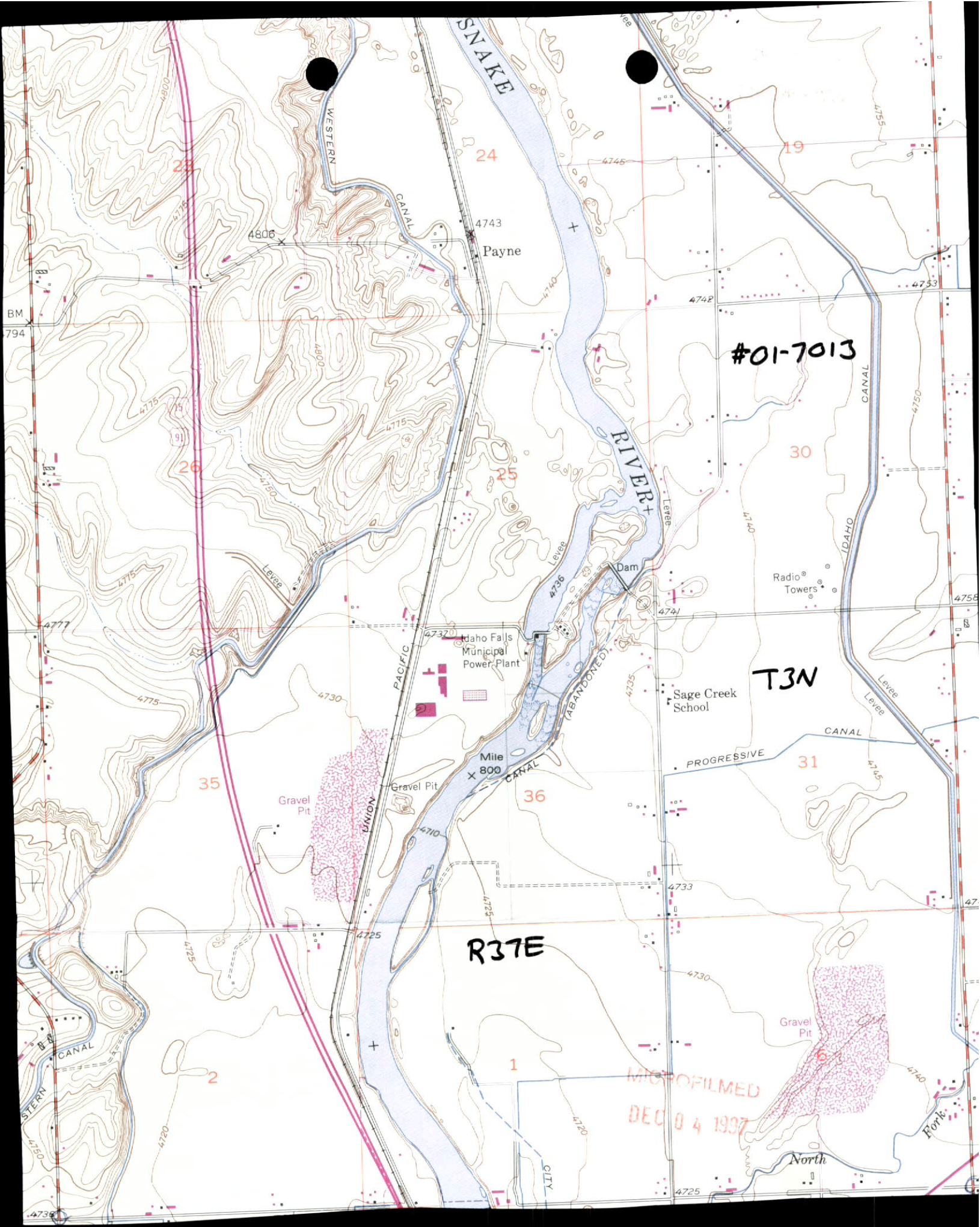


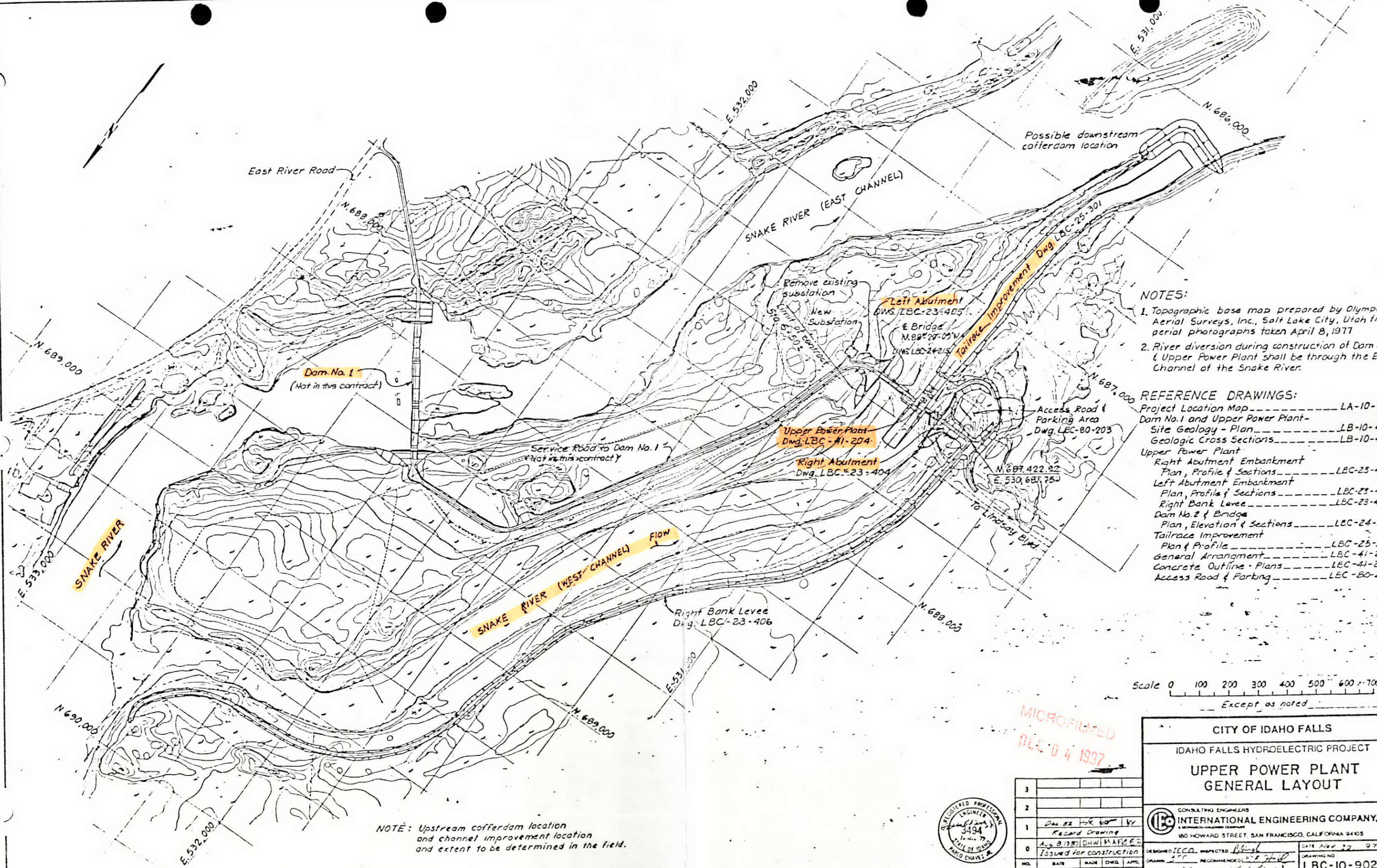
FROM INDEX TEST
 FROM GUARANTEED HILL DIAGRAM

Figure 5
EFFICIENCY COMPARISON

IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

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 DEC 04 1997





NOTES:

1. Topographic base map prepared by Olympus Aerial Surveys, Inc., Salt Lake City, Utah from aerial photographs taken April 8, 1977
2. River diversion during construction of Dam No. 1 & Upper Power Plant shall be through the East Channel of the Snake River.

REFERENCE DRAWINGS:

Project Location Map	LA-10-2
Dam No. 1 and Upper Power Plant	
Site Geology - Plan	LB-10-4
Geologic Cross Sections	LB-10-4
Upper Power Plant	
Right Abutment Embankment	
Plan, Profile & Sections	LBC-23-4
Left Abutment Embankment	
Plan, Profile & Sections	LBC-23-4
Right Bank Levee	LBC-23-4
Dam No. 2 & Bridge	
Plan, Elevation & Sections	LBC-24-2
Tailrace Improvement	
Plan & Profile	LBC-25-3
General Arrangement	LBC-41-2
Concrete Outline - Plans	LBC-41-2
Access Road & Parking	LEC-80-2

Scale 0 100 200 300 400 500 600 700

Except as noted

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DEC 04 1997



3					
2					
1	Dec 82	OK	BY		
0	Aug 81	OK	BY		
	Issued for construction				
NO.	DATE	MADE	CHG.	APPR.	

CITY OF IDAHO FALLS	
IDAHO FALLS HYDROELECTRIC PROJECT	
UPPER POWER PLANT GENERAL LAYOUT	
CONSULTING ENGINEERS INTERNATIONAL ENGINEERING COMPANY, 180 HOWARD STREET, SAN FRANCISCO, CALIFORNIA 94105	DATE Nov 22 77 DRAWING NO. LBC-10-902
DESIGNED: E.C.O. CHECKED: J.T. APPROVED: [Signature]	DATE Nov 22 77 DRAWING NO. LBC-10-902

NOTE: Upstream cofferdam location and channel improvement location and extent to be determined in the field.



Spillway

(01-7013
upper Plant)



Tailrace



Powerhouse

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DEC 04 1987

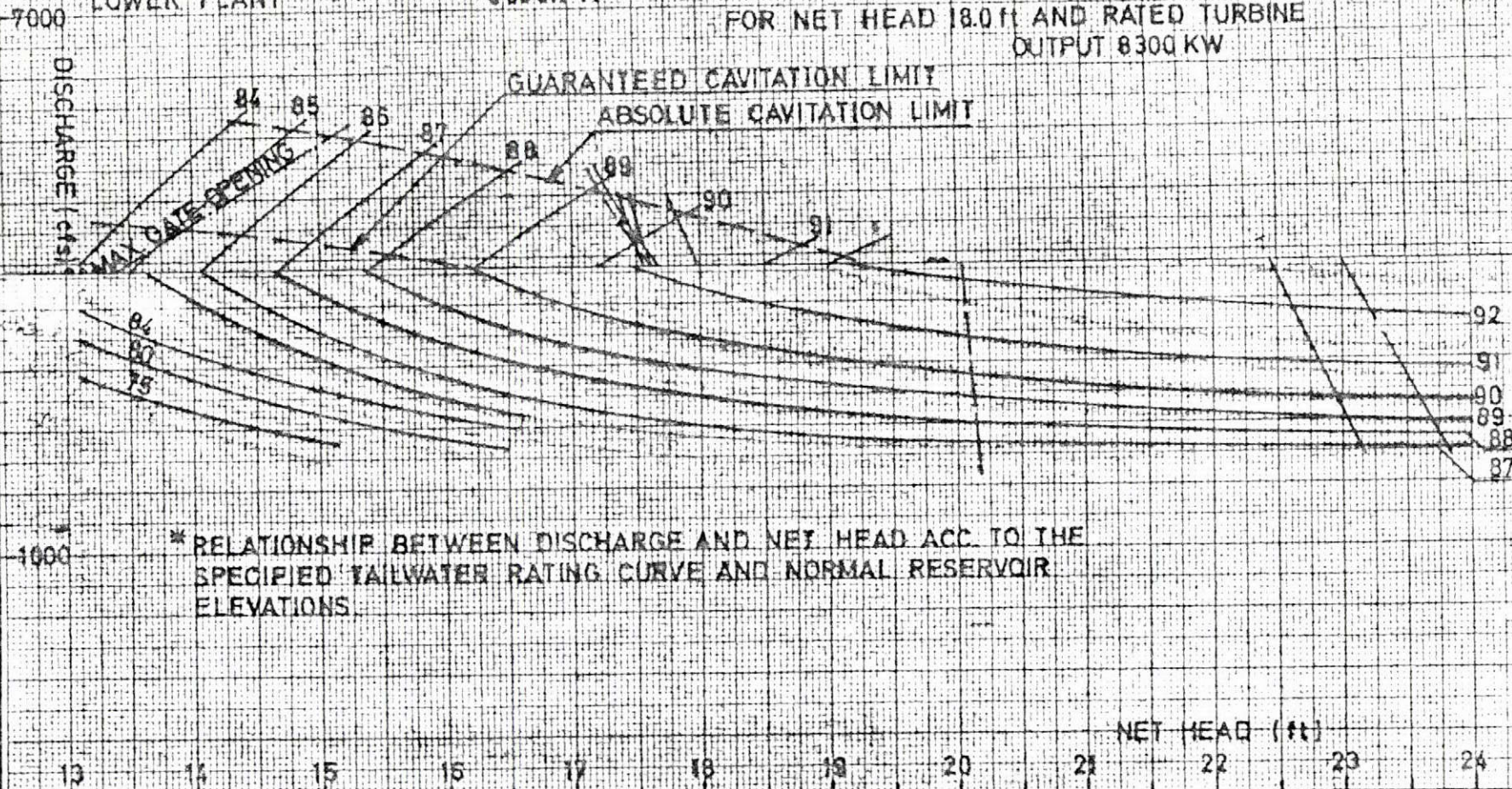
TOLERANCE OF MEASUREMENT (EC)

RUNNER DIAMETER (4.85 m) 190 ¹⁵/₁₆ inch
 SYNCHRONOUS SPEED 94.73 rpm
 CENTERLINE RUNNER
 UPPER PLANT 4896.3 ft
 CITY PLANT 4657.2 ft
 LOWER PLANT 4636.7 ft

THE CAVITATION LIMITS ARE BASED ON THE
 FOLLOWING NORMAL RESERVOIR ELEVATIONS:

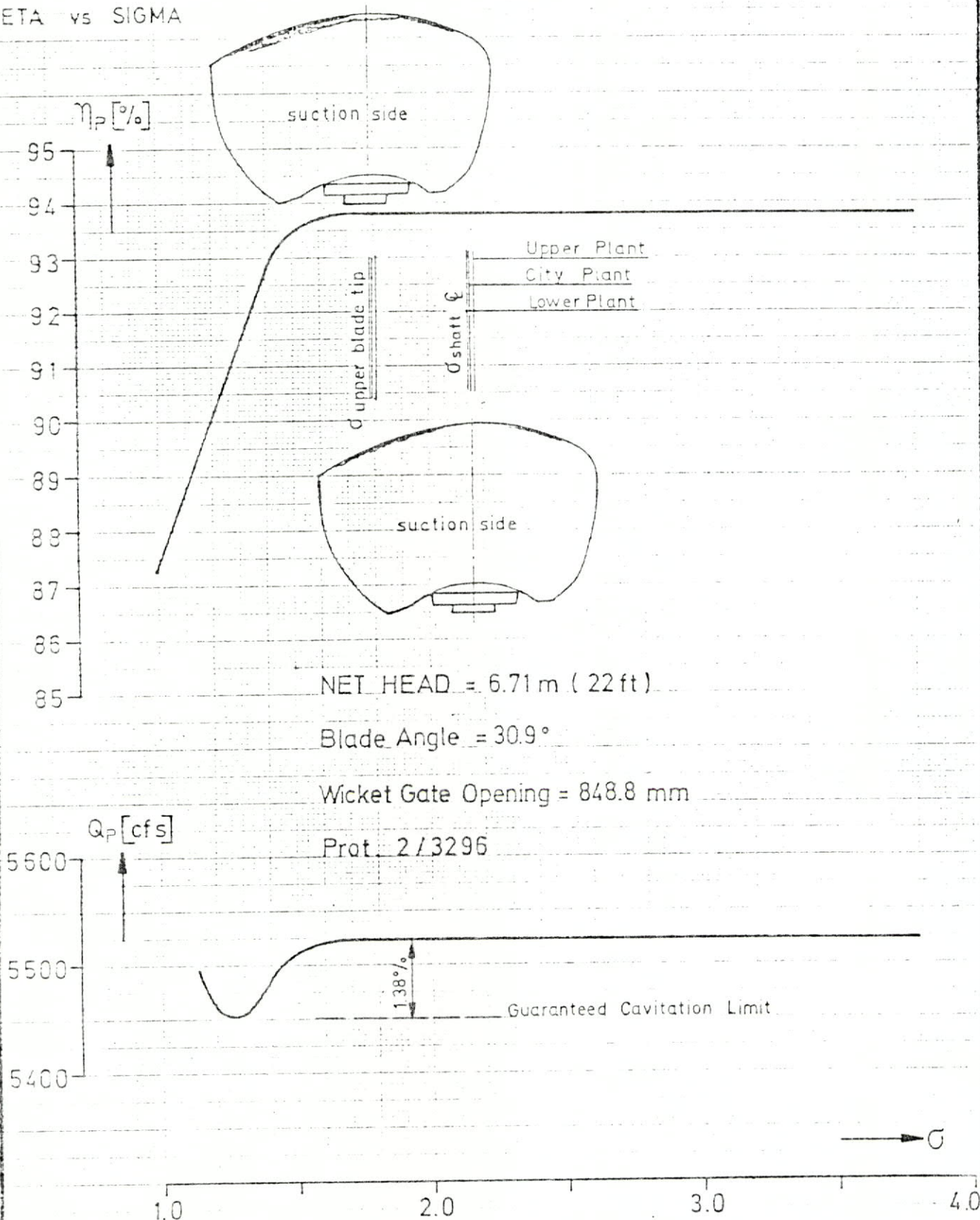
UPPER PLANT CITY PLANT LOWER PLANT
 4734.0 ft 4694.25 ft 4674.0 ft

FULL GATE OPENING = NOMINAL OPENING
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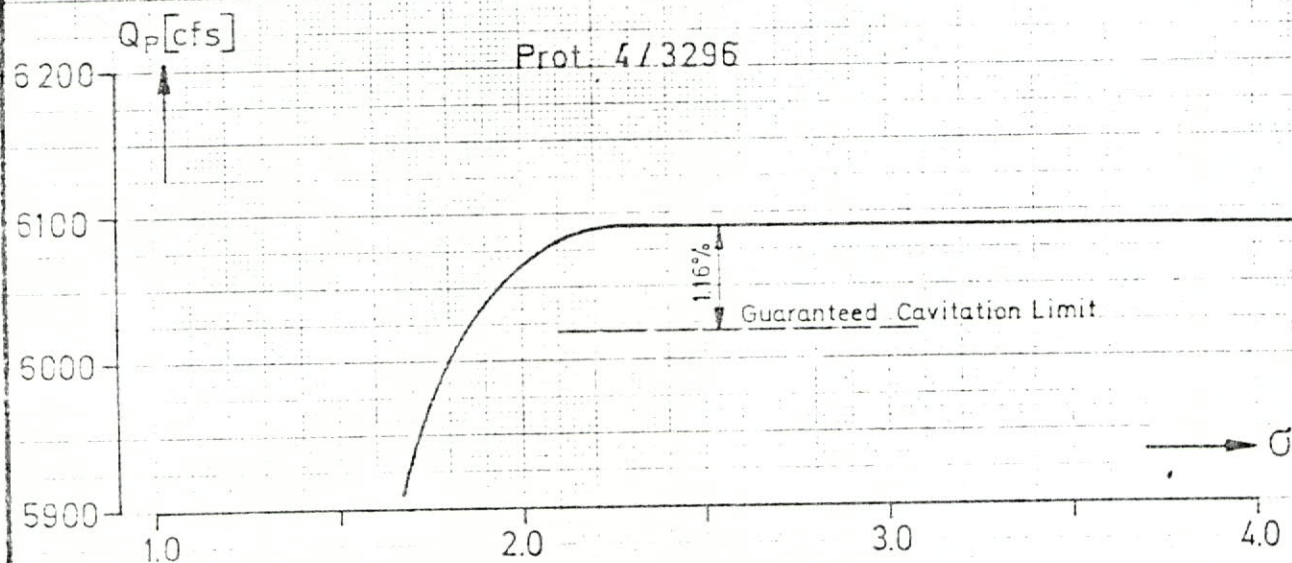
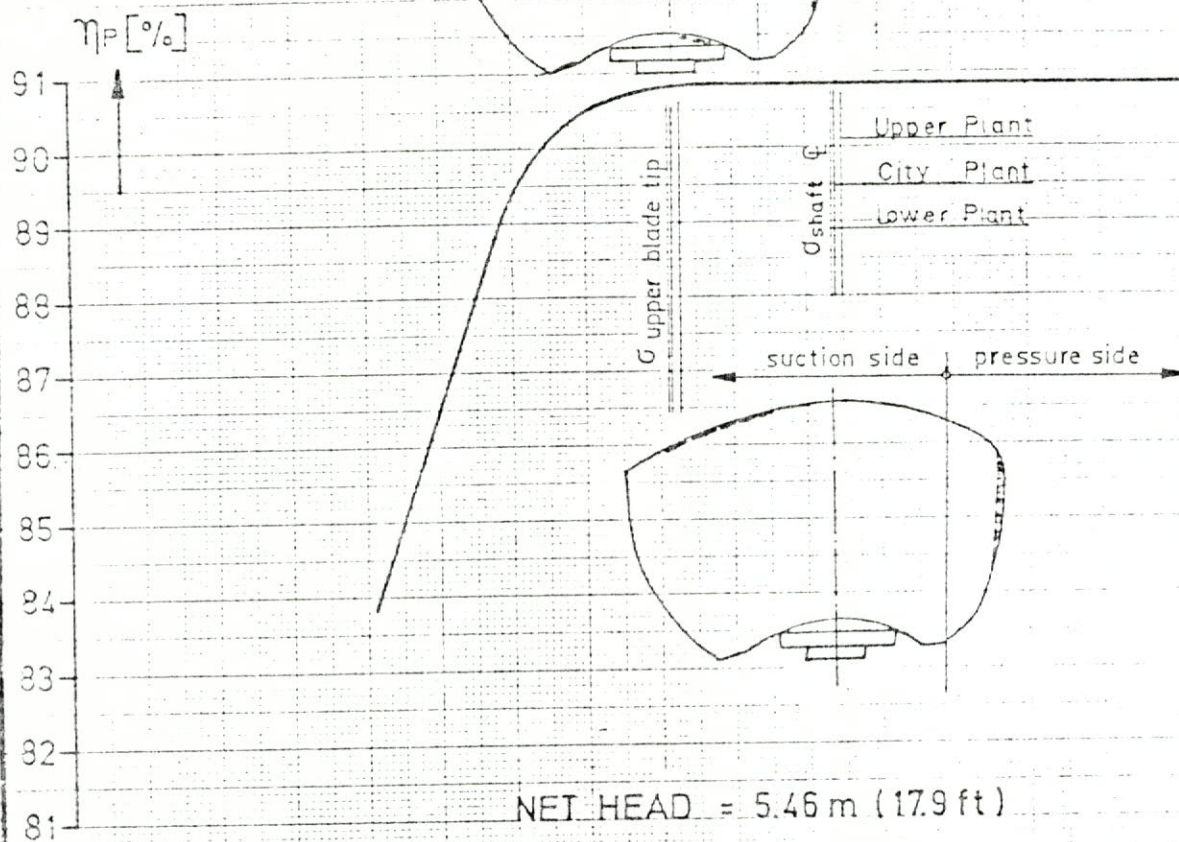
MODEL 344-4

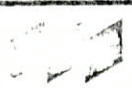
ETA vs SIGMA



MODEL 344-4

ETA vs. SIGMA





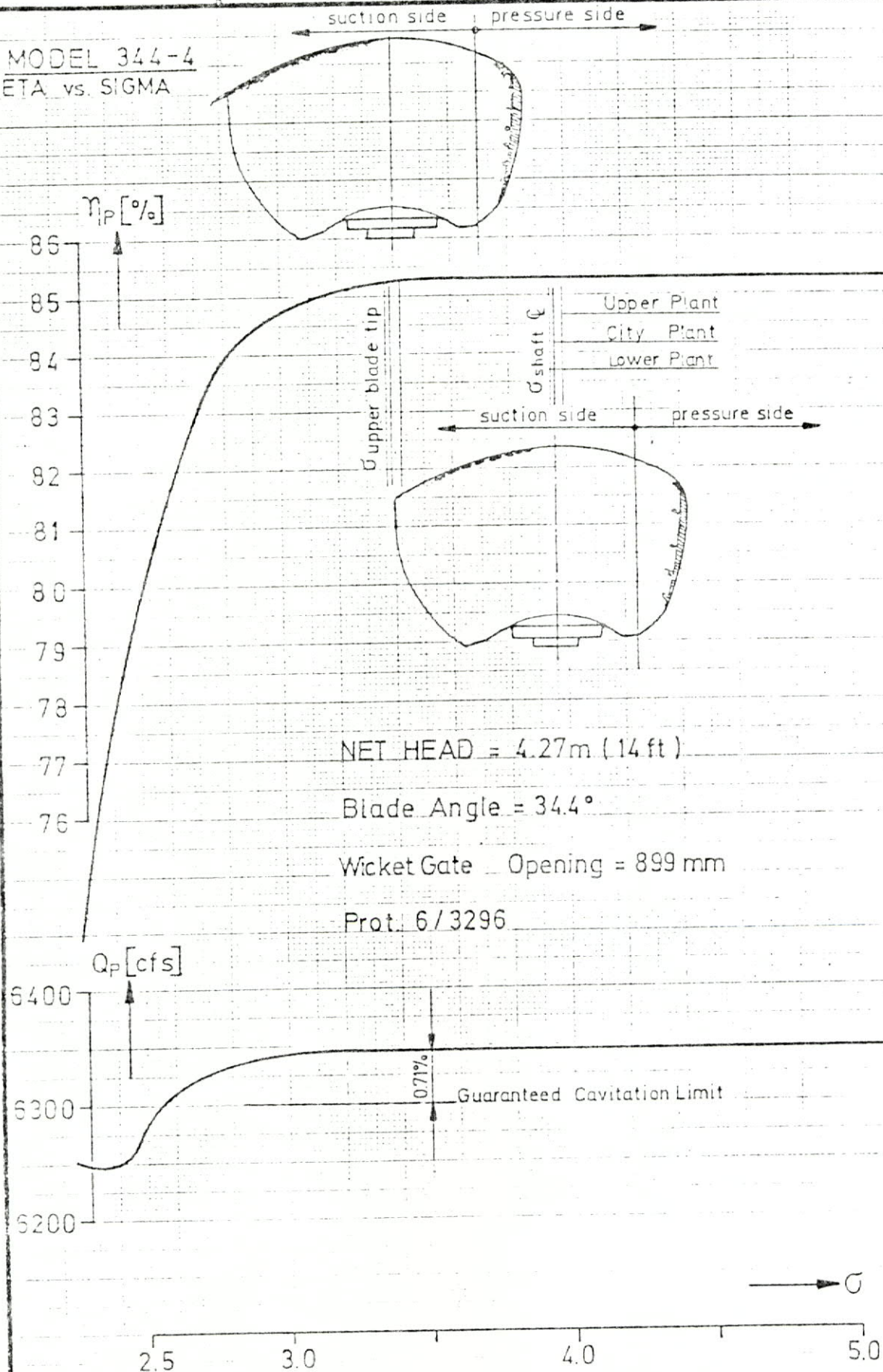
VÖEST-ALPINE AG
Finalbereich Linz

IDAHO FALLS HYDROELECTRIC PROJECT

S.O. 5644/10714

TLM 2

MODEL 344-4
ETA vs. SIGMA



State of Idaho
Department of Water Resources

WATER RIGHT LICENSE

WATER RIGHT NO. 01-07013

Priority: November 9, 1977

Maximum Diversion Rate:

2600.00 CFS

This is to certify, that CITY OF IDAHO FALLS

C/O M GENDRON

PO BOX 50220

IDAHO FALLS ID 83405

has complied with the terms and conditions of the permit, issued pursuant to Application for Permit dated November 9, 1977; and has submitted Proof of Beneficial Use on February 18, 1983. An examination indicates that the works have a diversion capacity of 6000.000 cfs of water from:

SNAKE RIVER

tributary to COLUMBIA RIVER

source, and a water right has been established as follows:

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>RATE OF DIVERSION</u>	<u>ANNUAL VOLUME</u>
POWER	01/01 to 12/31	2600.00 CFS	

LOCATION OF POINT(S) OF DIVERSION: Lot 7(NWNE), Sec. 36, Township 03N, Range 37E
BONNEVILLE County

PLACE OF USE: POWER

TWN RGE SEC

03N 37E 36 Lot 7(NWNE)

CONDITIONS OF APPROVAL AND REMARKS

1. This water right is appurtenant to the described place of use.
2. This right is subject to all prior water rights and may be forfeited by five years of non-use.
3. Modifications to or variance from this license shall be made within the limits of Section 42-222, Idaho Code, or the applicable Idaho law.
4. The water right confirmed in this license for hydropower purposes shall be junior and subordinate to all rights to the use of water, other than hydropower, within the State of Idaho that are initiated later in time than the priority of this license and shall not give rise to any right or claim against any future rights to the use of water, other than hydropower, within the State of Idaho initiated later in time than the priority of this license.
5. Use of water under this water right will be regulated by the watermaster of State Water District No. 01.
6. Use of water under this right shall be non-consumptive.

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DEC 04 1997

State of Idaho
Department of Water Resources

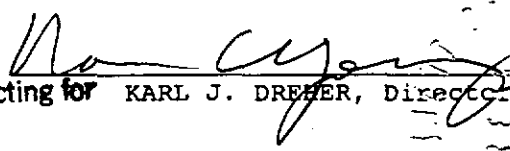
WATER RIGHT LICENSE

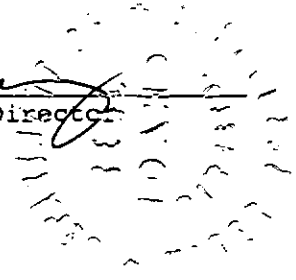
WATER RIGHT NO. 01-07013

CONDITIONS OF APPROVAL AND REMARKS

7. Use of water under this license shall not cause unreasonable fluctuations in the flows of the Snake River which impair the ability of prior right holders to divert their water.
8. The diversion and use of water under this license is subject to review by the Director after the date of expiration of license 2842 issued by the Federal Energy Regulatory Commission. Upon appropriate findings relative to the interest of the public, the Director may cancel all or any part of the use authorized herein and may revise, delete or add conditions under which the right may be exercised.
9. This power facility is known locally as the "Upper" Plant.

This license is issued pursuant to the provisions of Section 42-219, Idaho Code. Witness the seal and signature of the Director, affixed at Boise, this 7TH day of NOVEMBER, 1997.


Acting for KARL J. DREHER, Director



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DEC 04 1997

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NOV 03 1997

State of Idaho
Department of Water Resources

Department of Water Resources

APPLICATION FOR AMENDMENT

(For Licensing Purposes)

WATER RIGHT NO. 01-07013

Date of Priority: November 9, 1977 Maximum Diversion Rate: 2600.00 CFS
Comes now CITY OF IDAHO FALLS
C/O M GENDRON
PO BOX 50220
IDAHO FALLS ID 83405 and represents to the Director of the

Idaho Department of Water Resources:

That he is the owner and holder of Permit to appropriate the Public Waters of the State of Idaho No. 01-07013, and requests that the permit be changed as follows:

Source: SNAKE RIVER tributary to COLUMBIA RIVER

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>RATE OF DIVERSION</u>	<u>ANNUAL VOLUME</u>
-----------------------	----------------------	--------------------------	----------------------

POWER	01/01 to 12/31	2600.00 CFS	
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LOCATION OF POINT(S) OF DIVERSION: Lot 7(NWNE), Sec. 36, Township 03N, Range 37E
BONNEVILLE County

PLACE OF USE: POWER

TWN RGE SEC

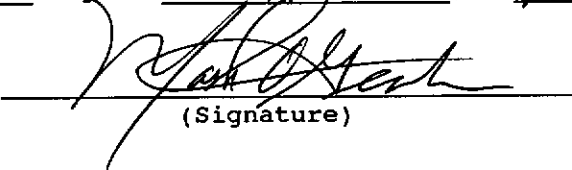
03N 37E 36 Lot 7(NWNE)

MICROFILMED

DEC 04 1997

Permit holder asserts that no one will be injured by such change and that such change will be made at permit holder's own risk.

Signed at Idaho Falls, this 24th day of October, 1997.


(Signature)

State of Idaho
Department of Water Resources

APPLICATION FOR AMENDMENT
(For Licensing Purposes)
WATER RIGHT NO. 01-07013

FOR DEPARTMENT USE ONLY

Preliminary check by _____ Fee = 5000 Received by KS # COUNSEL Date 11/3/97

ACTION OF THE DEPARTMENT OF WATER RESOURCES

I, Karl J. Dreher, of the Department of Water Resources hereby approve the
above Application for Amendment for Permit No. 01-07013 with the following;

CONDITIONS OF APPROVAL AND REMARKS

1. This water right is appurtenant to the described place of use.
2. This right is subject to all prior water rights and may be forfeited by five years of non-use.
3. Modifications to or variance from this license must be made within the limits of Section 42-222, Idaho Code, or the applicable Idaho law.
4. The water right confirmed in this license for hydropower purposes shall be junior and subordinate to all rights to the use of water, other than hydropower, within the State of Idaho that are initiated later in time than the priority of this license and shall not give rise to any right or claim against any future rights to the use of water, other than hydropower, within the State of Idaho initiated later in time than the priority of this license.
5. Use of water under this water right will be regulated by the watermaster of State Water District No. 01.
6. Use of water under this right shall be non-consumptive.
7. Use of water under this license shall not cause unreasonable fluctuations in the flows of the Snake River which impair the ability of prior right holders to divert their water.
8. The diversion and use of water under this license is subject to review by the Director after the date of expiration of license 2842 issued by the Federal Energy Regulatory Commission. Upon appropriate findings relative to the interest of the public, the Director may cancel all or any part of the use authorized herein and may revise, delete or add conditions under which the right may be exercised.
9. This power facility is known locally as the "Upper" Plant.

Witness my hand this 7TH day of NOVEMBER, 1997.

DEC 4 1997
Acting for KARL J. DREHER, Director

4/86

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MAR 18 1987Department of Water Resources
Eastern District Office

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

EXAMINATION FEE INFORMATION

For Office Use Only

Fee Received _____

Date _____

Receipt # _____

Receipt by _____

Sent to S.O. _____

RECEIVED

DEC 08 1987

1. Permit No. 01-7013

ONE OF THE FOLLOWING BOXES SHOULD BE MARKED TO DESIGNATE YOUR CHOICE

- ☐ I choose to have the department make the field examination of this permit; attached is the examination fee. (If this box is marked, complete items 1 thru 8.)

2. Permit Holder: City of Idaho Falls3. Post Office Address: PO Box 220 Idaho Falls, Id 83402Telephone No. 208 529 14304. Source of Water: Snake River

5. Extent of Use:

Domestic _____ (No. of households) Stockwater _____ (No. and type of stock)

Irrigation _____ (acres) Other/Remark Hydrogeneration6. Total rate &/or volume for which proof is submitted 2600 cfs _____ acre-feet

7. Show the date water was first diverted and beneficially used under this permit:

9-24-82 "From DOE final report dated May 1986"

8. Person to contact to accompany the department representative during the field examination:

MICROFILMED

(Name)

DEC 04 1987

(Address)

(Telephone Number)

- ☒ I choose to have the field examination conducted by a certified water right examiner. Attached is a statement from the certified examiner I have selected verifying that he has been retained to conduct the examination. (If this box is marked, complete items 1 thru 7.)

Date March 16, 1987

Signature of Permit Holder (and title, if appropriate)

MGR. ELECTRIC DIVISION

MEMORANDUM

December 17, 1997

TO: Files for Water Right 03-07018
Idaho Power Co. at Brownlee

FROM: Ralph Mellin

I met this morning at 10:00 with Idaho Power Co. staff Scott Larrando; Director, Water Management, Roger Fuhrman; and data manager, Jon Bolin (sp).

I discussed my need to verify the beneficial use field report, done in 1985 and the water used at the facilities at the last added unit, number 5, and in the prior constructed four units. This verification would be facilitated by me being able to review a post-construction turbine and generator evaluation report. The IPC staff agreed to look for such reports.

I also asked to see monthly generation and head water/tail water elevation data for the spring of 1997 or other period that IPC would like to submit as being a peak use period.

Mr Larrando lead the response and indicated they will review my request and tentatively agreed to meet again by mid-January to provide the available material.

The accuracy of direct river water measurement was discussed. Mr. Larrando indicated IPC's river measurement is done in a rated natural river section below Brownlee. He also noted the gauge manufactures claim an accuracy of two percent can be achieved while the USGS indicates an accuracy of five percent can be achieved. (The USGS gage below Hells Canyon dam is indicated by the USGS to be a "good" gage with a 95 percent accuracy of 90 percent instead of an "excellent" rating of a 95 percent accuracy as Mr. Larrando thought it was.) (We likely will use the river measurement only as an input into the formulas to determine a calculated rate of flow through the turbines.) Mr. Bolin indicated the highest generation particularly at Brownlee, because of special mechanical circumstances, is possible at a head less than the maximum head. (Evidently, he meant at a head with the water to the spillway crest but without spilling water over which there would be increase in the tail water elevation higher than the headwater because of the constricted river channel below the powerhouse.)

The IPC staff also indicated, they desired to discuss this request with their there contract water-rights attorney, Tim Tucker. The point was that they were, before my visit, reviewing water rights at all facilities to determine if they needed to file additional applications to cover the highest water use that is possible at each facility, supposably regardless of the amount of water used from storage. That is for licensing natural flow water rights instead of allowing for water use from diurnal storage. That is are we to license the maximum continuous loads or maximum instantaneous load which allow for some generator heating and/or turbine cavitation to occur. We may need to discuss the development of a rule.

For my next meeting, I might take a second person in order that we might acquire a fuller understanding of IPC's views.

cc: Jim Johnson

7-2

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE
STATE OF IDAHO

IN THE MATTER OF THE MEASURING DEVICE
REQUIREMENT ON PERMIT NOS. 01-7013, 01-7014,
01-7015, 01-7023, 01-7024 AND 01-7025 IN THE
NAME OF THE CITY OF IDAHO FALLS, IDAHO

ORDER

WHEREAS, on March 5, 1979, the Department of Water Resources issued the above-captioned permits with the conditions: "that proof of construction of works and application of water to beneficial use be submitted on or before April 1, 1983" and that "a measuring device of a type approved by this Department shall be installed and maintained as part of the diverting works"; and,

WHEREAS, on February 18, 1983, the Department received proof of beneficial use and a request to waive the measuring device requirement on each of the permits; and,

WHEREAS, the Department has determined that an installed measuring device is not necessary to measure the flow of water if other suitable methods of measurement as determined by the Director are readily available;

IT IS, THEREFORE, HEREBY ORDERED that the condition of approval requiring the installation of a measuring device of a type approved by the Department as part of the diverting works be changed to require that the permit holder shall provide information and/or flow data sufficient as determined by the Director to accurately reflect the rate of flow beneficially used under Permit Nos. 01-7013, 01-7014, 01-7015, 01-7023, 01-7024 and 01-7025.

Dated this 25th day of February, 1983.



L. GLEN SAXTON

Chief, Operations Bureau

11-2-83

Identification No. 01 7013
Application No. _____

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
APPLICATION FOR PERMIT

APPROVED

To Appropriate the Public Waters of the State of Idaho
(TYPE OR PRINT IN INK)

1. Name of applicant City of Idaho Falls % G.S. Harrison Phone: 522-5891
post office address P.O. Box 220
2. Source of water supply Snake River which is a tributary of Columbia
3. a. Location of point of diversion is SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Section 25 Township 3N
Range 37E B.M. Bonneville County; additional points of diversion if any: _____

- b. If water is not consumed, it will be discharged into Snake River at a point in NW $\frac{1}{4}$
of NE $\frac{1}{4}$ of Section 36 Township 3N Range 37E B.M. _____
4. Water will be used for the following purposes: @ Upper Plant
Amount 2600 CFS for Power Generation purpose from January 1 to December 31 (both dates inclusive)
(cfs or acre-feet per annum)
Amount _____ for _____ purpose from _____ to _____ (both dates inclusive)
(cfs or acre-feet per annum)
Amount _____ for _____ purpose from _____ to _____ (both dates inclusive)
(cfs or acre-feet per annum)
5. Total quantity to be appropriated:
a. 2600 cubic feet per second and/or
b. _____ acre feet per annum.
6. Proposed diverting works:
a. Description of ditches, flumes, pumps, headgates, etc. 20 ft. high by 300 ft. long gated concrete diversion dam

- b. Height of storage dam N.A. feet, active reservoir capacity N.A. acre feet; total reservoir capacity N.A. acre feet, materials used in storage dam: _____
Period of year during which storage will occur N.A. to N.A. inclusive.
(Mo. Day) (Mo. Day)
- c. Proposed well diameter is _____ inches; proposed depth of well is _____ feet.
7. a. Time required for the completion of the works and application of the water to the proposed beneficial use is 4 years.
b. Estimated construction cost is \$ 15 million.
8. Description of proposed uses:
a. If water is **not** for irrigation:
(1) Give the place of use of water: NW $\frac{1}{4}$ of NE $\frac{1}{4}$ of Section 36 Township 3N
Range 37E B.M. _____
(2) Amount of power to be generated: 9651 hp under 19.5 feet of head.
(3) List number of each kind of livestock to be watered N.A.

(4) Name of municipality to be served N.A., or number of families to be supplied with domestic water N.A.
(5) If water is to be used for other purposes describe: N.A.

RECORDED

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

TWP.	RANGE	SEC.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				TOTALS
			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	

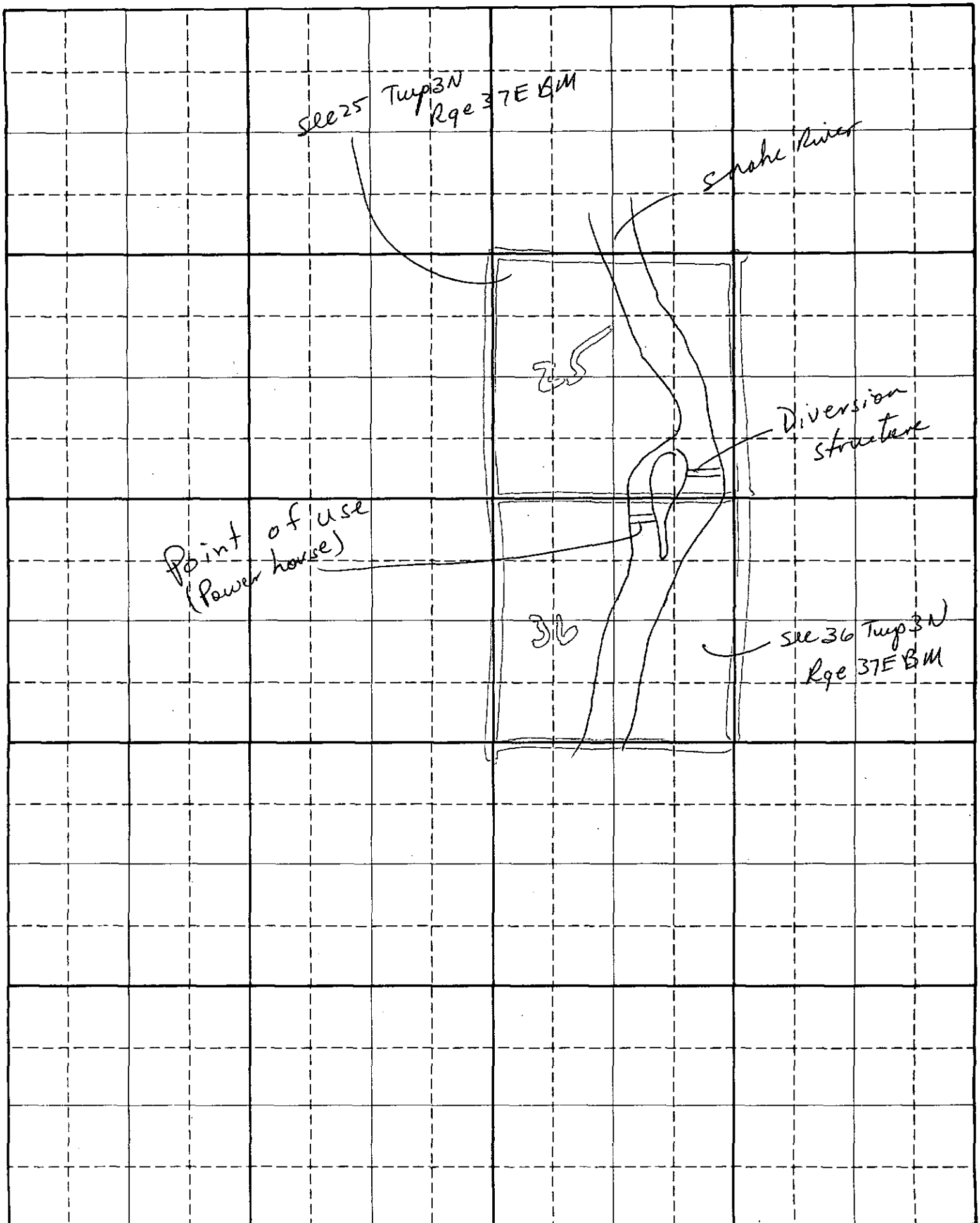
Total number of acres to be irrigated _____

c. Describe any other water rights used for the same purposes as described above. Existing water rights include rights #L 6799 and L 18271 of 500 CFS and 1500 CFS respectively and a claim for an additional right of 500 CFS the total of which represent previous historical use.

9. a. Who owns the property at the point of diversion The City of Idaho Falls and BLM
 b. Who owns the land to be irrigated or place of use The City of Idaho Falls
 c. If the property is owned by a person other than the applicant, describe the arrangement enabling the applicant to make this filing _____

10. Remarks This power site has been in continuous use from 1927 until damaged by the flood waters of the Teton Dam failure. New power generation facilities are being designed for this location. The new facilities will require 5100 CFS of water to operate at design capacity. The 2600 CFS applied for herein will supplement the existing rights and claims to provide the required 5100 CFS.

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



Scale: 2 inches equal 1 mile

BE IT KNOWN that the undersigned hereby makes application for permit to appropriate the public waters of the State of Idaho as herein set forth.

John R. Redman
(Applicant) MAYOR

MICROFILMED

Received by CW Date 11-09-77 Time 2:15p
 Preliminary check by EMC Fee \$ 1225⁰⁰
 Receipted by CW Date 11-09-77 # 9088
 Publication prepared by CW Date 11-10-77
 Published in Post Register
 Publication dates Nov. 17 & 24-1977
 Publication approved me Date November 30, 1977
 Priority reduced to _____ Reason _____

Protests filed by Jement-Madison / WITHDRAWN

Copies of protests forwarded by cd
 Hearing held by _____ Date _____
 Recommended for approval denial by EMC DET

ACTION OF THE DIRECTOR, DEPARTMENT OF WATER RESOURCES

This is to certify that I have examined Application for Permit to appropriate the public waters of the State of Idaho No. 01-7013, and said application is hereby APPROVED.

1. Approval of said application is subject to the following limitations and conditions:

- a. SUBJECT TO ALL PRIOR WATER RIGHTS.
- b. Proof of construction of works and application of water to beneficial use shall be submitted on or before April 1, 1983.
- c. Other: (1) A measuring device of a type approved by this Department shall be permanently installed and maintained as part of the diverting works. (2) Use of water under this permit is subject to control by the watermaster of State Water District No. 01, Snake River. (3) This permit is subject to the provisions of Sections 42-205 through 42-210, Idaho Code, restricting the sale, transfer, assignment, or mortgage of this permit. Failure to comply with these provisions is cause for immediate cancellation of this permit. (4) This project shall be operated in a manner that will not conflict or interfere with the future upstream diversion of water for irrigation or other beneficial consumptive uses.

Witness my hand this 5th day of March 19 79.

L. Glen Saxton
 Chief, Operations Bureau

NOTICE OF APPLICATION FOR WATER PERMIT

Notice is hereby given that the City of Idaho Falls, Idaho Falls, Idaho has on 11-09-77 submitted Application No. 01-7013 for a permit to appropriate 2600 cubic feet per second of water from the Snake River tributary to Columbia River by a dam within the SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 25, T. 3N, R. 37E, B.M., Bonneville County; to be used from Jan. 1 to Dec. 31 for power generation within the NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 36, T. 3N, R. 37E, B.M.

If issued, this permit will be subject to all prior water rights. Protests against the granting of the permit must be filed with the Idaho Department of Water Resources, 1515 Lincoln Road, Idaho Falls, Idaho, 83401, on or before December 5, 1977.

C. STEPHEN ALLRED
Director

Pub. Nov. 17 & 24, 1977.

I, John Dale Carlson, Water Resource Agent for the Department of Water Resources, State of Idaho, being duly sworn, do hereby certify that the above typed Notice of Application is a true and exact copy of a legal notice published in the Post Register on the 17th and 24th days of November, 1977, as copied from their microfilm records.

Subscribed and sworn to before me this 22nd day of March, 1979.

/s/ Colleen Wray
Notary Public
Residence Idaho Falls, Idaho
My Commission Expires 6-15-81

RECORDED

RECEIVED

WATER ADMINISTRATION

DEC 5 1977

Department of Water Resources
Eastern District Office

IN THE MATTER OF THE APPLICATION OF :
 CITY OF IDAHO FALLS, IDAHO, NOS. :
 017013, 017014, and 017015 TO : PROTEST OF FREMONT-
 ESTABLISH EXISTING USES OF WATER : MADISON IRRIGATION
 AND ACQUIRE NEW WATER RIGHTS. : DISTRICT.
 :

Comes now Fremont-Madison Irrigation District, a quasi-municipal corporation of the State of Idaho with its office and post office address at St. Anthony, Idaho, and in response to notice given that the City of Idaho Falls, Idaho, made applications Nos. 017013, 017014, and 017015 to establish existing uses of water and acquire new water rights from the Snake River and its tributaries, and makes the following protest against the approval of such application:

1. That the supply of water from the Henry's Fork of the Snake River and its tributaries is not sufficient to warrant such appropriation for power purposes.
2. That such appropriation would be in violation of the conditions of that certain contract between the United States of America, Fremont-Madison Irrigation District, Idaho of Idaho Falls, Idaho, and Utah Power and Light Company concerning power rights and release of damages, dated September 28, 1935.
3. That if such rights are granted, the City of Idaho Falls could force release of water from upstream dams to keep the water flowing up to the capacity of its rights.
4. The granting of any such rights would prevent the development of any additional irrigated lands upstream.
5. That the anticipation of the applicant to appropriate the water of Snake River and its tributaries is speculative because of the lack of water in said river and its tributaries and any such attempt will reduce the quantity of water to existing water rights.

R. Willis Walker
 R. Willis Walker, Chairman of
 Board of Directors, Fremont-Madison
 Irrigation District.

Paul S. H. Anthony

MICROFILMED

STATE OF IDAHO,)
 (SS
County of Madison.)

R. WILLIS WALKER, being first duly sworn, says that he is Chairman of the Board of Directors of Fremont-Madison Irrigation District and he makes this verification for and on behalf of said District; that affiant has read the foregoing Protest and knows the contents thereof and as to the matters and things therein alleged, affiant believes the same to be true.

R. Willis Walker

Subscribed and sworn to before this 5th day of
December, 1977.

Mary Smith
Notary Public, residing at
Rexburg, Idaho. My commission
expires: Life.

(Seal)

RECEIVED
DEC 11 1977

Proof of Publication
The Post-Register

RECEIVED

NOV 30 1977

Department of Water Resources
Eastern District Office

State of Idaho,
County of Bonneville } ss.

I, J. Robb Brady, first being duly sworn, depose and say: That I am the Principal Clerk of The Post Company, a corporation of Idaho Falls, Bonneville County, Idaho, publishers of The Post-Register, a newspaper of general circulation, published daily, except Saturday, at Idaho Falls, Idaho; said Post-Register being a consolidation of the Idaho Falls Times, established in the year 1890, The Idaho Register, established in the year 1880 and the Idaho Falls Post, established in 1903, such consolidation being made on the 1st day of November, 1931, and each of said newspapers having been published continuously and uninterruptedly, prior to consolidation, for more than seventy-eighty (78) weeks and said Post-Register having been published continuously and uninterruptedly from the date of such consolidation, up to and including the last publication of notice hereinafter referred to.

That the notice, of which a copy is hereto attached and made a part of this affidavit, was published in said Post-Register for two consecutive weeks, first publication having been made on the 17th day of November, 1977, last publication having been made on the 24th day of November, 1977, and that the said notice was published in the regular and entire issue of said paper on the respective dates of publication, and that such notice was published in the newspaper and not in a supplement.

Subscribed and sworn to before me, this 28th day of November, 1977

Karel Hule
Notary Public

My commission expires April 5, 1979

B10, 1M

**NOTICE OF APPLICATION
FOR WATER PERMIT**
Notice is hereby given that the City of Idaho Falls, Idaho Falls, Idaho has on 11-09-77 submitted Application No. 01-7013 for a permit to appropriate 2600 cubic feet per second of water from the Snake River tributary to Columbia River by means of a dam within the SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 25, T. 3N, R. 37E, B.M., Bonneville County; to be used from Jan. 1 to Dec. 31 for power generation within the NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 36, T. 3N, R. 37E, B.M.
If issued, this permit will be subject to all prior water rights. Protests against the granting of the permit must be filed with the Idaho Department of Water Resources, 1515 Lincoln Road, Idaho Falls, Idaho, 83401, on or before December 5, 1977.
C STEPHEN ALLRED
Director
Pub.: Nov. 17 & 24, 1977.



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, P.O. BOX 83720, Boise, Idaho 83720-0098

Phone: (208) 327-7900 FAX: (208) 327-7866

PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

November 10, 1997

CITY OF IDAHO FALLS
C/O M GENDRON
PO BOX 50220
IDAHO FALLS ID 83405-0220

RE: WATER RIGHTS 01-07013/01-07014/01-07015/01-07023/01-07024

Dear Water Right Holder(s):

The Department of Water Resources (the Department) has issued the enclosed licenses confirming that water rights have been established in accordance with the permits referenced above. The licenses are preliminary orders issued by the Department pursuant to section 67-5243, Idaho Code. They can and will become final orders without further action of the Department unless a party petitions for reconsideration or files an exception and/or brief as further described below.

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a preliminary order with the Department within fourteen (14) days of the service date of this order. The Department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See section 67-5243(3) Idaho Code.

EXCEPTIONS AND BRIEFS

Within twenty-one (21) days after (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding. Otherwise, this preliminary order will become a final order of the Department.

If any party appeals or takes exceptions to this preliminary order, opposing parties shall have twenty-one (21) days to respond to any party's appeal. Written briefs in support of or taking exceptions to the preliminary order shall be filed with the Department. The Department retains the right to review the preliminary order on its own motion.

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ORAL ARGUMENT

If the Department grants a petition to review the preliminary order, the Department shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Department will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Department orders otherwise, all oral arguments will be heard in Boise, Idaho.

CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Department in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with Rules of Procedure 302 and 303.

FINAL ORDER

The Department will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Department may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The Department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

Unless a different date is stated in a final order, the order is effective fourteen (14) days after its issuance if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:

- (a) the petition for reconsideration is disposed of; or
- (b) the petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

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DEC 04 1997

The appeal must be filed within twenty-eight (28) days of this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not itself stay the effectiveness or enforcement of the order under appeal.

Sincerely,



Shelley W. Keen
Water Rights Supervisor

SK:klt

Enclosure

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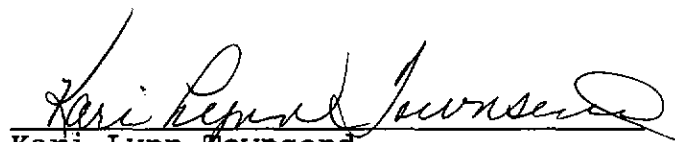
DEC 04 1997

CERTIFICATE OF MAILING

I hereby certify that on the 10th day of NOVEMBER, 1997, I mailed a true and correct copy, postage prepaid, of the foregoing **PRELIMINARY ORDERS (Approved Licenses)** to the person(s) listed below:

Water Rights 01-07013/01-07014/01-07015/01-07023/01-07024

CITY OF IDAHO FALLS
C/O M GENDRON
PO BOX 50220
IDAHO FALLS ID 83405-0220


Kari Lynn Townsend
Secretary

MICROFILMED

DEC 04 1997

Law Offices
HOLDEN, KIDWELL, HAHN & CRAPO, P.L.L.C.

FRED J. HAHN
KENT W. FOSTER
ROBERT E. FARNAM
WILLIAM D. FALER
STEPHEN E. MARTIN
CHARLES A. HOMER
GARY L. MEIKLE
GAYLE A. SORENSON, P.A.
DONALD L. HARRIS, P.A.
DALE W. STORER
MARIE T. TYLER
JOHN G. SIMMONS
ROBERT M. FOLLETT
FREDERICK J. HAHN, III
SHAN B. PERRY

U.S. BANK OF IDAHO BUILDING
330 SHOUP AVENUE, THIRD FLOOR
P.O. BOX 50130
IDAHO FALLS, IDAHO 83405

TELEPHONE (208) 523-0620
FACSIMILE (208) 523-9518
E-MAIL HOLDNLAW@SRV.NET

Arthur W. Holden
(1877-1967)
Robert B. Holden
(1911-1971)
Terry L. Crapo
(1939-1982)
William S. Holden
(1907-1988)

RECEIVED

NOV 03 1997

Department of Water Resources

October 30, 1997

Mr. Jim Johnson
IDAHO DEPARTMENT OF
WATER RESOURCES
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

Re: Permit Nos. 01-07013/07014/07015/07023/07024/07025

Dear Mr. Johnson:

We are enclosing with this letter the executed relinquishment of permit no. 01-07025 and the applications for amendments of permits nos. 01-07023 and 01-07013. As we understand it, this now completes the paperwork from our end. We have also enclosed our check in the amount of \$100.00 for the amendment filing fees.

We will look forward to the issuance of the five licenses and if there is any way we may be of further assistance please feel free to call upon us at your convenience.

Yours very truly,



Kent W. Foster

Enclosures

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DEC 04 1997

RECEIPT
For Monies Paid
to the
Idaho Department of Water Resources

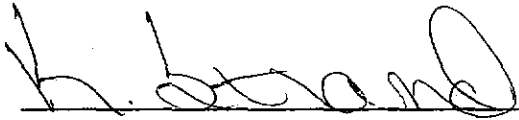
Receipt No: C040541

Date: 11/ 3/1997
Time: 14:35:22

Received
From: HOLDEN, KIDWELL, HAHN

Type of Payment	Program Acct	Amount
APPL FOR AMENDMENT 01-07023,01-07013	56105 229 21 1155	100.00
CHECK 09875	Total	\$ 100.00

Region: STATE

Signature: 

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DEC 04 1997



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, P.O. BOX 83720, Boise, Idaho 83720-0098

Phone: (208) 327-7900 FAX: (208) 327-7866

October 9, 1997

PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

Kent Foster
Holden, Kidwell, Hahn & Crapo
PO Box 50130
Idaho Falls, ID 83405

RE: Permit Nos. 01-07013/07014/07015/07023/07024/07025

Dear Mr. Foster:

In response to your phone conversation with Jim Johnson this morning, enclosed are modified Applications for Amendment on Permit Nos. 01-07013 and 01-07023. In addition, the other three permits which are attempting to license have had the same data entry changes as the two requiring amendments. Specifically, the address has been updated in care of Mr. Gendron at PO Box 50220, and the condition/remark concerning fluctuations in flows of the river has been changed to read "unreasonable fluctuations".

The other remaining permit, No. 01-07025 is the one we sent a relinquishment form out for the purpose of clearing our records. We look forward to receiving the signed relinquishment along with the two amendment applications and their filing fees so that we can finish the licensing process.

If you have any questions, just let me know.

Sincerely,

A handwritten signature in cursive script that reads 'Sharla Curtis'.

SHARLA CURTIS
Water Resource Agent

Enclosures

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DEC 04 1997



State of Idaho

DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, P.O. BOX 83720, Boise, Idaho 83720-0098

Phone: (208) 327-7900 FAX: (208) 327-7866

PHILIP E. BATT
GOVERNOR

September 18, 1997

KARL J. DREHER
DIRECTOR

CITY OF IDAHO FALLS
PO BOX 220
IDAHO FALLS ID 83402-0220

RE: Permit Nos. 01-07013, 01-07014, 01-07015
01-07023, 01-07024, and 01-07025

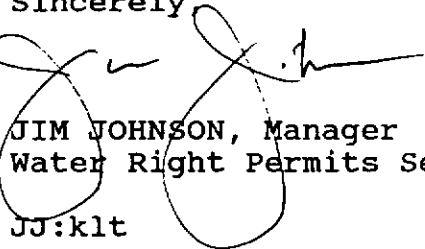
Gentlemen:

I previously wrote to you on August 11, 1997 regarding the above permits and stated that we are ready to finalize the licensing process.

Included with that letter were applications for amendment of Permit Nos. 01-07013 and 01-07023, a relinquishment form for Permit No. 01-07025 and draft copies of the licenses for the remaining rights, 01-07014, 01-07015 and 01-07024. I am enclosing copies of the applications for amendment, a relinquishment form and draft copies of the licenses as were sent with the August 11th letter.

If you have not already done so, please review the documents and if you concur, sign the amendments and relinquishment form and return them to our office along with the amendment filing fees (\$100 total - \$50 each permit). on receipt of the fees and forms, we will issue the licenses and clear our records for 01-07025.

Sincerely



JIM JOHNSON, Manager
Water Right Permits Section

JJ:klt

Enclosures

cc: Kent Foster

MICROFILMED
DEC 04 1997



State of Idaho
DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, P.O. BOX 83720, Boise, Idaho 83720-0098
Phone: (208) 327-7900 FAX: (208) 327-7866

PHILIP E. BATT
GOVERNOR

KARL J. DREHER
DIRECTOR

August 11, 1997

City of Idaho Falls
PO Box 220
Idaho Falls, ID 83402

RE: Permit Nos. 01-07013, 01-07014, 01-07015,
01-07023, 01-07024, and 01-07025

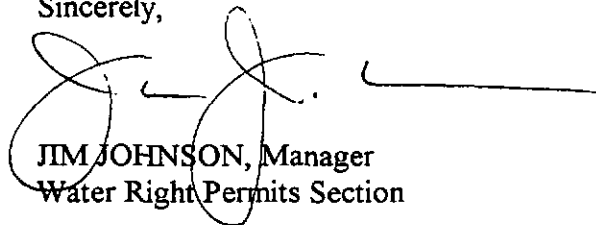
Gentlemen:

After a site visit and extensive review of the above referenced permits, we are ready to finalize the licensing process. I understand that Ralph Mellin of this department has forwarded a copy of his recommendations to Mark Gendron and that you are now in agreement with the proposals identified on the enclosed documents.

The enclosures are 1) applications for amendment of Permit Nos. 01-07013 and 01-07023, 2) a relinquishment form for Permit No. 01-07025, and 3) draft copies of the licenses for the remaining rights, 01-07014, 01-07015 and 01-07024.

Please review the documents and if you concur, sign the amendments and relinquishment form and return them to our office along with the amendment filing fees (\$100 total - \$50 each permit). Upon receipt of the fees and forms, we will issue the licenses and clear our records for 01-07025.

Sincerely,



JIM JOHNSON, Manager
Water Right Permits Section

JJ:sc

Enclosures

cc: Kent Foster

MICROFILMED
DEC 04 1997

MEMORANDUM

June 16, 1997

TO: Jim Johnson, Section Manager, State Office
Harold Jones, Water Resource Supervisor, Idaho Falls Regional Office

FROM: Ralph Mellin, Special Projects Coordinator *RJM*

SUBJECT: Idaho Falls Hydroelectric Plants Proposed License Flow

This memorandum culminates the request earlier this year for a review of past work in the analysis of water right field examinations and related work to license two water right permits at each of three hydroelectric plants; the City Plant, Upper Plant, and Lower Plant built for and operated by the City of Idaho Falls on the Snake River near Idaho Falls.

HISTORY:

The field examinations for these water rights were completed by a licensed consulting engineer just prior to the deadline date for submitting the Beneficial Use Field Report (field examination) on the applicable water permits. These field examinations are stamped as received on March 17, 1988. The river flow on January 12, 1988, the date of the field examination, was approximately one-half the amount needed to use the capacity of the turbines. In the field examination for water right file 01-07013, under Flow Measurements, it is stated that

"Flow on this date was determined by power generation using the formula flow x head / 14 = kilowatts. On this date power output was 3,800 kW. Head = 18. Therefore flow = 2,955 cfs. At time of measurement this was total flow."

Additional information on previous higher amounts of water use by the newly constructed power plants does not appear to have been submitted.

On May 18, 1993, Kent Foster, private attorney for the City of Idaho Falls, requested issuance of the applicable water licenses. On May 26, 1993, IDWR's staff review of the water permit files showed there was documentation for licensing the water permits for the amount of water shown on the field examinations. An internal memorandum to the files dated February 3, 1994, indicates the licenses were prepared for the Department's Administrator's signature in June 1993; however, questions were raised about the low amount of water use relative to the amount allowed in the water permits.

On June 30, 1993, Mr. Foster wrote a follow-up to a previous telephone conversation with the Department and indicated "that each of the plants is a replacement for a former smaller plant at each site." No clarifying information was provided that the two older operating turbines were left at the Lower Plant. Also, a 1986 draft copy of an extensive post-project report prepared by CH2M Hill was submitted to the IDWR apparently near this time. (The

DEC 04 1997

August 1989 final report was recently obtained by this author. No change was found from the draft report.) This CH2M Hill report indicates in its Hill Diagram (Figure 4) of turbine flows related to turbine efficiency and rated head that the "full gate opening" allowed 5,700 cfs for the City Plant and 5,800 cfs for the Upper Plant and the Lower Plants. This "full gate opening" is when all water possible is entering the turbine without water flowing over the spillway.

The above mentioned February 3, 1994, memorandum to the files, recommended licensing the water permits based on these full gate opening flows; although, the graph for the Upper Plant apparently was misread and 5,700 cfs was indicated as the proposed license amount instead of 5,800 cfs. (The proposed new license flow would be for that portion of water when added to the current water right flows at each plant would total the above noted amounts.) On March 3, 1994, the Department sent to Mr. Foster draft copies of the proposed licenses based on the "full gate opening" flows.

On June 21, 1994, Mr. Foster wrote that the city's engineers were reviewing the water use amounts; however, "at the lower plant, the (Department's) exams and reports didn't even take into consideration the existence of the old machines which are still used as well as the newer bulb turbine." On October 10, 1994, Mr. Foster transmitted a City of Idaho Falls letter to him with calculations that showed a maximum water use of 6,700 cfs at the City Plant, 6,200 cfs at the Upper Plant, and 8,700 cfs at the Lower Plant (which included 2,831 cfs for the old plant that has 2,740 cfs of water rights). (It appears the turbine efficiencies used are lower than the efficiencies shown in the Hill Diagram of the CH2M Hill report. This would give higher water flows.)

On November 15, 1994, our letter to Mr. Foster indicated that review of the material received suggested the correct total water use of the Upper Plant and the Lower Plant (apparently including the old plant) remained as previously listed, 5,700 cfs and 5,800 cfs respectively and the maximum use for the city plant could be increased to the permitted amount of 6,000 cfs.

THIS CURRENT ANALYSIS:

On March 4, 1997, we (Jim Johnson, Harold Jones, and Ralph Mellin) went to the office of the Hydroelectric Division, City of Idaho Falls to tour their Lower Plant, City Plant, and Upper Plant all operated by the city.

Before the tour, Mark Gendron, Director, Hydroelectric Division; Scott McBride, Engineer; and Steve Elliot, Hydro Plant Mechanical Foreman, discussed the general operation of the plants and answered our general questions. Then Mr. McBride lead us first through the Lower Plant, then the City Plant, and lastly the Upper Plant. (Harold Jones returned to our Eastern Region office after the tour of the City Plant.) Upon returning to the Hydroelectric Division office, Steve Elliot provided us with a computer disk of hourly generation and 15-minute flow data for the previous 5 months of October 1996 through February 1997. These

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plants were operating near capacity during our visit; however, subsequent review of the generation data showed slightly higher generation levels existed prior to our tour.

The Upper Plant, the City Plant, and the new construction for the Lower Plant have water rights and approved water permits for a total of 6,000 cfs. The new construction at each plant is a single 7,200 kW generator powered by a horizontal bulb turbine. At the City Plant and the Upper Plant, the new construction replaced and expanded the existing power plants. At the Lower Plant, the two older generators with a maximum generation of 3,100 kW recorded in the November 1996 to February 1997 period were retained in their separate, adjacent powerhouse. The previous water rights at the Lower Plant consist of water right no. 01-00281 for 1,500 cfs and no. 01-04001 for 1,240 cfs which gives a total of 2,740 cfs for the older turbines. These water rights and the quantity of water use by the turbines located in the old powerhouse of the Lower Plant was not reviewed in this analysis.

Solutions:

A simple solution to determine the additional amount of water to license would be to:

1. Leave unchanged the 2,740 cfs of the non-reviewed water rights at the old Lower Plant.
2. License total water rights, including present water rights, for the single new turbine at each new plant based on the "full gate opening" shown in the Hill Diagram in the CH2M Hill post-project-construction report. According to the graph the "full gate opening" is 5,700 cfs for the City Plant and 5,800 cfs each for the Upper Plant and the addition to the Lower Plant.

It is noted, based on the Hill Diagram in the CH2M Hill report, the turbines can take more water than the "full gate opening" flow. There is shown on the graph a "maximum gate opening" flow; however, as this flow is approached a "guaranteed cavitation limit" is reached and subsequently an "absolute cavitation limit." There are flows above the "full gate opening" flow that are below the "guaranteed cavitation limit"; see subsequent detailed discussion for the City Plant.

A detailed solution was used and is recommended because of the availability of individual-plant operational data that reflects actual operating conditions; that is:

1. Also, leave unchanged the 2,740 cfs of the non-reviewed water rights at the old Lower Plant.
2. License total water rights for the single new turbine at each plant based on calculations from the more specific separate formulas for each plant given in the CH2M Hill report and use the maximum generation level obtained in the last 5 months (October 1, 1996 through February 28, 1997) which includes a high-water flow.

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A total of 58 additional dates from 1988 to 1996 were reviewed in which the river flow was only slightly above the design capacity of all turbines in the Lower Plant to see if a higher total generation existed for the combination of the new turbine and the old turbines. No higher total hourly generation existed than the amount in the spring of 1997 with its exceedingly high runoff.

The new license amounts, calculated on the attached sheets, would be total 6,000 cfs for the City Plant, 6,000 cfs for the Upper Plant, and 4,800 cfs for the addition to Lower Plant.

Details:

Specific calculations are appended. The highest hourly generation level found was used. Turbine flow calculations also were made at river flows only slightly above the turbine capacity; however, the turbine flows were found to be slightly less than at the high river flows.

To calculate the turbine flow for a particular kW generation level, an estimated turbine flow first had to be used in order to determine the remaining flow over the spillway which would determine the head-water level. Estimated turbine flow also needed to be used to determine the head loss through the turbines.

Since the estimated turbine flow was used to determine the actual turbine flow, up to four iterations were needed before the two numbers would be closely matched. I have shown the first and last iteration for the each plant. It also is noted, the calculations for the City Plant and for the Upper Plant had to be done by linearly extending the graph provided by CH2M Hill past its termination at the "full gate opening."

For the City Plant, this above noted extension appeared to move into an area where the formula gave unstable results. It is repeated from earlier in this memorandum that the "full gate opening" is 5,700 cfs. The 6,800 cfs of calculated flow with the river at 11,052 cfs is past the absolute cavitation limit of 6,500 cfs. (Calculated flow of 6,400 cfs, not attached, was determined at a river flow of 7,500 cfs on Jan 11, 1997.) The guaranteed cavitation limit is at 6,150 cfs.

All numbers are suggested to be rounded to the nearest 100 units because of accuracy able to be obtained in the calculations. Dissenters could correctly state that three significant figures is the least number used in the input data so the answer should be carried to three significant figures or to the nearest ten units. This rule is expanded with the clarification that the last significant figure in the answer is not necessarily correct but represents merely the most probable value.

For the City Plant, this would allow for 6,100 cfs since a water right likely would not be given for an operation level that would cavitate the turbine impellers and at which the

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turbine owners would hesitate to operate within. In addition, since 6,000 cfs is the total allowed in the available water permits, this 6,000 cfs would be the maximum that currently could be licensed at the City Plant.

It is noted the calculation flow for the Upper Plant was 6,000 cfs or slightly past the "full gate opening" of 5,800 cfs. This flow takes place when there is extra flow to build up a head above the spillway lip.

For the new part of the Lower Plant, a flow rate of 5,200 cfs was calculated when the old turbines were not operating. The new water rights, however, should be limited to the 4,800 cfs of additional water used only through the new turbine when the turbines in both powerhouses are operating at capacity. It is noted for the Lower Plant, the maximum generation in the new powerhouse found when all turbines in both powerhouses were operating at capacity within the 5-months reviewed was 6,310 kW. That is somewhat below the 7,200 kW installed in the new powerplant. (Evidently the operation of the old turbines lowers the headwater for the new turbine with, of course, no corresponding lowering of the tailwater.) That 6,310 kW maximum increases to 7,100 kW when only the new turbine is in operation. (7,390 kW is the maximum generation recorded in both the City Plant and the Upper Plant.)

SUMMARY:

The total amount of flow recommended to be licensed follows.

Upper Plant:	6,000 cfs (3,840 cfs of new water rights)
City Plant:	6,000 cfs (4,060 cfs of new water rights)
Lower Plant:	7,540 cfs (4,800 cfs of new water rights)

Plant capacities would be shown as 6,100 cfs for the City Plant, 6,000 cfs for the Upper Plant, and 7,540 cfs for the Lower Plant. The plant capacity for the Lower Plant consists of 2,740 cfs non-reviewed capacity, under existing water rights, for the two older turbines left in-place plus 4,800 cfs for the new bulb turbine when both turbines in the older power house are operating but only 5,200 cfs for the new bulb turbine when neither turbine in the older power house is operating.

A revised summary of city of Idaho Falls hydroelectric water rights is enclosed.

A draft of this memorandum was sent to Mark Gendren, on April 11, 1997 and reviewed by telephone with Scott McBride and Jim Lingo, Generation Superintendent on May 20, 1997. A tentative agreement of flow amounts was provided in the telephone review with the stipulation that when the new turbine in the lower plant is operating alone, it can first use the earlier priority water rights.

cc: Mark Gendron

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UPPER PLANT

Generating 7,390 kW on 2/11/1997 at 0300

$Q_{\text{river (r)}} = 11,164$ cfs at Idaho Falls gage (Graph in Figure 1 does not fit.)

$Q_{\text{turbine (t)}} = \overset{6,050}{\cancel{5,800}}$ cfs estimate

$Q_{\text{spillway (s)}} = Q_r - Q_t = 11,164 - \overset{6,050}{\cancel{5,800}} = \overset{5,114}{\cancel{5,364}}$ cfs

The following formulas, specific to each power plant, are from the CH2M Hill report

Turbine efficiency (TE) = see Hill chart using flow & net head (Figure 4, CH2M Hill report)

Generator efficiency (GE) = 0.966 from CH2M Hill

Headwater Level (HW) = $4,733.7 + (Q_s/1,900)^{0.667} = 4,733.7 + \overset{5,114}{\cancel{(5,364/1,900)^{0.667}}}$

$$= 4,733.7 + \overset{1.94}{2.00} = \overset{4,735.64}{\cancel{4,735.70}} \text{ ft} \quad \begin{matrix} \text{vs } 4,735.00 \\ \text{IF } 8.12 \end{matrix}$$

Tailwater Level (TW) = $4,712 + Q_t/1,500 + (Q_s/1,700)^{0.667}$

$$= 4,712 + \overset{6,050}{\cancel{5,800}}/1,500 + \overset{5,114}{\cancel{(5,364/1,700)^{0.667}}} = 4,712 + \overset{4.03}{\cancel{3.87}} + \overset{2.08}{2.15} = \overset{4,718.11}{\cancel{4,718.02}} \text{ ft}$$

Head Loss (HL) = $(Q_t/6,325)^2 = \overset{6,050}{\cancel{(5,800/6,325)^2}} = \overset{0.91}{\cancel{0.84}} \text{ ft}$

Net Head (NH) = HW - TW - HL = $\overset{4,735.64}{\cancel{4,735.70}} - \overset{4,718.11}{\cancel{4,718.02}} - \overset{0.91}{\cancel{0.84}} = \overset{16.62}{\cancel{16.84}} \text{ ft}$

$Q_t = 11.8 \times \text{kW} / \text{NH} \times \text{TE} \times \text{GE} = 11.8 \times 7,390 / \overset{16.62}{\cancel{16.84}} \times \overset{0.899}{\cancel{0.909}} \times 0.966 = \overset{6,041}{\cancel{5,897}} \text{ cfs}$ Use 6,000 cfs

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CITY PLANT

Generating 7,390 kW on 1/30/1997 at 1900

$Q_{\text{river (r)}} = 11,124$ cfs at Idaho Falls gage (Graph in Figure 1 does not fit.)

$Q_{\text{turbine (t)}} = \overset{6.750}{6,500}$ cfs estimate

$Q_{\text{spillway (s)}} = Q_r - Q_t = 11,164 - \overset{6.750}{6,500} = \overset{4.414}{4,624}$ cfs

The following formulas, specific to each power plant, are from the CH2M Hill report

Turbine efficiency (TE) = see Hill chart using flow & net head (Figure 4, CH2M Hill report)

Generator efficiency (GE) = 0.966 from CH2M Hill report

Headwater Level (HW) = $4,694.5 + (Q_s/7,020)^{0.667} = 4,694.5 + \overset{4.414}{(4,624/7,020)^{0.667}}$

$$= 4,694.5 + \overset{0.73}{0.76} = \overset{4.69523}{4,695.26} \text{ ft}$$

*vs H695.15
3 Feb 97*

Tailwater Level (TW) = $4,675.5 + Q_r/3,500 = 4,675.5 + 11,124/3,500 = 4,675.5 + 3.18 = 4,678.68$ ft

Head Loss (HL) = $(Q_t/6,508)^2 = \overset{6.750}{(6,500/6,508)^2} = \overset{1.08}{1.00}$ ft

Net Head (NH) = $HW - TW - HL = \overset{4.69523}{4,695.26} - 4,678.68 - \overset{1.08}{1.00} = \overset{15.50}{15.58}$ ft

$Q_t = 11.8 \text{ kW} / \text{NH} \times \text{TE} \times \text{GE} = 11.8 \times 7,390 / \overset{15.5}{15.58} \times \overset{0.855}{0.867} \times 0.966 = \overset{6.811}{6,683}$ cfs

use 6800 cfs

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LOWER (NEW) PLANT

Generating 6,310 kW on 2/12/1997 at 0900
With both old turbines operating near capacity--3,100 kW

$Q_{\text{river (r)}} = 11,052 \text{ cfs at Idaho Falls gage (Graph in Figure 1 does not fit.)}$

$Q_{\text{turbine new plant (t)}} = \overset{4,750}{\cancel{5,200}} \text{ cfs (estimate)}$

$Q_{\text{turbine old plant (top)}} = 2,740 \text{ cfs (used previous water rights)}$

$Q_{\text{t + top}} = \overset{4,750}{\cancel{5,200}} + \overset{2,740}{\cancel{2,740}} = \overset{7,490}{\cancel{7,940}} \text{ cfs}$

$Q_{\text{spillway (s)}} = Q_{\text{r}} - Q_{\text{t + top}} = 11,052 - \overset{7,490}{\cancel{7,940}} = \overset{3,562}{\cancel{3,112}} \text{ cfs}$

The following formulas, specific to each power plant, are from the CH2M Hill report

Turbine efficiency (TE) = see Hill chart using flow & net head (Figure 4, CH2M Hill report)

Generator efficiency (GE) = 0.966 from CH2M Hill report

Headwater Level (HW) = $4,674.5 + (Q_{\text{s}}/2,424)^{0.667} = 4,674.5 + \overset{3.562}{\cancel{(3,112/2,424)^{0.667}}}$

$$= 4,674.5 + \overset{1.29}{\cancel{1.18}} \overset{4,675.79}{\cancel{4,675.68}} \text{ ft}$$

$\downarrow$
 $\begin{matrix} 4.675.79 \\ 1.29 \\ 1.6 \\ 1.6 \end{matrix}$

Tail Water Level (TW) = $4,654.6 + Q_{\text{r}}/3,226 = 4,654.6 + 11,052/3,226 = 4,654.6 + 3.43 = 4,658.03 \text{ ft}$

Head Loss (HL) = $(Q_{\text{t}}/6,535)^2 = \overset{4,750}{\cancel{(5,200/6,535)^2}} = \overset{0.53}{\cancel{0.63}} \text{ ft}$

Net Head (NH) = $\text{HW} - \text{TW} - \text{HL} = \overset{4,675.79}{\cancel{4,675.68}} - 4,658.03 - \overset{0.53}{\cancel{0.63}} = \overset{17.23}{\cancel{17.02}} \text{ ft}$

$Q_{\text{t}} = 11.83 \times \text{kW} / \text{NH} \times \text{TE} \times \text{GE} = 11.83 \times 6,310 / \overset{17.23}{\cancel{17.02}} \times \overset{0.9335}{\cancel{0.927}} \times 0.966 = \overset{4,804}{\cancel{4,897}} \text{ cfs}$ Use 4,800 cfs

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LOWER (NEW) PLANT

Generating 7,100 kW on 1/11/1997 at 1300
Without old turbines operating

$$Q_{\text{river (r)}} = 7,495 \text{ cfs at Idaho Falls gage (Graph in Figure 1 fits!)}$$

$$Q_{\text{turbine new plant (t)}} = \overset{5,200}{\cancel{5,400}} \text{ cfs (estimate)}$$

$$Q_{\text{turbine old plant (top)}} = \text{zero}$$

$$Q_{\text{t + top}} = \overset{5,200}{\cancel{5,400}} + 0 = \overset{5,200}{\cancel{5,400}} \text{ cfs}$$

$$Q_{\text{spillway (s)}} = Q_r - Q_{\text{t + top}} = 7,495 - \overset{5,200}{\cancel{5,400}} = \overset{2,295}{\cancel{2,095}} \text{ cfs}$$

The following formulas, specific to each power plant, are from the CH2M Hill report

Turbine efficiency (TE) = see Hill chart using flow & net head (Figure 4, CH2M Hill report)

Generator efficiency (GE) = 0.966 from CH2M Hill report

$$\text{Headwater Level (HW)} = 4,674.5 + (Q_s/2,424)^{0.667} = 4,674.5 + \overset{2,295}{\cancel{(2,095/2,424)^{0.667}}}$$

$$= 4,674.5 + \overset{0.96}{\cancel{0.91}} = \overset{4,675.46}{\cancel{4,675.41}} \text{ ft} \quad \begin{matrix} \text{VS } 4,675.40 \\ \text{J.F. } 4,675.42 \end{matrix}$$

$$\text{Tailwater Level (TW)} = 4,654.6 + Q_r/3,226 = 4,654.6 + 7,495/3,226 = 4,654.6 + 2.32 = 4,656.92 \text{ ft}$$

$$\text{Head Loss (HL)} = (Q_t/6,535)^2 = \overset{5,200}{\cancel{(5,400/6,535)^2}} = \overset{0.63}{\cancel{0.68}} \text{ ft}$$

$$\text{Net Head (NH)} = \text{HW} - \text{TW} - \text{HL} = \overset{4,675.46}{\cancel{4,675.41}} - 4,656.92 - \overset{0.63}{\cancel{0.68}} = \overset{17.91}{\cancel{17.81}} \text{ ft}$$

$$Q_t = 11.8 \text{ kW} / \text{NH} \times \text{TE} \times \text{GE} = 11.8 \times 7,100 / \overset{17.91}{\cancel{17.81}} \times 0.924 \times 0.966 = \overset{5,215}{\cancel{5,270}} \text{ cfs} \quad \text{Use } 5,200 \text{ cfs}$$

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UPPER PLANT located 3 miles north of Idaho Falls with diversions in Sec. 25, T. 3 N., R. 37 E., B.M.

Water Right No.	Type of Water Right or Decree Name	Decree Date, File No., & Page No. in Decree	Priority Date	Flow in cfs	Subordination Permit License/Decree
01-02047	Permitted 12-19-1927 Licensed 2-11-1939		10-28-1927	500 ¹	No No
01-04003	Idaho Falls Decree	9-03-1980, 01-B-4, p. 3	5-03-1930	580	No
01-02049	Permitted 5-15-1936 Licensed 3-14-1939		1-14-1936	1,080 ¹	No No
01-07013	Permitted 3-05-1979 Field exam 3-17-1988		11-09-1977	2,600	For diversion to beneficial uses ²
01-07023	Permitted 3-16-1979 Field exam 3-17-1988		2-15-1979	1,240	For diversion to beneficial uses ²
Subtotal of non-subordinated water rights				2,160 cfs	
Total (using permitted quantities)				6,000 cfs	

The footnotes are numbered consecutively for the group of four powerplants operated by the city of Idaho Falls.
Revised on June 12, 1997.

¹ See City of Idaho Falls vs Carlson, 9-03-80, File 01-B-4; the Stipulation makes no change in license 01-02047, but it reduces the subsequent licensed right 01-02049 from 1,500 cfs to 1,080 cfs.

² Idaho Code 42-203B(6) allows for subordination to upstream "depletory uses." Water Appropriation Rules, July 1, 1993, Rule 10.16 (010.16) defines a subordinated water right to be subject to depletion "for a purpose other than hydropower generation" (which appears to include recharge and non-hydropower storage). This type of language, which may clarify the status of recharge and non-hydropower storage, likely will be used at license time. A recent example is the condition placed on water license 01-07051 at Idaho Fall's Gem State Project which was licensed on 11-2-92 with the condition of subordination to future rights "other than hydropower." Idaho Code 42-4201A which states subsequent recharge rights are to be secondary to prior rights would have no bearing since the prior water right noted in this text would be a limited right in itself.

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CITY PLANT located in the city of Idaho Falls with diversions in Sec. 24, T. 2 N., R. 37 E., B.M.

Water Right No.	Type of Water Right or Decree Name	Decree Date, File No., & Page No. in Decree	Priority Date	Flow in cfs	Subordination Permit License/Decree	
01-00197	Rexburg Decree	12-16-1910, 01-B, p. 59	11-18-1898	(75) ³	No	
01-00040	Rexbury Decree	12-16-1910, 01-B, p. 10	4-20-1900	140 ⁴	No	
01-00041	Rexburg Decree	12-16-1910, 01-B, p. 11	10-22-1904	48 ⁴	No	
01-02014	Permitted 12-14-1907 Licensed 2-11-1918		12-03-1907	485 ⁵	No	No
01-00360	Idaho Falls Decree	9-03-1980, 01-B-4, p. 2	2-05-1915	388	No	
01-00361	Idaho Falls Decree	9-03-1980, 01-B-4, p. 3	7-18-1919	394	No	
01-04002	Idaho Falls Decree	9-03-1980, 01-B-4, p. 3	10-05-1923	485	No	
01-07015	Permitted 3-05-1979 Field exam 3-17-1988		11-09-1977	2,600	For diversion to beneficial uses ²	
01-07024	Permitted 3-16-1979 Field exam 3-17-1988		2-15-1979	1,460	For diversion to beneficial uses ²	
Subtotal of non-subordinated water rights				1,940 cfs		
Total (using permitted quantities)				6,000 cfs		

³ This Rexburg Decree water right in the name of G. G. Wright has not had an adjudication claim filed on it. This water right was not mentioned in the City of Idaho Falls vs Carlson Decree, 9-03-80, File 01-B-4, Findings of Fact and Conclusions of Law or the Stipulation. No transfer of ownership information or confirmation of this place of use is available. Evidently this power plant was dismantled; however, its exact location is unknown. Quantity not used in the totals.

⁴ Also see City of Idaho Falls vs Carlson, 9-03-80, File 01-B-4, Findings of Fact and Conclusions of Law, p. 4.

⁵ See City of Idaho Falls vs Carlson, 9-03-80, File 01-B-4; the Stipulation reduces the licensed right from 600 cfs to 485 cfs.

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LOWER PLANT located 1/2 mile south of Idaho Falls with diversions in Sec. 25, T. 2 N., R. 37 E., B.M.

Water Right No.	Type of Water Right or Decree Name	Decree Date, File No., & Page No. in Decree	Priority Date	Flow in cfs	Subordination Permit License/Decree
01-00281	Woodville Decree ⁶	6-29-1929, 01-K, p. 26	12-29-1905	1,500 ⁴	No
01-00282	Woodville Decree ^{6,7}	6-29-1929, 01-K, P. 26	9-07-1915	(100)	No
01-04001	Idaho Falls Decree	9-03-1980, 01-B-4, p. 3	10-05-1940	1,240	No
01-07014	Permitted 3-05-1979 Field exam 3-17-1988		11-09-1977	(5,100) ⁸ 4,800 ⁹	For diversion to beneficial uses ²
01-07025	Permitted 3-16-1979 Field exam 3-17-1988		2-15-1979	(900) ⁸ (860) ¹⁰ 0 ⁹	For diversion to beneficial uses ²
Subtotal of non-subordinated water rights				2,740 cfs	
Total (using permitted quantities)				(8,740 cfs) ⁸	
Total (using turbine capacity)				(8,700 cfs) ¹⁰	
Total				7,540 cfs	

⁶ Listed in the name of Utah Power and Light Co.

⁷ This water right was issued for the Shelley power plant located 1 1/2 miles downstream from the Lower Plant in Sec. 34, T. 2 N., R. 37 E., B.M. The water right for this site now removed could not be transferred to the City's Lower Plant because an expansion of a water right is not allowed.

⁸ Permitted amount. See water right file 01-07013 for most related data.

⁹ Total of new flow, 4,800 cfs recommended for new license. Add 1,500 cfs + 1,240 cfs for old plant.

¹⁰ Maximum amount needed. City of Idaho Falls "preliminarily determined turbine flow capacities to be" 8,700 cfs. See letter of October 4, 1994, to their private attorney, Kent Foster, located in water right file 01-07025.

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GEM STATE PROJECT located 4 miles south of Idaho Falls with diversions in Sec. 15, T. 1 N., R. 37 E., B.M.

Water Right No.	Type of Water Right or Decree Name	Decree Date, File No., & Page No. in Decree	Priority Date	Flow in cfs	Subordination Permit License/Decree
01-00283	Woodville Decree ⁶	6-29-1929, 01-K, p. 26	11-14-1924	(1,500) ¹¹	No
01-07051	Permitted 12-18-1985 Licensed 11-2-1992 ⁶		4-09-1980	3,000	Yes Yes ¹²
01-07018	Permitted 7-21-1982 Licensed 11-02-1992		3-17-1978	5,000	Yes Yes ¹²
Subtotal of non-subordinated water rights				none	
Total (using permitted and turbine capacity quantities)				8,000 cfs ¹³	

¹¹ The Decree refers to a water permit number that never was developed into a license.

¹² This water right was licensed on 11-2-92 with the condition that it is subordinate to future rights "other than hydropower."

¹³ October 14, 1992, Memorandum to File 01-07051 indicates the turbine capacity found during the field examination is 8,000 cfs.

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Department of Water Resources

BULB TURBINE HYDROELECTRIC PLANTS
TURBINE EVALUATION
AND
ENERGY GENERATION

Prepared for
CITY OF IDAHO FALLS

Prepared by

CH2M HILL
Boise, Idaho

Paul Otter - ?

*Eric Schultz - knowledgeable
but did not work on it*

per Lee DeHeer - CH2M Hill

*~ 2/97
Rm*

March 1986

Revised August 1989

Final

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DEC 04 1997

SUMMARY

This report describes the performance of the City's three bulb turbine hydroelectric plants completed in 1982. The manufacturer of the bulb turbines, Voest-Alpine, tested the plants and issued the results in the document titled Report on Index Test, revised December 1983. Relationships were derived from those tests and compared with operating records. The relationships between river discharge and headwater elevation, tailwater elevation, head losses, and power were derived for each plant. These were then converted to discharge versus generator output (MW) curves and plotted on Figure 1. The curves should be useful tools for the operators in adjusting plant output to river discharge. The curves are maximum potential output under ideal conditions and will be reduced by ice, trash, or other problems.

The long-term average energy generation from each plant was calculated using the above-described curves and a flow-duration curve developed by the U.S. Geologic Survey for the Shelley gage and adjusted by CH2M HILL for intervening canal diversions. The predicted average annual energy generation is as follows:

Upper Plant	49,410,000 kWh
City Plant	45,460,000 kWh
Lower Plant	<u>48,970,000 kWh</u>
TOTAL	143,840,000 kWh

The above averages should be reduced for downtime and less-than-optimum operation due to ice, trash, maintenance, repair, etc. Each day of downtime in one plant will reduce generation by about 130,000 kWh under average conditions.

BOT524/002

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ENERGY CALCULATION

GENERAL

FLOW

Energy calculations are based upon integration of the flow-duration curve. CH2M HILL used the flow-duration curve calculated by the U.S. Geological Survey for the 1960 through 1985 water years. This curve was calculated from daily flow measurements at the Shelley gage. The energy was adjusted for canal diversions between the Shelley gage and the plants. The period before 1960 was deleted because filling of Palisades Reservoir in the late 1950s caused unnatural variations in the river discharge.

The curve is shown in Figure 2 and compared with the curve used in the FERC license application.

Monthly average flows were used in the energy calculations done during preparation of the license application. Since the turbines are forced to react to frequent changes in river flow, the daily flows used in this study provide a more accurate estimate of the energy production.

HEAD

The head available to impart energy to the turbine is the net head (NH) and depends on three elements: headwater elevation (HW), tailwater elevation (TW), and head loss (HL) through the plant.

$$NH = HW - TW - HL$$

Headwater at each plant is controlled by the weir and consequently is relatively easy to predict. Conversely, tailwater elevation and plant losses depend on very complicated relationships that are difficult to accurately predict. Figure 3 shows the relationship between net head and river flow at each plant.

Headwater elevation was taken as slightly below the weir elevation for flows up to the plant capacity. Above plant capacity, the headwater elevation is a function of spill and the overflow weir characteristics. This function was derived for each plant.

Head losses were computed from results of the Voest-Alpine (VA) index tests and an expression was derived to relate head loss to turbine discharge.

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Tailwater values were plotted from the VA tests and measurements taken by the City in January 1986. However, since all the measurements were taken at relatively low river flow, the derived equations should be verified at flows above 6,000 cfs. Since tailwater is the most difficult element to estimate, additional measurements will be very valuable.

PLANT OUTPUT

The net head versus discharge shown in Figure 3 was plotted over the Voest-Alpine Guaranteed Hill Diagram shown in their Report on Index Test for each plant. Turbine efficiencies were picked off the Hill Diagram. Generator efficiencies were also taken from the VA report. Plant output was calculated by the following expression and plotted in Figure 1:

$$KW = QT \times NH \times TE \times GE / 11.8$$

KW = Generator output in kilowatts
QT = Turbine discharge in cfs
NH = Net head in feet
TE = Turbine efficiency
GE = Generator efficiency

$$QT = \frac{11.8 \cdot KW}{NH \cdot TE \cdot GE}$$

ENERGY GENERATION

Average energy generation in megawatt hours (MWh) was calculated for each plant by intergration of the flow-duration curve (Figure 2) with the plant output (Figure 1). This average generation was then distributed monthly in proportion to monthly river discharge up to plant capacity. Table 1 shows the predicted monthly energy from each plant and the total expected energy in an average year of full generation. Outages or reduced generation have not been accounted for. Thus, the MWh shown in Table 1 are maximum and should be reduced based on the City's judgment. A single-day outage at one plant would reduce the total by about 130 MWh.

BOT524/002

CITY PLANT

HEAD

Headwater elevation is controlled by the weir at Elevation 4694.8. Headwater elevation used in this study is 4694.5, up to the turbine capacity of 5,700 cfs. Above 5,700 cfs, water will spill over the weir, and headwater is a function of flow and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4694.5 + (QS/7020)^{.667}$$

HW = Headwater elevation (ft)
QS = Spill over the weir (cfs)
QR = River discharge (cfs)
QT = Turbine discharge (cfs)
QS = QR - QT (cfs)

City Plant tailwater is controlled by the weir at the Lower Plant and the river channel between the City and lower plants. The lower plant weir elevation is 4674.5. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4675.50 + QR/3500$$

TW = Tailwater elevation (ft)
QR = River discharge (cfs)

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6508)^2$$

HL = Head loss through plant (ft)
QT = Turbine discharge (cfs)

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

NH = Net head (ft)

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head versus discharge relationship noted above and the Guaranteed Hill

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Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.6 percent.

DISCHARGE

The river discharge (QR) is shown in Figure 2 as the flow-duration curve, as previously described. Turbine discharge (QT) is limited by the "full gate opening" shown on the Hill Diagram. Spill (QS) is the difference between QR and QT.

ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the City is required to bypass 850 cfs during March through November. In the period of April through July, river flows in an average year are high enough to supply the full plant capacity plus the 850 cfs spill. However, during August through November the bypass will reduce plant output. Furthermore, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation. Therefore, the energy output was adjusted to account for bypass and canal diversions as follows:

Base energy from Shelley gage records	47,640 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Gross potential at plant	48,990 MWh
Reduction due to 850 cfs bypass	<u>-3,530 MWh</u>
Net annual energy production (generator terminals)	45,460 MWh

BOT524/002

UPPER PLANT

HEAD

Headwater elevation is controlled by the weir at Elevation 4734.0. Headwater elevation used in this study is 4733.7, up to the turbine capacity of 5,700 cfs. Above 5,700 cfs, water will spill over the weir, and headwater is a function of flow and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4733.7 + (QS/1900)^{.667}$$

Tailwater is controlled by the tailrace channel and the river channel below it. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4712 + QT/1500 + (QS/1700)^{.667}$$

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6325)^2$$

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head-discharge relationship noted above and the Guaranteed Hill Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

However, the energy calculations using these efficiencies yielded more energy than expected and more than was produced in 1985. Consequently, the efficiencies from the Hill Diagram were compared with those shown in the VA Report on Index Test. The test efficiencies are lower than those derived from the hill curve. Therefore, it appears as though the turbine efficiency and output are below the guaranteed level in the flow range below 4,000 cfs. However, the curves are

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very close at the actual design point where head is 18.0 feet. The difference in turbine efficiency would appear to decrease average annual generation by about 3,000 MWh per year. A comparison of efficiencies is shown on Figure 5.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.5 percent.

DISCHARGE

The river discharge is shown in Figure 2 as the flow-duration curve, as previously described. Three discharges were calculated from the flow-duration curve and turbine characteristics (QR, QS, and QT).

ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the City is required to bypass 100 cfs. Since the 100-cfs bypass is required year-round, the flow-duration curve was reduced by 100 cfs to reflect flows actually available for generation. In addition, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation.

Results of the energy calculations are as follows:

Base energy from flow-duration curve decreased by 100 cfs for bypass	48,060 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Net annual energy production (generator terminals)	49,410 MWh

BOT524/002

LOWER PLANT

HEAD

Headwater elevation is controlled by the weir at Elevation 4674.5. Headwater elevation used in this study is 4674.5 up to the turbine capacity of 5,800. Above 5,800 cfs, water will spill over the weir, and headwater is a function of spill and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4674.5 + (QS/2424)^{.667}$$

Tailwater is controlled by the Woodville Canal diversion weir and the river channel between the weir and lower plant. The Woodville Canal weir elevation is 4654.0. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4654.6 + QR/3226$$

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6535)^2$$

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head versus discharge relationship shown above and the Guaranteed Hill Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

However, the energy calculations using these efficiencies yielded more energy than expected and more than was produced in 1985. Consequently, the efficiencies from the Hill Diagram were compared with those shown in the VA Report on Index Test. The test efficiencies are lower than those derived from the Hill Diagram. Therefore, it appears as though the

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turbine efficiency and output are below the guaranteed level in the flow range below 4,000 cfs. The difference in turbine efficiency would appear to decrease average annual generation by about 3,400 MWh per year. A comparison of efficiencies is shown in Figure 5. However, the curves are very close at the actual design point where head is 18.0 feet.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.6 percent.

DISCHARGE

The river discharge is shown in Figure 2 as the flow-duration curve, as previously described. Three discharges were calculated from the flow-duration curve and turbine characteristics (QR, QT, and QS).

ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation. Therefore, the energy output was adjusted to account for diversions as follows:

Base energy from Shelley gage records	47,620 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Net energy production (generator terminals)	48,970 MWh

BOT524/002

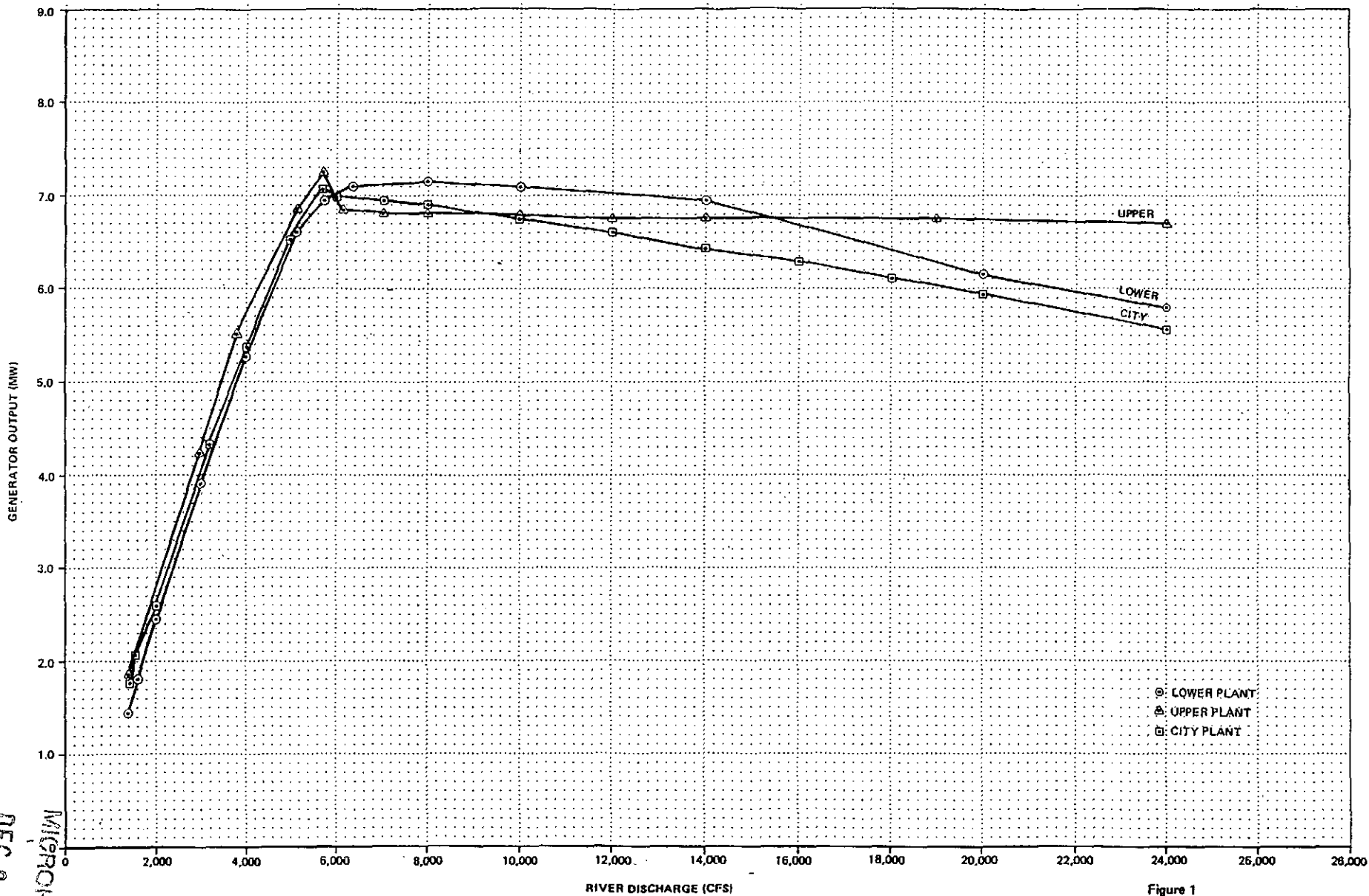
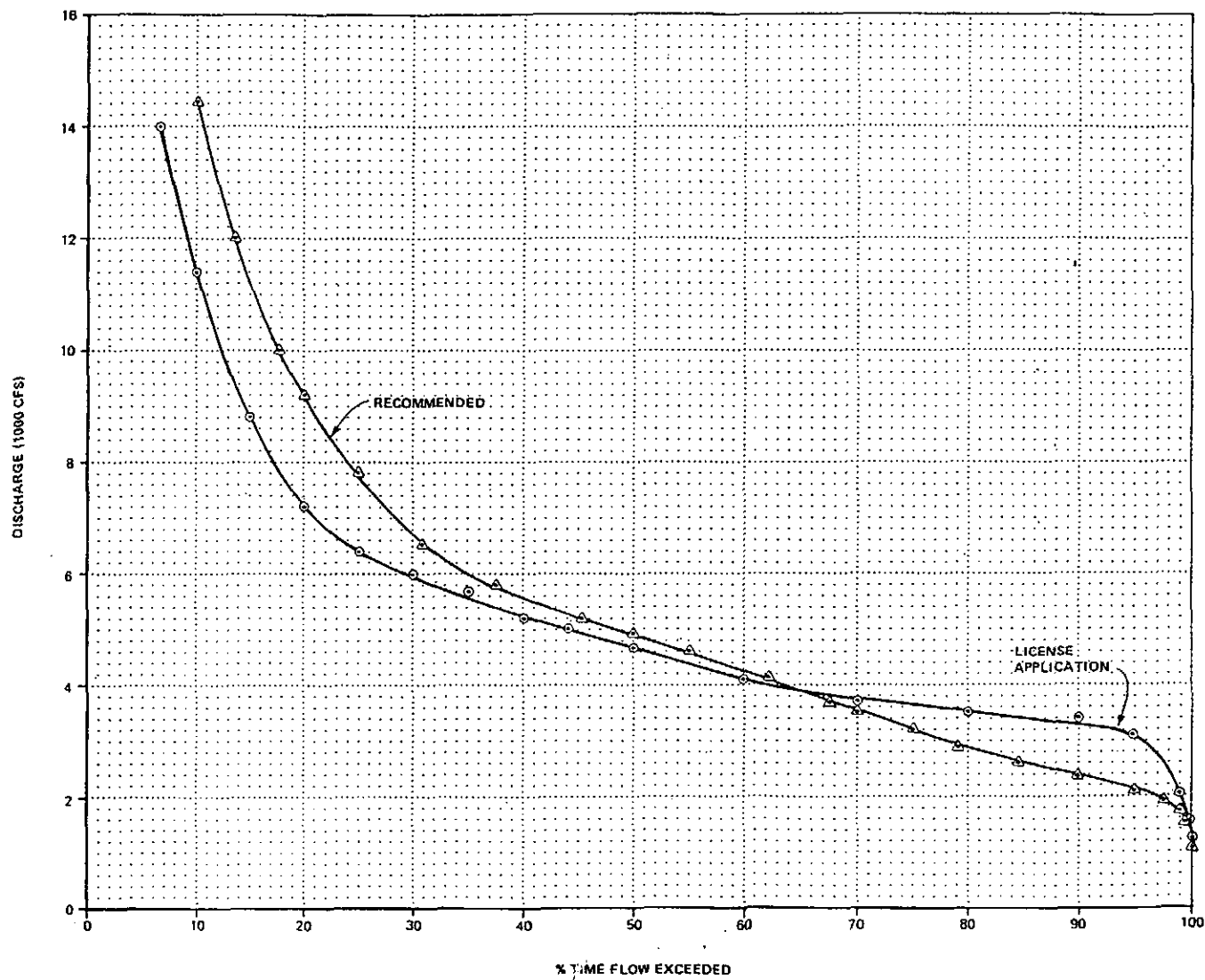


Figure 1
RIVER DISCHARGE VS. OUTPUT
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



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7812267-00



- △ DAILY O SHELLEY GAGE 1960 - 1985
- 1975 DEVELOPMENT MONTHLY 1928 - 1972

Figure 2
DAILY FLOW DURATION
SHELLEY GAGE (USGS)
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



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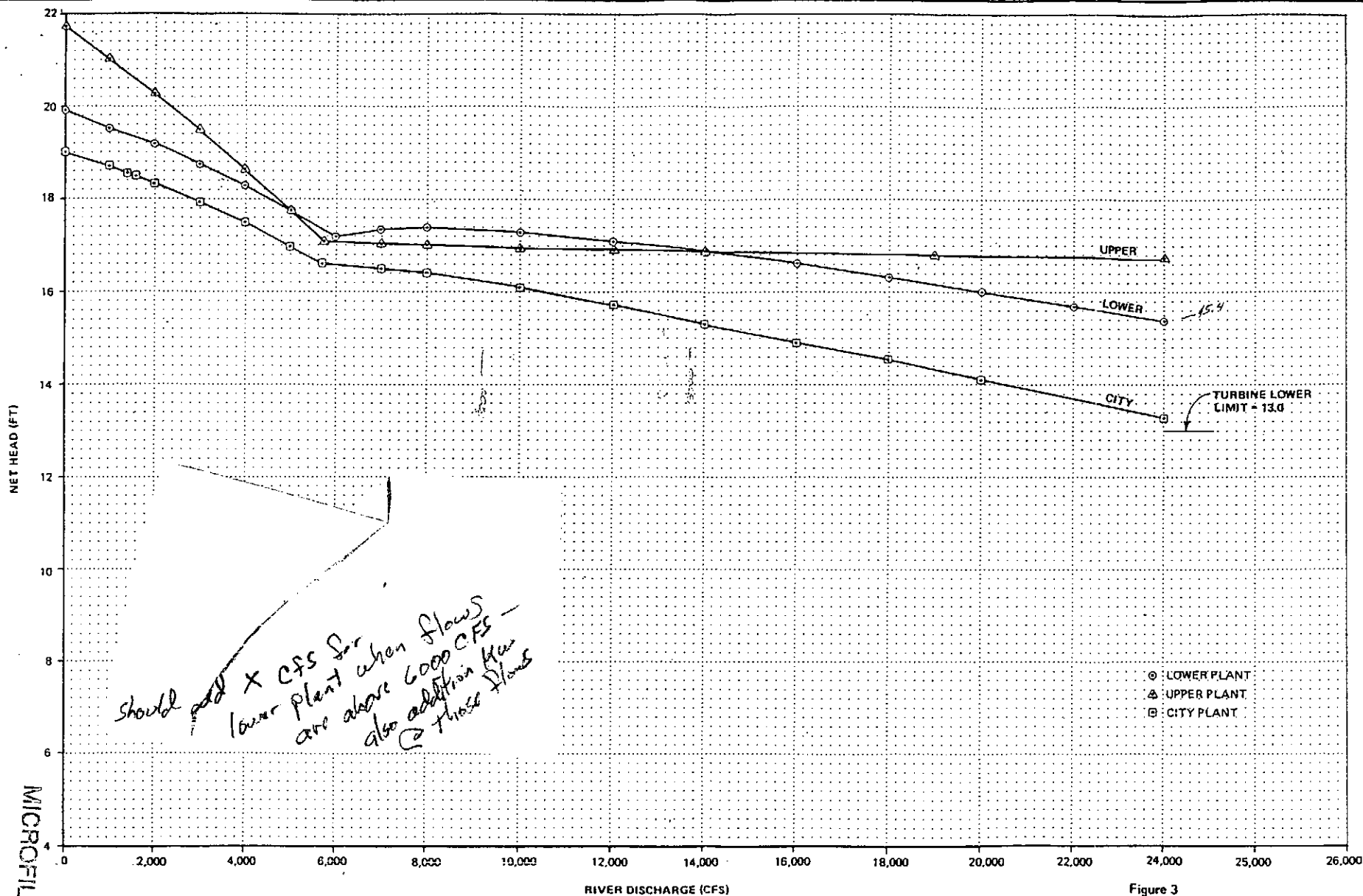


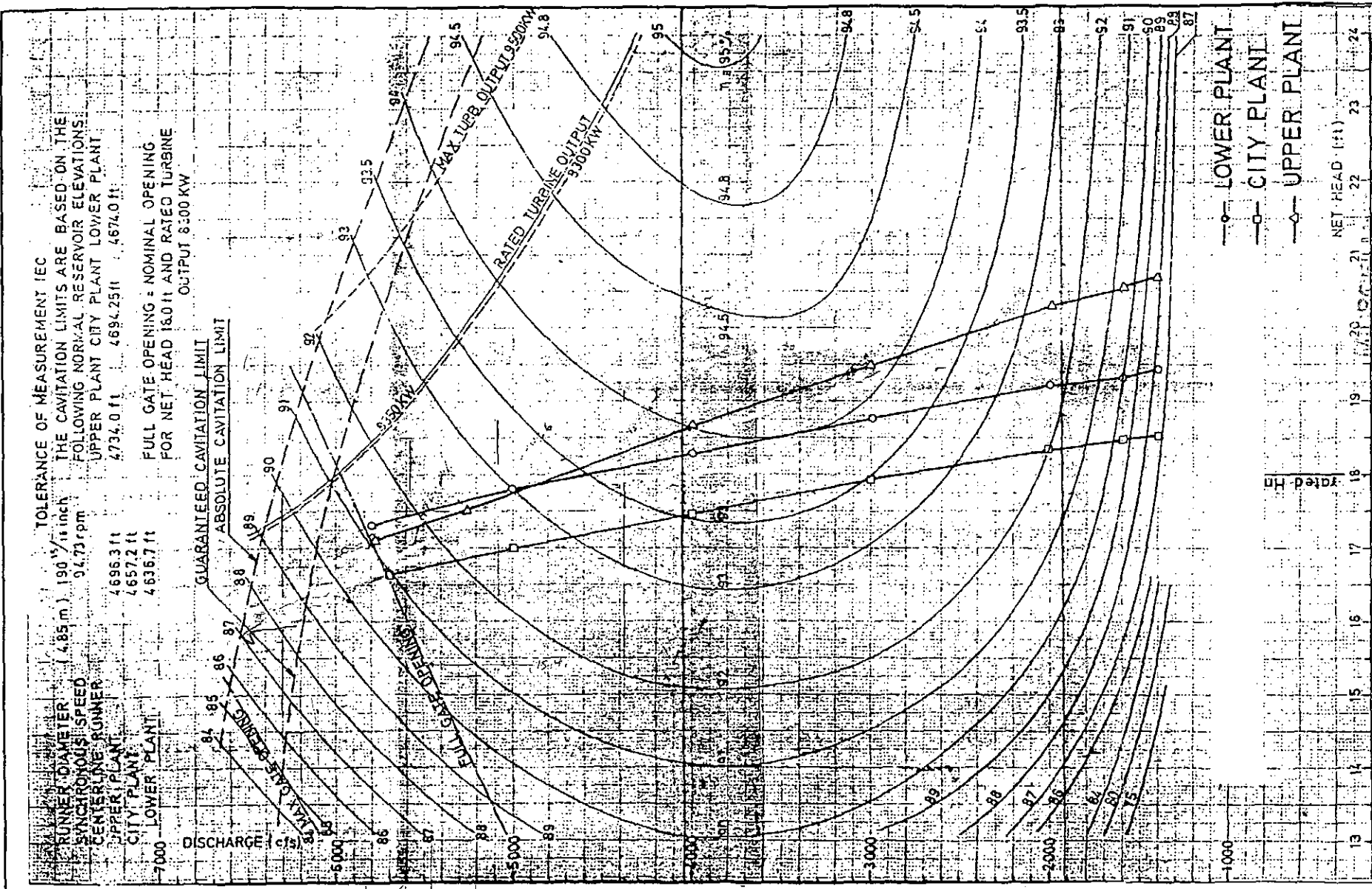
Figure 3
RIVER DISCHARGE VS. NET HEAD
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



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817261.00

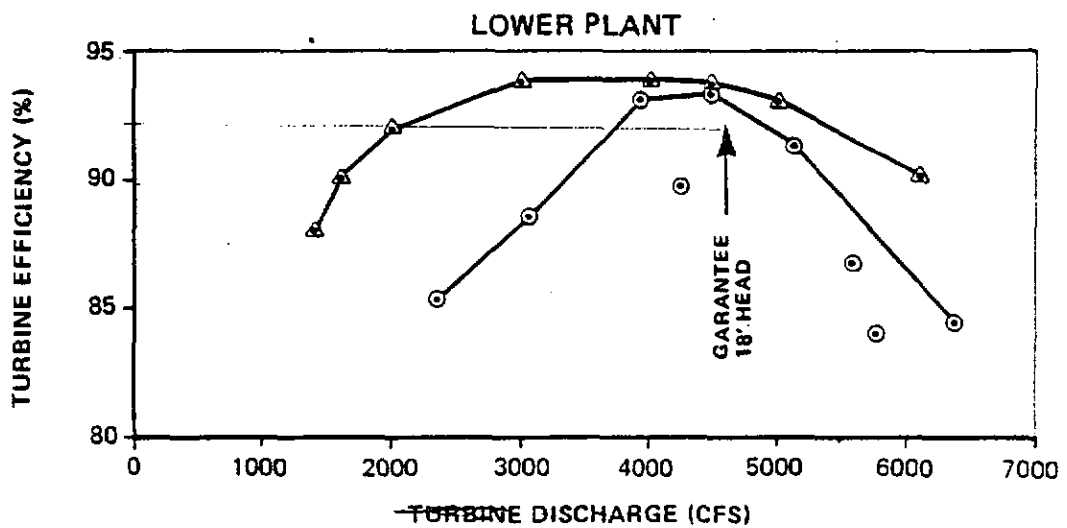
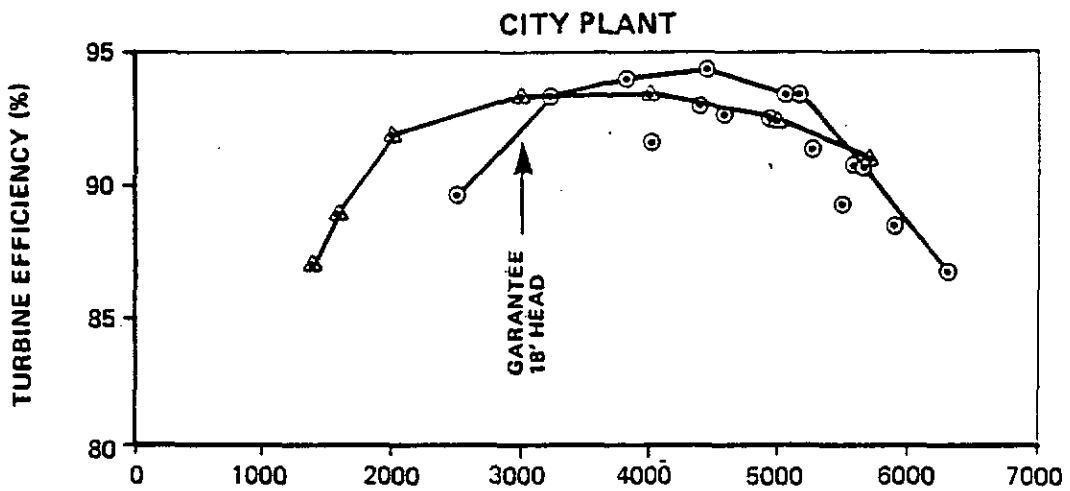
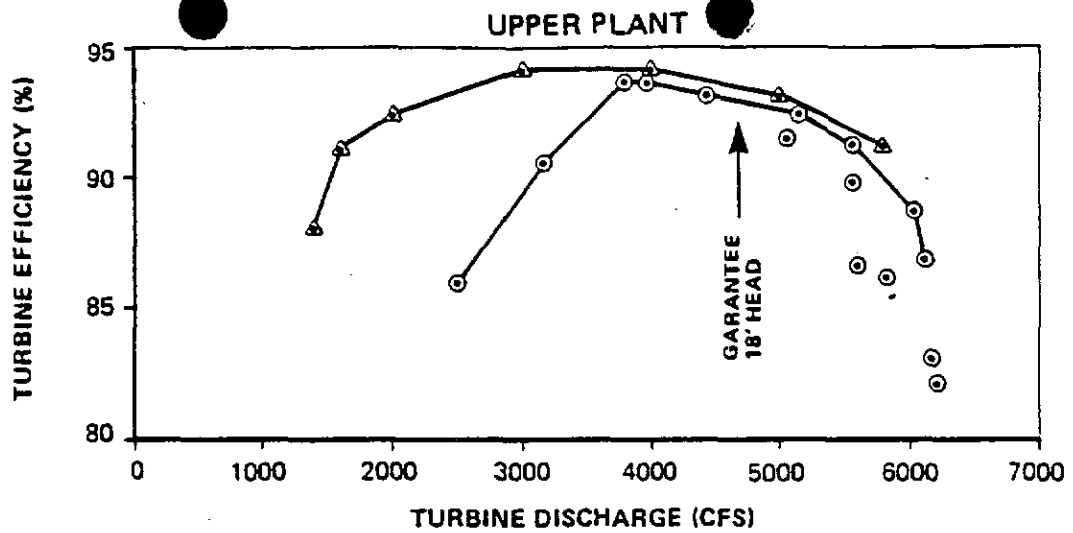


SOURCE: Hill diagram from Voest Alpine
Index Test Report, Dec. 1983.

Figure 4
OPERATING CONDITIONS
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

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RIVER

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 FROM INDEX TEST
 FROM GUARANTEED HILL DIAGRAM

Figure 5
EFFICIENCY COMPARISON

IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO



State of Idaho
DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720-9000

Phone: (208) 327-7900 FAX: (208) 327-7866

CECIL D. ANDRUS
GOVERNOR

R. KEITH HIGGINSON
DIRECTOR

November 15, 1994

RE: Permit Nos. 01-07013/07014/07015/07023/07024/07025

Kent W. Foster
Holden, Kidwell, Hahn & Crapo
PO Box 50130
Idaho Falls, ID 83405

Dear Mr. Foster:

We have reviewed your correspondence of October 10, which included the comments from the Chief Electrical Engineer from the City of Idaho Falls in relation to the above referenced permits. In response, I offer the following.

The information you submitted was routed to a departmental engineer who is familiar with power generating facilities. He reviewed the information along with the 1986 CH2M Hill report. Peak plant outputs taken from the city engineer's report were plotted onto the Hill diagram from the CH2M Hill report (copy enclosed). At 7.58 MW, the turbine flow at the "City Plant" would be about 6500 cfs, however, this operating point is on the absolute cavitation limit line. It is not logical that such a flow is utilized often and it would not be prudent to recommend a flow which could cause damage to the turbine. As you can see on the chart, the guaranteed cavitation limit line intersects at about 6150 cfs. The licenses to be issued for this plant will be changed to allow the maximum amounts permitted, thus bringing the city's rights for the plant to a total of 6000 cfs.

Plant output for the "Upper" and "Lower" plants calculates turbine flows below what has already been recommended by the Department, thus the figures recommended in our previous correspondence are generous and are the maximum to be considered for licensing.

One final note is that the figures recommended by the city's engineer for the "Upper" plant are considerably higher than what the city has water rights to cover, even after including the maximum rates permitted by the rights currently under review for that plant as well.

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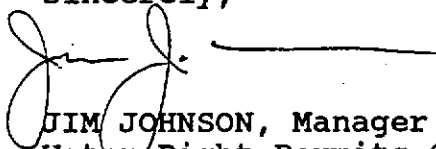
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Kent Foster
November 15, 1994
Page 2

I have again enclosed licensing amendments and a relinquishment form to finalize the licensing processing of these permits. Note that the amendment for Permit 01-07024 has been changed to the permitted rate of 1460.0 cfs to bring the total licensed amount for the "City" Plant to 6000.0 cfs.

If you have any further questions or concerns, feel free to give me a call at 327-7947.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jim Johnson", followed by a horizontal line.

JIM JOHNSON, Manager
Water Right Permits Section

Enclosures

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MEMORANDUM

November 8, 1994

To: ~~Jim Johnson and Sharla Curtis~~ ^{File}

From: Jeff Peppersack

Re: City of Idaho Falls Hydropower

I have reviewed the information submitted by the City dated October 4, 1994 and other information from the water right files including the 1986 CH2M Hill report.

In order to gain some understanding of the relationship between plant output and turbine flows I plotted the peak plant outputs submitted by the City onto the Hill diagram from the CH2M Hill report (Figure 4.) which shows the operating conditions for each plant. Plant output was calculated as recommended in the report.

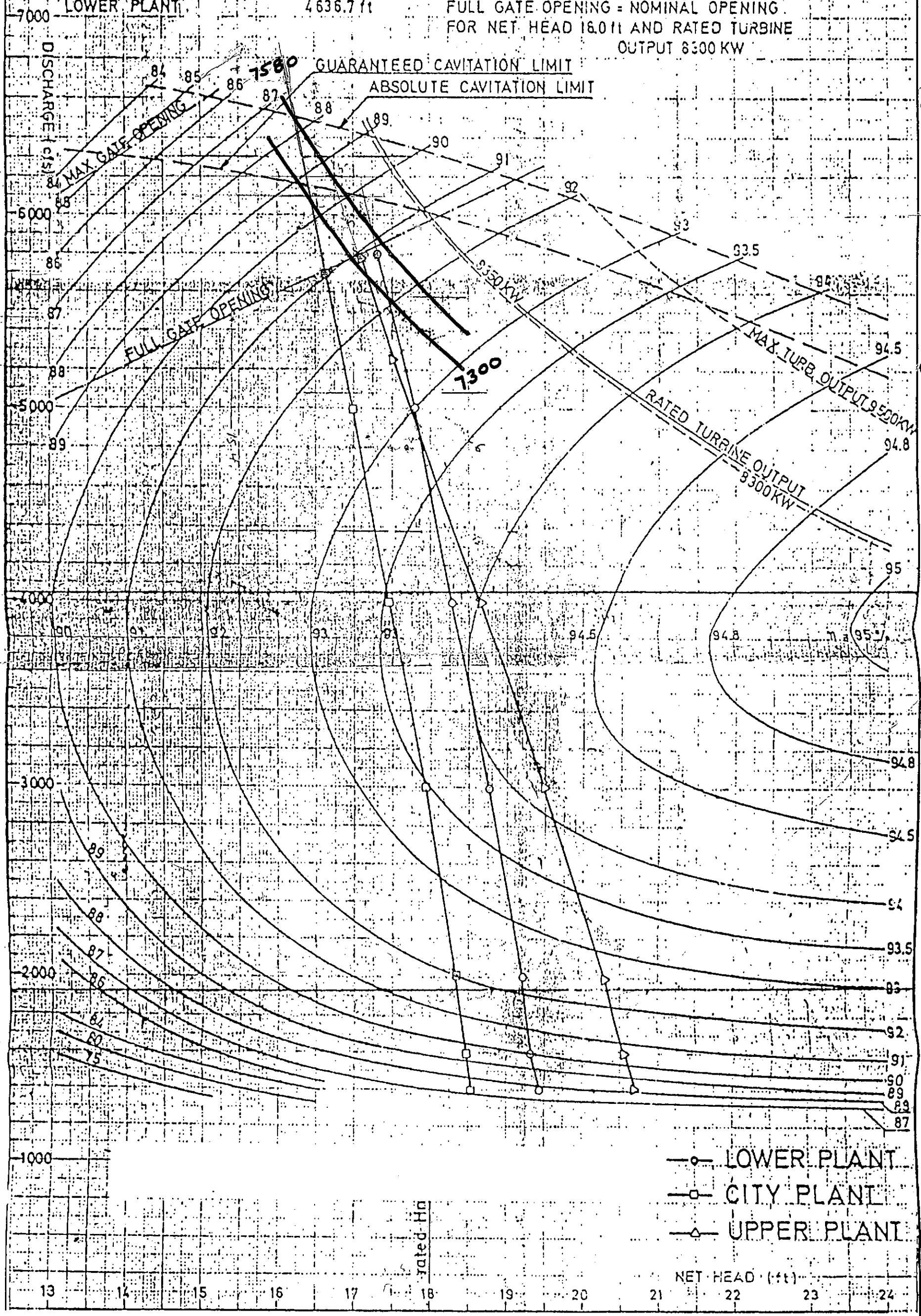
From the plot it can be seen that at 7.58 MW the turbine flow at the City plant would be about 6500 cfs. Note that this operating point is on the absolute cavitation limit line. Although turbine flow at the plant may have been near 6500 cfs it does not seem prudent to recommend a flow which could cause damage to the turbine. The guaranteed cavitation limit line intersects at about 6150 cfs. This flow would appear to be a reasonable upper limit for the plant.

Plant output for the Upper and Lower plants gives turbine flows below that already recommended by the Department.

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RUNNER DIAMETER (4.85 m) 190 15/16 inch
 SYNCHRONOUS SPEED 94.73 rpm
 CENTERLINE RUNNER
 UPPER PLANT 4696.3 ft
 CITY PLANT 4657.2 ft
 LOWER PLANT 4636.7 ft

TOLERANCE OF MEASUREMENT IEC
 THE CAVITATION LIMITS ARE BASED ON THE
 FOLLOWING NORMAL RESERVOIR ELEVATIONS:
 UPPER PLANT 4734.0 ft CITY PLANT 4694.25 ft LOWER PLANT 4674.0 ft
 FULL GATE OPENING = NOMINAL OPENING
 FOR NET HEAD 16.0 ft AND RATED TURBINE
 OUTPUT 8300 KW



SOURCE: Hill diagram from Voest Alpine
 Index Test Report, Dec. 1983.

Figure 4
 OPERATING CONDITIONS
 IDAHO FALLS BULB TURBINE EVALUATION
 CITY OF IDAHO



$$KW = QT \cdot NH \cdot TE \cdot GE / 11.8$$

$$GE = 96.6 \text{ (REPORT)}$$

$$KW = 5000 (16) \cdot 919 \cdot (966) / 11.8$$

$$KW = 6019$$

For Green line:

Solved for KW at Grid
points w/ cts & Hood & Ey
(See Jott for worksheet)

Law Offices
HOLDEN, KIDWELL, HAHN & CRAPO, P.L.L.C.

FRED J. HAHN
KENT W. FOSTER
ROBERT E. FARNAM
WILLIAM D. FALER
STEPHEN E. MARTIN
CHARLES A. HOMER
GARY L. MEIKLE
GAYLE A. SORENSON, P.A.
DONALD L. HARRIS, P.A.
DALE W. STORER
MARIE T. TYLER
JOHN G. SIMMONS, P.A.
ROBERT M. FOLLETT
FREDERICK J. HAHN, III
JAMES K. SLAVENS

WEST ONE BANK BLDG.
330 SHOUP AVENUE, THIRD FLOOR
P.O. BOX 50130
IDAHO FALLS, IDAHO 83405

TELEPHONE (208) 523-0620
TELEFAX (208) 523-9518

RECEIVED

OCT 13 1994

Department of Water Resources

Arthur W. Holden
(1877-1967)
Robert B. Holden
(1911-1971)
Terry L. Crapo
(1939-1982)
William S. Holden
(1907-1988)

October 10, 1994

Mr. Jim Johnson
IDAHO DEPARTMENT OF WATER
RESOURCES
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

Re: Permit Nos. 01-07013 / 07014 / 07015 / 07023 / 07024 / 07025

Dear Mr. Johnson:

We have now received a letter from the City of Idaho Falls Chief Electrical Engineer containing that department's comments relating to the proposed licenses, permit amendments, and relinquishment form which you sent to us some time ago. With the permission of the engineer, we have elected to send you the original of his letter to us with all of the attachments for your further consideration.

Would you please review this material and feel free to call us for any additional information that might be helpful in order to make appropriate adjustments. We will look forward to hearing from you when it is convenient.

Very truly yours,



Kent W. Foster

Enclosure

c. Mark Gendron

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DEC 04 1997



ELECTRIC DIVISION

CITY OF IDAHO FALLS

P.O. BOX 50220
IDAHO FALLS, IDAHO 83405-0220

RECEIVED OCT 6 1994

PHONE (208) 529-1430

October 4, 1994

Mr. Kent Foster
Holden, Kidwell, Hahn & Crapo
P.O. Box 50130
Idaho Falls, ID 83405

Dear Kent:

After review of your letter of March 21, 1994, transmitting proposed licenses, permit amendments, and a relinquishment form from IDWR relating to the Bulb Turbine Project, FERC No. 2842, we have the following comments:

The IDWR has used the CH₂M Hill generation report as a basis for establishing turbine capacities, and claim to have confirmed those capacities from power production records. After review of our records, we have determined the proposed capacities to be deficient for all three plants. Using the formulas from the CH₂M Hill report, actual generation records obtained from the Bonneville Power Administration; billing records, river flow information from the USGS SIFI and SHYI gauges, turbine efficiencies from manufacturer generator tests, we have preliminarily determined turbine flow capacities to be:

Upper Plant	:	6,200 cfs ¹
City Plant	:	6,700 cfs
Lower Plant	:	8,700 cfs

The calculations are attached. The generation MW output used to calculate flow was not necessarily the highest on record, but the highest in 1993. This allowed utilization of the daily river flow data available to us in our office. The generation output is expressed in hourly averages. Instantaneous peaks would be equal or higher, resulting in equal or higher flow. Also, maximum generation levels do not necessarily yield the maximum turbine flow. Maximum turbine flow results from a combination of high power output, low net head, and low turbine-generator efficiency.

¹Does not include 100 cfs FERC license required bypass flow.

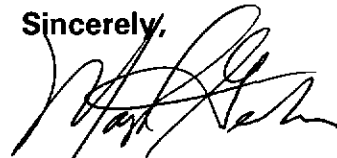
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We have not carefully evaluated turbine flow under any condition other than maximum power output. Summarizing, the flows listed above are not necessarily maximum quantities.

Also of concern is the proposed relinquishment of right 07025 (Lower Plant) and apparent reduction of rights 02049 (Upper Plant) and 02014 (City Plant). Finally, the flows for City Plant rights 04002, 00360, and 00361 do not agree with our records.

We believe that the licensed water rights for the Upper, City, and Lower Plants should be the higher of either the calculated flows herein or the sum of all old decrees, permits, and licenses, as summarized in your letter to Dale Storer dated March 25, 1986. After you have reviewed this information, please call to discuss our strategy with IDWR.

Sincerely,



Mark Gendron
Chief Engineer

MOG/180/mf
Enc.

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MAXIMUM GENERATION SUMMARY							
UPPER		CITY		LOWER		OLD LOWER	
MW	Date	MW	Date	MW	Date	MW	Date
7.20	9/2/93	7.14	8/3/93	6.93	7/9/93	3.14	6/26/93
7.25	8/9/93	7.58	7/8/93	6.96	3/7/86	3.256	7/10/86
7.30	7/16/93			6.98	8/1/85		
7.32	12/9/83			7.11	11/20/84		
				7.15	12/2/83		
				7.22	11/4/83		
				7.33	8/17/83		

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Upper Plant

Maximum Actual MW : 7.30

Date : 7/16/93 2300

River Q : 7,000 cfs

Assume Turbine Q = 6,000 cfs at SIFI gauge

From CH₂ Report:

$$HW = 4733.7 + \frac{1000}{1900}^{.667} = 4734.4$$

$$TW = 4712 + \frac{Qt}{1500} + \frac{Qs}{1700}^{.667} = 4716.7$$

$$HL = HW - TW - HL = 16.8 \text{ ft.}$$

$$E_T = .86 \quad E_G = .965 \quad E = .83$$

$$Q_T = \frac{(11.83)(kW)}{(NH)(E)} = \frac{(11.83)(7,300)}{(16.0)(.83)} = 6,193 \text{ cfs}$$

↓
20

$$IDWR \ Q = 5,700$$

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City Plant

Maximum Actual MW : 7.58 MW

Date : 7/8/93 1400

River Q : 8,000 cfs

Assume Turbine Q = 6,000 cfs

From CH₂ Report:

$$HW = 4694.5 + \frac{Q_s^{.667}}{7020} = 4694.9$$

$$TW = 4675.5 + \frac{Q_r}{3,500} = 4677.8$$

$$HL = \frac{Q_t^2}{6508} = .8$$

$$NH = HW - TW - HL = 16.3 \text{ ft}$$

$$E_T = .86 \quad E_G = .966 \quad E = .83$$

$$Q_T = \frac{(11.83)(kW)}{(NH)(E)} = \frac{(11.83)(7.580)}{(16.3)(.83)} = 6,628 \text{ cfs}$$

$$IDWR \ Q = 5,700 \text{ cfs}$$

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Lower Plant

Actual MW : 6.93 *

Date : 7/9/93 1800

River Q : 6,500 cfs @ SIFI gauge Assume Turbine Q = 6,000 cfs

From CH₂ Report:

$$HW = 4674.5 + \frac{Q_s^{.667}}{2424} = 4674.8$$

$$TW = 4654.6 + \frac{Q_r}{3226} = 4656.6$$

$$HL = \frac{Q_t^2}{6535} = .8$$

$$NH = HW - TW - HL = 17.4 \text{ ft}$$

$$E_G = .966 \quad E_T = .84 \quad E = .81$$

$$Q_T = \frac{(11.83)(kW)}{(NH)(E)} = \frac{(11.83)(6930)}{(17.4)(.81)} = 5,817 **$$

IDWR Q = 5,900 cfs

* Actual maximum output has exceeded 6.93 MW on several occasions (3/7/86, 8/1/85, 11/20/84, 12/2/83, 11/4/83, and 8/17/83) This output was used because we have better river Q data at this time.

** Combined with the Old Lower Plant Q_T of 2831 cfs the Lower Plant total turbine flow should be 8,648 cfs.

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Old Lower Plant

Actual MW : 3.14 *

Date : 6/26/93 1400

River Q : 12,000 cfs @ SIFI gauge Assume Combined Turbine Q = 9,000 cfs

From CH₂ Report:

$$HW = 4674.5 + \frac{Q_s^{.667}}{2424} = 4675.7$$

$$TW = 4654.6 + \frac{Q_r}{3226} = 4658.3$$

$$HL = 1 \text{ ft. assumed}$$

$$NH = HW - TW - HL = 16.4 \text{ ft}$$

$$E \text{ assumed} = .8$$

$$Q_T = \frac{(11.83)(kW)}{(NH)(E)} = \frac{(11.83)(3140)}{(16.4)(.8)} = 2,831$$

* Actual maximum output has exceeded 3.14 MW (3.256 MW on 7/10/86 for example) this output was used for this calculation due the available river flow records.

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U.S. DEPARTMENT OF ENERGY
 BONNEVILLE POWER ADMINISTRATION
 WHOLESALE POWER BILL

Box 3621

Portland, OR 97208-3621

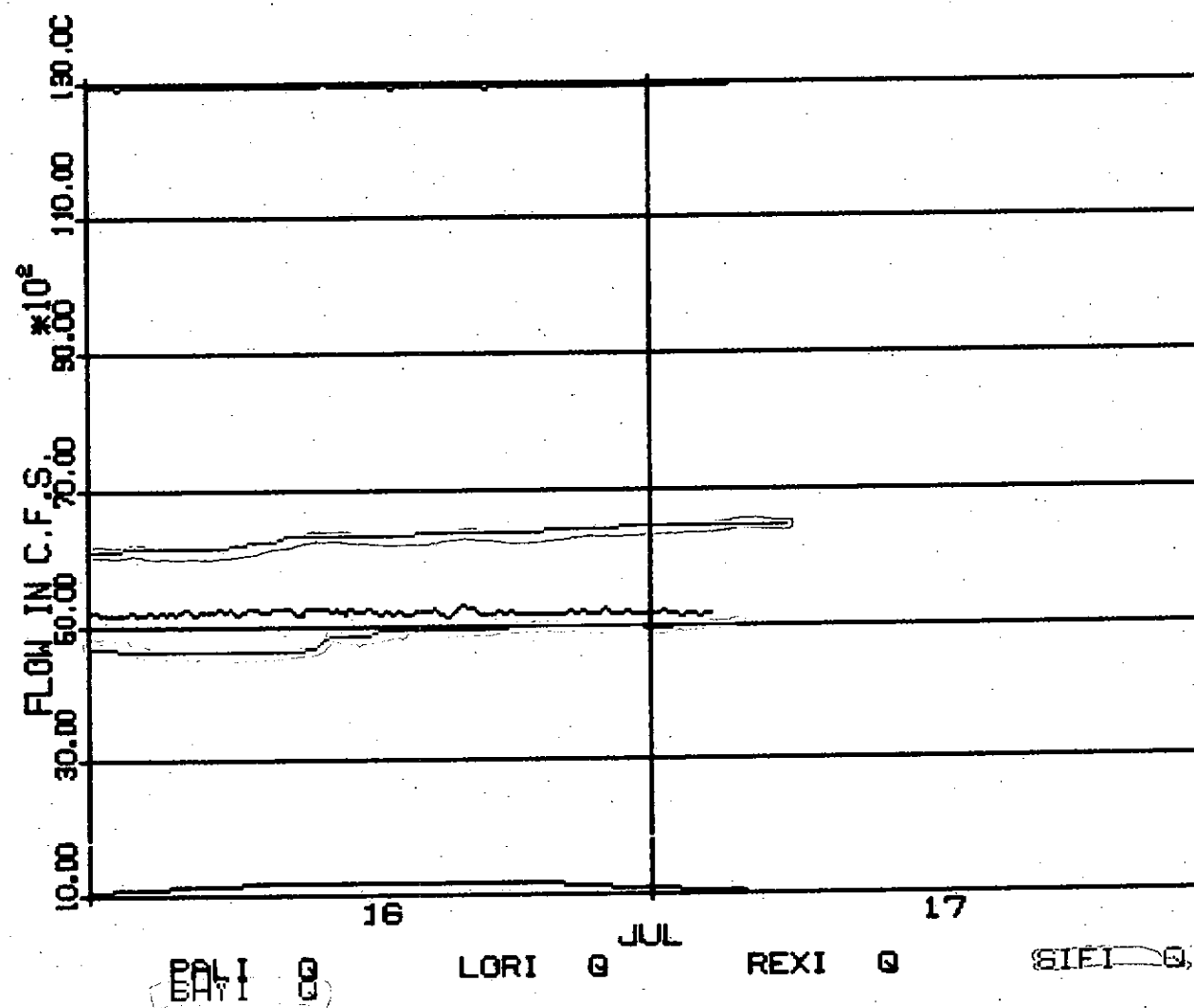
ACTUAL PEAK DEMAND SUPPLEMENTARY INFORMATION

CUSTOMER NAME - CITY OF IDAHO FALLS
 POWER BILL ID - 5152307
 MAILING DATE - 8/ 2/93

DEL.POINT	READING	K	LOSS FACT.	DEL.KW	MO DA HR
SUGRMILL1	399.000 ✓	50.00	1.000	19950	7 8 11
SUGRMILL2	449.000 ✓	50.00	1.000	22450	7 8 11
UPPER PNT	730.000 ✓	10.00	1.000	7300	7 16 23
CITY PNT	758.000 ✓	10.00	1.000	7580	7 8 14
OLDLWRPLT	166.000 ✓	10.00	1.000	1660	7 8 16
LWR PLANT	693.000 ✓	10.00	1.000	6930	7 9 18
WESTSDE	280.000 ✓	100.00	0.996	27891	7 13 14
WESTSDE/R	107.000 ✓	100.00	0.996	-10658	7 7 3
SGRML W	0.000 ✓	100.00	0.996		7 19 14
SGRML W/R	330.000 ✓	100.00	0.996	-32871	7 20 8
GEM/UTAH	908.000 ✓	25.00	0.996	22611	7 27 15
GEM/UT/RV	240.000 ✓	-25.00	0.996	-5977	7 7 10

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U.S. DEPARTMENT OF ENERGY
 BONNEVILLE POWER ADMINISTRATION
 WHOLESALE POWER BILL

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Portland, OR 97208-3621

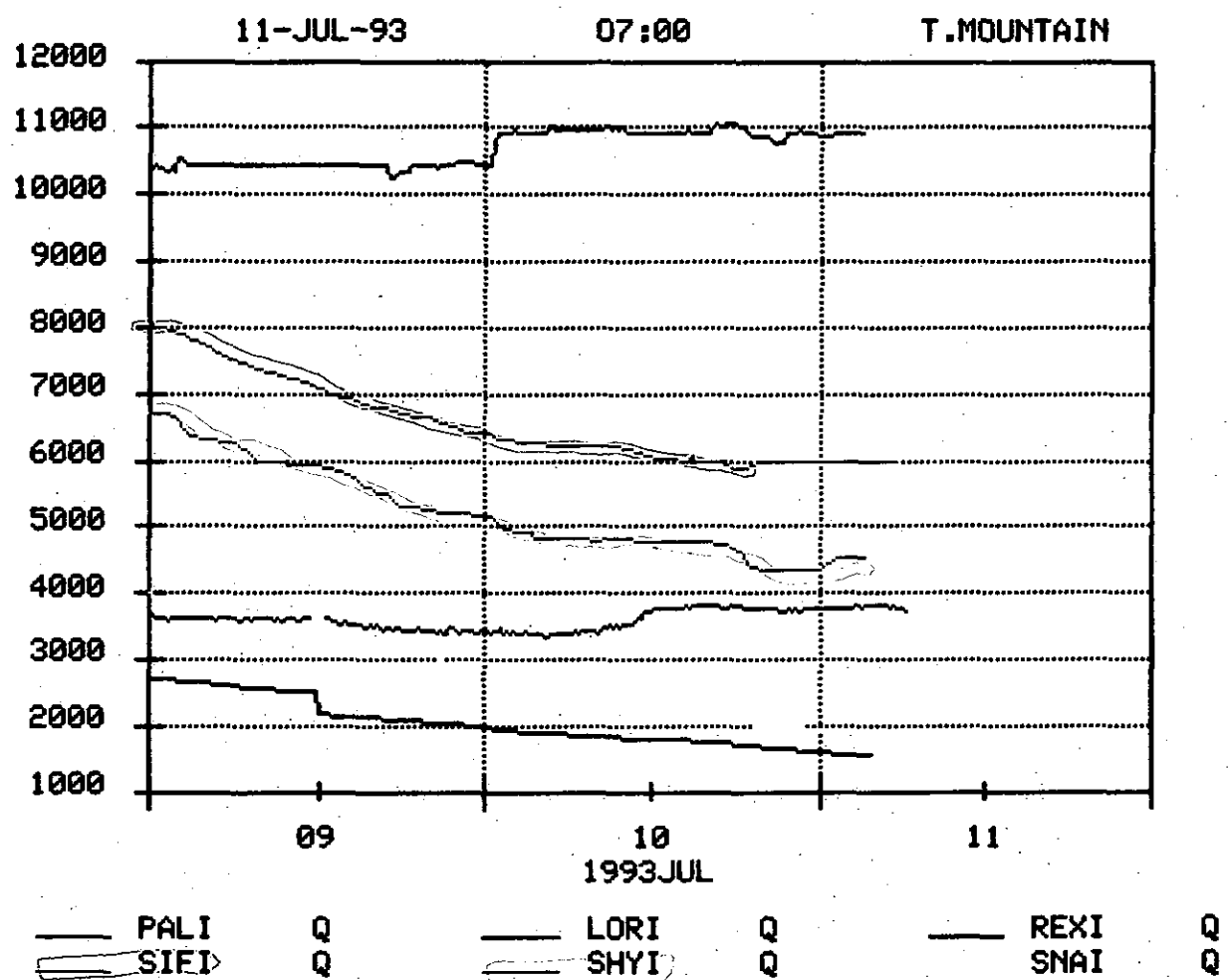
ACTUAL PEAK DEMAND SUPPLEMENTARY INFORMATION

CUSTOMER NAME - CITY OF IDAHO FALLS
 POWER BILL ID - 5152307
 MAILING DATE - 8/ 2/93

DEL.POINT	READING	K	LOSS FACT.	DEL.KW	MO	DA	HR
SUGRMILL1	399.000 ✓	50.00	1.000	19950	7	8	11
SUGRMILL2	449.000 ✓	50.00	1.000	22450	7	8	11
UPPER PNT	730.000 ✓	10.00	1.000	7300	7	16	23
CITY PNT	758.000 ✓	10.00	1.000	7580	7	8	14
GLDLWRPLT	166.000 ✓	10.00	1.000	1660	7	8	16
LWR PLANT	693.000 ✓	10.00	1.000	6930	7	9	18
WESTSDE	280.000 ✓	100.00	0.996	27891	7	13	14
WESTSDE/R	107.000 ✓	100.00	0.996	-10658	7	7	3
SGRML W	0.000 ✓	100.00	0.996		7	19	14
SGRML W/R	330.000 ✓	100.00	0.996	-32871	7	20	8
GEM/UTAH	908.000 ✓	25.00	0.996	22611	7	27	15
GEM/UT/RV	240.000 ✓	-25.00	0.996	-5977	7	7	10

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U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
 WHOLESALE POWER BILL

Box 3621

Portland, OR 97208-3621

ACTUAL PEAK DEMAND SUPPLEMENTARY INFORMATION

CUSTOMER NAME - CITY OF IDAHO FALLS
 POWER BILL ID - 5152306
 MAILING DATE - 7/ 2/93

DEL.POINT	READING	K	LOSS FACT.	DEL.KW	MO DA HR
SUGRMILL1	475.000 ✓	50.00	1.000	23750	6 5 10
SUGRMILL2	535.000 ✓	50.00	1.000	26750	6 5 10
UPPER PNT	719.000 ✓	10.00	1.000	7190	6 18 6
CITY PNT	738.000 ✓	10.00	1.000	7380	6 26 13
OLDLWRPLT	314.000 ✓	10.00	1.000	3140	6 26 14
LWR PLANT	687.000 ✓	10.00	1.000	6870	6 28 17
WESTSDE	291.000 ✓	100.00	0.996	28937	6 15 14
WESTSDE/R	42.000 ✓	100.00	0.996	-4184	6 1 3
SGRML W	0.000 ✓	100.00	0.996		
SGRML W/R	319.000 ✓	100.00	0.996	-31776	6 5 14
GEM/UTAH	914.000 ✓	25.00	0.996	22761	6 27 17
GEM/UT/RV	238.000 ✓	-25.00	0.996	-5927	6 27 7

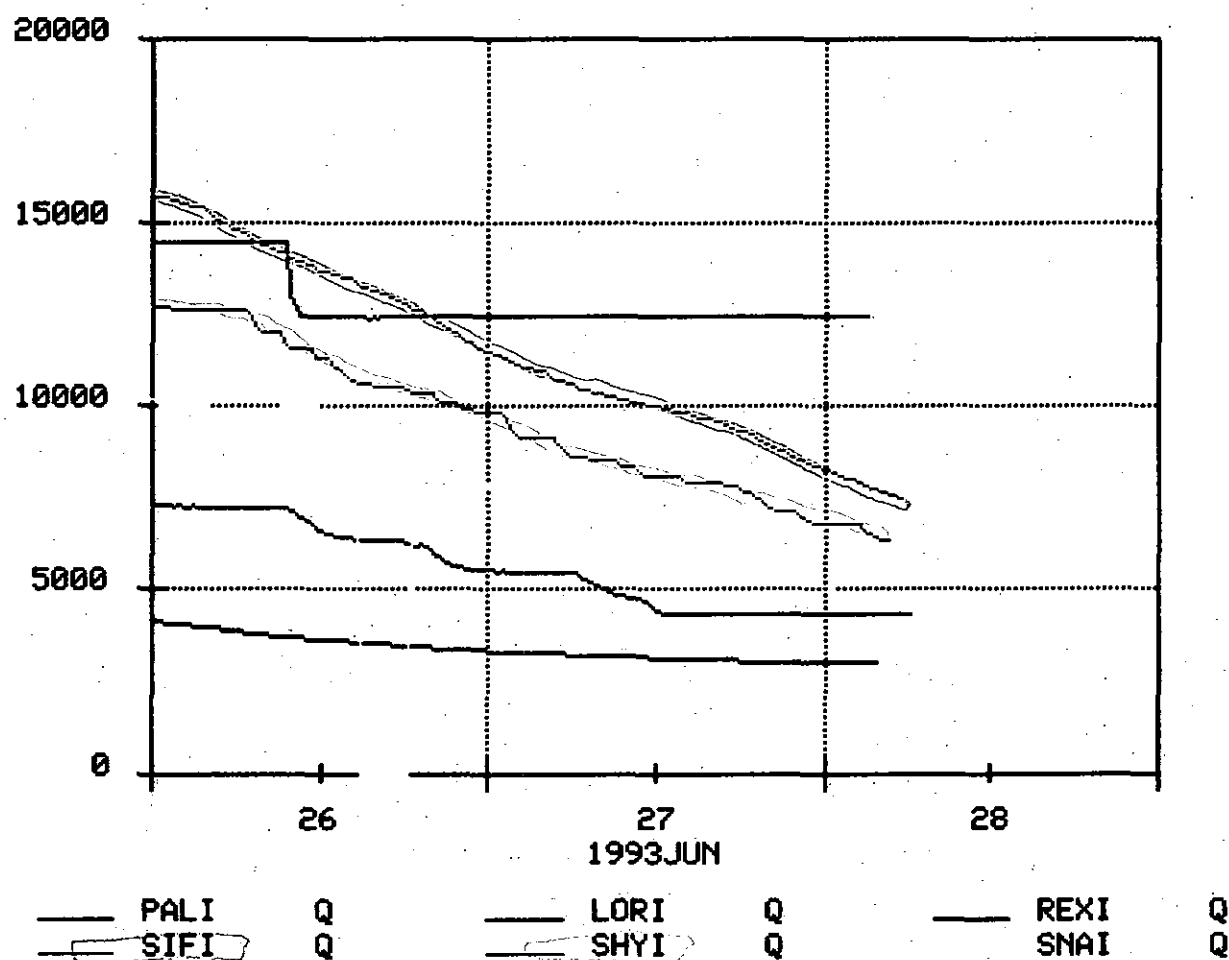
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J.LINGER

06:30

28-JUN-93



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VOEST-ALPINE AG
Maschinenbau
MACHINERY DEPARTMENT

IDAHO FALLS
HYDROELECTRIC PROJECT
S.O. 5644/10714

Part Page
III /A 1

A. MAIN DATA OF TURBINE

1. General

- type	KAPLAN BULBTURBINE
- manufacturer	VOEST-ALPINE
- number of units	3
- rated discharge	6000 cfs
- rated output	8300 kW
- rated speed	94,73 RPM
- runaway speed	240 RPM
- max.speed rise	45 %
- direction of rotation in view of water flow direction	clockwise
- turbine starting time	2,2 s
- starting time of water ways	3,1 s
- rated nethead	18 ft
- max.nethead	20,1 ft
- min.nethead	13,3 ft
- max.pressure rise	10 %
- cross section intake	44,75ftx28,52ft (1276,27ft ²)
- cross section outlet	31,58ftx22ft (694,76ft ²)
- flywheel effect turbine	7,775.10 ⁵ lb ft
- flywheel effect generator	3,57.10 ⁶ lb ft

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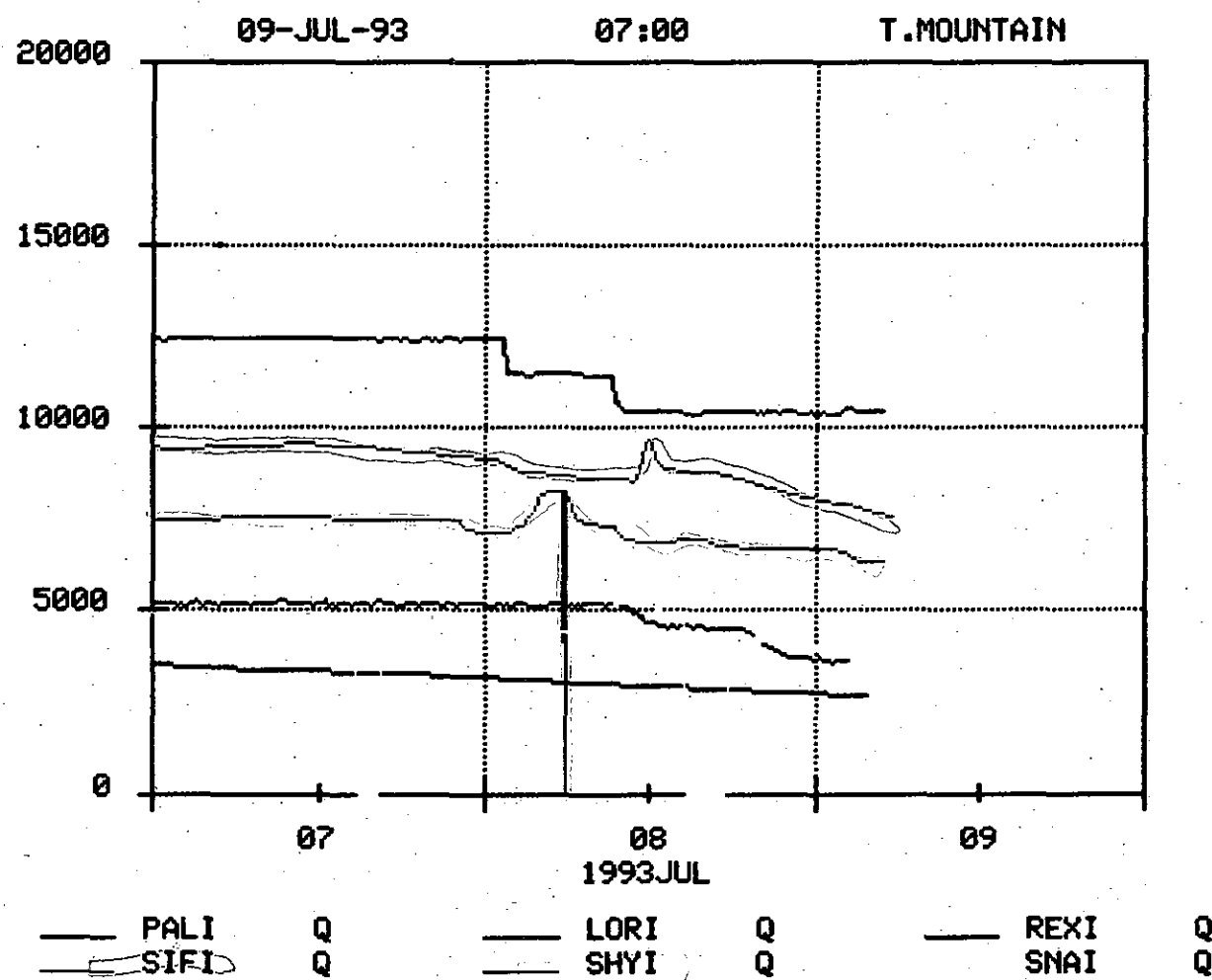
DEC 04 1967

ACTUAL PEAK DEMAND SUPPLEMENTARY INFORMATION

CUSTOMER NAME - CITY OF IDAHO FALLS
POWER BILL ID - 5152307
MAILING DATE - 8/ 2/93

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LWR PLANT	693.000 ✓	10.00	1.000	6930	7 9 18
WESTSDE	280.000 ✓	100.00	0.996	27891	7 13 14
WESTSDE/R	107.000 ✓	100.00	0.996	-10658	7 7 3
SGRML W	0.000 ✓	100.00	0.996		7 19 14
SGRML W/R	330.000 ✓	100.00	0.996	-32871	7 20 8
GEM/UTAH	908.000 ✓	25.00	0.996	22611	7 27 15
GEM/UT/RV	240.000 ✓	-25.00	0.996	-5977	7 7 10

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DEC 04 1997



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DEC 04 1997

LAW OFFICES
HOLDEN, KIDWELL, HAHN & CRAPO

RECEIVED
JUN 23 1994
Department of Water Resources

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WILLIAM S. HOLDEN
(1907-1988)

June 21, 1994

Mr. Jim Johnson
IDAHO DEPARTMENT OF WATER
RESOURCES
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

RE: Permit Nos. 01-07013/07014/07015/07023/07024/07025

Dear Mr. Johnson:

After receipt of the proposed licenses which you sent, we asked the city's electrical department to review them as you know. There were a number of questions and concerns that arose.

First, as the engineers began to compare the proposed licenses with the actual use of water through the turbines and their capacities, it became apparent that there were significant discrepancies. The engineers then went to the proof of beneficial use forms and the field exam reports and concluded that those documents don't contain the total plant capacities or actual amounts used, but rather appear only to address the extra amounts used under the two extra permits for each plant. For whatever reason, the amounts previously appropriated appear not to have been considered in preparation of the proof of beneficial use or the field exams, presumably because such rights were not at issue in connection with the licensing of the above numbered permits.

Also, at the lower plant, the exams and reports didn't even take into consideration the existence of the old machines which are still used as well as the newer bulb turbine.

The engineers are trying to prepare documentation which will provide an understandable record of both water diversion and power production by all generators at each

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DEC 04 1997

Mr. Jim Johnson
June 21, 1994
Page 2

plant since the installation of the three bulb turbines. As soon as that information is available, we will provide it to you.

Then, you may wish to visit with the city engineers yourself. You would of course even be welcome to come and personally tour the facilities at your convenience.

We will probably be in touch again soon. Thank you for your continued consideration in this matter.

Very truly yours,



Kent W. Foster

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DEC 04 1997



State of Idaho
DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720-9000
Phone: (208) 327-7900 FAX: (208) 327-7866

CECIL D. ANDRUS
GOVERNOR

R. KEITH HIGGINSON
DIRECTOR

June 14, 1994

CITY OF IDAHO FALLS
C/O G S HARRISON
PO BOX 220
IDAHO FALLS ID 83402

RE: Permit Nos. 01-07013, 01-07014, 01-07015, 01-07023,
01-07024 and 01-07025,

Dear Water Right Holder:

On March 3, 1994 we sent you copies of proposed licenses for Water Right Nos. 01-07014, 01-07015 and 01-07024; Amendment forms for Water Right Nos. 01-07013 and 01-07023 and a Relinquishment form for Water Right No. 01-07025.

On March 31, 1994 we received your letter of March 29, 1994 stating that your city engineers were reviewing the paperwork, and asking that we hold the matter in abeyance until they had time to complete their review.

We would appreciate knowing what progress you have made to date, and when we can expect to receive the Amendment forms back so that we can continue processing those rights. If you have any questions please call me at (208) 327-7947.

Sincerely,



JIM JOHNSON
Water Rights Supervisor

JJ:dc

Enclosure

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DEC 04 1997

LAW OFFICES
HOLDEN, KIDWELL, HAHN & CRAPO

IDAHO FALLS OFFICE

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(1907-1988)

March 29, 1994

Mr. Jim Johnson
IDAHO DEPARTMENT OF WATER
RESOURCES
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

RECEIVED
MAR 31 1994
Department of Water Resources

RE: The City of Idaho Falls Bulb Turbine Licenses

Dear Jim:

We have recently received your letter and the attached proposed licenses. We have sent a full set to the city engineers for review and have been advised that it will take some time before they are able to complete that. Would you please hold this matter in abeyance until we are able to get back to you. Thank you for your continued assistance.

Yours very truly,



Kent W. Foster

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DEC 04 1997



State of Idaho
DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Statehouse Mail, Boise, Idaho 83720-9000

Phone: (208) 327-7900 FAX: (208) 327-7866

CECIL D. ANDRUS
GOVERNOR

R. KEITH HIGGINSON
DIRECTOR

March 3, 1994

RE: Permit Nos. 01-07013/07014/07015/07023/07024/07025

Kent Foster
Holden, Kidwell, Hahn & Crapo
P.O. Box 50130
Idaho Falls, ID 83405

Dear Mr. Foster:

After an extensive review of the above referenced permits, we are ready to finalize the licensing process.

Enclosed are copies of the proposed licenses for Permit Nos. 01-07014, 01-07015 and 01-07024. Permit Nos. 01-07013 and 01-07023 require amendments due to changes in the point of diversion locations; the amendments have also been enclosed for signature.

A relinquishment form has been enclosed for Permit No. 01-07025. Since the capacity of 5800 cfs is covered by the two previous decreed and claimed rights and the license to be issued on Permit 01-07014, there is no additional water to be appropriated under the second permit.

Below is a compilation of rights covering the three plants, including the rights to now be licensed. The turbine capacities are stated in the Turbine Evaluation & Energy Generation report prepared by CH2M HILL. These capacities are confirmed by power production records and have been used as the capacities upon which the licenses are based.

Upper Plant -

01-02047	-	500 cfs
01-02049	-	1080 cfs (see enclosed Stipulation)
01-04003	-	580 cfs
01-07013*	-	2600 cfs
01-07023*	-	<u>940 cfs</u>
		5700 cfs

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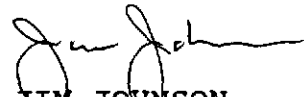
DEC 04 1997

Kent Foster
March 3, 1994
Page 2

Central Plant -	
01-00040 -	140 cfs
01-00041 -	48 cfs
01-02014 -	485 cfs (see enclosed Stipulation)
01-04002 -	388 cfs
01-00360 -	394 cfs
01-00361 -	485 cfs
01-07015* -	2600 cfs
01-07024* -	<u>1160 cfs</u>
	5700 cfs
Lower Plant -	
01-00281 -	1500 cfs
01-04001 -	1240 cfs
01-07014* -	3060 cfs
01-07025 -	<u>not needed</u>
	5800 cfs

If you concur with this information, please sign the relinquishment form and the two amendments. These documents can then be returned to us along with the amendment fees so that licenses can be issued. If you have any questions, feel free to give me a call at 327-7947.

Sincerely,



JIM JOHNSON
Water Rights Supervisor

Enclosures

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DEC 04 1997

MEMORANDUM

TO: Files 01-07013/07014/07015/07023/07024/07025

FROM: Sharla

DATE: February 3, 1994

RE: Plant Capacities and Licensing Rates of Diversion

Rights 01-07014/07015/07024/07025 were sent to Norm for license signature in June of 1993. They were returned by Norm with questions concerning plant capacities and flow rates to be licensed. After extensive review, the following summation is given.

In documentation contained in Right 01-07014, Skip Jones made some math and flow computations based on a formula provided by Internation Engineer for determining flow (Kilowatts = flow x head/14, thus $Q = kW \times 14/18$). Skip's calculation was based on plant records of kWh's and kW's from 1985 to 1987. While it appeared that November of 1985 had the highest kW output, comparison of the corresponding column (kWh) for that month with other similar kWh data, it appears that the 9,760 kW should be 6760 kW. Therefore, the data from March of 1986 was appropriately used to determine maximum generation.

The measuring device requirement under these rights was changed to require information &/or flow data to reflect the rate of flow beneficially used. While the data supplied with the exams is not as technically complete as would be preferred, the plant generating records are sufficient for calculation using the method stated above. Further compliance with the condition does not appear to need addressing.

In a listing of water rights covering these three bulb turbine plants which is contained in 01-07014, there were several errors in amount of cfs under some rights. Further investigation of adjudication claims and previous licenses revealed a Stipulation prepared in 1980 which set out the amounts to be recognized under 01-02014/02049 if ever included in a future adjudication. The ongoing SRBA will have to recognize these reduced amounts and the

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DEC 04 1997

reductions were considered when evaluating the flow needing to yet be licensed. The listing of rights covering the plants are as follows:

Upper Plant -

01-02047	-	500 cfs
01-02049	-	1080 cfs
01-04003	-	580 cfs
01-07013*	-	2600 cfs
01-07023*	-	<u>940 cfs</u>
		5700 cfs

Central Plant -

01-00040	-	140 cfs
01-00041	-	48 cfs
01-02014	-	485 cfs
01-04002	-	388 cfs
01-00360	-	394 cfs
01-00361	-	485 cfs
01-07015*	-	2600 cfs
01-07024*	-	<u>1160 cfs</u>
		5700 cfs

Lower Plant -

01-00281	-	1500 cfs
01-04001	-	1240 cfs
01-07014*	-	3060 cfs
01-07025	-	<u>not needed</u>
		5800 cfs

The turbine capacities are stated in the Turbine Evaluation & Energy Generation report prepared by CH2M HILL. These capacities are very close to the capacities determined when using the calculation described at the beginning of this memo. Therefore, the turbine capacities found in the report have been used as the capacities upon which the licenses are based.

*to be licensed

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LAW OFFICES
HOLDEN, KIDWELL, HAHN & CRAPO

RECEIVED

JUL 02 1993

Department of Water Resources

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WILLIAM S. HOLDEN
(1907-1988)

June 30, 1993

Jim Johnson, Water Right Supervisor
IDAHO DEPARTMENT OF WATER RESOURCES
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

RE: City of Idaho Falls Bulb Turbine Project

Dear Jim:

I believe we spoke briefly by telephone a few weeks ago about six permits for the City of Idaho Falls bulb turbine power plants. This letter is intended just as a follow-up since I have been asked to follow the matter until the licenses have been issued.

You will probably recall that there are three bulb turbine plants; we call them the "Upper Plant", the "Central Plant" and the "Lower Plant". They were completed and came on line in about 1980 or 1981. There are two permits for the Upper Plant (01-07013 and 01-07023), two for the Central Plant (01-07015 and 01-07024), and two for the Lower Plant (01-07014 and 01-07025). It appears the Proof of Beneficial Use was submitted in 1983 for all six permits, and the field exam was done in 1988.

As I recall, when we visited by telephone, we mentioned to you that each of the plants is a replacement of a former smaller plant at each site. The city started producing electricity at its first plant in about 1900, and over the years there have been a number of increases at each site until the culmination of the bulb turbine project of the late 70s and early 80s.

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Jim Johnson, Water Right Supervisor
June 30, 1993
Page 2

If we can provide information or be of service in any manner to help finish the licensing process on these six permits, we hope you will feel free to call upon us. We will look forward to hearing from you as soon as it is convenient.

Yours very truly,



Kent W. Foster

#0518.00/srs

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DEC 04 1997

Maik

BULB TURBINE HYDROELECTRIC PLANTS
TURBINE EVALUATION
AND
ENERGY GENERATION

Prepared for
CITY OF IDAHO FALLS

DRAFT

Prepared by
CH2M HILL
Boise, Idaho

March 1986

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DEC 04 1997

SUMMARY

This report describes the performance of the City's three bulb turbine hydroelectric plants completed in 1982. The manufacturer of the bulb turbines, Voest-Alpine, tested the plants and issued the results in the document titled Report on Index Test, revised December 1983. Relationships were derived from those tests and compared with operating records. The relationships between river discharge and headwater elevation, tailwater elevation, head losses, and power were derived for each plant. These were then converted to discharge versus generator output (MW) curves and plotted on Figure 1. The curves should be useful tools for the operators in adjusting plant output to river discharge. The curves are maximum potential output under ideal conditions and will be reduced by ice, trash, or other problems.

The long-term average energy generation from each plant was calculated using the above-described curves and a flow-duration curve developed by the U.S. Geologic Survey for the Shelley gage and adjusted by CH2M HILL for intervening canal diversions. The predicted average annual energy generation is as follows:

Upper Plant	49,410,000 kWh
City Plant	45,460,000 kWh
Lower Plant	<u>48,970,000 kWh</u>
TOTAL	143,840,000 kWh

The above averages should be reduced for downtime and less-than-optimum operation due to ice, trash, maintenance, repair, etc. Each day of downtime in one plant will reduce generation by about 130,000 kWh under average conditions.

BOT524/002

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DEC 04 1997

ENERGY CALCULATION

GENERAL

FLOW

Energy calculations are based upon integration of the flow-duration curve. CH2M HILL used the flow-duration curve calculated by the U.S. Geological Survey for the 1960 through 1985 water years. This curve was calculated from daily flow measurements at the Shelley gage. The energy was adjusted for canal diversions between the Shelley gage and the plants. The period before 1960 was deleted because filling of Palisades Reservoir in the late 1950s caused unnatural variations in the river discharge.

The curve is shown in Figure 2 and compared with the curve used in the FERC license application.

Monthly average flows were used in the energy calculations done during preparation of the license application. Since the turbines are forced to react to frequent changes in river flow, the daily flows used in this study provide a more accurate estimate of the energy production.

HEAD

The head available to impart energy to the turbine is the net head (NH) and depends on three elements: headwater elevation (HW), tailwater elevation (TW), and head loss (HL) through the plant.

$$NH = HW - TW - HL$$

Headwater at each plant is controlled by the weir and consequently is relatively easy to predict. Conversely, tailwater elevation and plant losses depend on very complicated relationships that are difficult to accurately predict. Figure 3 shows the relationship between net head and river flow at each plant.

Headwater elevation was taken as slightly below the weir elevation for flows up to the plant capacity. Above plant capacity, the headwater elevation is a function of spill and the overflow weir characteristics. This function was derived for each plant.

Head losses were computed from results of the Voest-Alpine (VA) index tests and an expression was derived to relate head loss to turbine discharge.

Tailwater values were plotted from the VA tests and measurements taken by the City in January 1986. However, since all the measurements were taken at relatively low river flow, the derived equations should be verified at flows above 6,000 cfs. Since tailwater is the most difficult element to estimate, additional measurements will be very valuable.

PLANT OUTPUT

The net head versus discharge shown in Figure 3 was plotted over the Voest-Alpine Guaranteed Hill Diagram shown in their Report on Index Test for each plant. Turbine efficiencies were picked off the Hill Diagram. Generator efficiencies were also taken from the VA report. Plant output was calculated by the following expression and plotted in Figure 1:

$$KW = QT \times NH \times TE \times GE / 11.8 ; \quad \Phi_t = \frac{KW \cdot 11.8}{NH \cdot TE \cdot GE}$$

KW = Generator output in kilowatts
QT = Turbine discharge in cfs
NH = Net head in feet
TE = Turbine efficiency
GE = Generator efficiency

ENERGY GENERATION

Average energy generation in megawatt hours (MWh) was calculated for each plant by intergration of the flow-duration curve (Figure 2) with the plant output (Figure 1). This average generation was then distributed monthly in proportion to monthly river discharge up to plant capacity. Table 1 shows the predicted monthly energy from each plant and the total expected energy in an average year of full generation. Outages or reduced generation have not been accounted for. Thus, the MWh shown in Table 1 are maximum and should be reduced based on the City's judgment. A single-day outage at one plant would reduce the total by about 130 MWh.

BOT524/002

CITY PLANT

city plant

HEAD

Headwater elevation is controlled by the weir at Elevation 4694.8. Headwater elevation used in this study is 4694.5, up to the turbine capacity of 5,700 cfs. Above 5,700 cfs, water will spill over the weir, and headwater is a function of flow and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4694.5 + (QS/7020)^{.667}$$

HW = Headwater elevation (ft)
QS = Spill over the weir (cfs)
QR = River discharge (cfs)
QT = Turbine discharge (cfs)
QS = QR - QT (cfs)

City Plant tailwater is controlled by the weir at the Lower Plant and the river channel between the City and lower plants. The lower plant weir elevation is 4674.5. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4675.50 + QR/3500$$

TW = Tailwater elevation (ft)
QR = River discharge (cfs)

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6508)^2$$

HL = Head loss through plant (ft)
QT = Turbine discharge (cfs)

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

NH = Net head (ft)

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head versus discharge relationship noted above and the Guaranteed Hill

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Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.6 percent.

DISCHARGE

The river discharge (QR) is shown in Figure 2 as the flow-duration curve, as previously described. Turbine discharge (QT) is limited by the "full gate opening" shown on the Hill Diagram. Spill (QS) is the difference between QR and QT.

ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the City is required to bypass 850 cfs during March through November. In the period of April through July, river flows in an average year are high enough to supply the full plant capacity plus the 850 cfs spill. However, during August through November the bypass will reduce plant output. Furthermore, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation. Therefore, the energy output was adjusted to account for bypass and canal diversions as follows:

Base energy from Shelley gage records	47,640 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Gross potential at plant	48,990 MWh
Reduction due to 850 cfs bypass	<u>-3,530 MWh</u>
Net annual energy production (generator terminals)	45,460 MWh

BOT524/002

UPPER PLANT

HEAD

upper plant

Headwater elevation is controlled by the weir at Elevation 4734.0. Headwater elevation used in this study is 4733.7, up to the turbine capacity of 5,700 cfs. Above 5,700 cfs, water will spill over the weir, and headwater is a function of flow and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4733.7 + (QS/1900)^{.667}$$

Tailwater is controlled by the tailrace channel and the river channel below it. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4712 + QT/1500 + (QS/1700)^{.667}$$

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6325)^2$$

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head-discharge relationship noted above and the Guaranteed Hill Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

However, the energy calculations using these efficiencies yielded more energy than expected and more than was produced in 1985. Consequently, the efficiencies from the Hill Diagram were compared with those shown in the VA Report on Index Test. The test efficiencies are lower than those derived from the hill curve. Therefore, it appears as though the turbine efficiency and output are below the guaranteed level in the flow range below 4,000 cfs. However, the curves are

very close at the actual design point where head is 18.0 feet. The difference in turbine efficiency would appear to decrease average annual generation by about 3,000 MWh per year. A comparison of efficiencies is shown on Figure 5.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.5 percent.

DISCHARGE

The river discharge is shown in Figure 2 as the flow-duration curve, as previously described. Three discharges were calculated from the flow-duration curve and turbine characteristics (QR, QS, and QT).

ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the City is required to bypass 100 cfs. Since the 100-cfs bypass is required year-round, the flow-duration curve was reduced by 100 cfs to reflect flows actually available for generation. In addition, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation.

Results of the energy calculations are as follows:

Base energy from flow-duration curve decreased by 100 cfs for bypass	48,060 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Net annual energy production (generator terminals)	49,410 MWh

BOT524/002

LOWER PLANT

Lower Plant

HEAD

5800

5800

Headwater elevation is controlled by the weir at Elevation 4674.5. Headwater elevation used in this study is 4674.5 up to the turbine capacity of ~~6,000~~. Above ~~6,000~~ cfs, water will spill over the weir, and headwater is a function of spill and weir characteristics. The relationship between flow and headwater elevation is shown below:

$$HW = 4674.5 + (QS/2424)^{.667}$$

Tailwater is controlled by the Woodville Canal diversion weir and the river channel between the weir and lower plant. The Woodville Canal weir elevation is 4654.0. The derived relationship between river discharge and tailwater elevation is as follows:

$$TW = 4654.6 + QR/3226$$

Head losses through the plant were derived from the VA test report as follows:

$$HL = (QT/6535)^2$$

Net head is the difference between headwater and tailwater minus losses.

$$NH = HW - TW - HL$$

Net head is plotted against river discharge in Figure 3.

EFFICIENCY

Turbine efficiencies were derived from the net head versus discharge relationship shown above and the Guaranteed Hill Diagram shown in the VA test report. The head versus discharge curve is plotted on the Hill Diagram, and turbine efficiencies are picked off at the points of intersection with the constant efficiency contours on the Hill Diagram. This line is different from the VA line because VA adjusted their output to the design head of 18 feet, whereas the CH2M HILL line is in terms of actual head at the plant. Figure 4 shows the plant characteristics plotted over the Hill Diagram.

However, the energy calculations using these efficiencies yielded more energy than expected and more than was produced in 1985. Consequently, the efficiencies from the Hill Diagram were compared with those shown in the VA Report on Index Test. The test efficiencies are lower than those derived from the Hill Diagram. Therefore, it appears as though the

turbine efficiency and output are below the guaranteed level in the flow range below 4,000 cfs. The difference in turbine efficiency would appear to decrease average annual generation by about 3,400 MWh per year. A comparison of efficiencies is shown in Figure 5. However, the curves are very close at the actual design point where head is 18.0 feet.

Generator efficiency is nearly constant over the operating range. The VA tests show an average generator efficiency of 96.6 percent.

DISCHARGE

The river discharge is shown in Figure 2 as the flow-duration curve, as previously described. Three discharges were calculated from the flow-duration curve and turbine characteristics (QR, QT, and QS).

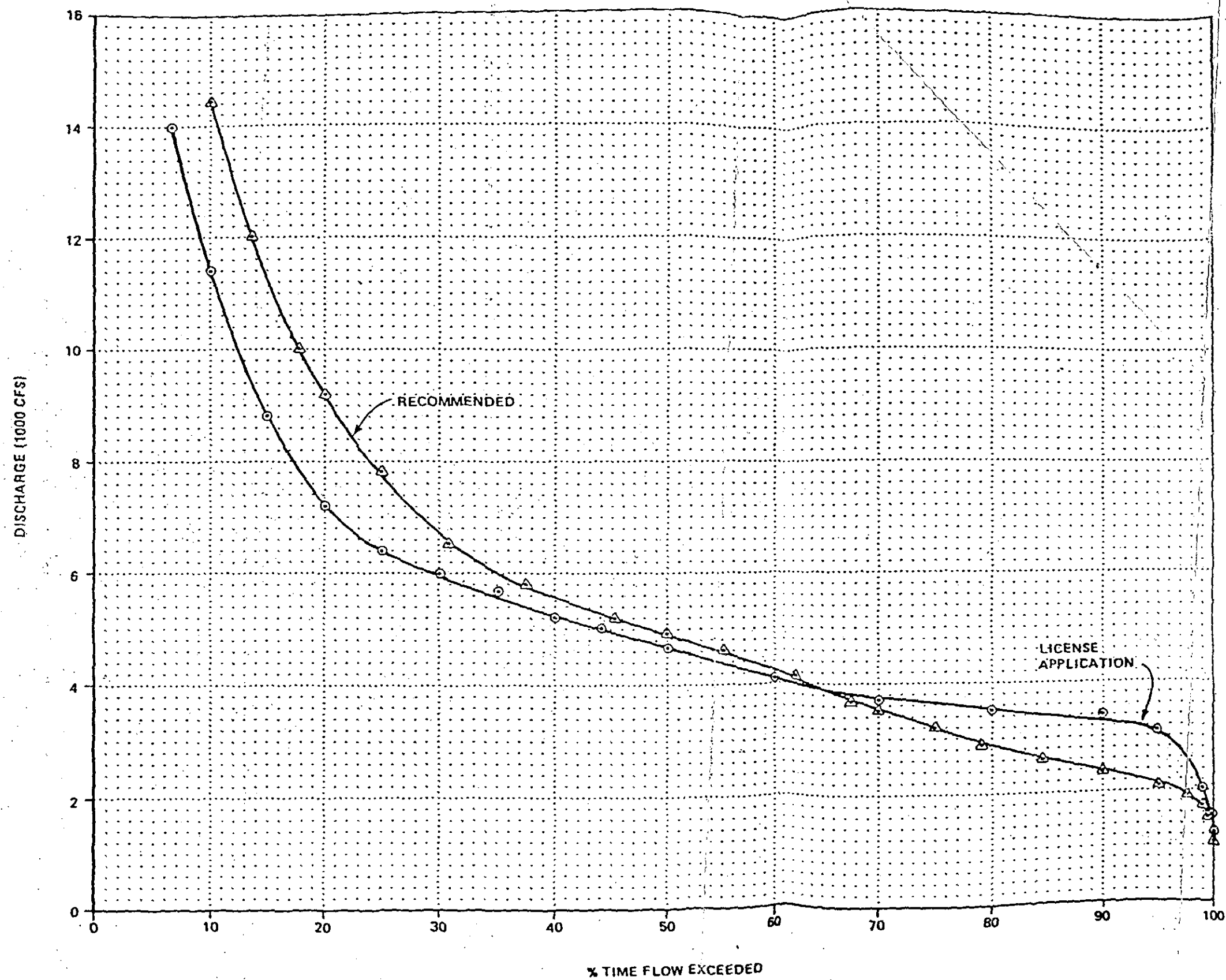
ENERGY CALCULATION

Integration of the flow-duration curve with the plant characteristics provides the potential energy at the site if flow at the site were the same as at the Shelley gage and no bypass around the plant occurred at flows below the plant capacity. However, the Shelley gage records do not include flows diverted to the Snake River Valley Canal or the Woodville Canal. Thus, more water is available at the plant, which will increase potential generation. Therefore, the energy output was adjusted to account for diversions as follows:

Base energy from Shelley gage records	47,620 MWh
Adjustment for canal diversions	<u>+1,350 MWh</u>
Net energy production (generator terminals)	48,970 MWh

BOT524/002

9
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△ DAILY Q SHELLEY GAGE 1960 - 1985
 ○ 1975 DEVELOPMENT MONTHLY 1928 - 1972

Figure 2
 DAILY FLOW DURATION
 SHELLEY GAGE (USGS)
 IDAHO FALLS BULB TURBINE EVALUATION
 CITY OF IDAHO FALLS, IDAHO



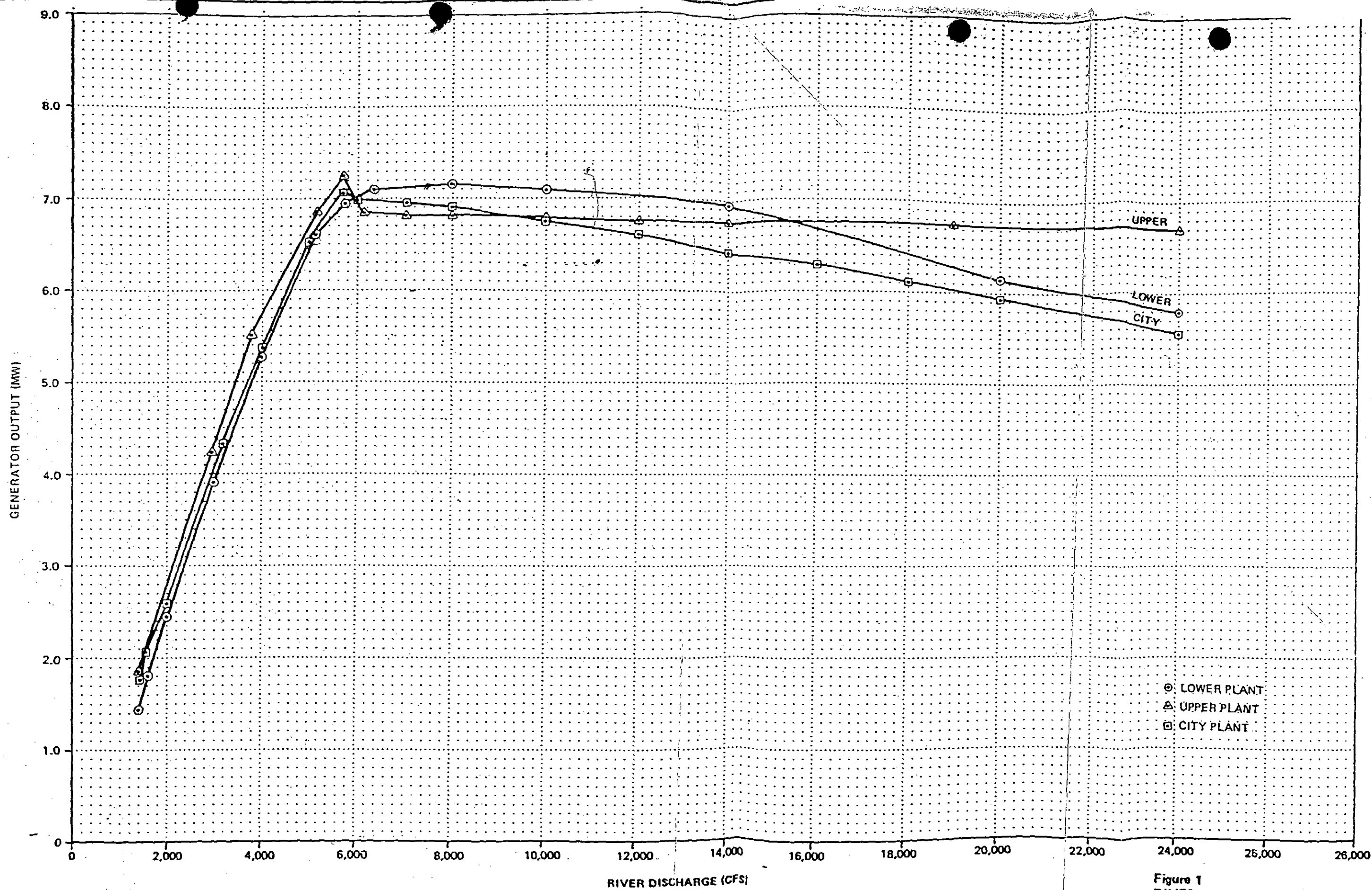


Figure 1
RIVER DISCHARGE VS. OUTPUT
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

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22

20

18

16

14

12

10

8

6

NET HEAD (FT)

UPPER

LOWER

CITY

○ LOWER PLANT
△ UPPER PLANT
□ CITY PLANT

TURBINE LOWER
LIMIT = 13.0MICROFILMED
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Figure 3
RIVER DISCHARGE VS. NET HEAD
IDAHO FALLS BULB TURBINE EVALUATION
CITY OF IDAHO FALLS, IDAHO

RIVER DISCHARGE (CFS)

26,000

24,000 25,000

20,000

18,000

16,000

14,000

12,000

10,000

8,000

6,000

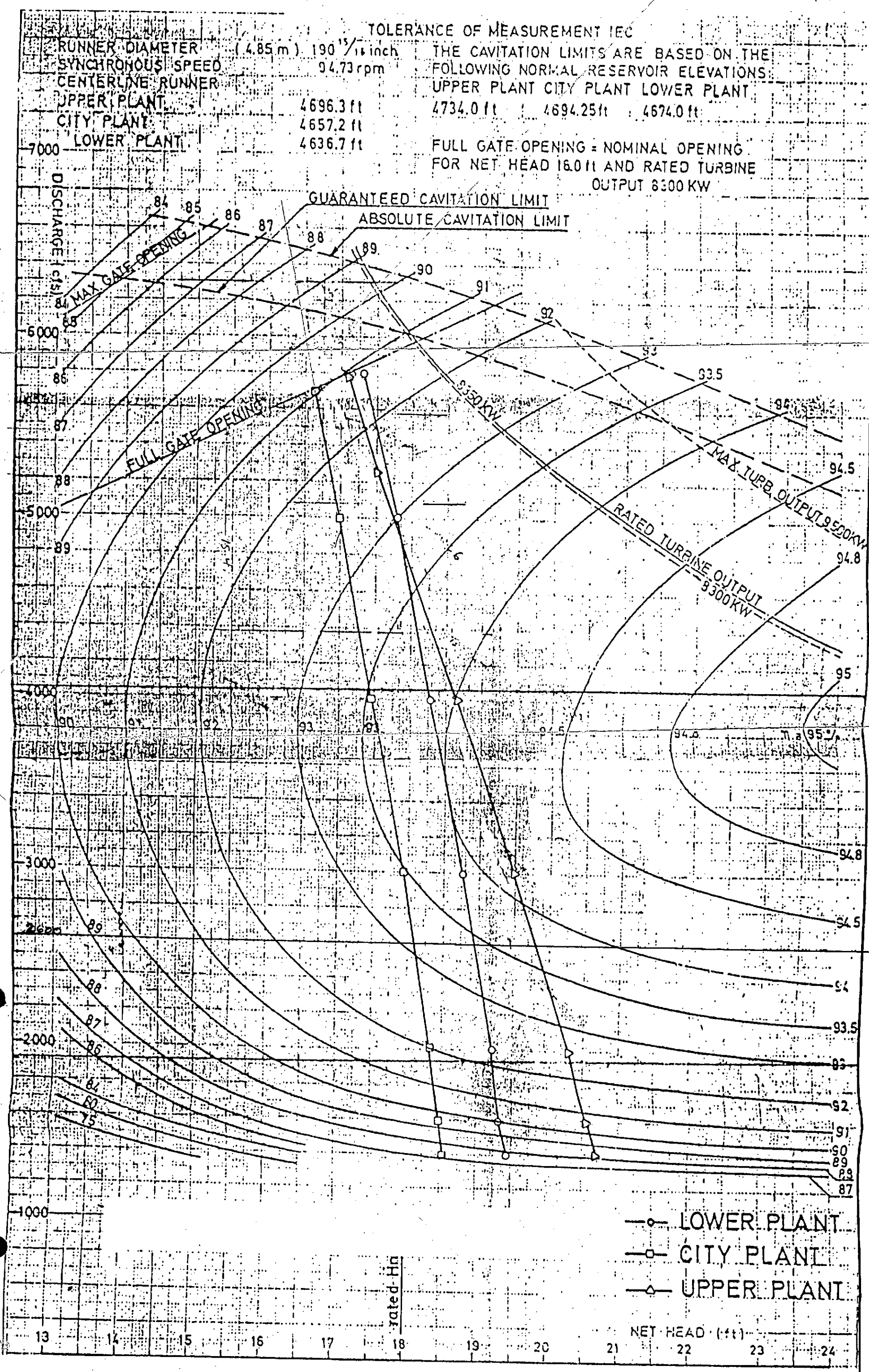
4,000

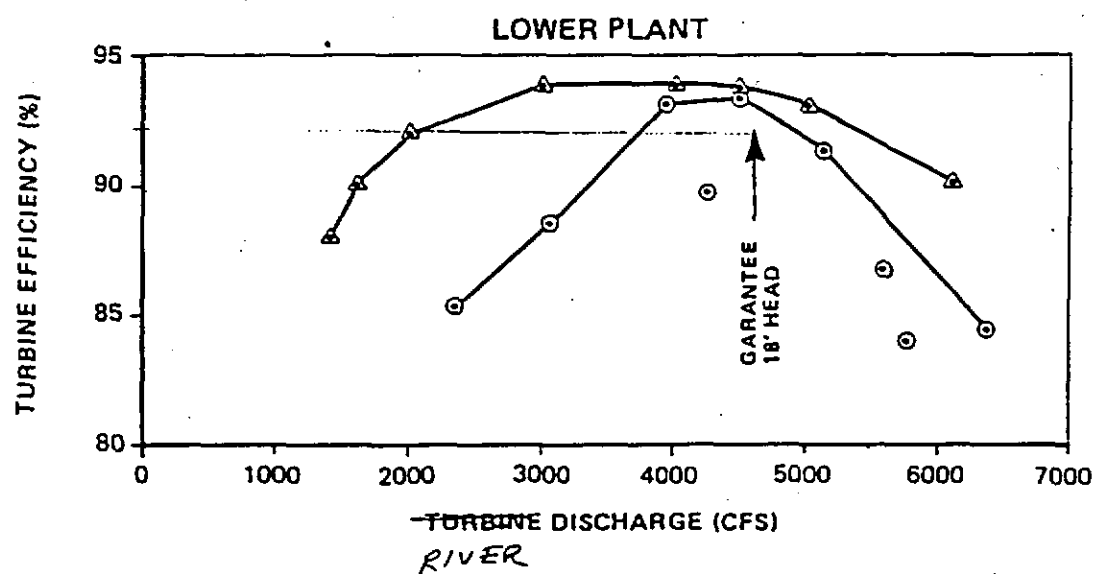
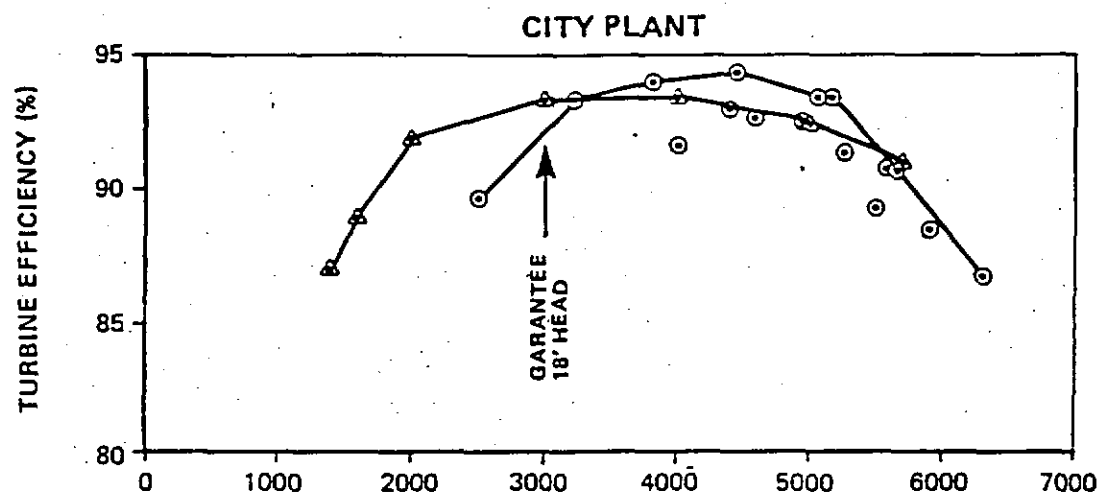
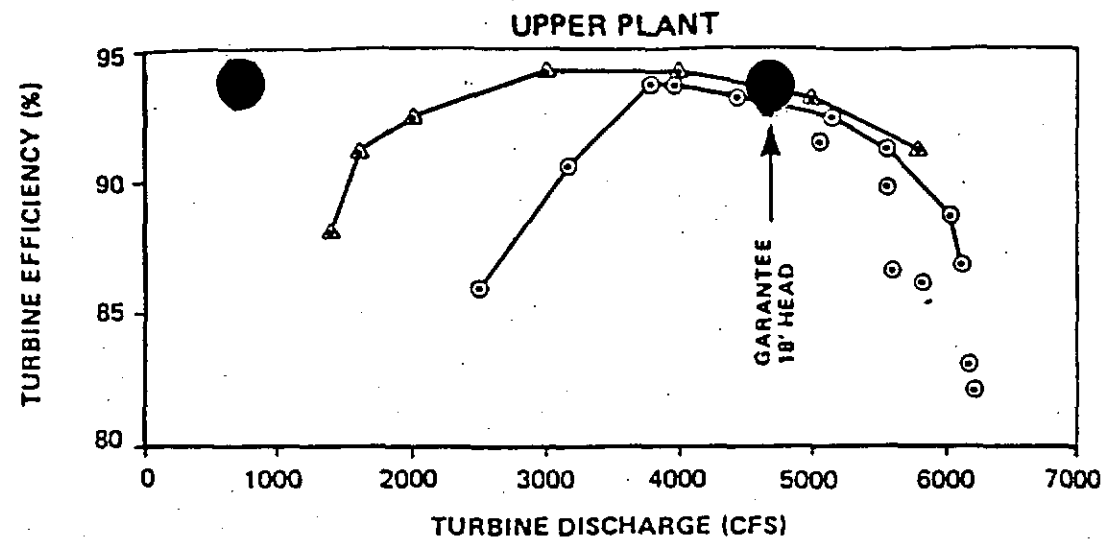
2,000

4

SOURCE: Hill diagram from Voest Alpine
Index Test Report, Dec. 1983.

Figure 4
OPERATING CONDITIONS
IDAHO FALLS BULB TURBINE EVAL.





FROM INDEX TEST
 FROM GUARANTEED HILL DIAGRAM

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Figure 5
EFFICIENCY COMPARISON
 IDAHO FALLS BULB TURBINE EVALUATION
 CITY OF IDAHO FALLS, IDAHO

IDAHO DEPARTMENT OF WATER RESOURCES
WATER RIGHT PROFILE REPORT
(REGIONAL)

BC
DATE: 05/26/93
PAGE: 1

OWNER CODE	NAME & ADDRESS	PRIORITY DATE	WATER USE	USE PERIOD FROM TO	DIVERSION RATE	DIVERSION VOLUME
C	CITY OF IDAHO FALLS C/O G S HARRISON PO BOX 220 IDAHO FALLS ID 83402 (208) 529-1430	11/09/1977	POWER	01-01 12-31	2600.00 CFS	1882341.0 AFA
TOTAL DIVERSION:					2600.00 CFS	1882341.0 AFA

Water Source: SNAKE RIVER

Tributary to: COLUMBIA RIVER

Stage: LICENSE

Point(s) of Diversion Capacity: 2600.00 CFS

Point(s) of Diversion: T03N R37E S36 Lot 07(NW NE)

Place of use Legal Description for: POWER

			NE				NW				SW				SE									
			NENE	NWNE	SWNE	SENE	:	NENW	NWNW	SWNW	SENW	:	NESW	NWSW	SWSW	SESW	:	NESE	NWSE	SWSE	SESE	:		
T	R	S	: Lt	Ac	Lt	Ac	Lt	Ac	Lt	Ac	Lt	Ac	:	Lt	Ac	Lt	Ac	Lt	Ac	Lt	Ac	Lt	Ac	:
03N	37E	36	:				:					:					:						:	
			:				:					:					:						:	

Pou County: BONNEVILLE

Conditions of Approval:

- R23 - The water right confirmed in this license for hydropower purposes
- shall be junior and subordinate to all rights to the use of
- water, other than hydropower, within the State of Idaho that are
- initiated later in time than the priority of this license and
- shall not give rise to any right or claim against any future
- rights to the use of water, other than hydropower, within the
- State of Idaho initiated later in time than the priority of this
- license.
- R04 - Use of water under this water right will be regulated by the
- watermaster of State Water District No. 01.
- 08A - This right is subject to the provisions of Sections 42-205
- through 42-210, Idaho Code, restricting the sale, transfer,
- assignment, or mortgage of this right. Failure to comply with
- these provisions is cause for immediate cancellation of this
- right.
- 017 - This project shall be operated in a manner that will not
- conflict or interfere with the future diversion of water for
- irrigation or other beneficial consumption.
- 027 - Use of water under this right shall be non-consumptive.

Remarks: ① Use of water under this license shall not cause fluctuation in
the flows of the Snake River which impairs the ability of prior
right holders to divert their water.

② The diversion and use of water under this license is subject to
review by the Director after the date of expiration of license
2842 issued by the Federal Energy Regulatory Commission. Upon
appropriate findings relative to the interest of the public, the
Director may cancel all or any part of the use authorized herein

Amend P/D

A

BC

Remarks: and may revise, delete or add conditions under which the right
may be exercised.

③ This license is subject to revocation pursuant to Section 42-350,
Idaho Code.

④ This power facility is known locally as the Three City Bulb
Turbine Plants.

Dates: App. Received: 11/09/1977 Priority Date: 11/09/1977
Proof Due Date: 04/01/1983 Proof Made Date: 02/18/1983
Exam Made Date: 01/12/1988 Exam Sent to S.O.:
Licensed Date:

Misc: Water District Number: 01 Field Exam Fee:

Audit: 05/26/93 CHAPMAN

LICENSE REVIEW CHECKLIST

Permit # 01-7013

Date 5-26-93

Brenda Chapman

NAME	<u>Yes</u>	<u>No</u>	Address Change?
	<u>—</u>	<u>✓</u>	
PRIORITY DATE	<u>—</u>	<u>✓</u>	Advance?
	<u>—</u>	<u>✓</u>	Memo to Advance
	<u>—</u>	<u>✓</u>	Order to Reinstate Needed?
TOTAL CFS	<u>-NA-</u>	<u>—</u>	Incorrect Fee for rate recommended?
	<u>—</u>	<u>✓</u>	Measurement Done <u>By LICENSED EXAMINER</u>
	<u>—</u>	<u>—</u>	Pumping Theoretical $(8.8) \times () \times (.7)$
	<u>—</u>	<u>—</u>	$(+ [2.31 \times])$
	<u>—</u>	<u>—</u>	System Capacity <u>2600 CFS</u>
	<u>—</u>	<u>—</u>	Allowable Amount: <u>2600 CFS</u>
TOTAL VOLUME	<u>—</u>	<u>—</u>	Rate/ac <u>—</u> AFA Irr. Season <u>—</u>
	<u>—</u>	<u>—</u>	Standard Irr. Season <u>—</u>
	<u>—</u>	<u>—</u>	Season Recommended <u>—</u>
	<u>-NA-</u>	<u>—</u>	Disagree with Examiner's Calculations?
	<u>—</u>	<u>✓</u>	Flow limit: $2600 \times 365 \times 1.9835 = 1,882,341 \text{ AF}$
SOURCE	<u>—</u>	<u>✓</u>	Changes? Clarification of <u>Originally</u>
	<u>—</u>	<u>✓</u>	<u>Intended</u> source
	<u>—</u>	<u>✓</u>	Notice of Intent to Void.
P/D	<u>✓</u>	<u>—</u>	Amendment Needed? <u>CHANGE TO NWNE SEC 36</u>
	<u>—</u>	<u>✓</u>	Overlap Analysis a Consideration?
P/U	<u>—</u>	<u>✓</u>	Amendment Needed? <u>Add Lot 7</u>
	<u>—</u>	<u>✓</u>	Overlap Analysis for 5+ Acres Needed?
USES	<u>—</u>	<u>✓</u>	Change(s) in Nature of Use?
	<u>—</u>	<u>✓</u>	Amendment Needed?
REMARKS	<u>—</u>	<u>✓</u>	Multiple P/Ds in 1/4 1/4?
	<u>✓</u>	<u>—</u>	Non-Irr. Uses <u>POWER</u>
	<u>—</u>	<u>✓</u>	Special Overlap Condition <u>conditions</u>
	<u>R23</u>	<u>—</u>	Other <u>(Replaces 17K) (also from 01-7018)</u>
CONDITIONS	<u>Changed</u>	<u>—</u>	Measuring Devices
R23 017	<u>R04</u>	<u>—</u>	W/Master Control
R04 027	<u>—</u>	<u>—</u>	Standard/Irr/Overlap
08A	<u>—</u>	<u>—</u>	Water Quality
	<u>—</u>	<u>—</u>	Dates/Misc
	<u>—</u>	<u>—</u>	<u>01</u> Water Dist
	<u>—</u>	<u>—</u>	<u>✓</u> App Rec'd
	<u>—</u>	<u>—</u>	<u>1-12-88</u> Exam Made

COMMENTS: Amend P/D

LICENSE — AMEND ✓ SPECIAL PARAGRAPH —

A

LAW OFFICES
HOLDEN, KIDWELL, HAHN & CRAPO

RECEIVED

MAY 20 1993

Department of Water Resources

BOISE OFFICE

WM. LYMAN BELNAP, P.A.
RANDALL B. REED
FREDERICK J. HAHN III
RONALD D. CHRISTIAN

IDAHO FALLS OFFICE

FRED J. HAHN
KENT W. FOSTER
ROBERT E. FARNAM
WILLIAM D. FALER
STEPHEN E. MARTIN
CHARLES A. HOMER
GARY L. MEIKLE
GAYLE A. SORENSON, P.A.
DONALD L. HARRIS
MARIE T. TYLER
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TELEFAX (208) 523-9518

KEY FINANCIAL CENTER
702 W. IDAHO SUITE 810
BOISE, IDAHO 83702

TELEPHONE (208) 343-0820
TELEFAX (208) 343-8078

May 18, 1993

ARTHUR W. HOLDEN
(1877-1967)
ROBERT B. HOLDEN
(1911-1971)
TERRY L. CRAPO
(1939-1982)
WILLIAM S. HOLDEN
(1907-1988)

Idaho Department of Water Resources
1301 North Orchard Street
Statehouse Mail
Boise, Idaho 83720

Idaho Department of Water Resources
900 North Skyline Drive
Idaho Falls, Idaho 83402-1718

Gentlemen:

In a recent review of some of the City of Idaho Falls' water rights, we discovered that a number of the potential licenses for water rights used for power production at the Three City Bulb Turbine Plants have never been issued. The following is a list of such rights: 01-7013, 01-7014, 01-7015, 01-7023, 01-7024 and 01-7025.

It appears that for each of these rights the proof of beneficial use was filed in 1983 and the field exams completed in 1988. We wonder if you would check these items to determine what the cause of the delay in issuing the licenses might be and advise us. If there is something the city needs to be doing in this regard, we would appreciate learning of that as well. Thank you for your kind attention to this matter.

Yours very truly,


Kent W. Foster

#0518.00/srs

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UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

-2-

City of Idaho Falls

Project No. 2842-026
Idaho

A: 01-7066

P: 01-7013-14-15-18-

23-24-25-47-

49-

D: 01-40-41-360-361-

4001-4002-4003

Commission's regulations. The acreage of land for such purpose is as follows:

a. The acreage for land other than for transmission line right-of-way is 9.61.

b. The acreage for land for transmission line right-of-way is 0.25.

(C) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. §385.713.

ORDER AMENDING LICENSE AND REVISING ANNUAL CHARGES

(Issued January 26, 1993)

On December 28, 1992, City of Idaho Falls, licensee for the Idaho Falls Project, FERC No. 2842,¹ filed with the Commission a request to amend its license to revise license article 51, subparagraph (ii). The filing was made in response to a Commission letter, dated November 19, 1992, requesting information regarding the federal lands occupied by the project.

License article 51, subparagraph (ii), states that the licensee shall recompense the United States for the use, occupancy and enjoyment of its lands, an amount to be determined later. The December 28, 1992, filing clarifies that the project occupies a total of 9.86 acres of federal land. Of this land, 0.25 acre is for the use of transmission line right-of-way and 9.61 acres is for the use of other than for transmission line right-of-way. The land, owned by the U. S. Bureau of Land Management, is shown on exhibit drawings 2842-51 and 2842-78.²

This order will revise license article 51 to include the amount of acreage of federal land for the purpose of annual charges, effective the first day of the month in which the license was issued. This order does not authorize a change in the installed capacity for the Idaho Falls Project.

The Director orders:

(A) The license for the Idaho Falls Project, FERC No. 2842, is amended as provided by this order.

(B) License article 51, subparagraph (ii), is revised to read as follows, effective the first day of the month in which the license was issued.

(ii) For the purpose of recompensing the United States for the use, occupancy, and enjoyment of its lands, an amount as may be determined from time to time pursuant to the

¹ Order Issuing License (Major), issued February 8, 1979, 6 FERC ¶61,120.

² 2842-51 submitted with application for license; 2842-78 approved in Order Approving As-built Exhibits, issued July 22, 1986.

DC-A-3

J. Mark Robinson
J. Mark Robinson
Director, Division of Project
Compliance and Administration

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FEB 1 1993

Department of Water Resources

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MAR 16 1990
752
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION Department of Water Resources

City of Idaho Falls

Project No. 2952-0247
Idaho

ORDER GRANTING EXTENSION OF TIME

(Issued March 12, 1990)

The licensee for the Gem State Project has requested an extension of time to comply with ordering paragraph B of the Commission's Order Approving Riparian Habitat Mitigation Plan with Modification issued September 29, 1988. The reasons advanced by the licensee in support of the requested extension of time are reasonable and justify the extension.

The Director orders:

(A) The deadline for filing the first annual riparian habitat mitigation monitoring report according to ordering paragraph B is extended to December 31, 1990.

(B) This order is issued under authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of its issuance.

J. Mark Robinson
J. Mark Robinson
Director, Division of Project
Compliance and Administration

DC-A-5

01- 7053/ 7066 (2400/ 143615# 1090)
01- 7025/ 7024/ 7023/ 7015/ 7014/ 7013 (611366# 2810)
01- 2047/ 2049 (3842)
01- 4001/ 4005/ 01- 0300/ 0301
(0000000000)
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DEC 04 1997

49 FERC 62,053

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

City of Idaho Falls

Project No. 2842-012
Idaho

ORDER APPROVING REVISED EXHIBIT K DRAWINGS
(Issued October 19, 1989)

On October 3, 1988, the City of Idaho Falls, licensee for the Upper Power Plant Project, FERC Project No. 2842, filed revised Exhibit K drawings in response to a letter dated April 19, 1988 from the Director, Division of Project Compliance and Administration.

The Exhibit K drawings have been revised to more accurately reflect the project boundary under all operating conditions and conform to the Commission's Rules and Regulations.

Director orders:

(A) The following revised Exhibit K drawings are approved and made a part of the license:

Exhibit	FERC No.	Drawing Title
K-1	2842-77	Project Boundary-Sheet 1 of 9
K-1	2842-78	Project Boundary-Sheet 2 of 9
K-1	2842-79	Project Boundary-Sheet 3 of 9
K-1	2842-80	Project Boundary-Sheet 4 of 9
K-1	2842-81	Project Boundary-Sheet 5 of 9
K-1	2842-82	Project Boundary-Sheet 6 of 9
K-1	2842-83	Project Boundary-Sheet 7 of 9
K-1	2842-84	Project Boundary-Sheet 8 of 9
K-1	2842-85	Project Boundary-Sheet 9 of 9

(B) Exhibit K drawing numbers 2842-3 and 2842-4 are superseded and removed from the license.

(C) Within 90 days of the date of issuance of this order, the licensee shall file an original of the approved Exhibit K drawings reproduced on silver or gelatin 35mm microfilm mounted on Type D (3 1/4" x 7 3/8") aperture cards for each drawing. In addition, the licensee shall file two Diazo-type duplicate aperture cards. The original set and one duplicate set of aperture cards should be filed with the Secretary of the Commission. The remaining duplicate set of aperture cards should be filed with the Commission's Portland Regional Office. The FERC drawing numbers (2842-77 through 2842-85) shall be shown in the margin below the title block of the microfilmed drawing and also in the upper right corner of each aperture card. The top

DC-A-8

*See
attachment*

-2-

lines of the aperture cards shall show the FERC Exhibit (i.e., K-1, K-2), Project Number, Drawing Title, and date of this order.

(D) This order is issued under authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order. Failure to file a petition appealing this order to the Commission shall constitute acceptance of this order.

J. Mark Robinson
J. Mark Robinson
Director, Division of Project
Compliance and Administration

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OCT 26 1989

Department of Water Resources

DEC 04 1989
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DEC 4 1967

POWER RIGHTS FOR CITY OF IDAHO FALLS
DIVERTING FROM SNAKE RIVER

✓ 0107066
✓ 0107025
✓ 0107024
✓ 0107023
✓ 0107015
✓ 0107014
✓ 0107013
✓ 0107018
✓ 0102047
✓ 0102049
0104001
0104003
0100360
0100361

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MAY 09 1989

01-7013-7015
01-7018/7023-01-7025
01-2047/2049

Department of Water Resources
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION 47 FERC 61,115

Before Commissioners: Martha O. Hesse, Chairman;
Charles G. Stalon, Charles A. Trabandt,
Elizabeth Anne Moler and Jerry J. Langdon.

City of Idaho Falls, Idaho) Project Nos. 2842-013 and
-017

**ORDER DISMISSING REQUESTS FOR REHEARING AND APPROVING
AMENDMENT OF LICENSE AND REVISED EXHIBIT R**

(Issued April 27, 1989)

By order issued June 24, 1988, the Director, Division of Project Compliance and Administration (Director), denied the request of the City of Idaho Falls, Idaho (licensee), filed March 22, 1988, to amend its license by deleting a requirement to install shore-to-shore buoy lines from the licensee's Exhibit R (recreation use plan) drawings for Project No. 2842. 1/ Based on recommendations and a site inspection by personnel of the Commission's Portland, Oregon Regional Office (PRO), the Director rejected the licensee's proposal to install warning signs in lieu of the required buoy lines. 2/ The Director noted that the PRO's

1/ See Order Approving in Part and Modifying in Part a Revised Exhibit R, 43 FERC ¶ 62,366 (1988). The Director's order also revised the Exhibit R to require: (1) seasonal installation of the buoy lines between May 1 and September 30 each year, beginning in 1989; and (2) permanent installation of (a) warning signs at four locations upstream from the buoy lines to warn boaters of the project's three dam locations and (b) warning horns at the spillway gates to alert persons downstream from the project of sudden water releases.

The license for Project No. 2842 was issued on February 8, 1979. See 6 FERC ¶ 61,120 (1979). Article 42 of the license (id. at p. 61,219) required the licensee to file for Commission approval a revised Exhibit R within one year from the date of issuance of the license. The licensee's Exhibit R, as filed on May 30, 1980, and approved November 16, 1981 (17 FERC ¶ 62,240 (1981)), included buoy lines in the project drawings.

Project Nos. 2842-013
and 2842-017

-2-

site inspection revealed that recreational boaters were coming dangerously close to the project's diversion structures. 3/

On July 25, 1988, the licensee timely filed an appeal of the Director's order, challenging the buoy-line requirement. On July 26, 1988, the Bonneville County, Idaho Sheriff's Department (Department) filed a request for intervention in the proceeding and a late appeal of the Director's order. By order issued October 7, 1988, the Commission granted the Department's intervention request and denied the appeals. 4/ The Commission found that the project's ungated spillways posed a hazard for recreationists and that the buoy lines would provide a needed additional measure of safety that warning signs alone could not provide. 5/

3/ Project No. 2842 is located on the Snake River in Bonneville County, Idaho, and consists of three run-of-river hydroelectric developments designated Upper Plant, City Plant, and Lower Plant. Upper Plant includes two combination concrete and earthfill dams, one 600 feet long and 23 feet high and the other 470 feet long and 33 feet high, and a reservoir with 800 gross acre-feet of capacity and 100 acres of surface area. City Plant includes a concrete dam and diversion structure 1,970 feet long and 30 feet high and a reservoir with 400 gross acre-feet of capacity and 50 acres of surface area. Lower Plant includes a concrete dam 930 feet long and 16 feet high and a reservoir with 800 acre-feet of capacity and 100 acres of surface area.

4/ See 45 FERC ¶ 61,042 (1988). Based on the Department's contentions that the buoy lines might hinder its rescue operations in the Snake River near the project, the Commission also required the licensee to file, by November 7, 1988, and after consultation with the Department, either a request to change the location of the buoy lines, with appropriately revised Exhibit R drawings, or a letter stating that no change in the buoy-line locations is needed. Id. at p. 61,139, note 21. After two extensions of time (see notices extending deadline, issued November 15, and December 27, 1988 (unpublished)), the licensee filed its supplemental Exhibit R drawings on January 23, 1989.

5/ 45 FERC ¶ 61,042, *supra*, at p. 61,136-140. The Commission (id. at pp. 61,136-37) also based its decision on Section 12.42 of the Commission's regulations (18 C.F.R. § 12.42 (1988)), which states that,

(continued...)

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STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

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Department of Water Resources

A. GENERAL INFORMATION

1. Owner: CITY OF IDAHO FALLS Permit No. 01-7013
Current Address: P.O. BOX 220 IDAHO FALLS IDAHO 83402 Phone No. 529-1430
2. Accompanied by: DEE LEWIS EXAM. DATE: 12 JAN '88
Address: P.O. BOX 220 IDAHO FALLS, IDAHO 83402 Phone No. 529-1430
Relationship to Permit Holder: EMPLOYEE
3. Source: SNAKE RIVER tributary to COLUMBIA RIVER

B. OVERLAP REVIEW

1. Other water rights with same place of use: 01-7023
☐ Copies Attached
2. Other water rights with same point of diversion: 01-7023
☐ Copies Attached ☒ Copies of Field Exam's Attached

C. SYSTEM DESCRIPTION

1. **Diversion System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe i.d. as applicable. ☒ Alternative diagram attached

SEE ATTACHED GENERAL LAYOUT DRAWING # LBC-10-90Z R1
COMPLETE PLANS ARE AVAILABLE AT THE CITY OF IDAHO FALLS ELECTRIC
DEPARTMENT.

Scale: 1" = NA

2. ☒ Copy of U.S.G.S. Quadrangle Attached ☒ Aerial Photo Attached
Showing location(s) of point(s) of diversion and (required for irrigation of 10 acres or more).
place(s) of use (required).
☒ Photo of Diversion and System Attached
(required for all but single household domestic groundwater, and stockwater).

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System Description (continued)

3. **Narrative:** Description (As operating at time of measurement. Indicate pressure, number of sprinklers, etc.)
 AT THIS LOCATION THE SNAKE RIVER SEPERATES INTO TWO SIMILAR SIZED CHANNELS. THE EAST CHANNEL IS CONTROLLED BY A DAM WITH A SPILLWAY. THE WEST CHANNEL IS CONTROLLED BY A DAM WITH A POWER HOUSE. THE RESULTING LAKE IS REGULATED TO PRODUCE POWER AND MAINTAIN THE INTEGRITY OF THE RIVER.

☐ See Remarks on page 4 for continuation

4.

Well or Diversion Identification No.*	TURBINE Motor Make	MW Hp	TURBINE Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
UPPER PLANT	VOEST-ALPINE	8.3	MB 9-059 / 3	—	—

*Code to correspond with No. on map and aerial photo

5. **Point(s) of Diversion:**

Ident. No.	Gov't. Lot	1/4	1/4	1/4	Sec.	Twp.	Rge.	County	Method of Determination/Remarks
	7		NW	NE	36	3N	37E	BONNEVILLE	USGS QUAD MAP

6. **Place(s) of Use:**

Indicate Method of Determination

Twp.	Rge.	Sec.	NE 1/4				NW 1/4				SW 1/4				SE 1/4				Totals
			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	
			DIVERSION, GENERATION AND RETURN FLOW ALL OCCUR AT SAME LOCATION																NA
3N	37E	36			P														
					L-7														

Do not use this space

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Do not use this space

D. FLOW MEASUREMENTS

☐ Additional Data Sheets Attached

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
VOEST-ALPINE TURBINE	KAPLIN	-	-	MB9-059/3	8.3 MW	1980
	BULB					

2. Measurements:

FLOW ON THIS DATE WAS DETERMINED BY POWER GENERATION USING THE
 FORMULA $FLOW \times HEAD = KILLOWATTS$ ON THIS DATE POWER OUTPUT
 14
 WAS 3800 KW. HEAD = 18' $\therefore$ FLOW = 2955 CFS - ?
 AT TIME OF MEASUREMENT THIS WAS TOTAL FLOW IN RIVER

E. FLOW CALCULATIONS

☐ Additional Computation Sheets Attached

1. Measured Method: MANUFACTURERS RATING CURVE.

2. Alternate Method for Checking Purposes:

F. PUMP EFFICIENCY DATA (Optional) 'NA'

Discharge Pressure: _____ psi $\times 2.31 =$ _____ ft (1); Dynamic pumping level: _____ ft (2)

Total Head: (1) + (2) = _____ (3) ; Flow rate: _____ cfs (4)

Water HP: (3) $\times$ (4) $\div 8.8 =$ _____ (5)

Meter Input KW: $3.6 \times$ _____ KH $\times$ _____ CTR or _____ MULT $\times$ _____ PTR $\times$ _____ N/ _____ T = _____ (6)

Meter Input HP: (6) $\times 1.34 =$ _____ (7)

Panel Input KW: _____ Ave PF $\times$ _____ Ave Volts $\times$ _____ Ave Amps $\times .001732 =$ _____ (6)

Panel Input HP: (6) $\times 1.34 =$ _____ (7) Efficiency: (5)/(7) $\times 100 =$ _____ %

G. VOLUME CALCULATIONS 'NA'

1. Volume Calculations for Irrigation:

$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$ _____

$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$ _____

$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} =$ _____

2. Volume Calculations for Other Uses:

APPROVED
 DATE 10/10/80

H. REMARKS AND OVERLAP REVIEW ANALYSIS

ON THE DATE OF THIS FIELD EXAM ONLY MINOR FLOWS ESCAPED
THRU THE SPILLWAY. INCLUDED IS A MONTHLY POWER PRODUCTION
CHART FOR 1985-1987. THE UPPER PLANT IS CAPABLE OF PRODUCING
8.3 MEGAWATTS.

EXISTING RIGHTS AND DECREES WILL PRODUCE APPROX. 3,300 KW OF POWER
PRODUCTION RECORDS SHOW PLANT HAS EXCEEDED 3,300 KW IN 36 OF LAST 36 MO.
THEREFORE CITY HAS DEMONSTRATED BENEFICIAL USE OF NEW PERMITS

R17 (01-2047, 01-2049, 01-7023) (5700 cfs) see pg 6 of Turbine
evaluation Draft
HWS

I. RECOMMENDATIONS**1. Recommended Amounts**

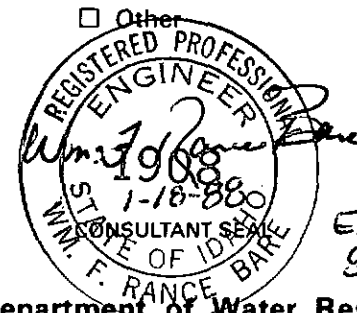
Beneficial Use	Period of Use		Rate of Diversion Q (cfs)	Annual Volume V (afa)
	From	To		
POWER GENERATION	JAN 1	DEC 31	AVAILABLE FLOW UP TO 2600 CFS	
Totals:				

2. Recommended Amendments

- ☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None
☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

J. AUTHENTICATION

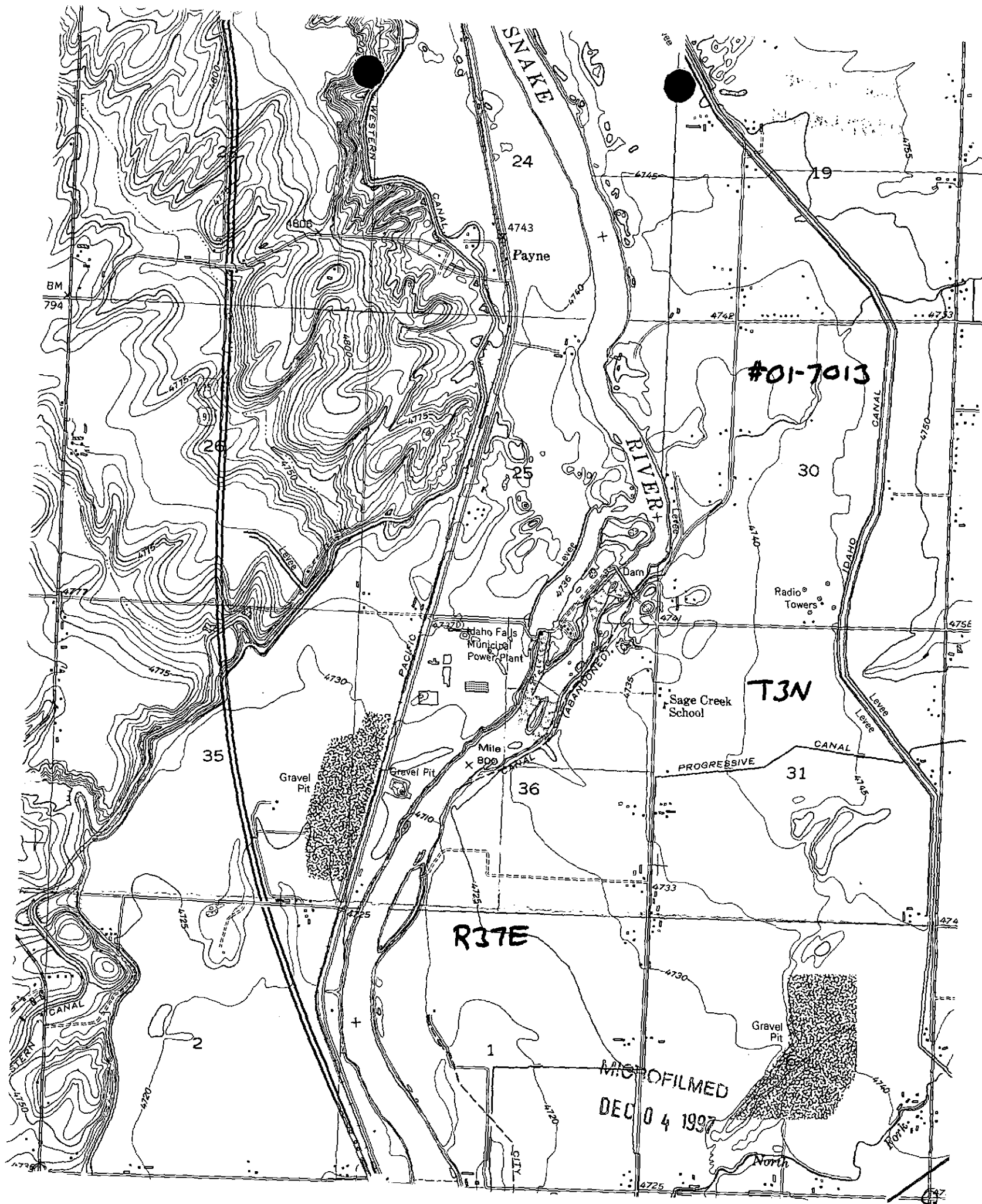
Field Examiner's Name DARYL KOFOED
 Signature Daryl Kofoed P.E.
 Certification Date 18 Jan, 88
 Field Report Preparation Date 12 JAN. '88

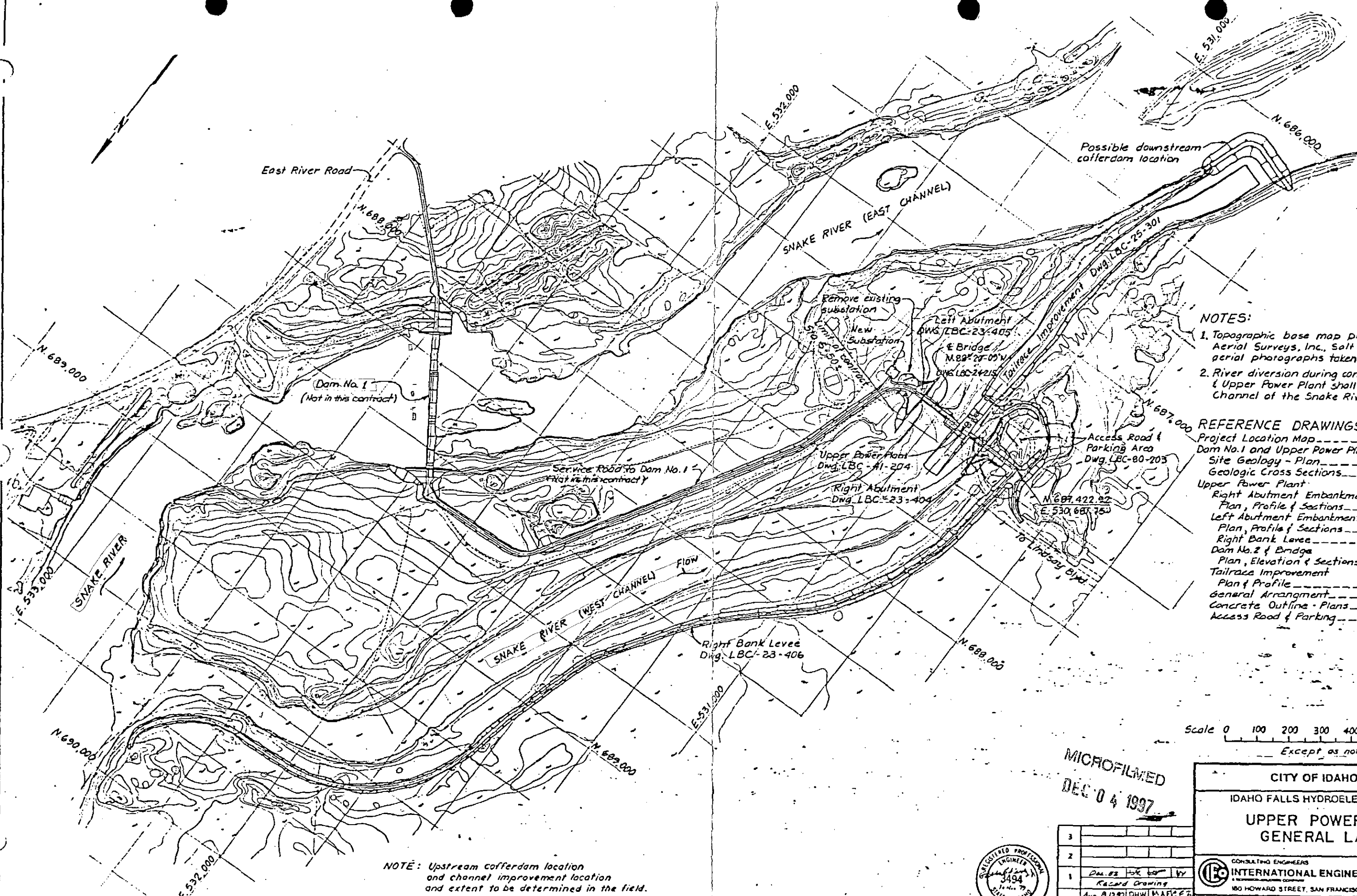


EXAM NO.
87-115

- K. Licensing recommendation shall be prepared by an Idaho Department of Water Resources employee on a computer printout attached hereto.**

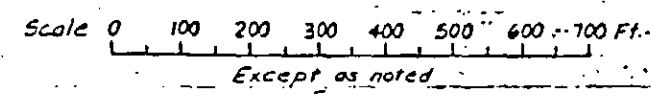
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- NOTES:**
- 1. Topographic base map prepared by Olympus Aerial Surveys, Inc., Salt Lake City, Utah from aerial photographs taken April 8, 1977
 - 2. River diversion during construction of Dam No. 2 & Upper Power Plant shall be through the East Channel of the Snake River.

- REFERENCE DRAWINGS:**
- Project Location Map LA-10-201
 - Dam No. 1 and Upper Power Plant - Site Geology - Plan LB-10-401
 - Geologic Cross Sections LB-10-402
 - Upper Power Plant:
 - Right Abutment Embankment Plan, Profile & Sections LBC-23-404
 - Left Abutment Embankment Plan, Profile & Sections LBC-23-405
 - Right Bank Levee LBC-23-406
 - Dam No. 2 & Bridge Plan, Elevation & Sections LBC-24-215
 - Tailrace Improvement Plan & Profile LBC-25-301
 - General Arrangement LBC-41-203
 - Concrete Outline Plans LEC-41-204
 - Access Road & Parking LEC-80-203



NOTE: Upstream cofferdam location and channel improvement location and extent to be determined in the field.

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3				
2				
1	Rev. 02	10/1/80	by	
	Record Drawing			
0	Aug. 8, 1980	DHW/MAF/CEH		
	ISSUED FOR CONSTRUCTION			
NO.	DATE	MADE	CHG.	APP.

CITY OF IDAHO FALLS

IDAHO FALLS HYDROELECTRIC PROJECT

**UPPER POWER PLANT
GENERAL LAYOUT**

CONSULTING ENGINEERS

INTERNATIONAL ENGINEERING COMPANY, INC.

180 HOWARD STREET, SAN FRANCISCO, CALIFORNIA 94103

DESIGNED: JEC

DRAWN: JEC

CHECKED: JEC

APPROVED: JEC

DATE: Nov 22 1979

DRAWING NO: LBC-10-902 R1

01-7013
upper plant

NORTH

S. 89° 45' W.

40.06

1878

5.94

S. 89° 18' W.

7.74

RESURVEY

25.52

3.30

8.54

N. 89° 35' W.

14.63

22.87

CARIN B.

DAM

3

15.50

NORTH
NORET.

DAM

POWER HOUSE

8

5.98

JOHN B. DAVID

7

2

RIVER

S. 31° 24' W.

29.77

0.729

80.00

Sec. 36

6.70

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BY

For Office Use Only
Fee Received _____
Date _____
Receipt # _____
Receipt by _____
Reviewed by _____
Sent to region _____

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

PROOF OF BENEFICIAL USE

The Idaho Department of Water Resources will consider this form as a statement that the permit holder(s) has completed all development that will occur under this permit and that water has been applied according to the provisions of the permit for the beneficial use(s) described below. This form must be accompanied by a license examination fee or a completed field examination report prepared by a certified water right examiner who has been appointed by the department.

Permit No. 01-7013

Name(s) of Permit Holder: CITY OF IDAHO FALLS, IDAHO

Post Office Address: P.O. BOX 220

IDAHO FALLS, IDAHO 83402

Telephone No. 208-529-1430

Source of Water: SNAILE RIVER

Extent of Use:

Domestic N/A (number of households)

Stockwater N/A (number and type of stock)

Irrigation N/A (acres)

Other/Remark POWER GENERATION

Total rate and/or volume for which proof is submitted 2600 cfs N/A acre-feet

Show the date water was first diverted and beneficially used under this permit: 7-24-82

Measuring Device: Required? ☐ Yes ☐ No
Installed? ☐ Yes ☐ No

Fee enclosed \$ _____
(See License Examination Fee Schedule)

Flow Measurement Port: Required? ☐ Yes ☐ No
Installed? ☐ Yes ☐ No

Person to contact to accompany the Department representative during the field examination:

FIELD EXAM BY PRIVATE CONSULTANT

(208) 523-1062

(Name)

(Telephone Number)

ELLSWORTH ENGINEERING INC. P.O. BOX 1822 IDAHO FALLS IDAHO 83401

(Address)

The above information is my true statement of the extent to which the above numbered permit has been developed and I relinquish any undeveloped portion of the permit to the state of Idaho.

Date

Signature of Permit Holder (and title, if appropriate)

1-18-88

[Signature] Chief Engineer

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UPPER POWER PLANT

1. License No. L.6799 (new number 01-47) for 500 cfs, with a priority of October 28, 1927.
2. License No. L.18271 (new number 01-2049) for 1500 cfs, with a priority of February 14, 1936.
3. Constitutional or claimed right (no number), for 160 cfs, with a priority of May 3, 1930.
4. Permit number 01-7013, issued March 5, 1979, for 2600 cfs with a priority of November 9, 1977.
5. Permit No. 01-7023 issued March 16, 1979, for 1240 cfs, with a priority of February 15, 1979.

Total: 6000 cfs

CITY OR CENTRAL PLANT

1. Decreed right No. 193 (new number 01-0040) for 140 cfs, with a priority of April 20, 1900.
2. Decreed Right No. 258 (new number 01-0041) for 48 cfs, with a priority of October 22, 1904.
3. License No. L.3304 (new number 01-2014) for 600 cfs, with a priority of December 3, 1907.
4. Constitutional or claimed right (no number), for 225 cfs, with a priority of February 5, 1915.
5. Constitutional or claimed right (no number), for 412 cfs, with a priority of July 18, 1919.
6. Constitutional or claimed right (no number), for 515 cfs, with a priority of October 5, 1923.
7. Permit No. 01-7014, issued March 5, 1979, for 2600 cfs, with a priority of November 9, 1977.
8. Permit No. 01-7024, issued March 16, 1979, for 460 cfs, with a priority of February 15, 1979.

Total: 6000 cfs

LOWER PLANT

1. Decreed right No. 01-0281 for 1500 cfs, with a priority of December 29, 1905.
2. Constitutional or claimed right (no number), for 1240 cfs, with a priority of October 5, 1940.
3. Permit No. 01-7015, issued March 5, 1979, for 5100 cfs, with a priority of November 9, 1977.
4. Permit No. 01-7025, issued March 16, 1979, for 1000 cfs, with a priority of February 15, 1979.

Total: 8740 cfs

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DEC 04 1997

UPPER PLANT

Month	1985		1986		1987	
	kWh	kW	kWh	kW	kWh	kW
Jan	3,198,000	6,850	4,640,000	6,470	3,637,000	6,940
Feb	3,152,000	5,040	4,216,000	7,200	3,371,000	6,080
Mar	4,646,000	6,860	4,587,000	7,090	3,243,000	7,060
Apr	4,572,000	7,050	4,679,000	6,950	4,114,000	7,140
May	4,794,000	6,730	5,019,000	6,760	3,933,000	7,180
Jun	4,511,000	7,120	4,501,000	6,760	4,770,000	7,220
Jul	4,671,000	6,990	4,891,000	7,020	5,088,000	7,120
Aug	4,425,000	5,240	5,034,000	6,940	4,290,000	6,540
Sep	2,647,000	6,800	4,791,000	7,180	3,875,000	6,150
Oct	3,653,000	5,650	4,910,000	7,050	3,018,000	4,770
Nov	3,886,000	6,160	4,440,000	6,980	2,597,000	4,160
Dec	4,238,000	6,530	5,010,000	7,200	2,632,000	3,950
TOTAL	48,393,000		56,718,000		44,568,000	

#01-7013

CITY PLANT

Month	1985		1986		1987		1988	
	kWh	kW	kWh	kW	kWh	kW	kWh	kW
Jan	4,020,000	6,540	4,302,000	6,250	4,367,000	7,210		
Feb	3,554,000	6,450	4,186,000	7,120	3,250,000	5,950		
Mar	4,411,000	7,020	4,279,000	6,990	2,907,000	6,570		
Apr	4,270,000	6,880	3,912,000	6,630	3,690,000	7,260		
May	3,887,000	6,680	3,467,000	5,880	4,880,000	7,010		
Jun	4,026,000	7,490	4,072,000	6,560	4,636,000	7,150		
Jul	4,209,000	6,620	4,997,000	7,170	4,891,000	6,960		
Aug	3,072,000	4,860	3,201,000	6,940	3,908,000	6,230		
Sep	3,213,000	5,960	0	0	3,373,000	5,570		
Oct	3,297,000	5,630	0	0	2,682,000	4,230		
Nov	3,433,000	5,620	0	0	2,224,000	3,610		
Dec	3,609,000	5,990	2,275,000	7,220	2,278,000	3,620		
TOTAL	45,001,000		34,691,000		43,086,000			

LOWER PLANT

Month	1985		1986		1987		1988	
	kWh	kW	kWh	kW	kWh	kW	kWh	kW
Jan	4,353,000	6,670	4,599,000	6,570	4,343,000	6,840		
Feb	4,090,000	6,690	4,134,000	6,890	2,923,000	6,040		
Mar	4,076,000	6,440	3,967,000	6,960	2,788,000	3,800		
Apr	4,214,000	6,900	3,381,000	5,770	4,008,000	6,950		
May	3,582,000	5,820	3,372,000	4,920	3,881,000	6,680		
Jun	3,959,000	6,320*	3,214,000	5,230	4,356,000	6,880		
Jul	2,490,000	6,930	4,081,000	3,256	4,489,000	6,090		
Aug	4,639,000	5,380	4,480,000	6,340	3,778,000	5770		
Sep	3,544,000	6,650	4,086,000	6,650	3,458,000	5,520		
Oct	3,406,000	5,590	4,489,000	6,770	2,707,000	4,270		
Nov	3,725,000	9,760	3,791,000	6,170	2,390,000	3,860		
Dec	4,003,000	6,340	4,727,000	6,910	2,340,000	3,650		
TOTAL	46,081,000		48,321,000		41,461,000			

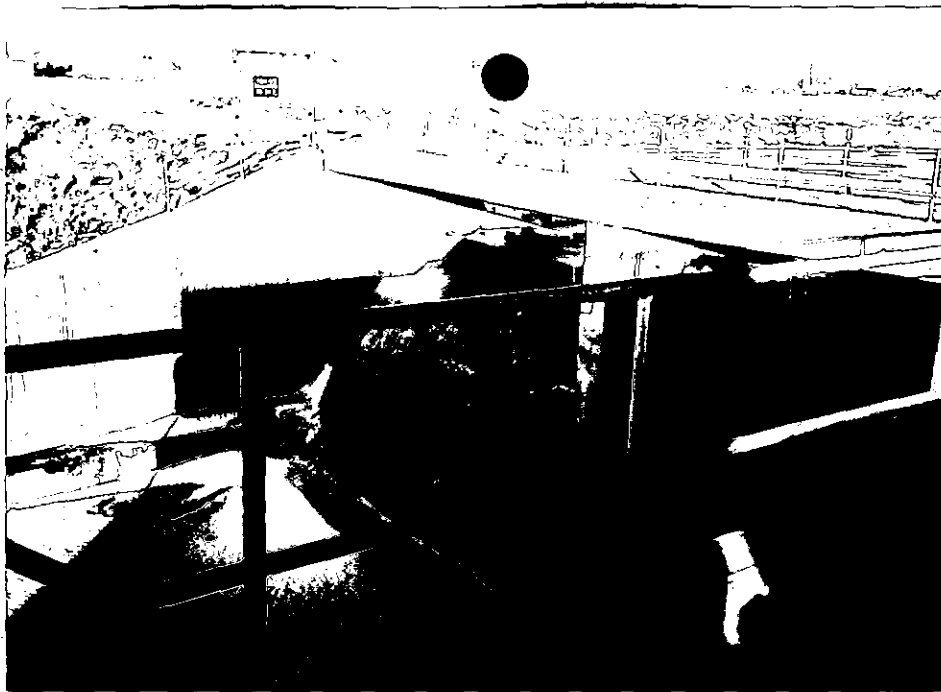
*Estimate, demand meter not stamping properly.

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DEC 04 1987

OLD LOWER PLANT

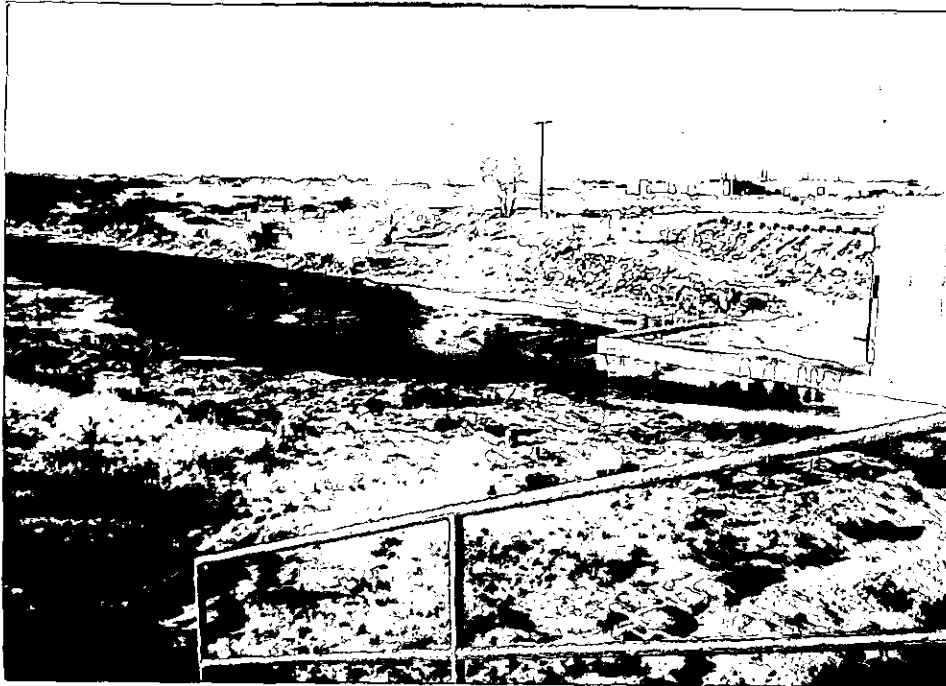
	<u>1985</u>		<u>1986</u>		<u>1987</u>		<u>1988</u>	
	<u>kWh</u>	<u>kW</u>	<u>kWh</u>	<u>kW</u>	<u>kWh</u>	<u>kW</u>	<u>kWh</u>	<u>kW</u>
Jan	796,800	1,632			607,000	1,720		
Feb	580,800	1,584			342,000	810		
Mar	710,400	3,360	1,214,400	3,160	145,000	3,270		
Apr	2,092,800	4,120	1,929,600	3,016	311,000	2,560		
May	2,208,000	3,552	1,824,000	2,592	600,000	2,950		
Jun	1,032,000	3,304	1,646,400	2,632	313,000	3,080		
Jul	936,000	3,376	1,564,800	6,350	0	0		
Aug	0	0	52,800	864	0	0		
Sep	0	0	110,400	1,680	0	0		
Oct	0	0	392,000	1,630	0	0		
Nov	0	0	692,000	1,610	0	0		
Dec	0	0	780,000	1,650	0	0		
	<u>8,626,800</u>		<u>10,206,400</u>		<u>2,318,000</u>			

MICROFILMED
DEC 04 1997



Spillway

(01-7013
upper plant)



Tailrace



Powerhouse

MICROFILMED
DEC 04 1987

**ELLSWORTH
ENGINEERING, INC.**

P.O. Box 1822 • 140 N. Corner Ave. - now 1020 E. Lincoln Rd.
Idaho Falls, Idaho 83401
(208) 523-1662
3/2/87

RECEIVED
MAR 18 1987

Department of Water Resources
Eastern District Office

March 17, 1987

Mr. Ronald Carlson, Manager
Idaho Department of Water Resources
150 Shoup Avenue, Suite 15
Idaho Falls, Idaho 83401

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DEC 08 1987

Re: City of Idaho Falls

Department of Water Resources

Dear Mr. Carlson:

The City of Idaho Falls has recently retained Ellsworth Engineering, Inc. to conduct the field examinations for determining the extent of beneficial use on the following permits: 01-7013; 01-7014; 01-7015; 01-7023; 01-7024; and 01-7025. Enclosed are the information sheets for each of the permits which indicate that the City has elected to secure their own examiners. Please note that all information sheets were signed March 16, 1987 which date is prior to the sixty days allowed for in your letter of transmittal dated January 26, 1987.

These examinations will be conducted by Rance Bare, Certification Number 87-115 of our office.

If there should be any questions, please call.

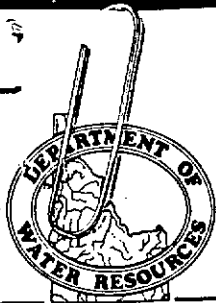
Yours truly,

ELLSWORTH ENGINEERING, INC.

Rance
Rance Bare, P.E.

cc: City Electric Division

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DEC 6 4 1987



STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

EASTERN REGION

John V. Evans
Governor

150 Shoup — Suite 15
Idaho Falls, Idaho 83402
(208) 525-7161

A. Kenneth Dunn
Director

January 26, 1987

01-7013
CITY OF IDAHO FALLS
C/O G. S. HARRISON
P.O. BOX 220
IDAHO FALLS, ID 83401

EXAMINATION FEE NOTICE



Dear Permit Holder:

Department records show that proof of beneficial use has been submitted for the above-referenced permit, but that a field examination has not yet been conducted to determine the extent of beneficial use of the water for licensing purposes.

House Bill 671 (effective April 4, 1986) enacted by the 1986 Idaho Legislature requires the payment of a fee before this Department can conduct the field examination needed to issue a license confirming use of water under the permit. This letter is notification that the license examination fee is due within sixty (60) days of the date of this letter. The examination fee information sheet (enclosed) must be returned with the fee.

As an alternative to submitting the fee, the Department will accept a field examination report completed by a certified water right examiner from the private sector. If you choose to have the examination done by a certified water right examiner, you need not submit the license examination fee to the Department, but you must within sixty (60) days of the date of this letter return to the Department, the examination fee information sheet showing appropriate information together with a statement from the certified examiner to verify that you have retained a certified examiner to conduct the field examination. If you choose this alternative, a completed field examination report must be submitted within one year of the date of this letter. You cannot later change your decision to use this alternative and submit the fee needed for the Department to conduct the field examination, but you may change to another certified examiner.

Certified water right examiners are licensed engineers, geologists, or land surveyors certified by the Department to conduct water right examinations. The procedure for certifying examiners results from the recently enacted HB 671 and is being developed at this time. A listing of certified water right examiners will be available from this Department when examiners have been certified.

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DEC 0 4 1997

If your permitted use, in fact, has already been examined by the Department and you have not asked to have the examination repeated, the fee requirement is not applicable to your permit. If you believe this is the case, please contact the Department.

The license examination fee is to be based on the amount of water you indicate you have developed, as listed in item 6 on the examination fee information sheet. The amount of water on which the examination fee is based can be less than the permitted amount, if less water has been diverted and beneficially used. The licensed amount of water, however, will not exceed the amount you claim on the examination fee information sheet. The enclosed license examination fee schedule shows a listing of applicable fees.

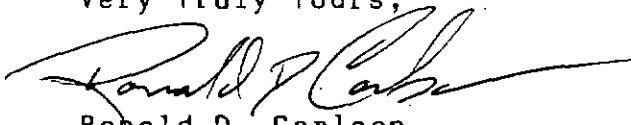
FAILURE TO SUBMIT WITHIN THE SIXTY (60) DAY PERIOD THE FEE OR THE STATEMENT THAT A CERTIFIED EXAMINER HAS BEEN RETAINED TO MAKE THE FIELD EXAMINATION WILL BE CAUSE TO ADVANCE THE PRIORITY OF THE PERMIT ONE DAY FOR EACH DAY THAT THE FEE SUBMITTAL IS LATE.

FAILURE TO SUBMIT THE FEE OR THE COMPLETED FIELD EXAMINATION REPORT WITHIN A YEAR WILL BE CAUSE TO CONSIDER THE PROOF OF BENEFICIAL USE TO BE INCOMPLETE AND TO LAPSE THE PERMIT.

The attached examination fee information sheet and the fee may be submitted to the following Department office:

Eastern Region
Idaho Dept. of Water Resources
150 Shoup Ave., Suite 15
Idaho Falls, Idaho 83401
Phone: 525-7161

Very Truly Yours,



Ronald D. Carlson
Eastern Regional Manager

Enclosures

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DEC 04 1997



STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES EASTERN REGION

John V. Evans
Governor

A. Kenneth Dunn
Director

150 Shoup
Idaho Falls, Idaho 8340
(208) 525-7161

March 23, 1983

City of Idaho Falls
c/o G.S. Harrison
P.O. Box 220
Idaho Falls, ID 83401

RE: Permits Nos. 01-7014, 01-7023, 01-7024, 01-7025, 01-7013, 01-7015

Dear Sir:

We acknowledge receipt of your statement submitted as proof of beneficial use for the above referenced permit.

Before a license can be issued, a field examination must be made by a representative of this Department.

_____ A field examination of your system has been scheduled for _____.

If this time and date is not convenient for you, please contact this office as soon as possible.

☒ A field examiner will contact you to arrange to examine your system.

If you have any questions regarding the field examination, please contact this office.

Sincerely,

KEITH C. WILSON
Sr. Resource Agent

KCW:cw

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DEC 04 1997

PLACE
13 CENT
STAMP
HERE

RECEIVED

FEB 18 1983

Department of Water Resources



IDAHO DEPARTMENT OF WATER RESOURCES
STATEHOUSE
BOISE, IDAHO 83720

MAILED

DEPARTMENT OF WATER RESOURCES

The Idaho Department of Water Resources will consider this card as a statement that the permit holder(s) has completed development to the extent shown below of Permit No. 01-7013.

Name(s) of Permit Holder: CITY OF IDAHO FALLS c/o G.S. HARRISON

Post Office Address: P.O. Box 220, IDAHO FALLS, ID.

83402-0220

Tel. No. 529-1430

Source of Water: _____

Extent of Use:

- ☐ Domestic _____ (number of households)
☐ Stockwater _____ (number and type of stock)
☐ Irrigation _____ (acres)
☒ Other POWER PRODUCTION

Measuring Device:

Required?

☒ Yes ☐ No

Installed?

☒ Yes ☐ No

Access Port:

Required?

☐ Yes ☐ No

Installed?

☐ Yes ☐ No

The above information is a true statement of the extent to which the above numbered permit has been developed.

2/16/83

Date

Thomas Campbell Mayor
Signature of Permit Holder



ELECTRIC DIVISION

CITY OF IDAHO FALLS

P.O. BOX 220
IDAHO FALLS, IDAHO 83402-0220

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MAR 4 1983

Department of Water Resources

(208) 529-1430

March 3, 1983

Ms. Rita Fleck
Secretary/Records Manager
Idaho Department of Water Resources
Statehouse
Boise, Idaho 83720

Re: City of Idaho Falls, Hydroelectric Project.

Dear Ms. Fleck:

Enclosed are the statement of Beneficial use postcards signed
by the Mayor of Idaho Falls for the following Permit Nos.

Permit No. 01-7013
Permit No. 01-7014
Permit No. 01-7015
Permit No. 01-7023
Permit No. 01-7024
Permit No. 01-7025

Sincerely,

ELECTRIC LIGHT DIVISION

G.S. HARRISON
MANAGER

GSH-83-33/sp

Enclosures as stated

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State of Idaho

DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 450 W. State Street, Boise, Idaho

JOHN V. EVANS

Governor

A. KENNETH DUNN

Director

Mailing address:

Statehouse

Boise, Idaho 83720

(208) 334-4440

February 28, 1983

City of Idaho Falls
P. O. Box 220
Idaho Falls, ID 83402-0220

Attention: G. S. Harrison or Larry E. Felton

Gentlemen:

Re: Permit Nos. 01-7013, 01-7014, 01-7015, 01-7023, 01-7024, and 01-7025

Pursuant to your request to waive the measuring device requirement on the above-referenced permits, enclosed is a copy of the Order changing the condition.

Also enclosed are the Statement of Beneficial Use postcards received for the above-referenced permit. Please have an authorized agent for the City of Idaho Falls sign the postcard and indicate his title. Return the postcards to the Department before April 1, 1983 to keep the permits in good standing.

If you have any questions concerning these permits, please feel free to contact this office.

Sincerely,

RITA I. FLECK
Secretary/Records Manager

Enclosures

ENCLOSURE

INTER-DEPARTMENT MEMO — 1

FROM Keith Wilson

DATE 14 Feb 83

TO Jim Johnson

SUBJECT Idaho Falls Power Permits

Permits 01-7013/7014/7015/7023/7024/7025

Enclosed is the index test procedure and an example of the test conducted for their (Idaho Falls) power permits they wish to have the measuring device requirement removed from the permits in ^{lieu} of the index test which will give "power vs flow" curves. Hopefully this will assist the department make their decision.

P.S. Also reference Corps of Engr. 1 May 63 pub. "Turbine Testing by Gibson + Index Methods"

Keith Wilson
SIGNATURE

5.5.1 Evaluation of the Results

EXAMPLE

Fix Data	Prototype - Throat Diameter	DA	m	6.3
	Model - Throat Diameter	DM	m	0.34
	Inlet Measuring Section - Area	Fe	mm ²	656894.00
	Outlet Measuring Section - Area	Fa	mm ²	306296.00
	Length of the Lever	L	mm	1145.92
Measuring Data	Barometric Head	Bo	mWC	9.95928
	Prototyp Net Head	HA	mWC	8.1000
	Measuring Point Number			1.000
	Wicket Gate Opening	a ₀	mm	54.000
	Water Temperature	tw	°C	19.100
	Manometric Head on the Model	Hmano	mWC	8.190
	Weight = Force on the Lever	G	kp	24.168
	Speed	nM	rpm	1530.800
	Pressure difference on the Venturitube	hQ	mmHg	334.200
	Suction Head	Hs	mWC	- 9.250
	Jager-Number = $\frac{1}{\sqrt{hQ}} \cdot (hQ/\gamma H_2O)^{0.5}$	JA		17.83370
	Calibration Factor of the Venturitube	C		33.98000
Results	Model - Discharge	QM	lit/s	621.69293
	Model Net Head	Heff	mWC	8.03831
	Model Speed referred to the Prototype	n	rpm	1536.80537
	Discharge on the Prototype	QA	m ³ /s	214.26238
	Referred Discharge for DA = 1m and HA = 1m	Q11	m ³ /s	1.89680
	Prototype Output	PA	kW	15638.07773
	Referred Output for DA = 1m and HA = 1m	P11	kW	17.09129
	Model Efficiency	η	(%)	91.88228
	Cavitation Number	σ	-	2.36722

Example for Measuring Point Number 1: Record Sheet PM 2 - 01

Info for the Model



5.5.2 Sample Computation of a Measuring Point

Efficiency, model -, prototype - and unit values are computed by means of the following formulas:

(measuring point No. 1 - sheet PM2-01)

Model discharge: Q_M

water temperature $t_w = 19^\circ \rightarrow \nu = 1.02591 \cdot 10^{-6} \text{ m}^2/\text{s}$
 $\delta_{H_2O} = 0.9984 \text{ kp/lit}$

$$J_d = \frac{1}{\nu} \cdot (h_Q / \delta_{H_2O})^{0.5} = \frac{1}{1.02591} \cdot \sqrt{\frac{334.2}{0.9984}} = 17.93$$

$C = 33.98$ (see diagr. D - 1.000 - 106.3 in the ASTRO Test Report)

$$Q_M = C \cdot (h_Q / \delta_{H_2O})^{0.5} = 33.98 \cdot \sqrt{\frac{334.2}{0.9984}} = \underline{621.69 \text{ lit/s}}$$

Effective model head: H_{eff}

$$H_{dyn} = \left(\frac{Q_M}{1000} \right)^2 \cdot \frac{1}{2g} \cdot \left(\frac{1}{F_e^2} - \frac{1}{F_d^2} \right) = \left(\frac{621.69}{1000} \right)^2 \cdot \frac{1}{19.62} \cdot \left(\frac{1}{0.306295^2} - \frac{1}{0.656894^2} \right)$$

$$H_{dyn} = 0.1643 \text{ m} \quad H_{STAT} = H_{MANO} \cdot \frac{1000}{\delta_{H_2O}}$$

$$H_{eff} = H_{STAT} + H_{dyn} = \frac{8.19 \cdot 1000}{998.4} - 0.1643 = \underline{8.039 \text{ m}}$$

Model speed referred to the prototype: n

$$n = n_M (H_A / H_M)^{0.5} = 1580.8 \cdot (8.1 / 8.0388)^{0.5} = \underline{1586.8}$$

Prototype - and unit discharge: Q_A, Q_{11}

$$Q_A = Q_M \cdot \left(\frac{D_A}{D_M} \right)^2 \cdot \sqrt{\frac{H_A}{H_M}} = 0.6217 \cdot \left(\frac{6.3}{0.34} \right)^2 \cdot \sqrt{\frac{8.1}{8.0388}} = \underline{214.26 \text{ m}^3/\text{s}}$$

$$Q_{11} = \frac{Q_A}{D_A^2 \sqrt{H_A}} = \frac{214.26}{6.3^2 \cdot \sqrt{8.1}} = \underline{1.8968}$$

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MAY 1 1964

Efficiency: η

$$\eta = 100 \cdot \frac{G \cdot L \cdot \pi \cdot n_M}{30 \cdot Q_M \cdot H_{eff} \cdot g} = 12 \cdot \frac{24.168 \cdot 1580.8}{0.6217 \cdot 8.039 \cdot 998.4} = \underline{91.88 \%}$$

Model -, prototype - and unit output: P_M, P_A, P_{11}

$$P_M = Q_M \cdot H_{eff} \cdot g \cdot \eta \cdot 9.80665 \cdot 10^{-3} = \underline{44.959697 \text{ kW}}$$

$$P_A = P_M \cdot \frac{g_A}{g_M} \cdot \left(\frac{D_A}{D_M} \right)^2 \cdot \left(\frac{H_A}{H_M} \right)^{\frac{3}{2}} = 44.959697 \cdot \frac{1000}{998.4} \cdot \left(\frac{5.3}{0.34} \right)^2 \cdot \left(\frac{8.1}{8.039} \right)^{\frac{3}{2}} = \underline{15638 \text{ kW}}$$

$$P_{11} = \frac{P_A}{D^2 \cdot H^{1.5}} = \frac{15638}{6.3^2 \cdot 8.1^{1.5}} = \underline{17.09 \text{ kW}}$$

Cavitation number: σ

$$\sigma = \frac{1}{H_{eff}} (B_0 - p_d - H_s) = \frac{9.959 - 0.18 + 9.25}{8.039} = \underline{2.367}$$

Nomenclature not included in the evaluation of results:

g (kp/lit) specific weight of water
 ν (m²/s) kinematic viscosity of water
 H_{STAT} (m WC) static test head
 p_d (m WC) vapour pressure of water

11.2 Prototype Hill Diagram11.2.1 Sample Computation for Efficiency Step-Up

According to the specification for efficiency step-up the HUTTON-formula was used for each point:

$$\frac{1 - E_P}{1 - E_M} = 0.3 + 0.7 \cdot \left(\frac{D_M}{D_P}\right)^{0.2} \cdot \left(\frac{H_M}{H_P}\right)^{0.1}$$

$$H_M/H_P = 1.38$$

E efficiency (-)

D runner diameter (m)

Subscripts: M model

P prototype

$$1 - E_P = (1 - E_M) \cdot (0.3 + 0.7 \cdot \left(\frac{D_M}{D_P}\right)^{0.2} \cdot \left(\frac{H_M}{H_P}\right)^{0.1})$$

$$E_P = 1 - (1 - E_M) \cdot (0.3 + 0.7 \cdot (D_M/D_P)^{0.2} \cdot (H_M/H_P)^{0.1})$$

Sample computation for operating point at full gate opening:

$$H = 18 \text{ ft}$$

$$D_P = 485 \text{ m} = 15.91 \text{ ft}$$

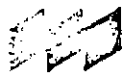
$$P = 8300 \text{ kW}$$

$$n_P = 9473 \text{ rpm}$$

$$Q_P = 5977 \text{ cfs}$$

$$Q_{11} = 0.5521 \frac{5977}{15.91^2 \cdot \sqrt{18}} = 3.07$$

$$n_{11} = 0.5521 \frac{94.73 \cdot 15.91}{\sqrt{18}} = 196.13$$



VOEST-ALPINE AG
Maschinenbau

IDAHO FALLS HYDROELECTRIC PROJECT

S.O. 5644/10714

TLM 2

Page 27

From model hill diagram MB 9-908.4514:

$$E_M = 88.0 \%$$

$$D_P = 4.85 \text{ m}$$

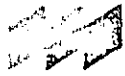
$$D_M = 0.34 \text{ m}$$

$$E_P = 1 - (1 - 0.88) \cdot (0.3 + 0.7 \cdot \left(\frac{0.34}{4.85}\right)^{0.2} \cdot 1.38^{0.1})$$

$$E_P = 91.30 \%$$

=====

MB 9-908.4514



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Maschinenbau

IDAHO FALLS HYDROELECTRIC PROJECT

S.O. 5644/10714

TLM 2

Page 28

11.2.2 Prototype Hill Diagram

Scaling up the model hill diagram with the aforementioned HUTTON formula point by point the guaranteed prototype hill diagram for IDAHO FALLS Hydroelectric Project was plotted (MB 9-908.4575).

MB 8-153.0062

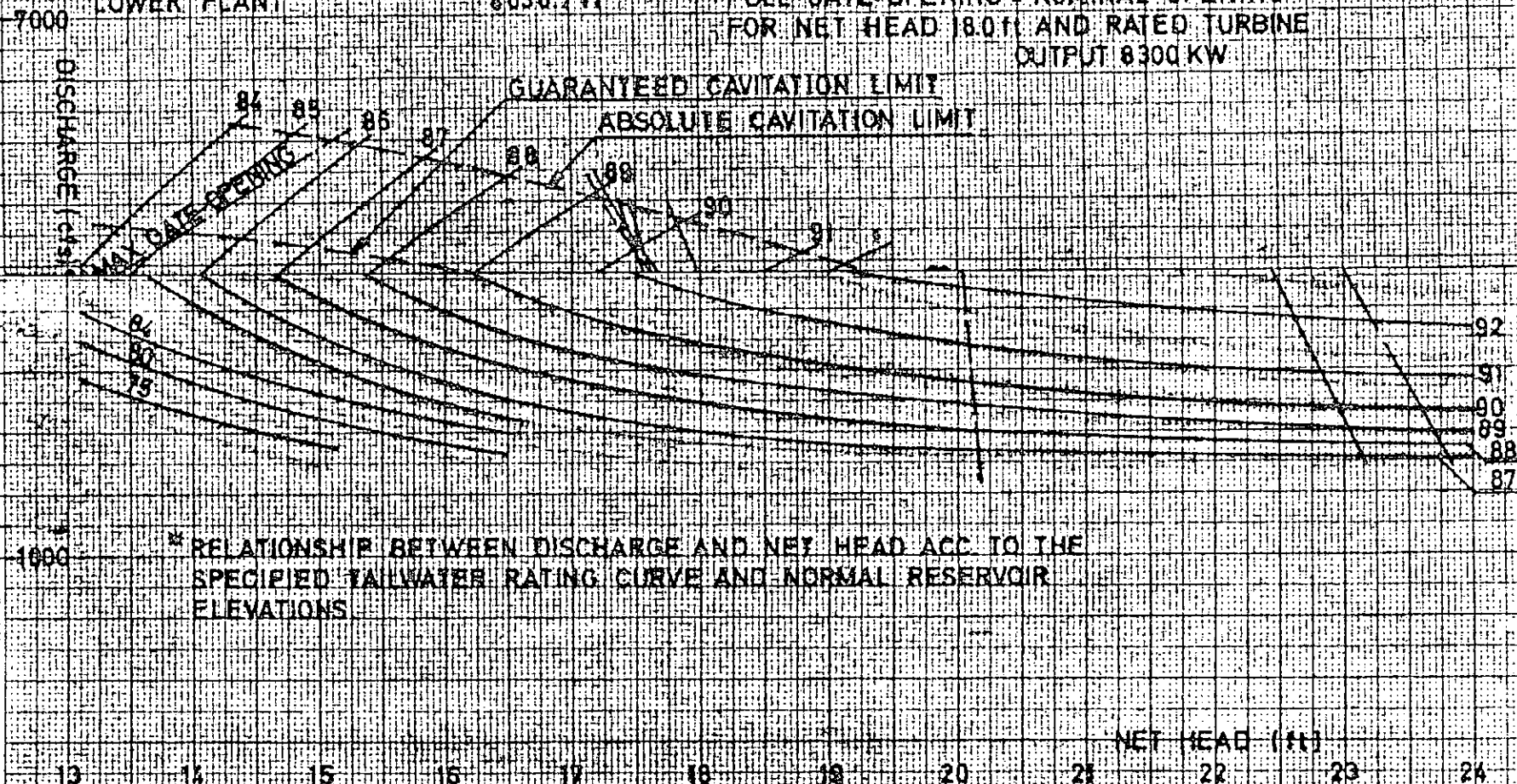
TOLERANCE OF MEASUREMENT (EC

RUNNER DIAMETER (4.85 m) 190 1/8 inch
 SYNCHRONOUS SPEED 94.73 rpm
 CENTERLINE RUNNER
 UPPER PLANT 4896.3 ft
 CITY PLANT 4657.2 ft
 LOWER PLANT 4636.7 ft

THE CAVITATION LIMITS ARE BASED ON THE
 FOLLOWING NORMAL RESERVOIR ELEVATIONS:

UPPER PLANT CITY PLANT LOWER PLANT
 4734.0 ft 4694.25 ft 4674.0 ft

FULL GATE OPENING = NOMINAL OPENING
 FOR NET HEAD 18.0 ft AND RATED TURBINE
 OUTPUT 8300 KW



A P P E N D I X

13. Cavitation Observation for Idaho Falls HEP

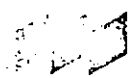
The layout of the bulb turbine for Idaho Falls HEP is based on the cavitation tests carried out with the model for MELK power station.

On the sheets MB 9-908.4576/1+3 prototype efficiency η_p and prototype discharge Q_p versus cavitation number σ and cavitation pictures for σ referred to the shaft centerline and σ referred to the upper blade tip are plotted for three points near to the guaranteed cavitation limit.

These three points are:

H (ft.)	Q (cfs.)
22	5525
17.9	6090
14	6345

MB 8-158.0062



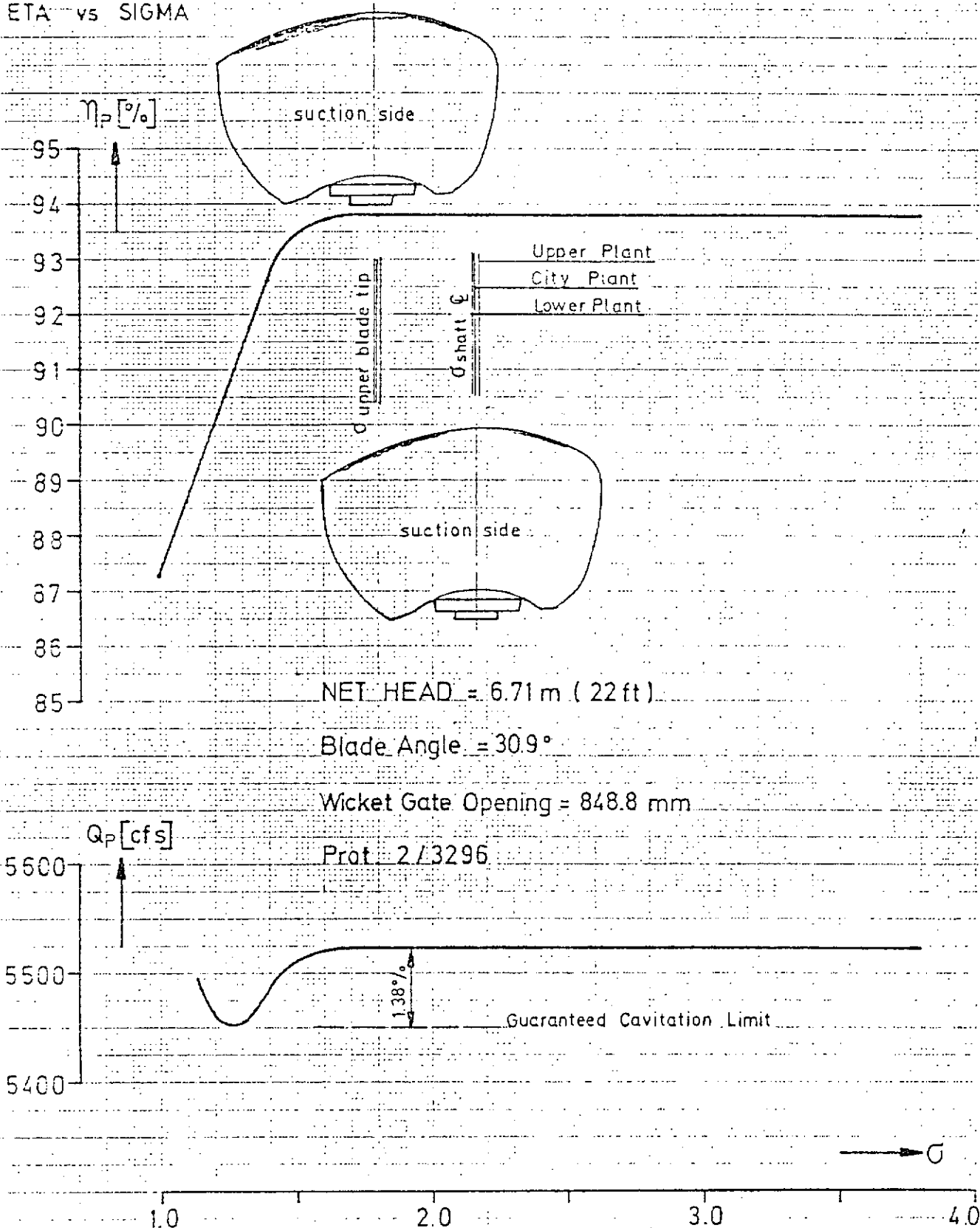
VOEST-ALPINE AG
Friedrich-Lenz

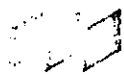
IDAHO FALLS HYDROELECTRIC PROJECT S.O. 5644 / 10714

TLM 2

MODEL 344 - 4

ETA vs SIGMA





VOEST-ALPINE AG
Energiebereich Linz

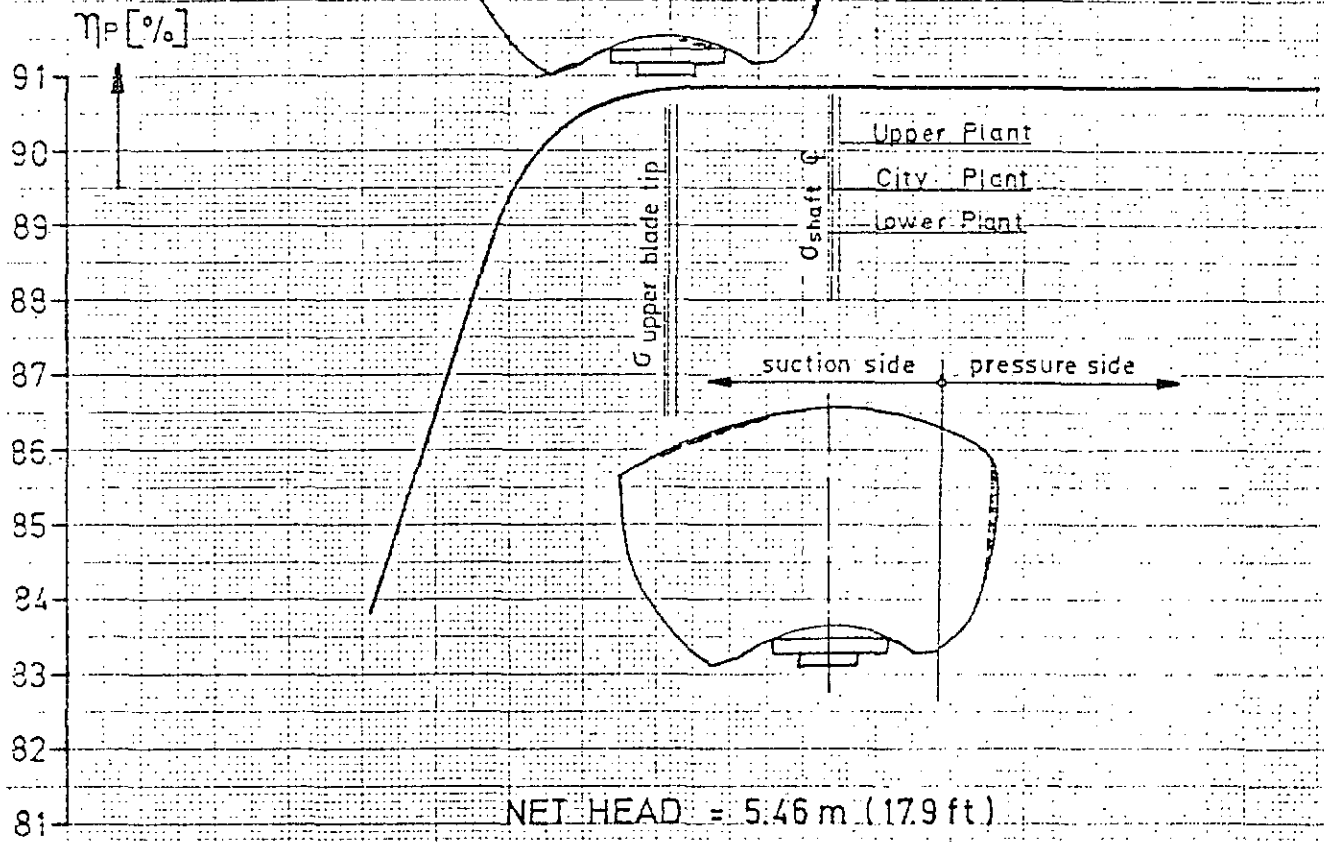
IDAHO FALLS HYDROELECTRIC PROJECT

S.O. 5644/10714

TLM 2

MODEL 344-4

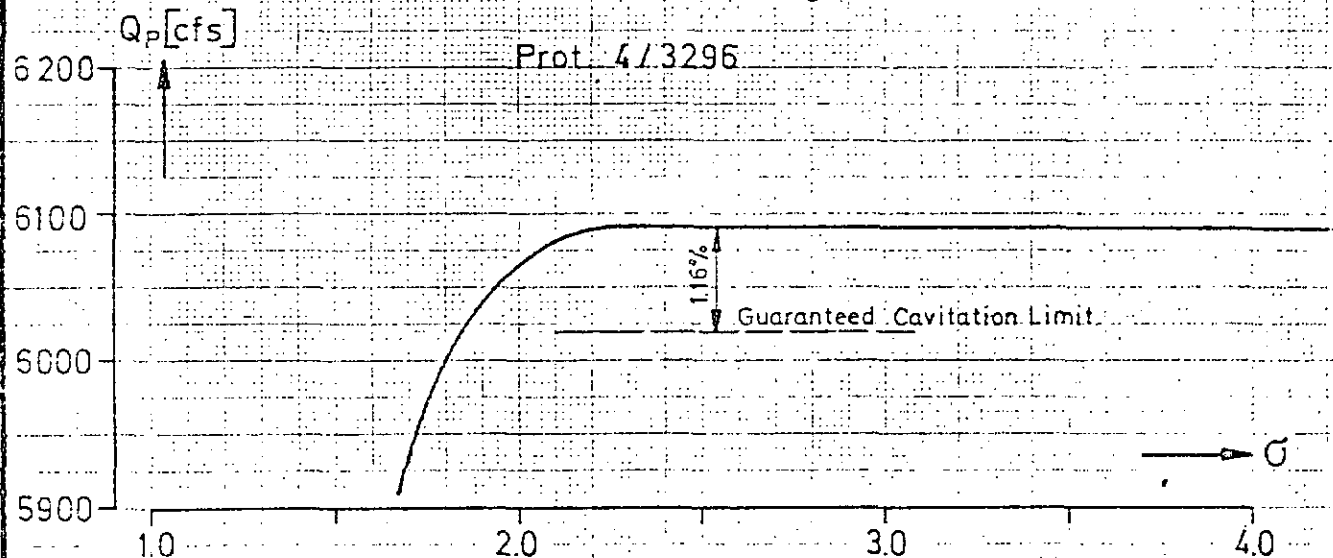
ETA vs. SIGMA

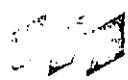


Blade Angle = 33.25°

Wicket Gate Opening = 884.4 mm

Prot. 4/3296





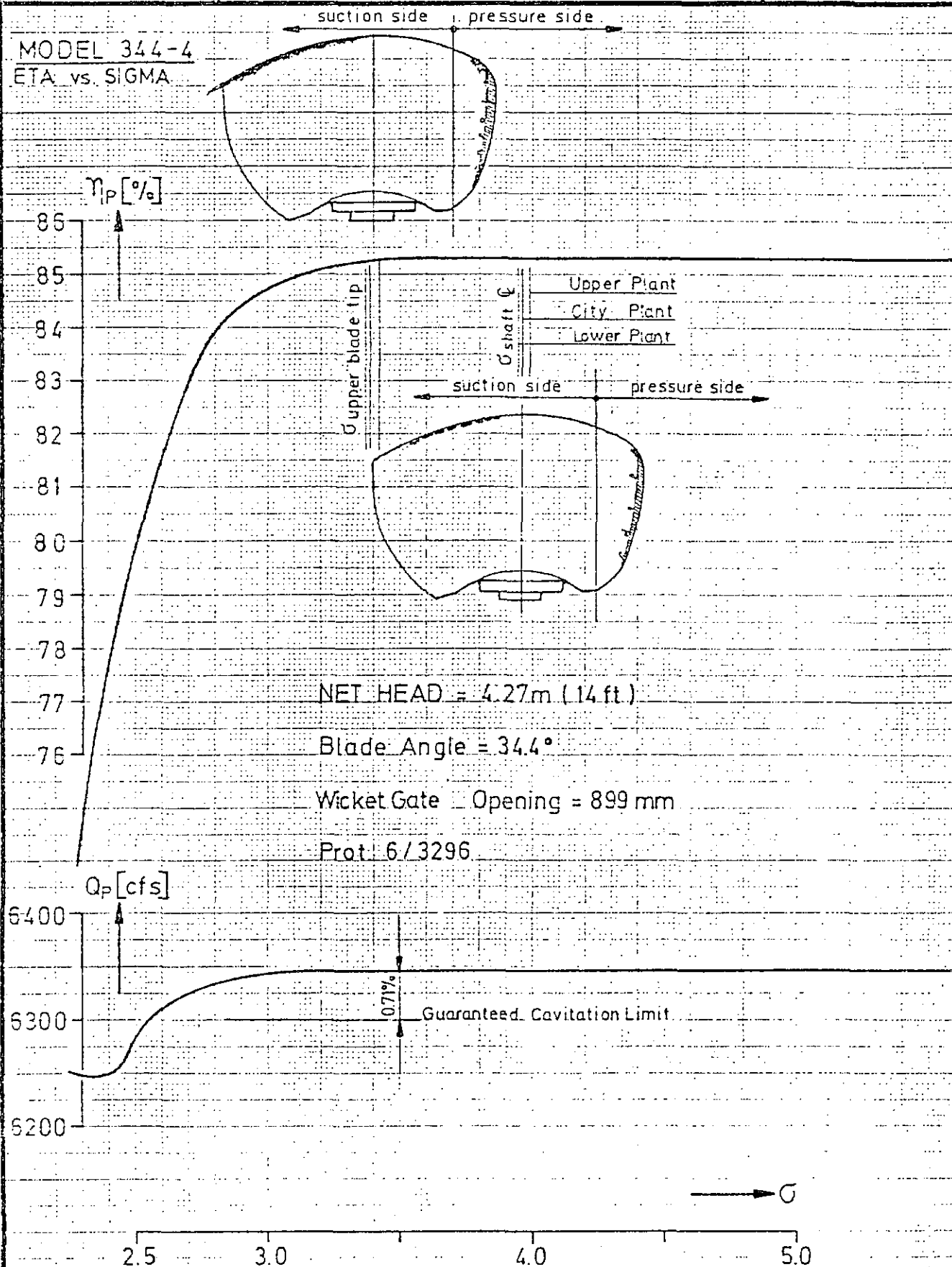
VÖEST-ALPINE AG
Finalbereich Linz

IDAHO FALLS HYDROELECTRIC PROJECT

S.O. 5644/10714

TLM 2

MODEL 344-4
ETA vs. SIGMA



Robert Chappell
International Engineering Co., Inc.

Att.: Mr. Pablo Chavez

180 Howard Street

SAN FRANCISCO, CA 94105/USA

TLM1/Scha/sa/2409.

August 20, 82

Idaho Falls
S.O. 5644/10714

Your telexes xnh204 dated August 6th, 1982 and xnh210 dated August 11th, 1982.

Enclosed please find the requested index test procedure MB9-350.0070E for your information.

The governor is designed regarding isolated load operation as stipulated in Specification Section 15981, 1-3 with the speed no load parameter settings. The dampening selection for speed no load respectively isolated load operation will be optimized between both operating modes.

However, if selection of individual dampening for isolated load operation is requested, five different dampening settings can be chosen by remote selector switch. This can be installed and we have to charge you with arising cost.

Index tests will be performed as required on all three units.

Very truly yours,

VOEST-ALPINE AG

[Signature]
I.V.

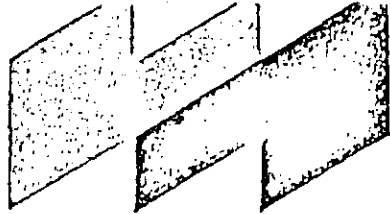
[Signature]
I.A.

Enzenhofer

Haslinger

ENCLOSURE
Encls: 2
as cited above

8009-210
DATE



VOEST-ALPINE

FINISHED PRODUCTS DIVISION LINZ
HYDRO TURBINES

INDEX TEST PROCEDURE
FOR KAPLAN BULB TURBINE

FOR
IDAHO FALLS

Prepared by: Ing. Schatz Johannes
Linz, August 1982

MB9-350.0070 E

Page 1 - 8

VOEST-ALPINE AG, Postfach 2, A-4010 Linz, Austria

GENERAL

The tests will be carried out in accordance with IEC-Code Publication 41.

1. Observation Stations and Test Equipment

1.1 Static Pressure Head Turbine Inlet H stat 1:

✓ The H stat 1 is measured at the turbine inlet section after the trash rack in the chamber of the stop logs.

1.2 Static Pressure Head Turbine Outlet H stat 2:

The H stat 2 is measured at the turbine outlet section in the chamber of the tailwater stop logs. *ND*

1.3 Headwater Level:

✓ The free water level is measured after the trash rack using a plate gauge.

1.4 Tailwater Level:

✓ The free water level is measured using a plate gauge.

1.5 Turbine Output Pt:

✓ The measurement of the turbine output Pt is done indirectly by determining the generator output Pg using an accurate wattmeter and taking into consideration the guaranteed generator efficiency. *OK*

1.6 Servomotor Stroke Wicket Gate SM :

The servomotor stroke SM is measured directly on the piston rod of the servomotor using a measuring tape.

(K) HALZBACHNER

EF-35003

MB9-350.0070 E



1.7 Runner Blade Angle ϕ :

The runner blade angle is read directly on the runner blade position indicator mounted on the oil head.

1.8 Turbine Discharge Q_t :

The measurement of Q_t is done indirectly by determining the differential pressure D with a differential pressure transmitter.

The differential pressure is picked-up between the taps fixed on the bulb case and the tap fixed in the generator bulb.

2. Measuring Procedure

Measurement is effected in manual mode.

Five different runner blade positions are set, whereby for each blade position the Kaplan curve is determined with 6 to 8 different wicket gate positions. For each wicket gate position measurements are taken for 10 minutes, whereby readings of the different values are effected at intervals of 30 sec. each.

The respective average value is used for calculating the discharge and efficiency and the result is entered in a diagram.

3. Notations

SM	(inch)	Wicket Gate-Servomotor Stroke
ϕ	(degrees)	Runner Blade Position
H ~~stat~~ 1	(ft)	~~Static~~ Pressure Head Turbine Inlet
H ~~stat~~ 2	(ft)	~~Static~~ Pressure Head Turbine Outlet
v1	(ft/s)	Water Discharge Velocity in Turbine Inlet Section
v2	(ft/s)	Water Discharge Velocity in Turbine Outlet Section
hv1	(ft)	Velocity Head in Turbine Inlet Section
hv2	(ft)	Velocity Head in Turbine Outlet Section
HW	(ft)	Headwater Level
TW	(ft)	Tailwater Level
Hn	(ft)	Net Head
E1	(ft)	Total Energy Potential Turbine Inlet
E2	(ft)	Total Energy Potential Turbine Outlet
g	(ft/s ²)	Gravitation Constant
γ	(lb/ft ³)	Specific Weight - Water
D	(ft)	~~Winter-Kennedy~~ Differential Pressure
k	(-)	~~WR~~ - Calibrating Factor

HUNGARIAN

HUNGARIAN

EF-35500



n (-) ~~HK~~ - Exponent

Qt (cfs) Turbine Discharge

Pd (kW) Hydraulic Power

Pt (kW) Turbine Output

Pg (kW) Generator Output

eta g (%) Generator Efficiency
(guaranteed)

eta t (%) Turbine Efficiency

Ptr (kW) Reference Turbine Output

Qtr (cfs) Reference Turbine Discharge

Hr (ft) Reference Net Head

MB9-350.0070 E

MB9-350.0070 E

4. General Computation

4.1 Net Head:

$$H_n = E_1 - E_2 \quad (\text{ft})$$

$$E_1 = H_{\text{stat } 1} + h_{v1} \quad (\text{ft})$$

$$E_2 = H_{\text{stat } 2} + h_{v2} \quad (\text{ft})$$

$$h_{v1} = \frac{v_1^2}{2g} \quad (\text{ft})$$

$$h_{v2} = \frac{v_2^2}{2g} \quad (\text{ft})$$

$$v_1 = \frac{Q_t}{A_e}$$

$$v_2 = \frac{Q_t}{A_a} \quad (\text{ft/s})$$

4.2 Turbine Discharge:

$$Q_t = k \cdot D^n \quad (\text{cfs})$$

$$n = 0,5$$

$$k = \frac{Q_t}{\sqrt{D}}$$

For determining k the first test run is carried out approx. peak efficiency for the pertaining net head.

Q is calculated with the efficiency taken from the hill diagram acc.:

$$Q = \frac{P_t}{H_n \cdot \eta_t \cdot \gamma \cdot k} \quad \text{Use diff. Symbol} \quad k = \frac{1356}{1000,000}$$

As net head H_n is depending on discharge Q several iteration steps have to be performed using in the first step an estimated discharge close to the expected one.

4.3 Hydraulic Power:

(power available to picked up by the turbine)

$$P_d = Q_t \cdot H_n \cdot \gamma \cdot \frac{1356}{1000} \quad (\text{KW})$$

4.4 Turbine Output:

(mechanical power available at the turbine shaft)

$$P_t = \frac{P_g}{\eta_{tg}} \quad (\text{KW})$$

4.5 Turbine Efficiency:

$$\eta_t = \frac{P_t}{P_d} \cdot 100 \quad (\%)$$

4.6 Reference Turbine Output and Reference Turbine Discharge at Constant Net Head:

$$P_{tr} = P_t \cdot \left[\frac{H_r}{H_n} \right]^{3/2} \quad (\text{KW})$$

$$Q_{tr} = Q_t \cdot \left[\frac{H_r}{H_n} \right]^{1/2} \quad (\text{cfs})$$

4.7 Calculation of the Value for Probable Inaccuracy f_z 4.7.1 Discharge

Measurement of Winter-Kennedy differential pressure by means of differential pressure transmitter.

$$f_Q = \pm 1.0 \%$$

4.7.2 Net Head

Measurement of free water level by means of plate gauge.

$$f_h = \pm 0.8 \%$$

4.7.3 Turbine Output

Measurement of generator output by means of watt-hour-meter.

$$f_p = \pm 0.8 \%$$

4.7.4 Efficiency

The probable inaccuracy f_η of the turbine efficiency determination is computed from the estimated individual inaccuracies by

$$f = \pm \sqrt{f_Q^2 + f_H^2 + f_P^2}$$

$$f = \pm \sqrt{1.0^2 + 0.8^2 + 0.8^2} =$$

$$f = \pm 1.51 \%$$

=====



CITY OF IDAHO FALLS

P.O. BOX 220
IDAHO FALLS, IDAHO 83402-0220

ELECTRIC DIVISION

(208) 529-1430

February 16, 1983

RECEIVED

FEB 16 1983

Department of Water Resources

Ms. Rita Fleck
Secretary/Records Manager
Idaho Department of Water Resources
Statehouse
Boise, Idaho 83720

Re: Flow Measuring Device Requirement for City of Idaho Falls
Hydroelectric Project.

Dear Ms. Fleck:

Enclosed as requested are completed "Statement of Beneficial Use" cards you sent the City of Idaho Falls January 31, 1983, regarding Water Permit Numbers 01-7013, 01-7014, 01-7015, 01-7023, 01-7014, and 01-7025. These permits allow the City non-consumptive use of up to 6,000 cfs for power production purposes at the City's three recently completed hydroelectric projects.

One of your Department's conditions of approval is that the City install a permanent flow measuring device at each point of use. Since this is a nonconsumptive use permit, the City of Idaho Falls respectfully requests that the Idaho Department of Water Resources waive this requirement because the City can accurately determine flow from power production records. Each of the three plants has been index tested which is a standard method of determining the efficiency at which they utilize the water. The test results establish a flow versus power curve for each project. The City proposes to use these curves to determine flow on an hour by hour basis in lieu of other types of flow measuring devices. The particulars of index testing and the above request has been discussed with Keith Wilson of the Department of Water Resources, Idaho Falls Office. He should be communicating his opinion of our request for waiver with your office in the near future.

Please inform us of the Department's decision regarding this matter. If we can be of any further assistance, please let us know.

Sincerely,

ELECTRIC LIGHT DIVISION

Larry E. Felton

LARRY E. FELTON
ELECTRICAL ENGINEER

LEF-83-008/sp
00511

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

STATEHOUSE
BOISE, IDAHO 83720
(208) 334-4440
CERTIFIED MAIL

138142

CITY OF IDAHO FALLS
C/O G. S. HARRISON
P.O. BOX 220
IDAHO FALLS, ID 83401

PROOF DUE NOTICE

JANUARY 31, 1983

DEAR PERMIT HOLDER:

ONE OF THE CONDITIONS OF APPROVAL OF YOUR WATER PERMIT NO. 01-7013 WAS THAT PROOF OF THE EXTENT OF YOUR BENEFICIAL USE MUST BE SUBMITTED TO THIS OFFICE ON OR BEFORE APRIL 01, 1983. (SEE LAST PAGE OF YOUR APPROVED PERMIT OR YOUR LAST APPROVED EXTENSION REQUEST). ENCLOSED IS A POSTCARD WHICH MAY BE USED TO SUBMIT THE REQUIRED PROOF.

IF YOU HAVE NOT FULLY COMPLETED YOUR PROJECT, AND YOU OR A PREVIOUS OWNER OF THIS PERMIT HAVE NOT RECEIVED A PRIOR EXTENSION OF TIME, YOU MAY REQUEST AN EXTENSION OF TIME IF THE DELAY IS FOR REASONABLE CAUSE AS PROVIDED IN SECTION 42-204, IDAHO CODE. IF YOU HAVE BEEN PREVENTED FROM PROCEEDING BY A GOVERNMENTAL AGENCY OR BY LITIGATION, MORE THAN ONE EXTENSION OF TIME CAN BE GRANTED. AN EXTENSION OF TIME REQUEST FORM IS ENCLOSED FOR YOUR CONVENIENCE.

EITHER THE BENEFICIAL USE POSTCARD OR A REQUEST FOR AN EXTENSION OF TIME MUST BE RECEIVED BY THIS DEPARTMENT ON OR BEFORE THE ABOVE DESCRIBED PROOF DUE DATE. IF NEITHER IS RECEIVED, THE DEPARTMENT WILL SEND YOU A LAPSE NOTICE. WITHIN SIXTY (60) DAYS OF THE MAILING OF THE LAPSE NOTICE, THE PERMIT WILL NO LONGER BE OF ANY FORCE NOR EFFECT.

SINCERELY,

RITA FLECK
SECRETARY/RECORDS MANAGER

ENCLOSURES

INTER-DEPARTMENT MEMO — 1

FROM Dave Tuthill

DATE 3-6-79

TO Donna Henriques

SUBJECT 01-7013

In the attached memo you described a possibility of obtaining a "hand copy" of the publication affidavit. Please make this copy, attest to its accuracy with a notarized signature, and return it to me as soon as possible.

PROVIDED: SEE UNDER PERMIT
DRT 3-26-79

DPT

SIGNATURE

MICROFILMED

MEMO TO FILE

APPLICATION FOR PERMIT 01-7013

After contacting the newspaper a number of times in an effort to secure an affidavit for this application, we were informed they keep copies only for a period of one year. Since the legal notice was published Nov. 17 and 24, 1977, they only record they had of it was on microfilm. They do not have means of duplication from their microfilm, however, we were invited to copy from the microfilm by hand if we so desire.

DONNA HENRIQUES
Secretary

February 28, 1979

MICROFILMED



State of Idaho

DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 373 W. Franklin Street, Boise, Idaho

JOHN V. EVANS

Governor

C. STEPHEN ALLRED

Director

Mailing address:

Statehouse

Boise, Idaho 83720

(208) 384-2215

March 5, 1979

Re: Permit No.'s 01-7013, 01-7014, & 01-7015

City of Idaho Falls
c/o G. S. Harrison
P.O. Box 220
Idaho Falls, Idaho 83401

Dear Mr. Harrison:

Enclosed are copies of your approved Applications for Permit. We direct your attention to the conditions of approval as listed on the fourth pages.

Be sure to note the special conditions requiring you to install and maintain measuring devices at your points of diversion prior to submitting proof of beneficial use of water. We have enclosed a letter describing the different types of measuring devices accepted by this office.

Sincerely,

DAVID R. TUTHILL, JR.
Supervisor, Water Allocations Section

DRT:lr

Enc: 5

cc: Fremont-Madison Irrigation District

MICROFILMED



State of Idaho

DEPARTMENT OF WATER RESOURCES

STATE OFFICE, 373 W. Franklin Street, Boise, Idaho

JOHN V. EVANS
Governor

C. STEPHEN ALLRED
Director

Mailing address:
Statehouse
Boise, Idaho 83720
(208) 384-2215

March 5, 1979

Re: Permit No.'s 01-7013, 01-7014, & 01-7015

City of Idaho Falls
c/o G. S. Harrison
P.O. Box 220
Idaho Falls, Idaho 83401

Dear Mr. Harrison:

Enclosed are copies of your approved Applications for Permit. We direct your attention to the conditions of approval as listed on the fourth pages.

Be sure to note the special conditions requiring you to install and maintain measuring devices at your points of diversion prior to submitting proof of beneficial use of water. We have enclosed a letter describing the different types of measuring devices accepted by this office.

Sincerely,

DAVID R. TUTHILL, JR.
Supervisor, Water Allocations Section

DRT:lr

Enc: 5

cc: Fremont-Madison Irrigation District

RECEIVED
MAR 10 1979
STATE OF IDAHO

FREMONT-MADISON IRRIGATION DISTRICT

ST. ANTHONY, IDAHO 83445

January 31, 1979

RECEIVED

FEB 1 1979

Department of Water Resources
Eastern District Office

Mr. Ronald Carlson
Department of Water Resources
1515 Lincoln Road
Idaho Falls Idaho 83401

Dear Mr. Carlson:

The Fremont-Madison Irrigation District hereby withdraws its protest against the applications of the City of Idaho Falls, Nos. 017013, 017014, and 017015, and future applications it may deem necessary to file pertaining to the same purposes set forth in the above numbered applications, providing that the Department of Water Resources, in granting any such permits, make such permits subject to upstream agricultural development.

Also, that the granting of such permits does not in any way abrogate or change in any manner that certain Contract between the United States of America, Fremont-Madison Irrigation District, City of Idaho Falls, and the Utah Power & Light Company dated September 28, 1935.

Yours very truly,

FREMONT-MADISON IRRIGATION DISTRICT

J. Max Mortensen

By:

J. Max Mortensen
Chairman

S

cc - Mr. Kent Foster
Mr. Art Smith

MICROFILMED

November 21, 1978

Ms. Mary Smith
Attorney at Law
30 S. Second Street
Rexburg, Idaho 83440

Dear Ms. Smith:

Re: Applications No. 01-7013, 01-7014, 01-7015

As you will recall, this office is still holding the three power applications filed by the City of Idaho Falls. These applications were made nearly a year ago, and to date Fremont-Madison and the City have ^{apparently} been unable to reach an agreement that will resolve the Fremont-Madison protests.

It appears from the correspondence we have received that if these filings are subordinated to future upstream irrigation development, the protests would be resolved. I believe there is a good chance that in his final review the Director will make these rights subordinate to future water development for agriculture. Perhaps a hearing can be avoided and the final action on these applications can be expediated if Fremont-Madison would write a letter. *expedited*

Respectfully submitted,

ERNEST M. CARLSEN
Water Resource Analyst

EMC:dh

RECEIVED

JUL 17 1978

SMITH, HANCOCK & MOSS

Attorneys at Law

Department of Water Resources
Eastern District Office

MARY SMITH
J. D. HANCOCK
BRENT J. MOSS
W. LLOYD ADAMS (1885-1969)

30 SOUTH 2nd WEST
REXBURG, IDAHO 83440
PHONE: 208-356-5493

July 14, 1978

Mr. Ronald D. Carlson
Supervisor
Department of Water Resources
Eastern Region
1515 Lincoln Road
Idaho Falls, Idaho 83401

Dear Mr. Carlson:

I am enclosing herewith the proposed Stipulation Agreement between the Fremont-Madison Irrigation District and the City of Idaho Falls.

Kindest regards,



Mary Smith

b1

Enclosure

RECEIVED

REC-6

JUL 17 1978

Department of Water Resources
Eastern District Office

BEFORE THE DEPARTMENT OF WATER ADMINISTRATION
FOR THE STATE OF IDAHO

IN THE MATTER OF PROTEST AGAINST :
APPROVAL OF APPLICATION OF CITY :
OF IDAHO FALLS, IDAHO, NOS. :
017013, 017014, and 017015 TO : STIPULATION AGREEMENT
ESTABLISH EXISTING USES OF WATER :
AND ACQUIRE NEW WATER RIGHTS. :
:

The Applicant, City of Idaho Falls, having filed with the Department of Water Resources of the State of Idaho, applications No. 017013, 017014, and 017015 to establish existing uses of water and acquire new water rights from the Snake River and its tributaries, and Fremont-Madison Irrigation District having filed a protest against the approval of said applications;

The parties involved, the City of Idaho Falls, a municipal corporation of the State of Idaho, and the Fremont-Madison Irrigation District, a quasi municipal corporation, stipulate and agree to the following:

1. This Stipulation Agreement does not abrogate or change in any manner that certain contract between the United States of America, Fremont-Madison Irrigation District, City of Idaho Falls, and the Utah Power and Light Company concerning power rights and release of damages dated September 28, 1935.

2. The granting of such rights to the City of Idaho Falls will be subject to upstream agricultural development.

3. In the event it is necessary for the City of Idaho Falls to take natural flow or water held in storage in order to fill its rights, the same shall be taken proportionately from the entire Minidoka Project.

MICROFILMED

4. The Fremont-Madison Irrigation District hereby withdraws the protest filed against the applications of the City of Idaho Falls to establish existing uses of water and acquire new water rights from Snake River and its tributaries and waive further protests on the condition that such permits will be subject to all prior water rights and will not constitute an enlargement in the use of the original rights.

Dated:

CITY OF IDAHO FALLS

By _____
Its Mayor.

FREMONT-MADISON IRRIGATION DISTRICT

By _____
Its Chairman.

MICROFILMED



STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
EASTERN REGION

John V. Evans
Governor

C. Stephen Allred
Director

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 523-7186

June 22, 1978

RE: Applications for Permits Nos. 01-7013, 01-7014 and 01-7015
CITY OF IDAHO FALLS

Fremont-Madison Irrigation District
c/o Mary Smith, Attorney
30 S. Second West
Rexburg, Idaho 83440

Dear Ms. Smith:

The Department has been attempting since the first of the year to hear Fremont-Madison's protest against the granting of the City's applications Nos. 01-7013, 01-7014 and 01-7015.

As you will recall a conference or hearing was scheduled for February 8, 1978 but was continued at the request of the attorneys involved. On April 28th we were informed that an agreement had been prepared and was being reviewed by the City of Idaho Falls. To date our office has not received a copy of any agreement and therefore we are wondering how to proceed in this matter. At this point we can only assume that no agreement has been reached and will proceed with the scheduling of a conference and/or hearing. Unless we hear from you in the near future we will proceed with the scheduling of this matter for hearing during the month of July.

Very truly yours,

RONALD D. CARLSON
Supervisor,
Eastern Region

RDC:bp

UNRECORDED



STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
EASTERN REGION

John V. Evans
Governor

C. Stephen Allred
Director

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 523-7186

June 22, 1978

RE: Applications for Permits Nos. 01-7013, 01-7014 and 01-7015.

City of Idaho Falls
c/o G. S. Harrison
P. O. Box 220
Idaho Falls, Idaho 83401

Dear Mr. Harrison:

The Department has been attempting since the first of the year to hear Fremont-Madison's protest against the granting of the City's applications Nos. 01-7013, 01-7014 and 01-7015.

As you will recall a conference or hearing was scheduled for February 8, 1978 but was continued at the request of the attorneys involved. On April 28th we were informed that an agreement had been prepared and was being reviewed by the City of Idaho Falls. To date our office has not received a copy of any agreement and therefore we are wondering how to proceed in this matter. At this point we can only assume that no agreement has been reached and will proceed with the scheduling of a conference and/or hearing. Unless we hear from you in the near future we will proceed with the scheduling of this matter for hearing during the month of July.

Very truly yours,


RONALD D. CARLSON
Supervisor,
Eastern Region

RDC:bp

RECEIVED
JUL 2 1978

INTER-DEPARTMENT MEMO — 1

FROM

Ernie

DATE

May 8, 1978

TO

City of Idaho Falls Applications

01-7013, 14 and 15.

SUBJECT

Ms. Mary Smith telephoned April 28, 1978, and indicated they have prepared an agreement and it is being reviewed the the City of Idaho Falls.

SIGNATURE



STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES EASTERN REGION

John V. Evans
Governor

C. Stephen Allred
Director

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 523-7186

April 6, 1978

RE: Applications for Permits No. 01-7013, 01-7014 and 01-7015
—
CITY OF IDAHO FALLS

Mr. Max Mortenson, Chairman
Board of Directors
Fremont Madison Irrigation District
Box 5
St. Anthony, Idaho 83445

Dear Mr. Mortenson:

At the request of the attorneys for the city and Fremont Madison Irrigation District, the Department of Water Resources has twice cancelled a conference and/or hearing on the above referenced applications for permits. The cancellations were granted to allow time for establishing an agreement between the City of Idaho Falls and the Irrigation District. We have yet to receive a copy of the agreement in question or be advised as to the status of the negotiations

Please advise us of the progress that has been made or if the Department should consider rescheduling this matter for conference and/or hearing.

Respectfully submitted,

ERNEST M. CARLSEN
Water Resource Agent

EMC:cw

MICROFILMED

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE
STATE OF IDAHO

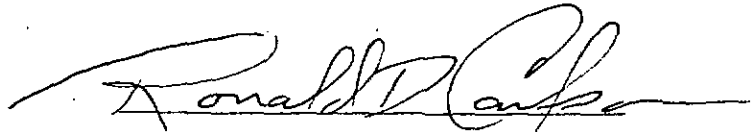
In the Matter of Protest Against Approval
of Applications for Permits No. 01-7013,
01-7014, and 01-7015 in the Name of the
CITY OF IDAHO FALLS

NOTICE OF CANCELLATION

Notice is hereby given that the Department of Water Resources has cancelled the conference and/or hearing concerning the above referenced applications at the request of the attorneys.

The Department will reschedule the conference and/or hearing in the near future at which time all interest parties will again be notified.

Dated this 6th day of February, 1978.



RONALD D. CARLSON
Supervisor, Eastern Region

SENT TO: City of Idaho Falls
Fremont Madison
Ms. Mary Smith

RECEIVED

01-7013, 01-7014, 01-7015 - City of Idaho Falls

Conference Room, Water Resources, 1515 Lincoln Road, Idaho Falls, Idaho

February 8, 1978 - 9:00 a.m.

ROSTER OF ATTENDANCE

<u>Name</u>	<u>Address</u>	<u>Representing</u>
-------------	----------------	---------------------

RECEIVED
FEB 10 1978

DEPARTMENT OF WATER RESOURCES

DEPARTMENT OF WATER RESOURCES

EASTERN DISTRICT OFFICE
1515 LINCOLN ROAD
IDAHO FALLS, IDAHO 83401

Name and Address of Sender

Indicate type of mail:
☐ REGISTERED ☐ REGISTERED C.O.D.
☒ CERTIFIED

Affix stamp here if issued as certificate of mailing or for additional copies of this bill.
POSTMARK AND DATE OF RECEIPT

NUMBER OF ARTICLE	NAME OF ADDRESSEE, STREET AND POST OFFICE ADDRESS	POSTAGE	FEE	R.R. FEE	POST. DEL. FEE	ACTUAL VALUE	HANDLING CHARGE	REMARKS*
1	City of Idaho Falls P.O. Box 220, Idaho Falls	13	60					01-7013
2	Mrs Mary Smith 308 2nd West, Rexburg							7014
3	Willis Walker Box 5, St. Anthony							7015
4	Hayden Christiansen, P.O. Box 302, Drummondville							27-7118
5	Robert M. Johnson Rt 2 Box 212, Pocatello							"
6	Floyd D. Nelson, P.O. Box 122, Soda Springs, Id.							"
7	Kevin Bros Box 362, Soda Springs							"
8	W. J. McConville, First Natl Agency, First Natl Bldg							"
9	John D. Spranger, Rt 1 Box 82, Pocatello							"
10	D. Woodall, Box 55, Soda Springs							"
11	Norman Wright, Rt. 3 Box 66, Blackfoot							"
12	William J. Hill 165 S. Meridian, Blackfoot							"
13	Ray Moller, P.O. Box 1090, Pocatello, Id.							"
14	Paul D. Moss 304 2nd W, Rexburg							"
15	Arthur H. Rogers & Chas. Box 432, Arco							21-7141
16	L. Verne Tidwell, P.O. Box 129, Idaho Falls, Id.							"
17	Forest Shewell, Box 602, Ashton, Id.							"
18	Blair Driver, P.O. Box 36, Rigby							"
19								
20								

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January 30, 1978

Mr. Tom Reinecker
Regional Supervisor
Department of Fish & Game
1515 Lincoln Road
Idaho Falls, Idaho 83401

Dear Tom:

This is to confirm the use of the conference room for conference and/or hearing to be held by this office on Wednesday, February 8, 1978, at 9:00 a.m.

Very truly yours,

RONALD D. CARLSON
Supervisor,
Eastern Region

RDC:CW

MICROFILMED

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE
STATE OF IDAHO

In the Matter of Protest Against Approval
of Applications for Permits No. 01-7013,
01-7014, and 01-7015 in the Name of CITY
OF IDAHO FALLS

NOTICE OF COMBINED
CONFERENCE AND/OR HEARING

On November 9, 1977, the City of Idaho Falls filed with the Department of Water Resources applications to appropriate the public waters of the State of Idaho. On December 5, 1977, the Department received protest against approval of said applications from Fremont Madison Irrigation District.

The Department has set the matter of protests for conference and/or hearing for Wednesday, February 8, 1978, at 9:00 a.m., in the conference room at the Department of Water Resources, Idaho Falls, Idaho. Any hearing will be held in accordance with the Rules and Regulations of the Idaho Code and adopted Rules of Practice and Procedure of the Department of Water Resources. Opportunity shall be afforded all parties to respond and present evidence and argument on all issues involved. Because of the similarity of the issues involved the conference and/or hearing shall be combined with application for permit No. 01-7013, 01-7014 and 01-7015.

Any party may request in writing five (5) days before any hearing that the oral proceedings thereof be taken in the form of stenographic notes. Any party may have such stenographic notes of the oral proceedings, or part thereof, transcribed at his own expense. A taped record of the proceedings will be maintained for the appeal period.

Failure to appear at the time and place set for hearing by the applicant or protestants may allow the Department without prejudice to dismiss the protest or the or the application. Any and all cost incurred by reason of such non-appearance may be assessed against such non-appearing parties.

Dated this 30th day of January, 1978.


RONALD D. CARLSON
Supervisor, Eastern Region

RECEIVED
JAN 31 1978
WATER RESOURCES
DIVISION



STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
EASTERN REGION

John V. Evans
Governor

December 5, 1977

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 523-7186

C. Stephen Allred
Director

RE: Application for Permit No. 01-7013 City of Idaho Falls
01-7014
01-7015

City of Idaho Falls
c/o G. S. Harrison
P.O. Box 220
Idaho Falls, ID 83401

Dear Mr. Harrison:

Enclosed is a copy of a protest filed against the issuance of a permit pursuant to your Application No. ⁰¹⁻⁷⁰¹³~~01-7014~~. The Department suggests you contact the protestant directly in an effort to determine the nature of the protest and to attempt to resolve the protest.

If you do not advise us within twenty (20) days that the protest has been resolved, the matter will be scheduled for conference and/or hearing. At such a conference and/or hearing, the following are the principle items the Department can consider in either approving or denying the application for permit (Section 42-203, Idaho Code):

1. Will the proposed use reduce the quantity of water under existing water rights?
2. Is the proposed water supply insufficient for the purposes intended?
3. Is the application made in good faith or for delay or speculative purposes?
4. Has the applicant sufficient financial resources with which to complete the project?

If this office can be of further assistance, please contact us.

Sincerely,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:GD

Enc

RECEIVED
DEC 11 1977
IDaho Falls



STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
EASTERN REGION

John V. Evans
Governor

December 5, 1977

1515 Lincoln Road
Idaho Falls, Idaho 83401
(208) 523-7186

C. Stephen Allred
Director

RE: Application for Permit No. 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

Fremont-Madison Irrigation District
R. Willis Walker, Chairman of the Board of Directors
Box 5
St. Anthony, Idaho 83445

Dear Mr. Walker:

Your protest against the approval of the above referenced application has been received and a copy has been sent to the applicant. The Department suggests you contact the applicant directly in an effort to determine what is proposed by the application and to attempt to resolve the protest.

If you do not advise us within twenty (20) days that the protest has been resolved, the matter will be scheduled for conference and/or hearing. At such a conference and/or hearing, the following are the principle items the Department can consider in either approving or denying an application for permit (Section 42-203, Idaho Code):

1. Will the proposed use reduce the quantity of water under existing water rights?
2. Is the proposed water supply insufficient for the purpose intended?
3. Is the application made in good faith or for delay or speculative purposes?
4. Has the applicant sufficient financial resources with which to complete the project?

If this office can be of further assistance, please contact us.

Sincerely,

RONALD D. CARLSON
Supervisor,
Eastern Region

RDC:CW

cc: IDWR - State Office
Mary Smith, Attorney

RECEIVED
DEC 11 1977
MICROFILMED



Department of Energy
Bonneville Power Administration
Idaho Falls District Office
P.O. Box 2558
Idaho Falls, Idaho 83401

RECEIVED

NOV 28 1977

Department of Water Resources
Eastern District Office

In reply refer to: OWI

November 23, 1977

Mr. Ronald D. Carlson, Supervisor
Eastern Division
State of Idaho Department of Water Resources
1515 Lincoln Road
Idaho Falls, Idaho 83401

Dear Mr. Carlson:

Subject: City of Idaho Falls, Application No. 01-7013
City of Idaho Falls, Application No. 01-7014
City of Idaho Falls, Application No. 01-7015

Thank you for the opportunity to comment on the City of Idaho Falls applications for additional water rights associated with its proposed project to install 7.2 MW bulb turbines at each of its three hydro generation sites on the Snake River in the vicinity of the City of Idaho Falls.

In view of the critical electric energy supply situation facing the Pacific Northwest, the additional electrical generation to be developed by these projects is needed by the City of Idaho Falls as well as the region. It should be noted that Bonneville Power Administration has given notice to all its Preference Customers, including the City of Idaho Falls, that after July 1, 1983, it will no longer be able to serve these utilities' load growth requirements, and thereafter these utilities must be responsible for making other arrangements to meet their increasing loads.

The City of Idaho Falls is to be commended for taking appropriate action to meet its utility responsibility to its citizens. Redevelopment of low head hydro generation at existing sites appears to be one of the most environmentally acceptable methods of developing additional resources.

Additionally, the participation of the Department of Energy in this project will enhance the state of the art for future similar developments elsewhere in the United States.

RECORDED

OWI

November 23, 1977

Page 2

Letter to Mr. Ronald D. Carlson, State of Idaho Department of Water Resources

Although I understand that there is considerable demand and competition for water rights on the upper Snake River, I would foresee no objection to the City of Idaho Falls application for additional water rights of a non-consumptive nature.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "M. C. Derksema", with a long, sweeping horizontal line extending to the right.

Martin C. Derksema
District Manager

RECEIVED
NOV 23 1977



STATE OF IDAHO

DEPARTMENT OF LANDS

STATEHOUSE, BOISE, IDAHO 83720

GORDON C. TROMBLEY
DIRECTOR

21 November 1977

Mr. Ronald D. Carlson
Department of Water Resources
Eastern Region
1515 Lincoln Road
Idaho Falls, ID 83401

Dear Ron:

Thank you very much for furnishing copies of the diversion applications from the City of Idaho Falls. The new type turbines which the City plans to install will be of great interest to other agencies around the nation and within Idaho as well.

We have no objections to the proposed, additional allotment of water to the City, however, we have advised the City that an easement will be required for the replacement of power houses and diversion structures.

Very truly yours,

DIVISION OF EARTH RESOURCES

William A. Scribner
WILLIAM A. SCRIBNER, Chief
Bureau of Navigable Waters

WAS:ph

cc: Eastern Idaho Area

STATE BOARD OF LAND COMMISSIONERS

JOHN V. EVANS
GOVERNOR AND PRESIDENT
PETE T. CENARRUSA
SECRETARY OF STATE
WAYNE L. KIDWELL
ATTORNEY GENERAL
JOE R. WILLIAMS
STATE AUDITOR
ROY TRUBY
SUPT OF PUBLIC INSTRUCTION

RECEIVED

NOV 23 1977

Department of Water Resources
Eastern District Office

WAS:ph

RECEIVED

NOV 22 1977

Department of Water Resources
Eastern District Office

21 November 1977

Mr. S. Eddie Pedersen
Mayor, City of Idaho Falls
P.O. Box 220
Idaho Falls, ID 83401

RE: 01-7013
01-7014
01-7015

Dear Mr. Pedersen:

Recently the Department of Lands received copies of applications for increasing the water allocation to the City of Idaho Falls for the production of electric power. We are aware of the long time which the City has utilized the sites described in the above-numbered applications. We are also aware of the new type of turbines which you plan to install in cooperation with ERDA to demonstrate low-head generation of electric power. You are to be commended for your foresight.

In spite of the long occupancy of the river by the diversion structures described in the applications, it is our understanding that at least two of these and the complimentary power houses are to be totally replaced. Because of this replacement process, an easement from the State of Idaho will be required for the continued occupancy and use of the riverbed. The easement application fee is \$5.00 for each easement and \$150.00 for each location. The attached information sheet describes the type of information which will be required, so that an easement may be prepared.

If you have questions concerning this requirement, please contact our Area Office in Idaho Falls. Mr. Lou Benedick will assist you in preparation of an appropriate application.

Very truly yours,

DIVISION OF EARTH RESOURCES

WILLIAM A. SCRIBNER, Chief
Bureau of Navigable Waters

WAS:ph
Attachment
cc: Eastern Area
Dept. of Water Resources



STATE OF IDAHO

DEPARTMENT OF FISH AND GAME

REGION 6
1515 LINCOLN ROAD
IDAHO FALLS, IDAHO 83401

RECEIVED
NOV 17 1977

November 16, 1977

Mr. Ronald D. Carlson, Supervisor
Eastern Region
State of Idaho
Department of Water Resources
1515 Lincoln Road
Idaho Falls, Idaho 83401

Department of Water Resources
Eastern District Office

Dear Ron:

Re: 01-7013, City of Idaho Falls

Personnel from our Department have reviewed the above-referenced application for a permit to appropriate water from the Snake River in Bonneville County. The location of the point of diversion is SE $\frac{1}{4}$ of SE $\frac{1}{4}$ of Section 25 Township 3N Range 37E BM. We have no objections to this work.

Thank you for the opportunity to review and comment on this project.

Sincerely,

DEPARTMENT OF FISH AND GAME
Joseph C. Greenley, Director

Tom Reinecker

Tom Reinecker
Regional Supervisor
Region 6

cc: Bureau of Program Coordination
Bureau of Fisheries
Paul Jeppson

RECEIVED
NOV 17 1977

CITY OF IDAHO FALLS, IDAHO
GENERAL SERVICES

Box 220

Idaho Falls, Idaho 83401

NOV 16 1977

Department of Water Resources
Eastern District Office

CHANGE ORDER

296

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D
O
RIdaho Department Water Resource
Statehouse
Boise, ID 83720Purchase Order No. 13017 (11-2-77)Requisition No. 13641 ElectricDate November 9, 1977

QUANTITY

DESCRIPTION

UNIT
PRICE

AMOUNT

CHANGE ORDER

Filing Fees

Addition to Purchase Order:

40.00

Original - white
Purchasing - yellow
Controller - pink
Requestor - goldenrodBy Chris Stanger
Director

MICROFILMED

November 14, 1977

RE: Application for Permit N. 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

Federal Energy Regulatory Commission
Bureau of Power
555 Battery Street
Room 415
San Francisco, CA 94111

Gentlemen:

We are enclosing copies of three applications that may be of interest to your agency. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

R. HALD D. CARLSON
Supervisor
Eastern Region

RDC:CD

Enclosures

RECEIVED
NOV 17 1977
FEDERAL ENERGY REGULATORY COMMISSION

November 14, 1977

RE: Application for Permit No. 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

Mr. Martin C. Derksence
District Manager
Bonneville Power Administration
Box 2558
Idaho Falls, Idaho 83401

Dear Mr. Derksence:

We are enclosing a copy of three applications that may be of interest to your agency. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:ED

Enclosures

RECEIVED
NOV 15 1977

November 14, 1977

RE: Application for Permit No. 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

Department of Lands
Statehouse,
Boise, ID 83720

Gentlemen:

We are enclosing a copy of applications that may be of interest to your agency. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:CD

Enclosures

RECORDED
INDEXED

November 14, 1977

RE: Application for Permit No. 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

District Engineer
Walla Walla Corps of Engineers
Bldg. 602, City-County Airport
Walla Walla, WA 99362

Dear Sir:

We are enclosing copies of three applications that may be of interest to your agency. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:CD

Enclosures

NOV 17 1977

November 14, 1977

RE: Application for Permit No.: 01-7013 CITY OF IDAHO FALLS
01-7014
01-7015

Mr. Tom Reinecker
Regional Supervisor
Department of Fish & Game
1515 Lincoln Rd.
Idaho Falls, ID 83401

Dear Tom:

We are enclosing copies of three applications that may be of interest to your agency. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:CD

Enclosures

RECEIVED
NOV 15 1977

November 10, 1977

RE: Application for Permit No. 01-7013 City of Idaho Falls
01-7014
01-7015
21-7143 Mrs. Earl Weatherston

Mr. Art Larson, Watermaster
Water District No. 01
P.O. Box 1099
Idaho Falls, ID 83401

Dear Art:

We are enclosing a copy of four applications that may be of interest to your water district. Please review the applications and if you have any comments, submit them to our Department as soon as possible. The last date of protest is December 5, 1977, and we are required to take final action shortly thereafter.

If we may be of further assistance, please feel free to contact us.

Very truly yours,

RONALD D. CARLSON
Supervisor
Eastern Region

RDC:CD

Enclosures

RECEIVED

November 10, 1977

RE: Claim to a Water Right No. 01-4001, 01-4002 & 01-4003
Application for Permit No. 01-7013, 01-7014 & 01-7015
CITY OF IDAHO FALLS

Post Register
P.O. Box 1800
Idaho Falls, Idaho 83401

Gentlemen:

Enclosed you will find a legal notice which we wish to have published once a week for two consecutive weekly issues of your newspaper. We have inserted the publication dates allowing time for you to submit us a galley proof for review before publication.

After sending us a galley proof, proceed with the publication on the dates we have inserted, assuming the notice is correct. If we have any corrections, we will notify you before the first publication. If you cannot publish the notice on the proposed dates, please contact us immediately.

An affidavit of publication must be submitted to the Department along with the publication bill.

Very truly yours,

RONALD D. CARLSON
Supervisor,
Eastern Region

RDC:CW

Enc: Legal Notice (6)

Bill submitted 11-30-77 by CW

MICROFILMED

NOTICE OF APPLICATION FOR WATER PERMIT

Notice is hereby given that _____
Idaho Falls, Idaho

the City of Idaho Falls,

has on 11-09-77 submitted Application No. 01-7013
for a permit to appropriate 2600 cubic feet per second XXXXXXXXXXXXXXXXXXXX
of water from the Snake River tributary to Columbia River
by means of a dam
within the SE $\frac{1}{4}$ SE $\frac{1}{4}$, Sec. 25, T. 3N, R. 37E, B.M., Bonneville County;

to be used from Jan. 1 to Dec. 31
for power generation

within the NW $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 36, T. 3N, R. 37E, B.M.

If issued, this permit will be subject to all prior water rights. Protests
against the granting of the permit must be filed with the Idaho Department of
Water Resources, 1515 Lincoln Road, Idaho Falls, Idaho, 83401 on or before _____
December 5, 1977

C. STEPHEN ALLRED
XXXXXXXXXXXXXXXXXXXX
R. KEITH HIGGINSON

Director

Published in the Post Register, Idaho Falls, Idaho
on November 17 and November 24, 1977

me. d. C. W. A.

me. d. C. W. A.

MAIL CERTIFIED INVOICE TO:

CONTROLLERS OFFICE

P. O. BOX 220

IDAHO FALLS, IDAHO

City of Idaho Falls, Idaho

PURCHASE ORDER

No. 13017

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CITY OF IDAHO FALLS

IDAHO FALLS, IDAHO

RECEIVED

NOV 9 1977

Department of Water Resources
Eastern District OfficeIdaho Department Water Resource
Statehouse
Boise, ID 83720

398404

☐ CONFIRMING☒ NON CONFIRMING

REQ. NO. 13641 Electric

DATE November 2, 1977

☐ FREIGHT F.O.B. IDAHO FALLS☐ FREIGHT BILLING MUST
ACCOMPANY INVOICE.

DELIVERY DATE

QUANTITY		DESCRIPTION	ACCOUNT	UNIT PRICE	AMOUNT
RECEIVED	ORDERED				
		Filing fees for applications for water right permits as follows:	005 510 401.79.48		
		Upper Power Plant-2600CFS			1225 ⁰⁰ ~~1205.00~~
		City Power Plant-2600CFS			1225 ⁰⁰ ~~1205.00~~
		Lower Power Plant-5100CFS			<u>1475.00</u>
					3885.00
					3925 ⁰⁰
					<i>J. Staine</i>

IDAHO STATE TAX EXEMPTION CERTIFICATE

NO. 0024045S-10-2-1

CITY OF IDAHO FALLS

BY

PURCHASING AGENT

1. MAIL INVOICE AT TIME OF SHIPMENT. INVOICES RECEIVED AFTER 25TH OF MONTH WILL BE INCLUDED IN FOLLOWING MONTHS BUSINESS.
2. MAIL A SEPARATE INVOICE FOR EACH SHIPMENT AGAINST THIS PURCHASE ORDER IF PARTIAL SHIPMENTS ARE MADE.
3. ALL PACKAGES, INVOICES AND BILLS OF LADING MUST SHOW THE ABOVE PURCHASE ORDER NUMBER.
4. PLEASE ACKNOWLEDGE RECEIPT OF THIS PURCHASE ORDER BY RETURN MAIL; AND IF NOT ACCEPTED AS WRITTEN, ADVISE AT ONCE, WITH EXPLANATION; ALSO GIVE SHIPPING DATE.
5. BE SURE TO ENCLOSE DELIVERY OR PACKING LIST WITH EACH SHIPMENT.
6. MAIL BILL OF LADING AT TIME OF SHIPMENT SHOWING THE ABOVE ORDER NUMBER AND COMPLETE ROUTING.

ORIGINAL

01/20/57 11:01

01/20/57 11:01

CONDITIONS OF PURCHASE UNLESS OTHERWISE SPECIFIED

01/20/57 11:01

01/20/57 11:01

01/20/57

Goods subject to our inspection and approval on arrival, notwithstanding prior payment to obtain cash discount.

Goods rejected on account of inferior quality or workmanship will be returned to you with charge for transportation both ways, plus labor reloading, trucking, etc., and may not be replaced except upon receipt of written instructions from us.

Seller guarantees and agrees that the goods, wares, and merchandise to be furnished hereunder, will not infringe any patents or trade-marks, and that Seller will at Seller's own expense defend any and all actions or suits alleging such infringement and will pay us, our associates and affiliates, and those for whom we may act as agents in the purchase of said goods, wares and merchandise, harmless in cases of such infringement.

Your acceptance of this order constitutes an agreement on your part, guaranteeing that all materials furnished pursuant to this order will strictly comply in every respect with all Federal laws and all State laws and regulations of all Cities and Counties, and that you will defend this City against all actions and proceedings and will indemnify it against all costs, fines, judgments, damages, and legal expenses incurred by reason of the violation of such laws and ordinances or against any action brought by any person for injury, illness or death caused by or resulting from the equipment or materials being defective in any respect.

All specifications, drawings, technical information or data furnished by the Buyer to the Seller hereunder shall be used only in the manufacture of material furnished to the Buyer.

It is mutually agreed that time shall be of the essence of this order.

The Buyer shall not be bound by any provisions at variance with this Purchase Order inserted by the Seller on the attached Acknowledgment Copy or appearing on any other acknowledgment form, unless agreed to in writing by the Buyer.

Prices for the items hereunder shall include State, Local Sales and Use Taxes, where applicable.

By accepting this order the Seller warrants that the material to be furnished hereunder will be in full conformity with the specifications, drawings or samples, and agrees that this warranty shall survive acceptance of and payment for the material. The Buyer in addition to other rights may accept a part of any shipment which fulfills the specifications and reject the balance. Rejected material shall be returnable to the Seller for full credit at the price charged, plus transportation charges. The Buyer may have rejected material replaced by the Seller or not at the Buyer's option and at the purchase price stipulated in the order. If this order covers materials that are required by law to be packaged, labeled or registered in a prescribed manner (e.g., foods, combustibles, drugs, fabrics and others), the Seller hereby warrants that shipments to the Buyer will be in compliance with the Federal law irrespective of whether the Seller's shipment to the Buyer is interstate or intrastate and the applicable state law.

The Seller shall not without the Buyer's consent assign this order in whole or in part with respect to work to be done. No assignment of accounts receivable under this order shall preclude the Seller from negotiating directly with the Buyer amendments to or settlements of this order or impose on the Buyer any obligation toward the assignee other than for the payment of money due.

The Buyer may terminate work under this order in whole or in part at any time by written or telegraphic notice and thereupon the Seller shall as and to the extent directed by the Buyer stop work under this order. As compensation to the Seller for such termination, the Buyer shall pay to the Seller the contract price for all articles or services completed in accordance with this order plus (1) the actual costs incurred by the Seller and properly allocable to the terminated portion of this order less the disposal value of work in process and unused materials, if any, included in such costs, and (2) a percentage of such costs (before crediting said disposal value), such percentage to be equal to the profit factor (percentage) included in the contract price.

Seller certifies and warrants that the product furnished under this purchase order contains no food additive, as defined by the food additive amendment to the Federal Food Drug and Cosmetic Act or, if it contains such food additive, that such additive has been approved by the F.D.A. for use in foods. The date of such F.D.A. approval was _____

[Handwritten signature]

01-20-57/11:01