

# MEMORANDUM

**Date:** November 13, 2013  
**To:** Water Right File 36-15959  
**From:** Michele Edl  
**Re:** rate and volume recommendations

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## Background

I have been asked to contribute to the licensing of the permits associated with the Pristine Springs, Inc. complex by recommending rate and volume for one of two hydroelectric plants sited on the property.

In 2012, I was asked to locate and provide data which confirmed that power was generated during the development period of both of the hydro-power projects. As a result of filling that request, I found that the two hydro projects were attached to Idaho Power Company's grid and under Idaho Public Utilities Commission jurisdiction. The hydroelectric project developed under this permit, (36-15959) is the lower, downstream power plant.

Idaho Power Company identifies it as Pristine Springs Hydro #3 (31415165).

FERC identifies it as conduit, exempt project # P-12144.

## Method options

The rate of water beneficially used for power is intimately tied to the capacity of the turbine. The best confirmation of a beneficial flow rate for hydropower use is the maximum turbine discharge that accompanies power generation. That maximum discharge does not necessarily occur at peak generation.

When turbine discharge flow rates and companion generation are unknown, then a second-best method can be used. The method recognizes that the design hydraulic capacity of a turbine will provide a reasonable basis for the maximum rate for a license. The design flow and other specifications are often displayed on the turbine nameplate. However, if the turbine was not designed for the specific setting wherein it is found, then additional nameplate or design information must be obtained. Nameplate elevation and generation information must be collected and compared with the actual conditions of the site.

If information for either of the above methods is unavailable, then the flow can be estimated from the equation  $P = Q \times H \times e / 11.81$ . Rearranged to solve for Q, the equation is  $Q = (P \times 11.81) / (H \times e)$  where:

Q is flowrate in cfs

P is power in kW

H is elevation change (often called head) in ft

e is efficiency in decimal format

11.81 is a constant of conversion

To avoid simultaneously solving four equations for the four unknowns, at least two of the parameters should be known or measured and e can be estimated.

The available contents of this water right file were insufficient to make a rate determination through any of the above methods. Additional information was required.

## Information search

I discussed the information needed and reviewed the project data and photos that had already been collected by planning bureau staff.

I found that the headwater pool of this hydro-project was also the impoundment behind a dam under the jurisdiction of IDWR's Dam Safety Section. I reviewed the information available in the dam safety file for this project.

Unfortunately, the routine FERC inspections were not part of any of the Department's files and not available to the public from their website. I solicited and received CEII (Critical Energy Infrastructure Information) documents related to this project from FERC personnel. In addition to copies of FERC inspection reports, I received as-built plans.

Because the upstream aquaculture complex requires water quality monitoring, I discussed the water quality monitoring requirements with IDEQ personnel.

I discussed the turbine-generator set with the current manager of the Pristine Hydro #3 project (Scott Kastor, of Hydro Plus). Mr. Kastor provided me the turbine type and size.

Finally, I researched the internet to find specs for the turbine.

## **Results**

### Operation records

A single, turbine-generator set was installed and has been producing electricity at this facility since August 2003.

No turbine discharge-generation relationship is being used by current operators to identify atypical or unexpected operations. The available operator's logs have primarily tracked forced outages, shut-downs and similar incidents.

### Power generation

Routine submittals of generation data is typically required by power sales contracts with Idaho Power Company. Although historical data is available, the data is in monthly time-steps and is not granular enough to compare with any available instantaneous or daily flow records.

Limited analysis of generation data from 2003 – 2005 indicates that the generator was not delivering the generation authorized by the FERC exemption. The FERC order which granted this project an exemption from licensing, expected that a new, 500-kW, turbine-generator unit would be installed. Instead, the installed turbine and generator are used. The as-built plans made available through FERC show a 250 Hp generator. (250 Hp = 186,500 Watts.) But to be consistent with the monthly generation records obtained from Idaho Power Company, it is likely that this turbine-generator set is capable of 200 kW.

The FERC inspections did not report a consistent generation capacity for this facility. But I did not pursue equipment specs for the generator.

### Head

The spillway of Pristine Springs Dam (NID # ID00692) was modified and repurposed in 2002 to function as the intake to the Pristine Springs Hydro #3 powerhouse. The headwater pool of this hydro-project is the water impounded behind this dam.

Corey Skinner (IDWR Dam Safety section) provided surveys of the dam and the spillway/intake works which were measured as part of a dam safety inspection. In the 2003 survey, the total gross head was measured at 15.54 feet. This is the vertical distance from the top of the discharge pipe to the top of the overflow wall which surrounds the north and west sides of powerhouse. Some head would be lost due to friction developed at the wicket gate entrance to the turbine, so the effective head available to the turbine would be somewhat less than 15.54 feet

Water storage in the headwater pool is authorized by decreed right 36-15378 for water quality and aesthetic use. According to IDEQ, the impoundment provides temperature dampening for the geothermal water which is one source of water used in the complex. The impoundment is not required to treat any

other property of the water.

#### Flow rate

The intake-dam spillway which is the point-of-diversion for this right can easily provide 240.3 cfs, the total rate permitted by right 36-15959.

There is no device measuring the flow through the concrete intake channel and IDWR personnel have not been successful in taking spot measurements of the inflow.

Although IDEQ monitors water quality at several points in the aquiculture complex, dilution calculations are not required for the discharge. Therefore IDEQ does not take a discharge measurement.

FERC inspections from 2006, and 2009 reported instantaneous generation and flow. The generation readings would have been available from instrument displays in the powerhouse but the flows must have been provided by Pristine Springs personnel. They are lower flow rates than predicted by the power equation calculations for this hydro power facility and therefore, are likely measurements taken from the weir on Alpheus Creek which is some distance upstream.

Warm Creek may not be the sole source of water flowing through this powerhouse. The FERC application states that the source water is Warm Creek and unnamed springs located along the north side of the property. Nevertheless, this hydro-power use is the last use of the water flowing through the Pristine Springs aquiculture complex before it is discharged into the Snake River at river mile 608.

#### Turbine spec and efficiency

I was able to match pictures of the turbine-generator set with similar pictures on the internet and located a copy of the power table developed for this turbine. Based on that design table, recovered from <http://www.frenchriverland.com>, the maximum flowrate is 13000 cubic feet per minute or 216.6 cfs.

Francis turbines are 80-82% efficient if operating within their preferred range. There is no evidence that this turbine-generator has ever operated so inefficiently that it utilized the full rate authorized by the permit.

#### Power equation confirmation

From Idaho Power generation records, this powerhouse generated an average of 193.6 kW per hour in December 2003. If the effective head is 15 feet and we assume that the turbine is operating in the range it can be most efficient, then by the power equation, the flow rate is 186 cfs. The mathematics looks like this

$$Q = (P \times 11.81) / (H \times e) = (193.6 \times 11.81) / (15.1 \times 0.82) = 185.8 \text{ cfs}$$

However, it is reasonable to assume that as a used turbine, retrofit into this powerhouse setting, it may be only 70% efficient. The mathematics now looks like this:  $(193.6 \times 11.81) / (15 \times 0.71) = 216 \text{ cfs}$

### **Conclusions**

#### Rate

The turbine appears to be a Leffel 33-inch 'Z', vertical-shaft, Francis turbine. It has been installed in a water chamber rather than in a pressurized scroll casing.

The effective head at this powerhouse is approximately 15 feet.

The flow for a turbine of this size and type, in a setting with 15 feet of effective head is approximately 216 cfs.

#### Volume

This hydro-project is operated in run-of-river mode. The headwater storage is authorized for water quality and aesthetics, not power.



Effective 3/29/2012, the Beneficial Use Examination Rules exempt on-stream, run-of-the-river, power generation from the volume reporting requirement. This facility qualifies.

Term limit

This is an FERC exempt project and therefore not subject to any license renewal timelines. Therefore the term date should be set to coincide with the term date of the active sales agreement. That date is February 18, 2015.

**Recommendations**

I recommend the design capacity of this turbine in a 15 foot setting as the license flow rate. I recommend 216 cfs

No volume is required for the license of an on-stream, run-of-river, hydroelectric plant, so I am not recommending a volume.

**Edl, Michele**

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**From:** Yenter, Cindy  
**Sent:** Friday, November 01, 2013 7:55 AM  
**To:** Edl, Michele  
**Subject:** RE: source water Pristine Springs hydro 3

I think I may have that resolved. I noted the same issue with the Warm Creek source on one of the fish prop permits, where the source of the water is actually waste water from Alpheus Creek which has been INJECTED into Warm Creek. So I'm adding points of injection/rediversion on that permit, which has an earlier priority and diverts upstream. So, as that effluent then is discharged into Warm Creek it'll be there legitimately and maybe we can just leave this right as source=Warm Creek.....subject of course to beneficial use under other rights. I don't believe I can add a source but any new owner might want to get a supplemental permit for waste water just to be on the safe side. I'll ruminate some more on that one.

I know what you mean about OD and Halloween. I had OD yesterday too, and I don't even really like halloween yet they sucked me in anyway. Problem is, I like food! Then I had a dentist appt late in the day and that blew the rest of the day.

Here's hoping you had a great weekend! No special rush on the memo; I'll see it next week I'm sure!

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**From:** Edl, Michele  
**Sent:** Thursday, October 31, 2013 5:39 PM  
**To:** Yenter, Cindy  
**Subject:** source water Pristine Springs hydro 3

Cindy,

I didn't finish my memo to 36-15959. Office day and Halloween combined to sabotage the effort. And I am taking a couple days off to burn up some cpt. But I wanted to leave a thought with you that occurred to me as I was writing the memo.

I am recommending 216 ish cfs for power use thru the lower hydro. The permit names Warm Creek as the only source. But I see that the water is not just from Warm Creek but all the upstream sources comingled. If Warm Creek cannot deliver 216-ish cfs, then we will need to solicit and process another permit for power which correctly list the sources.  
Michele

4/30/02

Hydro

## FIRM ENERGY SALES AGREEMENT

BETWEEN

IDAHO POWER COMPANY

AND

PRISTINE SPRINGS INC

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SCANNED

OCT - 8 2008

PRISTINE  
SPRINGS  
HYDRO # 3

200KW

TERM: 2/2005  
THRU 2/2015

FERC P-12144-00

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FIRM ENERGY SALES AGREEMENT  
(10 aMW or Less)

PRISTINE SPRINGS # 3

Project Number: 31415165

THIS AGREEMENT, entered into on this 18<sup>th</sup> day of February 2005 between  
PRISTINE SPRINGS INC, an Idaho corporation (Seller), and IDAHO POWER COMPANY, an  
Idaho corporation (Idaho Power), hereinafter sometimes referred to collectively as "Parties" or  
individually as "Party."

WITNESSETH:

WHEREAS, Seller, owns, maintains and operates an electric generation facility; and

WHEREAS, Seller wishes to sell, and Idaho Power is willing to purchase, firm electric energy  
produced by the Seller's Facility.

THEREFORE, In consideration of the mutual covenants and agreements hereinafter set forth, the  
Parties agree as follows:

ARTICLE I: DEFINITIONS

As used in this Agreement and the appendices attached hereto, the following terms  
shall have the following meanings:

- 1.1 "Commission" - The Idaho Public Utilities Commission.
- 1.2 "Contract Year" - The period commencing each calendar year on the same calendar date as the  
Operation Date and ending 364 days thereafter.
- 1.3 "Designated Dispatch Facility" - Idaho Power's Systems Operations Group, or any subsequent  
group designated by Idaho Power.
- 1.4 "Disconnection Equipment" - All equipment specified in Appendix B and Appendix D.
- 1.5 "Facility" - That electric generation facility described in Appendix B of this Agreement.
- 1.6 "Generation Interconnection Process" - Idaho Power's generation interconnection application  
and engineering review process developed to ensure a safe and reliable generation

interconnection in compliance with all applicable regulatory requirements, Prudent Electrical Practices and national safety standards.

- 1.7 "Inadvertent Energy" – Electric energy Seller does not intend to generate. Inadvertent energy is more particularly described in paragraph 7.3 of this Agreement.
- 1.8 "Interconnection Facilities" - All equipment specified in Appendix B and Appendix D.
- 1.9 "Initial Capacity Determination" – As specified in Appendix B of this Agreement, the Maximum Capacity of this Facility is 200 kW. Therefore, Idaho Power accepts this Maximum Capacity data and the associated nameplate data as establishing that under normal or average design conditions, this Facility's average monthly energy deliveries to Idaho Power will not exceed 10 MW and is therefore eligible to be paid the published rates in accordance with Commission Order No. 29632.
- 1.10 "Losses" – The loss of electrical energy expressed in kilowatt hours (kWh) occurring as a result of the transformation and transmission of energy between the point where the Facility's energy is metered and the point the Facility's energy is delivered to the Idaho Power electrical system. The loss calculation formula will be as specified in Appendix B of this Agreement.
- 1.11 "Market Energy Cost" – Eighty-five percent (85%) of the weighted average of the daily on-peak and off-peak Dow Jones Mid-Columbia Index (Dow Jones Mid-C Index) prices for non-firm energy. If the Dow Jones Mid-Columbia Index price is discontinued by the reporting agency, both Parties will mutually agree upon a replacement index, which is similar to the Dow Jones Mid-Columbia Index. The selected replacement index will be consistent with other similar agreements and a commonly used index by the electrical industry.
- 1.12 "Material Breach" – A Default (paragraph 22.2.1) subject to paragraph 22.2.2.
- 1.13 "Maximum Capacity Amount" – The maximum capacity (MW) of the Facility will be as specified in Appendix B of this Agreement.
- 1.14 "Metering Equipment" - All equipment specified in this Agreement and specified in Appendix B and Appendix D required to measure, record and telemeter power flows between the Seller's electric generation plant and Idaho Power's system.

- 1.15    “Net Energy” – All of the electric energy produced by the Facility, less Station Use, less Losses, expressed in kilowatt hours (kWh). Seller commits to deliver all Net Energy to Idaho Power at the Point of Delivery for the full term of the Agreement. Net Energy does not include Inadvertent Energy.
- 1.16    “Operation Date” – The day commencing at 0001 hours, Mountain Time following the day that all requirements of paragraph 5.2 have been completed.
- 1.17    “Point of Delivery” – The location specified in Appendix B, where Idaho Power’s and the Seller’s electrical facilities are interconnected.
- 1.18    “Prudent Electrical Practices” – Those practices, methods and equipment that are commonly and ordinarily used in electrical engineering and operations to operate electric equipment lawfully, safely, dependably, efficiently and economically.
- 1.19    “Schedule 72” – Idaho Power’s Tariff No 101, Schedule 72 or its successor schedules as approved by the Commission.
- 1.20    “Season” – The three periods identified in paragraph 6.2.1 of this Agreement.
- 1.21    “Special Facilities” - Additions or alterations of transmission and/or distribution lines and transformers as described in Appendix B, Appendix D, Schedule 72 or the Generation Interconnection Process required to safely interconnect the Seller's Facility to the Idaho Power system.
- 1.22    “Station Use” – Electric energy that is used to operate equipment that is auxiliary or otherwise related to the production of electricity by the Facility.
- 1.23    “Surplus Energy” – (1) Net Energy produced by the Seller’s Facility and delivered to the Idaho Power electrical system during the month which exceeds 110% of the monthly Net Energy Amount for the corresponding month specified in paragraph 6.2. or (2) If the Net Energy produced by the Seller’s Facility and delivered to the Idaho Power electrical system during the month is less than 90% of the monthly Net Energy Amount for the corresponding month specified in paragraph 6.2, then all Net Energy delivered by the Facility to the Idaho Power

electrical system for that given month or (3) All Net Energy produced by the Seller's Facility and delivered by the Facility to the Idaho Power electrical system prior to the Operation Date.

- 1.24 "Total Cost of the Facility" - The total cost of structures, equipment and appurtenances.

## ARTICLE II: NO RELIANCE ON IDAHO POWER

- 2.1 Seller Independent Investigation - Seller warrants and represents to Idaho Power that in entering into this Agreement and the undertaking by Seller of the obligations set forth herein, Seller has investigated and determined that it is capable of performing hereunder and has not relied upon the advice, experience or expertise of Idaho Power in connection with the transactions contemplated by this Agreement.
- 2.2 Seller Independent Experts - All professionals or experts including, but not limited to, engineers, attorneys or accountants, that Seller may have consulted or relied on in undertaking the transactions contemplated by this Agreement have been solely those of Seller.

## ARTICLE III: WARRANTIES

- 3.1 No Warranty by Idaho Power - Any review, acceptance or failure to review Seller's design, specifications, equipment or facilities shall not be an endorsement or a confirmation by Idaho Power and Idaho Power makes no warranties, expressed or implied, regarding any aspect of Seller's design, specifications, equipment or facilities, including, but not limited to, safety, durability, reliability, strength, capacity, adequacy or economic feasibility.
- 3.2 Qualifying Facility Status - Seller warrants that the Facility is a "Qualifying Facility," as that term is used and defined in 18 CFR §292.207. After initial qualification, Seller will take such steps as may be required to maintain the Facility's Qualifying Facility status during the term of this Agreement and Seller's failure to maintain Qualifying Facility status will be a Material Breach of this Agreement. Idaho Power reserves the right to review the Seller's Qualifying Facility status and associated support and compliance documents at anytime during the term of this Agreement.

- 3.3 FERC License - Seller warrants that the Facility possesses a valid license or exemption from licensing from the Federal Energy Regulatory Commission ("FERC") for the Facility. Seller recognizes that Seller's possession and retention of a valid FERC license or exemption is a material part of the consideration for Idaho Power's execution of this Agreement. Seller will take such steps as may be required to maintain a valid FERC license or exemption for the Facility during the term of this Agreement and Seller's failure to maintain a valid FERC license or exemption will be a Material Breach of this Agreement.

ARTICLE IV: CONDITIONS TO CONTINUED ACCEPTANCE OF ENERGY

- 4.1 Prior to an Operation Date being issued for the Seller's Facility, the Seller shall complete the following:
- 4.1.1 This Facility is currently interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. The Seller has previously submitted proof to Idaho Power that all licenses, permits or approvals necessary for the Seller to operate under the current Schedule 86 agreement have been obtained from applicable federal, state or local authorities, including, but not limited to, evidence of compliance with Subpart B, 18 CFR 292.207. The Seller shall submit any additional permits required for the Facility to operate under this Firm Energy Sales Agreement.
- 4.1.2 Engineer's Certifications - This Facility is currently interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. The Seller will submit a Certification of Ongoing Operations and Maintenance (O & M) as described in Commission Order No. 21690 that has been completed no more than 60 days prior to the effective date of this Agreement. This certificate will be in the form specified in Appendix C but may be modified to the extent necessary to recognize

the different engineering disciplines providing the certificates.

- 4.1.4 Insurance – Seller shall submit written proof to Idaho Power of all insurance required in Article XV.
- 4.1.5 Interconnection – Seller shall complete all interconnection modifications, upgrades or additions as specified in Appendix D of this Agreement.
- 4.1.6 Seller shall demonstrate to Idaho Power's reasonable satisfaction that the Facility is capable of delivering Net Energy in the amounts as specified in paragraph 6.2 of this Agreement for the full term of this Agreement in a consistent, reliable and safe manner.
- 4.1.7 Written Acceptance - Obtain written confirmation from Idaho Power that all conditions to acceptance of energy have been fulfilled. Such written confirmation shall not be unreasonably withheld by Idaho Power.

#### ARTICLE V: TERM AND OPERATION DATE

- 5.1 Term - This agreement shall be in full force and effect for a period of ten (10) Contract Years from the Operation Date.
- 5.2 Operation Date – The Operation Date may occur only after the Facility has achieved all of the following:
  - a) Completed all requirements of Article IV of this Agreement
  - b) Commission approval of this Agreement in a form acceptable to Idaho Power has been received.
  - c) Seller has requested an Operation Date from Idaho Power in a written format.
  - d) Seller has received written confirmation from Idaho Power of the Operation Date.

This confirmation will not be unreasonably withheld by Idaho Power.

- 5.3 Seller's failure to complete all of the requirements of Article IV, Conditions to Acceptance of Energy of this Agreement within 120 days of the effective date of this Agreement will be an event of default.

- 5.4 Upon completion of the requirements of paragraph 5.2, the Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003 for this Facility will be terminated effective as of the Operation Date of this Agreement.

ARTICLE VI: PURCHASE AND SALE OF NET ENERGY

- 6.1 Delivery and Acceptance of Net Energy - Except when either Party's performance is excused as provided herein, Idaho Power will purchase and Seller will sell all of the Net Energy to Idaho Power at the Point of Delivery. All Inadvertent Energy produced by the Facility will also be delivered by the Seller to Idaho Power at the Point of Delivery. At no time will the total amount of Net Energy and/or Inadvertent Energy produced by the Facility and delivered by the Seller to the Point of Delivery exceed the Maximum Capacity Amount.

- 6.2 Net Energy Amounts - Seller intends to produce and deliver Net Energy in the following monthly amounts:

6.2.1 Initial Year Monthly Net Energy Amounts:

|          | <u>Month</u> | <u>kWh</u> |
|----------|--------------|------------|
| Season 1 | March        | 134,000    |
|          | April        | 125,500    |
|          | May          | 120,000    |
| Season 2 | July         | 119,500    |
|          | August       | 128,000    |
|          | November     | 135,500    |
|          | December     | 131,000    |
| Season 3 | June         | 113,000    |
|          | September    | 135,000    |
|          | October      | 137,500    |
|          | January      | 140,500    |
|          | February     | 129,000    |

- 6.2.2 Ongoing Monthly Net Energy Amounts - Seller shall initially provide Idaho Power with one year of monthly generation estimates (Initial Year Monthly Net Energy Amounts) and beginning at the end of month nine and every three months thereafter provide Idaho

Power with an additional three months of forward generation estimates. This information will be provided to Idaho Power by written notice in accordance with paragraph 28.1, no later than 5:00 PM of the 5<sup>th</sup> day following the end of the previous month. If the Seller does not provide the Ongoing Monthly Net Energy amounts in a timely manner, Idaho Power will use the most recent 3 months of the Initial Year Monthly Net Energy Amounts specified in paragraph 6.2.1 for the next 3 months of monthly Net Energy amounts.

6.2.3 Seller's Adjustment of Net Energy Amount –

6.2.3.1 No later than the Operation Date, by written notice given to Idaho Power in accordance with paragraph 28.1, the Seller may revise all of the previously provided Initial Year Monthly Net Energy Amounts.

6.2.3.2 Beginning with the end of the 3<sup>rd</sup> month after the Operation Date and at the end of every third month thereafter: (1) the Seller may not revise the immediate next three months of previously provided Net Energy Amounts, (2) but by written notice given to Idaho Power in accordance with paragraph 28.1, no later than 5:00 PM of the 5<sup>th</sup> day following the end of the previous month, the Seller may revise all other previously provided Net Energy Amounts. Failure to provide timely written notice of changed amounts will be deemed to be an election of no change.

6.2.4 Idaho Power Adjustment of Net Energy Amount – If Idaho Power is excused from accepting the Seller's Net Energy as specified in paragraph 14.2.1 or if the Seller declares a Suspension of Energy Deliveries as specified in paragraph 14.3.1 and the Seller's declared Suspension of Energy Deliveries is accepted by Idaho Power, the Net Energy Amount as specified in paragraph 6.2 for the specific month in which the reduction or suspension under paragraph 14.2.1 or 14.3.1 occurs will be reduced in accordance with the following:

Where:

NEA = Current Month's Net Energy Amount (Paragraph 6.2)

SGU = a.) If Idaho Power is excused from accepting the Seller's Net Energy as specified in paragraph 14.2.1 this value will be equal to the percentage of curtailment as specified by Idaho Power multiplied by the TGU as defined below.

b.) If the Seller declares a Suspension of Energy Deliveries as specified in paragraph 14.3.1 this value will be the sum of the individual generation units size ratings as specified in Appendix B that are impacted by the circumstances causing the Seller to declare a Suspension of Energy Deliveries.

TGU = Sum of all of the individual generator ratings of the generation units at this Facility as specified in Appendix B of this agreement.

RSH = Actual hours the Facility's Net Energy deliveries were either reduced or suspended under paragraph 14.2.1 or 14.3.1

TH = Actual total hours in the current month

Resulting formula being:

$$\text{Adjusted Net Energy Amount} = \text{NEA} - \left( \left( \frac{\text{SGU}}{\text{TGU}} \times \text{NEA} \right) \times \left( \frac{\text{RSH}}{\text{TH}} \right) \right)$$

This Adjusted Net Energy Amount will be used in applicable Surplus Energy calculations for only the specific month in which Idaho Power was excused from accepting the Seller's Net Energy or the Seller declared a Suspension of Energy.

- 6.3 Unless excused by an event of Force Majeure, Seller's failure to deliver Net Energy in any Contract Year in an amount equal to at least ten percent (10%) of the sum of the Initial Year Net Energy Amounts as specified in paragraph 6.2 shall constitute an event of default.

## ARTICLE VII: PURCHASE PRICE AND METHOD OF PAYMENT

7.1 Net Energy Purchase Price – For all Net Energy, Idaho Power will pay the non-levelized energy

price in accordance with Commission Order 29646 with seasonalization factors applied:

~~Jan-Apr~~      ~~May-Aug~~      ~~Sep-Dec~~  
 Season 1 - (73.50 %)      Season 2 - (120.00 %)      Season 3 - (100.00 %)

|                                                   | <u>Year</u> | <u>Mills/kWh</u> | <u>Mills/kWh</u> | <u>Mills/kWh</u> |
|---------------------------------------------------|-------------|------------------|------------------|------------------|
| <i>Season 1<br/>Mar-Apr-May</i>                   | 2005        | 37.00            | 60.41            | 50.34            |
|                                                   | 2006        | 37.85            | 61.80            | 51.50            |
|                                                   | 2007        | 38.73            | 63.23            | 52.69            |
|                                                   | 2008        | 39.62            | 64.68            | 53.90            |
| <i>Season 2<br/>JULY<br/>AUG<br/>NOV<br/>DEC</i>  | 2009        | 40.53            | 66.17            | 55.14            |
|                                                   | 2010        | 41.46            | 67.69            | 56.41            |
|                                                   | 2011        | 42.42            | 69.25            | 57.71            |
|                                                   | 2012        | 43.39            | 70.85            | 59.04            |
| <i>Season 3<br/>JUNE, SEPT,<br/>OCT, JAN, FEB</i> | 2013        | 44.39            | 72.48            | 60.40            |
|                                                   | 2014        | 45.42            | 74.16            | 61.80            |
|                                                   | 2015        | 46.47            | 75.86            | 63.22            |

7.2 Surplus Energy Price – For all Surplus Energy, Idaho Power shall pay to the Seller the current month's Market Energy Cost or the Net Energy Purchase Price specified in paragraph 7.1, whichever is lower.

7.3 Inadvertent Energy –

7.3.1 Inadvertent Energy is electric energy produced by the Facility, expressed in kWh, which the Seller delivers to Idaho Power at the Point of Delivery that exceeds 10,000 kW multiplied by the hours in the specific month in which the energy was delivered. (For example January contains 744 hours. 744 times 10,000 kW = 7,440,000 kWh, Energy delivered in January in excess of 7,440, 000 kWh in this example would be Inadvertent Energy.)

7.3.2 Although Seller has designed and operates the Facility to generate no more than 10 average MW and therefore does not intend to generate Inadvertent Energy, Idaho Power will accept Inadvertent Energy that does not exceed the Maximum Capacity Amount but will not purchase or pay for Inadvertent Energy

7.4 Payment Due Date – Energy payments to the Seller will be disbursed within 30 days of the date

which Idaho Power receives and accepts the documentation of the monthly Net Energy and Inadvertent Energy actually produced by the Seller's Facility and delivered to Idaho Power as specified in Appendix A.

- 7.5 Continuing Jurisdiction of the Commission – This Agreement is a special contract and, as such, the rates, terms and conditions contained in this Agreement will be construed in accordance with Idaho Power Company v. Idaho Public Utilities Commission and Afton Energy, Inc., 107 Idaho 781, 693 P.2d 427 (1984); Idaho Power Company v. Idaho Public Utilities Commission, 107 Idaho 1122, 695 P.2d 1 261 (1985); Afton Energy, Inc. v. Idaho Power Company, 111 Idaho 925, 729 P.2d 400 (1986); Section 210 of the Public Utilities Regulatory Policies Act of 1978 and 18 CFR §292.303-308.

#### ARTICLE VIII: ENVIRONMENTAL ATTRIBUTES

- 8.1 Idaho Power waives any claim to ownership of Environmental Attributes. Environmental Attributes include, but are not limited to, Green Tags, Green Certificates, Renewable Energy Credits (RECs) and Tradable Renewable Certificates (TRCs) directly associated with the production of energy from the Seller's Facility.

#### ARTICLE IX: FACILITY AND INTERCONNECTION

- 9.1 Design of Facility - This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. Seller has designed, constructed, installed and will own, operate and maintain the Facility and any Seller-owned Interconnection Facilities so as to allow safe and reliable generation and delivery of electric energy to Idaho Power for the full term of the Agreement.
- 9.2 Interconnection Facilities - This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. Idaho Power has reviewed

the existing Interconnection Facilities and has identified specific items that will require modification, upgrades or additions to the existing equipment. These items are documented in Appendix D of this agreement. The Seller will be responsible to complete the modifications, upgrades or additions as specified in Appendix D. All costs of all items identified within Appendix D and payment to Idaho Power will be in accordance with Schedule 72.

#### ARTICLE X: DISCONNECTION EQUIPMENT

- 10.1 This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. Idaho Power has reviewed the existing Disconnection Equipment and has identified specific items that will require modification, upgrades or additions to the existing equipment. These items are documented in Appendix D of this agreement. The Seller will be responsible to complete the modifications, upgrades or additions as specified in Appendix D. All costs of all items identified within Appendix D and payment to Idaho Power will be in accordance with Schedule 72.

#### ARTICLE XI: METERING AND TELEMETRY

- 11.1 Metering - This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. Idaho Power has reviewed the Metering and Telemetry and has identified specific items that will require modification, upgrades or additions to the existing equipment. These items are documented in Appendix D of this agreement. The Seller will be responsible to complete the modifications, upgrades or additions as specified in Appendix D. All costs of all items identified within Appendix D and payment to Idaho Power will be in accordance with Schedule 72. All meters used to determine the billing hereunder shall be sealed and the seals shall be broken only by Idaho Power when the meters are to be inspected, tested or adjusted.

11.1.1 Meter Inspection - Idaho Power shall inspect and test all meters upon their Installation and at least once every four (4) years thereafter. If requested by Seller, Idaho Power shall make a special inspection or test of a meter and Seller shall pay the reasonable costs of such special inspection. Both Parties shall be notified of the time when any inspection or test shall take place, and each Party may have representatives present at the test or inspection. If a meter is found to be inaccurate or defective, it shall be adjusted, repaired or replaced, at Idaho Power's expense in order to provide accurate metering. If a meter fails to register, or if the measurement made by a meter during a test varies by more than two percent (2%) from the measurement made by the standard meter used in the test, adjustment (either upward or downward) to the payments Seller has received shall be made to correct those payments affected by the inaccurate meter for the actual period during which inaccurate measurements were made. If the actual period cannot be determined, corrections to the payments will be based on the shorter of (1) a period equal to one-half the time from the date of the last previous test of the meter to the date of the test which established the inaccuracy of the meter; or (2) six (6) months.

#### ARTICLE XII - RECORDS

- 12.1 Maintenance of Records - Seller shall maintain at the Facility or such other location mutually acceptable to the Parties adequate total generation, Net Energy, Station Use, actual monthly maximum generator output (kW) and Inadvertent Energy records in a form and content recommended by Idaho Power.
- 12.2 Inspection - Either Party, after reasonable notice to the other Party, shall have the right, during normal business hours, to inspect and audit any or all generation, Net Energy, Station Use, maximum generator output (kW) and Inadvertent Energy records pertaining to the Seller's Facility.

### ARTICLE XIII - PROTECTION

- 13.1 This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. Idaho Power has reviewed the existing Protection equipment and has identified specific items that will require modification, upgrades or additions to the existing equipment. These items are documented in Appendix D of this agreement. The Seller will be responsible to complete the modifications, upgrades or additions as specified in Appendix D. All costs of all items identified within Appendix D and payment to Idaho Power will be in accordance with Schedule 72. Seller shall provide and maintain adequate protective equipment sufficient to prevent damage to the Facility and Seller-furnished Interconnection Facilities. In some cases, some of Seller's protective relays will provide back-up protection for Idaho Power's facilities. In that event, Idaho Power will test such relays annually and Seller will pay the actual cost of such annual testing.

### ARTICLE XIV - OPERATIONS

- 14.1 Communications - Idaho Power and the Seller shall maintain appropriate operating communications through Idaho Power's Designated Dispatch Facility in accordance with Appendix A of this Agreement.

14.2 Energy Acceptance -

- 14.2.1 Idaho Power shall be excused from accepting and paying for Net Energy or accepting Inadvertent Energy produced by the Facility and delivered by the Seller to the Point of Delivery, if it is prevented from doing so by an event of Force Majeure, or if Idaho Power determines that curtailment, interruption or reduction of Net Energy or Inadvertent Energy deliveries is necessary because of line construction or maintenance requirements, emergencies, electrical system operating conditions on its system or as otherwise required by Prudent Electrical Practices. If, for reasons other than an event of Force Majeure, Idaho Power requires such a curtailment, interruption or reduction of Net Energy

deliveries for a period that exceeds twenty (20) days, beginning with the twenty-first day of such interruption, curtailment or reduction, Seller will be deemed to be delivering Net Energy at a rate equivalent to the pro rata daily average of the amounts specified for the applicable month in paragraph 6.2. Idaho Power will notify Seller when the interruption, curtailment or reduction is terminated.

14.2.2 If, in the reasonable opinion of Idaho Power, Seller's operation of the Facility or Interconnection Facilities is unsafe or may otherwise adversely affect Idaho Power's equipment, personnel or service to its customers, Idaho Power may physically interrupt the flow of energy from the Facility as specified within Schedule 72 or take such other reasonable steps as Idaho Power deems appropriate.

14.2.3 Under no circumstances will the Seller deliver Net Energy and/or Inadvertent Energy from the Facility to the Point of Delivery in an amount that exceeds the Maximum Capacity Amount. Seller's failure to limit deliveries to the Maximum Capacity Amount will be a Material Breach of this Agreement.

14.3 Seller Declared Suspension of Energy Deliveries

14.3.1 If the Seller's Facility experiences a forced outage due to equipment failure which is not caused by an event of Force Majeure or by neglect, disrepair or lack of adequate preventative maintenance of the Seller's Facility, Seller may, after giving notice as provided in paragraph 14.3.2 below, temporarily suspend all deliveries of Net Energy to Idaho Power from the Facility or from individual generation unit(s) within the Facility impacted by the forced outage for a period of not less than 48 hours to correct the forced outage condition ("Declared Suspension of Energy Deliveries"). The Seller's Declared Suspension of Energy Deliveries will begin at the start of the next full hour following the Seller's telephone notification as specified in paragraph 14.3.2 and will continue for the time as specified (not less than 48 hours) in the written notification provided by the Seller. In the month(s) in which the Declared Suspension of Energy occurred, the Net Energy Amount will be adjusted as specified in paragraph 6.2.4.

- 14.3.2 If the Seller desires to initiate a Declared Suspension of Energy Deliveries as provided in paragraph 14.3.1, the Seller will notify the Designated Dispatch Facility by telephone. The beginning hour of the Declared Suspension of Energy Deliveries will be at the earliest the next full hour after making telephone contact with Idaho Power. The Seller will, within 24 hours after the telephone contact, provide Idaho Power a written notice in accordance with Article XXVIII that will contain the beginning hour and duration of the Declared Suspension of Energy Deliveries and a description of the conditions that caused the Seller to initiate a Declared Suspension of Energy Deliveries. Idaho Power will review the documentation provided by the Seller to determine Idaho Power's acceptance of the described forced outage as qualifying for a Declared Suspension of Energy Deliveries as specified in paragraph 14.3.1. Idaho Power's acceptance of the Seller's forced outage as an acceptable forced outage will be based upon the clear documentation provided by the Seller that the forced outage is not due to an event of Force Majeure or by neglect, disrepair or lack of adequate preventative maintenance of the Seller's Facility.
- 14.5 Voltage Levels - Seller, in accordance with Prudent Electrical Practices shall minimize voltage fluctuations and maintain voltage levels acceptable to Idaho Power. Idaho Power may, in accordance with Prudent Electrical Practices, upon one hundred eighty (180) days' notice to the Seller, change its nominal operating voltage level by more than ten percent (10%) at the Point of Delivery, in which case Seller shall modify, at Idaho Power's expense, Seller's equipment as necessary to accommodate the modified nominal operating voltage level.
- 14.6 Generator Ramping - Idaho Power, in accordance with Prudent Electrical Practices, shall have the right to limit the rate that generation is changed at startup, during normal operation or following reconnection to Idaho Power's electrical system. Generation ramping may be required to permit Idaho Power's voltage regulation equipment time to respond to changes in power flow.
- 14.7 Scheduled Maintenance - On or before January 31 of each calendar year, Seller shall submit a written proposed maintenance schedule of significant Facility maintenance for that calendar year and Idaho Power and Seller shall mutually agree as to the acceptability of the proposed schedule.

The Parties determination as to the acceptability of the Seller's timetable for scheduled maintenance will take into consideration Prudent Electrical Practices, Idaho Power system requirements and the Seller's preferred schedule. Neither Party shall unreasonably withhold acceptance of the proposed maintenance schedule.

- 14.8 Maintenance Coordination - The Seller and Idaho Power shall, to the extent practical, coordinate their respective line and Facility maintenance schedules such that they occur simultaneously.
- 14.9 Contact Prior to Curtailment - Idaho Power will make a reasonable attempt to contact the Seller prior to exercising its rights to curtail, interrupt or reduce deliveries from the Seller's Facility. Seller understands that in the case of emergency circumstances, real time operations of the electrical system, and/or unplanned events Idaho Power may not be able to provide notice to the Seller prior to interruption, curtailment, or reduction of electrical energy deliveries to Idaho Power.

#### ARTICLE XV: INDEMNIFICATION AND INSURANCE

- 15.1 Indemnification - Each Party shall agree to hold harmless and to indemnify the other Party, its officers, agents, affiliates, subsidiaries, parent company and employees against all loss, damage, expense and liability to third persons for injury to or death of person or injury to property, proximately caused by the indemnifying Party's construction, ownership, operation or maintenance of, or by failure of, any of such Party's works or facilities used in connection with this Agreement. The indemnifying Party shall, on the other Party's request, defend any suit asserting a claim covered by this indemnity. The indemnifying Party shall pay all costs, including reasonable attorney fees that may be incurred by the other Party in enforcing this indemnity.
- 15.2 Insurance - During the term of this Agreement, Seller shall secure and continuously carry the following insurance coverage:
- 15.2.1 Comprehensive General Liability Insurance for both bodily injury and property damage with limits equal to \$1,000,000, each occurrence, combined single limit. The deductible for such insurance shall be consistent with current Insurance Industry Utility practices for

similar property.

15.2.2 The above insurance coverage shall be placed with an insurance company with an A.M.

Best Company rating of A- or better and shall include:

- (a) An endorsement naming Idaho Power as an additional insured and loss payee as applicable; and
- (b) A provision stating that such policy shall not be canceled or the limits of liability reduced without sixty (60) days' prior written notice to Idaho Power.

15.3 Seller to Provide Certificate of Insurance - As required in paragraph 4.1.4 herein and annually thereafter, Seller shall furnish Idaho Power a certificate of insurance, together with the endorsements required therein, evidencing the coverage as set forth above.

15.4 Seller to Notify Idaho Power of Loss of Coverage - If the insurance coverage required by paragraph 15.2 shall lapse for any reason, Seller will immediately notify Idaho Power in writing. The notice will advise Idaho Power of the specific reason for the lapse and the steps Seller is taking to reinstate the coverage. Failure to provide this notice and to expeditiously reinstate or replace the coverage will constitute a Material Breach of this Agreement.

#### ARTICLE XVI. FORCE MAJEURE

16.1 As used in this Agreement, "Force Majeure" or "an event of Force Majeure" means any cause beyond the control of the Seller or of Idaho Power which, despite the exercise of due diligence, such Party is unable to prevent or overcome. Force Majeure includes, but is not limited to, acts of God, fire, flood, storms, wars, hostilities, civil strife, strikes and other labor disturbances, earthquakes, fires, lightning, epidemics, sabotage, or changes in law or regulation occurring after the Operation Date, which, by the exercise of reasonable foresight such party could not reasonably have been expected to avoid and by the exercise of due diligence, it shall be unable to overcome. If either Party is rendered wholly or in part unable to perform its obligations under this Agreement because of an event of Force Majeure, both Parties shall be excused from whatever performance is affected by the event of Force Majeure, provided that:

- (1) The non-performing Party shall, as soon as is reasonably possible after the occurrence of the Force Majeure, give the other Party written notice describing the particulars of the occurrence.
- (2) The suspension of performance shall be of no greater scope and of no longer duration than is required by the event of Force Majeure.
- (3) No obligations of either Party which arose before the occurrence causing the suspension of performance and which could and should have been fully performed before such occurrence shall be excused as a result of such occurrence.

#### ARTICLE XVII: LAND RIGHTS

- 17.1 Seller to Provide Access - Seller hereby grants to Idaho Power for the term of this Agreement all necessary rights-of-way and easements to install, operate, maintain, replace, and remove Idaho Power's Metering Equipment, Interconnection Equipment, Disconnection Equipment, Protection Equipment and other Special Facilities necessary or useful to this Agreement, including adequate and continuing access rights on property of Seller. Seller warrants that it has procured sufficient easements and rights-of-way from third parties so as to provide Idaho Power with the access described above. All documents granting such easements or rights-of-way shall be subject to Idaho Power's approval and in recordable form.
- 17.2 Use of Public Rights-of-Way - The Parties agree that it is necessary to avoid the adverse environmental and operating impacts that would occur as a result of duplicate electric lines being constructed in close proximity. Therefore, subject to Idaho Power's compliance with paragraph 17.4, Seller agrees that should Seller seek and receive from any local, state or federal governmental body the right to erect, construct and maintain Seller-furnished Interconnection Facilities upon, along and over any and all public roads, streets and highways, then the use by Seller of such public right-of-way shall be subordinate to any future use by Idaho Power of such public right-of-way for construction and/or maintenance of electric distribution and transmission

facilities and Idaho Power may claim use of such public right-of-way for such purposes at any time. Except as required by paragraph 17.4, Idaho Power shall not be required to compensate Seller for exercising its rights under this paragraph 17.2.

17.3 Joint Use of Facilities - Subject to Idaho Power's compliance with paragraph 17.4, Idaho Power may use and attach its distribution and/or transmission facilities to Seller's Interconnection Facilities, may reconstruct Seller's Interconnection Facilities to accommodate Idaho Power's usage or Idaho Power may construct its own distribution or transmission facilities along, over and above any public right-of-way acquired from Seller pursuant to paragraph 17.2, attaching Seller's Interconnection Facilities to such newly constructed facilities. Except as required by paragraph 17.4, Idaho Power shall not be required to compensate Seller for exercising its rights under this paragraph 17.3.

17.4 Conditions of Use - It is the intention of the Parties that the Seller be left in substantially the same condition, both financially and electrically, as Seller existed prior to Idaho Power's exercising its rights under this Article XVII. Therefore, the Parties agree that the exercise by Idaho Power of any of the rights enumerated in paragraphs 17.2 and 17.3 shall: (1) comply with all applicable laws, codes and Prudent Electrical Practices, (2) equitably share the costs of installing, owning and operating jointly used facilities and rights-of-way. If the Parties are unable to agree on the method of apportioning these costs, the dispute will be submitted to the Commission for resolution and the decision of the Commission will be binding on the Parties, and (3) shall provide Seller with an interconnection to Idaho Power's system of equal capacity and durability as existed prior to Idaho Power exercising its rights under this Article XVII.

#### ARTICLE XVIII: LIABILITY; DEDICATION

18.1 Nothing in this Agreement shall be construed to create any duty to, any standard of care with reference to, or any liability to any person not a Party to this Agreement. No undertaking by one Party to the other under any provision of this Agreement shall constitute the dedication of that Party's system or any portion thereof to the other Party or to the public or affect the status of

Idaho Power as an independent public utility corporation or Seller as an independent individual or entity.

#### ARTICLE XIX: SEVERAL OBLIGATIONS

- 19.1 Except where specifically stated in this Agreement to be otherwise, the duties, obligations and liabilities of the Parties are intended to be several and not joint or collective. Nothing contained in this Agreement shall ever be construed to create an association, trust, partnership or joint venture or impose a trust or partnership duty, obligation or liability on or with regard to either Party. Each Party shall be individually and severally liable for its own obligations under this Agreement.

#### ARTICLE XX: WAIVER

- 20.1 Any waiver at any time by either Party of its rights with respect to a default under this Agreement or with respect to any other matters arising in connection with this Agreement shall not be deemed a waiver with respect to any subsequent default or other matter.

#### ARTICLE XXI: CHOICE OF LAWS AND VENUE

- 21.1 This Agreement shall be construed and interpreted in accordance with the laws of the State of Idaho without reference to its choice of law provisions.
- 21.2 Venue for any litigation arising out of or related to this Agreement will lie in the District Court of the Fourth Judicial District of Idaho in and for the County of Ada.

#### ARTICLE XXII: DISPUTES AND DEFAULT

- 22.1 Disputes - All disputes related to or arising under this Agreement, including, but not limited to, the interpretation of the terms and conditions of this Agreement, will be submitted to the Commission for resolution.
- 22.2 Notice of Default -
- 22.2.1 Defaults. If either Party fails to perform any of the terms or conditions of this Agreement (an "event of default"), the nondefaulting Party shall cause notice in

writing to be given to the defaulting Party, specifying the manner in which such default occurred. If the defaulting Party shall fail to cure such default within the sixty (60) days after service of such notice, or if the defaulting Party reasonably demonstrates to the other Party that the default can be cured within a commercially reasonable time but not within such sixty (60) day period and then fails to diligently pursue such cure, then, the nondefaulting Party may, at its option, terminate this Agreement and/or pursue its legal or equitable remedies.

22.2.2 Material Breaches – The notice and cure provisions in paragraph 22.2.1 do not apply to defaults identified in this Agreement as Material Breaches. Material Breaches must be cured as expeditiously as possible following occurrence of the breach.

22.3 Security for Performance - Prior to the Operation Date and thereafter for the full term of this Agreement, Seller will provide Idaho Power with the following:

22.3.1 Insurance - Evidence of compliance with the provisions of paragraph 15.2. If Seller fails to comply, such failure will be a Material Breach and may only be cured by Seller supplying evidence that the required insurance coverage has been replaced or reinstated;

22.3.2 Engineer's Certifications - Every three (3) years after the Operation Date, Seller will supply Idaho Power with a Certification of Ongoing Operations and Maintenance (O & M) from a Registered Professional Engineer licensed in the State of Idaho, which Certification of Ongoing O & M shall be in the form specified in Appendix C. Seller's failure to supply the required certificate will be an event of default. Such a default may only be cured by Seller providing the required certificate; and

22.3.3 Licenses and Permits - During the full term of this Agreement, Seller shall maintain compliance with all permits and licenses described in paragraph 4.1.1 of this Agreement. In addition, Seller will supply Idaho Power with copies of any new or additional permits or licenses. At least every fifth Contract Year, Seller will update the documentation described in Paragraph 4.1.1. If at any time Seller fails to maintain

compliance with the permits and licenses described in paragraph 4.1.1 or to provide the documentation required by this paragraph, such failure will be an event of default and may only be cured by Seller submitting to Idaho Power evidence of compliance from the permitting agency.

#### ARTICLE XXIII: GOVERNMENTAL AUTHORIZATION

- 23.1 This Agreement is subject to the jurisdiction of those governmental agencies having control over either Party of this Agreement.

#### ARTICLE XXIV: COMMISSION ORDER

- 24.1 This Agreement shall become finally effective upon the Commission's approval of all terms and provisions hereof without change or condition and declaration that all payments to be made to Seller hereunder shall be allowed as prudently incurred expenses for ratemaking purposes.

#### ARTICLE XXV: SUCCESSORS AND ASSIGNS

- 25.1 This Agreement and all of the terms and provisions hereof shall be binding upon and inure to the benefit of the respective successors and assigns of the Parties hereto, except that no assignment hereof by either Party shall become effective without the written consent of both Parties being first obtained. Such consent shall not be unreasonably withheld. Notwithstanding the foregoing, any party which Idaho Power may consolidate, or into which it may merge, or to which it may convey or transfer substantially all of its electric utility assets, shall automatically, without further act, and without need of consent or approval by the Seller, succeed to all of Idaho Power's rights, obligations and interests under this Agreement. This article shall not prevent a financing entity with recorded or secured rights from exercising all rights and remedies available to it under law or contract. Idaho Power shall have the right to be notified by the financing entity that it is exercising such rights or remedies.

ARTICLE XXVI: MODIFICATION

- 26.1 No modification to this Agreement shall be valid unless it is in writing and signed by both Parties and subsequently approved by the Commission.

ARTICLE XXVII: TAXES

- 27.1 Each Party shall pay before delinquency all taxes and other governmental charges which, if failed to be paid when due, could result in a lien upon the Facility or the Interconnection Facilities.

ARTICLE XXVIII: NOTICES

- 28.1 All written notices under this agreement shall be directed as follows and shall be considered delivered when deposited in the U. S. Mail, first-class postage prepaid, as follows:

To Seller:                      Pristine Springs Inc.  
                                        Curtis Gay  
                                        201 Warm Creek Road  
                                        Jerome, ID 83338

To Idaho Power:

Original document to:

Vice President, Power Supply  
Idaho Power Company  
P O Box 70  
Boise, Idaho 83707

Copy of document to:

Cogeneration and Small Power Production  
Idaho Power Company  
P O Box 70  
Boise, Idaho 83707

An electronic copy (e-mail) of the copy of the document is acceptable. If the Seller desires to provide the copy via e-mail Idaho Power will provide the Seller the appropriate e-mail address upon request by the Seller.

ARTICLE XXIX: ADDITIONAL TERMS AND CONDITIONS

29.1 This Agreement includes the following appendices, which are attached hereto and included by reference:

|            |   |                                       |
|------------|---|---------------------------------------|
| Appendix A | - | Generation Scheduling and Reporting   |
| Appendix B | - | Facility and Point of Delivery        |
| Appendix C | - | Engineer's Certifications             |
| Appendix D | - | Modifications, Upgrades and Additions |

ARTICLE XXX: SEVERABILITY

30.1 The invalidity or unenforceability of any term or provision of this Agreement shall not affect the validity or enforceability of any other terms or provisions and this Agreement shall be construed in all other respects as if the invalid or unenforceable term or provision were omitted.

ARTICLE XXXI: COUNTERPARTS

31.1 This Agreement may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

ARTICLE XXXII: ENTIRE AGREEMENT

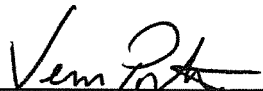
32.1 This Agreement constitutes the entire Agreement of the Parties concerning the subject matter hereof and supersedes all prior or contemporaneous oral or written agreements between the Parties concerning the subject matter hereof.

IN WITNESS WHEREOF, The Parties hereto have caused this Agreement to be executed  
in their respective names on the dates set forth below:

Idaho Power Company

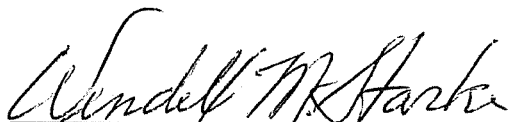
Pristine Springs Inc

By



N. Vern Porter - Mgr Power Supply Operations

By



Wendell M. Starke - President

Dated

FEBRUARY 17, 2005

"Idaho Power"

Dated

Feb. 18<sup>th</sup>, 2005

"Seller"

APPENDIX A

A -1 MONTHLY POWER PRODUCTION AND SWITCHING REPORT

At the end of each month the following required documentation will be submitted to:

Idaho Power Company  
Attn: Cogeneration and Small Power Production  
P O Box 70  
Boise, Idaho 83707

The Meter readings required on this report will be the reading on the Idaho Power Meter Equipment measuring the Facility's total energy production, Station Usage, Inadvertent Energy delivered to Idaho Power and the maximum generated energy (kW) as recorded on the Meter Equipment and/or any other required energy measurements to adequately administer this Agreement.

# Idaho Power Company

## Cogeneration and Small Power Production

### MONTHLY POWER PRODUCTION AND SWITCHING REPORT

Month \_\_\_\_\_ Year \_\_\_\_\_

Project Name \_\_\_\_\_ Project Number: \_\_\_\_\_  
 Address \_\_\_\_\_ Phone Number: \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

|                                 | Facility<br>Output | Station<br>Usage | Station<br>Usage | Metered<br>Maximum Generation |
|---------------------------------|--------------------|------------------|------------------|-------------------------------|
| Meter Number:                   | _____              | _____            | _____            | kW                            |
| End of Month kWh Meter Reading: | _____              | _____            | _____            |                               |
| Beginning of Month kWh Meter:   | _____              | _____            | _____            |                               |
| Difference:                     | _____              | _____            | _____            | Net Generation                |
| Times Meter Constant:           | _____              | _____            | _____            |                               |
| kWh for the Month:              | _____              | - _____          | - _____ =        |                               |
| Metered Demand:                 | _____              | _____            | _____            |                               |

#### Breaker Opening Record

| Date | Time | Meter |
|------|------|-------|
|      |      |       |
|      |      |       |

| * | Reason |
|---|--------|
|   |        |
|   |        |

#### Breaker Closing Record

| Date | Time | Meter |
|------|------|-------|
|      |      |       |
|      |      |       |

#### \* Breaker Opening Reason Codes

- 1 Lack of Adequate Prime Mover
- 2 Forced Outage of Facility
- 3 Disturbance of IPCo System
- 4 Scheduled Maintenance
- 5 Testing of Protection Systems
- 6 Cause Unknown
- 7 Other (Explain)

I hereby certify that the above meter readings are true and correct as of Midnight on the last day of the above month and that the switching record is accurate and complete as required by the Firm Energy Sales Agreement to which I am a Party.

Signature \_\_\_\_\_

Date \_\_\_\_\_

A-2 ROUTINE REPORTING

Seller's Contact Information

24-Hour Project Operational Contact

Name: Curtis Gay  
Office Telephone: 208-736-1606  
Home Telephone: 208-733-1335  
Cell Phone: 208-308-8220

Name: Brian Tadlock  
Office Telephone: 208-736-1684  
Home Telephone: 208-543-2809  
Cell Phone: 208-420-7217

Project On-site Contact information

Telephone Number: \_\_\_\_\_

## APPENDIX B

### FACILITY AND POINT OF DELIVERY

PROJECT NO. 31415165

PRISTINE SPRINGS # 3

#### B-1 DESCRIPTION OF FACILITY

The Seller's Facility is described as one (1) hydro driven synchronous generator with a nameplate rating of 200-kW, 2400-volt, three-phase, 60 hertz.

#### B-2 LOCATION OF FACILITY

The Facility is located on Warm Creek (north of Twin Falls, Idaho) in the NW 1/4 of Section 19, Township 9 South, Range 17 East, Boise Meridian, Jerome County, Idaho.

B-3 MAXIMUM CAPACITY AMOUNT: This value will be 200 kW, the maximum energy that potentially could be delivered by the Seller's Facility to the Idaho Power electrical system at any moment in time. This value is consistent with the Seller's Generation Interconnection request.

#### B-4 POINT OF DELIVERY

Energy will be delivered to Idaho Power at 12.47-kV, three-phase, 60-Hz. The Point of Delivery of energy from the Seller to Idaho Power will be at Idaho Power's pole-mounted disconnect switch (Disconnect Device) located between the Idaho Power provided primary meter and the Seller provided 15-kv rated pole-mounted recloser.

#### B-5 Station Use

The demand component of the station use shall not exceed 30 kW and the annual Station Usage (kWh) shall not exceed 5% of the energy delivered by this Facility to the point of delivery.

## B-6 LOSSES

If the Idaho Power Metering equipment is capable of measuring the exact energy deliveries by the Seller to the Idaho Power electrical system, no Losses will be calculated for this Facility. If the Idaho Power Metering is unable to measure the exact energy deliveries by the Seller to the Idaho Power electrical system, a Losses calculation will be established to measure the energy losses (kWh) between the Seller's Facility and the Idaho Power electrical system. This loss calculation will be initially set at 2% of the kWh energy production recorded on the Facility generation metering equipment. At such time as Seller provides Idaho Power with the electrical equipment specifications (transformer loss specifications, conductor sizes, etc) of all of the electrical equipment between the Facility and the Idaho Power electrical system, Idaho Power will configure a revised loss calculation formula to be agreed to by both parties and used to calculate the kWh Losses for the remaining term of the Agreement. If at anytime during the term of this Agreement, Idaho Power determines that the loss calculation does not correctly reflect the actual kWh losses attributed to the electrical equipment between the Facility and the Idaho Power electrical system, Idaho Power may adjust the calculation and retroactively adjust the previous 12 months kWh loss calculations.

## B-7 INTERCONNECTION FACILITIES

### Metering and Telemetry

Idaho Power will provide primary metering (12.47-kv) and the associated metering equipment (instrument transformers) to accurately measure the energy (kWh) delivered to Idaho Power. This metering will be separate from any metering of Seller's load. Idaho Power provided Meter Equipment will be owned and maintained by Idaho Power, with total cost of purchase, installation, operation, and maintenance, including administrative cost to be reimbursed to Idaho Power by the Seller.

Metering equipment required to measure and record the instantaneous energy deliveries to Idaho Power that Idaho Power has access to.

In the event it is determined that automated telemetry is required at this location. Idaho Power will purchase and install this equipment at the Seller's expense. The Seller will provide the necessary communication lines for this automated telemeter at the Seller's expense.

#### Disconnection Equipment

Idaho Power will provide and maintain:

- Protection and control equipment that consists of instrument transformers, protective relaying, dedicated DC power supply, and associated controls to remotely operate the Seller provided 15-kV recloser. Idaho Power's protection and control equipment will provide automatic control of the Seller provided 15-kV recloser.
  - Protection and control equipment is required to insure that the Seller's Facility will be disconnected from Idaho Power's system in the event of a disturbance on either Idaho Power's system or the Seller's Facility. This equipment is for the protection of only Idaho Power's equipment. The Seller is responsible to provide adequate protection and control equipment to protect the Seller's equipment from any Idaho Power or Seller disturbances.

#### Special Facilities

Idaho Power will provide and maintain:

- 12.5 Kv three-phase line extension to the metering and protection packages

- A single-phase 7200-120/240V (15-kVA) transformer connected on Idaho Power's side of the Seller owned recloser to provide power to Idaho Power's protective relaying package and to the Seller's recloser closing solenoid.
- All poles and other mounting facilities required for the IPC provided equipment.

#### Seller Provided Equipment and Facilities

Pristine Springs Hydro #3 will provide and maintain:

- Overhead secondary voltage (2,400-volt) distribution circuit from the generator to the generation step-up transformer
- Generation step-up transformer. The transformer shall be two winding (an autotransformer is not permitted) connected grounded-wye (12,470Y/7,200 Volt) on the primary side of the transformer and connected ungrounded wye (2,400Y Volt) on the secondary (generator) side of the transformer.
- 15-kV recloser located on the primary side (12.47-kV) of the generation step-up transformer. The recloser shall be rated for the continuous current of the circuit and shall have a minimum 12.5-kA symmetrical interrupting rating. The recloser shall be designed for control from a microprocessor-based recloser controller (e.g. Cooper Power System Form 6, Schweitzer Engineering Laboratories, Inc. (SEL) 351R, or equal). The Idaho Power provided protective relaying package will be utilized to perform the recloser control functions. The recloser shall be provided with an auxiliary switch to provide indication of recloser contact position (one normally open contact

and one normally closed contact are required) to the Idaho Power protective relaying package. The recloser shall have a 120/240VAC closing solenoid and Idaho Power will provide the 120/240VAC power from the protective relaying package.

- A single-phase 7200-120/240V transformer connected on the generator side of the recloser to provide a hot line/close block potential to the Idaho Power protective relaying package. The secondary circuit will be fused at Idaho Power's protective relaying package.
- Circuits (recloser control, auxiliary switch, and hot line/close block potential) and raceway between the recloser pole and Idaho Power's protective relaying package.
- Manual controls/indication to provide manual control and status of the Seller provided circuit-interrupting device (15-kV recloser). The manual controls shall be supervised via Idaho Power's protection and control equipment.
- All poles and other mounting facilities required for the Seller provided equipment.

All equipment and facilities provided by Seller shall meet applicable UL, ANSI, and IEEE standards, and shall be installed to meet all applicable local, state, and federal codes.

The Seller shall provide the certification required by Schedule 72 that the Seller provided Interconnection Facilities are functioning in accordance with all applicable standards and codes and are in good working condition.

B-8 SYNCHRONOUS GENERATORS

If a governor is used, the governor characteristics shall be capable of adjustment to at least five percent (5%) speed droop. The initial droop setting will be five percent (5%). Idaho Power may specify changes in the setting within the five percent (5%) capability.

The Seller shall provide automatic synchronizing equipment or manual synchronizing with relay supervision. The synchronizing facilities shall have the following:

- Slip frequency matching 0.1 Hz, or less
- Voltage matching +10%, or less
- Phase angle acceptance +10 degrees, or less
- Breaker closure time compensation

Synchronous generators shall be capable of operating continuously at maximum power output within five percent (5%) of rated voltage and anywhere within a power factor range of from ninety percent (90%) lagging to ninety-five percent (95%) leading.

Unless otherwise approved by Idaho Power, synchronous generators shall be equipped with an excitation system capable of automatically controlling generator voltage over the full range of generator power and reactive capability.

The generator excitation system shall have over and under excitation limiter equipment that will permit voltage regulator action to control the reactive output within the range of the generator's capability.

The reactive capability of the Facility shall be operated as specified by Idaho Power, within the generator reactive capability, to regulate either the interconnection voltage or Facility output power factor or both. Idaho Power will provide the desired voltage, power factor, and schedules

required by the Seller to set voltage regulators, power factor regulators and programmed or remote signal controllers. Idaho Power may change these desired values from time to time as system requirements change.

If the Facility is not operated to control reactive output in the manner specified and after notification, the Seller does not make necessary corrections within a reasonable time, a default will be declared.

**B-9 REACTIVE POWER**

The excitation system controls shall be set for power factor regulation. The Seller shall operate the synchronous generator within plus or minus 5% of unity power factor.

**B-10 COSTS**

Original Interconnection Equipment

The cost of the Original Interconnection equipment was \$44,205.81, which was reimbursed to Idaho Power by Pristine Springs Inc.

Additional Interconnection Equipment

If any modifications, upgrades, or additions are specified within this Agreement, Appendix D or at any time during the term of this Agreement that is not routine Operations and Maintenance of the Original Equipment, the Seller will be required to reimburse Idaho Power all costs of this addition equipment as specified in Schedule 72 or its successor schedule(s).

In addition to the installation and construction charges above, during the term of this Agreement, Seller will pay Idaho Power the operation and maintenance charge specified in Schedule 72 INTERCONNECTIONS TO NON-UTILITY GENERATION or its successor schedule(s).

The monthly charges will be a sum of the following:

Original Equipment Monthly Charge

This Original Interconnection Equipment was installed and became operational as of June 2003 under the previous Schedule 86 Agreement for this Facility dated March 28, 2003. Therefore the applicable year to be used in calculating the Schedule 72 Monthly Operation and Maintenance Charges for this Original Interconnection Equipment will be based upon the June 2003 installation of this equipment. For example – June 2003 thru May 2004 equals year 1, June 2004 – May 2005 equals year 2 and so on for the term of this agreement.

Additional Equipment Monthly Charge

The applicable year of the Additional Equipment for use in calculating the Schedule 72 Monthly Operation and Maintenance Charges will be based upon the date the Additional Equipment is installed and becomes operational.

**B-11 SALVAGE**

No later than sixty (60) days after the termination or expiration of this Agreement, Idaho Power will prepare and forward to Seller an estimate of the remaining value of those Idaho Power furnished Interconnection Facilities as required under Schedule 72, the Generation Interconnection Process and/or described in this Agreement, less the cost of removal and transfer to Idaho Power's nearest warehouse, if the Interconnection Facilities will be removed. If Seller elects not to obtain ownership of the Interconnection Facilities but instead wishes that Idaho Power reimburse the Seller for said Facilities the Seller may invoice Idaho Power for the net salvage value as estimated by Idaho Power and Idaho Power shall pay such amount to Seller within thirty (30) days after receipt of the invoice. Seller shall have the right to offset the invoice amount against any present or future payments due Idaho Power.

APPENDIX C

ENGINEER'S CERTIFICATION

OF

ONGOING OPERATIONS AND MAINTENANCE

The undersigned \_\_\_\_\_, on behalf of himself and \_\_\_\_\_ hereinafter collectively referred to as "Engineer," hereby states and certifies to the Seller as follows:

1. That Engineer is a Licensed Professional Engineer in good standing in the State of Idaho.
2. That Engineer has reviewed the Energy Sales Agreement, hereinafter "Agreement," between Idaho Power as Buyer, and \_\_\_\_\_ as Seller, dated \_\_\_\_\_
3. That the cogeneration or small power production project which is the subject of the Agreement and this Statement is identified as IPCo Facility No. \_\_\_\_\_ and hereinafter referred to as the "Project".
4. That the Project, which is commonly known as the \_\_\_\_\_ Project, is located at \_\_\_\_\_
5. That Engineer recognizes that the Agreement provides for the Project to furnish electrical energy to Idaho Power for a twenty (20) year period.
6. That Engineer has substantial experience in the design, construction and operation of electric power plants of the same type as this Project.
7. That Engineer has no economic relationship to the Design Engineer of this Project.
8. That Engineer has made a physical inspection of said Project, its operations and maintenance records since the last previous certified inspection. It is Engineer's professional opinion, based on the Project's appearance, that its ongoing O&M has been substantially in accordance with said O&M Policy; that it is in reasonably good operating condition; and that if adherence to said O&M Policy continues, the Project will continue producing at or near its design electrical output, efficiency and plant factor for the

remaining \_\_\_\_\_ years of the Agreement.

9. That Engineer recognizes that Idaho Power, in accordance with paragraph 4.1 of the Agreement, is relying on Engineer's representations and opinions contained in this Statement.

10. That Engineer certifies that the above statements are complete, true and accurate to the best of his knowledge and therefore sets his hand and seal below.

By \_\_\_\_\_

(P.E. Stamp)

Date \_\_\_\_\_

## APPENDIX D

### MODIFICATIONS, UPGRADES AND ADDITIONS

PROJECT NO. 31415165

PRISTINE SPRINGS #3

This Facility is interconnected to Idaho Power and is selling energy to Idaho Power as a Qualifying Facility in accordance with a Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003. The Interconnection Facilities, Disconnection Equipment, Metering Equipment, Telemetry Equipment and Protection Equipment were designed, installed, operated and maintained in accordance with this previous agreement.

Idaho Power has reviewed the existing Interconnection Facilities, Disconnection Equipment, Metering Equipment, Telemetry Equipment and Protection Equipment and listed below are specific modifications, upgrades and /or additions required for these facility to continue to deliver energy to Idaho Power at the Point of Delivery under this new Energy Sales Agreement. The Seller will be responsible to complete the modifications, upgrades or additions as specified in this Appendix D. All costs of all items identified within this Appendix D and payment to Idaho Power will be in accordance with Schedule 72.

#### D-1 INTERCONNECTION FACILITIES

Idaho Power has reviewed the existing Interconnection Facilities at the Sellers facility and finds that no upgrades, modifications or additions are required as of the date of this Agreement. If in the future, Prudent Electrical Practices, regulations, electrical codes or safety codes require upgrades, modifications or additions to the existing equipment, Idaho Power will notify the Seller of these requirements and the Seller will be responsible for all costs of all items identified and payment to Idaho Power will be in accordance with Schedule 72.

#### D-2 DISCONNECTION EQUIPMENT

Idaho Power has reviewed the existing Disconnection Equipment at the Sellers facility and finds

that no upgrades, modifications or additions are required as of the date of this Agreement. If in the future, Prudent Electrical Practices, regulations, electrical codes or safety codes require upgrades, modifications or additions to the existing equipment, Idaho Power will notify the Seller of these requirements and the Seller will be responsible for all costs of all items identified and payment to Idaho Power will be in accordance with Schedule 72.

**D-3 METERING EQUIPMENT**

Idaho Power has reviewed the existing Metering Equipment at the Sellers facility and finds that no upgrades, modifications or additions are required as of the date of this Agreement. If in the future, Prudent Electrical Practices, regulations, electrical codes or safety codes require upgrades, modifications or additions to the existing equipment, Idaho Power will notify the Seller of these requirements and the Seller will be responsible for all costs of all items identified and payment to Idaho Power will be in accordance with Schedule 72.

**D-4 TELEMETRY EQUIPMENT**

Telemetry is currently not required at this Facility. If in the future, Prudent Electrical Practices, regulations, electrical codes or safety codes requires this equipment be installed at this Facility, Idaho Power will notify the Seller of these requirements and the Seller will be responsible for all costs of all items identified and payment to Idaho Power will be in accordance with Schedule 72.

**D-5 PROTECTION EQUIPMENT**

Idaho Power has reviewed the existing Protection Equipment at the Sellers facility and finds that no upgrades, modifications or additions are required as of the date of this Agreement. If in the future, Prudent Electrical Practices, regulations, electrical codes or safety codes require upgrades, modifications or additions to the existing equipment, Idaho Power will notify the Seller of these requirements and the Seller will be responsible for all costs of all items identified and payment to Idaho Power will be in accordance with Schedule 72.

MONICA MOEN, ISB # 5734  
BARTON KLINE, ISB # 1526  
Idaho Power Company  
1221 West Idaho Street  
P. O. Box 70  
Boise, Idaho 83707  
Telephone: (208) 388-2692  
FAX Telephone: (208) 388-6936

Attorney for Idaho Power Company

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IDAHO PUBLIC  
UTILITIES COMMISSION

BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION

IN THE MATTER OF THE APPLICATION OF )  
IDAHO POWER COMPANY FOR APPROVAL )  
OF A FIRM ENERGY SALES AGREEMENT )  
FOR THE SALE AND PURCHASE OF )  
ELECTRIC ENERGY BETWEEN IDAHO )  
POWER COMPANY AND PRISTINE )  
SPRINGS, INC. FOR PRISTINE SPRINGS # 3 )  
\_\_\_\_\_ )

CASE NO. IPC-E-05-12

APPLICATION

COMES NOW Idaho Power Company ("Idaho Power" or the "Company") and, pursuant to RP 52, hereby applies for an Idaho Public Utilities Commission ("IPUC" or the "Commission") Order approving a Firm Energy Sales Agreement between Idaho Power and Pristine Springs, Inc. under which Pristine Springs, Inc. would sell and Idaho Power would purchase electric energy generated by the Pristine Springs #3 small hydroelectric generation facility located on Warm Creek, north of Twin Falls, Idaho ("Facility").

This Application is based on the following:

I.

The Facility consists of a single 200 kW hydroelectric generation unit.

## II.

Pristine Springs, Inc. is currently selling energy to Idaho Power from this Facility under a previously approved Schedule 86, Uniform Agreement for the sale of non-firm energy to Idaho Power, dated March 28, 2003 (approved in IPUC Order 29234). The Facility will continue to be a qualified small power production facility under the applicable provisions of the Public Utilities Regulatory Policy Act of 1978 ("PURPA").

## III.

On February 18, 2005, Idaho Power and Pristine Springs, Inc. entered into a Firm Energy Sales Agreement ("Agreement") pursuant to the terms and conditions of Commission Order No. 29632 and Commission Order 29646 to replace the existing Schedule 86 agreement for this Facility. Under the terms of that Agreement, Pristine Springs, Inc. elected to contract with Idaho Power for a 10-year term. Pristine Springs, Inc. further elected to contract with the Company using the Non-Levelized Published Avoided Cost Rates as currently established by the Commission for energy deliveries of less than 10 average MW.

## IV.

In many respects, this Agreement is similar to the agreement entered into by Idaho Power and US Geothermal that was recently approved in Commission Order 29692, dated January 24, 2005, and the Lewandowski Farms agreement submitted to the IPUC for approval on February 14, 2005 (Case No. IPC-E-05-03). This Agreement contains the various PURPA terms and conditions previously approved by the Commission in other PURPA agreements and as revised by Commission Order No. 29632 in Case No. IPC-E-04-8 (US Geothermal complaint). This Agreement also notes that that the Facility has an

existing Schedule 86, Non Firm energy sales agreement and is currently selling energy to Idaho Power.

**V.**

The nameplate rating and the maximum generation capability of this Facility is 200 kW (Appendix B of the Agreement). Therefore, as stated in Paragraph 1.9 of the Agreement, this Facility is eligible for the less than 10 average MW published avoided cost rates.

**VI.**

Because this Facility is currently interconnected and selling energy to Idaho Power under a Schedule 86, non-firm agreement, interconnection of this Facility to the Company's distribution system is completed. The previously established interconnection costs set out in the Schedule 86 agreement will be used to value the interconnection costs under the proposed Agreement. The applicable monthly Schedule 72 charges will apply.

**VII.**

Section 24 of the Agreement provides that the Agreement will not become effective until the Commission has approved all of the Agreement's terms and conditions and declared that all payments Idaho Power makes to Pristine Springs, Inc. for purchases of energy will be allowed as prudently incurred expenses for ratemaking purposes.

**VIII.**

Within this Agreement, various requirements have been placed upon Pristine Springs, Inc. in order for Idaho Power to accept energy deliveries from this Facility. Idaho Power will monitor compliance with these initial requirements. Once these requirements have been met, the existing Schedule 86 agreement will be terminated (paragraph 5.4 of the Agreement). In addition, Idaho Power will monitor the ongoing requirements through

the full term of this Agreement. Should the Commission approve this Agreement, Idaho Power intends to consider the Effective Date of the Agreement to be February 18, 2005.

IX.

The Agreement, as signed and submitted by the Parties thereto, contains Non-Levelized Published Avoided Cost Rates in conformity with applicable IPUC Orders.

X.

Service of pleadings, exhibits, orders and other documents relating to this proceeding should be served on the following:

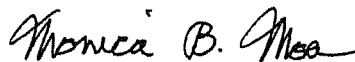
Monica B. Moen, Attorney II  
Barton L. Kline, Senior Attorney  
Idaho Power Company  
P.O. Box 70  
Boise, Idaho 83707

Randy C. Allphin  
Contract Administrator  
Idaho Power Company  
P.O. Box 70  
Boise, Idaho 83707

NOW, THEREFORE, based on the foregoing, Idaho Power Company hereby requests that the Commission issue its Order:

- (1) Approving the Firm Energy Sales Agreement between Idaho Power Company and Pristine Springs, Inc. without change or condition; and
- (2) Declaring that all payments for purchases of energy under the firm Energy Sales Agreement between Idaho Power Company and Pristine Springs, Inc. be allowed as prudently incurred expenses for ratemaking purposes.

Respectfully submitted this 4<sup>th</sup> day of March 2005.



---

MONICA B. MOEN  
Attorney for Idaho Power Company

## CERTIFICATE OF MAILING

I HEREBY CERTIFY that on the 4<sup>th</sup> day of March 2005, I served a true and correct copy of the within and foregoing APPLICATION upon the following named parties by the method indicated below, and addressed to the following:

Wendell Starke  
Pristine Springs Inc.  
274 Kay Drive  
Twin Falls, ID 83301

|                                     |                |
|-------------------------------------|----------------|
| <input type="checkbox"/>            | Hand Delivered |
| <input checked="" type="checkbox"/> | U.S. Mail      |
| <input type="checkbox"/>            | Overnight Mail |
| <input type="checkbox"/>            | FAX            |

*Monica B. Moen*

MONICA B. MOEN

**BEFORE THE IDAHO PUBLIC UTILITIES COMMISSION**

**CASE NO. IPC-E-05-12**

**IDAHO POWER COMPANY**

**EXHIBIT 1**

## MEMORANDUM

**Date:** October 30, 2013  
**To:** Water Right File 36-15959  
**From:** medl  
**Re:** Pristine Hydro #3

---

Using the limited information provided by Hydro Plus personnel and photos of the turbine taken when repairs were made in 2010, I queried the internet. The following pages were downloaded from a single site, <http://www.frenchriverland.com>. These search results confirm the manufacturer, the type and the design parameters of the turbine.

Refer to page 16 of the Leffel Bulletin 54 for the specifics of the turbine installed at this site. It is a 33-inch Leffel 'Z' type turbine set at approximately 15 feet of head.



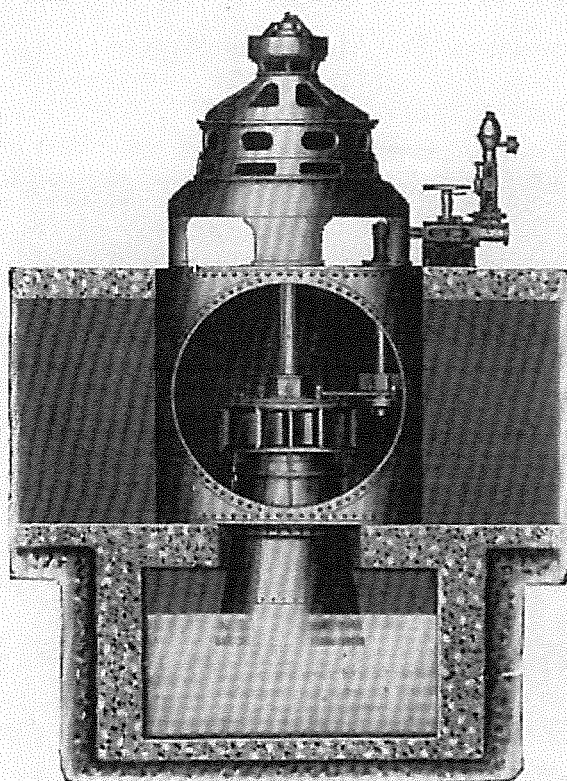
Here, my business partner, Ken Smith, is inspecting the 33 inch, Leffel "Z",

This photo was downloaded from [www.frenchriverland.com/1852\\_fourneyron.htm](http://www.frenchriverland.com/1852_fourneyron.htm) on 10/30/2013

This is the same size and type as turbine for Hydro #3.

However, Hydro #3 is installed in a water chamber, not the pressure chamber shown.

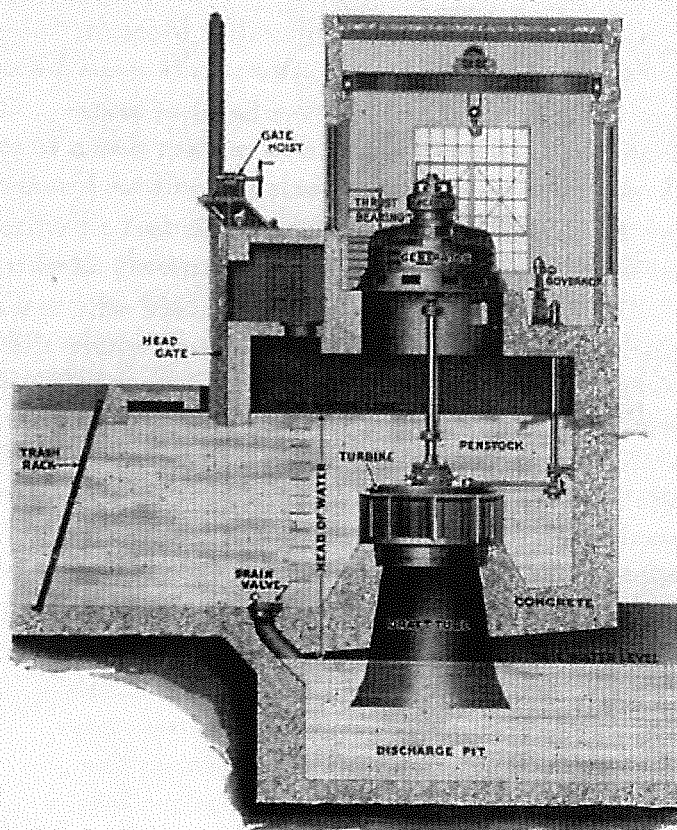
# SPRINGFIELD, OHIO, U. S. A.

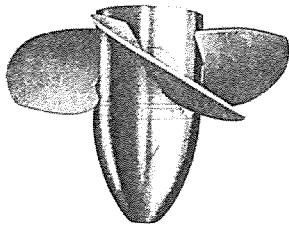


Design 156

Design 156 shows a Vertical LEFFEL Turbine in a Steel Pressure Flume and direct connected to a Vertical Electric Generator which is mounted on top of the Flume. This makes a complete self contained unit, very economical as to field construction and erection costs. It may be used under low heads of water where present conditions do not permit of an economical open Flume installation and it is also admirably suited to the higher head developments involving Pipe Lines. LEFFEL Turbines of all types may be used in this Design.

Design A159, shown at the right, illustrates a complete typical Open Flume setting for a LEFFEL Vertical Turbine direct connect to Vertical Electric Generator. This type of setting is particularly adapted to the lower Heads of Water and, when ample water passages are provided, highest Efficiency is possible. WE ALSO FURNISH MANY other designs of Vertical Turbines suitable for high or low heads of water and for installation in cast iron, steel or concrete Scroll Cases. WRITE FOR FURTHER PARTICULARS.





**GREEN**

**AND**

**CLEAN**

**POWER**

**French River Land Company's Website!**

French River Land  
Company's Home Page!

Poetry of Power

FRL History

Hydrolec Disassembly

Hydrolec Rebuild

Key Personnel

Machine Shop

News Page

Previous Pictures

Previous Pictures Two

Previous Pictures  
Three

Previous Pictures  
Four

Bill Munch

Projects

Rebuilding 120" Niles  
Boring Mill

For Sale

**HYDROELECTRIC SITES:**

Alternatives Hydro

Anasagunticook Lake  
Dam Replacement-  
C.Fay & W.Fay

Appleton HEP-Jim  
Lichoulas

Appleton Wisconsin  
Anniversary

Badger Pond Dam

## Leffel Bulletin 54 Web Page

**POWER TABLE CALCULATOR:**

All new style gate cases, not including SAMSON turbines

**Missing: Microsoft Office Web Components**

This page requires the Microsoft Office Web Components.

[Click here to install Microsoft Office Web Components.](#)

This page also requires Microsoft Internet Explorer 5.01 or higher.

[Click here to install the latest Internet Explorer.](#)

Removal

Senor Bonifettis'  
sites in Chile

Chittendon Falls

Claytor Dam

Collins Bascule Dam

ESAC WORKS            July  
1985

Fiske Mill

1852 Fourneyron

Golden Pond Hydro

Harry Terbush Sites

Hunts Pond

Indian River Rebuild

Kaplans

Jaffery Fire  
Protection

Konkapot Creek

Lake May Pelton Wheel  
Removal

Livermore Falls

Martinsville Hydro

OSV

Shaker Mill Dam

Silk Knitters- Ron  
MacLeod

South Village Dam

Sparhawk Mills

Tannery Pond

Tannery Rebuild

Turners Falls  
Generator Rewind

Valatie Falls

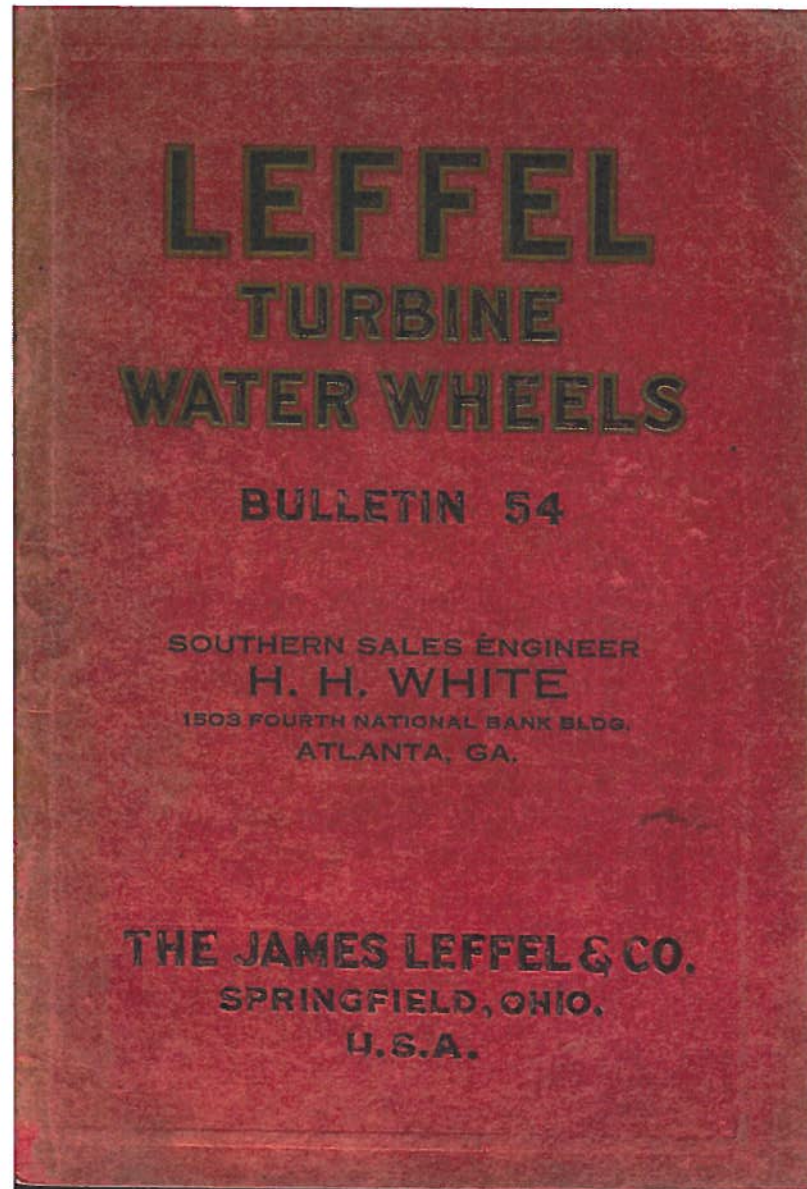
Valley Paper

USEFUL ENGINEERING:

Admitting Air to  
Turbine Runners  
Improves Efficiency,  
S. Logan Kerr

Air Admission to  
Hydro Runners, David  
Cox, USCOE, Kerr Dam

The Banki Water  
Turbine Mockmoore and  
Merryfield



Barrel Stave Bearing  
Repair

Bishops Method-  
STABGM Program

Blade Design Kovalev

Blade Pitting- Boving  
LTD 1930

Cavitation-  
Accelerated Research,  
Allis Chalmers  
Research

Cavitation &  
Vibration of a Draft  
Tube

Cavitation-  
Prevention &  
Reduction, Allis  
Chalmers Research

Causes & Effects of  
Cavitation in  
Hydraulic Turbines

Chain Turbine by:  
Nguyen Minh Duy

Chain Turbine  
Mechanics-  
Discussions with Duy

Characteristics of  
Modern Hydraulic  
Turbines-Chester  
Larner

Comparative Tests On  
Experimental Draft  
Tubes- C M Allen & I  
A Winter 1923

Design of an Overshot  
Waterwheel

(by Carl Weidner)

Design of Pelton  
Buckets

Design of Small Water  
Turbines for Farm and  
Small Communities

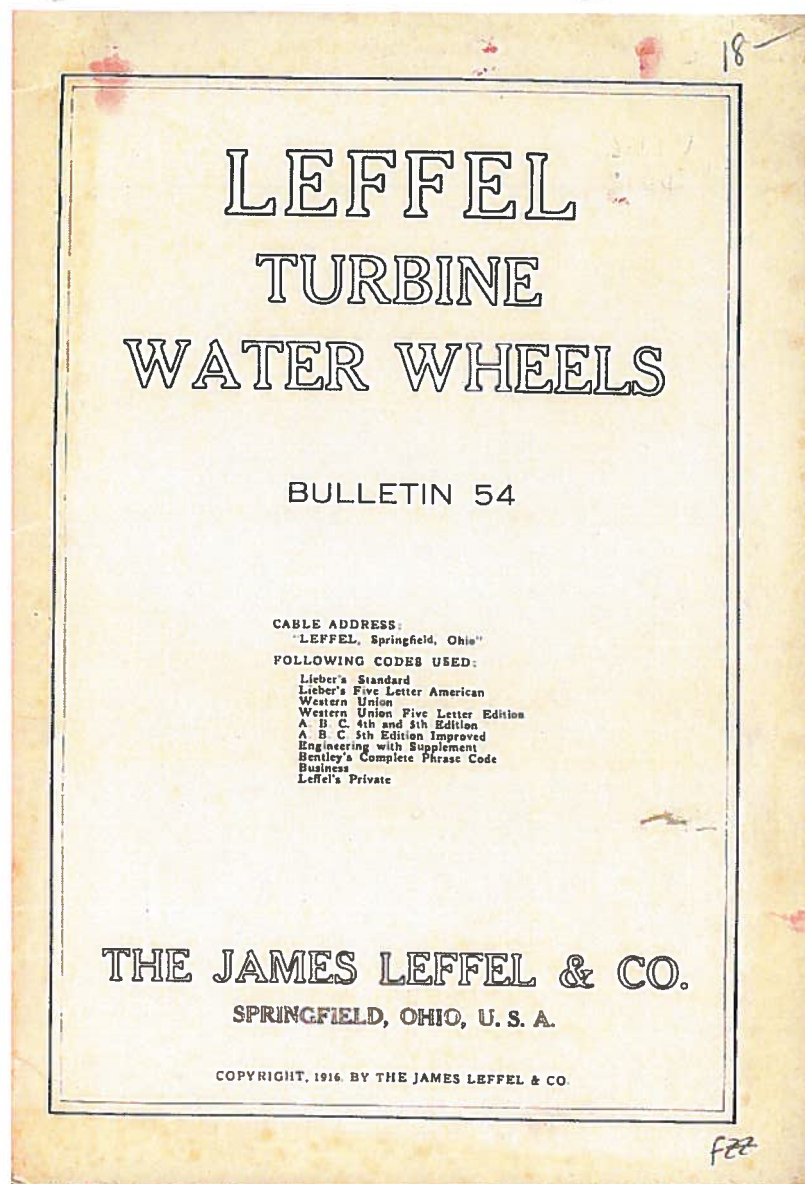
Design of the runner  
of a Kaplan turbine  
for small  
hydroelectric power  
plants: Timo  
Flaspöhler

Draft Tube Design

Draft Tubes of Hydro-  
Electric Stations by  
M. F. Gubin

Draft Tube Tests

Ejection into  
Tailraces of  
Hydropower Plants: S.



M. Slisskii

Erection & Alignment  
of Vertical  
Waterwheel Generator  
Units-R.O. Standing

Evolution of  
Hydraulic Prime  
Movers-Byron McCoy

Fall Increaser- Henry  
Ford

Fall Increaser  
Herschel Venturi Tube

Fall Increaser Moody  
Ejector Turbine

Fall Increaser  
Hydraulic Jump Apron

Flashboard Pins

Gatecase Design-  
Kovalev

Generator Shaft  
Design Calculation-  
Olav Hødtvedt

Governor Theory for  
the Plant Operator

Graphics of Water  
Wheels- William Fox

Hydraulic Motors- M.  
Bresse & F. A. Mahan  
1869

Hydraulic Turbine and  
Governor Field  
Erection Information

Hydraulic Turbines-  
Robert Long Daugherty

Hydraulic Turbines by  
Arnold Pfau

Hydraulic Turbines  
Gelpke & Van Cleve

Hydrokinetic Energy  
in Massachusetts,  
William D. B. Fay

Hydrostatic Beam  
Analysis

Impulse Turbines by  
Ely Hutchinson

Interference fitting  
a large runner shaft

Kaplan Blade Design  
NACA Air Foil- Report  
No. 460

Kaplan Blade Design  
NACA Air Foil- Report  
No. 628

# THE JAMES LEFFEL & CO.

## BULLETIN 54

THIS Bulletin illustrates and describes in detail our two principal types of turbines, our Standard SAMSON and TYPE Z turbines. We also illustrate in this Bulletin several latest designs of hydro installments equipped with our SAMSON and TYPE Z turbines. We also build many other types and designs of turbines for low, medium and high heads and of reduced, medium and high powers and speeds for both vertical and horizontal installments.

Our STANDARD SAMSON TURBINES are equipped with our latest type of double bucket runners and are illustrated and described in detail on pages 6 to 13 inclusive. We have built these Samson turbines for several years. Also, we build this type of turbine of many other different power, speed and efficiency values.

Our TYPE Z TURBINES are illustrated and described on pages 14 to 19 inclusive. These turbines installed under low and medium heads are especially adapted for direct connection to electric generators, exciters, centrifugal pumps, grinders and other high-speed machinery.

We also design and build FRANCIS type turbines for medium and high heads, with scroll or volute casings, single and double discharge designs, developing various power and speed values. We were the first hydraulic engineers to build and install turbines at Niagara Falls, under the full head of water of about 210 feet. These turbines are horizontal designs, both ends of turbine shafts direct connected to generators. These turbines are thoroughly commercial and most successful in every particular, and developing high efficiencies at all gateages.

Our Engineering and Manufacturing Departments are experts in turbine designing and how best to construct the complete installment for developing maximum results at lowest initial cost and minimum operating expenses. The many highly successful hydro installments using our various types and designs of turbines, prove these claims absolutely.

When considering new turbines, advise us with as much information pertaining to same as possible. Our engineers are prepared to inspect your location and requirements. We will promptly submit drawings and proposals for turbines which we would recommend as best adapted.

We have thousands of our turbines installed and in successful operation all over the world. We have been continuously building turbine water wheels since the establishment of this business in 1862. During all of these years we have actively applied our resources to the development and improvement of our turbines and installment of same.

When correctly installed and operated we fully guarantee our turbines.

Kaplan Design-  
Kovalev

Kaplan Design Marko  
Kogovsek.xls

A Laboratory Study to  
Improve the  
Efficiency of  
Crossflow Turbines-  
N. Aziz & V. Desai

Low Head Hydroplants,  
Emil Mosonyi

Meggering Generators

Meggering Earth  
Resistance

Motors as Generators  
for Microhydro, Nigel  
Smith

Miroslav Nechleba

Natick Dam Powerhouse  
Calcs

Operation &  
Maintenance of Hydro-  
Generators

Out Gassing of Cross  
Flow Turbines

Parallel Operation of  
Turbines Analysis

Pelton Design-  
Daugherty

Powerhouse Design-  
Miniwatt Hydro

Powerhouse Design-  
Natick Dam

Power Plant  
Inspection

Rake-Leonard

Rake-Newport News

Rack Design-Chicopee-  
Olav Hotvedt

Rack Design- PHI-  
Bill Fay

Rack Design-PHI-Brian  
French

Rack Design-PHI-Ken  
Smith

Rack Design-ASCE

Rack Design-  
Hydraulic Institute of  
Munich

Rack Design-Flow  
Induced Vibrations

## SPRINGFIELD, OHIO, U. S. A.

Established 1862



### LEFFEL Turbine Water Wheel Shops

Our shops are located in the immediate vicinity of many large rolling mills, blast furnaces, steel foundries, forges and coal mines, from which we obtain the highest grade materials used by us in the building of our turbines and other machinery.

We have all of the principal railroad connections directly into our shops, insuring rapid handling and transportation of both domestic and foreign shipments. Our Traffic Department will secure lowest freight rates and best routing for all of our shipments, via railroad or steamship, to any shipping point in the world.

Our shops are especially designed and constructed for the rapid building of our various types of turbines. Our workmen with years of experience are skilled in the building of our turbines, insuring high-grade workmanship throughout. Each department is fully equipped with special tools and machinery driven electrically by our own power plant. We give all orders our most prompt and careful attention.

### LEFFEL GUARANTEE

We guarantee the workmanship and material used by us in the construction of our turbines to be strictly first class throughout. Also, we guarantee our turbines and machinery to be our latest designs of their respective types, built strong and substantial in all details.

Furthermore, we guarantee the power, speed and efficiency values of our turbines when they are correctly installed and operated.

Furthermore, we guarantee to furnish within one year after shipment, free of cost, on cars our shops, any part of our turbines that may prove defective because of improper material or design.

Rigging a large  
generator

Selecting Hydraulic  
Reaction Turbines  
BUREC

Shafts- Kovalev

Shaft Couplings

Snows Improved Water  
Wheel Governor

Standard for  
Hydraulic Turbine and  
Generator Shaft  
Couplings and Shaft  
Runout Tolerances

Stoplog Design  
Calculation

Stoplog Structure  
Design Calculation

Stress Analysis of  
Hydraulic Turbine  
Parts, BUREC- F.O.  
Ruud

Some Fluid Flow  
Characteristics of a  
Cross Flow Type  
Hydraulic Turbine-  
Durgin & Fay

Tenth Census of the  
US, 1880, Water Power  
of the US, Part I-  
Professor Trowbridge

Tenth Census of the  
US, 1880, Water Power  
of the US, Part II-  
Professor Trowbridge

Tests on a Kaplan  
Hydraulic Turbine

Theoretical  
Conditions Related to  
an Open Channel Flow  
Linear Turbine-  
Ishida & Service

Theory of Turbines-  
De Volson Wood

Treatise relative to  
the Testing of Water-  
Wheels and Machinery,  
James Emerson 1879

Trash Rack  
Differential  
Equations 2L/3

Trashrack  
Differential  
Equations General  
Solution  $f(x)$

Turbine Water-Wheel  
Tests- Robert Horton

## THE JAMES LEFFEL & CO.

### Holyoke and Power Plant Tests

THE Holyoke Water Power Company, in their testing flume at Holyoke, Mass., have tested, during the past twenty-five years or more, many of our various types and capacities of turbines. The latest Holyoke tests of our improved turbines developed results heretofore unequaled, highest speeds, highest horsepower, highest efficiencies.

We have many power plant tests of our vertical and horizontal turbines installed and operating under different conditions and duties. These tests were made not only for power, speed and efficiency values, but also to determine the strength and adaptability of the turbines, together with speed regulation results.

Using these various tests, together with our turbine experience of over fifty-four years, we design and build our turbines to develop the highest hydraulic and best commercial values.

Our improved turbine runners are of the strongest and highest efficiency construction. We have hundreds of these runners operating successfully, under extremely heavy load changes and severe power plant conditions and requirements, proving the superior strength and efficiency construction of our runners.

Our improved gate casings are strongly built and of simplest designs, fitted with easy moving, balanced swing-type gates. Frequently, to meet special requirements, the gates; links and all moving parts are bronze bushed. The gates are independently adjustable and removable.

Thrust bearings that carry the revolving parts of our turbines are designed from long, practical experience and extensive Holyoke and power plant tests in which the weight of the turbine revolving parts and water thrust were accurately weighed and carefully calibrated.

Correctly designed waterways, penstocks and draft-tubes are absolute requirements for developing maximum hydraulic values. We have many of these tests which we use for designing high efficiency installations and for correct operation of our turbines under all conditions.

Constant turbine speed, together with high efficiencies at all gate-ages, and with the turbines running under extreme varying heads of water, is essentially necessary for a thoroughly successful commercial installment. To illustrate: we call your especial attention to the following tables compiled from Holyoke tests, of three vertical turbines of different types running under widely varying heads of water from part gate to full gate, at a constant speed of 175 revolutions per minute.

These constant speed values are given in the tables on opposite page 5.

Turgo, A High Speed  
Impulse Turbine- Paul  
Wilson

Vortices at Intakes

Water Hammer-Lorenzo  
Allievi-Text

Water Hammer-Lorenzo  
Allievi-Figures

Water Hammer-ASME  
Symposium 1933

Water Hammer \_ Norman  
Gibson

Water Hammer-  
E.B.Strowger

Waterpower  
Engineering-Daniel  
Webster Mead

Water Turbines  
Contributions to  
Their Study,  
Computation and  
Design-S.J. Zowski

Water Wheel Design-  
Ken Smith

Weights

WHAMO

White Hydracone  
Regainer

Wooden Penstocks

TRADE CATALOGUES:

Bradway Turbine  
(progressive gate)

C.P.Bradway Turbine

Brook Waterwheel

Charmilles Turbines

Christiana Machine  
(register gate)

Dayton Globe

Electric Machinery  
Company (EM)

English Pelton

ESAC

Essex Turbines

GE WW Vert Gen

GE Springbed Brg

GEH 527C

Gilkes Turbines

# SPRINGFIELD, OHIO, U. S. A.

## CONSTANT SPEED TABLES

### HOLYOKE TEST No. 1892 VERTICAL 35 STANDARD SAMSON TURBINES.

| Revolutions per Minute | Proportional Gateage | 11 Ft. Head |             | 14 Ft. Head |             | 17 Ft. Head |             | 20 Ft. Head |             |
|------------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                        |                      | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power |
| 175                    | 1.000                | 78.15       | 93.4        | 80.40       | 137.0       | 79.85       | 181.5       | 78.70       | 228.2       |
| 175                    | .970                 | 79.90       | 93.4        | 81.75       | 136.6       | 81.17       | 180.8       | 79.80       | 226.8       |
| 175                    | .906                 | 82.80       | 93.0        | 84.15       | 135.5       | 83.25       | 178.6       | 81.60       | 223.2       |
| 175                    | .800                 | 78.30       | 75.2        | 87.48       | 128.2       | 85.90       | 168.5       | 83.70       | 208.8       |
| 175                    | .762                 | 78.20       | 62.3        | 88.00       | 124.5       | 86.35       | 163.3       | 84.00       | 201.2       |
| 175                    | .700                 | 78.20       | 59.4        | 85.00       | 109.2       | 86.85       | 153.3       | 84.20       | 188.7       |
| 175                    | .600                 | 74.20       | 47.4        | 80.75       | 86.1        | 83.07       | 122.2       | 83.95       | 161.7       |

### HOLYOKE TEST No. 2359 VERTICAL 35 TYPE F TURBINES.

| Revolutions per Minute | Proportional Gateage | 11 Ft. Head |             | 14 Ft. Head |             | 17 Ft. Head |             | 20 Ft. Head |             |
|------------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                        |                      | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power |
| 175                    | 1.000                | 88.00       | 108.5       | 87.47       | 154.5       | 86.00       | 202.4       | 84.25       | 251.5       |
| 175                    | .889                 | 89.30       | 99.6        | 91.08       | 147.6       | 88.60       | 190.6       | 86.30       | 234.5       |
| 175                    | .833                 | 86.45       | 87.0        | 93.00       | 141.4       | 90.15       | 182.2       | 86.65       | 222.5       |
| 175                    | .778                 | 84.85       | 80.1        | 90.80       | 127.5       | 90.10       | 172.4       | 86.70       | 210.0       |
| 175                    | .667                 | 81.25       | 66.9        | 87.45       | 103.2       | 88.00       | 141.6       | 86.60       | 180.2       |
| 175                    | .556                 | 76.00       | 49.5        | 83.45       | 80.1        | 84.83       | 112.2       | 84.35       | 142.3       |

### HOLYOKE TEST No. 2363, VERTICAL 30 TYPE Z TURBINES.

| Revolutions per Minute | Proportional Gateage | 11 Ft. Head |             | 14 Ft. Head |             | 17 Ft. Head |             | 20 Ft. Head |             |
|------------------------|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                        |                      | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power | Efficiency  | Horse Power |
| 175                    | 1.000                | 83.50       | 162.3       | 83.35       | 227.5       | 81.40       | 288.0       | 79.30       | 348.0       |
| 175                    | .891                 | 87.30       | 160.0       | 87.30       | 223.5       | 85.35       | 285.0       | 83.30       | 344.0       |
| 175                    | .796                 | 88.35       | 148.7       | 90.00       | 215.5       | 87.90       | 273.0       | 85.85       | 330.5       |
| 175                    | .749                 | 86.65       | 137.8       | 90.50       | 206.5       | 89.07       | 265.0       | 86.75       | 320.8       |
| 175                    | .700                 | 84.20       | 127.0       | 89.55       | 192.5       | 89.28       | 252.0       | 87.00       | 305.0       |
| 175                    | .600                 | 77.20       | 100.4       | 83.90       | 155.2       | 87.23       | 215.5       | 85.90       | 269.5       |
| 175                    | .500                 | 70.90       | 77.8        | 77.20       | 121.0       | 80.65       | 168.0       | 81.60       | 217.5       |

We furnish blueprint curve tables showing guaranteed power, speed and efficiency values for any of our various turbines running constant speed, at different gateages, under variable heads. Also, blueprint copies of tests of our turbines tested at Holyoke and in place, together with blueprint drawing showing correct installation and operation of our turbines under all conditions and requirements.

GilkesWaterpower

Head Gate Hoists- S.  
Morgan Smith

Holyoke Hercules

Hunt Cat 29 A&amp;B

Hunt cylinder

J & W Jolly  
(cylinder gate)

Kingsbury Brg

Leffel Bulletin 38

Leffel Bulletin 54

Leffel Hoppes Unit

Leffel Laboratory  
Unit

Leffel Miscellaneous

Kingsbury Catalog C-1

Lombard Direct-  
Connected Oil  
Pressure Governors  
Bulletin NO. 113  
October 1st, 1912

Lombard Governor

Lombard Governor  
Company Type T  
Instruction Book

Lombard Governors for  
Waterwheels and Steam  
Engines-1902

Lombard Water Wheel  
Governors Catalogue  
26

Michell Bearings

Pelton Wheel (1909)

Pelton Wheel (1925)

Ridgway Perfection  
Water-Wheel

Rodney Hunt

Samson PamK

Smith Bulletin 110

Smith Power Tables

Smith Kaplan

Smith Power

Smith Pelton

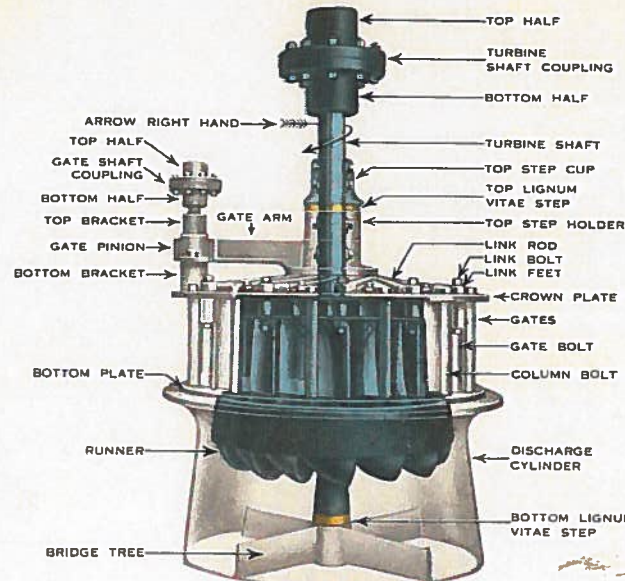
Smith Develop

Smith Turbines:  
Bulletin 105

# THE JAMES LEFFEL & CO

## Vertical Standard Samson Turbines

These turbines are built strong and substantial, and equipped with our exclusive design double steel bucket runners fitted on steel shafts. Large top and bottom lignumvitae step bearings for carrying the revolving parts of these turbines, including the weight of extra upright shafting and gearing. Also, balanced swing-type gates with separate adjustable steel connections. Each gate removable independently. All bearings of large dimensions and special material. Bolted couplings.



NAMES of the different turbine parts given above.  
All revolving parts of these turbines are colored BLUE.  
Top and bottom lignumvitae step bearings colored YELLOW.  
The arrow on turbine shaft shows turbine revolving RIGHT HAND.  
Turbines revolving opposite to this arrow would revolve LEFT HAND.  
We BORE and KEYSEAT the upper half turbine and gate shaft couplings.  
POWER TABLES of these SAMSON turbines on pages 10 to 13, inclusive.  
CONSTANT SPEED table these SAMSON turbines page 5, Holyoke Test No. 1892.  
CORRECT installment dimensions of these turbines on opposite page 7.  
We also build SPECIAL SAMSON, TYPE F, TYPE J, TYPE K turbines.  
We furnish special particulars regarding these SPECIAL SAMSON turbines.  
We also build these STANDARD and SPECIAL SAMSON turbines horizontal designs.

Swain Turbine  
Trump Hydraulic Turbines  
Trump Turbines  
Tyler Turbine  
Vertical Shaft Water Wheel Driven Generators- General Electric  
Wellman Seaver Morgan  
Westinghouse Small Vertical Waterwheel-Driven A-C Generators, July 1944  
Westinghouse WW Generators  
Woodward Governor

Links:

Swiftriverhydro.com

damengineers.com

Smith Alternative Energy:

www.smithtest.com

Small Turbine Manufacturers Websites:

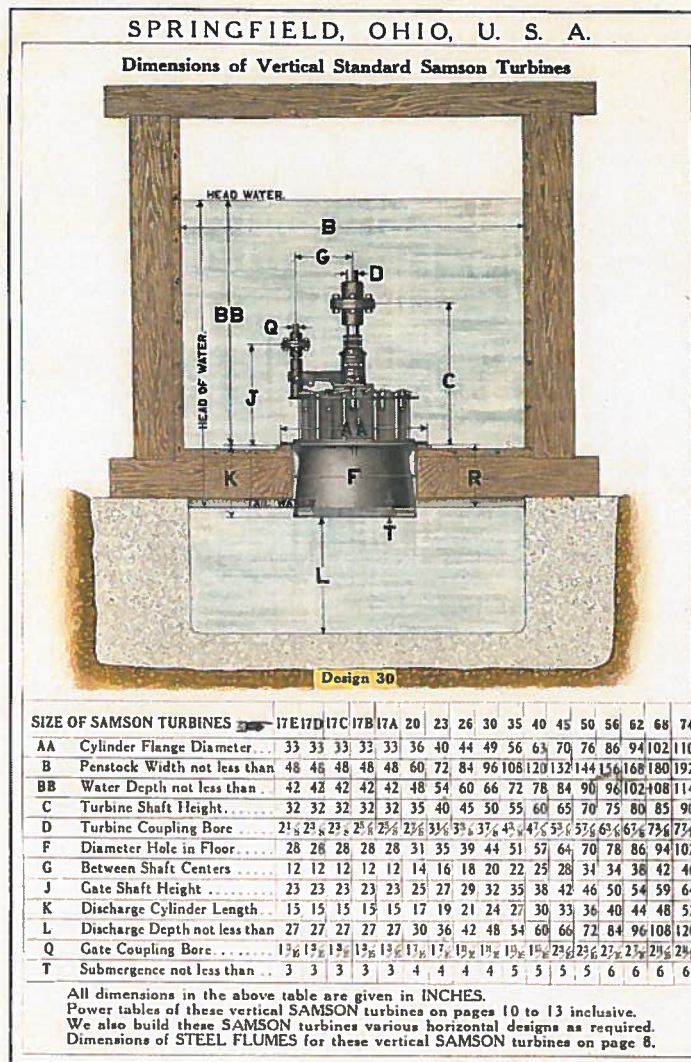
www.waterturbine.com

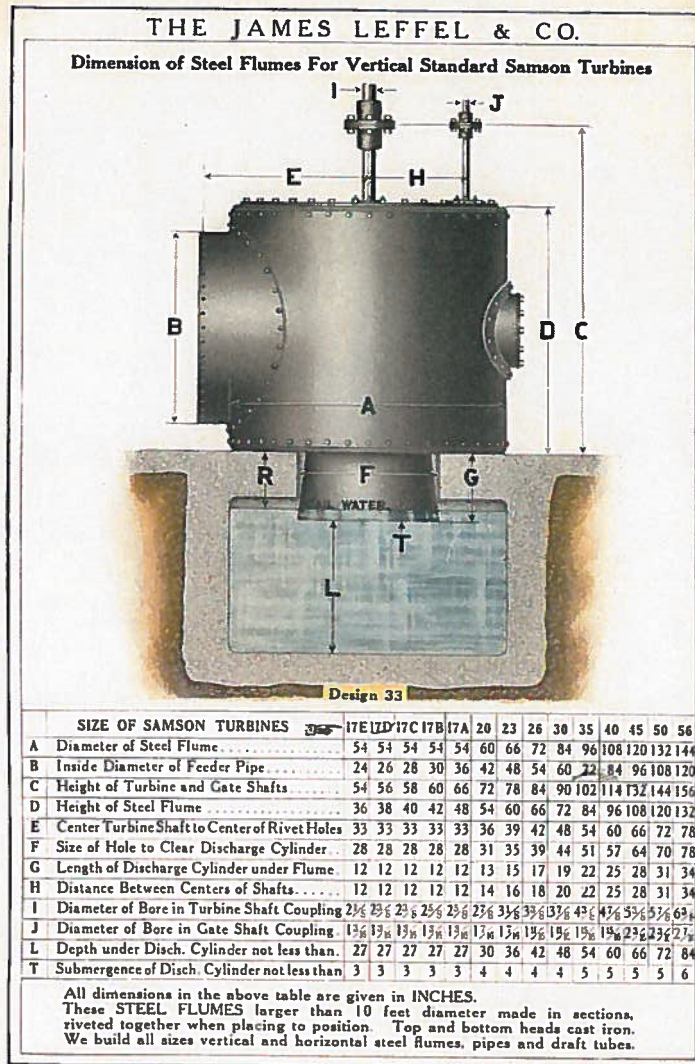
www.varspeedhydro.com

www.hydropower.nu

www.ossberger.de

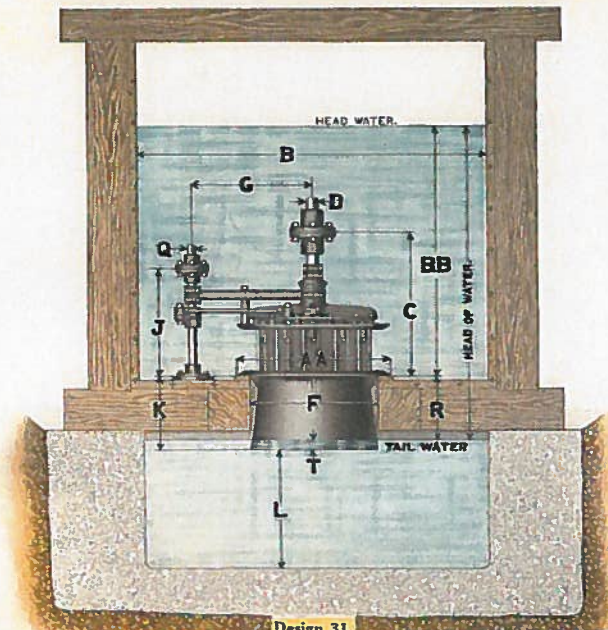
www.gilkes.com/





SPRINGFIELD, OHIO, U. S. A.

Special Vertical Samson Turbines with Top Gate Operating Ring



Design 31

We furnish our various types of vertical SAMSON turbines with different designs of connections for operating the gates. The above illustration shows our improved gate operating ring of simple design, strongly constructed, split and easily removable. The upright gate shaft rotates 45° or 60° for full gate movement, reducing to minimum friction and wear. These gates under water pressure are balanced design and so arranged that in case of breakage the gates will slowly close. Each gate can be removed separately. The revolving parts of these turbines are carried on large top and bottom lignumvitae step bearings. If required, we will bronze bush all the gate connection bearings. We also build our various types of vertical SAMSON turbines with gates of special design, also top and bottom plates with curved inlet edges, as illustrated above, which increases the power, speed and efficiency values. These SAMSON turbines built with special gate equipment and curved plates, we specify as our special TYPE F, TYPE J and TYPE K SAMSON turbines.

We also build these special SAMSON turbines horizontal design.

# THE JAMES LEFFEL & CO.

## POWER TABLE—VERTICAL STANDARD SAMSON TURBINES.

| Size of Turbine | Head                    | 3                   | 4                   | 5                    | 6                     | 7                     | 8                     | 9                     | 10                    | 11                    | 12                    | 13                    | 14                    |
|-----------------|-------------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 17 E.           | Power<br>Water<br>Speed | 1.1<br>252<br>161   | 1.7<br>291<br>186   | 2.5<br>325<br>208    | 3.2<br>356<br>228     | 4.1<br>384<br>246     | 5.0<br>411<br>264     | 6.0<br>436<br>280     | 7.0<br>460<br>294     | 8.1<br>482<br>308     | 9.2<br>503<br>322     | 10.4<br>524<br>335    | 11.7<br>544<br>348    |
| 17 D.           | Power<br>Water<br>Speed | 1.5<br>328<br>181   | 2.3<br>379<br>186   | 3.2<br>423<br>208    | 4.3<br>464<br>228     | 5.4<br>502<br>246     | 6.5<br>536<br>264     | 7.8<br>569<br>280     | 9.2<br>601<br>294     | 10.6<br>629<br>308    | 12.0<br>657<br>322    | 13.6<br>683<br>335    | 15.2<br>709<br>348    |
| 17 C.           | Power<br>Water<br>Speed | 2.0<br>433<br>161   | 3.0<br>492<br>186   | 4.3<br>558<br>208    | 5.6<br>611<br>228     | 7.1<br>650<br>246     | 8.6<br>686<br>264     | 10.3<br>719<br>280    | 12.1<br>749<br>294    | 14.0<br>778<br>308    | 15.8<br>806<br>322    | 17.9<br>834<br>335    | 19.0<br>854<br>348    |
| 17 B.           | Power<br>Water<br>Speed | 2.4<br>533<br>161   | 3.7<br>616<br>186   | 5.3<br>689<br>208    | 7.0<br>754<br>228     | 8.7<br>815<br>246     | 10.6<br>871<br>264    | 12.7<br>924<br>280    | 14.9<br>975<br>294    | 17.2<br>1021<br>308   | 19.5<br>1066<br>322   | 21.8<br>1110<br>335   | 24.7<br>1153<br>348   |
| 17 A.           | Power<br>Water<br>Speed | 3.2<br>697<br>161   | 4.9<br>805<br>186   | 6.9<br>900<br>208    | 9.1<br>988<br>228     | 11.4<br>1065<br>246   | 13.9<br>1139<br>264   | 16.6<br>1208<br>280   | 19.5<br>1275<br>294   | 22.5<br>1335<br>308   | 25.5<br>1391<br>322   | 28.6<br>1441<br>335   | 32.3<br>1486<br>348   |
| 20.             | Power<br>Water<br>Speed | 4.2<br>914<br>140   | 6.4<br>1055<br>162  | 9.0<br>1180<br>182   | 11.5<br>1293<br>199   | 15.0<br>1396<br>215   | 18.3<br>1483<br>230   | 21.8<br>1569<br>244   | 25.5<br>1659<br>257   | 29.5<br>1750<br>270   | 33.5<br>1828<br>282   | 37.6<br>1903<br>293   | 42.3<br>1975<br>304   |
| 23.             | Power<br>Water<br>Speed | 5.6<br>1209<br>127  | 8.5<br>1391<br>141  | 11.9<br>1581<br>158  | 15.7<br>1719<br>173   | 19.8<br>1847<br>187   | 24.2<br>1974<br>200   | 29.8<br>2094<br>211   | 33.8<br>2207<br>224   | 39.0<br>2315<br>235   | 44.4<br>2418<br>245   | 50.0<br>2517<br>255   | 55.9<br>2612<br>265   |
| 26.             | Power<br>Water<br>Speed | 7.10<br>1545<br>108 | 10.9<br>1764<br>125 | 15.2<br>1985<br>140  | 20.1<br>2185<br>153   | 25.3<br>2360<br>166   | 30.9<br>2523<br>177   | 36.8<br>2678<br>188   | 43.2<br>2821<br>198   | 49.8<br>2959<br>207   | 56.7<br>3090<br>217   | 64.0<br>3216<br>226   | 71.5<br>3338<br>234   |
| 30.             | Power<br>Water<br>Speed | 9.44<br>2237<br>84  | 14.5<br>2375<br>100 | 20.3<br>2556<br>121  | 26.7<br>2698<br>132   | 33.6<br>2843<br>143   | 41.1<br>2989<br>153   | 49.1<br>3136<br>163   | 57.5<br>3283<br>171   | 66.2<br>3438<br>180   | 75.5<br>3584<br>188   | 85.2<br>3728<br>195   | 95.2<br>3864<br>203   |
| 35.             | Power<br>Water<br>Speed | 12.8<br>2789<br>81  | 19.7<br>3220<br>93  | 27.5<br>3600<br>104  | 36.2<br>3944<br>114   | 45.6<br>4260<br>123   | 55.7<br>4554<br>132   | 66.5<br>4830<br>140   | 77.9<br>5091<br>147   | 89.8<br>5339<br>154   | 102.0<br>5577<br>161  | 115.0<br>5805<br>168  | 129.0<br>6024<br>174  |
| 40.             | Power<br>Water<br>Speed | 18.8<br>3657<br>70  | 28.6<br>4223<br>81  | 38.1<br>4722<br>91   | 47.5<br>5172<br>100   | 59.8<br>5587<br>108   | 73.1<br>5972<br>115   | 87.2<br>6335<br>122   | 102.0<br>6677<br>129  | 118.0<br>7003<br>135  | 134.0<br>7315<br>141  | 151.0<br>7613<br>147  | 168.0<br>7890<br>152  |
| 45.             | Power<br>Water<br>Speed | 21.2<br>4629<br>63  | 32.7<br>5341<br>72  | 45.7<br>5975<br>81   | 60.1<br>6548<br>88    | 75.7<br>7070<br>96    | 92.5<br>7553<br>102   | 110.0<br>8017<br>109  | 129.0<br>8450<br>114  | 149.0<br>8891<br>120  | 170.0<br>9327<br>125  | 192.0<br>9635<br>130  | 214.0<br>9999<br>135  |
| 50.             | Power<br>Water<br>Speed | 26.2<br>5714<br>56  | 40.5<br>6580<br>65  | 56.4<br>7377<br>73   | 74.2<br>8081<br>80    | 93.5<br>8729<br>86    | 114.0<br>9331<br>92   | 136.0<br>9887<br>98   | 160.0<br>10433<br>103 | 184.0<br>10942<br>108 | 210.0<br>11428<br>113 | 235.0<br>11785<br>117 | 264.0<br>12349<br>122 |
| 56.             | Power<br>Water<br>Speed | 32.9<br>7168<br>50  | 50.6<br>8277<br>58  | 70.8<br>9254<br>65   | 93.8<br>10137<br>71   | 117.0<br>10950<br>77  | 143.0<br>11765<br>82  | 171.0<br>12415<br>87  | 200.0<br>13087<br>92  | 231.0<br>13729<br>96  | 263.0<br>14336<br>101 | 297.0<br>14922<br>105 | 332.0<br>15486<br>109 |
| 62.             | Power<br>Water<br>Speed | 40.3<br>8787<br>43  | 62.1<br>10149<br>62 | 86.8<br>11344<br>89  | 114.0<br>12428<br>114 | 144.0<br>13419<br>144 | 178.0<br>14349<br>178 | 210.0<br>15219<br>210 | 245.0<br>16042<br>245 | 283.0<br>16825<br>283 | 323.0<br>17574<br>323 | 364.0<br>18291<br>364 | 407.0<br>18982<br>407 |
| 68.             | Power<br>Water<br>Speed | 48.5<br>10570<br>41 | 74.7<br>12201<br>43 | 104.0<br>13645<br>53 | 137.0<br>14947<br>59  | 171.0<br>16145<br>63  | 211.0<br>17258<br>68  | 252.0<br>18306<br>72  | 295.0<br>19287<br>76  | 341.0<br>20233<br>79  | 388.0<br>21129<br>83  | 436.0<br>22002<br>88  | 485.0<br>22832<br>89  |
| 74.             | Power<br>Water<br>Speed | 57.5<br>12517<br>38 | 88.5<br>14453<br>44 | 124.0<br>16159<br>49 | 162.0<br>17701<br>51  | 205.0<br>19120<br>55  | 250.0<br>20439<br>62  | 299.0<br>21679<br>66  | 350.0<br>22852<br>70  | 403.0<br>23967<br>73  | 460.0<br>25034<br>78  | 518.0<br>26056<br>82  | 579.0<br>27039<br>86  |

### EXPLANATION OF ABOVE TABLES

HEAD — Effective head in feet. WATER — Cubic feet discharged per minute.  
 POWER — Full gate horsepower. SPEED — Number of revolutions per minute.  
 We also build STANDARD SAMSON turbines developing power and speed values  
 HALF WAY between each of the different sizes of turbines given in above table.  
 These vertical STANDARD SAMSON turbines to develop above power, speed and  
 efficiency values, must be installed and operated substantially as given on page 7.

# SPRINGFIELD, OHIO, U. S. A.

## POWER TABLE—VERTICAL STANDARD SAMSON TURBINES.

| Size of Turbine | Head                    | 15                    | 16                    | 17                    | 18                    | 19                    | 20                    | 21                     | 22                     | 23                     | 24                     | 25                     | 26                     |
|-----------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 17 E.           | Power<br>Water<br>Speed | 12.9<br>553<br>360    | 14.3<br>581<br>373    | 15.6<br>629<br>384    | 17.0<br>677<br>394    | 18.4<br>724<br>405    | 19.8<br>771<br>416    | 21.4<br>818<br>428     | 22.9<br>865<br>436     | 24.5<br>912<br>446     | 26.2<br>959<br>454     | 27.8<br>1006<br>464    | 29.5<br>1053<br>474    |
| 17 D.           | Power<br>Water<br>Speed | 16.9<br>734<br>368    | 18.6<br>758<br>373    | 20.4<br>782<br>384    | 22.1<br>806<br>394    | 24.0<br>827<br>405    | 25.9<br>848<br>416    | 27.9<br>869<br>428     | 29.9<br>890<br>436     | 32.0<br>911<br>446     | 34.1<br>932<br>454     | 36.2<br>953<br>464     | 38.5<br>974<br>474     |
| 17 C.           | Power<br>Water<br>Speed | 22.2<br>987<br>360    | 24.6<br>1029<br>373   | 26.8<br>1071<br>384   | 29.1<br>1113<br>394   | 31.8<br>1155<br>405   | 34.1<br>1197<br>416   | 36.8<br>1239<br>428    | 39.4<br>1281<br>436    | 42.2<br>1323<br>446    | 45.0<br>1365<br>454    | 47.7<br>1407<br>464    | 50.7<br>1449<br>474    |
| 17 B.           | Power<br>Water<br>Speed | 27.4<br>1193<br>360   | 30.2<br>1235<br>373   | 33.1<br>1277<br>384   | 36.0<br>1319<br>394   | 39.0<br>1361<br>405   | 42.1<br>1403<br>416   | 45.4<br>1445<br>428    | 48.6<br>1487<br>436    | 52.0<br>1529<br>446    | 55.5<br>1571<br>454    | 58.9<br>1613<br>464    | 62.6<br>1655<br>474    |
| 17 A.           | Power<br>Water<br>Speed | 35.6<br>1555<br>360   | 39.5<br>1610<br>373   | 43.3<br>1665<br>384   | 47.0<br>1720<br>394   | 51.0<br>1775<br>405   | 55.0<br>1830<br>416   | 59.3<br>1885<br>428    | 63.6<br>1940<br>436    | 68.0<br>1995<br>446    | 72.5<br>2050<br>454    | 77.0<br>2105<br>464    | 81.8<br>2160<br>474    |
| 20.             | Power<br>Water<br>Speed | 46.9<br>2044<br>315   | 51.3<br>2111<br>325   | 56.6<br>2179<br>335   | 61.7<br>2230<br>345   | 66.9<br>2280<br>354   | 72.2<br>2330<br>364   | 77.7<br>2380<br>373    | 83.3<br>2430<br>381    | 89.0<br>2480<br>390    | 94.9<br>2530<br>398    | 101.0<br>2580<br>407   | 107.0<br>2630<br>415   |
| 23.             | Power<br>Water<br>Speed | 62.8<br>2703<br>274   | 68.3<br>2782<br>283   | 74.9<br>2879<br>292   | 81.6<br>2961<br>300   | 88.5<br>3043<br>308   | 95.5<br>3122<br>316   | 103.0<br>3199<br>324   | 110.0<br>3274<br>332   | 118.0<br>3348<br>339   | 126.0<br>3420<br>346   | 133.0<br>3489<br>354   | 141.0<br>3559<br>361   |
| 26.             | Power<br>Water<br>Speed | 79.3<br>3435<br>242   | 87.3<br>3529<br>250   | 95.7<br>3628<br>258   | 104.0<br>3725<br>266  | 113.0<br>3828<br>273  | 121.0<br>3919<br>280  | 131.0<br>4088<br>287   | 141.0<br>4181<br>293   | 151.0<br>4279<br>300   | 160.0<br>4370<br>306   | 171.0<br>4460<br>313   | 180.0<br>4549<br>319   |
| 30.             | Power<br>Water<br>Speed | 106.0<br>4506<br>210  | 116.0<br>4751<br>217  | 127.0<br>4937<br>224  | 139.0<br>5177<br>230  | 150.0<br>5439<br>236  | 162.0<br>5712<br>242  | 175.0<br>5994<br>248   | 188.0<br>6281<br>254   | 200.0<br>6571<br>260   | 214.0<br>6866<br>266   | 227.0<br>7165<br>271   | 241.0<br>7469<br>276   |
| 35.             | Power<br>Water<br>Speed | 143.0<br>6236<br>180  | 156.0<br>6540<br>186  | 173.0<br>6858<br>192  | 188.0<br>7181<br>197  | 204.0<br>7509<br>203  | 220.0<br>7841<br>208  | 237.0<br>8178<br>213   | 254.0<br>8520<br>218   | 272.0<br>8867<br>223   | 290.0<br>9219<br>227   | 308.0<br>9575<br>232   | 327.0<br>9926<br>237   |
| 40.             | Power<br>Water<br>Speed | 188.0<br>8178<br>157  | 207.0<br>8446<br>163  | 229.0<br>8706<br>168  | 247.0<br>8950<br>172  | 266.0<br>9204<br>177  | 286.0<br>9463<br>182  | 311.0<br>9727<br>186   | 336.0<br>10004<br>191  | 362.0<br>10286<br>195  | 388.0<br>10568<br>199  | 414.0<br>10850<br>203  | 428.0<br>10977<br>207  |
| 45.             | Power<br>Water<br>Speed | 238.0<br>10350<br>140 | 262.0<br>10640<br>145 | 287.0<br>11018<br>149 | 312.0<br>11337<br>153 | 336.0<br>11648<br>158 | 368.0<br>11951<br>162 | 393.0<br>12246<br>168  | 422.0<br>12534<br>170  | 451.0<br>12816<br>173  | 481.0<br>13091<br>177  | 511.0<br>13361<br>181  | 542.0<br>13626<br>184  |
| 50.             | Power<br>Water<br>Speed | 283.0<br>12777<br>128 | 324.0<br>13180<br>130 | 354.0<br>13603<br>134 | 385.0<br>13997<br>138 | 418.0<br>14390<br>142 | 451.0<br>14784<br>145 | 480.0<br>15118<br>149  | 521.0<br>15474<br>153  | 557.0<br>15822<br>156  | 593.0<br>16162<br>159  | 631.0<br>16496<br>162  | 669.0<br>16822<br>166  |
| 56.             | Power<br>Water<br>Speed | 368.0<br>16028<br>112 | 405.0<br>16354<br>116 | 444.0<br>16763<br>120 | 484.0<br>17158<br>123 | 524.0<br>17539<br>127 | 568.0<br>17908<br>130 | 609.0<br>18265<br>133  | 653.0<br>18611<br>136  | 699.0<br>18947<br>139  | 744.0<br>19274<br>142  | 791.0<br>19592<br>145  | 839.0<br>19882<br>148  |
| 62.             | Power<br>Water<br>Speed | 451.0<br>19640<br>102 | 497.0<br>20032<br>105 | 544.0<br>20417<br>108 | 593.0<br>20793<br>111 | 643.0<br>21153<br>114 | 694.0<br>21498<br>117 | 747.0<br>21828<br>120  | 801.0<br>22153<br>123  | 856.0<br>22474<br>126  | 913.0<br>22781<br>128  | 970.0<br>23085<br>131  | 1030.0<br>23385<br>134 |
| 68.             | Power<br>Water<br>Speed | 542.0<br>22634<br>93  | 597.0<br>23069<br>96  | 654.0<br>23500<br>99  | 713.0<br>23926<br>101 | 773.0<br>24348<br>104 | 835.0<br>24756<br>107 | 896.0<br>25151<br>109  | 963.0<br>25544<br>112  | 1039.0<br>25925<br>115 | 1099.0<br>26303<br>117 | 1167.0<br>26678<br>120 | 1238.0<br>27051<br>122 |
| 74.             | Power<br>Water<br>Speed | 642.0<br>27938<br>85  | 709.0<br>28390<br>88  | 775.0<br>28839<br>91  | 844.0<br>29284<br>94  | 916.0<br>29716<br>96  | 992.0<br>30138<br>99  | 1064.0<br>30544<br>101 | 1141.0<br>30944<br>103 | 1220.0<br>31341<br>106 | 1296.0<br>31735<br>108 | 1382.0<br>32117<br>110 | 1468.0<br>32498<br>112 |

### EXPLANATION OF ABOVE TABLES

HEAD — Effective head in feet. WATER — Cubic feet discharged per minute.  
 POWER — Full gate horsepower. SPEED — Number of revolutions per minute.  
 We also build STANDARD SAMSON turbines developing power and speed values  
 HALF WAY between each of the different sizes of turbines given in above table.  
 These vertical STANDARD SAMSON turbines to develop above power, speed and  
 efficiency values, must be installed and operated substantially as given on page 7.

| THE JAMES LEFFEL & CO.                         |                         |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |
|------------------------------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| POWER TABLE—VERTICAL STANDARD SAMSON TURBINES. |                         |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |                        |
| Size of Turbine                                | Head<br>Feet            | 27                     | 28                     | 29                     | 30                     | 31                     | 32                     | 33                     | 34                     | 35                     | 36                     | 37                     | 38                     |
| 17 E.                                          | Power<br>Water<br>Speed | 31.4<br>755<br>453     | 32.9<br>769<br>437     | 34.8<br>783<br>501     | 36.5<br>796<br>510     | 38.3<br>809<br>518     | 40.4<br>822<br>526     | 42.2<br>835<br>534     | 44.0<br>847<br>542     | 46.2<br>860<br>550     | 48.0<br>872<br>557     | 50.2<br>884<br>564     | 52.0<br>896<br>573     |
| 17 D.                                          | Power<br>Water<br>Speed | 41.0<br>985<br>453     | 42.9<br>1003<br>492    | 45.4<br>1021<br>501    | 47.6<br>1039<br>510    | 49.0<br>1056<br>518    | 52.8<br>1072<br>526    | 55.1<br>1089<br>534    | 57.5<br>1105<br>542    | 60.3<br>1121<br>550    | 62.8<br>1137<br>557    | 65.5<br>1153<br>564    | 67.8<br>1169<br>573    |
| 17 C.                                          | Power<br>Water<br>Speed | 53.0<br>1207<br>453    | 56.4<br>1321<br>492    | 58.7<br>1344<br>501    | 62.6<br>1367<br>510    | 65.7<br>1389<br>518    | 69.4<br>1412<br>526    | 72.5<br>1433<br>534    | 75.8<br>1454<br>542    | 79.4<br>1476<br>550    | 82.5<br>1497<br>557    | 86.2<br>1518<br>564    | 89.3<br>1538<br>573    |
| 17 B.                                          | Power<br>Water<br>Speed | 65.6<br>1600<br>483    | 69.6<br>1629<br>492    | 73.7<br>1659<br>501    | 77.3<br>1687<br>510    | 81.1<br>1714<br>518    | 85.7<br>1742<br>526    | 89.5<br>1769<br>534    | 93.3<br>1795<br>542    | 97.0<br>1821<br>550    | 102.0<br>1847<br>557   | 106.0<br>1873<br>564   | 110.0<br>1898<br>573   |
| 17 A.                                          | Power<br>Water<br>Speed | 87.0<br>2092<br>483    | 91.0<br>2130<br>492    | 96.3<br>2168<br>501    | 101.0<br>2205<br>510   | 106.0<br>2241<br>518   | 112.0<br>2277<br>526   | 117.0<br>2312<br>534   | 122.0<br>2347<br>542   | 129.0<br>2381<br>550   | 133.0<br>2415<br>557   | 139.0<br>2449<br>564   | 144.0<br>2481<br>573   |
| 20.                                            | Power<br>Water<br>Speed | 113.0<br>2742<br>473   | 120.0<br>2829<br>430   | 126.0<br>2916<br>450   | 133.0<br>2999<br>415   | 139.0<br>3082<br>453   | 146.0<br>3165<br>467   | 153.0<br>3248<br>481   | 160.0<br>3331<br>494   | 167.0<br>3414<br>508   | 174.0<br>3497<br>522   | 182.0<br>3580<br>536   | 189.0<br>3663<br>550   |
| 23.                                            | Power<br>Water<br>Speed | 150.0<br>3877<br>369   | 158.0<br>3994<br>374   | 167.0<br>4111<br>381   | 175.0<br>4228<br>367   | 184.0<br>4345<br>394   | 193.0<br>4462<br>400   | 202.0<br>4579<br>406   | 212.0<br>4696<br>412   | 221.0<br>4813<br>419   | 231.0<br>4930<br>424   | 240.0<br>5047<br>430   | 250.0<br>5164<br>438   |
| 26.                                            | Power<br>Water<br>Speed | 191.0<br>4835<br>325   | 202.0<br>4970<br>331   | 213.0<br>5105<br>337   | 224.0<br>5240<br>343   | 236.0<br>5375<br>348   | 247.0<br>5510<br>354   | 259.0<br>5645<br>359   | 271.0<br>5780<br>365   | 283.0<br>5915<br>370   | 295.0<br>6050<br>375   | 307.0<br>6185<br>380   | 320.0<br>6320<br>386   |
| 30.                                            | Power<br>Water<br>Speed | 255.0<br>6171<br>232   | 269.0<br>6285<br>287   | 284.0<br>6399<br>292   | 299.0<br>6513<br>297   | 314.0<br>6627<br>302   | 329.0<br>6741<br>307   | 344.0<br>6855<br>311   | 360.0<br>6969<br>316   | 376.0<br>7083<br>321   | 393.0<br>7197<br>325   | 409.0<br>7311<br>330   | 426.0<br>7425<br>337   |
| 35.                                            | Power<br>Water<br>Speed | 348.0<br>8386<br>202   | 364.0<br>8520<br>246   | 385.0<br>8654<br>250   | 405.0<br>8788<br>255   | 425.0<br>8922<br>261   | 446.0<br>9056<br>263   | 467.0<br>9190<br>267   | 488.0<br>9324<br>271   | 510.0<br>9458<br>275   | 532.0<br>9592<br>279   | 554.0<br>9726<br>282   | 577.0<br>9860<br>287   |
| 40.                                            | Power<br>Water<br>Speed | 453.0<br>10972<br>211  | 479.0<br>11173<br>215  | 506.0<br>11374<br>219  | 531.0<br>11565<br>223  | 558.0<br>11756<br>226  | 585.0<br>11947<br>230  | 612.0<br>12138<br>234  | 640.0<br>12329<br>237  | 668.0<br>12520<br>240  | 694.0<br>12711<br>244  | 727.0<br>12902<br>247  | 757.0<br>13093<br>251  |
| 45.                                            | Power<br>Water<br>Speed | 574.0<br>13866<br>188  | 606.0<br>14140<br>191  | 638.0<br>14414<br>195  | 672.0<br>14688<br>198  | 706.0<br>14962<br>201  | 740.0<br>15236<br>205  | 775.0<br>15510<br>208  | 811.0<br>15784<br>211  | 847.0<br>16058<br>214  | 883.0<br>16332<br>217  | 920.0<br>16606<br>220  | 958.0<br>16880<br>223  |
| 50.                                            | Power<br>Water<br>Speed | 708.0<br>17143<br>169  | 748.0<br>17458<br>172  | 788.0<br>17766<br>175  | 829.0<br>18070<br>178  | 871.0<br>18369<br>181  | 914.0<br>18668<br>184  | 957.0<br>18967<br>187  | 1000.0<br>19266<br>190 | 1045.0<br>19565<br>192 | 1090.0<br>19864<br>195 | 1136.0<br>20163<br>198 | 1184.0<br>20462<br>201 |
| 56.                                            | Power<br>Water<br>Speed | 888.0<br>21504<br>150  | 938.0<br>21900<br>153  | 989.0<br>22296<br>156  | 1040.0<br>22692<br>159 | 1093.0<br>23088<br>162 | 1146.0<br>23484<br>164 | 1200.0<br>23880<br>167 | 1256.0<br>24276<br>169 | 1314.0<br>24672<br>172 | 1368.0<br>25068<br>174 | 1428.0<br>25464<br>176 | 1483.0<br>25860<br>179 |
| 62.                                            | Power<br>Water<br>Speed | 1089.0<br>26360<br>136 | 1150.0<br>26833<br>139 | 1212.0<br>27307<br>141 | 1275.0<br>27781<br>144 | 1340.0<br>28255<br>146 | 1408.0<br>28729<br>148 | 1470.0<br>29203<br>150 | 1538.0<br>29677<br>153 | 1608.0<br>30151<br>155 | 1675.0<br>30625<br>157 | 1745.0<br>31100<br>159 | 1818.0<br>31574<br>162 |
| 68.                                            | Power<br>Water<br>Speed | 1310.0<br>31709<br>124 | 1390.0<br>32280<br>127 | 1457.0<br>32854<br>129 | 1534.0<br>33430<br>131 | 1610.0<br>33993<br>134 | 1689.0<br>34556<br>136 | 1768.0<br>35119<br>138 | 1847.0<br>35682<br>140 | 1932.0<br>36245<br>142 | 2018.0<br>36808<br>144 | 2100.0<br>37371<br>146 | 2186.0<br>37934<br>148 |
| 74.                                            | Power<br>Water<br>Speed | 1551.0<br>37550<br>114 | 1640.0<br>38240<br>116 | 1728.0<br>38930<br>118 | 1816.0<br>39620<br>120 | 1910.0<br>40310<br>122 | 2005.0<br>40999<br>124 | 2095.0<br>41689<br>125 | 2193.0<br>42379<br>126 | 2292.0<br>43069<br>128 | 2390.0<br>43759<br>130 | 2490.0<br>44449<br>132 | 2591.0<br>45139<br>134 |

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## POWER TABLE VERTICAL STANDARD SAMSON TURBINES.

| Size of Turbine | Head                    | 39                     | 40                     | 41                     | 42                     | 43                     | 44                     | 45                     | 46                     | 47                     | 48                     | 49                     | 50                     |
|-----------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| 17 E.           | Power<br>Water<br>Speed | 54.2<br>906<br>581     | 56.3<br>919<br>583     | 58.5<br>936<br>586     | 60.6<br>942<br>588     | 62.8<br>953<br>590     | 65.0<br>964<br>592     | 67.0<br>974<br>594     | 69.0<br>984<br>596     | 71.0<br>993<br>598     | 73.6<br>1006<br>600    | 76.0<br>1016<br>602    | 78.0<br>1026<br>604    |
| 17 D.           | Power<br>Water<br>Speed | 70.7<br>1164<br>581    | 73.5<br>1180<br>583    | 76.3<br>1196<br>586    | 79.1<br>1228<br>588    | 82.0<br>1243<br>590    | 84.8<br>1257<br>592    | 87.0<br>1270<br>594    | 90.0<br>1284<br>596    | 93.0<br>1297<br>598    | 96.0<br>1314<br>600    | 99.0<br>1325<br>602    | 102.0<br>1338<br>604   |
| 17 C.           | Power<br>Water<br>Speed | 93.0<br>1350<br>581    | 96.7<br>1379<br>583    | 100.0<br>1400<br>586   | 104.0<br>1426<br>588   | 108.0<br>1457<br>590   | 112.0<br>1483<br>592   | 116.0<br>1509<br>594   | 119.0<br>1530<br>596   | 123.0<br>1556<br>598   | 128.0<br>1582<br>600   | 131.0<br>1603<br>602   | 135.0<br>1629<br>604   |
| 17 B.           | Power<br>Water<br>Speed | 115.0<br>1923<br>581   | 119.0<br>1948<br>583   | 124.0<br>1971<br>586   | 128.0<br>1995<br>588   | 133.0<br>2020<br>590   | 138.0<br>2042<br>592   | 142.0<br>2068<br>594   | 147.0<br>2090<br>596   | 152.0<br>2110<br>598   | 156.0<br>2132<br>600   | 162.0<br>2158<br>602   | 167.0<br>2179<br>604   |
| 17 A.           | Power<br>Water<br>Speed | 150.0<br>2514<br>581   | 156.0<br>2546<br>583   | 162.0<br>2577<br>586   | 168.0<br>2609<br>588   | 174.0<br>2640<br>590   | 180.0<br>2668<br>592   | 186.0<br>2708<br>594   | 192.0<br>2739<br>596   | 198.0<br>2760<br>598   | 204.0<br>2789<br>600   | 211.0<br>2818<br>602   | 218.0<br>2846<br>604   |
| 20.             | Power<br>Water<br>Speed | 187.0<br>3258<br>581   | 194.0<br>3338<br>583   | 201.0<br>3390<br>586   | 208.0<br>3420<br>588   | 216.0<br>3461<br>590   | 224.0<br>3500<br>592   | 232.0<br>3540<br>594   | 240.0<br>3579<br>596   | 248.0<br>3618<br>598   | 256.0<br>3656<br>600   | 264.0<br>3694<br>602   | 272.0<br>3731<br>604   |
| 23.             | Power<br>Water<br>Speed | 250.0<br>4359<br>442   | 270.0<br>4415<br>447   | 280.0<br>4470<br>453   | 291.0<br>4524<br>458   | 301.0<br>4577<br>463   | 312.0<br>4630<br>468   | 322.0<br>4683<br>474   | 333.0<br>4734<br>479   | 344.0<br>4785<br>485   | 355.0<br>4835<br>490   | 366.0<br>4885<br>495   | 377.0<br>4935<br>500   |
| 26.             | Power<br>Water<br>Speed | 332.0<br>5571<br>291   | 345.0<br>5642<br>296   | 359.0<br>5712<br>300   | 372.0<br>5781<br>305   | 385.0<br>5850<br>310   | 398.0<br>5917<br>315   | 417.0<br>5964<br>319   | 426.0<br>6056<br>324   | 440.0<br>6115<br>329   | 453.0<br>6180<br>334   | 468.0<br>6241<br>339   | 482.0<br>6296<br>344   |
| 30.             | Power<br>Water<br>Speed | 443.0<br>7417<br>329   | 460.0<br>7512<br>343   | 477.0<br>7605<br>347   | 495.0<br>7697<br>351   | 512.0<br>7788<br>356   | 530.0<br>7878<br>360   | 548.0<br>7967<br>364   | 567.0<br>8054<br>369   | 585.0<br>8142<br>372   | 604.0<br>8228<br>376   | 623.0<br>8314<br>379   | 642.0<br>8391<br>381   |
| 35.             | Power<br>Water<br>Speed | 600.0<br>10055<br>291  | 623.0<br>10183<br>294  | 647.0<br>10308<br>298  | 670.0<br>10434<br>301  | 695.0<br>10558<br>305  | 719.0<br>10677<br>309  | 743.0<br>10790<br>312  | 768.0<br>10890<br>315  | 792.0<br>11037<br>318  | 819.0<br>11160<br>322  | 845.0<br>11260<br>325  | 871.0<br>11385<br>329  |
| 40.             | Power<br>Water<br>Speed | 787.0<br>13188<br>254  | 817.0<br>13354<br>257  | 848.0<br>13520<br>260  | 879.0<br>13684<br>263  | 911.0<br>13845<br>268  | 944.0<br>14000<br>270  | 975.0<br>14155<br>273  | 1008.0<br>14315<br>276 | 1041.0<br>14475<br>279 | 1075.0<br>14625<br>282 | 1109.0<br>14768<br>285 | 1143.0<br>14930<br>288 |
| 45.             | Power<br>Water<br>Speed | 996.0<br>16660<br>228  | 1034.0<br>16901<br>229 | 1072.0<br>17116<br>232 | 1115.0<br>17320<br>235 | 1155.0<br>17520<br>238 | 1196.0<br>17720<br>240 | 1238.0<br>17920<br>243 | 1278.0<br>18120<br>246 | 1320.0<br>18320<br>248 | 1362.0<br>18520<br>251 | 1405.0<br>18718<br>254 | 1448.0<br>18900<br>256 |
| 50.             | Power<br>Water<br>Speed | 1232.0<br>20600<br>203 | 1280.0<br>20870<br>205 | 1330.0<br>21120<br>208 | 1378.0<br>21390<br>211 | 1427.0<br>21640<br>213 | 1478.0<br>21890<br>215 | 1527.0<br>22140<br>218 | 1579.0<br>22390<br>220 | 1630.0<br>22610<br>223 | 1683.0<br>22850<br>225 | 1736.0<br>23100<br>227 | 1789.0<br>23330<br>230 |
| 55.             | Power<br>Water<br>Speed | 1543.0<br>25860<br>181 | 1602.0<br>26200<br>183 | 1662.0<br>26520<br>185 | 1725.0<br>26820<br>188 | 1787.0<br>27150<br>190 | 1849.0<br>27470<br>192 | 1912.0<br>27780<br>195 | 1976.0<br>28090<br>197 | 2040.0<br>28400<br>199 | 2105.0<br>28700<br>201 | 2172.0<br>29000<br>203 | 2238.0<br>29260<br>205 |
| 62.             | Power<br>Water<br>Speed | 1890.0<br>31790<br>164 | 1963.0<br>32100<br>166 | 2035.0<br>32500<br>168 | 2110.0<br>32900<br>170 | 2186.0<br>33280<br>172 | 2266.0<br>33650<br>174 | 2340.0<br>34050<br>176 | 2420.0<br>34410<br>178 | 2500.0<br>34800<br>180 | 2579.0<br>35180<br>182 | 2660.0<br>35550<br>184 | 2743.0<br>35900<br>186 |
| 68.             | Power<br>Water<br>Speed | 2272.0<br>38150<br>150 | 2361.0<br>38820<br>152 | 2450.0<br>39100<br>154 | 2540.0<br>39580<br>156 | 2632.0<br>40050<br>157 | 2725.0<br>40500<br>159 | 2818.0<br>40950<br>161 | 2912.0<br>41400<br>163 | 3008.0<br>41850<br>165 | 3105.0<br>42300<br>166 | 3200.0<br>42750<br>168 | 3300.0<br>43200<br>170 |
| 74.             | Power<br>Water<br>Speed | 2682.0<br>45100<br>137 | 2809.0<br>45700<br>139 | 2908.0<br>46250<br>141 | 3012.0<br>46800<br>143 | 3120.0<br>47350<br>144 | 3232.0<br>47900<br>146 | 3340.0<br>48450<br>148 | 3452.0<br>49000<br>149 | 3565.0<br>49500<br>151 | 3680.0<br>50050<br>151 | 3795.0<br>50550<br>154 | 3912.0<br>51100<br>156 |

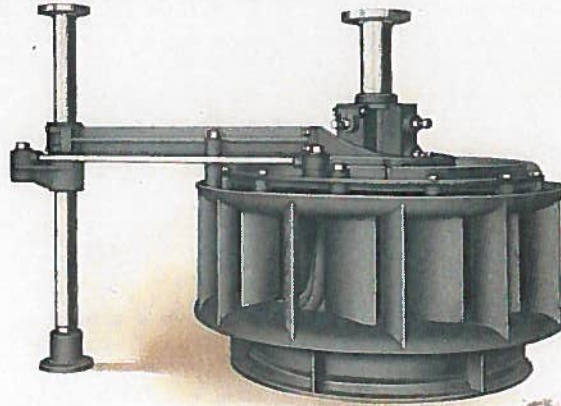
### EXPLANATION OF ABOVE TABLES

HEAD = Effective head in feet. WATER = Cubic feet discharged per minute.  
 POWER = Full gate horsepower. SPEED = Number of revolutions per minute.  
 We also build STANDARD SAMSON turbines developing power and speed values  
 HALF WAY between each of the different sizes of turbines given in above table.  
 These vertical STANDARD SAMSON turbines to develop above power, speed and  
 efficiency values, must be installed and operated substantially as given on page 7.

## THE JAMES LEFFEL & CO.

### Vertical Type Z Turbines

These turbines are designed especially to develop highest power, speed and efficiencies for direct connection to generators and other high-speed machinery. These turbines are equipped with our latest type of single bucket runners of the strongest construction and fitted with special steel shafts. The gate casings are built with our improved balanced gates each separately removable. These gates connected to gate operating ring located in most accessible position on top of crown plate. This gate ring direct connected to vertical gate shaft which rotates  $45^\circ$  or  $60^\circ$  for full gate movement. The speed or guide vane ring guides the water into the gates, increasing the efficiency and securely holding the crown plates to position. The weight of the revolving parts of these vertical turbines must be carried on suitable anti-friction thrust bearings, roller or disk types running in oil and furnished in connection with the driven machines which are located on power house floor.



We also build these vertical TYPE Z turbines with gate operating ring located below the gates and direct connected to vertical gate shaft like illustration page 19. Located on the top of crown plate is large split removable lignumvitae pedestal bearing fitted with bronze adjusting bolts for holding turbine shaft in vertical alignment. We frequently bronze bush the gate casing bearings and construct gates and connections of steel.

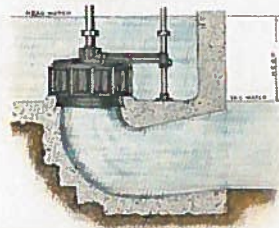
### GUARANTEE

We guarantee the full power, speed and efficiency values of these vertical Type Z turbines as given in power tables on pages 16 to 18, inclusive, when installed and operated in correctly designed penstocks and draft tubes in accordance with our drawings and specifications for same, substantially as illustrated on opposite page 15.

## SPRINGFIELD, OHIO, U. S. A.

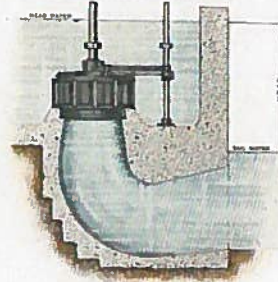
## Correct Installment For Vertical Type Z Turbines

Low Head Installments



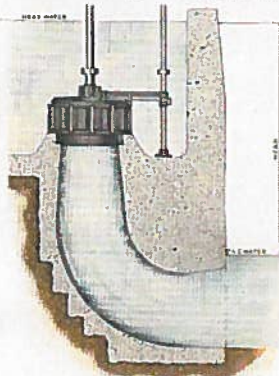
Design 75

Medium Head Installments



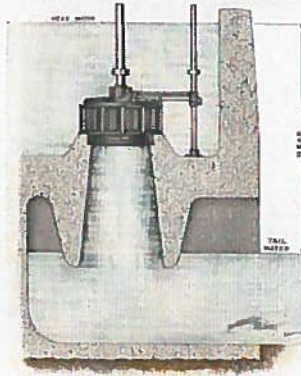
Design 76

Medium and High Head Installments



Design 77

Medium and High Head Installments



Design 78

Our vertical TYPE Z turbines to develop the power, speed and efficiency values given in power tables, pages 16 to 18, inclusive, must be installed and operated as illustrated above and in accordance with our plans and specifications, in correctly designed penstocks and draft tubes. Also, the weight of all revolving parts of complete unit must be carried by suitable thrust bearing, usually roller or disk type running in oil.

If these turbines are installed differently than shown above, or if built horizontally, we will furnish special curve tables showing power speed and efficiency values that we would guarantee for same.

## THE JAMES LEFFEL &amp; CO.

## POWER TABLE VERTICAL TYPE Z TURBINES.

| Size of Turbine | Head                    | 6                      | 7                       | 8                       | 9                       | 10                      | 11                      | 12                      | 13                      | 14                      | 15                      | 16                       | 17                       |
|-----------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|--------------------------|
| 12.             | Power<br>Water<br>Speed | 9 85<br>1035<br>306 0  | 11 53<br>1120<br>331 0  | 14 38<br>1202<br>354 0  | 17 15<br>1278<br>375 0  | 20 40<br>1352<br>395 0  | 23 50<br>1420<br>415 0  | 26 90<br>1487<br>432 0  | 30 50<br>1551<br>450 0  | 34 25<br>1613<br>457 0  | 38 15<br>1670<br>484 0  | 42 20<br>1730<br>500 0   | 46 20<br>1782<br>516 0   |
| 15.             | Power<br>Water<br>Speed | 14 47<br>1625<br>245 0 | 18 24<br>1755<br>285 0  | 22 50<br>1885<br>263 0  | 27 85<br>2006<br>300 0  | 31 85<br>2115<br>316 0  | 37 20<br>2225<br>332 0  | 42 50<br>2330<br>348 0  | 48 20<br>2432<br>360 0  | 54 10<br>2530<br>374 0  | 59 20<br>2620<br>387 0  | 66 70<br>2710<br>400 0   | 72 98<br>2795<br>412 0   |
| 18.             | Power<br>Water<br>Speed | 21 08<br>2350<br>204 0 | 25 70<br>2550<br>221 0  | 32 80<br>2725<br>236 0  | 39 40<br>2900<br>250 0  | 46 40<br>3060<br>263 0  | 54 00<br>3220<br>276 0  | 61 80<br>3370<br>289 0  | 70 20<br>3520<br>300 0  | 78 80<br>3665<br>312 0  | 87 50<br>3785<br>323 0  | 96 80<br>3895<br>333 0   | 106 0<br>4045<br>343 0   |
| 21.             | Power<br>Water<br>Speed | 29 65<br>3225<br>175 0 | 35 72<br>3485<br>189 1  | 45 30<br>3740<br>202 0  | 54 50<br>3960<br>214 0  | 63 90<br>4190<br>225 5  | 74 50<br>4425<br>237 0  | 85 50<br>4630<br>247 0  | 96 60<br>4830<br>257 0  | 108 9<br>5020<br>277 0  | 121 0<br>5200<br>288 0  | 133 9<br>5380<br>299 0   | 146 6<br>5550<br>304 0   |
| 24.             | Power<br>Water<br>Speed | 38 35<br>4230<br>153 0 | 48 50<br>4580<br>165 5  | 60 00<br>4920<br>177 0  | 71 90<br>5225<br>187 5  | 84 50<br>5510<br>197 5  | 98 50<br>5810<br>207 5  | 112 90<br>6075<br>216 0 | 127 0<br>6340<br>225 0  | 143 5<br>6580<br>234 0  | 160 0<br>6835<br>242 0  | 178 8<br>7070<br>250 0   | 193 5<br>7280<br>257 5   |
| 27.             | Power<br>Water<br>Speed | 48 25<br>5375<br>136 0 | 62 00<br>5825<br>147 0  | 78 60<br>6250<br>157 0  | 91 60<br>6650<br>166 8  | 108 1<br>7000<br>175 8  | 126 0<br>7385<br>184 5  | 144 3<br>7730<br>192 0  | 163 5<br>8060<br>200 0  | 183 8<br>8360<br>208 0  | 204 5<br>8670<br>215 0  | 226 5<br>8960<br>222 0   | 247 5<br>9250<br>229 0   |
| 30.             | Power<br>Water<br>Speed | 61 40<br>6650<br>122 5 | 77 50<br>7230<br>132 2  | 95 70<br>7760<br>141 4  | 114 9<br>8250<br>150 0  | 135 0<br>8700<br>158 1  | 157 2<br>9185<br>165 8  | 180 4<br>9600<br>172 2  | 204 0<br>10015<br>180 2 | 229 5<br>10415<br>187 0 | 258 5<br>10790<br>193 6 | 282 7<br>11150<br>200 0  | 310 0<br>11500<br>206 0  |
| 33.             | Power<br>Water<br>Speed | 74 55<br>8050<br>111 3 | 93 55<br>8730<br>120 5  | 115 2<br>9350<br>128 5  | 138 2<br>9940<br>136 2  | 163 2<br>10500<br>143 5 | 189 5<br>11080<br>151 0 | 217 5<br>11650<br>157 2 | 248 5<br>12250<br>163 5 | 276 5<br>12800<br>170 0 | 308 0<br>13300<br>176 0 | 342 0<br>13800<br>181 8  | 375 0<br>14300<br>187 0  |
| 36.             | Power<br>Water<br>Speed | 88 15<br>8610<br>102 0 | 111 0<br>10420<br>110 5 | 138 0<br>11180<br>118 0 | 165 5<br>11650<br>125 0 | 195 0<br>12560<br>131 5 | 226 5<br>13200<br>138 0 | 260 0<br>13810<br>144 0 | 294 0<br>14400<br>150 0 | 330 0<br>14990<br>156 0 | 367 5<br>15510<br>161 0 | 407 0<br>16040<br>166 5  | 446 0<br>16560<br>171 5  |
| 39.             | Power<br>Water<br>Speed | 103 7<br>11290<br>94 0 | 131 0<br>12210<br>102 0 | 162 0<br>13110<br>109 0 | 194 2<br>13950<br>115 5 | 228 3<br>14700<br>121 5 | 266 0<br>15500<br>127 7 | 304 5<br>16200<br>133 0 | 345 5<br>16920<br>138 4 | 388 0<br>17600<br>143 9 | 431 5<br>18260<br>148 9 | 477 5<br>18930<br>153 8  | 524 0<br>19420<br>158 4  |
| 42.             | Power<br>Water<br>Speed | 120 1<br>13100<br>87 5 | 152 0<br>14170<br>94 5  | 187 7<br>15210<br>101 0 | 225 3<br>16190<br>107 0 | 265 0<br>17050<br>113 0 | 308 0<br>17960<br>118 5 | 353 5<br>18800<br>122 5 | 400 0<br>19610<br>128 0 | 450 0<br>20440<br>133 5 | 500 0<br>21190<br>138 5 | 554 5<br>21850<br>143 0  | 607 5<br>22550<br>147 0  |
| 45.             | Power<br>Water<br>Speed | 138 0<br>15030<br>81 5 | 174 5<br>16270<br>88 3  | 215 5<br>17450<br>94 2  | 258 0<br>18550<br>100 0 | 304 0<br>19570<br>105 4 | 354 0<br>20610<br>110 6 | 406 0<br>21600<br>115 4 | 458 5<br>22510<br>120 0 | 517 0<br>23460<br>124 5 | 575 0<br>24270<br>128 0 | 636 0<br>25050<br>133 2  | 697 0<br>25880<br>137 3  |
| 48.             | Power<br>Water<br>Speed | 157 0<br>17190<br>76 5 | 198 2<br>18515<br>82 7  | 245 0<br>19860<br>88 4  | 293 8<br>21120<br>93 6  | 346 0<br>22300<br>98 7  | 403 0<br>23480<br>103 6 | 461 0<br>24560<br>108 0 | 522 0<br>25650<br>112 5 | 587 5<br>26650<br>117 0 | 654 0<br>27600<br>121 0 | 724 0<br>28530<br>126 0  | 793 0<br>29440<br>129 0  |
| 51.             | Power<br>Water<br>Speed | 176 5<br>19300<br>72 0 | 224 0<br>20900<br>78 0  | 276 5<br>22410<br>83 2  | 332 0<br>23870<br>88 2  | 391 0<br>25150<br>93 0  | 455 0<br>26500<br>97 5  | 521 5<br>27730<br>101 8 | 590 0<br>28920<br>106 0 | 663 0<br>30120<br>110 0 | 738 0<br>31160<br>114 0 | 816 5<br>32200<br>117 5  | 895 0<br>33200<br>121 0  |
| 54.             | Power<br>Water<br>Speed | 188 0<br>21640<br>68 0 | 251 3<br>23430<br>73 6  | 310 0<br>25120<br>78 5  | 372 0<br>26730<br>83 3  | 438 0<br>28200<br>87 0  | 510 0<br>29700<br>92 2  | 584 0<br>31060<br>96 0  | 660 0<br>32400<br>100 0 | 743 0<br>33760<br>104 0 | 827 5<br>34830<br>107 5 | 916 0<br>36100<br>111 0  | 1003 0<br>37250<br>114 5 |
| 57.             | Power<br>Water<br>Speed | 220 6<br>24120<br>64 5 | 280 0<br>26120<br>69 6  | 345 2<br>28000<br>74 5  | 414 0<br>29750<br>79 0  | 488 0<br>31400<br>83 0  | 568 0<br>33100<br>87 3  | 651 0<br>34630<br>91 0  | 736 0<br>36120<br>94 6  | 828 0<br>37600<br>98 4  | 921 0<br>38980<br>101 7 | 1020 0<br>40230<br>105 0 | 1120 0<br>41500<br>108 5 |
| 60.             | Power<br>Water<br>Speed | 244 5<br>26730<br>61 2 | 310 0<br>28920<br>66 2  | 383 0<br>31040<br>70 7  | 458 0<br>33000<br>75 0  | 541 0<br>34800<br>79 0  | 629 0<br>36670<br>83 0  | 721 0<br>38360<br>86 5  | 817 0<br>40060<br>90 0  | 918 0<br>41700<br>93 5  | 1020 0<br>43125<br>96 7 | 1131 0<br>44600<br>100 0 | 1240 0<br>46000<br>103 0 |

## EXPLANATION OF ABOVE TABLES

HEAD — Effective head in feet. WATER — Cubic feet discharged per minute.  
 POWER — Full gate horsepower. SPEED — Number of revolutions per minute.  
 These vertical TYPE Z turbines to develop above power, speed and efficiency values, must be installed and operated substantially as given on page 15.  
 We also build these TYPE Z turbines developing different power and speed values than given in above tables, for which we will furnish special particulars.

# SPRINGFIELD, OHIO, U. S. A.

## POWER TABLE—VERTICAL TYPE Z TURBINES.

| Size of Turbine | Head                    | 18                       | 19                       | 20                       | 21                       | 22                       | 23                       | 24                       | 25                       | 26                       | 27                       | 28                       | 29                       |
|-----------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 12.             | Power<br>Water<br>Speed | 50.35<br>1834<br>550 0   | 54.50<br>1883<br>545 0   | 58.90<br>1933<br>559 0   | 63.40<br>1980<br>572 5   | 67.80<br>2026<br>587 0   | 72.60<br>2072<br>600 0   | 77.40<br>2118<br>612 0   | 82.30<br>2160<br>625 0   | 87.25<br>2205<br>637 0   | 92.40<br>2245<br>650 0   | 97.60<br>2290<br>662 0   | 102.9<br>2328<br>674 0   |
| 15.             | Power<br>Water<br>Speed | 79.63<br>2875<br>424 0   | 86.60<br>2950<br>436 0   | 93.00<br>3030<br>447 0   | 100.0<br>3106<br>458 0   | 107.4<br>3186<br>470 0   | 114.5<br>3260<br>480 0   | 122.2<br>3320<br>489 0   | 130.0<br>3390<br>500 0   | 137.6<br>3453<br>510 0   | 146.0<br>3520<br>520 0   | 154.8<br>3588<br>530 0   | 162.3<br>3650<br>539 0   |
| 18.             | Power<br>Water<br>Speed | 115.8<br>4165<br>353 0   | 125.2<br>4275<br>363 0   | 135.0<br>4385<br>372 0   | 145.5<br>4490<br>382 0   | 156.0<br>4600<br>392 0   | 166.8<br>4700<br>400 0   | 177.7<br>4800<br>408 0   | 189.5<br>4910<br>417 0   | 200.5<br>5000<br>425 0   | 212.5<br>5100<br>433 0   | 224.5<br>5190<br>441 0   | 236.3<br>5285<br>449 0   |
| 21.             | Power<br>Water<br>Speed | 159.5<br>5705<br>303 0   | 173.0<br>5885<br>311 5   | 187.0<br>6015<br>319 0   | 201.0<br>6160<br>327 0   | 215.5<br>6310<br>336 0   | 230.0<br>6450<br>343 0   | 245.5<br>6590<br>350 0   | 261.5<br>6730<br>357 0   | 276.8<br>6855<br>364 0   | 293.8<br>6985<br>371 0   | 309.5<br>7120<br>378 5   | 325.2<br>7245<br>385 0   |
| 24.             | Power<br>Water<br>Speed | 211.0<br>7490<br>265 0   | 228.6<br>7790<br>279 0   | 247.0<br>7990<br>290 0   | 265.3<br>8095<br>298 0   | 284.5<br>8285<br>294 0   | 303.5<br>8460<br>300 0   | 324.0<br>8650<br>306 0   | 345.0<br>8840<br>312 5   | 366.0<br>9010<br>318 5   | 387.2<br>9175<br>325 0   | 409.0<br>9350<br>331 0   | 431.0<br>9510<br>337 0   |
| 27.             | Power<br>Water<br>Speed | 268.5<br>9520<br>235 5   | 282.0<br>9780<br>242 0   | 316.0<br>10040<br>249 5  | 340.0<br>10300<br>254 4  | 364.5<br>10548<br>261 0  | 390.0<br>10775<br>267 0  | 414.0<br>10990<br>272 0  | 442.2<br>11225<br>278 0  | 468.0<br>11450<br>283 0  | 497.0<br>11670<br>289 0  | 523.0<br>11890<br>294 5  | 552.0<br>12100<br>299 5  |
| 30.             | Power<br>Water<br>Speed | 327.5<br>11620<br>212 0  | 375.2<br>12150<br>218 0  | 385.4<br>12590<br>223 8  | 424.0<br>12800<br>229 0  | 455.0<br>13080<br>235 0  | 488.5<br>13360<br>240 0  | 517.5<br>13650<br>245 0  | 551.5<br>13960<br>250 0  | 585.0<br>14230<br>255 0  | 620.0<br>14500<br>259 5  | 653.0<br>14760<br>265 0  | 689.0<br>15050<br>269 5  |
| 33.             | Power<br>Water<br>Speed | 408.0<br>14300<br>192 5  | 443.0<br>14700<br>198 0  | 479.0<br>15110<br>203 0  | 514.0<br>15500<br>208 0  | 551.0<br>15890<br>213 5  | 589.0<br>16300<br>218 0  | 628.0<br>16700<br>222 5  | 670.0<br>17100<br>227 0  | 710.0<br>17500<br>232 0  | 750.0<br>17900<br>236 5  | 792.0<br>18300<br>241 0  | 833.0<br>18700<br>245 0  |
| 36.             | Power<br>Water<br>Speed | 485.5<br>17030<br>176 5  | 527.0<br>17500<br>181 5  | 570.0<br>18000<br>186 0  | 612.0<br>18410<br>191 0  | 656.0<br>18810<br>196 0  | 701.0<br>19250<br>200 0  | 747.5<br>19650<br>204 0  | 790.0<br>20100<br>208 0  | 844.0<br>20480<br>212 5  | 893.0<br>20880<br>217 0  | 943.0<br>21230<br>221 0  | 993.0<br>21600<br>224 5  |
| 39.             | Power<br>Water<br>Speed | 578.0<br>20900<br>163 0  | 618.0<br>20520<br>167 5  | 669.0<br>21110<br>172 0  | 718.0<br>21650<br>176 0  | 770.0<br>22100<br>180 5  | 822.7<br>22600<br>184 5  | 877.0<br>23080<br>188 4  | 935.0<br>23560<br>192 2  | 990.0<br>24050<br>196 0  | 1050.0<br>24500<br>200 0 | 1107.0<br>24930<br>204 0 | 1168.0<br>25410<br>207 0 |
| 42.             | Power<br>Water<br>Speed | 681.0<br>23200<br>151 5  | 717.0<br>23800<br>155 5  | 776.0<br>24508<br>159 5  | 833.0<br>25100<br>163 5  | 894.0<br>25600<br>168 0  | 954.0<br>26290<br>171 0  | 1017.0<br>26750<br>175 0 | 1085.0<br>27350<br>178 5 | 1150.0<br>27840<br>182 0 | 1215.0<br>28400<br>185 5 | 1283.0<br>28910<br>189 0 | 1353.0<br>29480<br>192 5 |
| 45.             | Power<br>Water<br>Speed | 789.0<br>25680<br>141.3  | 824.0<br>27230<br>145 4  | 890.0<br>28160<br>149 0  | 958.0<br>28880<br>152 8  | 1025.0<br>29400<br>156 5 | 1095.0<br>30106<br>160 0 | 1168.0<br>30700<br>163 0 | 1245.0<br>31400<br>166 5 | 1320.0<br>32020<br>170 0 | 1395.0<br>32650<br>173 5 | 1474.0<br>33200<br>176 5 | 1553.0<br>33850<br>179 5 |
| 48.             | Power<br>Water<br>Speed | 864.0<br>30390<br>132 5  | 936.0<br>31100<br>136 0  | 1013.0<br>32000<br>139 5 | 1088.0<br>32780<br>143 0 | 1167.0<br>33470<br>147 0 | 1247.0<br>34250<br>150.0 | 1328.0<br>34950<br>153 0 | 1417.0<br>35720<br>156 0 | 1500.0<br>36420<br>159 0 | 1587.0<br>37120<br>162 5 | 1678.0<br>37800<br>165 5 | 1767.0<br>38500<br>168 3 |
| 51.             | Power<br>Water<br>Speed | 975.0<br>34150<br>125 0  | 1058.0<br>35050<br>128 0 | 1144.0<br>36100<br>131 5 | 1230.0<br>37000<br>134 6 | 1318.0<br>37780<br>138 0 | 1408.0<br>38600<br>141.0 | 1500.0<br>39400<br>144.0 | 1600.0<br>40290<br>147 0 | 1694.0<br>41100<br>150 0 | 1790.0<br>41850<br>153 0 | 1891.0<br>42600<br>156 0 | 1995.0<br>43450<br>158 5 |
| 54.             | Power<br>Water<br>Speed | 1083.0<br>38350<br>117.8 | 1185.0<br>38350<br>121.0 | 1283.0<br>40450<br>124.0 | 1377.0<br>41450<br>127 0 | 1477.0<br>42350<br>130 5 | 1577.0<br>43350<br>133 0 | 1682.0<br>44200<br>136 0 | 1782.0<br>45250<br>139 0 | 1896.0<br>46100<br>141 5 | 2009.0<br>46950<br>144 5 | 2122.0<br>47750<br>147 0 | 2236.0<br>48750<br>149 5 |
| 57.             | Power<br>Water<br>Speed | 1219.0<br>42700<br>111.8 | 1320.0<br>43830<br>114 6 | 1430.0<br>45150<br>117 6 | 1535.0<br>46200<br>120 5 | 1646.0<br>47200<br>123 6 | 1760.0<br>48250<br>126 0 | 1873.0<br>49250<br>129 0 | 1996.0<br>50360<br>131 5 | 2117.0<br>51380<br>134 0 | 2240.0<br>52300<br>137 0 | 2368.0<br>53280<br>139 0 | 2490.0<br>54300<br>142 0 |
| 60.             | Power<br>Water<br>Speed | 1350.0<br>47320<br>106 0 | 1465.0<br>48650<br>109 0 | 1584.0<br>50000<br>111.7 | 1700.0<br>51280<br>114 5 | 1824.0<br>52320<br>117 5 | 1948.0<br>53520<br>120 0 | 2078.0<br>54600<br>122 5 | 2212.0<br>55840<br>125 0 | 2344.0<br>56920<br>127.5 | 2480.0<br>58000<br>130 0 | 2620.0<br>59040<br>132 5 | 2660.0<br>60200<br>134.7 |

### EXPLANATION OF ABOVE TABLES

HEAD — Effective head in feet. WATER — Cubic feet discharged per minute.

POWER — Full gate horsepower. SPEED — Number of revolutions per minute.

These vertical TYPE Z turbines to develop above power, speed and efficiency values, must be installed and operated substantially as given on page 15.

We also build these TYPE Z turbines developing different power and speed values than given in above tables, for which we will furnish special particulars.

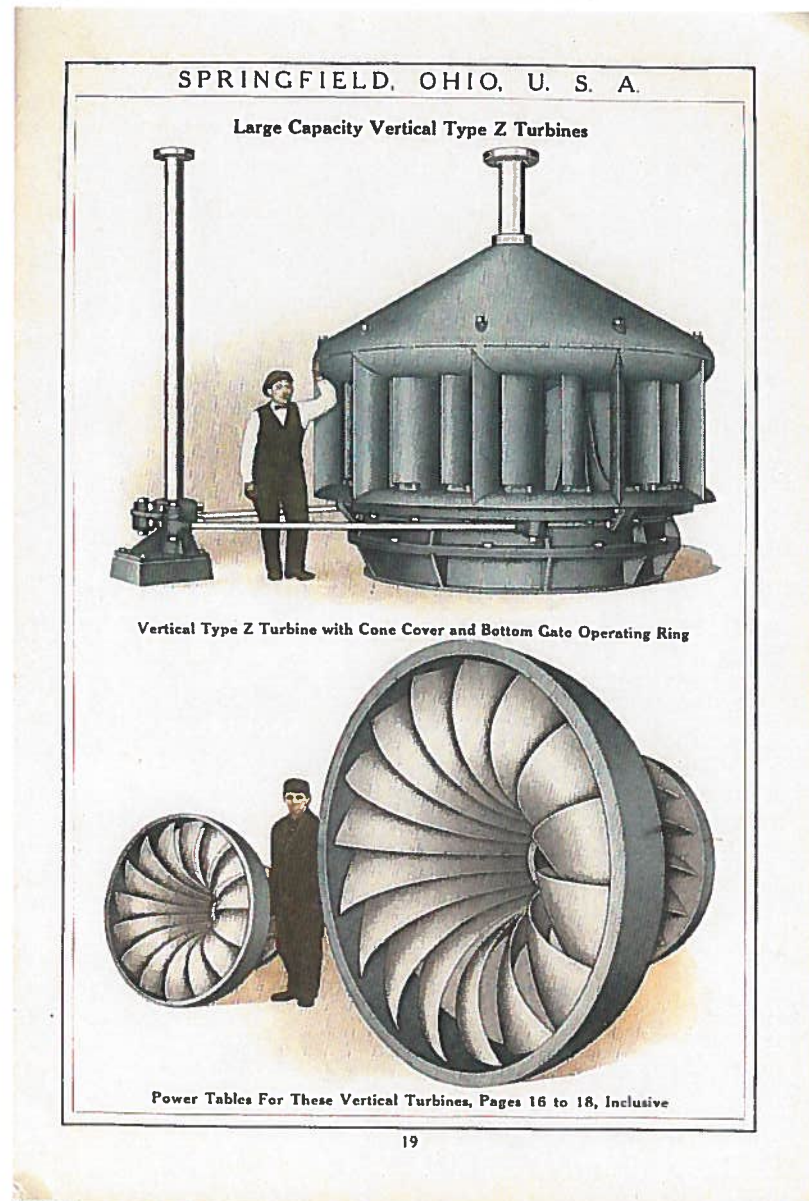
## THE JAMES LEFFEL &amp; CO.

## POWER TABLE - VERTICAL TYPE Z TURBINES.

| Size of Turbine | Head  | 30     | 31     | 32     | 33     | 34     | 35     | 36     | 37     | 38     | 39     | 40     | 41     |
|-----------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 12.             | Power | 188.2  | 113.8  | 119.3  | 124.8  | 130.6  | 136.2  | 142.1  | 148.3  | 154.5  | 160.5  | 166.5  | 173.0  |
|                 | Water | 2368   | 2408   | 2445   | 2480   | 2520   | 2557   | 2590   | 2630   | 2665   | 2700   | 2738   | 2785   |
|                 | Speed | 645.0  | 695.5  | 707.0  | 717.0  | 730.0  | 740.0  | 750.0  | 766.0  | 771.0  | 782.5  | 790.0  | 800.0  |
| 15.             | Power | 171.0  | 179.0  | 188.5  | 197.0  | 205.2  | 215.5  | 224.5  | 234.0  | 244.0  | 253.0  | 263.0  | 273.5  |
|                 | Water | 3710   | 3770   | 3833   | 3890   | 3955   | 4015   | 4070   | 4120   | 4160   | 4235   | 4288   | 4340   |
|                 | Speed | 548.0  | 557.0  | 566.0  | 574.0  | 584.0  | 592.0  | 600.0  | 608.0  | 617.0  | 628.0  | 632.0  | 640.0  |
| 18.             | Power | 249.0  | 262.0  | 274.5  | 288.0  | 301.5  | 314.0  | 327.0  | 341.0  | 355.0  | 369.5  | 383.0  | 398.0  |
|                 | Water | 5375   | 5483   | 5550   | 5640   | 5725   | 5805   | 5890   | 5970   | 6050   | 6125   | 6200   | 6285   |
|                 | Speed | 456.0  | 464.0  | 471.0  | 478.0  | 486.0  | 493.0  | 500.0  | 506.0  | 514.0  | 521.0  | 526.0  | 533.0  |
| 21.             | Power | 343.0  | 360.0  | 378.0  | 396.5  | 414.0  | 433.0  | 451.5  | 470.0  | 490.0  | 509.0  | 529.0  | 549.0  |
|                 | Water | 7370   | 7495   | 7610   | 7725   | 7850   | 7965   | 8075   | 8180   | 8300   | 8405   | 8505   | 8610   |
|                 | Speed | 391.0  | 398.0  | 404.0  | 410.0  | 417.0  | 423.0  | 428.5  | 434.0  | 440.5  | 447.0  | 452.0  | 457.0  |
| 24.             | Power | 454.0  | 477.0  | 500.0  | 524.0  | 547.0  | 571.5  | 596.0  | 622.0  | 646.0  | 672.0  | 698.0  | 724.0  |
|                 | Water | 9680   | 9840   | 9990   | 10150  | 10300  | 10460  | 10600  | 10750  | 10890  | 11040  | 11170  | 11300  |
|                 | Speed | 342.0  | 348.0  | 354.0  | 358.5  | 365.0  | 370.0  | 375.0  | 380.0  | 385.0  | 391.0  | 395.0  | 400.0  |
| 27.             | Power | 580.0  | 610.0  | 640.0  | 670.5  | 700.0  | 732.0  | 761.0  | 794.0  | 827.0  | 860.0  | 893.0  | 927.0  |
|                 | Water | 12300  | 12500  | 12700  | 12900  | 13100  | 13300  | 13460  | 13650  | 13850  | 14015  | 14200  | 14380  |
|                 | Speed | 304.5  | 309.5  | 314.5  | 319.0  | 324.5  | 329.0  | 333.0  | 338.0  | 343.0  | 348.0  | 351.0  | 356.0  |
| 30.             | Power | 725.0  | 761.0  | 800.0  | 838.0  | 874.0  | 912.5  | 951.0  | 993.0  | 1033.0 | 1074.0 | 1118.0 | 1158.0 |
|                 | Water | 15235  | 15540  | 15800  | 16090  | 16380  | 16680  | 16980  | 17280  | 17500  | 17840  | 18180  | 18500  |
|                 | Speed | 274.0  | 278.5  | 283.0  | 287.0  | 292.0  | 296.0  | 300.0  | 304.0  | 308.0  | 312.0  | 316.0  | 320.0  |
| 33.             | Power | 879.0  | 923.0  | 967.5  | 1014.0 | 1060.0 | 1108.0 | 1153.0 | 1205.0 | 1253.0 | 1300.0 | 1355.0 | 1400.0 |
|                 | Water | 18500  | 18800  | 19100  | 19400  | 19700  | 20000  | 20300  | 20540  | 20800  | 21090  | 21340  | 21580  |
|                 | Speed | 249.0  | 253.0  | 257.0  | 261.0  | 265.0  | 269.0  | 272.5  | 276.0  | 280.5  | 284.0  | 287.0  | 291.0  |
| 36.             | Power | 1045.0 | 1100.0 | 1152.0 | 1207.0 | 1261.0 | 1318.0 | 1374.0 | 1434.0 | 1490.0 | 1550.0 | 1613.0 | 1667.0 |
|                 | Water | 22000  | 22400  | 22730  | 23100  | 23420  | 23750  | 24100  | 24450  | 24790  | 25100  | 25400  | 25700  |
|                 | Speed | 228.0  | 232.0  | 236.0  | 239.0  | 243.0  | 247.0  | 250.0  | 253.0  | 257.0  | 260.0  | 263.0  | 267.0  |
| 39.             | Power | 1228.0 | 1290.0 | 1352.0 | 1417.0 | 1480.0 | 1548.0 | 1613.0 | 1685.0 | 1750.0 | 1817.0 | 1892.0 | 1955.0 |
|                 | Water | 25820  | 26270  | 26700  | 27100  | 27500  | 27900  | 28300  | 28700  | 29080  | 29440  | 29800  | 30160  |
|                 | Speed | 211.0  | 214.0  | 217.3  | 221.0  | 224.5  | 227.5  | 231.0  | 234.0  | 237.3  | 241.0  | 243.0  | 246.0  |
| 42.             | Power | 1423.0 | 1487.0 | 1559.0 | 1642.0 | 1717.0 | 1793.0 | 1870.0 | 1945.0 | 2023.0 | 2110.0 | 2188.0 | 2270.0 |
|                 | Water | 29990  | 30450  | 30900  | 31330  | 31750  | 32148  | 32580  | 32950  | 33300  | 33700  | 34180  | 34600  |
|                 | Speed | 185.5  | 188.0  | 190.5  | 193.0  | 195.5  | 197.2  | 199.0  | 200.0  | 203.0  | 205.5  | 208.0  | 210.0  |
| 45.             | Power | 1634.0 | 1717.0 | 1800.0 | 1888.0 | 1950.0 | 2060.0 | 2148.0 | 2235.0 | 2320.0 | 2420.0 | 2512.0 | 2600.0 |
|                 | Water | 34400  | 34950  | 35500  | 36100  | 36600  | 37100  | 37550  | 38000  | 38500  | 39000  | 39500  | 40100  |
|                 | Speed | 182.5  | 185.5  | 188.5  | 191.0  | 193.5  | 197.2  | 200.0  | 203.0  | 205.5  | 208.5  | 211.0  | 213.5  |
| 48.             | Power | 1858.0 | 1953.0 | 2048.0 | 2145.0 | 2242.0 | 2342.0 | 2435.0 | 2540.0 | 2648.0 | 2750.0 | 2855.0 | 2960.0 |
|                 | Water | 38150  | 38760  | 39350  | 39900  | 40450  | 41000  | 41550  | 42000  | 42500  | 43000  | 43500  | 44000  |
|                 | Speed | 171.0  | 174.0  | 177.0  | 179.0  | 182.4  | 185.0  | 187.5  | 190.0  | 192.5  | 195.0  | 197.5  | 200.0  |
| 51.             | Power | 2109.0 | 2267.0 | 2311.0 | 2421.0 | 2530.0 | 2645.0 | 2745.0 | 2866.0 | 2980.0 | 3105.0 | 3225.0 | 3340.0 |
|                 | Water | 44120  | 44850  | 45600  | 46300  | 47000  | 47600  | 48350  | 49000  | 49780  | 50550  | 51000  | 51550  |
|                 | Speed | 161.0  | 164.0  | 166.5  | 169.0  | 172.0  | 174.3  | 176.5  | 179.0  | 181.5  | 184.0  | 186.0  | 188.5  |
| 54.             | Power | 2353.0 | 2473.0 | 2592.0 | 2716.0 | 2838.0 | 2950.0 | 3090.0 | 3215.0 | 3340.0 | 3480.0 | 3610.0 | 3745.0 |
|                 | Water | 49550  | 50350  | 51150  | 52000  | 52700  | 53400  | 54150  | 54950  | 55700  | 56450  | 57100  | 57750  |
|                 | Speed | 152.0  | 154.5  | 157.0  | 159.5  | 162.0  | 164.5  | 167.0  | 169.0  | 171.5  | 173.5  | 175.5  | 178.0  |
| 57.             | Power | 2623.0 | 2756.0 | 2890.0 | 3028.0 | 3150.0 | 3290.0 | 3435.0 | 3580.0 | 3722.0 | 3875.0 | 4027.0 | 4178.0 |
|                 | Water | 55150  | 56050  | 56900  | 57750  | 58700  | 59500  | 60300  | 61200  | 62000  | 62850  | 63650  | 64400  |
|                 | Speed | 144.0  | 146.5  | 149.0  | 151.0  | 153.5  | 156.0  | 158.0  | 160.0  | 162.5  | 164.5  | 166.5  | 168.5  |
| 60.             | Power | 2904.0 | 3052.0 | 3200.0 | 3350.0 | 3490.0 | 3640.0 | 3805.0 | 3973.0 | 4130.0 | 4300.0 | 4465.0 | 4630.0 |
|                 | Water | 61180  | 62160  | 63200  | 64200  | 65000  | 65900  | 66850  | 67800  | 68800  | 69700  | 70550  | 71400  |
|                 | Speed | 137.0  | 139.2  | 141.5  | 143.5  | 146.0  | 148.0  | 150.0  | 152.0  | 154.0  | 156.0  | 158.0  | 160.0  |

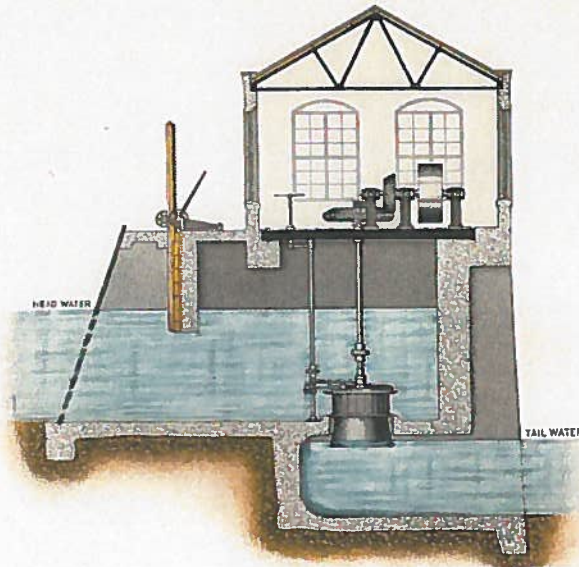
## EXPLANATION OF ABOVE TABLES

HEAD = Effective head in feet. WATER = Cubic feet discharged per minute.  
 POWER = Full gate horsepower. SPEED = Number of revolutions per minute.  
 These vertical TYPE Z turbines to develop above power, speed and efficiency values, must be installed and operated substantially as given on page 15.  
 We also build these TYPE Z turbines developing different power and speed values than given in above tables, for which we will furnish special particulars.



## THE JAMES LEFFEL &amp; CO

## Vertical Samson Turbines in Open Penstocks



Design 40

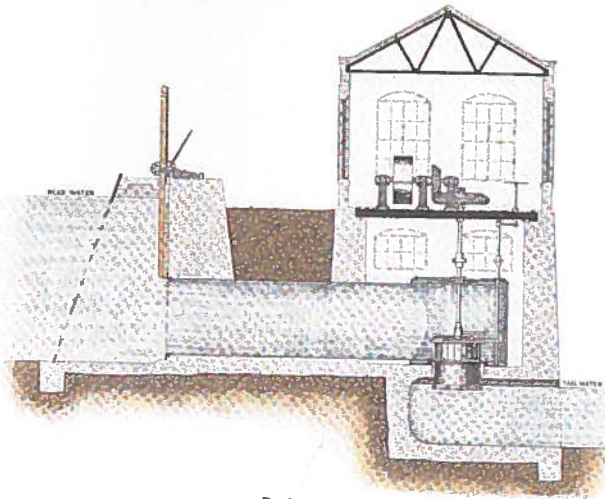
This illustrates the installment of our vertical SAMSON turbines with top gate operating ring in open penstock. The vertical gate shaft rotates  $45^{\circ}$  to  $60^{\circ}$  full gate movement. We sometimes build these turbines with gate operating ring located below the turbine gates as illustrated, page 22. These vertical turbines are usually furnished with our regular design conical discharge cylinder as illustrated. Frequently we build these turbines with short base rings for special draft tubes.

We also design and build all sizes and arrangement of power transmission machinery, shafting, couplings, bearings, gearing, cast iron bridge-trees, steel beam construction, belt and rope driving pulleys. All shafting made of open-hearth steel, large shafts forged steel. All gray iron castings made of the very best grade of pig iron. All materials used by us in the construction of our turbines and machinery are of the highest qualities throughout. We analyze and test all materials used by us in the construction of our work.

We also furnish all styles and sizes of head gate hoisting irons.

SPRINGFIELD, OHIO, U. S. A.

## Vertical Samson Turbines in Steel Flumes



Design 41

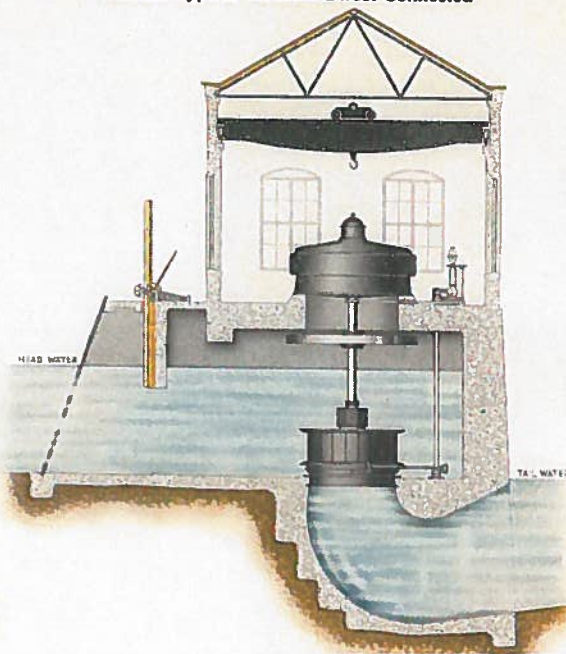
Frequently steel flumes and steel feeder pipes can be installed much more economically and to better advantage than open penstock installment as illustrated on page 20. We build all sizes of steel flumes and feeder pipes. The dimension of these steel flumes for our vertical standard SAMSON turbines are given in table on page 8. We build these steel flumes in one piece up to 10 feet diameter. Larger diameters we build split, necessary for transportation, and arranged for bolting and riveting together when installing to position. We completely erect in our shops these steel flumes and feeder pipes, together with the turbines and accessories, then carefully and plainly mark each piece before knocking down for shipment. These steel flumes have top removable covers with adjustable stuffing boxes for turbine and gate shafts, also large man-holes with bolted covers, top and bottom heads cast iron heavily ribbed.

We furnish riveted steel feeder pipes of all diameters and thicknesses of plate and of different designs and arrangements to suit location and requirements. All rivets are carefully fitted and driven with special pneumatic tools, and all joints are properly fitted and calked. All of our work before shipment is marked in detail and thoroughly covered with hydraulic paint. We have a complete up-to-date boiler shop and equipment for this particular work. All machine tools of latest design and driven electrically.

Give us an opportunity to submit estimates on your requirements.

THE JAMES LEFFEL & CO.

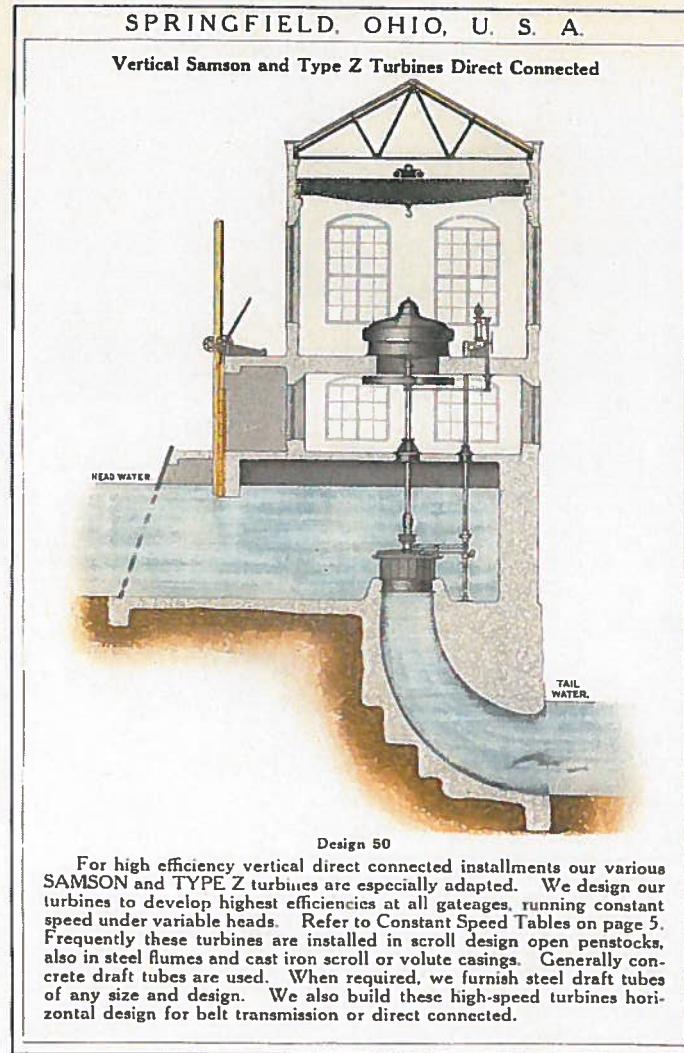
Vertical Type Z Turbines Direct Connected



Design 52

This illustrates our high-power, high-speed, high-efficiency vertical TYPE Z turbine installed under low head and direct connected to generator. Turbine fitted with our improved bottom gate operating ring direct connected to vertical gate shaft that rotates  $45^\circ$  or  $60^\circ$  for full gate travel. Gate shaft connected directly to oil pressure governor driven from turbine shaft. The governor pressure pump may be motor or belt driven. Frequently, to assist speed regulation, it is necessary to install on turbine shaft heavy balance wheel as illustrated. The weight of all revolving parts of complete unit carried on suitable thrust bearing located on top of generator. If unit is properly erected, one man can easily rotate the revolving parts. This means highest efficiencies and lowest operating expense. We have many of these units running.

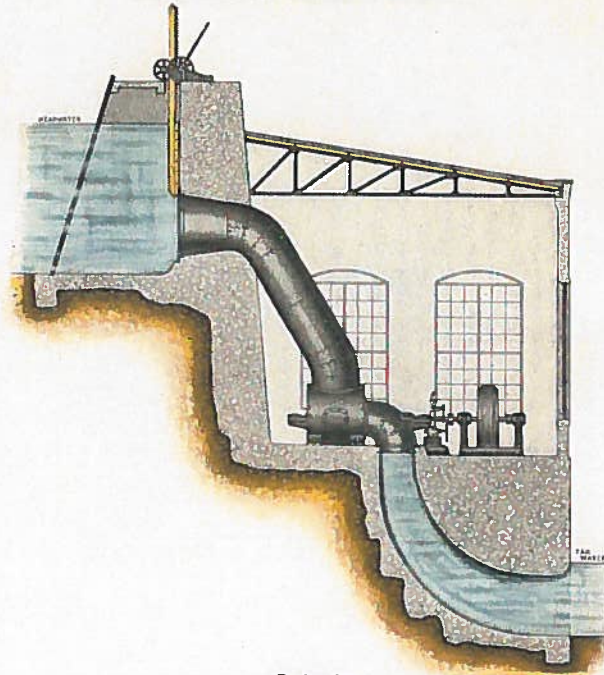
These turbines, to develop power table values, must be installed and operated substantially as shown on page 15. We will furnish complete drawings, together with specifications and operating instructions.



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# THE JAMES LEFFEL & CO.

## Single Discharge Horizontal Turbines



Design 24

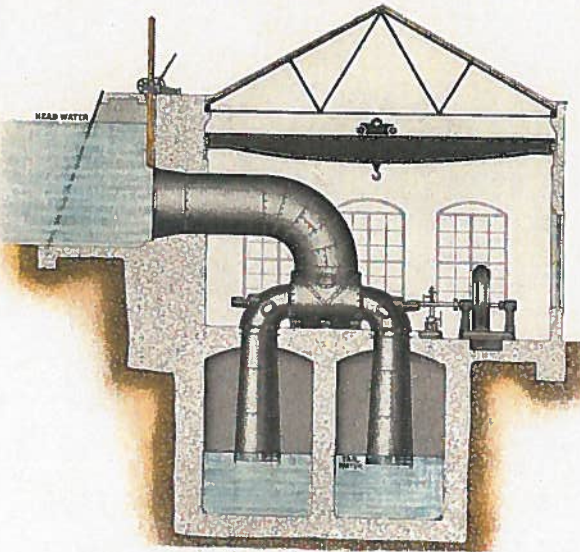
We furnish these single discharge horizontal turbines either for direct connection or with driving pulleys, with feeder pipe connection on top of flume as illustrated, or on one side or end of flume opposite discharge end. The water pressure thrust on turbine shaft is satisfactorily carried in suitable thrust bearing in combination with ring-oiling bearing which carries turbine shaft. No turbine shaft bearings inside of flume.

We also build these turbines with cast iron scroll or volute casings for medium and high heads. Also, we frequently sectionalize these turbines for mule-back transportation. We also furnish steel draft tubes if required, together with quick-acting governors. Sometimes we furnish balance wheels on turbine shafts to assist speed regulation.

We furnish curve tables giving guaranteed power, speed and efficiency values, also speed regulation under variable heads and load changes.

# SPRINGFIELD, OHIO, U. S. A.

## Double Discharge Horizontal Turbines



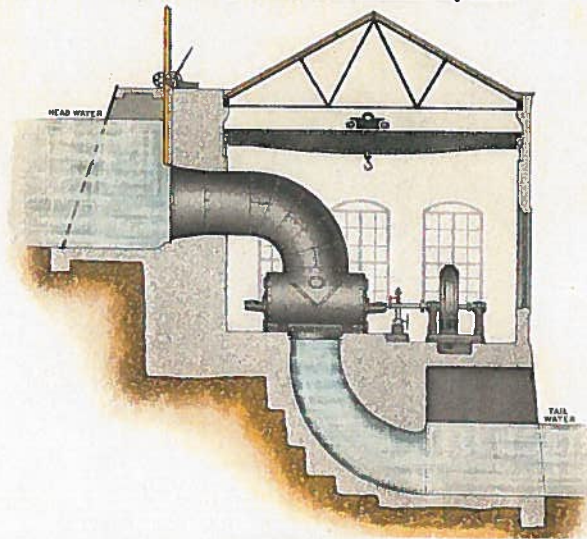
Design 21

We build this design of horizontal turbines equipped with our different SAMSON or TYPE Z turbines for direct connection or belt transmission, and fitted with two separate turbine runners and gate casings. Each runner discharges into elbow with draft tube. Both runners fitted on one horizontal shaft. Sometimes this shaft is made in two pieces coupled together between runners. We usually build both gate casings connected to one gate shaft, both gate casings operating together. Or, each gate casing connected to separate gate shafts, one gate shaft fitted with hand operating wheel, the other gate shaft connected to governor, or both gate shafts connected to governor as required. By this arrangement both turbines will run together or only one turbine run to suit available water. This means using the different quantities of water up to maximum capacity of turbines at highest efficiencies. We also build these turbines with scroll or volute casings for medium and high heads. The feeder pipe may be connected on top as illustrated, or on side of flume. We furnish turbine shaft with suitable thrust bearing in combination with turbine shaft ring-oiling bearings located outside of discharge elbows. These turbines can be installed on concrete draft tubes.

We furnish governors and accessories for complete installment.

## THE JAMES LEFFEL &amp; CO.

## Center Discharge Horizontal Turbines Top Inlet



Design 19 — Top Inlet

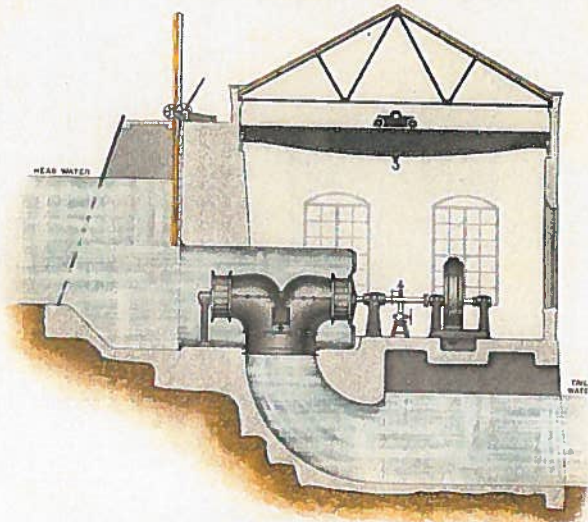
For medium and higher heads and with sufficient water for running each turbine unit to capacity, this design of turbine can be most advantageously installed and operated at minimum cost. In this design of horizontal turbine both runners are fitted on one continuous turbine shaft. Both gate casings direct connected to one gate shaft which rotates  $45^\circ$  or  $60^\circ$  for full gate travel. The end of gate shaft direct connected to governor with suitable arrangement so governor can be disconnected and gate shaft hand operated if required. Where head of water permits, the feeder pipe can be located on top of flume as illustrated, or connected to side of flume. Frequently, to better suit location, the end of flume is extended into forebay as shown on page 27. These turbines can be fitted with either concrete or steel draft tubes. Sometimes we furnish our horizontal turbines mounted on steel beams. Frequently without steel beams and bolted directly on concrete foundation as illustrated. The flumes are fitted with large manholes, also suitable drain valves together with adjustable stuffing boxes for turbine and gate shafts.

With our different types of turbine runners and gate casings, we can furnish horizontal turbines developing almost any power and speed values that may be required installed under low, medium and high heads.

Give us full particulars regarding your proposed turbine installment.

## SPRINGFIELD, OHIO, U. S. A.

## Center Discharge Horizontal Turbines End Inlet

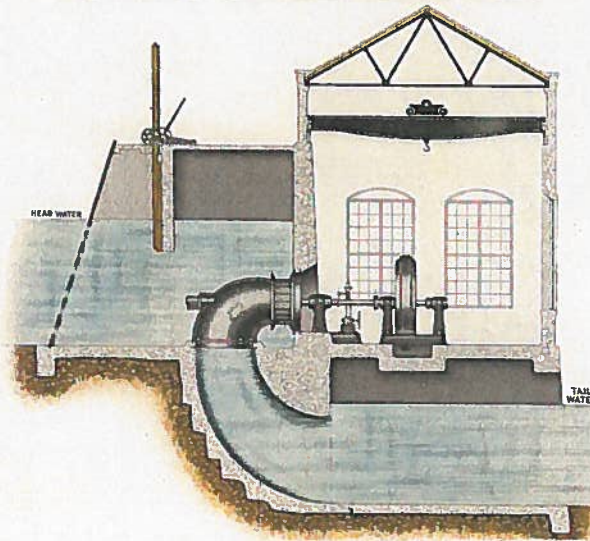


Design 19 — End Inlet

The same detailed specifications as given on page 26 also practically covers this type of turbine, excepting end inlet arrangement as illustrated above. Frequently we furnish these turbines with steel beams designed to suit the building foundations, also without steel beams as shown above. The center casing into which both turbines discharge is made of cast iron in sections bolted together, convenient for handling. The base ring on which the center discharge casing is mounted, can be arranged for either steel or concrete draft tubes. This turbine is so designed that all inside parts including turbine shaft with runners, gate casings and center discharge casing can be removed through the flume head, out on to power house floor, without disturbing the steel flume. The illustration also shows large head gate closing immediately over inlet end of flume. This head gate is raised and lowered with suitable hoisting irons located on foundation above head water. Small flood gates should be built in these large head gates so that when the head gates are closed and with full water pressure against the head gates, these flood gates can be opened and the flume filled with water, then the head gates can be easily hoisted. We furnish all designs and sizes of head gate hoisting irons. All installations should be equipped with steel screen rack located in head water in forebay to keep trash and debris out of the turbines, thereby eliminating danger of breakage and interference with movement of turbine gates.

## THE JAMES LEFFEL &amp; CO.

## Single Discharge Open Penstock Horizontal Turbines



Design 25

This design of horizontal turbine is largely used for driving exciters and other small capacity, high speed machinery installed in connection with large power units in open penstock construction as illustrated on pages 29 and 30. This design of horizontal turbine can be furnished and installed at comparatively low cost. We build our SAMSON and TYPE Z turbines this design. We frequently build this same design of turbine so arranged that the turbine runner and gate casing are located in the head water in the penstock, and the discharge cylinder ring built in the bulkhead wall, with the discharge elbow located on power house floor and shaft extended either for direct connection or belt transmission. This arrangement of turbine we specify our Design 26. Drawings and details of same furnished as required. These turbines are fitted with our improved runners and with gate casings direct connected to gate shaft arranged for connection to governor, or with operating hand wheel. We equip our horizontal turbines with our special design collar thrust bearing built in combination with turbine shaft bearing. These bearings are ring-oiling heavy pattern and lined with special metal. When thrust is heavy we build these bearings water-cooled design. These thrust bearings have proven most satisfactory. We furnish turbine bearings of all designs and sizes for both vertical and horizontal shafts.



## MEMORANDUM

**Date:** October 28, 2013  
**To:** Water Right File 36-15959  
**From:** medl  
**Re:** Pristine Hydro #3

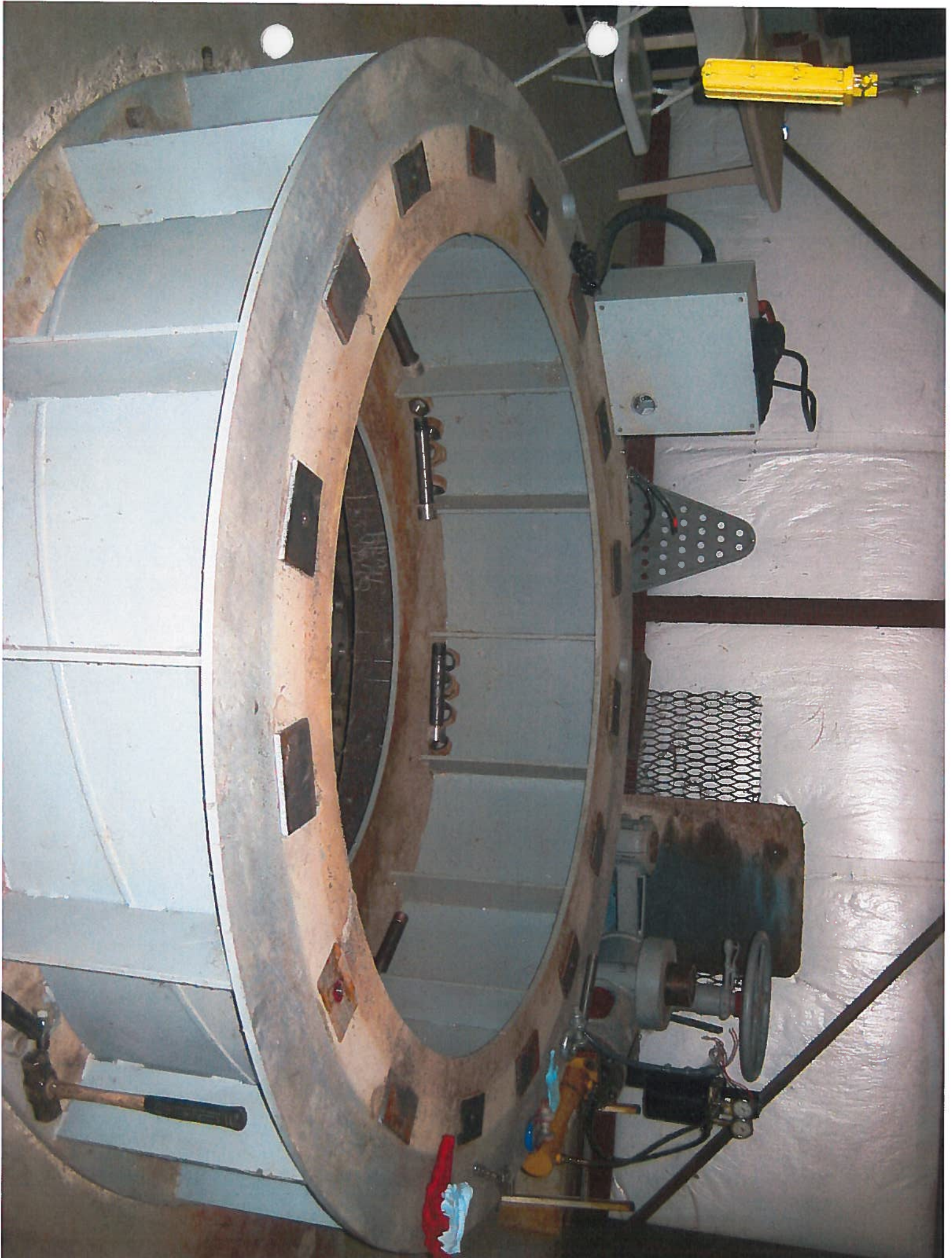
---

The following photos were taken by Stuart Van Greuningen on October 14, 2010, when the turbine-generator was taken offline for repairs.



## Brief description of pictures

| <u>Pic #</u> | <u>Description</u>                                                                                                                                                                                                                                                              |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 45           | Generator base                                                                                                                                                                                                                                                                  |
| 46 – 47      | Looking into turbine from above                                                                                                                                                                                                                                                 |
| 48           | Gap seen at back-bottom needs to be maintained at 30 thousands. This is what started to touch from 2009 high water.                                                                                                                                                             |
| 49           | The gap between the unit and the floor needs to be leveled for the unit to set properly (below the reddish part). A base will be formed around the unit the same height as the lip seen here. Grout will be inserted into base form to support the turbine and maintain height. |
| 50 – 53      | Show the turbine and hardware that keeps the turbine in place. Also looking up at generator.                                                                                                                                                                                    |
| 54           | This is where shims were added in 2009 when high water from the Snake caused problems and shut down the system. The high water caused the unit to pitch toward the south.                                                                                                       |
| 55           | Inlet screen and gate, north side. Similar on south side.                                                                                                                                                                                                                       |
| 56 – 57      | Show cobwebs in building. I bumped camera setting taking it out of my pocket so pictures aren't that good.                                                                                                                                                                      |

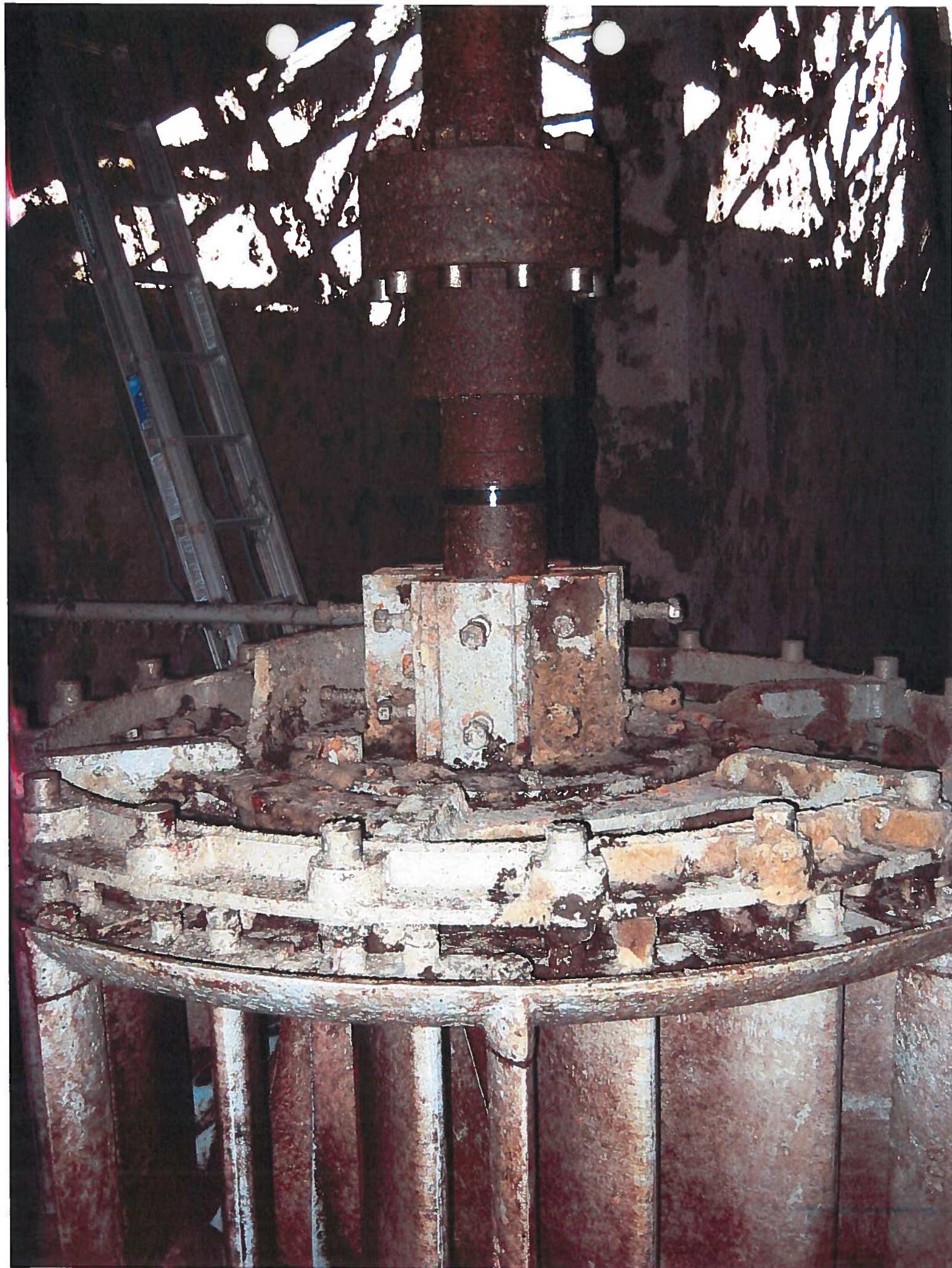
























## MEMORANDUM

**Date:** October 2013  
**To:** Water Right File 36-15959  
**From:** medl  
**Re:** Pristine Springs Hydro #3

---

The following documents are available to the public and were downloaded from the FERC website.

The FERC inspection reports of the facility are now considered CEII (Critical Energy Infrastructure Information) and not accessible to the general public. Copies of the inspection reports for Pristine Springs Hydro #3 can be viewed in IDWR's Dam Safety archive.



STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

FEDERAL ENERGY  
REGULATORY COMMISSION

1363 FILLMORE STREET • TWIN FALLS, IDAHO 83301 • (208) 738-2190

August 31, 2006

Mr. Wendell Stark, Owner  
& Mr. Curtis Gay, Dam Safety Manager  
Pristine Springs, Inc.  
210 Warm Creek Road  
Jerome, ID 83338

SEP 5 2006  
SEP 5, 2006  
PORTLAND  
REGIONAL OFFICE

JAMES E. RISCH, GOVERNOR  
TONI HARDESTY, DIRECTOR

Re: Pristine Springs Project, FERC No. 12144 – Emergency Tailrace Armoring

Dear Sirs:

On August 30, 2006 Mr. Wendell Stark visited with me at the Idaho Department of Environmental Quality (IDEQ) in Twin Falls, Idaho. The nature of the visit has in reference to a letter (No. P-12144-ID; dated August 10, 2006) from the Federal Energy Regulatory Commission (FERC) that he received as a result of a FERC Operation Inspection of the Pristine Springs small conduit hydroelectric project, FERC No. 12144. The August 10<sup>th</sup> letter identifies certain items which require a plan and schedule for addressing them within 45 days of the date of the letter.

Mr. Stark explained that two of the three items had already been accomplished. The one outstanding item dealt with the “susceptibility of tailrace releases to erode the toe of the tailrace slope” into the Snake River. As explained in the August 10<sup>th</sup> letter, “due to seasonal high flows and the susceptibility of tailrace releases to erode the toe of the tailrace slope and to deposit the eroded sediment into the waterway, it is highly recommended that the toe area of the slope in the vicinity of the tailrace be armored with riprap to prevent further erosion.”

This letter is in response to the August 30<sup>th</sup> visit and provides suggestions to answering the outstanding item. The nature of FERC’s recommendation for riprap potentially involves a Section 404 permit as defined under the Clean Water Act. Depending on the nature of the proposed riprap activity, the following recommendations are suggested:

1. Please contact the U. S. Army Corps of Engineers (ACOE) at the Idaho Falls Regulatory Office and speak with Mr. Robert “Bob” Brochu (Telephone: 208-522-1645). The ACOE is the regulatory agency that issues the Section 404 permits as required under Section 10 of the Rivers and harbors Act of 1899 for any structures or work in or affecting navigable waters of the United States, including their adjacent wetlands. The ACOE would need to make the determination if a permit is necessary for the proposed riprap activity.
2. Please contact the Idaho Department of Water Resources (IDWR) at the Twin Falls Regional Office and speak with Mr. Terry Blau (Telephone: 208-736-3033, extension 232). The IDWR is the Idaho state agency that is responsible

Mr. Wendell Stark & Mr. Curtis Gay

Pristine Springs, Inc.

August 31, 2006

Page 2

for managing the Idaho Stream Channel Protection Act (Title 42, Chapter 38, Idaho Code), and IDWR would need to make the determination if a permit is necessary for the proposed riprap activity.

3. Please contact the Idaho Department of Lands (IDL) at the Jerome Field Office and speak with Mr. Timothy "Tim" Duffner (Telephone: 208-324-2561). The IDL is the Idaho state agency that is responsible for dealing with the Idaho Lake Protection Act (§58-142 et seq., Idaho Code), and IDL would need to make the determination if a permit is necessary for the proposed riprap activity.
4. Since the proposed riprap activity would potentially involve a discharge of erodible, dredged or fill materials and thus affect water quality; and especially if the activity would potentially occur below the ordinary high water mark of the Snake River; a Section 401 water quality certification would be required under the Clean Water Act. IDEQ is the Idaho state agency that issues these certifications, but their issuance is dependent on the issuance of the federal Section 404 permit from the ACOE; so both the Section 404 permit and the Section 401 certification would be issued at the same time as part of the Section 404 process.

In order to expedite the process, a Joint Application for Permits is available on the IDWR Web site at [http://www.idwr.idaho.gov/water/stream\\_dam/sca/SCA%20Joint%20Application.pdf](http://www.idwr.idaho.gov/water/stream_dam/sca/SCA%20Joint%20Application.pdf) and would cover the necessary information needed for the ACOE, IDWR and IDL. The ACOE would then communicate directly with IDEQ on the Section 401 water quality certification. In addition, you may want to review the IDWR Emergency Permit Application to Alter a Stream Channel at [http://www.idwr.idaho.gov/water/stream\\_dam/sca/emergency.pdf](http://www.idwr.idaho.gov/water/stream_dam/sca/emergency.pdf); but IDWR would have to make the determination if an emergency permit would be necessary.

If you have any further questions, please don't hesitate to contact me at (208) 736-2190.

Sincerely,

*For D.H.B. by [Signature] 31 Aug 2006*

Doug Howard, P. E.  
Regional Administrator

DH/BBB:gl

cc: Jeffrey Racicot, FERC, Portland Regional Office, Portland, Oregon  
Robert Brochu, ACOE, Idaho Falls Regulatory Office, Idaho Falls, Idaho  
Terry Blau, IDWR, Twin Falls, Idaho  
IDEQ-TFRO File: FERC Small Conduit Hydroelectric Project, FERC No. 12144

2006 SEP 12 AM 8:37

P-12144

September 23, 2006

Mr. Patrick Regan, P.E.  
Federal Energy Regulatory Commission  
Portland Oregon

FEDERAL ENERGY  
REGULATORY COMMISSION

OCT 2 2006  
OCT. 2, 2006

PORTLAND  
REGIONAL OFFICE

Dear Mr. Regan:

In response to your 8/10/06 letter  
(copy enclosed), the recommended steps  
#2 and #3 have been completed.

Implementation of #1 requires  
various state and federal approvals.  
I am enclosing a letter from Idaho  
DEQ outlining all the various agencies  
who must sign off on this rather  
urgently needed project.

Pristine Springs, Inc. will continue  
to seek these approvals and make  
the necessary physical improvements  
when and if all such approvals  
can be secured.

We agree with your recommendation and  
are eager to implement as soon as permitted  
to do so.

Sincerely,  
Wendell Starke  
President, Pristine  
Springs

FEDERAL ENERGY REGULATORY COMMISSION

Office of Energy Projects  
Division of Dam Safety and Inspections  
Portland Regional Office  
101 S.W. Main Street, Suite #905  
Portland, Oregon 97204

In reply refer to:  
P-12144-ID

AUG 10 2006

Mr. Curtis Gay  
Dam Safety Manager  
Pristine Springs, Inc.  
201 Warm Creek Rd.  
Jerome, ID 83338

Dear Mr. Gay:

On July 12, 2006, Mr. Jeffrey Racicot of this office conducted an Operation Inspection of the Pristine Springs Project, FERC No. 12144. It appeared that you are operating and maintaining the project in a safe and acceptable manner. The following items requiring follow-up action were identified and discussed during the inspection:

\* 1. Due to seasonal high flows and the susceptibility of tailrace releases to erode the toe of the tailrace slope and to deposit the eroded sediment into the waterway, it is highly recommended that the toe area of the slope in the vicinity of the tailrace be armored with riprap to prevent further erosion.

Done 2. It is recommended that the powerhouse operator-emergency contact phone be put in service with emergency phone numbers posted next to the phone.

Done 3. The missing generating unit nameplate should be installed. The nameplate should include all pertinent power generating data.

Within 45 days of the date of this letter, please provide this office with three copies of a plan and schedule that addresses the above items.

Thank you for your cooperation relative to project safety. If you have any questions, please contact Mr. Racicot at (503) 552-2738.

Sincerely,

Patrick I. Reown P.E.

*This is really needed*  
*Jeffrey Racicot*



STATE OF IDAHO  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY

FILE COPY

1363 FALMERE STREET • TWIN FALLS, IDAHO 83301 • (208) 736-2150

JAMES E. P. CH. GOVERNOR  
TOM HARRIS, CITY DIRECTOR

August 31, 2006

Mr. Wendell Stark, Owner  
& Mr. Curtis Gay, Dam Safety Manager  
Pristine Springs, Inc.  
210 Warm Creek Road  
Jerome, ID 83338

Re: Pristine Springs Project, FERC No. 12144 - Emergency Tailrace Armoring

Dear Sirs,

On August 30, 2006 Mr. Wendell Stark visited with me at the Idaho Department of Environmental Quality (IDEQ) in Twin Falls, Idaho. The nature of the visit has in reference to a letter (No P-12144-ID; dated August 10, 2005) from the Federal Energy Regulatory Commission (FERC) that he received as a result of a FERC Operation Inspection of the Pristine Springs small conduit hydroelectric project, FERC No. 12144. The August 10<sup>th</sup> letter identifies certain items which require a plan and schedule for addressing them within 45 days of the date of the letter.

Mr. Stark explained that two of the three items had already been accomplished. The one outstanding item dealt with the "susceptibility of tailrace releases to erode the toe of the tailrace slope" into the Snake River. As explained in the August 10<sup>th</sup> letter, "due to seasonal high flows and the susceptibility of tailrace releases to erode the toe of the tailrace slope and to deposit the eroded sediment into the waterway, it is highly recommended that the toe area of the slope in the vicinity of the tailrace be armored with riprap to prevent further erosion."

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Mr. Wendell Stark & Mr. Curtis Gay  
Pristine Springs, Inc.  
August 31, 2006  
Page 2

for managing the Idaho Stream Channel Protection Act (Title 42, Chapter 38, Idaho Code), and IDWR would need to make the determination if a permit is necessary for the proposed riprap activity.

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If you have any further questions, please don't hesitate to contact me at (208) 736-2190.

Sincerely,

 3/1/06

Doug Howard, P. E.  
Regional Administrator

DH/BBB:gl

cc: Jeffrey Rasicot, FERC, Portland Regional Office, Portland, Oregon  
Robert Brochu, ACOE, Idaho Falls Regulatory Office, Idaho Falls, Idaho  
Terry Blau, IDWR, Twin Falls, Idaho  
IDEQ-TFRQ File: FERC Small Conduit Hydroelectric Project, FERC No. 12144

FEDERAL ENERGY REGULATORY COMMISSION

Office of Energy Projects  
Division of Dam Safety and Inspections  
Portland Regional Office  
101 S.W. Main Street, Suite #905  
Portland, Oregon 97204

*Aug 10 2006*  
*AUG 10 2006*

In reply refer to:  
P-12144-ID

Mr. Curtis Gay  
Dam Safety Manager  
Pristine Springs, Inc.  
201 Warm Creek Rd.  
Jerome, ID 83338

Dear Mr. Gay:

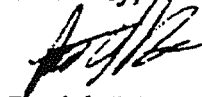
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1. Due to seasonal high flows and the susceptibility of tailrace releases to erode the toe of the tailrace slope and to deposit the eroded sediment into the waterway, it is highly recommended that the toe area of the slope in the vicinity of the tailrace be armored with riprap to prevent further erosion.
2. It is recommended that the powerhouse operator-emergency contact phone be put in service with emergency phone numbers posted next to the phone.
3. The missing generating unit nameplate should be installed. The nameplate should include all pertinent power generating data.

Within 45 days of the date of this letter, please provide this office with three copies of a plan and schedule that addresses the above items.

Thank you for your cooperation relative to project safety. If you have any questions, please contact Mr. Racicot at (503) 552-2738.

Sincerely,



Patrick J. Regan, P. E.  
Regional Engineer

.....

201 Warm Creek Road  
Jerome, ID 83338  
Voice (208) 736-1606  
Fax (801) 459-0529

**PRISTINE SPRINGS ANGUS**

FEDERAL ENERGY  
REGULATORY COMMISSION

March 27, 2006

MAY 4 - 2006

Mr. Patrick Regan  
Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Dam Safety and Inspections  
101 S.W. Main Street, Suite 905  
Portland, OR 97204

PORTLAND  
REGIONAL OFFICE

re: Pristine Springs Hydro #1 QF93-106-000  
Pristine Springs Hydro #3 P-12144-000

Dear Mr. Regan:

Following up on our telephone conversation, I am writing to certify that the two hydroelectric generating projects above referenced are small and, in the event of total failure, would present no danger to life or property downstream.

Also, please note that the previous person of record for notification is deceased. The new contacts are:

Curtis Gay, Manager  
Pristine Springs Angus  
201 Warm Creek Road  
Jerome, ID 83338  
office: 208-736-1606  
cell: 208-308-8220  
email: [pristinespringsangus@yahoo.com](mailto:pristinespringsangus@yahoo.com)

.....

April 26, 2006  
Page 2

Wendell M. Stark  
Pristine Springs, Inc.  
4038 Chestatee Road  
Gainesville, GA 30506  
office: 770-532-3400  
cell: 404-229-7769  
email: wmoorestar@aol.com

Thank you for your assistance.

Sincerely,

A handwritten signature in black ink that reads "Wendell M. Starke". The signature is fluid and cursive, with the first name "Wendell" being the most prominent part.

Wendell M. Starke  
Pristine Springs, Inc.

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Pristine Springs, Inc.

Project No. 12144-000

ORDER GRANTING EXEMPTION FROM LICENSING  
(CONDUIT)

(Issued April 30, 2002)

On January 23, 2002, supplemented on March 14, 2002, Pristine Springs, Inc. filed an application to exempt the Pristine Springs Hydro #3 Project from the licensing requirements set forth in Part I of the Federal Power Act (FPA). The small conduit hydropower project would be located on Warm Creek, in Jerome County, Idaho. The project would not occupy federal or tribal lands.

The project will be located at the outflow of an existing Aquaculture facility. The existing outflow exits an existing dam through a concrete structure and into the Snake River. The project will consist of a new powerhouse and a new 500 kW turbine generating unit. A channel will be built that allows the water to go through the turbine and exit by an 80-inch pipeline to the Snake River at the same place it does now. The turbine will be operated as run-of-river. Approximately 4000 feet of power lines will be built to connect with lines that exist on the property. The average annual generation would be 1,762,305 kWh.

Public notice of the application was issued on March 6, 2002, with April 14, 2002 as the last day to file comments. On April 11, 2002, the State of Idaho Agencies (the Idaho Department of Fish and Game (IDFG), the Idaho Department of Environmental Quality, and the Idaho Water Resource Board) filed a timely motion to intervene, comments, and terms and conditions.<sup>1</sup> No protests were filed.

Article 2 of this exemption requires compliance with the terms and conditions prepared by federal or state fish and wildlife agencies to protect fish and wildlife resources. In the State of Idaho Agencies' April 11, 2002 filing, the IDFG provided terms

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<sup>1</sup>The motion to intervene was not opposed, therefore, the motion was granted automatically, pursuant to 18 CFR 385.214(c)(2001).

0205010416.3

DOCKETED  
BN

and conditions to be added to the exemption. In accordance with standard article 2 of the exemption, the exemptee must comply with the mandatory terms and conditions set forth in the April 11, 2002 filing.

Preparation of an environmental assessment or an environmental impact statement is not required for this project pursuant to Section 380.4(a)(14) of the regulations. Nonetheless, we have considered the environmental information in the exemption application, and other public comments, and find that issuance of this order is not a major federal action significantly affecting the quality of the human environment.

The Director orders:

(A) The Pristine Springs Hydro #3 Project is exempted from the licensing requirements of Part I of the Federal Power Act, subject to the attached articles. See 18 C.F.R. § 4.94.

(B) This order is issued under authority delegated to the Director and 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.

A handwritten signature in black ink, appearing to read 'Hossein Ildari', with a long horizontal line extending to the right.

Hossein Ildari  
Division of Hydropower  
Administration and Compliance

## FEDERAL ENERGY REGULATORY COMMISSION

**§ 4.94 Standard terms and conditions of exemption.**

**Any exemption granted under § 4.93 for a small conduit hydroelectric facility is subject to the following standard terms and conditions:**

(a) **Article 1.** The Commission reserves the right to conduct investigations under sections 4(g), 306, 307, and 311 of the Federal Power Act with respect to any acts, complaints, facts, conditions, practices, or other matters related to the construction, operation, or maintenance of the exempt facility. If any term or condition of the exemption is violated, the Commission may revoke the exemption, issue a suitable order under section 4(g) of the Federal Power Act, or take appropriate action for enforcement, forfeiture, or penalties under Part III of the Federal Power Act.

(b) **Article 2.** The construction, operation, and maintenance of the exempt project must comply with any terms and conditions that the United States Fish and Wildlife Service and any state fish and wildlife agencies have determined are appropriate to prevent loss of, or damage to, fish and wildlife resources or otherwise to carry out the purposes of the Fish and Wildlife Coordination Act, as specified in Exhibit E of the application for exemption from licensing or in the comments submitted in response to the notice of the exemption application.

(c) **Article 3.** The Commission may revoke this exemption if actual construction of any proposed generating facilities has not begun within two years or has not been completed within four years from the effective date of this exemption. If an exemption is revoked under this article, the Commission will not accept from the prior exemption holder a subsequent application for exemption from licensing or a notice of exemption from licensing for the same project within two years of the revocation.

(d) **Article 4.** In order to best develop, conserve, and utilize in the public interest the water resources of the region, the Commission may require that the exempt facilities be modified in structure or operation or may revoke this exemption.

(e) **Article 5.** The Commission may revoke this exemption if, in the application process, material discrepancies, inaccuracies or falsehoods were made by or on behalf of the applicant.

**(f) Article 6.** Before transferring any property interests in the exempt project, the exemption holder must inform the transferee of the terms and conditions of the exemption. Within 30 days of transferring the property interests, the exemption holder must inform the Commission of the identity and address of the transferee.

April 11, 2002

Magalie R. Salas, Secretary  
Federal Energy Regulatory Commission  
888 First Street NE Rm 1A  
Washington, D.C. 20426

Re: STATE OF IDAHO AGENCIES' MOTION TO INTERVENE, COMMENTS,  
TERMS AND CONDITIONS  
Application for Conduit Exemption by Pristine Springs, Inc., for the Pristine  
Springs Hydro #3 Project No. 12144-000

Dear Ms. Salas:

Attached for filing in the above-named matter is the original STATE OF IDAHO  
AGENCIES' MOTION TO INTERVENE, COMMENTS, TERMS AND CONDITIONS

Thank you for your assistance in this matter.

Sincerely,

HARRIET A. HENSLEY  
Deputy Attorney General  
Natural Resources Division

HH/pb

**Attachment 1 Original**

cc: The official Service List compiled by the Secretary in Project No. 12144-000 as of  
4/11/02.

ALAN G. LANCE  
Attorney General  
State of Idaho

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

HARRIET A. HENSLEY  
Deputy Attorney General  
Natural Resources Division  
700 W. Jefferson St., Room 210  
P. O. Box 83720  
Boise, Idaho 83720-0010  
Telephone: (208) 334-2400  
Facsimile: (208) 334-2690  
Idaho State Bar #5235 (Hensley)

Attorneys for State of Idaho

UNITED STATES OF AMERICA

FEDERAL ENERGY REGULATORY COMMISSION

In the Matter of Application for Conduit    ) Project No. 12144-000  
Exemption by Pristine Springs, Inc. for    )  
the Pristine Springs Hydro #3                ) STATE OF IDAHO AGENCIES'  
                                                          ) MOTION TO INTERVENE,  
                                                          ) COMMENTS, TERMS AND  
\_\_\_\_\_) CONDITIONS

TO: **MAGALIE R. SALAS**, SECRETARY, FEDERAL ENERGY REGULATORY  
COMMISSION.

On January 23, 2002, Pristine Springs, Inc. ("applicant") filed an application with the Federal Energy Regulatory Commission ("Commission") for a conduit exemption from certain provisions of the Federal Power Act (FPA) for the proposed Pristine Springs Hydro #3 project located on Warm Creek, in Jerome County, Idaho. The State of Idaho, ex rel., the Idaho Department of Fish and Game, Idaho Department of Environmental

Quality, and Idaho Water Resource Board, by and through its undersigned counsel, Harriet A. Hensley, Deputy Attorney General, hereby respectfully moves the Commission for an order permitting the State of Idaho to intervene as a party for all purposes in the above-referenced project proceeding pursuant to Rule 214, 18 C.F.R. § 385.214. Pursuant to 18 CFR 385.2001(a)(1)(iii), this document has been filed electronically with the Federal Energy Regulatory Commission this date and thus all requirements for file copies have been met.

**I. STATEMENT OF INTEREST AND GROUNDS FOR INTERVENTION**

A. The Attorney General is a duly-established executive officer of the State of Idaho and is authorized to represent the State in all legal proceedings. Idaho Code § 67-1401. The names and addresses of the persons designated for service of documents in connection with this motion and all further proceedings are as follows:

Harriet A. Hensley, (ISB #5235)  
Deputy Attorney General  
Natural Resources Division  
700 W. Jefferson Street, Rm. 210  
P. O. Box 83720  
Boise, Idaho 83720-0010

Scott Grunder  
Fishery Program Coordinator  
Natural Resources Policy Bureau  
Idaho Department of Fish and Game  
600 S. Walnut Street  
P.O. Box 25  
Boise, ID 83707

Douglas Conde (ISB #3073)  
Deputy Attorney General  
Idaho Department of Environmental Quality  
1410 N. Hilton  
Boise, ID 83706-1255

Phillip J. Rassier (ISB # 1750)  
Deputy Attorney General  
Idaho Department of Water Resources  
1301 N. Orchard Street  
Boise, ID 83706-2237

B. The Idaho Department of Fish and Game is a duly-established executive department of the State of Idaho. Idaho Code §§ 36-101 and 67-2402(1). The statutory policy of the State of Idaho is to preserve, protect, perpetuate, and manage all fish and wildlife. Idaho Code § 36-103(a). The Idaho Department of Fish and Game, acting

under the supervision of the Idaho Fish and Game Commission, has the responsibility to carry out that policy. Idaho Code §§ 36-102(a) and 36-103(b).

C. The Idaho Department of Environmental Quality is a duly-established executive department of the State of Idaho. Idaho Code § 39-104. The statutory policy of the State of Idaho is to provide for the protection of human health and the environment. Idaho Code § 39-102 and 102A. The Idaho Department of Environmental Quality implements these policies of the State of Idaho. Idaho Code § 39-104. The Idaho Department of Environmental Quality is the state agency responsible for developing and implementing water quality standards and providing certification regarding federal licenses and permits pursuant to Sections 303 and 401 of the Clean Water Act and Idaho Code §§ 39-101 to 39-130 and 39-3601 to 39-3639.

D. The Idaho Water Resource Board (“Water Board”) is a constitutionally established water agency within the Idaho Department of Water Resources and consists of eight members appointed by the Governor. Idaho Const. art. 15, § 7; Idaho Code § 42-1732. Among the Water Board’s duties is “to formulate, adopt and implement a comprehensive state water plan for conservation, development, management and optimum use of all unappropriated water resources and waterways of this state in the public interest.” Idaho Code § 42-1734A. The Water Board has adopted a component of the Comprehensive State Water Plan addressing site-specific issues associated with the area of the proposed project subject to this proceeding.

E. The participation of the State of Idaho is in the public interest. The Idaho Department of Fish and Game represents the public interest in fish and wildlife resources. The Idaho Department of Environmental Quality represents the public interest in

protection of water quality. The Idaho Water Resource Board represents the public's interest in the implementation of state water policy regarding water use and planning. The applicant and Commission need to know the policies of the State of Idaho by and through these agencies regarding the proposed construction and operation of the Pristine Springs Hydro #3 project.

## **II. POSITION OF THE STATE OF IDAHO AGENCIES**

### **A. Proposed Project Site Description**

The proposed project is located on Warm Creek, in Jerome County, Idaho.

### **B. Water Quality**

The entire Middle Snake River from Milner Dam to King Hill has been designated by the State as a Water Quality Limited Segment under 303(d) of the Clean Water Act, 16 U.S.C. § 1313(d). This designation indicates that water quality has been degraded to the point that it is no longer able to fully support designated uses including cold water biota, salmonid spawning, primary and secondary contact recreation, and agricultural water supply. The State has made restoration of the water quality in this segment a high priority.

The Middle Snake River Watershed Management Plan (WMP) has been developed as a long-range plan, consistent with the concept of sustainability, to restore water quality conditions in the Middle Snake River. The WMP states:

This sustainable development strategy requires integrated economic, environmental, and social planning that extend beyond the current generation. Restoring and maintaining the water quality of the Middle Snake River and protecting beneficial uses are recognized as important factors influencing the future economic and social well-being of the region.

The Middle Snake River WMP has been approved by the Environmental Protection Agency as meeting the requirements of Section 303(d) of the Clean Water Act. The Middle Snake River WMP establishes a total daily maximum load (TMDL) for total phosphorus. New facilities or expansions of existing facilities that contribute to phosphorus loading are only allowed if they can acquire phosphorus through pollution trading or otherwise demonstrate compliance with the TMDL.

The Middle Snake River WMP includes an industry specific management plan to reduce impacts on water quality associated with hydroelectric facilities.

Subsequent to the development of the Middle Snake River WMP, the Department of Environmental Quality developed, and the Environmental Protection Agency approved, the Upper Snake-Rock WMP, that includes a TMDL for total suspended sediment (TSS) and nutrients for the Snake River. The Upper Snake-Rock WMP is a continuation of the State's efforts to restore water quality in the Middle Snake River. Similar to the Middle Snake River WMP, the Upper Snake-Rock WMP provides that future growth that impacts TSS and nutrients should be allowed only when pollutant trading or other actions establish compliance with the goals set forth in the TMDL.

Hydroelectric projects typically alter riverine characteristics such as water velocity, discharge, water depth, and water retention times. Significant potential water quality changes associated with the construction of such projects include dissolved oxygen and temperature modifications, gas supersaturation (i.e., nitrogen), sedimentation, and local nutrient processing. It is in this context that the Idaho Department of Environmental Quality will review applications for the construction and operation of new hydroelectric power projects in the Snake River system.

C. Fish and Wildlife

The Idaho Department of Fish and Game's ("IDFG") Fisheries Management Plan (IDFG 2001) sets forth general policies as well as specific directives for fish management in the Snake River systems. Additional policies that should be considered in reviewing the application for a conduit exemption for this project should include the Nongame and Endangered Wildlife Plan (IDFG 1991), Furbearers Plan (IDFG 1990), and Waterfowl Plan (IDFG 1990).

Prior to construction of hydropower dams, the Snake River from Shoshone Falls downstream, supported a diverse and rich aquatic community. Several salmon species and stocks, steelhead trout, white sturgeon, redband or rainbow trout, Pacific lamprey, bull trout and a host of other aquatic species, inhabited the river and could freely range throughout the Snake and Columbia river systems. Construction of hydroelectric projects on the Snake River eliminated anadromous species and contributed significantly to the reduction of native rainbow trout, bull trout and white sturgeon. The inundation of riparian-wetland communities from the reservoirs created by hydropower development resulted in the complete loss of important wildlife habitat along extensive stretches of the Snake River. The cumulative loss of riparian-wetland communities along the Snake River has been significant.

The Snake River provides habitat for important resident fish populations, including brown trout, cutthroat trout, rainbow trout, mountain whitefish, white sturgeon, channel catfish, largemouth bass, smallmouth bass and yellow perch. The trout, white sturgeon, and warm water species provide a substantial fishery. However, the extensive development of the Snake River has resulted in depleted flows for fish populations.

There is a wide diversity of terrestrial and avian wildlife in the project area. The construction of the proposed hydroelectric project has the potential to adversely impact the quality and quantity of adjacent riparian habitat for numerous bird and mammalian species. The desert surrounding Warm Creek provides excellent habitat for a variety of raptors. Bald eagles and hawks use this as a wintering area; falcons are common and nest in the area. Wildlife in the project area include coyotes, ground squirrels, rock chucks, mice, rabbits and muskrat. The project area also provides habitat for deer.

The IDFG submits the following terms and conditions to prevent loss of, or damage to, fish and wildlife resources that may be affected by construction and operation of the proposed project.

1. Terms and Conditions

- a. All transmission lines should be installed underground or be raptor-proof.
- b. All riparian vegetation that is disturbed and/or removed in the course of construction of the project should be restored. The applicant should be required to consult with the IDFG to determine the appropriate measures for restoring and recovering vegetation important to maintain fish and wildlife values in the area.
- c. Any potential erosion problems associated with streambank disturbance or the outflow that may adversely affect fish and wildlife values, must be mitigated. The applicant should be required to consult with the IDFG to determine the appropriate measures for preventing such adverse effects and mitigation measures if appropriate.

- d. The proposed channel configuration to be constructed for carrying water into the turbine must be fenced to deter animals from becoming trapped and drowning.

D. Water Use and Planning.

The Constitution of the State of Idaho provides that waters of the state are subject to regulation and control of the State. Idaho Const. art. 15, §§ 1 and 3. The Constitution provides that the Water Board shall have the power to formulate and implement a state water plan for optimum use and conservation in the public interest, subject to legislative review.

The Water Board adopted a resolution on March 17, 1993, which approved the Comprehensive State Water Plan Snake River: Milner Dam to King Hill (1993) (Comprehensive Plan). Idaho Code § 42-1734B. The Comprehensive Plan designates the stream reach of the proposed project as a protected river (recreational) and within the stream channel, alterations would be prohibited except those necessary (1) to maintain and improve existing utilities, roadways, diversion works, fishery enhancement structures, and stream access facilities; (2) for the maintenance of private property; (3) for new diversion works; and (4) for construction of new public access facilities and fishery enhancement structures.

**PRAYER FOR RELIEF**

For the reasons given above, the State of Idaho respectfully requests as follows:

1. That the State of Idaho Agencies' Motion to Intervene be granted for all purposes.
2. That a copy of all pleadings filed with the Commission in this matter be sent to the State of Idaho at the addresses stated on page 2.

3. For such other and further relief as the Commission may deem just and proper.

DATED this 11<sup>th</sup> day of April 2002.

ALAN G. LANCE  
Attorney General  
State of Idaho

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HARRIET A. HENSLEY  
Deputy Attorney General  
Natural Resources Division

## **CERTIFICATE OF SERVICE**

I HEREBY CERTIFY that I have on this 11<sup>th</sup> day of April 2002, served the foregoing document, STATE OF IDAHO AGENCIES' MOTION TO INTERVENE, COMMENTS, TERMS AND CONDITIONS, upon each person designated on the official service list compiled by the Secretary in this proceeding by U.S. Mail, postage prepaid.

NYAL HOFFMAN  
PRISTINE SPRINGS, INC.  
201 WARM CREEK ROAD  
JEROME ID 83338-6490

NYAL HOFFMAN  
2122 E 3950 N  
FILER ID 83328

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HARRIET A. HENSLEY  
Deputy Attorney General  
Natural Resources Division

Q:\Hydro Conduit Exemptions\Pristine Springs 12144\motinterve-Pristine12144.doc

FEDERAL ENERGY REGULATORY COMMISSION  
Washington, D. C. 20426

OFFICE OF ENERGY PROJECTS

Project No. 12144-000  
Pristine Springs Hydro #3 Project  
Pristine Springs, Inc.

Mr. Nyal Hoffman  
2122E 3950N  
Filer, ID 83328

MAR 19 2002

Subject: Conduit Exemption Application Accepted for Filing

Dear Mr. Hoffman:

Your conduit exemption application for the project referenced above has been accepted by the Commission for filing as of January 23, 2002. The Commission's public notice (copy enclosed), issued March 6, 2002, has informed federal, state, and local agencies that they may obtain a copy of the complete application from you. The public notice also informed these agencies that they must send you a copy of their comments. Please respond to the comments by filing a detailed and documented rebuttal of any agency comment you wish to refute. You should submit your response within 10 days from the closing date in the public notice.

All submittals to the Commission must be in one original and 8 copies and addressed as follows:

The Secretary  
Federal Energy Regulatory Commission  
Mail Code: DHAC, PJ-12.1  
888 First Street, N.E.  
Washington, D.C. 20426

Also, please note that any additional information the staff needs, beyond that specified in the Commission's regulations, to complete its analysis of your proposal may be requested, pursuant to 18 C.F.R. 4.32(g), any time before final action on your application.

020326.0274.3

Project No. 12144-000

2

If you have any questions concerning this matter, please call Ms. Regina Saizan at (202) 219-2673.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter J. McGovern".

Peter J. McGovern  
Division of Hydropower  
Administration and Compliance

Enclosure:

Notice of Conduit Exemption Application issued March 6, 2002

UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

NOTICE OF APPLICATION ACCEPTED FOR FILING AND SOLICITING MOTIONS  
TO INTERVENE, PROTESTS, COMMENTS, RECOMMENDATIONS, AND TERMS  
AND CONDITIONS

(March 6, 2002)

Take notice that the following hydroelectric application has been filed with the Commission and is available for public inspection:

- a. Type of Application: Conduit Exemption
- b. Project No.: 12144-000
- c. Date filed: January 23, 2002
- d. Applicant: Pristine Springs, Inc.
- e. Name of Project: Pristine Springs Hydro #3
- f. Location: On Warm Creek, in Jerome County, Idaho. The project would not occupy federal or tribal lands.
- g. Filed Pursuant to: Federal Power Act 16 USC §§ 791(a) -825 (r).
- h. Applicant Contact: Mr. Nyal Hoffman, 2122E 3950N, Filer, Idaho 83328, (208) 326-5680
- i. FERC Contact: Regina Saizan, (202) 219-2673.
- j. Status of Environmental Analysis: This application is ready for environmental analysis at this time - see the following paragraphs about filing responsive documents.
- k. Deadline for filing motions to intervene, protests and comments: (April 14, 2002)

All documents (original and eight copies) should be filed with: The Secretary, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, D.C. 20426. Comments, protests and interventions may be filed electronically via the Internet in lieu of paper; see 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's web site under the "e-Filing" link. Please include the Project Number (P-12144-000) on any comments, protests, or motions filed.

The Commission's Rules of Practice and Procedure require all interveners filing a document with the Commission to serve a copy of that document on each person in the official service list for the project. Further, if an intervener files comments or documents with the Commission relating to the merits of an issue that may affect the responsibilities of a particular resource agency, they must also serve a copy of the document on that resource agency.

l. Description of Project: The project will be located at the outflow of an existing Aquaculture facility. The existing outflow exits an existing dam through a concrete structure and into the Snake River. The hydroelectric facility will consist of a new concrete structure connected to the existing one. The project will consist of a new powerhouse and a new 500 kW turbine generating unit. A channel will be built that allows the water to go through the turbine and exit by a 80-inch pipeline to the Snake River. The turbine will be operated as run-of-river. Approximately 4000 feet of power lines will be built to connect with lines that exist on the property. The average annual generation would be 1,762,305 kWh.

m. Available Locations of Application: A copy of the application is available for inspection and reproduction at the Commission's Public Reference Room, located at 888 First Street, NE, Room 2A, Washington, D.C. 20426, or by calling (202) 208-1371. This filing is available for review at the Commission or may be viewed on the Commission's web site at <http://www.ferc.gov> using the "RIMS" link, select "Docket #" and follow the instructions (call 202-208-2222 for assistance).

n. Development Application -- Any qualified applicant desiring to file a competing application must submit to the Commission, on or before the specified deadline date for the particular application, a competing development application, or a notice of intent to file such an application. Submission of a timely notice of intent allows an interested person to file the competing development application no later than 120 days after the specified deadline date for the particular application. Applications for preliminary permits will not be accepted in response to this notice.

o. Notice of Intent -- A notice of intent must specify the exact name, business address, and telephone number of the prospective applicant, and must include an

unequivocal statement of intent to submit, if such an application may be filed, either a preliminary permit application or a development application (specify which type of application). A notice of intent must be served on the applicant(s) named in this public notice.

p. **Protests of Motions to Intervene** -- Anyone may submit a protest or a motion to intervene in accordance with the requirements of Rules of Practice and Procedure, 18 CFR 385.210, 385.211, and 385.214. In determining the appropriate action to take, the Commission will consider all protests filed, but only those who file a motion to intervene in accordance with the Commission's Rules may become a party to the proceeding. Any protests or motions to intervene must be received on or before the specified deadline date for the particular application.

q. **Filing and Service of Responsive Documents** -- The application is ready for environmental analysis at this time, and the Commission is requesting comments, reply comments, recommendations, terms and conditions, and prescriptions.

The Commission directs, pursuant to Section 4.34(b) of the Regulations (see Order No. 533 issued May 8, 1991, 56 FR 23108, May 20, 1991) that all comments, recommendations, terms and conditions and prescriptions concerning the application be filed with the Commission within 30 days from the issuance date of this notice. All reply comments must be filed with the Commission within 45 days from the date of this notice.

r. Anyone may obtain an extension of time for these deadlines from the Commission only upon a showing of good cause or extraordinary circumstances in accordance with 18 CFR 385.2008.

s. All filings must (1) bear in all capital letters the title "PROTEST", "MOTION TO INTERVENE", "NOTICE OF INTENT TO FILE COMPETING APPLICATION", "COMPETING APPLICATION", "COMMENTS", "REPLY COMMENTS", "RECOMMENDATIONS", "TERMS AND CONDITIONS", or "PRESCRIPTIONS"; (2) set forth in the heading the name of the applicant and the project number of the application to which the filing responds; (3) furnish the name, address, and telephone number of the person protesting or intervening; and (4) otherwise comply with the requirements of 18 CFR 385.2001 through 385.2005. All comments, recommendations, terms and conditions or prescriptions must set forth their evidentiary basis and otherwise comply with the requirements of 18 CFR 4.34(b). Agencies may obtain copies of the application directly from the applicant. Any of these documents must be filed by providing the original and the number of copies required by the Commission's regulations to: The Secretary, Federal Energy Regulatory Commission, 888 First Street, N.E., Washington, D.C. 20426. A copy of any protest or motion to intervene must be served

Project No. 12144-000

4

upon each representative of the applicant specified in the particular application. A copy of all other filings in reference to this application must be accompanied by proof of service on all persons listed in the Service list prepared by the Commission in this proceeding, in accordance with 18 CFR 4.34(b) and 385.2010.

Magalie R. Salas  
Secretary

FILED  
OFFICE OF THE SECRETARY  
02 JAN 23 PM 12:58  
FEDERAL ENERGY  
REGULATORY COMMISSION

Nyal Hoffman  
2122E 3950N  
Filer, Idaho 83328  
Phone 1 208 326 5680  
Fax.. 1 208 326 5679  
Email: nyal@filertel.com

Secretary  
Federal Energy Regulatory Commission.  
888 1st. Street N.E.  
Washington D.C. 20426

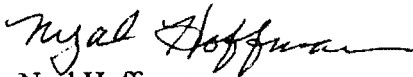
R 12144-000

January 21, 2002

Dear Sirs:

Enclosed please find an application for a small hydroelectric exemption from full licensing.  
An original and eight copies of each documents are included.

Sincerely



Nyal Hoffman  
Pristine Springs Inc.  
201 Warm Creek Road  
Jerome, Idaho 83338

0201250325- 3



FERC DOCKETED

1/9/02

Before The Federal Energy Regulatory Commission

Application for Exemption for Small Conduit Hydroelectric Facility

Pristine Springs Inc. applies to the Federal Energy Commission for an exemption for the  
Pristine Springs Hydro # 3, a small hydroelectric power project that is proposed to have an  
installed capacity of 5 megawatts or less, from licensing under the Federal Power Act.

FILED  
OFFICE OF THE SECRETARY  
02 JAN 23 PM 12:58  
FEDERAL ENERGY  
REGULATORY COMMISSION

The location of the project is:

(State or Territory) State of Idaho

County: Jerome

Township or nearby town: Township 9 S

Stream or body of water located Warm creek and unnamed springs located along the north side of the property.

The exact name and business address of each applicant are.

Pristine Springs Inc. 201 Warm Creek Road - Jerome, Idaho 83338.

The exact name and address of each person authorized to act as agent for the applicant in this application are: Nyal Hoffman 2122E 3950 N Filer, Idaho 83328

Pristine Springs Inc. is a corporation incorporated under the laws of the State of Idaho.

*Exhibit A.*

This facility will be built at the outflow of an existing Aquaculture facility

There is an existing dam that has been there for many years. The Existing outflow exits this dam thru a concrete structure and into Snake River. The hydroelectric facility will consist of a new concrete structure connected to the existing one as shown in the plans provided. Water will pass thru a Francis Type Turbine and flow into Snake River at the same point it flows at the present. This hydro will not be used as a peaking facility flow and head will be constant. Any variance would be due to changes in flow from the springs which supply the water.

(1) All water now flows thru an existing concrete structure and flows into Snake River. There is no consumptive use as the water is supplied by the outflow from an existing Aquaculture Facility. A new concrete structure will be built connecting to the existing structure. A new powerhouse will be built that houses a generator and turbine. A channel will be built that allows the water to go thru the turbine and exit by a 80" pipeline to Snake River at the same place it does at the present.

Aprox. 4000 ' of power lines will be built to connect with lines that exist on the property. there will be no adverse damage resulting from this project as all construction is located on private property.

(2) It is proposed that (1) one 500 k w generating unit be used at this site. No provisions will be made for future expansion and there are no hydroelectric units at this site

(3) One Francis type, variable flow turbine will be used.

(4) This Turbine will be operated as a run - of - river.

(5) This Project will be operated on a year around flow that is steady. It is substantiated by weirs located upstream that measure the flow to those facilities. No flow is, nor can be diverted below the aquaculture facility and ahead of the hydroelectric facility.

Estimations of:

- (i) The average annual generation would be 1,762,305 kilowatt hours.
- (ii) The average head of the plant will be 15'.
- (iii) The hydraulic capacity of the plant will be 240.3 cfs plus or minus .
- (iv) The number of surface acres of the man- made impoundment. Aprox. 8 acres with aprox. 72 acre feet of net impounded water.
- (v) All water described above is available for power generation.
- (7) The planned date for beginning construction of this facility would be April 1, 2002 or as soon as the required permits are in place. We are allowed 2 years to put the water to a beneficial use to be in compliance with the laws of the Sate of Idaho Dept. of Water Resources. Our plans would be to have this facility in operation by Nov. of 2002.
- (8) The existing structure has been raised 4' which would be done without the hydro facility to assure there would be no overflow of the dam as the amount of water raised because of expansion of the aquaculture facility The surface area will remain virtually the same.

(d) *Exhibit B*

Enclosed is a U.S.Geological Survey Map that shows the information requested in the following paragraphs.

- (1) All information requested under this paragraph.
- (2) All information requested under this paragraph
- (3) The applicant - Pristine Springs Inc. owns all property upon which this small hydro project will be constructed.
- (4) The proposed project boundary that encloses all project work on this project is, the property lines of Pristine Springs Inc.

(f) *Exhibit E.*

(1) The environmental setting of this project is located by the bank of Snake River. There is vegetative cover around the project that will not be disturbed.  
There has been a stream alteration permit issued in the very area that is involved in this project. The State of Idaho Department of Water Resources permit number issued for that project is 36-S-49 dated December- 2-1999.

A copy of that permit is enclosed.

There will be no adverse impact on any fish or wildlife in this area as nothing will change in the flow pattern.

Water quantity and quality will not change as this project is a run of the river project.

There are no public recreational uses on the private property involved.

There are no threatened or endangered plant or animal species in this area.

There are no sites eligible for inclusion in the National Register of Historical Places involved at this site.

(2)There will be no expected environmental impacts from this project.

(3)The main asthetic resourse in the area is the existing lake.This project will have no effect on the lake as it will remain the same.

*Exhibit G.*

Enclosed are the drawings noted in this paragraph.

USGS Map showing.

The directions to the project site from the intersection of higway 93 and 79 North of Twin Falls Idaho.

All pertinent location information for this project.

1/9/02

Arial photograph of the site showing the existing lake, dam and the hydro site. Also shown are fish rearing ponds that were eliminated several years ago. Snake River on the left of the photo. Enlarged topog picture of the site showing location of hydro site.

The lake and the existing dam.

Also enclosed is a letter from State of Idaho Dept. of Fish & Game referring to the recent stream alteration.

Tha

If there any questions or remarks, please contact me at the following.

Nyal Hoffman

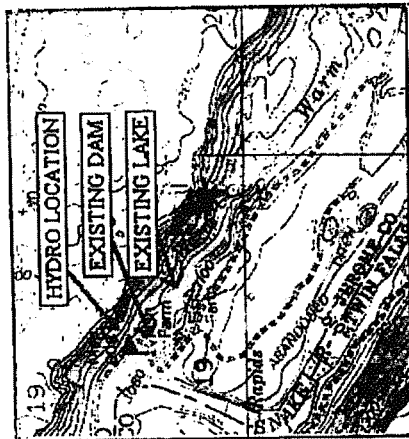
2122E 3950N

Filer, Idaho 83328

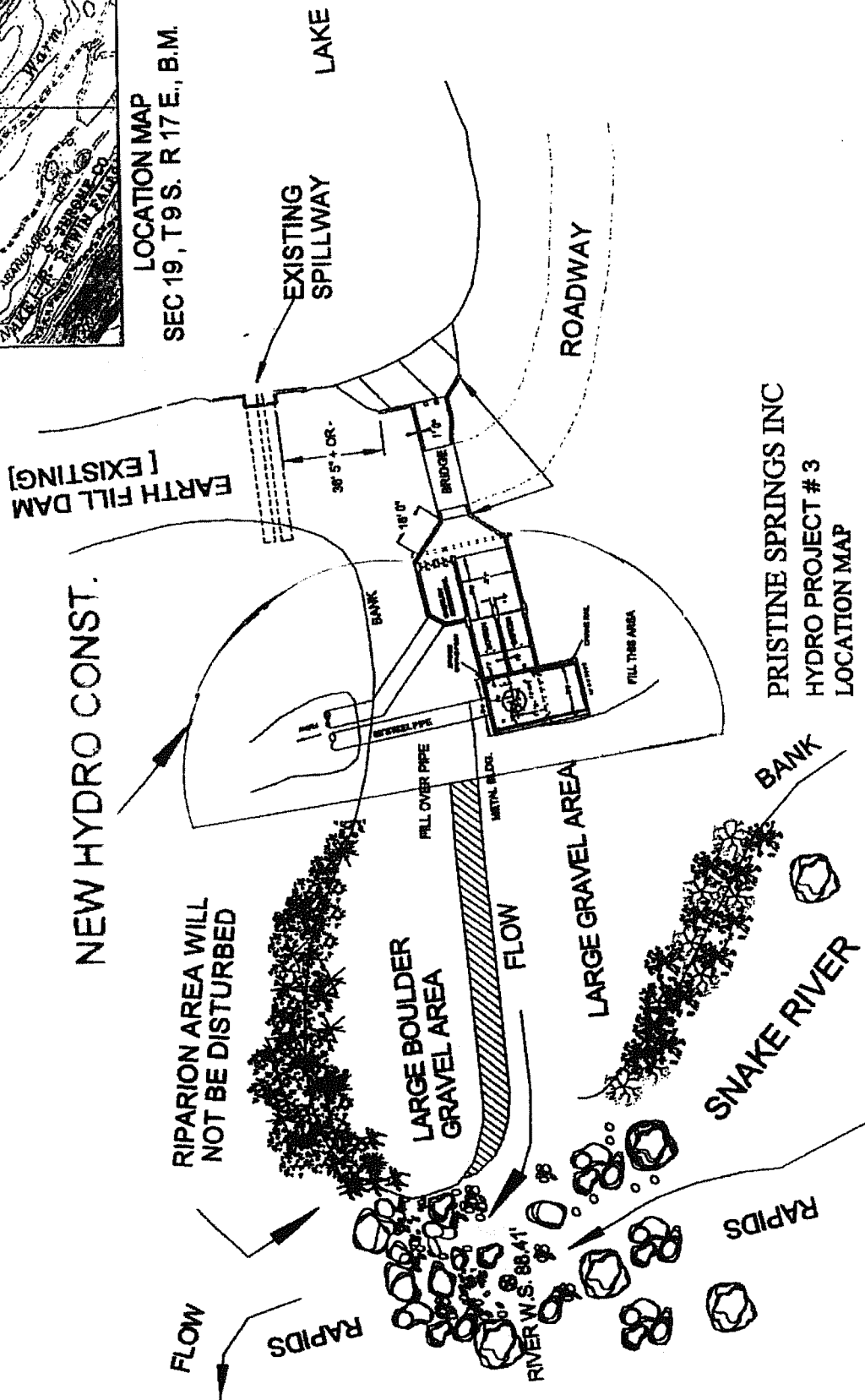
Phone- 208 326 5680

Fax. - 208 326 5679

Email - [nyal@filertel.com](mailto:nyal@filertel.com)

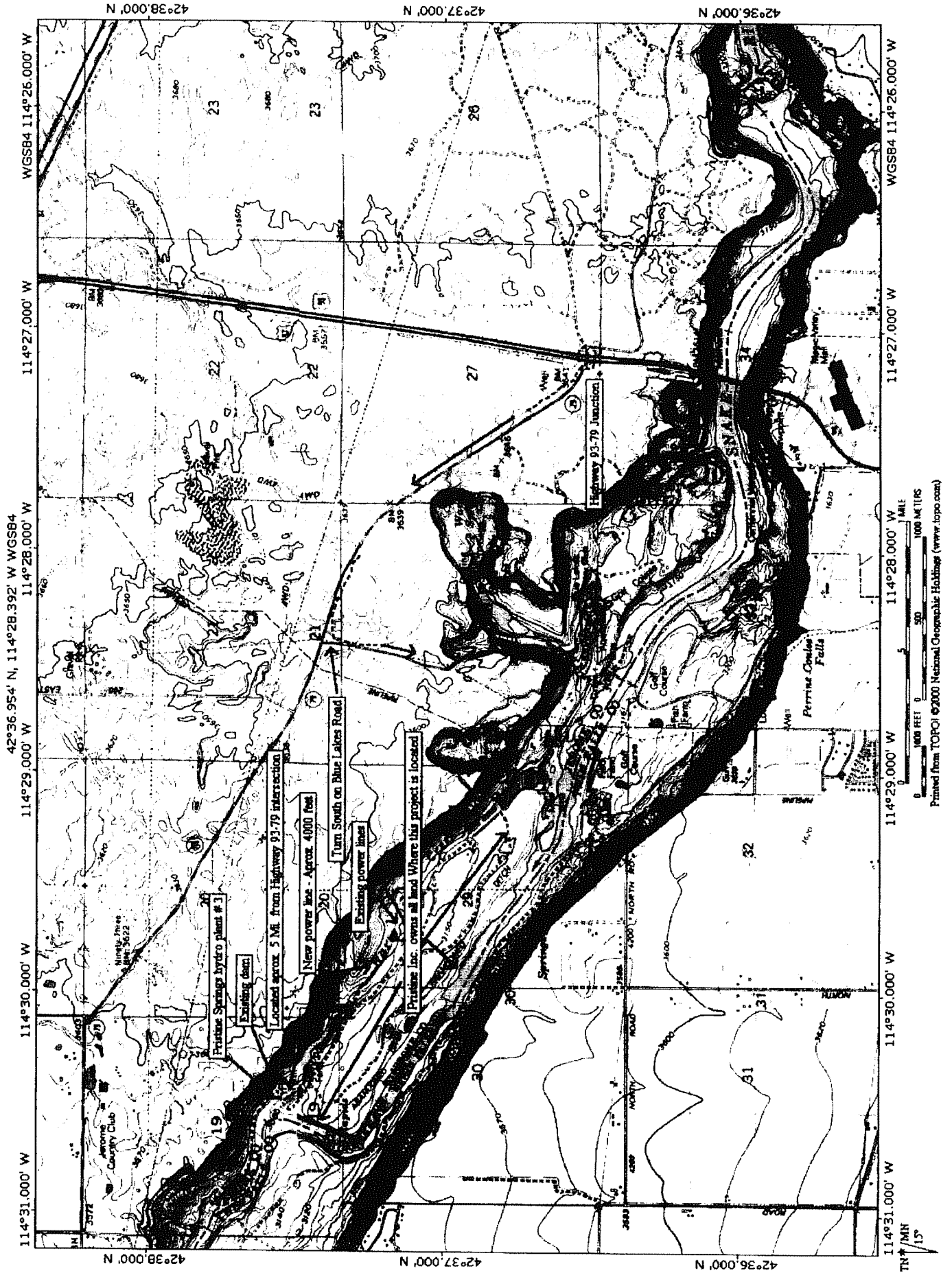


LOCATION MAP  
SEC 19, T9S. R 17E., B.M.



PRISTINE SPRINGS INC  
HYDRO PROJECT # 3  
LOCATION MAP

PLOT PLAN OF PROJECT  
IN RESPECT TO EXISTING  
FACILITIES AND AREA.



114°31.000' W

WGS84 114°30.000' W

42°38.000' N

42°38.000' N

Pristine Springs hydro plant #3



114°31.000' W

WGS84 114°30.000' W

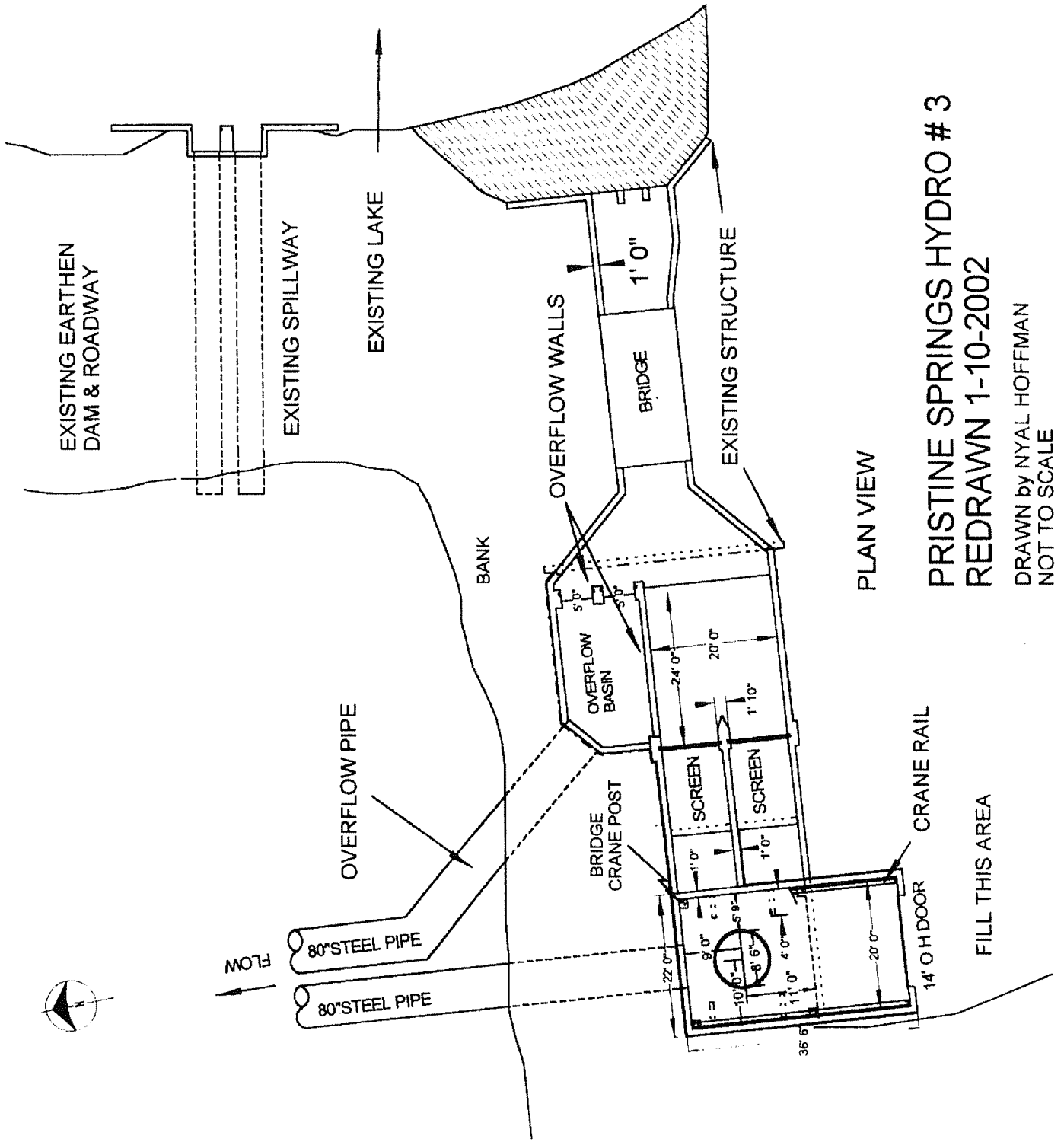
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Printed from T0201 00000 National Geographic Holdings (www.natgeo.com)

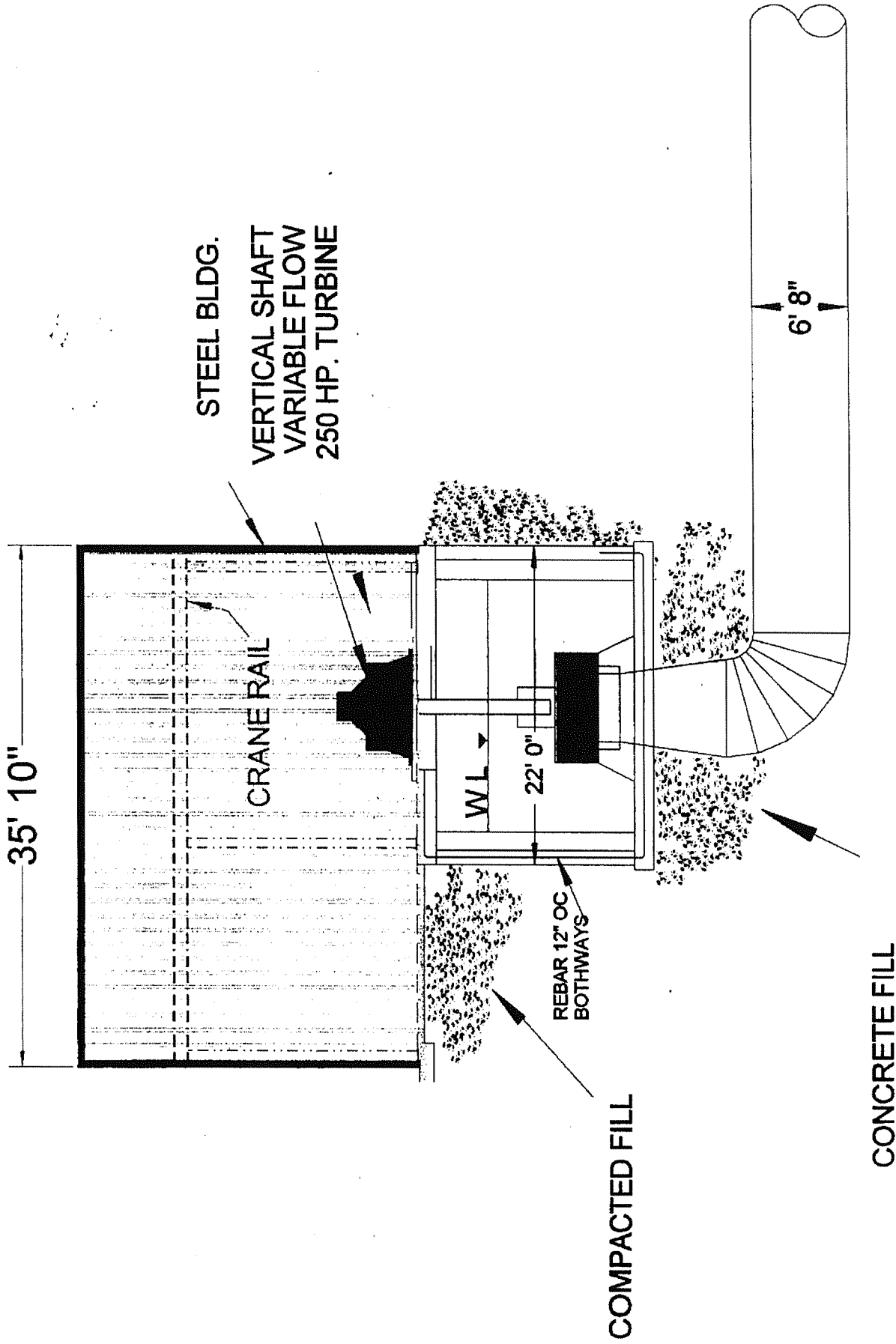




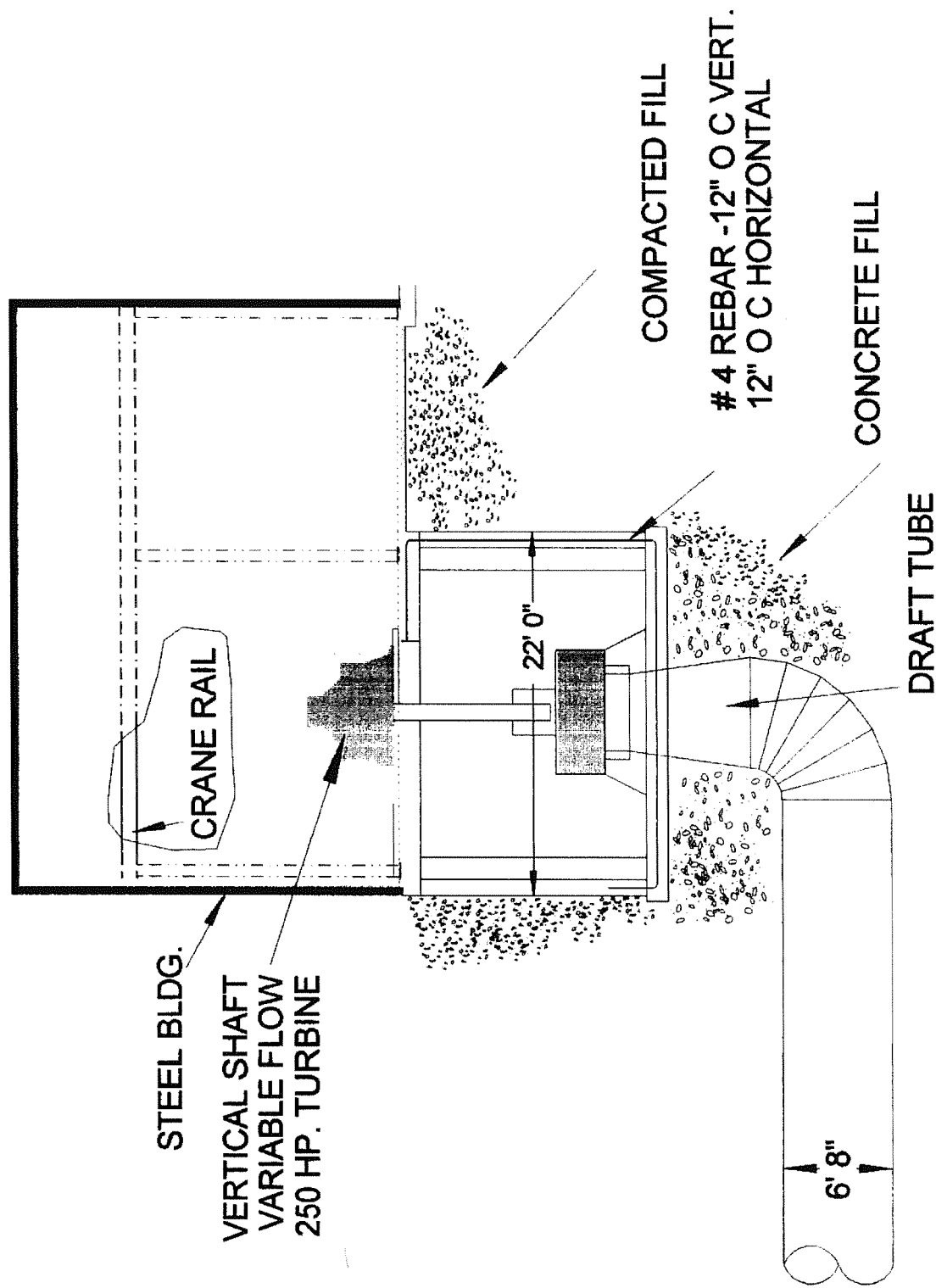
PLAN VIEW

PRISTINE SPRINGS HYDRO # 3  
REDRAWN 1-10-2002

DRAWN by NYAL HOFFMAN  
NOT TO SCALE

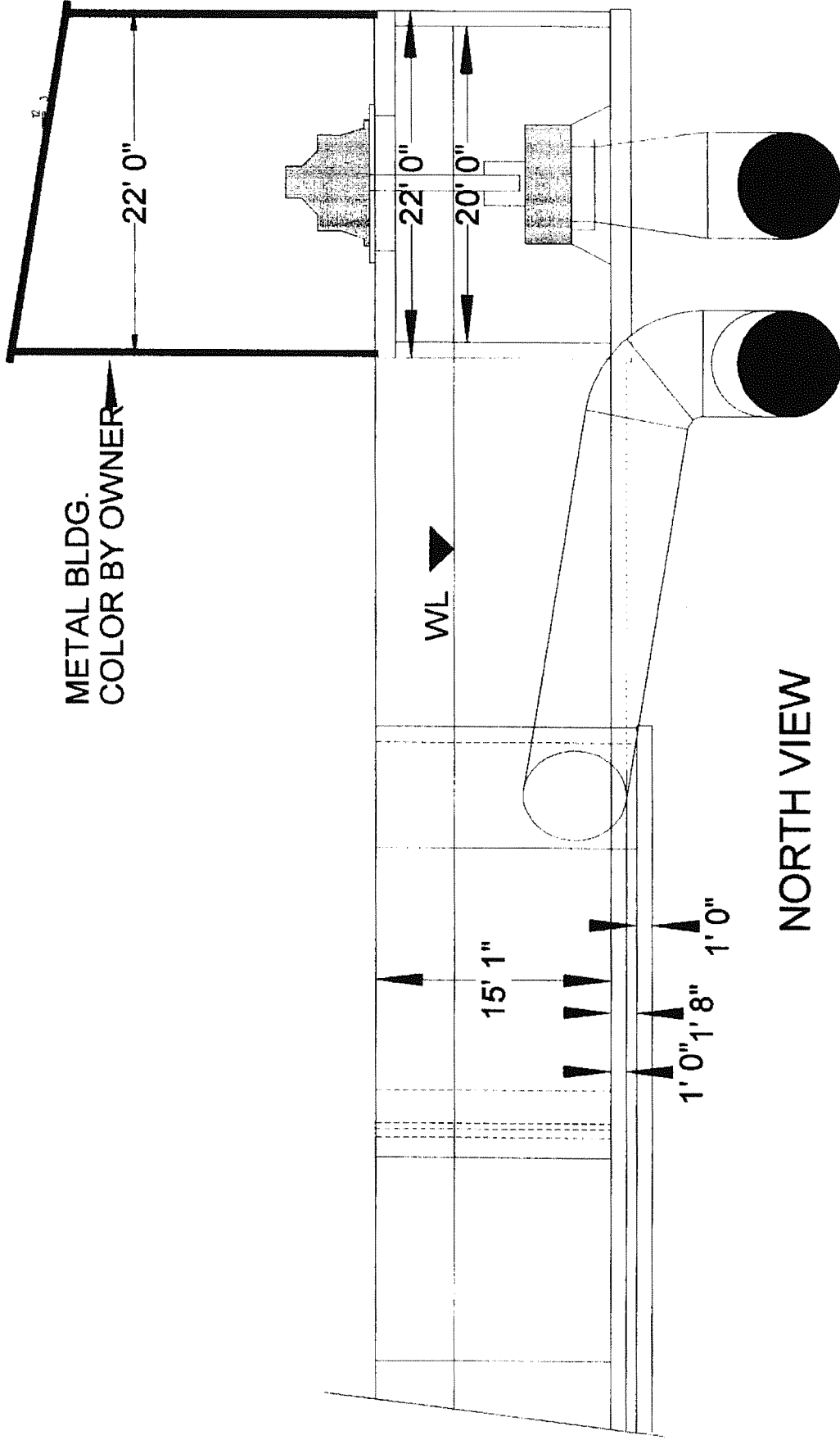


## EAST PROFILE PRISTINE SPRINGS HYDRO # 3



WEST PROFILE

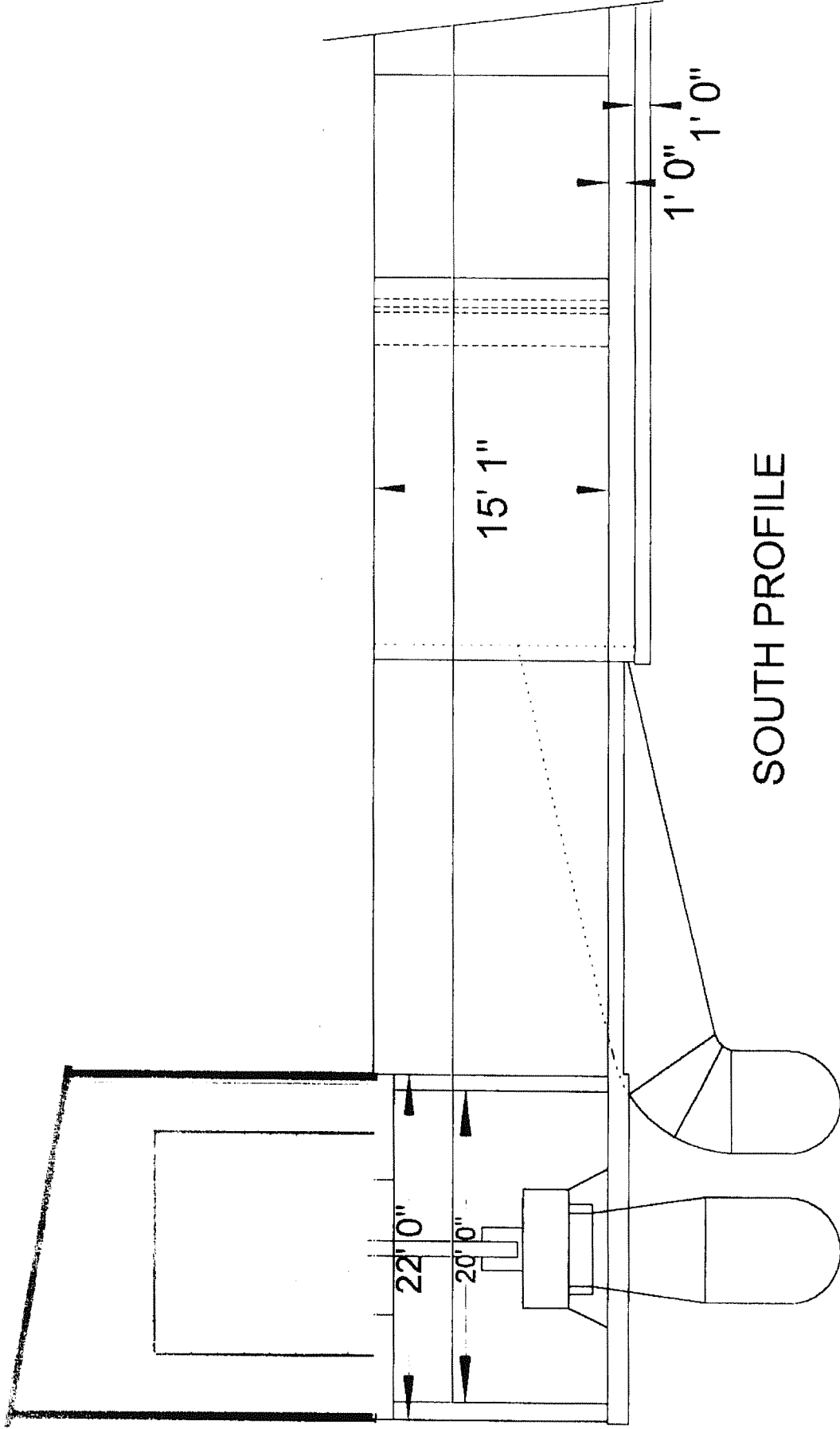
PRISTINE SPRINGS HYDRO # 3



# PRISTINE SPRINGS HYDRO # 3

DRAWN by NYAL HOFFMAN  
(NTS)

3 / 12 PITCH  
ON ROOF



PRISTINE SPRINGS HYDRO # 3  
(nts)



**IDAHO FISH & GAME**

MAGIC VALLEY REGION  
868 East Main Street  
P.O. Box 428  
Jerome, Idaho 83338-0428

November 18, 1999

Dirk Kempthorne / Governor  
Jerry Mallet / Interim Director

Mr. Terry Blau  
Idaho Dept. of Water Resources  
1341 Fillmore Street, Suite 200  
Twin Falls, Idaho 83301-3380

Re: Stream Alteration Application 36-S-49 Pristine Springs – Warm Creek

Dear Terry,

We have reviewed the above referenced application to install an emergency spillway into the Warm Creek impoundment. Provided all work is done in the dry, as stated in the application, impacts should be minimal on fish and wildlife resources.

Sincerely,

*for* Carl H. Nellis  
Magic Valley Regional Supervisor

Cc: IDFG-NRB  
COE-Boise (Flowers) via email  
Nyal Hoffman



State of Idaho

DEPARTMENT OF WATER RESOURCES

1341 Fillmore Street, Suite 200, Twin Falls, ID 83301-3380

Phone: (208) 736-3033 FAX: (208) 736-3037

SOUTHERN REGION

December 2, 1999

DIRK KEMPTHORNE  
GOVERNOR

ATTN WENDELL STARKE  
PRISTINE SPRINGS INC  
201 WARM CREEK ROAD  
JEROME ID 83338

KARL J. DREHER  
DIRECTOR

RE: Application for Permit No. 36-S-49

Dear Mr. Starke:

This office has reviewed your above referenced application for a permit to alter the channel of Warm Creek and has prepared a decision as provided for in Section 42-3805, Idaho Code.

You may consider this letter as a permit to construct a spillway from lower pond to river, provided the conditions and minimum standards listed below are adhered to. If you feel you cannot meet the conditions set forth in this permit please contact this office for further consideration.

MINIMUM STANDARDS:

(These standards are established in the State of Idaho, Department of Water Resources Administrative Rules regarding Stream Channel Alterations dated July 1, 1993, and are enclosed with this permit.)

Rule 56 - Construction Procedures

SPECIAL CONDITIONS:

- [1] All construction activities shall be conducted in such a manner so as to minimize turbidity and comply with Idaho water quality standards.
- [2] Fuel, oil, and other hazardous materials shall be stored, and equipment refueled and serviced, away from the stream to insure that a spill cannot enter the waterway.
- [3] All construction shall be completed in accordance with descriptions and methods on the application and attachments submitted with the application unless otherwise specified. Any changes must be approved by this department prior to construction.
- [4] No construction to be done below the ordinary high water mark of the Snake River.
- [5] Channel stabilization materials shall be free of fines and of sufficient size and density to ensure erosion protection.
- [6] This permit does not relieve the applicant from the requirement of obtaining Section 404 approval from the U. S. Army Corps of Engineers. A copy of this permit has been forwarded to their office.
- [7] The Twin Falls office of the Department of Water Resources shall be notified of specific date(s) of the project at least three (3) days prior to commencement.
- [8] This permit shall expire March 31, 2000.

December 2, 1999

[9] Channel stabilization materials shall be free of fines and of sufficient size and density to ensure erosion protection.

GENERAL CONDITIONS:

This permit does not constitute any of the following:

- a. An easement or right-of-way to trespass or work upon property belonging to others.
- b. Other approval that may be required by State or Federal Government, unless specifically stated in the special conditions above.
- c. Responsibility of the Department of Water Resources for damage to adjacent properties due to work done.
- d. Compliance with the Federal Flood Insurance Program, FEMA regulations or approval of the local Planning and Zoning authority.

The permit holder or operator must have a copy of this permit at the alteration site, available for inspection at all times.

The Department of Water Resources may cancel this permit at any time that it determines that the permit conditions are not being followed.

To avoid damage to buried utility lines Idaho Code, Sections 55-2201 - 55-2210 requires the applicant and/or his contractors to contact Digline not less than three (3) working days prior to the start of any excavation for this project. The phone numbers for Digline are, Boise area 342-1585 and statewide 1 (800) 342-1585.

CONDITIONS AND CONSTRUCTION PROCEDURES APPROVED UNDER THIS PERMIT MAY NOT COINCIDE WITH THE PROPOSAL AS SUBMITTED. FAILURE TO ADHERE TO CONDITIONS AS SET FORTH HEREIN CAN RESULT IN LEGAL ACTION AS PROVIDED FOR IN SECTION 42-3809, IDAHO CODE.

If you object to the decision issuing this permit with the above conditions, you have fifteen days in which to notify this office in writing that you request a formal hearing on the matter. If an objection has not been received within fifteen days, the decision will be final.

Please contact Terry Blau of my staff at 736-3033 if you have any questions regarding this matter.

Sincerely,



Allen D. Merritt, P.E.  
Manager, Southern Regional Office

ADM:tb  
enc.

pc: IDFG(Jer.), IDHW-DEQ(TF), C of E(Boise), Jerome County, Nyal Hoffman

ORIGINAL

3/4/02

POOR QUALITY ORIGINAL(S)

Before The Federal Regulatory Commission  
supplemental Information on small hydra application # B-12144-000  
02 MAR 19 PM 12:32  
FEDERAL ENERGY  
REGULATORY COMMISSION

Exhibit B

# 1 Attached is the deed of ownership of the property being used for the construction of this project.

# 2 Sheet denoting project boundaries.

#3 This project will be operated automatic as to the head control and shut down. The system will be started manual.

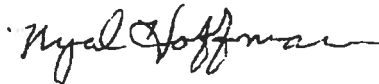
#4 The average flow at the plant will be 240.3 cfs. The flow at the plant will be the flow available for use threw the plant The only variation from 240.3 cfs would be if the spring water varies in flow.

#5 There are no alternative measures that can be utilized for power generation to be used for the purpose that this power will be used.

Please accept Pristine Springs application change to petition for waiver of section 4.30(b) (28) (v) submitted pursuant to 18 cfr 385.207.

This Information is being submitted by Nyal Hoffman on behalf of Pristine Springs Inc.

Sincerely yours



Nyal Hoffman

0203280267-3

DOCKETED  
h

PLEASE RECORD AND RETURN TO:

Rayborn &amp; Rayborn

Attorneys At Law

First Interstate Bank Building

P.O. Box 321

Twin Falls, ID 83303-0321

02 MAR 19 PM 12:32  
REGULATORY COMMISSION

## WARRANTY DEED

For Value Received RONALD C. YANKE and LINDA L. YANKE, husband and wife, the Grantors, whose address is 4414 S. Gekeler Lane, Boise, Idaho 83705, do hereby grant, bargain, sell and convey unto PRISTINE SPRINGS, INC., an Idaho corporation whose business address is 101 1/2th Avenue South, Buhl, ID 83316, the Grantee, the following described premises, in JEROME COUNTY, IDAHO to wit:

AND that real property which is more particularly described as Parcels A, B and C in Schedule "A" attached hereto and by this reference made apart hereof.

DO HAVE AND TO HOLD the said premises, with their appurtenances unto the said Grantee, its successors and assigns forever. The said Grantors do hereby covenant to and with the said Grantee that they are the owners in fee simple of said premises, that they are free from all encumbrances except current year's taxes, levies, and assessments, and except restrictions, reservations and easements of record and easements visible upon the premises, and that they will warrant and defend the same from all lawful claims whatsoever.

DATED: January 29, 1991

GRANTORS:

Ronald C. Yanke  
Ronald C. Yanke

Linda L. Yanke  
Linda L. Yanke

912089

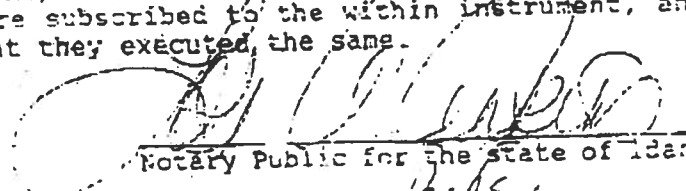
NOTED FOR RECORDING

JAN 31 1991

JAN 31 1991

STATE OF IDAHO )  
                  ) ss  
COUNTY OF ADA )

On this 29th day of January, 1995, before me, a  
notary public in and for said State, personally appeared RONALD C.  
YANKE and LINDA L. YANKE, husband and wife, known to me to be the  
persons whose names are subscribed to the within instrument, and  
acknowledged to me that they executed the same.

  
Notary Public for the state of Idaho

Residing at: BMSL

My commission expires: 7/13/95

FILED  
02 MAR 19 PM 12:30  
FEDERAL ENERGY  
REGULATORY COMMISSION

WARRANTY DEED

- PAGE 2

## SCHEDULE "A"

## PARCEL A:

TOWNSHIP 9 SOUTH, RANGE 17, EAST OF THE BOISE MERIDIAN,  
JEROME COUNTY, IDAHO

## THAT PART OF:

Notice

Section 19: Lot 13: NS+SE; SE+SW;

Section 20: Lots 3 and 4;

Section 29: Lots 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 and 18;

Section 30: Lots 5, 6, 13 and 14;

All of which is more particularly described as follows:

Commencing at the corner one-sixteenth corner between Sections 29 and 30;

Thence running South 71° 48' East for 4,082.0 feet to a large lava boulder marked by a chiseled cross, said lava boulder being THE REAL POINT OF BEGINNING;

Thence along the westerly boundary of a tract of land owned by Percy Green and Harold S. Miller known as the Blue Lake Trout Farm Property on the following courses:

South 59° 18' West for 380.0 feet;

Thence South 48° 30' East for 430.0 feet;

Thence South 35° 45' East for 320.0 feet;

Thence South 22° 41' West for 190.0 feet;

Thence South 11° 37' West for 131.0 feet, more or less, to the Mean High Water Mark of the right bank of the Snake River;

Thence running along the High Water Mark of the Snake River in the Northwesterly direction for 7900.0 feet, more or less;

Thence in a Northeasterly direction along said high water line for 2000.0 feet, more or less, to the northerly boundary of Lot 13 of Section 19;

Thence Easterly along said northerly boundary to the Northeast corner of said Lot 13;

Thence Northerly along the westerly boundary of the NE+SE to the intersection of said westerly boundary and the top edge of the rock;

Thence in a Southeasterly direction for 1900.0 feet, more or less, to the Easterly boundary of Lots 14 and 16 of Section 19 extended;

C o n t i n u e d

Thence Southerly along said Easterly boundary to the Northerly boundary of the above described Blue Lakes Trout Farm Property;  
Thence North 44°30' West for 45.0 feet, more or less, to THE REAL POINT OF BEGINNING.

EXCEPTING THEREFROM the Sunnybrook Subdivision No. 1 in a part of Lot 4 of Section 20 and in a part of Lots 9 and 10 of Section 29.

AND EXCEPTING THEREFROM the following described parcel of land:

Lots 8, 9, 10, 11, 12, 14, 15, 18 and 19 of Section 29, Township 9 South, Range 17, East of the Boise Meridian, being more particularly described as follows:

Commencing at the North one-sixteenth corner between Sections 29 and 30;  
Thence running South 71°46' East for 4,082.0 feet to a large lava boulder marked by a chiseled cross, said lava boulder being THE REAL POINT OF BEGINNING;

Thence along the Westerly boundary of a tract of land owned by Percy Green and Harold S. Miller known as the Blue Lakes Trout Farm Property on the following courses:

South 59°18' West for 380.0 feet;

Thence South 48°30' East for 430.0 feet;

Thence South 35°45' East for 320.0 feet;

Thence South 22°41' West for 190.0 feet;

Thence South 11°37' West for 131.0 feet, more or less, to the Mean High Water Mark of the right bank of the Snake River;

Thence running along the High Water Mark of the Snake River in the Northwestern directions for 1690 feet, more or less, to the west line of Lot 18 of said Section 29;

Thence North along the West line of Lots 18 and 14 of said Section 29 for 1,483.0 feet;

Thence North 54°00' West for 710.0 feet, more or less, to the centerline of a fork in an existing road;

Thence Northwesternly along the centerline of the North fork of said road for 695 feet;

Thence South 85°00' West for 375.0 feet;

Thence North 58°00' West for 440 feet;

Thence North 35°00' West for 154.0 feet, more or less, to the centerline of a fork in an existing road;

Thence Northwesternly along the centerline of the

C o n t i n u e d

West fork of said road for 1,000.00 feet, more or less, to the West line of Lot 10 of said Section 19.

Thence North along said West line for 175.00 feet, more or less, to the Northwest corner of said Section 19, being a United States Geodetic Survey Brass Cap;

Thence East along the North line of Lot 10 of said Section 19 for 210.57 feet to the Northwestern boundary of Sunnybrook Subdivision No. 1;

Thence South 22° 57' West along said Northwestern boundary for 44.10 feet to the Western most point of said subdivision;

Thence Southeasterly along the Southwestern boundary of said subdivision for the following 19 courses and distances:

South 21° 20' 4" East, 100.50 feet;

South 71° 52' 6" East, 175.86 feet;

South 54° 34' East, 96.54 feet;

South 24° 53' East, 101.97 feet;

South 51° 21' 5" East, 116.87 feet;

South 47° 13' East, 104.00 feet;

South 38° 23' 4" East, 107.31 feet;

South 65° 54' 3" East, 98.06 feet;

South 37° 13' 5" East, 50.83 feet;

South 55° 43' 9" East, 83.51 feet;

North 77° 42' East, 100.00 feet;

South 47° 33' East, 10.00 feet;

South 28° 41' West, 85.00 feet;

South 32° 51' 4" East, 118.04 feet;

South 50° 09' 5" East, 95.46 feet;

South 64° 51' 7" East, 102.43 feet;

South 49° 00' 4" East, 99.50 feet;

North 39° 00' East, 40.0 feet, more or less,

to the centerline of an existing road;

Thence Easterly along the centerline of said road for 560.0 feet;

Thence North 54° 37' East for 400.00 feet;

Thence South 44° 00' East, 3,385.00 feet, more or less, to THE REAL POINT OF BEGINNING.

AND EXCEPTING THEREFROM a tract of land located in Lot 13 of Section 19, Township 9 South, Range 17, East of the Boise Meridian, described as follows:

Beginning at the Southeast corner of Lot 13 of said Section 19;

Thence North along the East line of said Lot 13 for 300.0 feet;

Thence West and parallel to the South line of said Lot 13 for 59.0 feet to THE REAL POINT OF BEGINNING;

C o n t i n u e

Page 3  
Continuation

Thence continuing west and parallel to the East line of said Lot 13 for 365.5 feet, more or less, to the Mean High Water Mark of the right bank of the Snake River;

Thence running along the High Water Mark of the Snake River in the Northeasterly direction for 1950.5 feet, more or less, to the North line of Lot 13 of said Section 15;

Thence East along the North line of said Lot 13 for 335.8 feet, more or less, to a point 69.0 feet West of the East line of said Lot 13;

Thence South 69.0 feet West of and parallel to the East line of said Lot 13, 1010.0 feet, more or less, to THE TRUE POINT OF BEGINNING.

AND EXCEPTING THEREFROM the following described parcel of land:

Commencing at the Northwest corner of Government Lot 16 of Section 29, which is marked by a 3" O. Brass Cap;

Thence South 71°45' East for a distance of 1022.0 feet (recorded) 14078.75 feet measured; to a chiseled cross in a large lava boulder;

Thence along the westerly boundary of the Blue Lakes Trout Farm on the following courses:

South 59°18' West, 380.0 feet;

South 48°30' East, 430.0 feet;

South 35°45' East, 20.0 feet to THE TRUE

POINT OF BEGINNING;

Thence continuing South 35°45' East for a distance of 340.0 feet;

Thence South 22°41' West for a distance of 193.0 feet;

Thence South 11°37' West for a distance of 131.0 feet to the Mean high water of the Snake River;

Thence leaving the westerly boundary of the Blue Lakes Trout Farm and along the mean high water of the Snake River on the following courses:

South 51°31'23" West, 18.13 feet;

South 73°44'53" West, 132.14 feet;

North 79°33'50" West, 35.54 feet;

North 73°52'15" West, 68.09 feet;

North 70°12'42" West, 10.00 feet;

Thence leaving the Mean High Water of the Snake River North 17°25'30" East for a distance of 588.69 feet to THE TRUE POINT OF BEGINNING.

C o n t i n u e d

## PARCEL 3:

TOWNSHIP 9 SOUTH, RANGE 17, EAST OF THE 101ST MERIDIAN,  
JEROME COUNTY, IDAHO

Section 29 A tract of land located in Lots 8, 9, 10, 11, 12, 13, 14, 15, 18 and 19, described as follows:

Commencing at the North one-sixteenth corner between Sections 29 and 30;

Thence running South 71° 48' East for 4,062.0 feet to a large lava boulder marked by a chiseled cross, said lava boulder being THE REAL POINT OF BEGINNING;

Thence along the westerly boundary of a tract of land owned by Perry Green and Harold S. Miller known as the Blue Lakes Trout Farm Property on the following courses:

South 59° 18' West for 380.0 feet;

Thence South 40° 30' East for 430.0 feet;

Thence South 35° 45' East for 320.0 feet;

Thence South 22° 01' West for 150.0 feet;

Thence South 17° 37' West for 131.0 feet, more or less, to the Mean High Water Mark of the right bank of the Snake River;

Thence running along the High Water Mark of the Snake River in the Northwestly directions for 1690 feet, more or less, to the West line of Lot 18 of said Section 29;

Thence North along the West line of Lots 18 and 14 of said Section 29 for 1,480.0 feet;

Thence North 54° 00' West for 710.0 feet, more or less, to the centerline of a fork in an existing road;

Thence Northwestly along the centerline of the North fork of said road for 695 feet;

Thence South 25° 00' West for 375.0 feet;

Thence North 58° 00' West for 440 feet;

Thence North 85° 00' West for 154.0 feet, more or less, to the centerline of a fork in an existing road;

Thence Northwestly along the centerline of the West fork of said road for 1,786.0 feet, more or less, to the West line of Lot 20 of said Section 29;

Thence North along said West line for 175.00 feet, more or less, to the Northwest corner of said Section 29, being a United States Geodetic Survey Brass Cap;

Thence East along the North line of Lot 10 of said Section 29 for 210.67 feet to the Northwestly

Continued

Boundary of Sunnyrock Subdivision No. 1;  
Thence South 32°57' West along said Northwesterly  
boundary for 44.10 feet to the Western most  
point of said subdivision;  
Thence Southeasterly along the Southwesterly bound-  
ary of said Subdivision for the following 12  
courses and distances:

South 51°20.4' East, 100.50 feet;  
South 71°52.6' East, 175.86 feet;  
South 54°34' East, 96.54 feet;  
South 24°53' East, 101.97 feet;  
South 51°21.6' East, 116.07 feet;  
South 47°33' East, 104.00 feet;  
South 38°33.4' East, 102.21 feet;  
South 65°54.3' East, 98.96 feet;  
South 37°13.5' East, 50.03 feet;  
South 55°43.9' East, 83.51 feet;  
North 77°42' East, 100.00 feet;  
South 47°33' East, 10.00 feet;  
South 26°42' West, 85.00 feet;  
South 32°51.4' East, 118.04 feet;  
South 50°09.5' East, 99.46 feet;  
South 64°51.7' East, 102.43 feet;  
South 49°00.4' East, 99.50 feet;  
North 39°00' East, 40.0 feet, more or less,  
to the centerline of an existing road;  
Thence Easterly along the centerline of said road  
for 560.0 feet;  
Thence North 54°37' East for 400.00 feet;  
Thence South 44°00' East, 3,385.00 feet, more or  
less, to THE REAL POINT OF BEGINNING.

TOWNSHIP 9 SOUTH, RANGE 17, EAST OF THE BOISE MERIDIAN,  
JEROME COUNTY, IDAHO

Section 19: A tract of land located in Lot 13, described as  
follows:

Beginning at the Southeast corner of Lot 13 of said  
Section 19;  
Thence North along the East line of said Lot 13 for  
310.0 feet;  
Thence West and parallel to the South line of said  
Lot 13 for 69.0 feet to THE REAL POINT OF  
BEGINNING;  
Thence continuing West and parallel to the South  
line of said Lot 13 for 865.5 feet, more or  
less, to the Mean High Water Mark of the right  
bank of the Snake River;  
Thence running along the High Water Mark of the  
Snake River in the Northeasterly direction for  
1950.6 feet, more or less, to the North line of

C o n t i n u e d

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Continuation

Lot 13 of said Section 29, thence East along the North line of said Lot 13 for 335.8 feet, more or less, to a point 69.0 feet West of the East line of said Lot 13; thence South 69.0 feet West of and parallel to the East line of said Lot 13, 1210.0 feet, more or less, to the REAL POINT OF BEGINNING.

TOGETHER WITH a 50 foot wide ditch and access road easement thru Lots 19, 18, 17, 15 and 16 of Section 29, Lots 13, 8 and 9 of Section 30, Lot 22 and the SE 1/4 of Section 19, all in Township 9 South, Range 17, East of the Boise Meridian, said easement being 20 feet on the South side and 10 feet on the North side of the existing centerline.

TOGETHER WITH a 50 foot wide ditch and access road easement thru Lot 20 of Section 29, Lot 8 of Section 30, the SW 1/4 and Lot 13 of Section 19, all in Township 9 South, Range 17, East of the Boise Meridian, said easement being 10 feet on the South side and 10 feet on the North side of the existing centerline.

TOGETHER WITH the right of ingress and egress over and across all existing roadways leading to and from the above described tracts of land.

The above described tracts of land are based on the Dependent Resurvey of Sections 19, 20, 28, 29, 30 and 33 of Township 9 South, Range 17, East of the Boise Meridian, as approved April 17, 1918 by the Surveyor General and a supplemental plat of Sections 28, 29 and 30 approved August 16, 1923. Also based on a survey plat of Sunnybrook Subdivision No. 1 as filed with the office of Clerk and Recorder, Jerome County, Idaho.

#### PARCEL C:

Lots 1, 2, 3 and 4 in Block 1 and Lots 1, 2, 3, 4, 5, 6, 7, 8, and 9 in Block 2 of Sunnybrook Subdivision No. 1, Jerome County, Idaho, as shown of record by plat filed September 14, 1945 under instrument Number 165247, Jerome County records.

TOGETHER WITH all water, water rights, ditches, canals and rights thereto, which are appurtenant to the above described Parcels A, B and C specifically including, but not limited to the following enumerated water rights:

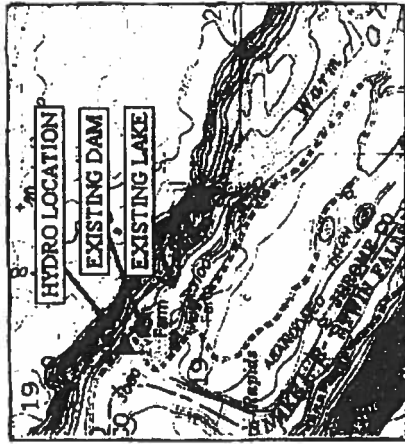
- (1) License No. 36-2603B
- (2) License No. 36-7130
- (3) Decreed Water Right 36-00200
- (4) Permit No. 36-08414
- (5) Permit No. 36-07757
- (6) Application For Permit No. 36-08073

Page 7

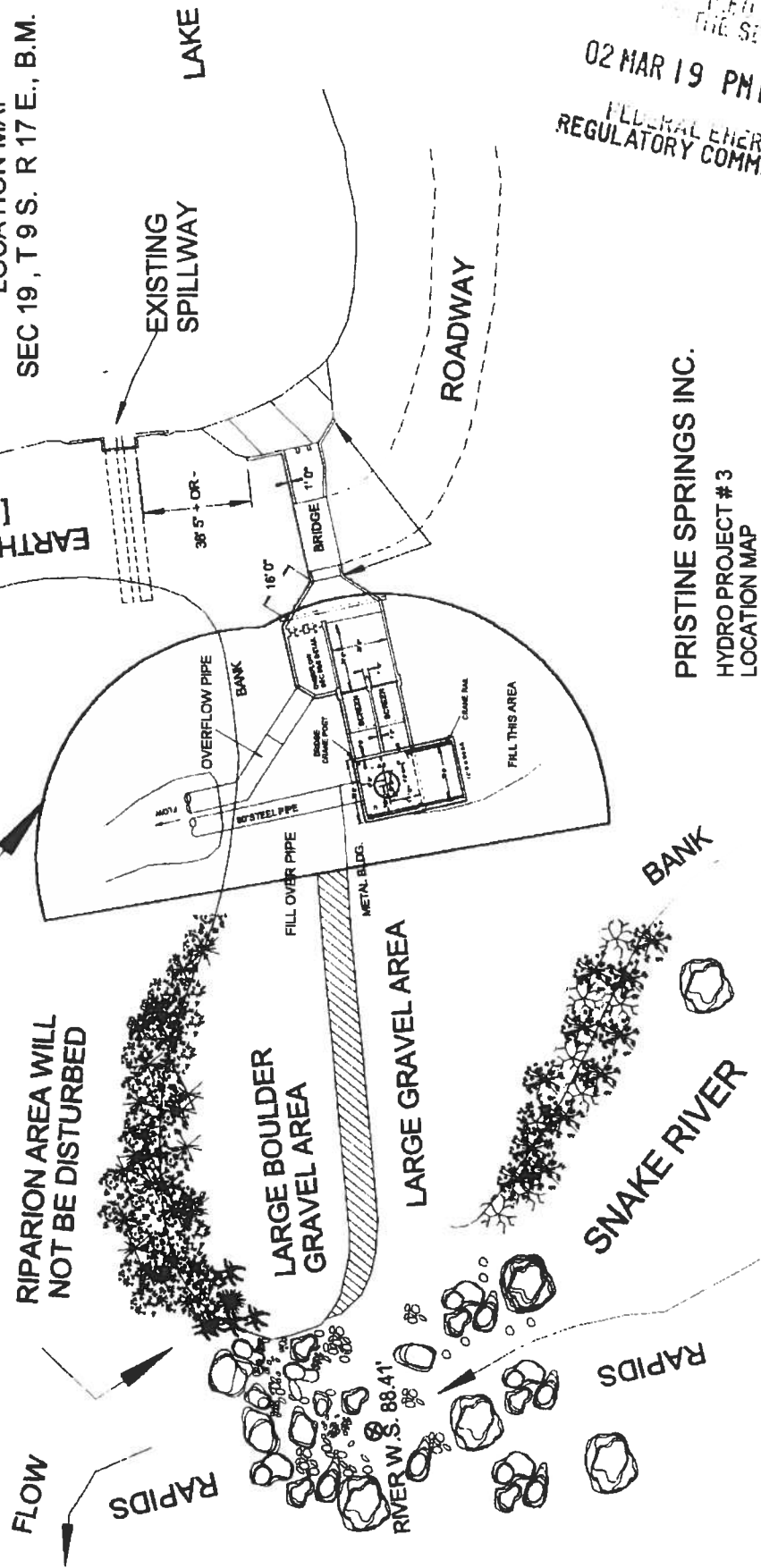
Continuation of



# Boundries of hydro project Pristine Springs #3 NEW HYDRO CONST.



LOCATION MAP  
SEC 19, T 9 S. R 17 E., B.M.



02 MAR 19 PM 12:32  
FEDERAL ENERGY  
REGULATORY COMMISSION

PRISTINE SPRINGS INC.  
HYDRO PROJECT #3  
LOCATION MAP  
PLOT PLAN OF PROJECT  
IN RESPECT TO EXISTING  
FACILITIES AND AREA

**Edl, Michele**

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**From:** Skinner, Corey  
**Sent:** Monday, October 28, 2013 10:45 AM  
**To:** Edl, Michele  
**Subject:** RE: max head at Pristine #3

Here is another survey performed on 11/4/2004. This one has an elevation of 97.7 ft for the elevation of the "top of flashboard supports". The elevation for the top of the 9 foot outlet pipe elevation on this survey is 81.26 feet (0.00 feet on 10/15/2003 survey).



Pristine Springs  
Dam Survey.pd...

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**From:** Edl, Michele  
**Sent:** Friday, October 25, 2013 3:16 PM  
**To:** Skinner, Corey  
**Cc:** Nelson, Dan  
**Subject:** max head at Pristine #3

Corey,

I have been asked to assist with the power water right for the lower hydro project at Pristine Springs. It is associated with a dam that you have inspected on several occasions. In one of the dam safety memos, you record elevations for the dam crest, the outlet channel and the overflow crest spillway. I believe that you and Mr. Feitag surveyed them in Oct 15-16 2003.

If I understand this powerhouse correctly, the maximum elevation available for power production is the spillway crest elevation which is 15.44 or 15.45 ft above the top of the draft tube pipe. Has there been a structural change to the dam since you made those measurements?

Michele