

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 63-33599

Exam Date: 6/24/2015

1. Current Owner: BOISE PROJECT BOARD OF CONTROL
2465 OVERLAND RD
BOISE ID 83705
(208)344-1141

2. Accompanied by: Jordan Reimer (FERC inspector), Ashley Newbry (IDWR), Tim Page, Boise Project Board of Control (BPBC), Terry Daugherty (Riverside, Inc) and other BPBC personnel.

Phone No:

Address:

Relationship to Permit Holder:

3. SOURCE

BOISE RIVER

TRIBUTARY

SNAKE RIVER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: There are no other water rights for power use at this powerhouse.
2. Other water rights with the same point of diversion: Multiple rights are also diverted from the Boise River at the Diversion dam.

C. DIVERSION AND DELIVERY SYSTEM1. LOCATION OF POINT(S) OF DIVERSION:

BOISE RIVER lot 17 (NW1/4SW1/4) Sec. 3, Twp 02N, Rge 03E, B.M.

ADA County

Method of Determination:

The POD was determined by aerial photography and a review of existing spatial data points. Spatial data point #365674 at the Diversion Dam is the best representation of the POD.

This portion of the Boise River was resurveyed in 2013. The POD location has not changed but the government lot number in the PLSS address has changed.

2.

PLACE OF USE: POWER

Twp	Rge	Sec	NE				NW				SW				SE				
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
03N	05W	2			X														

The POU is within Canyon County

Method of Determination:

The powerhouse is visible in aerial photography.

3. ☒ Delivery System Diagram Attached (required). See the engineering drawings excerpted from the Application for Amendment of Exemption which BPBC submitted to FERC in 2011.

☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

☐ Aerial Photo Attached (required for irrigation of 10+ acres).

☐ Photo of Diversion and System Attached

4.

Well or Diversion ID No.

<u>Generator Make</u>	<u>Hp or kW</u>	<u>Generator Type.</u>
Chaozhou Huineng Electric Machinery	1000 kW	Synchronous

Turbine Make**Turbine Discharge Size**

Zhejiang Jinlun Electromechanical Co 873 kW at 2.26 m³/s (~79.8 cfs) and 43.28 m (~142 ft) head

Zhejiang Jinlun Electromechanical Co 237 kW at 1.13 m³/s (~39.9 cfs) and 24.38 m (~80 ft) head

This is a very unusual turbine-generator configuration. A single generator and two differently sized turbines share a common drive shaft. The turbines are both horizontal shaft Francis type.

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>

2. Measurements:

During the site visit the project was generating 937-939 kW on a flow rate of approximately 92 cfs.

I requested and received data from the development period of this permit which confirmed beneficial use. Instantaneous generation, bypass flow and turbine flow, were available from a combination of instrumentation displays in the powerhouse. The type of meter, accuracy of measurements and calibration date(s) are not known.

E. FLOW CALCULATIONS

 X Additional Computation Sheets Attached

Measured Method:

Data provided by the operators of the powerhouse show that the project is capable of utilizing more rate than the Proof of Beneficial Use statement listed.

Based on the additional information supplied, the project used as much as 117.2 cfs during the development period.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: not applicable

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

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

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

2. Volume Calculations for Other Uses:

Effective 3/29/2012, the Beneficial Use Examination Rules exempt on-stream, run-of-the-river, power generation from the volume reporting requirement. This project does not fit this description, but I am not recommending a volume on the license. Refer to the narrative below.

G. NARRATIVE/REMARKS/COMMENTSOwnership

The ownership is of this hydro project is complex.

Boise Project Board of Control (BPBC) is the operating agent for five irrigation districts: Boise-Kuna Irrigation District, Big Bend Irrigation District, Nampa & Meridian Irrigation District, New York Irrigation District, and Wilder Irrigation District. BPBC's purpose is to manage irrigation facilities and related works and to deliver water to the districts' landowners. It was created in 1926 as a result of contracts between the U.S. Bureau of Reclamation and the five irrigation districts. The contracts are not water rights but they do define the space allocations for water that is stored in reservoirs on the Boise River system.

According to a letter from the United States Department of the Interior, the Fargo Drop #1 and related right-of-ways and facilities "are reserved from the land as an easement under the Act of August 30, 1980." (See a copy of the letter and the Act in the original application submitted by BPBC to FERC.)

This water right, the FERC Exemption from Licensing, and the canal system structures are held by the Boise Project Board of Control.

The POD is located on USBOR property and water is provided to the project through an agreement with USBOR. The powerhouse and power generation equipment are currently owned and operated by Riverside Investments, LLC. The current energy sales agreement is between Idaho Power Company and Riverside Investments, LLC.

POU

Available Canyon County taxlot information shows that the project land is owned by the Boise Project Board of Control. The project is located on the BPBC's Deer Flat Lowline Canal.

POD

The government lots near the Diversion Dam (the POD) have recently been renumbered and are not consistent with the available GIS layer. A comparison of the BLM's Government Land Office maps for 1910, 2001 and 2013 confirms that three different government lots represent the same location. The 2013 dependent resurvey of Township 2 North, Range 3 East, shows the POD in government lot 17, which is the address I use for the license. Available GIS data in ArcMap is based on a 2001 dependent resurvey and shows this POD in government lot 13. Recent SRBA partial decrees show this same POD in government lot 9, which appears to be the address from the original 1910 survey.

The PLSS address of the POD now includes a government lot number. Adding a government lot is considered a clarification so an amendment of the permit is not required.

Water Use

The Proof-of-Beneficial-Use statement was submitted on 3/2/2015. At my request, additional information was provided by the permit holder. Most of that information could have been provided with the Proof statement.

Idaho Power Company identifies the Fargo Drop project as #21615215. Monthly summary reports from Idaho Power Company show hourly average generation. The reports confirm that beneficial use occurred during the development period of the permit and that the season-of-use is appropriate.

The additional information also shows beneficial use greater than the Proof statement and greater than I had witnessed during my site visit.

Operation strategy

No storage for power use is authorized by the permit. The stilling pool at the project's headworks holds less than one day's worth of water. The project is operated in run-of-river mode.

Rate

I am recommending 117.2 cfs for the license.

This recommendation is based on the maximum daily average flow rate. That flow occurred on July 21, 2013 which was within the development period. Refer to Exhibit F of the additional information submittal.

Volume

I am not recommending a volume for the license.

Fargo Drop #1 receives and uses only the water that comes to it via storage releases for other purposes. The rate and volume of water released from Boise's system of reservoirs is not under the control of the power plant operator. Because the water contained in the canal system is managed for the benefit of irrigation and not necessarily for the benefit of hydroelectric power generation, I contend that this right qualifies for exemption from the volume requirement. Power production is an additional, incidental use of the water delivered for irrigation use.

At the time of this report I am awaiting guidance on volume recommendations for power use from the bureau chief.

If a volume is required, I can make a recommendation based on two different perspectives of the use. I can recommend a volume based on 1) the actual generation during the development period. That volume is not likely to be representative of the best irrigation year and an additional permit may be required to cover any additional use. Or 2) I can recommend a volume based on the capacity of the turbines in continuous use for the number of days in the season-of-use. That volume will exceed the water available to the project in the best possible year but no additional permit will be needed. Given that a water right for power generation is subservient to all other uses, even a license volume which allows for the maximum incidental use will have no impact on the dominant, primary use.

SOU

Permit 63-33599 authorized a SOU which is equivalent to the current irrigation season for the area (3/1-11/15). Generation records indicate that the project has confined power production to this season-of-use.

Point-of-Discharge

The Fargo Drop #1 powerhouse is built onto the Boise Project Board of Control canal system. The penstocks divert water from the canal system and the turbines discharge that water back into the canal system. Any water discharged from the project and not used by downstream irrigators is eventually returned to the Snake River. No water is returned to the Boise River.

Conditions

Condition 5 of the permit required that the right holder install a measuring device that could be used to determine the instantaneous rate of flow "through the system". There are several measuring and controlling points on the canal system's extensive diversion works.

There are transducers in the water path near the Fargo Drop #1 project. Flow through the turbine is a subtraction problem. It requires a calculation based on a combination of headwater elevation, wicket gate position, and bypass flow.

The measuring device nearest to the diversion of the New York Canal from the Boise River, is a gauging station on the New York Canal, which is located approximately 1 mile below the Diversion Dam, in section 33, Twp 3N, Rge 3E. This USBR Hydromet station provides real-time data under the identifier BSEI.

Term limit

On October 23, 1981, FERC issued an order granting an Exemption from Licensing for a Conduit Hydroelectric Project to the BPBC for this project. The project is known to FERC as the Fargo No. 1 Hydroelectric Project, docket or project #5042.

The project is self-certified with FERC as a qualifying facility for the purposes of selling the power that is generated. IPUC has approved a Firm Energy Sales Agreement (FESA) between Riverside Investments, Inc., (the operators of the project), and Idaho Power Company. A copy of the IPUC Order 32451 on Case IPC-E-11-27 and the FESA are attached. The agreement has a 20-year term and is set to expire on July 31, 2032. This date will be the review date for this water right.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
POWER	03/01 to 11/15	117.20 CFS	N/A
<u>Totals:</u>		117.20 CFS	

2. Recommended Amendments

☐ Change P.D. as reflected above ☐ Add P.D. as reflected above ☒ None

☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name  Date 8/31/2015
 Reviewer _____ Date _____

MR# 63-33599
powerhouse interior

06/24/2015 01:51



WR# 63-33599
powerhouse interior

06/24/2015 01:43





水轮发电机 Synchronous Generator

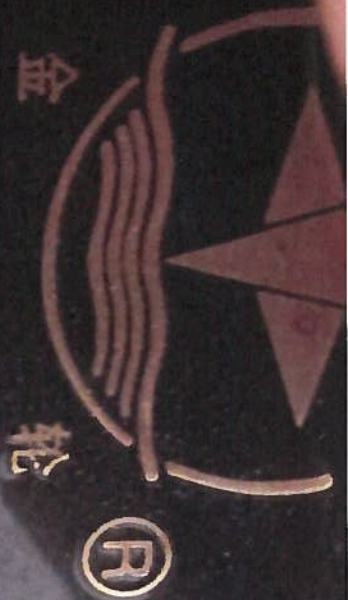


Type:	SLW 1000-10/1180	Exc. Voltage:	671.2 V
Phase:	3	Exc. Current:	152.1 A
Power:	1000 kW	Rated Speed:	720 r/min
Voltage:	480 V	Runaway Speed:	1440 r/min
Current:	1336.4 A	Insulate Class:	Arm. F
Frequency:	60 Hz	Weight:	Fi. F
Power Factor:	0.9	Date:	10690 kg
Connection:	Y		2012.06
Serial NO.:	12108		

潮州市汇能电机有限公司 中国, 广东

Chaozhou Huineng Electric Machinery Co., LTD. Guangdong P.R. of China

06/24/2015 01:47



金轮牌

TRADE MARK

WR# 63-33599
turbine nameplate
(larger turbine)

型号 TYPE HLA696-WJ-65

型水轮机
WATER TURBINE

力 PUT 813 千瓦 KW

转 SPEED

720

头 AD 43.28 米 m

产品编号
SERIAL.NO.

037

量 2.26 米³/秒 m³/s

制造日期
DATE

2012

年 YEAR 05

中华人民共和国
浙江金轮机电实业公司
06/24/2015 01:44
ZHEJIANG JINLUN ELECTROMECHANICAL CO., LTD.

WR# 63-33599
turbine nameplate
(smaller turbine)



金轮牌
TRADE MARK

型号
TYPE

HLA153-WJ-50

型水轮机
WATER TURBINE

出力
OUTPUT

237

千瓦
KW

转速
SPEED

720

转/分
r/min

水头
HEAD

24.38

米
m

产品编号
SERIAL NO.

038

流量
FLOW

1.13

米³/秒
m³/s

制造日期
DATE

2012

年
YEAR

05

月
MONTH

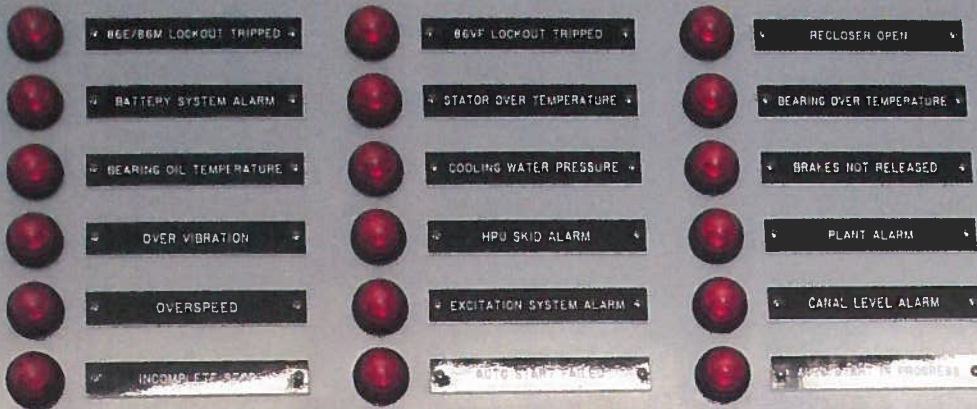
中华人民共和国

浙江金轮机电实业有限公司

ZHEJIANG JINLUN ELECTROMECHANICAL CO., LTD.

06/24/2015 01:45

WR# 63-33599
instrument panel



BYPASS GATE 1 POSITION
BSPM



BYPASS GATE 2 POSITION
BSPM



THIS SECTION CONTAINS
MAIN BONDING JUMPER
AND GROUNDING ELECTRODE
CONDUCTOR TERMINAL.

THIS SECTION CONTAINS
THE NEUTRAL DISCONNECTIVE
MEANS.

BAT ELECTRIC
CUSTOM CONTROL
AND SWITCHGEAR
REDDING, CA (530) 221-1000

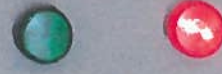
BYPASS GATE 1 STATUS
FULL RUNNER FULL OPEN



GENERATOR BREAKER STATUS
OPEN CLOSED



BYPASS GATE 2 STATUS
FULL CLOSED FULL OPEN



WARNING
Arc Flash and Shock Hazard
Appropriate PPE Required

⚠ DANGER

High voltage.
Will cause
severe injury or death.

Multiple power sources can
automatically energize
switchgear.

Turn off all power sources
before working behind panels.

Only authorized personnel
should open panel.

06/24/2015 01:51

EMERGENCY STOP

WR# 63-33599
Instrument panel

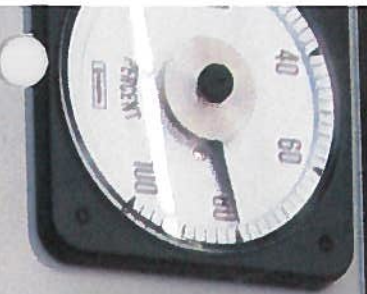
06/24/2015 01:49



WR# 63-33599

938.9 kW

WICKET GATE 1 POSITION
WGP1M



GENERATOR METER
BM



DIGITAL MULTIMETER
NON



BUS METER
BM



WICKET GATE 2 POSITION
WGP2M



ART MODE
MAN
AUTO



M-3410A
INTERTE / GENERATOR
PROTECTION

Integrated Protection Systems

BECKWITH
ELECTRIC
D-CO. INC.
MADE IN U.S.A.

COMM 1
PHASE LV 27
GROUND LV 27Q
FUNCTIONAL PWR 32
LOSS OF FIELD 40
CUR. IMBALANCE 48
WCT UNBALANCE 41
OVERCURRENT 51/57
OUTPUT 1
SAFETY PHASE OV
200 OVERCUT OV
RVL FUSE LOSS
BI OLV FREQUENCY
OVC TRIPPER
OVERCUT
RELAY ON
OUTPUT 2

MODE SWITCH
OFF
MAN
AUTO



E 1 STATUS
FULL OPEN



HOURLY METER
HM1



TURBINE GATE STATUS
FULL OPEN



WICKET GATE 2 STATUS
FULL OPEN

06/24/2015 01:50

EXCITATION ADJ.



HOURS



TURBINE GATE



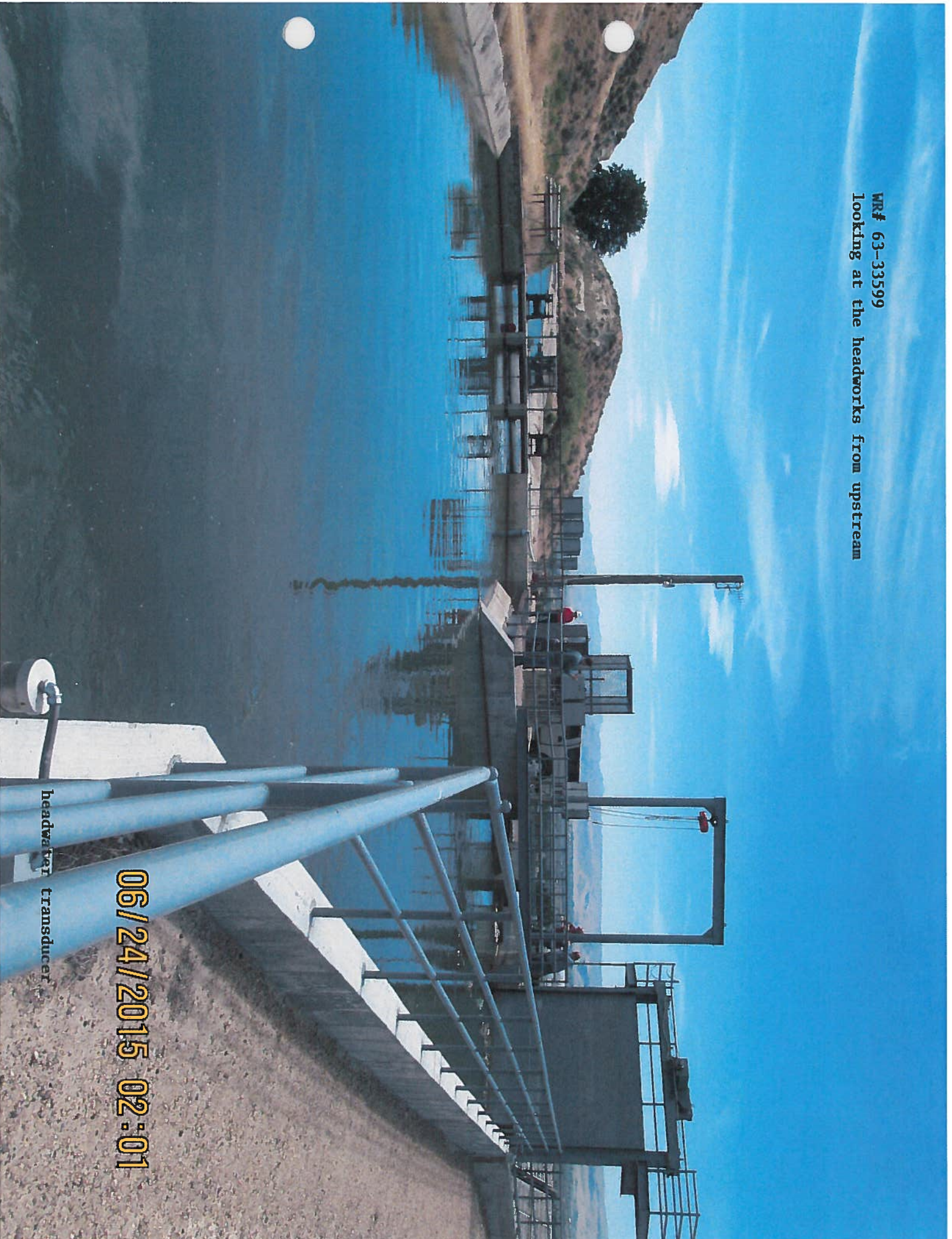
WICKET GATE 2



WR# 63-33599
Looking at the headworks from upstream

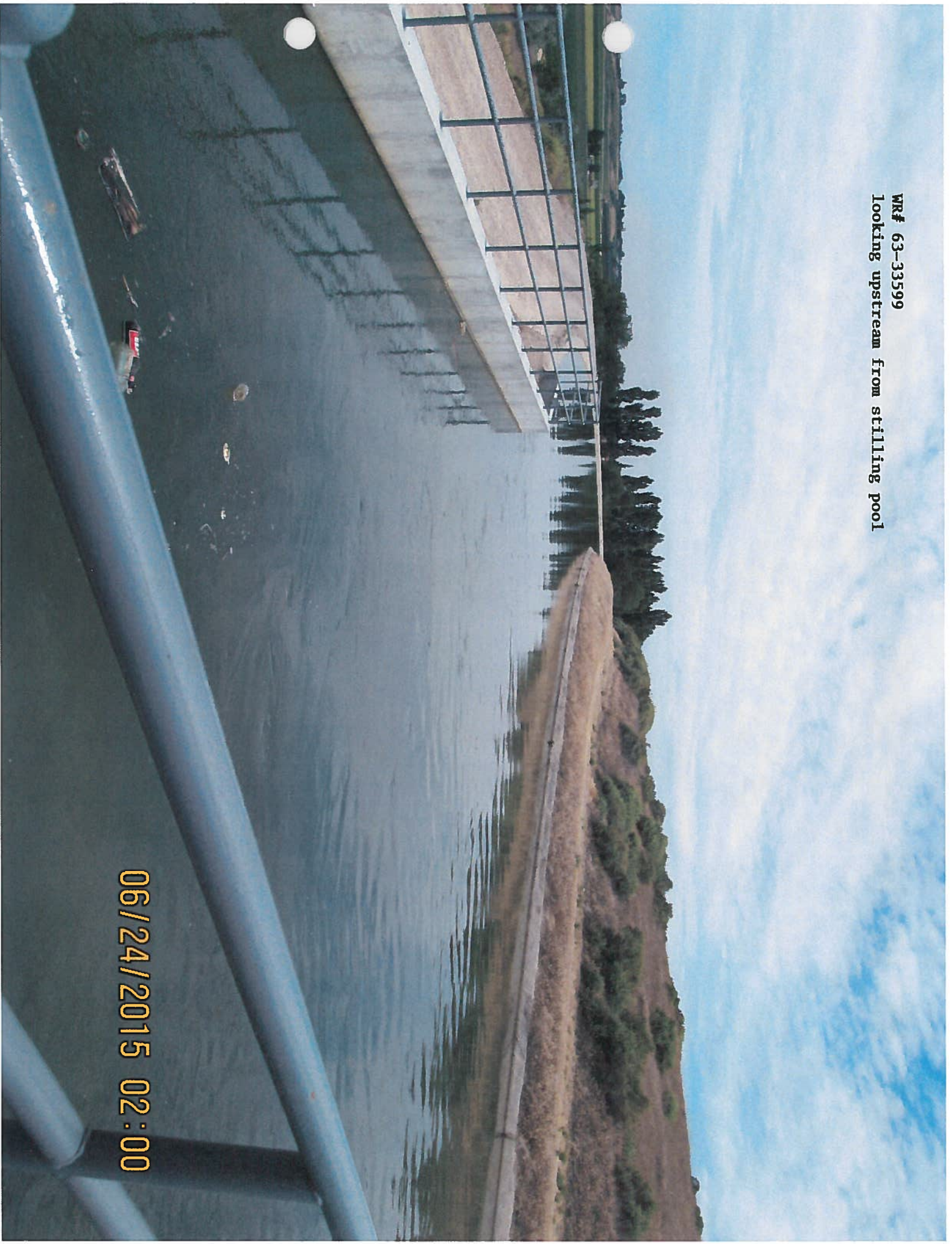
06/24/2015 02:01

headwater transducer



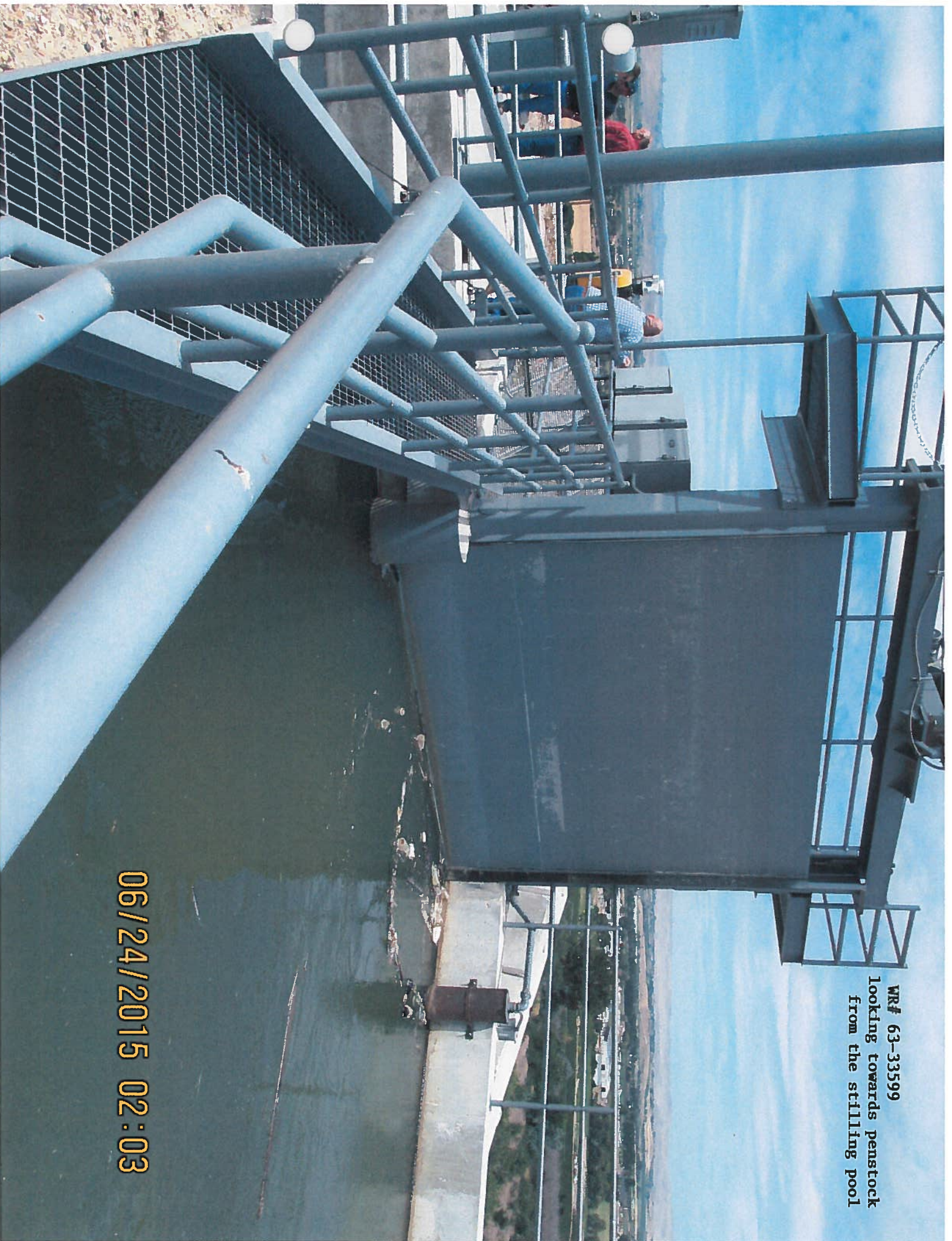
WR# 63-33599
Looking upstream from stilling pool

06/24/2015 02:00



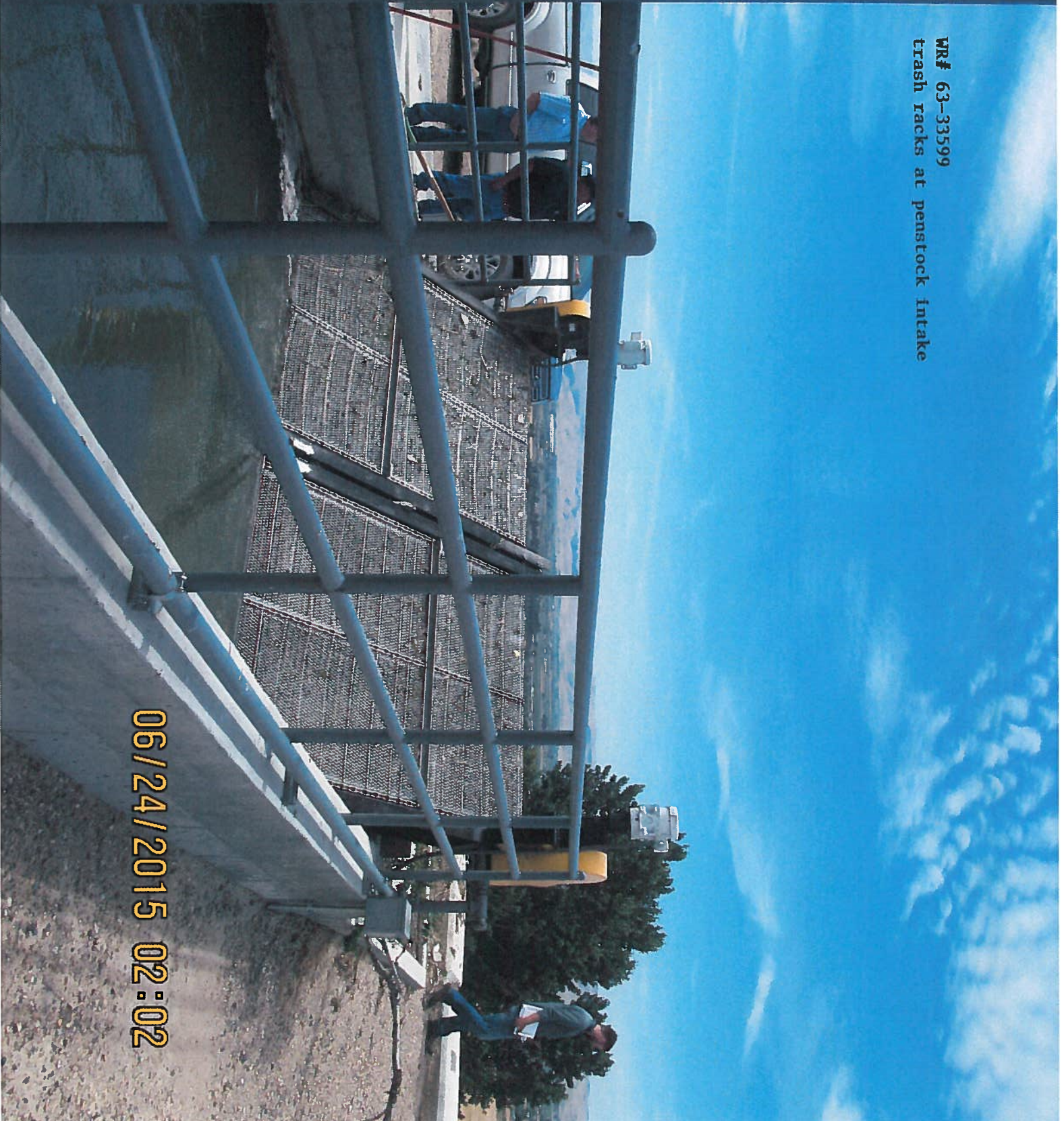
WR# 63-33599
looking towards penstock
from the stilling pool

06/24/2015 02:03



WR# 63-33599
trash racks at penstock intake

06/24/2015 02:02



WR# 63-33599
downstream view of the trashracks

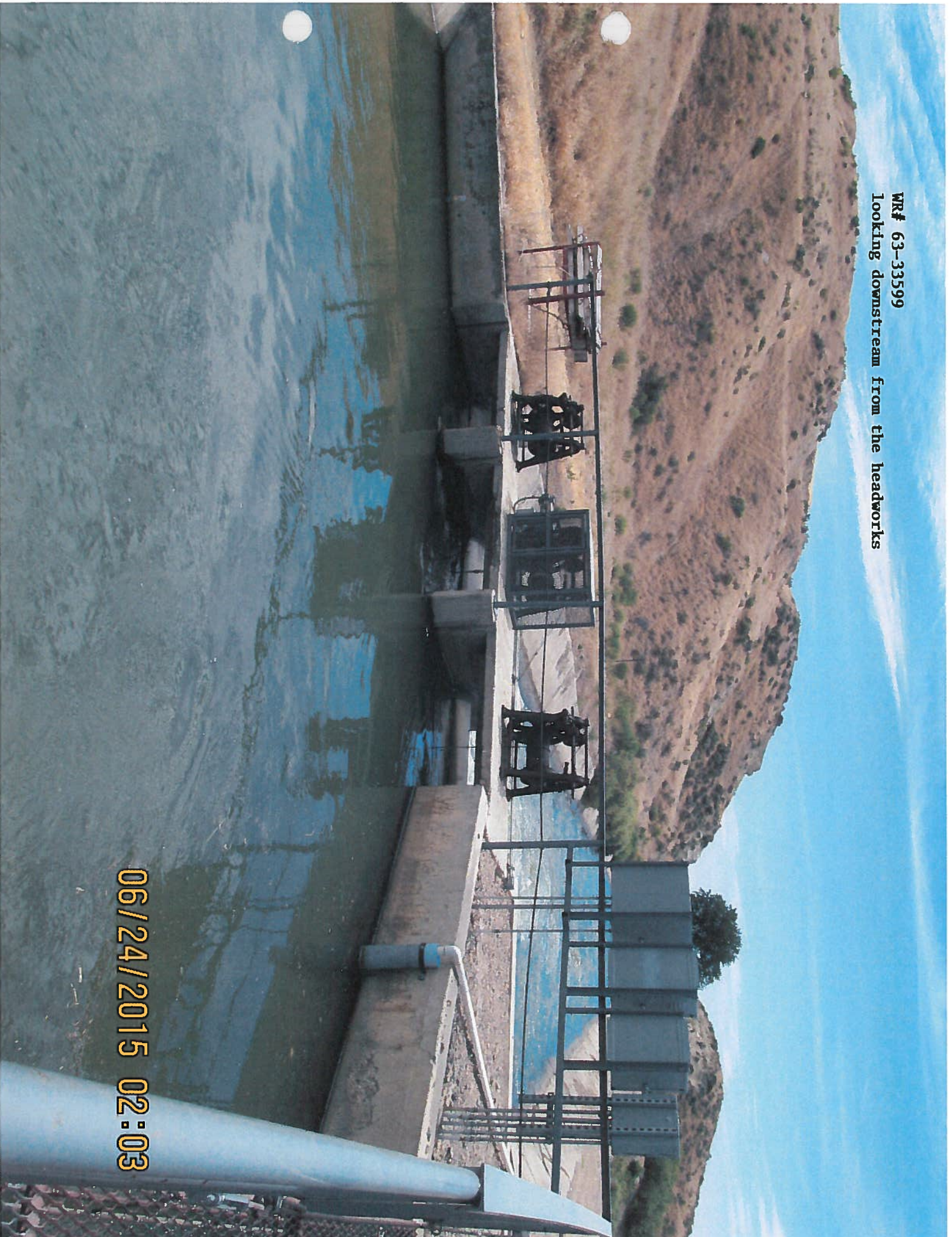


06/24/2015 02:18

WR# 63-33599

Looking downstream from the headworks

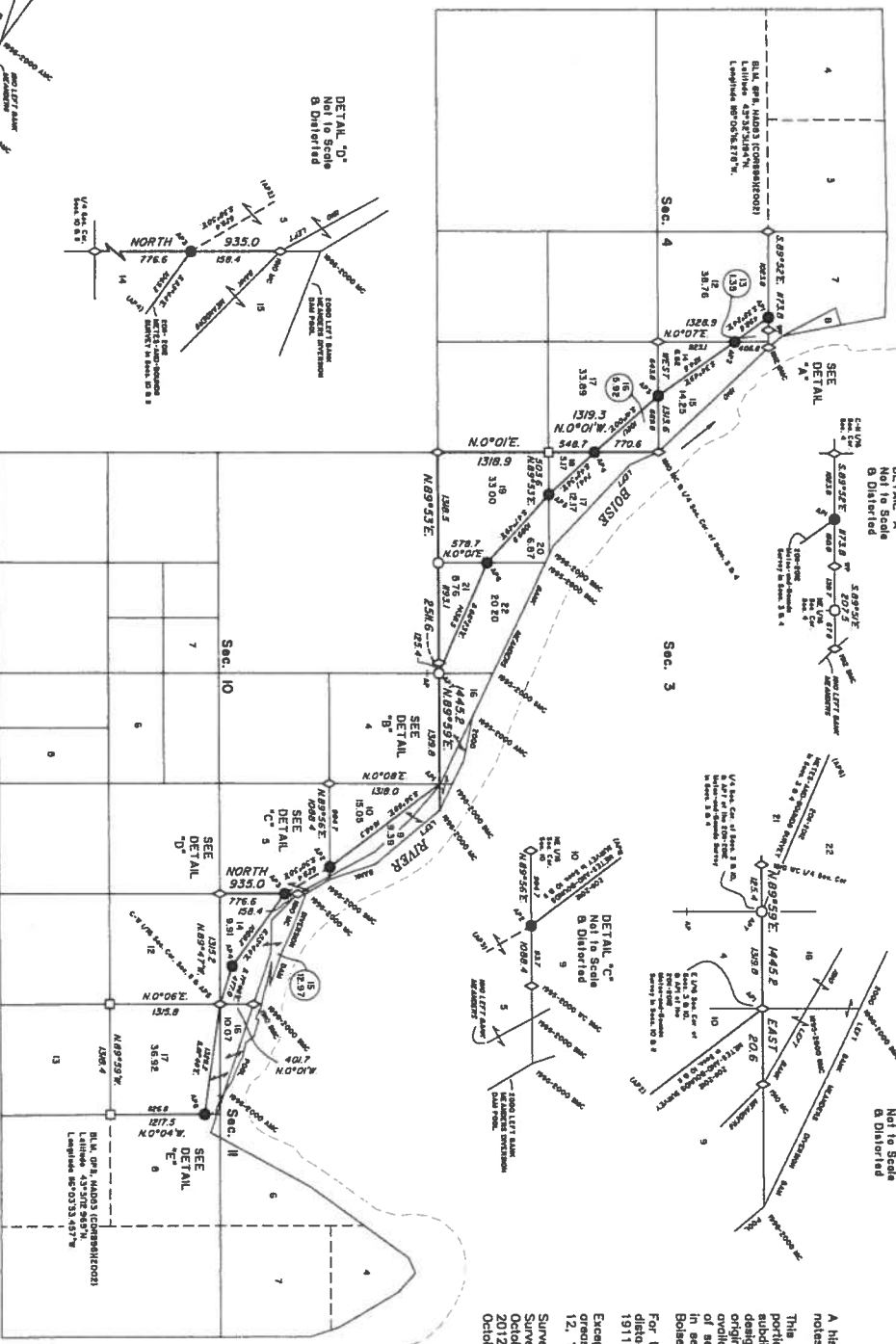
06/24/2015 02:03



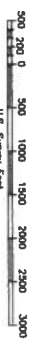
TOWNSHIP 2 NORTH, RANGE 3 EAST, OF THE BOISE MERIDIAN, IDAHO DEPENDENT RESURVEY, SUBDIVISION, AND METES-AND-BOUNDS SURVEY

DETAIL "A"
Not to Scale
Distorted

DETAIL "B"
Not to Scale
Distorted



- CORNER SYMBOL LEGEND**
- ◊ BLM/GLO corner
 - Local or BOR corner
 - Corner determined, not monumented
 - Corner determined and monumented



A history of surveys is contained in the field notes.

This plot represents the dependent resurvey of portions of the subdivision lines and subdivisions of sections 3, 4, 10, and 11, designed to restore the corners in their true original locations according to the best available evidence, and the further subdivision of section 4, and a cross-section survey in sections 3, 4, 10, and 11, T. 2 N., R. 3 E., Boise Meridian, Idaho.

For those lines not depicting bearings and distances, refer to the plots accepted May 12, 1911, November 12, 1912, and July 31, 2001.

Except as depicted hereon, the lottings and areas are as shown on the plots accepted May 12, 1911 and July 31, 2001.

Survey executed by Keith C. Brooks, Cadastral Surveyor, Bureau of Reclamation, beginning October 18, 2011 and completed July 15, 2012, pursuant to special instructions dated October 17, 2011, for Group No. 1366, Idaho.

NOTE: Dashed line is the Boise River and is shown for informational purposes only.

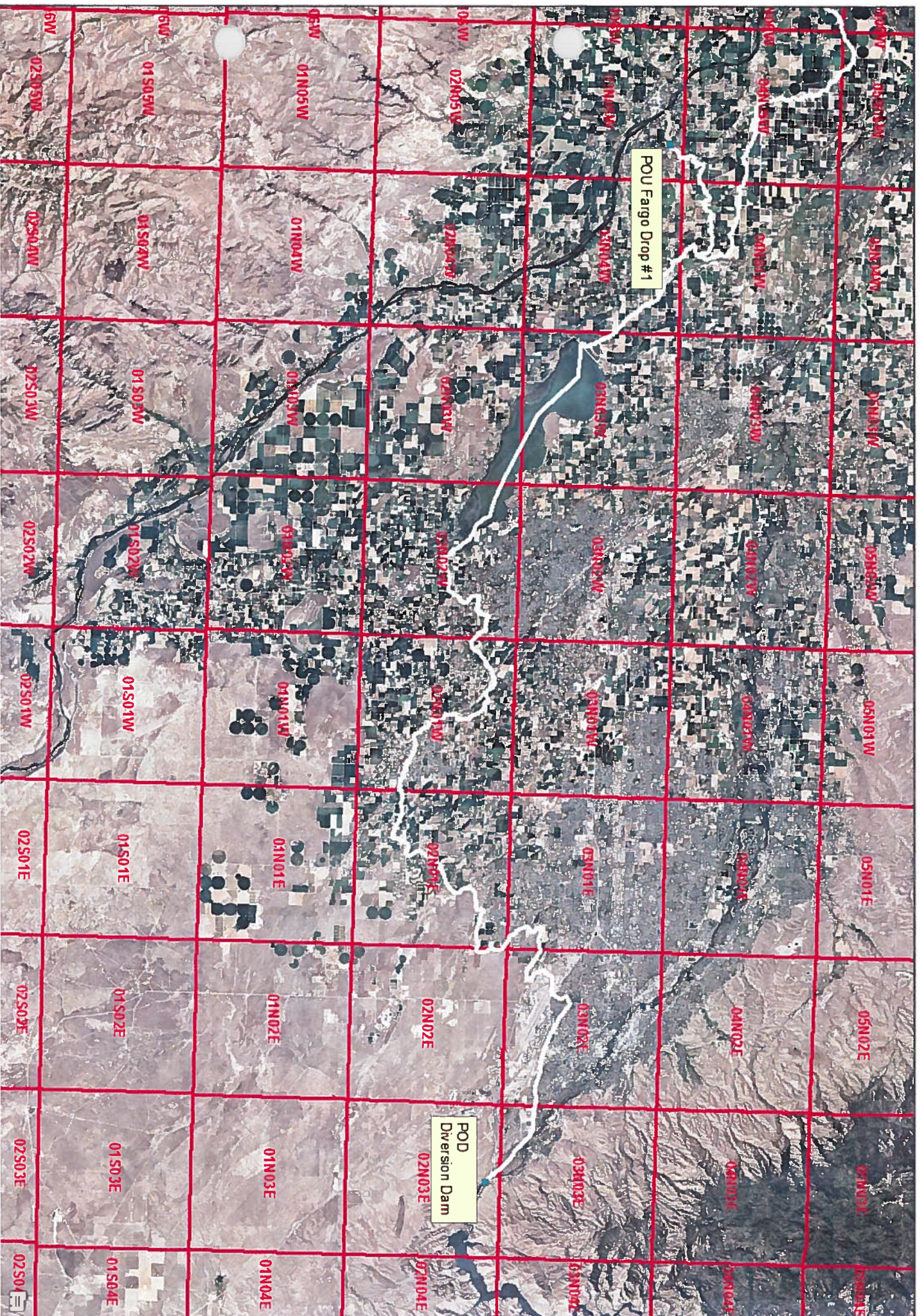
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Boise, Idaho May 29, 2013

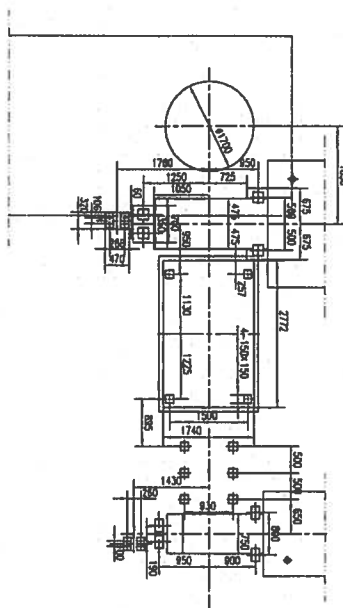
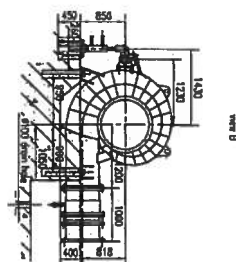
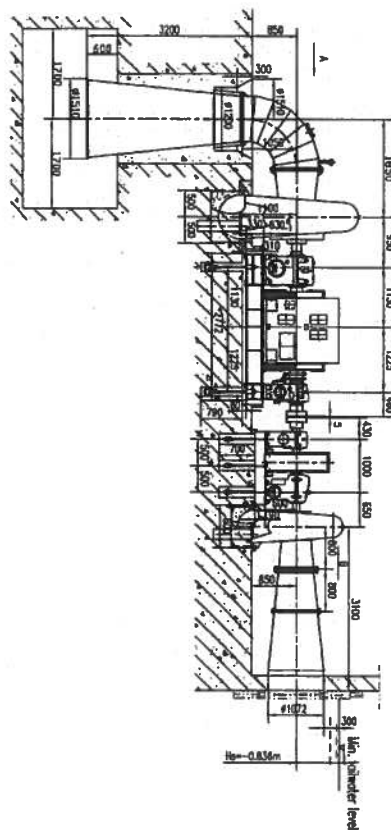
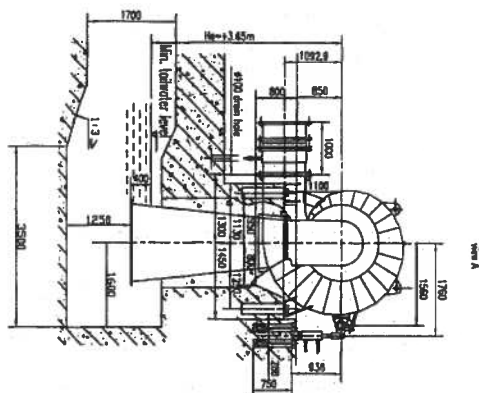
This plot is strictly conformable to the approved field notes and the survey, having been correctly executed in accordance with the requirements of law and the regulations of this Bureau, is hereby accepted.

For the Director

Keith C. Brooks
Chief Cadastral Surveyor for Idaho



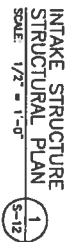
The following pages are copies of engineering drawings excerpted from a submittal made by Boise Project Board of Control to FERC in 2011. They were submitted as attachment F to an Application for Amendment of Exemption.



Technical Requirements

1. The size used to generate, generator and who are referred to in the corresponding drawings.

H65/(11)114									
1	2	3	4	5	6	7	8	9	10
Installation Drawing									
P/000									
YINSHIJI5有限公司									



THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE---REDUCE SCALES
ACCORDINGLY

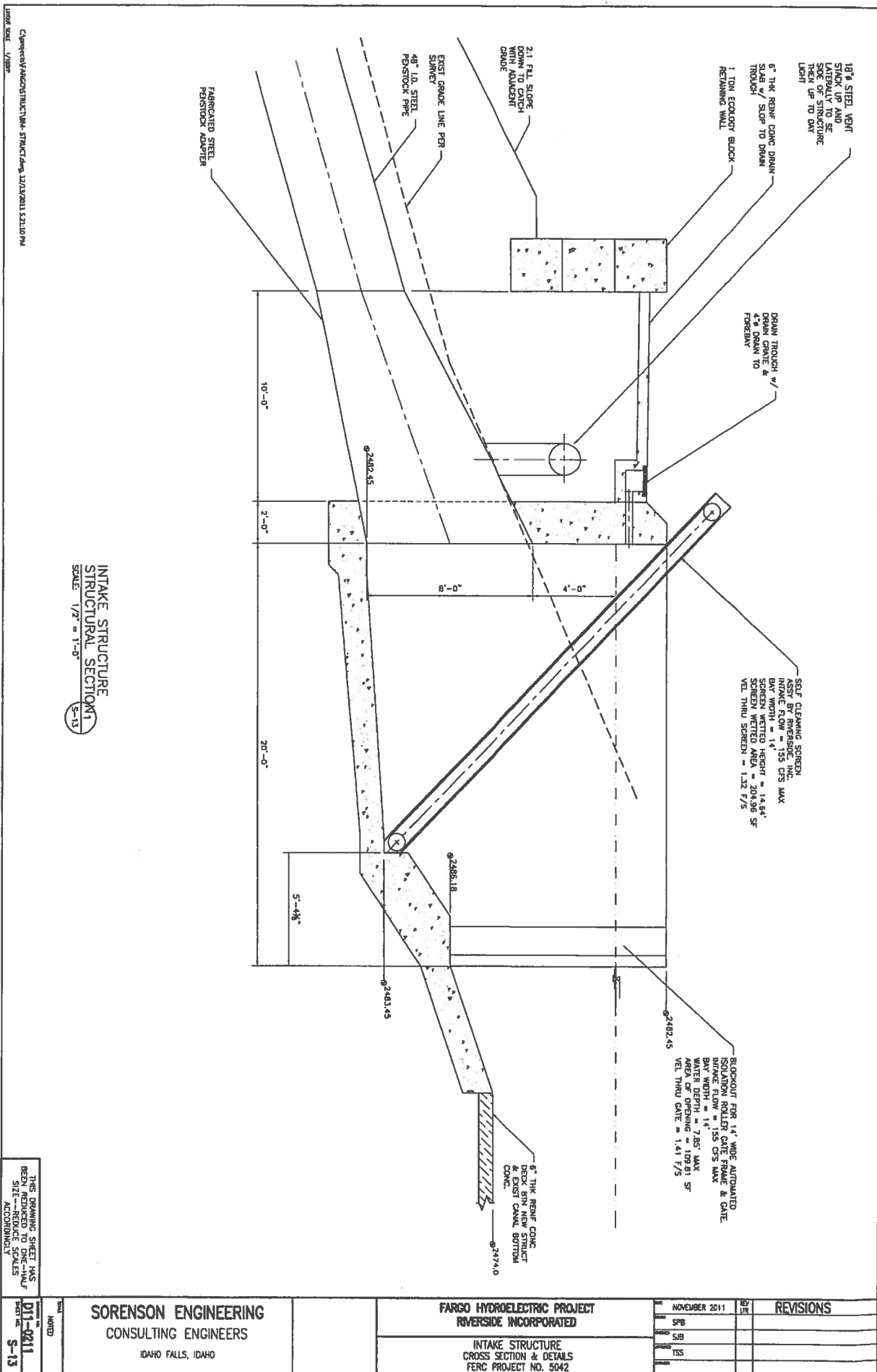
011-0211
S-12

SORENSEN ENGINEERING
CONSULTING ENGINEERS
IDAHO FALLS, IDAHO

**FARGO HYDROELECTRIC PROJECT
RIVERSIDE INCORPORATED**

INTAKE STRUCTURE
PENSTOCK INTAKE & TRASHRACK PLAN
FERC PROJECT NO. 5042

DATE	NOVEMBER 2011	REV	1	REVISIONS
BY	SPB			
CHKD	SJB			
APPV	TSS			
REMARKS				



SORENSEN ENGINEERING
CONSULTING ENGINEERS
IDAHO FALLS, IDAHO

FARGO HYDROELECTRIC PROJECT
RIVERSIDE INCORPORATED

INTAKE STRUCTURE
CROSS SECTION & DETAILS
FERC PROJECT NO. 5042

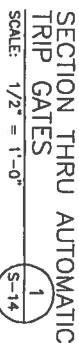
REVISIONS	
NO.	DESCRIPTION
1	NOVEMBER 2011
2	SPB
3	SJB
4	TSS

DATE: 01-09-11
SHEET NO: S-13



INTAKE STRUCTURE
STRUCTURAL SITE PLAN
FERC PROJECT NO. 5042

DATE	NOVEMBER 2011	REV	178	REVISIONS
DESIGN	SPB			
BY	SJB			
PROJECT	TSS			



THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE---REDUCE SCALES
ACCORDINGLY

D11-0211
S-14

SORENSEN ENGINEERING
CONSULTING ENGINEERS
IDAHO FALLS, IDAHO

**FARGO HYDROELECTRIC PROJECT
RIVERSIDE INCORPORATED**

INTAKE STRUCTURE
ATG SECTION & DETAILS
FERC PROJECT NO. 5042

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ISSUED	SPB			
REVISION	SUB			
APPROVED	TSS			
REVISION				

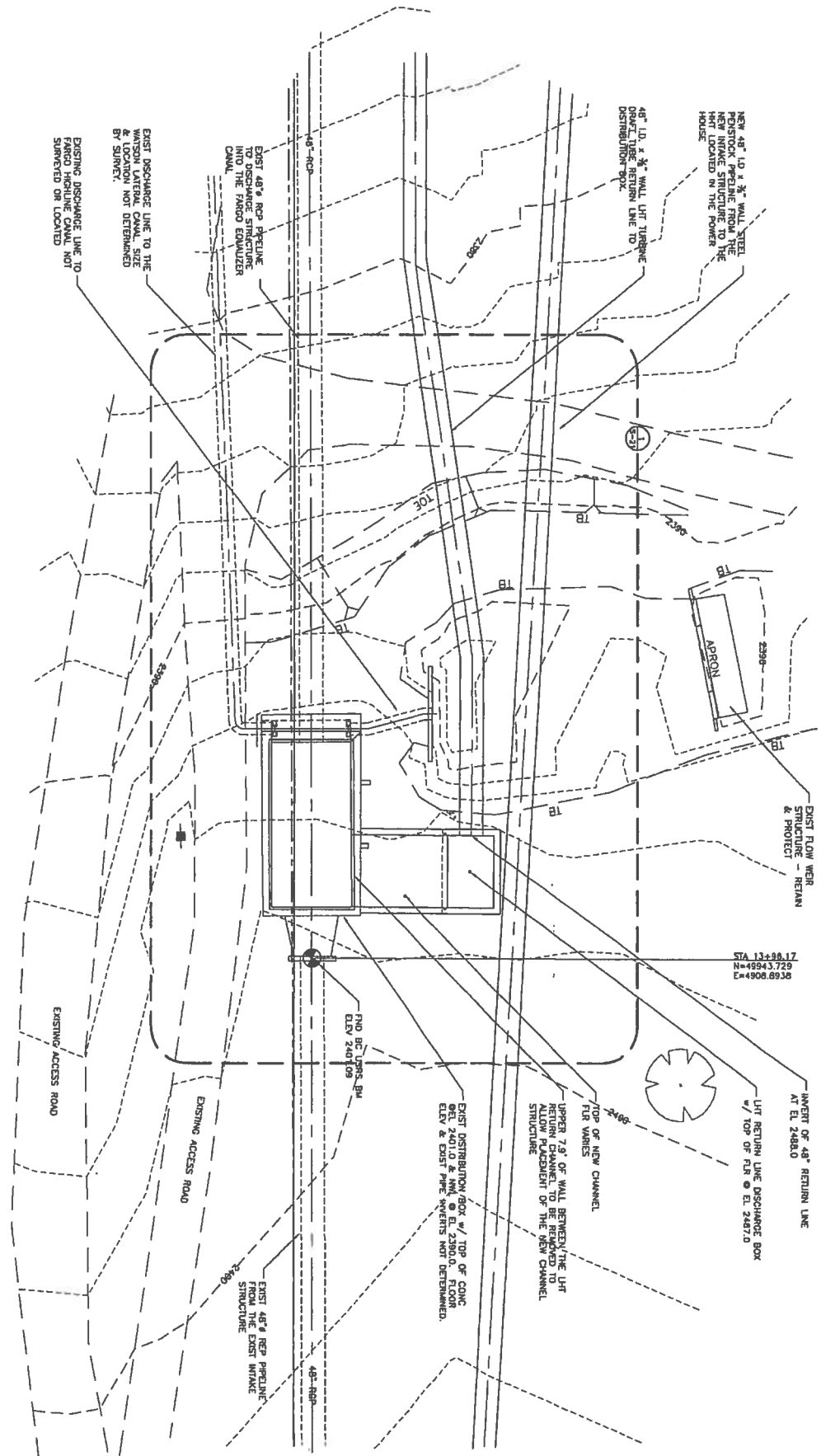
Copyrighted Structural Steelwork, Structural Steelwork, 11/26/2011 4:03:37 PM

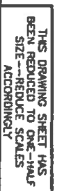
EXIST DISTRIBUTION BOX MOD
SITE PLAN
SCALE: 1/8" = 1'-0"

1
S-20

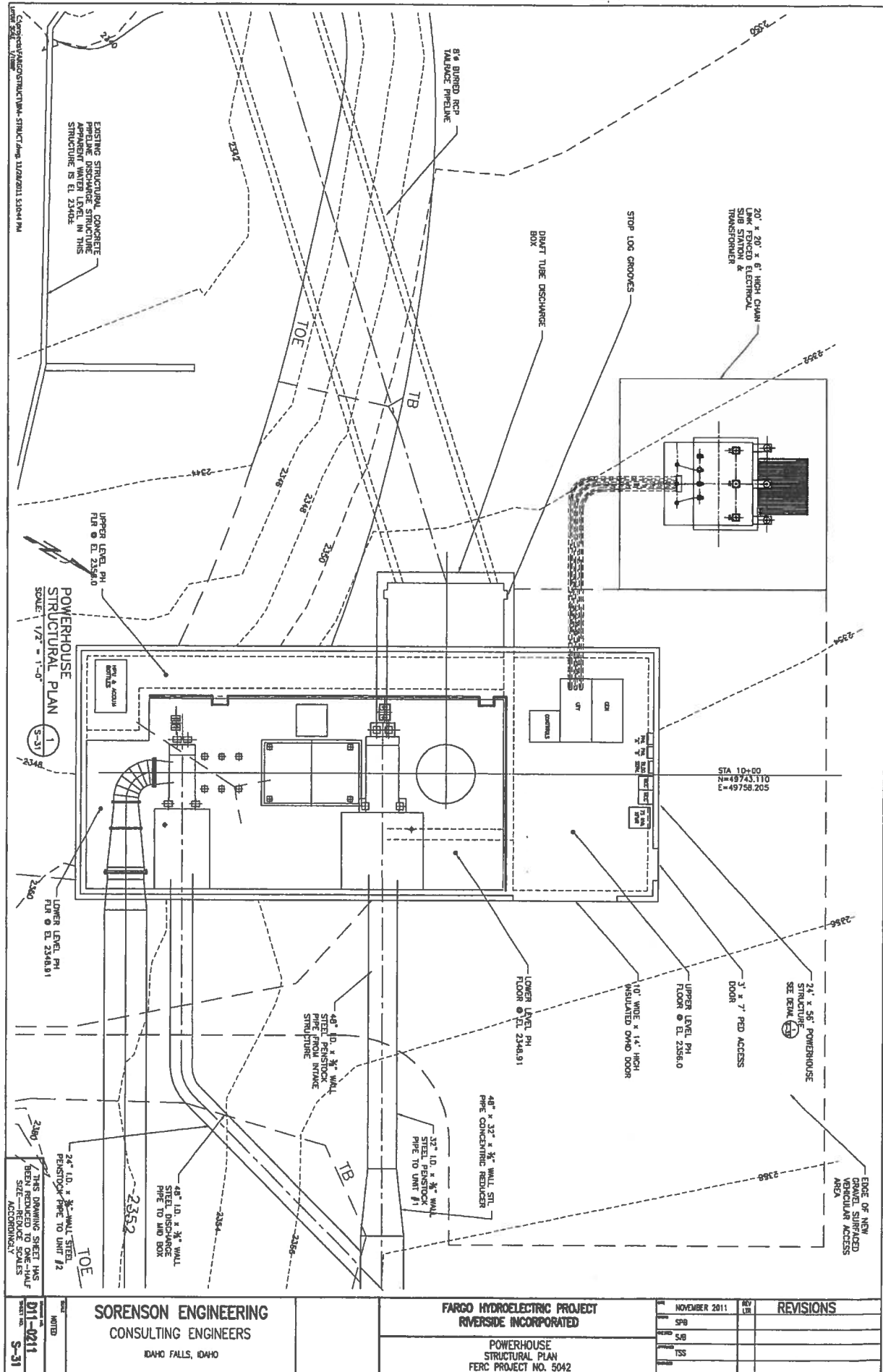
THIS DRAWING SHEET HAS
BEEN REDUCED TO ONE-HALF
SIZE - REDUCE SCALES
ACCORDINGLY

DATE 11-02-11 SHEET NO. S-20	SORENSEN ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO	FARGO HYDROELECTRIC PROJECT RIVERSIDE INCORPORATED DISTRIBUTION BOX MODIFICATIONS STRUCTURAL SITE PLAN FERC PROJECT NO. 5042	REVISIONS NO. DATE BY 1 NOVEMBER 2011 SPB 2 SSB 3 TSS
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NOTED	SORENSEN ENGINEERING CONSULTING ENGINEERS IDAHO FALLS, IDAHO	FARGO HYDROELECTRIC PROJECT RIVERSIDE INCORPORATED	DATE NOVEMBER 2011 BY SPB CHECK SJB APPROVED TSS REVISIONS





POWERHOUSE
STRUCTURAL PLAN
FERC PROJECT NO. 5042

DATE	NOVEMBER 2011	REV	1/1	REVISIONS
BY	SPB			
CHECKED	SUB			
APPROVED	TSS			
REMARKS				