

REV D, 12/26/07 REVISED GEN. to 47kW from 45kW and NAVD NOTE SHTS 2-6

GENERAL NOTES:

1. THE INFORMATION OBTAINED TO CREATE THE PROJECT PLAN COMES FROM SEVERAL SOURCES, MOST NOTABLY, BEALS & THOMAS INC. DRAWING 0968P002B. FOR ADDITIONAL INFORMATION, PLEASE CONSULT THIS DRAWING.

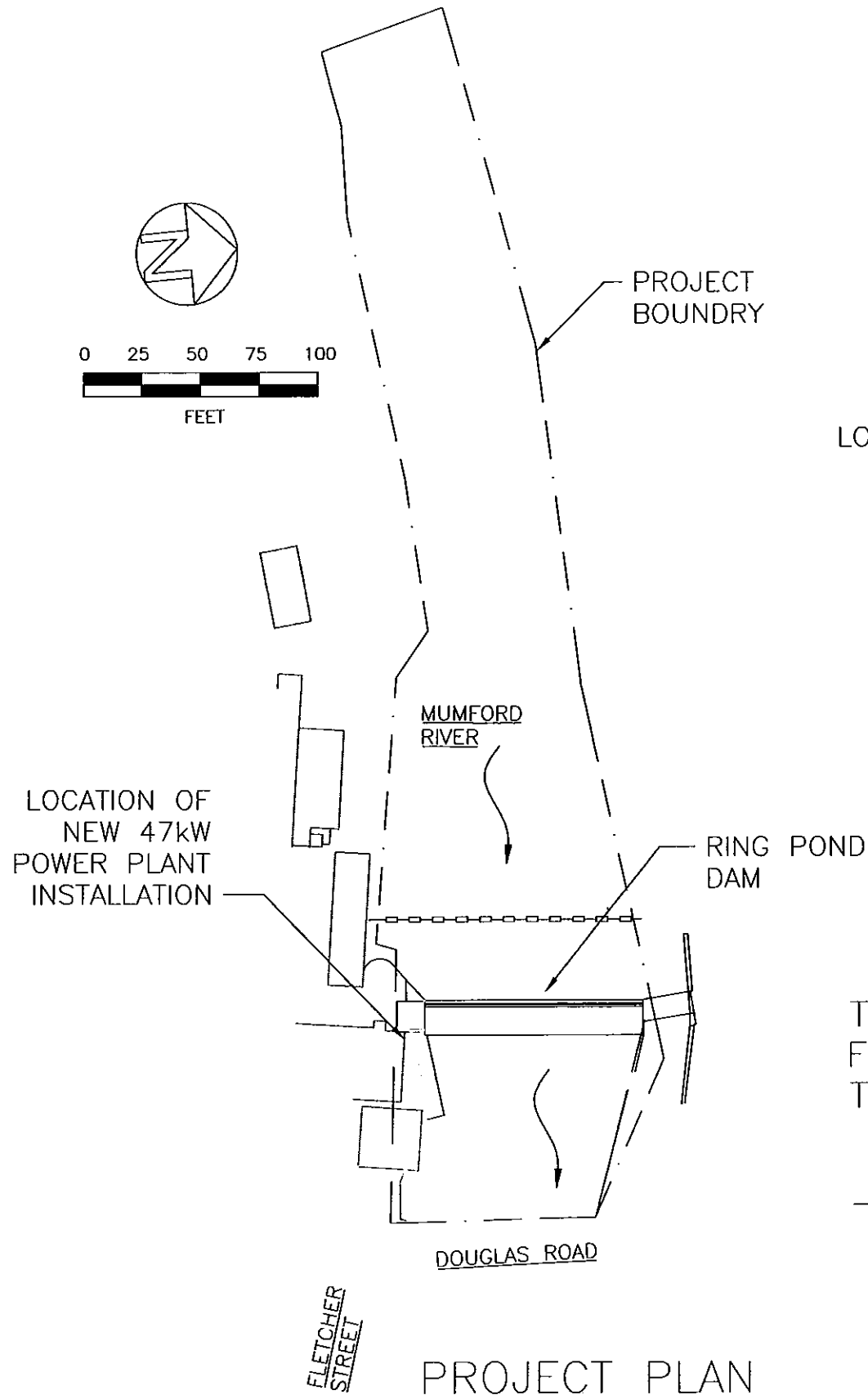
2. THE OFFICIAL PROJECT IS TO BE KNOWN AS:

Application for Exemption of a Small Hydroelectric Project from Licensing

The Alternatives Hydro Power Project

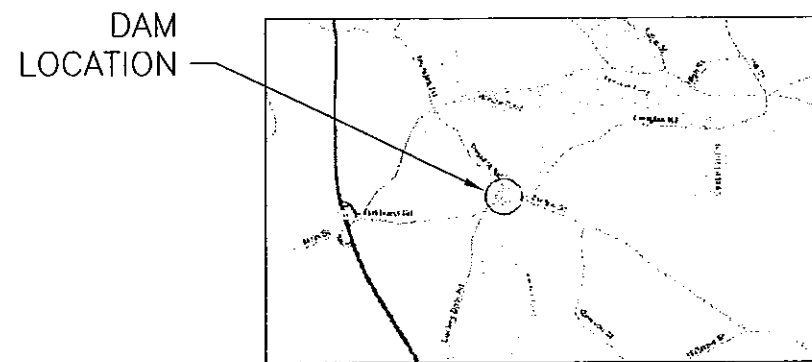
Town of Northbridge (Village of Whitinsville)

County of Worcester, Massachusetts

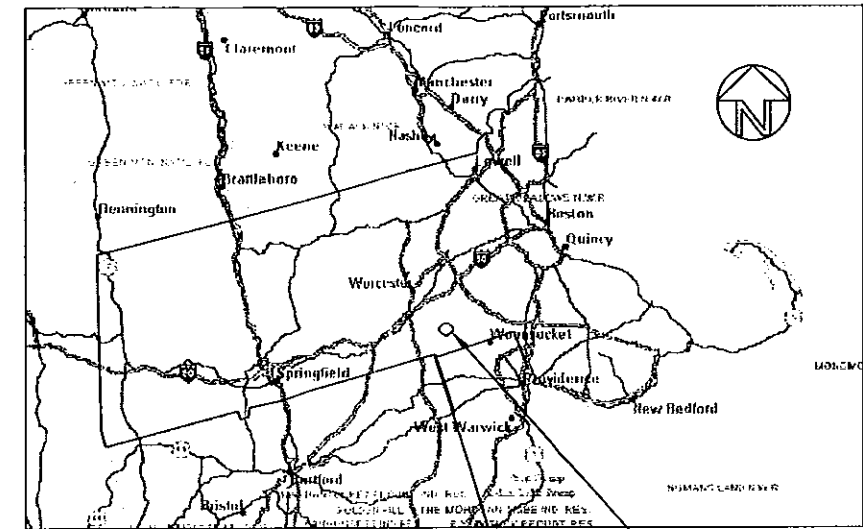


PROJECT PLAN

Scale: 1/64"=1'



Whitinsville, Massachusetts



LOCATION MAP

PROJECT LOCATION

THIS DRAWING IS PART OF THE APPLICATION FOR LICENSE MADE BY THE UNDERSIGNED THIS DAY OF _____, 2007

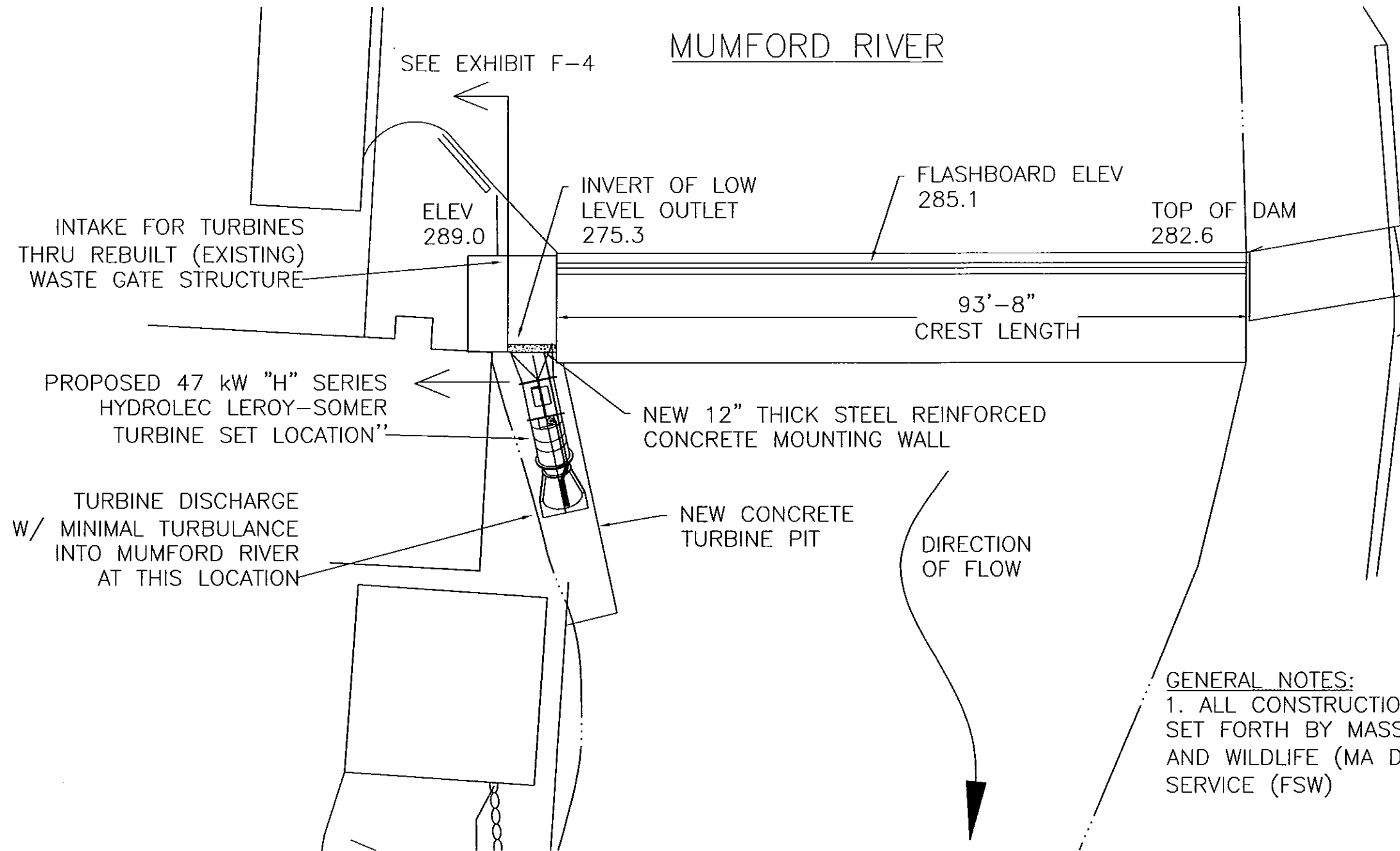
**The Alternatives Hydro Power Project
FERC No. 12608-000 -MA
EXHIBIT F-1**

RWB TECHNICAL SERVICES
Spencer, Ma
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DRAWN	DATE	CLIENT
RWB	05/10/05	The Alternatives Hydro Power Project Northbridge, Ma
CHECKED	DATE	TITLE
WKF	06/08/05	LOCATION MAP-PROJECT BOUNDRY
APPROVED	DATE	DWG NO.
W FAY	06/10/05	WH-100-1

SIZE	SCALE	REV
B	AS NOTED	D

REF:



NOTE:
ALL VERTICAL ELEVATIONS ARE REFERENCED TO NORTH AMERICA VERTICAL DATUM (NAVD)

GENERAL NOTES:

1. ALL CONSTRUCTION WILL BE WITHIN THE GUIDELINES SET FORTH BY MASSACHUSETTS DIVISION OF FISHERIES AND WILDLIFE (MA DFW) AND US FISH AND WILDLIFE SERVICE (FSW)

PLAN VIEW

SCALE: 1/16=1'

The Alternatives Hydro Power Project
FERC No.12608-000-MA
EXHIBIT F-2

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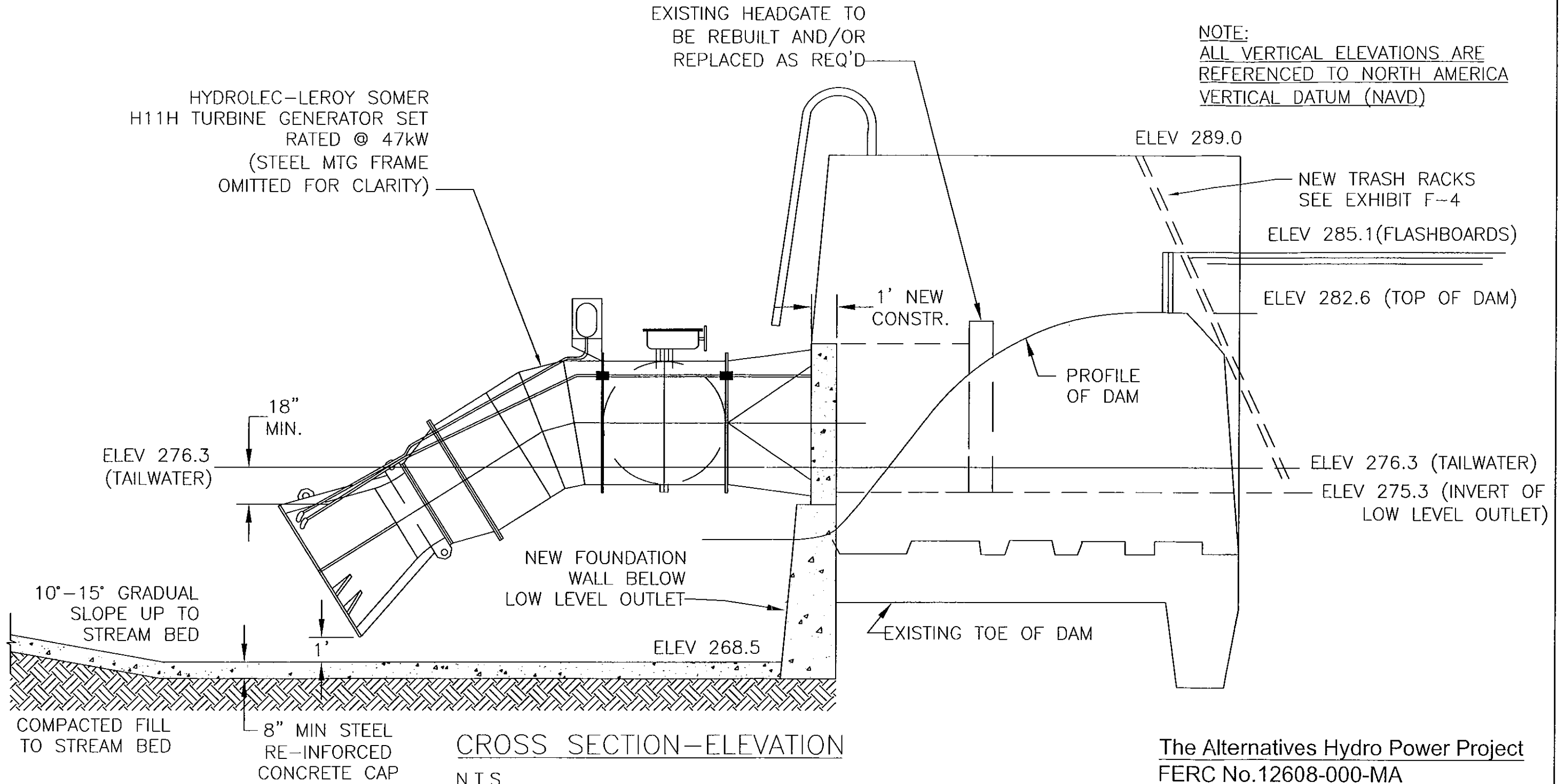
DRAWN	DATE
RWB	05/15/05
CHECKED	DATE
WKF	6/08/05
APPROVED	DATE
W FAY	06/10/05

CLIENT
The Alternatives Hydro Power Project
Northbridge, Ma

TITLE
PLAN VIEW

SIZE	SCALE
B	AS NOTED

DWG NO. WH-100-2
REV D




NOTE:
ALL VERTICAL ELEVATIONS ARE REFERENCED TO NORTH AMERICA VERTICAL DATUM (NAVD)

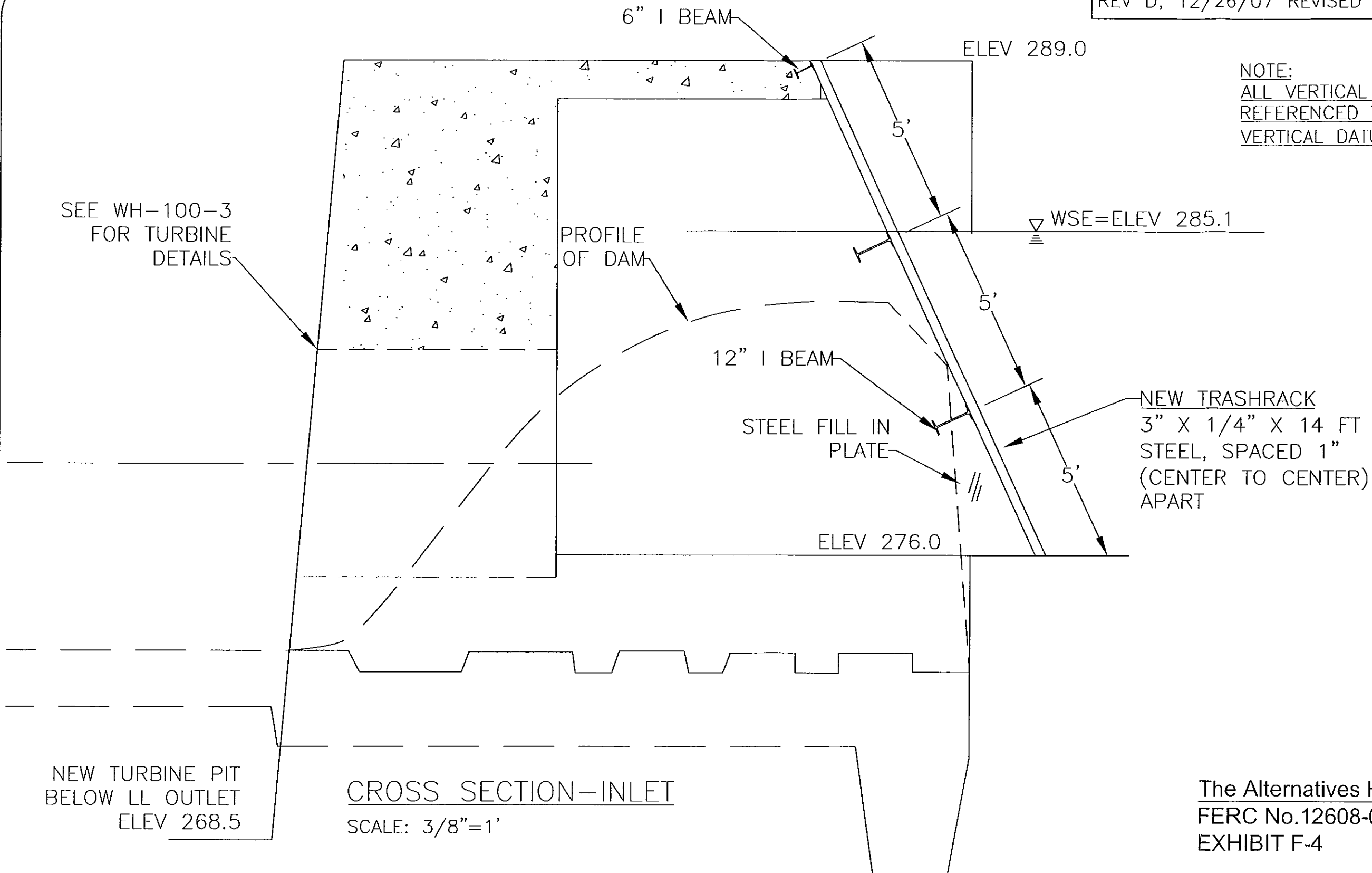
CROSS SECTION-ELEVATION
N.T.S

The Alternatives Hydro Power Project
FERC No.12608-000-MA
EXHIBIT F-3

THIS DRAWING IS PART OF THE APPLICATION FOR LICENSE MADE BY THE UNDERSIGNED THIS DAY OF _____, 2007

 RWB TECHNICAL SERVICES Spencer, Ma UNLESS OTHERWISE SPECIFIED: DO NOT SCALE DRAWING This drawing is confidential and the sole property of RWB Technical Services and may not be copied or reproduced by any means without the expressed consent of RWB Technical services.	DRAWN RWB	DATE 05/15/05	CLIENT The Alternatives Hydro Power Project Northbridge, Ma
	CHECKED WKF	6/08/05	TITLE ELEVATIONS
	APPROVED W FAY	6/10/05	DWG NO. WH-100-3
SIZE B	SCALE AS NOTED	REV D	SHEET 3 OF 6

NOTE:
ALL VERTICAL ELEVATIONS ARE
REFERENCED TO NORTH AMERICA
VERTICAL DATUM (NAVD)



SEE WH-100-3
FOR TURBINE
DETAILS

PROFILE
OF DAM

12" I BEAM

STEEL FILL IN
PLATE

ELEV 276.0

NEW TRASHRACK
3" X 1/4" X 14 FT
STEEL, SPACED 1"
(CENTER TO CENTER)
APART

NEW TURBINE PIT
BELOW LL OUTLET
ELEV 268.5

CROSS SECTION--INLET
SCALE: 3/8"=1'

The Alternatives Hydro Power Project
FERC No.12608-000-MA
EXHIBIT F-4

THIS DRAWING IS PART OF THE APPLICATION
FOR LICENSE MADE BY THE UNDERSIGNED
THIS DAY OF _____, 2007

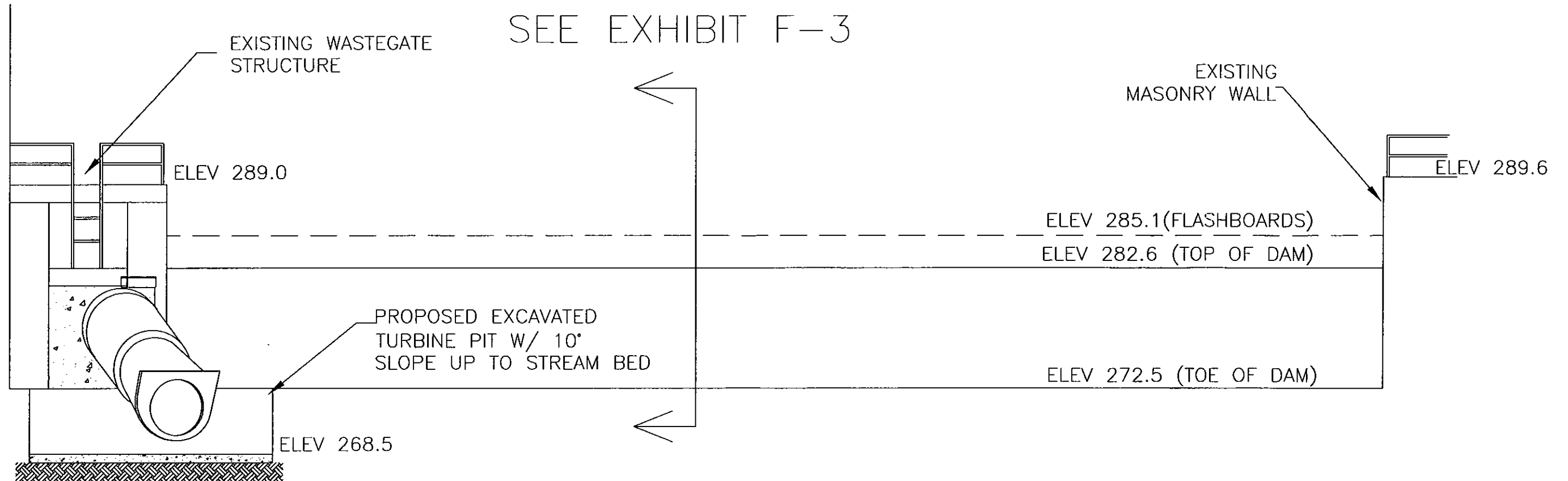
RWB TECHNICAL SERVICES
Spencer, Ma
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DRAWN	DATE	CLIENT
RWB	05/15/05	The Alternatives Hydro Power Project
CHECKED		Northbridge, Ma
WKF	6/08/05	TITLE
APPROVED		ELEVATIONS
W FAY	6/10/05	

SIZE	SCALE
B	AS NOTED

DWG NO.	REV
WH-100-4	D


NOTE:
 ALL VERTICAL ELEVATIONS ARE
 REFERENCED TO NORTH AMERICA
 VERTICAL DATUM (NAVD)



DOWN STREAM—ELEVATION
 (LOOKING UP STREAM)
 SCALE: 1/8"=1'

The Alternatives Hydro Power Project
 FERC No.12608-000-MA
 EXHIBIT F-5

THIS DRAWING IS PART OF THE APPLICATION
 FOR LICENSE MADE BY THE UNDERSIGNED
 THIS DAY OF _____, 2007

 RWB TECHNICAL SERVICES Spencer, Ma UNLESS OTHERWISE SPECIFIED: DO NOT SCALE DRAWING This drawing is confidential and the sole property of RWB Technical Services and may not be copied or reproduced by any means without the expressed consent of RWB Technical services.	DRAWN RWB	DATE 05/15/05	CLIENT The Alternatives Hydro Power Project Northbridge, Ma
	CHECKED WKF	6/08/05	TITLE DOWN STREAM ELEVATION (LOOKING UPSTREAM)
	APPROVED W FAY	6/10/05	DWG NO. WH-100-5
SIZE B	SCALE AS NOTED	REV D	

REV D, 12/26/07 REVISED
NAVD NOTE

WARNING SIGN
"DAM AHEAD"

MUMFORD RIVER

BOAT RESTRAINING
BARRIER - 75 FT
UPSTREAM

WARNING SIGN
"DAM AHEAD"

WARNING SIGN

ELEV
289.0

FLASH BRD ELEV 285.1

TOP OF DAM ELEV 282.6

LADDER

LIFE
PRESEVER

ABANDONED
INTAKE

EXISTING LOCKED
CHAIN LINK
FENCE

DIRECTION OF FLOW

NOTE:
ALL VERTICAL ELEVATIONS ARE
REFERENCED TO NORTH AMERICA
VERTICAL DATUM (NAVD)

PLAN VIEW

SCALE: 1/16=1'

The Alternatives Hydro Power Project
FERC No.12608-000-MA

THIS DRAWING IS PART OF THE APPLICATION
FOR LICENSE MADE BY THE UNDERSIGNED
THIS DAY OF _____, 2007



RWB TECHNICAL
SERVICES
Spencer, Ma

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This drawing is confidential and the sole
property of RWB Technical Services and
may not be copied or reproduced by any
means without the expressed consent of
RWB Technical services.

DRAWN	DATE
RWB	02/20/07
CHECKED	DATE
WKF	02/20/07
APPROVED	DATE
W FAY	02/21/07

CLIENT
The Alternatives Hydro Power Project
Northbridge, Ma

TITLE
PUBLIC SAFETY PLAN

SIZE	SCALE
B	AS NOTED

DWG NO. WH-100-6

REV D

REF:

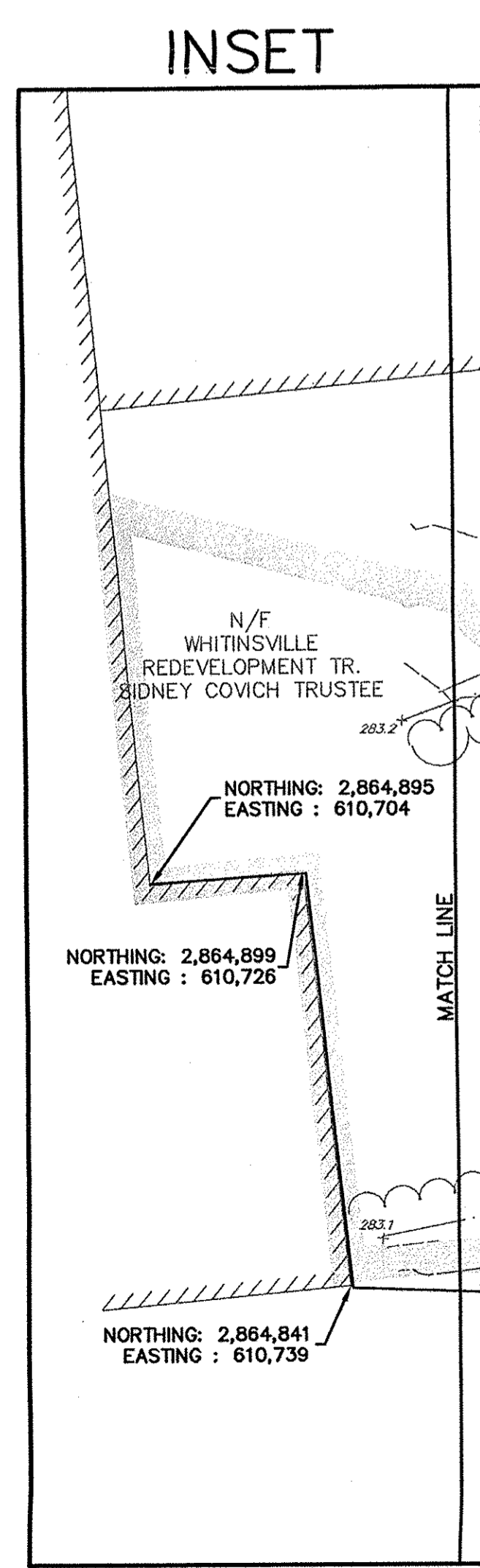
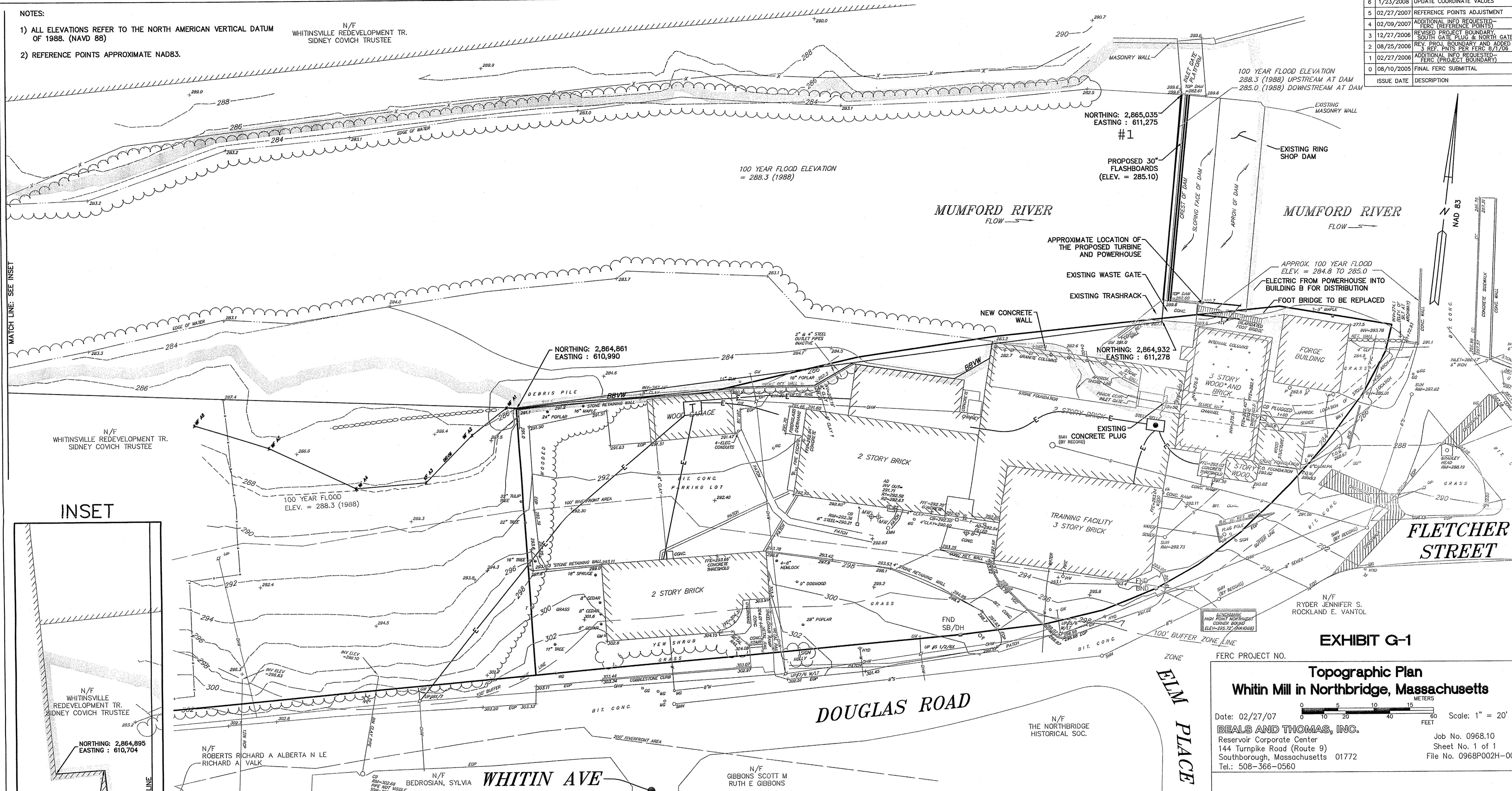
SHEET 6 OF 6

NOTES:

- ALL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988. (NAVD 88)
- REFERENCE POINTS APPROXIMATE NAD83.

N/F
WHITINSVILLE REDEVELOPMENT TR.
SIDNEY COVICH TRUSTEE

6	1/23/2008	UPDATE COORDINATE VALUES
5	02/27/2007	REFERENCE POINTS ADJUSTMENT
4	02/09/2007	ADDITIONAL INFO REQUESTED - FERC (REFERENCE POINTS)
3	12/27/2006	REVISED PROJECT BOUNDARY SOUTH GATE PLUG & NORTH GATE
2	08/25/2006	REV. PROJ. BOUNDARY AND ADDED 3 REF. POINTS PER FERC 9/1/06
1	02/27/2006	ADDITIONAL INFO REQUESTED - FERC (PROJECT BOUNDARY)
0	08/10/2005	FINAL FERC SUBMITTAL
	ISSUE DATE	DESCRIPTION



LEGEND	
	SEWER LINE/MANHOLE
	DRAIN LINE/MANHOLE
	CATCH BASIN
	AREA DRAIN
	FLARED END
	GAS LINE/GATE
	WATER LINE/GATE
	HYDRANT
	POST INDICATOR VALVE
	ELECTRIC LINE/MANHOLE
	PROP. ELECTRIC LINE/MANHOLE
	PROP. ELECTRIC TRANSFORMER
	OVERHEAD WIRE
	BUILDING LIGHT
	UTILITY POLE
	GUY WIRE
	SIGN
	POST
	CHAIN LINK FENCE
	CONCRETE CURB
	GRANITE CURB
	TREE
	TREE LINE
	STONE WALL
	BUILDING
	MINOR CONTOUR
	MAJOR CONTOUR
	SPOT ELEVATION
	EDGE OF WATER
	BITUMINOUS CONCRETE
	CONCRETE
	CORRUGATED METAL PIPE
	EDGE OF PAVEMENT
	POLYVINYL CHLORIDE
	REINFORCED CONCRETE PIPE
	STONE BOUND
	FOUND
	APPROX. LIMIT OF PROJECT BOUNDARY

REFERENCE:

- THIS PLAN IS COMPILED IN PART FROM AN ON THE GROUND SURVEY AND IN PART FROM OTHER PLANS.
- METCALF AND EDDY/ZECCO, INC. REVISED AMENDED SOW ESTIMATED LIMIT OF SOIL EXCAVATION. PLAN DATED: APRIL 8, 1991.
- NEW RINGSHOP DAM GENERAL PLAN, WORCESTER COUNTY COMMISSIONERS, WORCESTER COUNTY ENGINEERING DEPARTMENT, PLAN OF DAM ON MUMFORD RIVER, NORTHBRIDGE, FOR WHITIN MACHINE WORKS, AS FILED AND APPROVED BY THE COUNTY COMMISSIONERS, 8/22/41.
- SITE PLAN IN WHITINSVILLE, MA, BY HERITAGE DESIGN GROUP, DATED OCTOBER 20, 2004.
- THIS DRAWING IS PART OF THE APPLICATION FOR EXEMPTION MADE BY THE UNDERSIGNED THIS _____ DAY OF _____, 2005.
- MA83F COORDINATE SYSTEM USED FOR REFERENCE POINTS.

EXHIBIT G-1

FERC PROJECT NO. _____

Topographic Plan
Whitin Mill in Northbridge, Massachusetts

Date: 02/27/07

BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772
Tel.: 508-366-0560

Job No. 0968.10
Sheet No. 1 of 1
File No. 0968P002H-001

Scale: 1" = 20'

Low Impact Hydro Power Questionnaire

A. Flows

Run-of-River Monitoring Plan
(with MADFW and
US FWS Review and Approval Letters)
FERC Order Approving Run of River Monitoring Plan

BEALS AND THOMAS, INC.

Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772-2104
mail@btiweb.com

Tel: 508-366-0560
Fax: 508-366-4391
www.btiweb.com

October 7, 2008

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Committee
Mail Code: DHAC, PJ-12
888 First Street, N.E.
Washington, DC 20426

Via: Certified Mail

Reference: Water Quality/Monitoring Plan
The Alternatives Hydro Power Project
FERC Project No. 12608-00
Northbridge, Massachusetts
BTI Project No. 968.10

Dear Secretary Bose:

As required by Federal Energy Regulatory Commission (FERC) in the Order Granting Exemption from Licensing of the above-reference project, we are submitting the enclosed Run-of-River Monitoring Plan and Water Quality Monitoring Plan for approval.

For maintaining and monitoring run-of-river operation, the Order required:

The Exemptee shall, within three (3) months of the date of issuance of an exemption from licensing, prepare and file for approval by the U.S. Fish and Wildlife Service, a plan for maintaining and monitoring run-of-river operation and spillway flows at the project. The plan shall include a description of the mechanisms and structures that will be used, the level of automatic operation, the methods to be used for recording data on run-of-river operation, an implementation schedule, and a plan for maintaining the data for inspection by the Massachusetts Division of Fisheries and Wildlife, the Federal Energy Regulatory Commission, and the U.S. Fish and Wildlife Service.

The proposed Run-of-River Monitoring Plan complies with these conditions by detailing the mechanisms and procedures to be used for monitoring water level over the dam before and after use of the turbines. The Order also required a plan to monitor water quality at the project site:

The first field season following commencement of project operation, the Exemptee shall conduct a simple water quality study to determine if project operations are adversely affecting the water quality in the area immediately below the dam. The study plan shall be developed in consultation with the Massachusetts Division of Fisheries and Wildlife and the U.S. Fish and Wildlife Service, and shall require approval by the Massachusetts Division of

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Committee
October 7, 2008
Page 2

Fisheries and Wildlife and the U.S. Fish and Wildlife Service prior to implementation.

The proposed Water Quality Monitoring Plan fulfills these criteria by including two rounds of sample collection and testing, before and after the installation of the new bypass, to ensure that the project is not negatively impacting water quality.

The Run-of-River Monitoring Plan and Water Quality Monitoring Plan were reviewed and accepted by the Massachusetts Division of Fisheries and Wildlife and the United States Department of the Interior, Fish and Wildlife Service. In addition, the Water Quality Monitoring Plan was reviewed by the Massachusetts Department of Environmental Protection at the request of the Massachusetts Division of Fisheries and Wildlife. All comment letters from these agencies are included in the Appendix of both Plans.

We appreciate your assistance with this matter. If you have any questions, please feel free to contact our office at (508) 366-0560.

Very truly yours,

BEALS AND THOMAS, INC.



Kathleen D. Hervol
Project Manager

Enclosure

cc: Mr. Caleb Slater, Massachusetts Division of Fisheries & Wildlife
Ms. Melissa Grader, United States Department of the Interior, Fish and Wildlife Service
Mr. Philip Ingersoll-Mahoney, Alternatives Unlimited, Inc.
Mr. Bill Fay, Swift River Hydro Operations Company
Mr. Ken Smith

KDH/JLJ/cp/096810LT015.docx

BEALS AND THOMAS, INC.

Run-of-River Monitoring Plan

The Alternatives Hydro Power Project Mumford River (FERC Project # 12608-00)

**Town of Northbridge
(Village of Whitinsville)
County of Worcester, Massachusetts**

Presented to:

**Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426**

Presented by:

**Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772**

On Behalf of:

**Alternatives Unlimited, Inc.
54 Douglas Road
Whitinsville, MA 01586**

October 7, 2008

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2.0 WATER LEVEL MONITORING 2

3.0 DATA COLLECTION 2

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 4.2 REFILLING SEQUENCE 4

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6.0 AGENCY CONSULTATION 4

FIGURES

FIGURE 1: WATER LEVEL MONITORING LOCATIONS

APPENDICES

APPENDIX A: COMMENT LETTERS

1.0 INTRODUCTION

This Run-of-River Monitoring Plan (the Plan) was prepared in consultation with the Massachusetts Department of Fish and Wildlife (MA DFW) and the U.S. Fish and Wildlife Service (US FWS) as required by Federal Energy Regulatory Commission (FERC), in their Order Granting Exemption from Licensing (the Order). The Plan includes a description of the mechanisms and structures that will be used, the level of automatic operation, the methods to be used for recording data on run-of-river operation, an implementation schedule, and a plan for maintaining the data for inspection.

Furthermore, the Plan will ensure that the Project is in compliance with the following mandatory Section 30(c) Conditions filed by the U.S. Department of the Interior and the Massachusetts Division of Fisheries and Wildlife :

1. The Exemptee shall operate the project in a run-of-river mode, whereby inflow to the Project will equal outflow from the Project on an instantaneous basis and water levels above the dam are not drawn down for the purpose of generating power.
2. The Exemptee shall discharge a minimum of 0.1 feet (1.2 in.) of water over the entire length of the spillway at all times for the protection of in-stream habitat, water quality, and aesthetics. This will require maintaining the headpond elevation at 284.6 feet (NGVD) or higher (equivalent to 285.2 ft NAVD or higher).
3. The Exemptee shall implement a refill procedure whereby, during impoundment refilling after drawdowns for maintenance (including flashboard replacement) or emergency purposes, 90% of inflow is passed downstream and the headpond is refilled on the remaining 10% of inflow to the project.

1.1 Dam Structure and Control System

The Alternatives Unlimited (Alternatives) hydroelectric project is located on the Mumford River in the Town of Northbridge, Village of Whitinsville, Massachusetts. The Project Dam was constructed in 1941 and is called Ring Shop Dam. The dam consists of a right concrete abutment with a low level outlet and a left concrete abutment with a hydro-plant intake; a concrete ogee spillway connects the two abutments.

Flashboard risers will be installed on the spillway, with a top-of-boards elevation of 285.1 feet (NAVD). Therefore, the water surface elevation over the boards must be maintained at an elevation of 285.2 feet to meet the bypass reach discharge requirement.

The flashboards are supplied with a control system that includes a controlled source of compressed air and a means for controlled venting of air from the air bladders. The automatic system also includes a provision for local manual control. The system also includes an air compressor, a receiver tank, and various control valves.

The control system uses an all-pneumatic water level controller to automatically regulate air bladder pressure in inverse proportion to upstream water level. This system requires no electrical power to accurately maintain a constant upstream pool elevation, which is sensed by a bubbler line, over a full range of turbine gate positions and spillway flow rates.

Alternatives will install one 47 kW Kaplan Turbine at the base of the Project Dam. The turbine will be a Hll-H Automatically Adjustable Semi-Kaplan, which produces between 15 and 47 kW, depending on the flow conditions of the river.

2.0 WATER LEVEL MONITORING

The Project Dam will be operated strictly "Run-of-River", where inflow will equal outflow. No "Peaking" or "Ponding" will occur. Alternatives proposes to install an automated system to control and record future operations at the Project Dam. The system will generally consist of an electronic transducer, and a Programmable Logic Controller (PLC) with full Supervisory Control And Data Acquisition (SCADA) controls. This system will allow for the continuous, closed loop adjustment of the turbine gates and runner blade position such that the required bypass reach water surface elevation will be maintained.

The electronic transducer will be mounted on the southern abutting concrete foundation, prior to water being diverted through the turbine gates. The transducer will continuously measure the water level over the bypass spillway and will be monitored for significant deviations between readings. A staff gauge, reading in feet and tenths of feet, will also be installed at the intake structure to calibrate and visually verify water levels measured by the electronic transducer, when necessary.

The transducer will be connected to the turbine gates via a Programmable Logic Controller (PLC). The PLC system will be programmed to open and close the turbine gates in order to maintain the minimum headpond elevation. When headpond elevation is below 284.6 ft (NGVD), the turbine gates will automatically close so that all flow will be directed over the bypass reach. During higher flow conditions, the automation system will allow the project turbines to operate at full capacity and excess flow will be passed over the flashboards to the bypass reach.

3.0 DATA COLLECTION

All data collected during bypass water level and turbine flow monitoring will be documented and maintained for inspection by Massachusetts DFW, U.S. FWS, and FERC. The automation system will directly measure the headpond elevation at the Project Dam, as well as station generation, instantaneously. These readings will be averaged and recorded at 1-hour intervals by a datalogger. All data will be stored in an electronic database and will be made available for inspection.

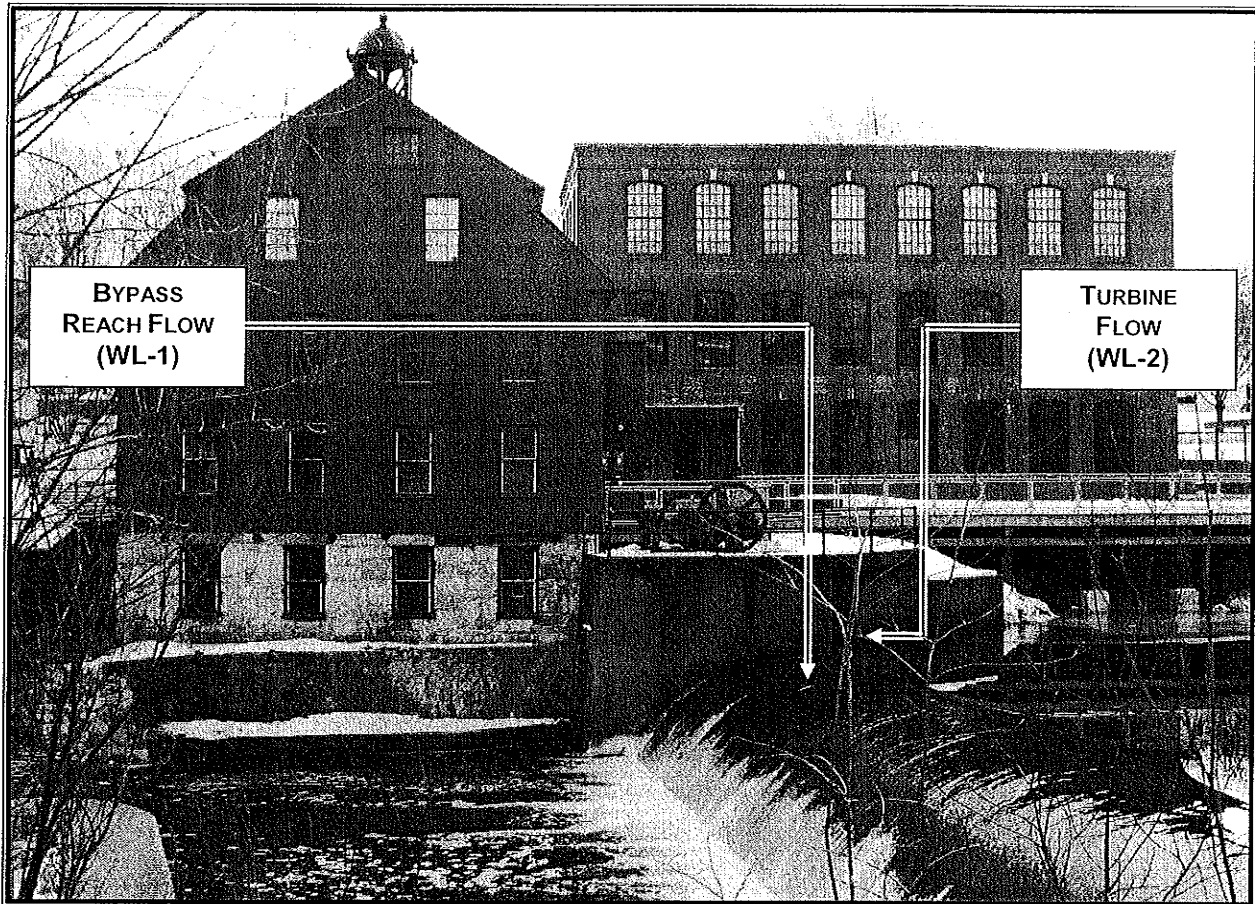


Figure 1. Monitoring stations at the Project Dam.

4.0 FLASHBOARD MAINTENANCE PROTOCOLS

Condition 4 of the Terms and Conditions required by the United States Department of the Interior Fish and Wildlife Service mandates a procedure for refilling the impoundment after any drawdown to perform maintenance activities or for emergency purposes. The following information, which satisfies this requirement, was taken from the Operation and Maintenance Manual for Automatic Flashboards prepared for the Alternatives Hydro Project.

Routine maintenance of the Project Dam includes the removal of large debris caught in the crest of the boards and replacement of damaged flashboard sections. Non-routine maintenance includes failure of the PLC, failure of the lift bags/cylinders or replacement of pneumatic/hydraulic lines. The following procedure shall be used for any of these conditions:

1. Notify the Town of Northbridge Conservation Commission that a problem has occurred. They can be reached by calling (508) 234-0817, faxing (508) 234-0814, or visiting their office at Piedmont Street, Whitinsville, MA.
2. Arrange for members of the Conservation Commission to view the problem.
3. After receiving approval by the Chairman, initiate a drawdown sequence.

At any time when drawdown is required, turbine flow will be terminated so that all river flow is directed through the bypass reach.

4.1 Drawdown Sequence

The drawdown sequence for routine maintenance consists of lowering the flashboard risers in six inch increments at 20-minute intervals. Once the flashboards are completely depressed, the low level outlet will be opened to stop water from flowing over the dam crest, equalizing the impoundment level several inches below the dam crest. After drawdown is complete, maintenance tasks can be performed as required.

4.2 Refilling Sequence

Section 30(c) Condition 3 filed by the U.S. Department of the Interior and the Massachusetts Division of Fisheries and Wildlife that requires that, during refilling, 90% of inflow is passed downstream and the headpond is refilled on the remaining 10% of inflow to the project. Therefore, at least 90% of the instantaneous inflow to the dam will be released to the bypass reach or turbine, such that minimum required flow to the bypass reach are met at all times.

The procedure for refilling the impoundment sequence will be followed after maintenance activities are complete. The flashboards should be fully raised with the outflow still flowing through the low level outlet. The low level outlet should be slowly closed in six inch increments at 20-minute intervals. Full closure of the outlet should not occur until water is flowing over the crest of the flashboards. This sequence allows the impoundment to refill without stopping the downstream flow of water.

Once the impoundment has been refilled, or in the event that refilling will take longer than anticipated, the Town of Northbridge Conservation Commission should be informed.

5.0 IMPLEMENTATION SCHEDULE

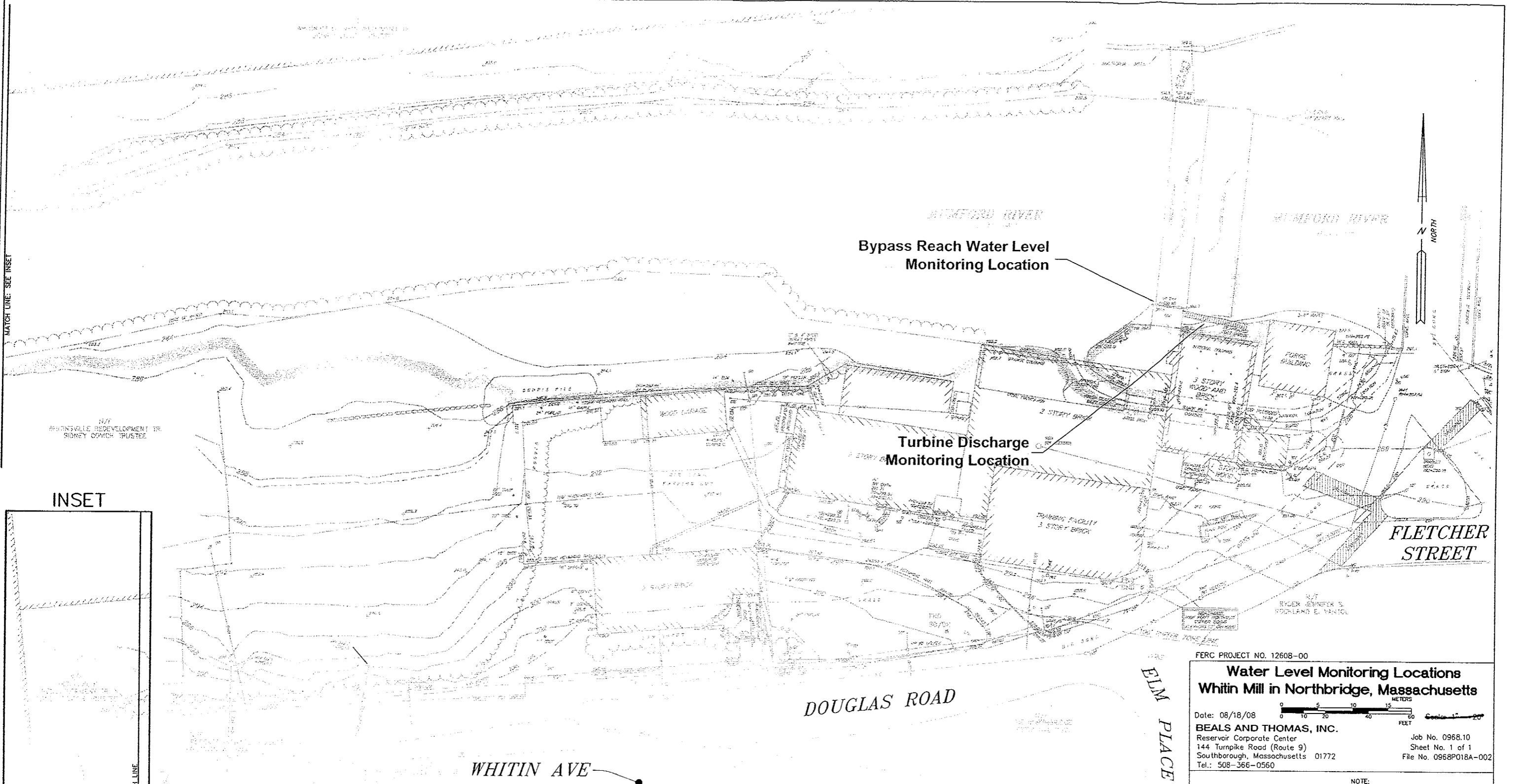
The electronic transducer, staff gauges will be installed a minimum of one month prior to the opening of the turbine gates to establish the baseline water surface elevation over the bypass reach. The water level over the bypass reach will be monitored until the requirements of the Order are satisfied.

6.0 AGENCY CONSULTATION

A draft of this plan was provided to MA DFW and US FWS. Comment letters were received and are contained in Appendix A.

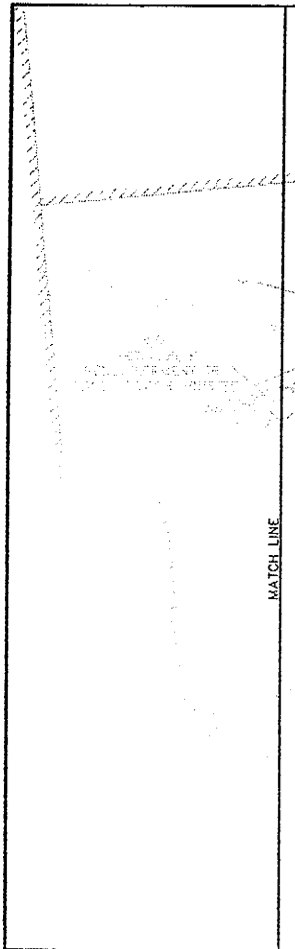
FIGURES

Figure 1: Water Level Monitoring Locations



MATCH LINE: SEE INSET

INSET



MATCH LINE

LEGEND

WATER LEVEL MONITORING LOCATION	BUILDING LIGHT	MINOR CONTOUR
SEWER LINE/MANHOLE	UTILITY POLE	MAJOR CONTOUR
DRAIN LINE/MANHOLE	GUY WIRE	SPOT ELEVATION
CATCH BASIN	SIGN	EDGE OF WATER
AREA DRAIN	POST	BIT. CONC.
FLARED END	CHAIN LINK FENCE	CONC.
GAS LINE/GATE	CONCRETE CURB	CMP
WATER LINE/GATE	GRANITE CURB	EOP
HYDRANT	TREE	PVC
POST INDICATOR VALVE	TREE LINE	RCP
ELECTRIC LINE/MANHOLE	STONE WALL	FND
OVERHEAD WIRE	BUILDING	FOUND
		APPROX. LIMIT OF PROJECT BOUNDARY

REFERENCE:

- THIS PLAN IS COMPILED IN PART FROM AN ON THE GROUND SURVEY AND IN PART FROM OTHER PLANS.
- METCALF AND EDDY/ZECCO, INC. REVISED AMENDED SOW ESTIMATED LIMIT OF SOIL EXCAVATION, PLAN DATED: APRIL 8, 1991.
- NEW RINGSHOP DAM GENERAL PLAN, WORCESTER COUNTY COMMISSIONERS, WORCESTER COUNTY ENGINEERING DEPARTMENT, PLAN OF DAM ON MUMFORD RIVER, NORTHBRIDGE, FOR WHITIN MACHINE WORKS, AS FILED AND APPROVED BY THE COUNTY COMMISSIONERS, 8/22/41.
- SITE PLAN IN WHITINSVILLE, MA, BY HERITAGE DESIGN GROUP, DATED OCTOBER 20, 2004.

FERC PROJECT NO. 12608-00

Water Level Monitoring Locations
Whitin Mill in Northbridge, Massachusetts

Date: 08/18/08

BEALS AND THOMAS, INC.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772
Tel.: 508-366-0560

Job No. 0968.10
Sheet No. 1 of 1
File No. 0968P018A-002

0 10 20 30 40 50 60
METERS
0 10 20 30 40 50 60
FEET

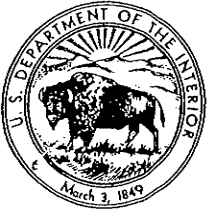
Scale: 1" = 20'

NOTE:
THIS PLAN IS A REDUCED VERSION OF THE ORIGINAL PLAN AND IS NOT TO SCALE.

APPENDICES

Appendix A

Comment Letters



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
<http://www.fws.gov/northeast/newenglandfieldoffice>

REF: FERC No. 12608
Alternatives Unlimited

September 18, 2008

Kathleen D. Hervol
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

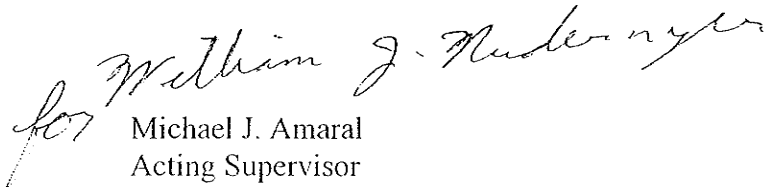
Dear Ms. Hervol:

This responds to your August 18, 2008 cover letter and accompanying revised monitoring plans for the Alternatives Hydropower Project, located on the Mumford River in Worcester County, Massachusetts. The Run of River and Water Quality Monitoring Plans are required pursuant to mandatory terms and conditions set by this office and the Massachusetts Division of Fisheries and Wildlife.

We have reviewed the revised plans and they appear to address all of the recommendations we provided in our July 16, 2008 letter commenting on the draft plans. Please consider the revised plans as approved by this office for the purpose of fulfilling the pertinent Section 30(c) conditions of the Exemption from Licensing permit for the Alternatives Project.

Thank you for this opportunity to comment. If you have any questions or require further information, please contact Melissa Grader of this office at (413) 548-8002, extension 124.

Sincerely yours,

for 
Michael J. Amaral
Acting Supervisor
New England Field Office

Cc: Alternatives Unlimited
54 Douglas Road
Whitinsville, MA 01586
FERC, Secretary
FERC/DHAC
MA DFW, Caleb Slater
MA DEP, Bob Kubit
MA Audubon, Donna Williams
Reading File
ES: MGrader:9-18-08:(603)223-2541



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
<http://www.fws.gov/northeast/newenglandfieldoffice>

REF: FERC No. 12608
Alternatives Unlimited

July 16, 2008

Kathleen D. Hervol
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

Dear Ms. Hervol:

This responds to your June 23, 2008, cover letter and accompanying draft Run-of-River and Bypass Discharge Monitoring Plan (ROR Plan) and draft Water Quality Monitoring Plan (WQ Plan) for the Alternatives Hydropower Project, located on the Mumford River in Worcester County, Massachusetts. The plans are required pursuant to mandatory terms and conditions set by this office and the Massachusetts Division of Fisheries and Wildlife (MA DFW). We have reviewed the draft plans and have the following comments.

I. ROR PLAN PROPOSAL

Monitoring System

Alternatives Unlimited (Alternatives) proposes to equip the project with a pond leveling device to accurately match the turbine conditions with flow conditions. When inflow becomes too low for efficient operation, the units [sic] will drop off-line. The required spill (0.1 feet) will be monitored using a staff gauge that will be mounted on the southern abutting concrete foundation, immediately downstream of the intake.

Data Collection

All data collected will be compiled on a spreadsheet and maintained for inspection by this office, the MA DFW, and the Federal Energy Regulatory Commission.

COMMENTS

The draft ROR Plan submitted to us lacks sufficient detail. We suggest that Alternatives use the attached plan (Appendix A) as a guide for the components that should be included in the ROR Plan. Below are some specific points that should be addressed in any revised plan submitted for our review:

- Throughout the plan, Alternatives uses the term “bypass” to describe the generating equipment. This terminology is confusing and should be changed, as resource agencies typically use that word to describe the reach of river between the dam and the tailrace discharge.
- The pond leveling device should be described in more detail. In general, new projects typically propose to use headpond level sensors in combination with a Programmable Logic Controller (PLC) and full SCADA controls. This type of system allows for the continuous, closed loop automatic adjustment of the turbine wicket gates and runner blade positions to maintain a specified water level that should ensure run-of-river operation and the required spillway discharge are continuously maintained.
- If a sensor/PLC/SCADA system will be used, the plan will need to specify the target water surface elevations for the Start, Run, and Stop settings of the control system. According to the draft plan, the top-of-boards elevation is 285.1 feet NAVD. In order to meet the spillway discharge condition, the headpond would need to be maintained at or above 285.2 feet NAVD (this elevation may need to be increased depending on the accuracy and operational tolerances of the equipment).
- The plan should contain a discussion of how the monitoring equipment will be calibrated and maintained.
- It appears that Alternatives proposes to manually record turbine discharge and staff gauge readings, then enter them into a spreadsheet that would be available for agency inspection. The staff gauge would be read weekly, while no frequency is specified for taking turbine discharge measurements. Reading and recording measurements at any interval greater than hourly is unacceptable. Typically, PLC-SCADA systems will automatically read and record water surface elevation and station generation at 15- or 30-minute intervals by a datalogger. The automation system does not directly measure turbine or spillway flow; rating curves are used to convert generation (in kW) to turbine flow, and water level elevations are used to calculate spillway discharge. We strongly recommend that Alternatives adopt this type of system (i.e., automatic, electronic, computer-based).
- By letter dated May 16, 2006, we provided mandatory Terms and Conditions for the project. Condition 4 mandates a procedure for refilling the impoundment after any drawdown to perform maintenance activities (including flashboard replacement) or for emergency purposes. The subject plan should contain a discussion of the protocol that will be followed to ensure compliance with Condition 4.
- The implementation schedule should specify when the pond leveling device will be installed.

2. WQ PLAN

PROPOSAL

Sampling Protocol

Alternatives will measure water temperature, pH and conductivity at three locations (headpond, tailwater, and tailrace) during low flow conditions on four occasions (two during dry weather and two after rain events) during July and August. During those sampling events, Alternatives also will collect samples for laboratory analysis of dissolved oxygen (DO) and total suspended solids. This protocol will be followed before the project goes on-line to determine baseline conditions, and then again after the project starts generating to assess if project operations are adversely affecting water quality.

Data Organization

All data collected will be compiled on a spreadsheet that compares the results for both the pre- and post-construction sampling rounds.

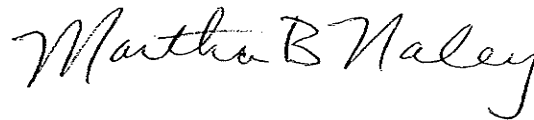
COMMENTS

While we have no objections to the proposed water quality monitoring plan, below we provide comments on the protocol:

- The draft plan does not specify the time of day the samples will be taken. We recommend collecting water samples for DO analysis in the early morning (i.e., before 8:00 a.m.).
- Because our primary interest is to assess the project's impact on water quality, all post-project measurements/samples should be taken during a period when inflow is low, but within the hydraulic capacity of the unit (i.e., only the minimum spill is being discharged over the dam).
- The plan does not describe how monitoring results will be distributed to the resource agencies. We recommend that a draft Water Quality Monitoring Report be provided to this office, the MA DFW and the Massachusetts Department of Environmental Protection within three months of completing the post-project sampling.

Thank you for this opportunity to comment. If you have any questions regarding these comments, please contact Melissa Grader of this office at (413) 548-8002, extension 124.

Sincerely yours,



Martha B. Naley
Acting Supervisor
New England Field Office

Enclosure

cc: Alternatives Unlimited
54 Douglas Road
Whitinsville, MA 01586
FERC, Secretary
FERC/DHAC
MA DFW, Caleb Slater
MA DEP, Bob Kubit
MA Audubon, Donna Williams
Reading File
ES: MGrader:7-16-08:(603)223-2541



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

June 27, 2008

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Alternatives Hydro Project
FERC No. 12608
Comment on Draft Run-of-River and Bypass Discharge Monitoring Plan
Comment on Draft Water Quality Monitoring Plan

Dear Secretary Bose,

The Massachusetts Division of Fisheries and Wildlife (Division) is the agency responsible for the protection and management of the fish and wildlife resources of the Commonwealth. As such we monitor operations at hydroelectric projects within the Commonwealth. The Division has the following comments in response to the "Draft Run-of-River and Bypass Discharge Monitoring Plan" and "Draft Water Quality Monitoring Plan", submitted on June 23, 2008 by Alternatives Unlimited Hydro Project (P-12608), Mumford River, Northbridge, Massachusetts.

Background

An Exemption from Licensing for the Alternatives Project was issued on December 8, 2006. The authorized facilities at the project include: (1) the 127-foot-long Ring Shop Dam consisting of a concrete 9.5-foot-high spillway with a crest elevation of 282.6 feet North American Vertical Datum (NAVD), topped with 2.5-foot-high flashboards (2) a 2-acre reservoir with a water surface elevation of 285.2 feet NAVD (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round) (3) an 8-foot-wide headgate intake structure with trashracks; (4) a concrete support structure housing a 6-foot diameter, 24-foot-long penstock; (7) three cross flow turbine generating units with a total installed capacity of 45 kW.

An order amending this exemption was issued on March 21, 2008. The amendment allows the Alternatives to install one 47-kW semi-Kaplan turbine generating unit instead of installing three 15-kW cross flow turbine generating units, as authorized in the exemption. The maximum hydraulic capacity of the project has been decreased from 90

www.masswildlife.org

Division of Fisheries and Wildlife
Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-6301
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

cubic feet per second (cfs) to 70 cfs, and the minimum hydraulic capacity has been increased from 18 cfs to 23.1 cfs.

Draft Run-of-River and Bypass Discharge Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a "Draft Run-of-River and Bypass Discharge Monitoring Plan". The Draft Plan states that the project will operate strictly Run-of-River, where outflow equals inflow on an instantaneous basis, and that a minimum of 0.1 foot (1.2 inches) of water will flow over the project spillway at all times. The draft plan proposes to monitor and record turbine flow. The Draft plan proposes that flow over the spillway will be visually monitored by a staff gauge installed on the dam crest with spill levels recorded weekly.

Comments

General

There seems to be some misunderstanding of the terminology being used. In the Draft Plan the Alternatives discuss monitoring the "Bypass Discharge". It is unclear if this refers to the turbine flow or the flow in the bypass reach. Flow through the turbine should be referred to as "turbine flow" while flow in the section of the river in between the dam and the tailrace should be referred to as "bypass reach flow".

Section 2.0

The draft plan lacks many important details. What is the "bypass structure" that will be equipped with a "pond leveling device"? What is this "pond leveling device"? How, exactly, will it "accurately match the turbine conditions with flow conditions"? How, exactly, will "all minimum stream flow conditions be maintained"? This project does not have a gate to deliver the minimum flow into the bypass reach, so I must assume that the "bypass structure" is the turbine head gate. Please describe the "pond leveling device" (physical description, proposed location, accuracy). I would propose the use of an electronic transducer located just up stream of the dam to continuously monitor the water surface elevation in the project reservoir. This transducer must be connected to the turbine gates via a Programmable Logic Control Unit (PLC)- both must have a level of accuracy and precision which will maintain a water surface elevation of at least 285.2 feet NAVD in the project reservoir (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round). A properly programmed PLC system will open and close the turbine gates in order to maintain the minimum project reservoir water surface elevation. Maintaining this minimum reservoir water surface elevation will ensure both Run-of-River operation and delivery if the required bypass reach flow. Electronic records of the water surface elevation and turbine gate settings should be saved to a database at least hourly.

Section 3.1

The Draft Plan proposes installing a staff gauge on the project spillway and reporting gauge readings weekly. Daily (or more frequent) manual monitoring would be useful as a ground truth for the hourly electronic water surface elevation data collected by the transducer in the project reservoir and will help the project operators fine tune the PLC to

be sure that the minimum flow requirements are met during the first few months of operation. Weekly visual monitoring of spillway water elevations is not sufficient by itself to meet the exemption requirements for Run-of-River operation and Minimum Flow monitoring.

Section 3.2

This section should refer to “turbine flow” rather than “bypass discharge flow”. Please describe what parameters of turbine operation will be monitored and recorded (flow, gate setting, and/or generation). As described previously- these parameters should be recorded at least hourly and paired with reservoir water surface elevation data.

Section 4.0

Data collected should include hourly water surface elevation of the project reservoir paired with hourly turbine data (gate settings, flow, and/or generation). This data should be stored in an electronic data base and be available for inspection.

Draft Water Quality Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a “Draft Water Quality Monitoring Plan”. The Draft Plan describes how the project owner will sample water quality parameters (temperature, pH, conductivity, dissolved oxygen, and total suspended solids) at three locations (project impoundment, bypass reach, and below project tailrace) during the first summer after the project begins to generate.

Comments

General

The Draft Plan is acceptable; the Division expects that the MA DEP may have more specific comments.

Thank you for this opportunity to comment.

Sincerely,



Caleb Slater, Ph.D.
Anadromous Fish Project Leader

cc Bob Kubit, MADEP
Melissa Grater, USFWS
Kathleen Hervol, Beals and Thomas, Inc.



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

August 27, 2008

Kathleen Hervol
Beals and Thomas, INC.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

RE: Alternatives Hydro Project
FERC No. 12608
Comment on Draft Run-of-River and Bypass Discharge Monitoring Plan
Comment on Draft Water Quality Monitoring Plan

Dear Secretary Bose,

The Massachusetts Division of Fisheries and Wildlife (Division) is the agency responsible for the protection and management of the fish and wildlife resources of the Commonwealth. As such we monitor operations at hydroelectric projects within the Commonwealth. The Division has the following comments in response to the draft "Run-of-River Monitoring Plan" and draft "Water Quality Monitoring Plan", submitted on August 18, 2008 by Alternatives Unlimited Hydro Project (P-12608), Mumford River, Northbridge, Massachusetts.

Background

An Exemption from Licensing for the Alternatives Project was issued on December 8, 2006. The authorized facilities at the project include: (1) the 127-foot-long Ring Shop Dam consisting of a concrete 9.5-foot-high spillway with a crest elevation of 282.6 feet North American Vertical Datum (NAVD), topped with 2.5-foot-high flashboards (2) a 2-acre reservoir with a water surface elevation of 285.2 feet NAVD (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round) (3) an 8-foot-wide headgate intake structure with trashracks; (4) a concrete support structure housing a 6-footdiameter, 24-foot-long penstock; (7) three cross flow turbine generating units with a total installed capacity of 45 kW.

An order amending this exemption was issued on March 21, 2008. The amendment allows the Alternatives to install one 47-kW semi-Kaplan turbine generating unit instead of installing three 15-kW cross flow turbine generating units, as authorized in the exemption. The maximum hydraulic capacity of the project has been decreased from 90 cubic feet per second (cfs) to 70 cfs, and the minimum hydraulic capacity has been increased from 18 cfs to 23.1 cfs.

Draft Run-of-River Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a draft "Run-of-River and Bypass Discharge Monitoring Plan". The Draft Plan states that the project will operate strictly Run-of-River, where outflow equals inflow on an instantaneous basis, and that a minimum of 0.1 foot (1.2 inches) of water will flow over the project spillway at all times.

Comments

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-6301

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

General

The Draft Plan is acceptable. In the final draft the water surface elevation datum cited should be consistent (NAVD or NGVD) or both should be used to avoid confusion. In section 1.0 the project impoundment water surface minimum elevation is described in both NGVD (284.6 feet) and NAVD (286.2 feet). In section 1.1 it is described only in NAVD (286.2 feet), then in the next section (2.0) it is only described in NAVD (286.2 feet) only, this cross reference allows the casual reader to assume that the project impoundment will be drawn down 6 inches (the difference between the two measurements) when in fact they are referring to the same elevation.

The final plan should reference the river flow at which the inflatable flashboards will deflate to allow maximum spillway capacity to pass this high flow and at what river flow they will re-inflate to maintain the project impoundment minimum surface elevation.

Draft Water Quality Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a "Draft Water Quality Monitoring Plan". The Draft Plan describes how the project owner will sample water quality parameters (temperature, pH, conductivity, dissolved oxygen, and total suspended solids) at three locations (project impoundment, bypass reach, and below project tailrace) during the first summer after the project begins to generate.

Comments

General

The Draft Plan is acceptable; the Division expects that the MA DEP may have more specific comments.

Thank you for this opportunity to comment.

Sincerely,



Caleb Slater, Ph.D.
Anadromous Fish Project Leader

cc Bob Kubit, MADEP
Melissa Grater, USFWS



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Kathleen Hervol, Project Manager
Beals and Thomas, Inc.
144 Turnpike Road
Southborough MA 01772-2104

September 10, 2008

Re: Alternatives Hydropower Project
FERC Project #12608

Dear Ms. Hervol,

The Massachusetts Department of Environmental Protection (the Department) would like to add comments to the draft Water Quality Monitoring Plan dated August 18, 2008 for the Alternatives Hydropower Project (FERC Project #12608), located on the Mumford River in Northbridge, Massachusetts.

1. Dry weather should be defined as no precipitation 24 hours before the sample is taken.
2. I recommend not sampling after rain events. By doing so, it becomes very difficult to duplicate sampling conditions from one year to the next when considering factors such as rain intensity and time of concentration. Comparing pre-construction to post-construction samples is valid when collected under the same conditions.
3. The statement "A sample must be collected and transported to the laboratory to measure dissolved oxygen" is not true. Dissolved oxygen could be measured with a properly calibrated water quality meter. To be clear, the proposed method in the plan is adequate.

If you have any questions, please call me at 508/767-2854.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Kubit".

Robert Kubit, P.E.
Environmental Engineer

Cc: Caleb Slater/MADFW
Melissa Grader/USFWS

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Alternatives Unlimited, Inc.

Project No. 12608-009

ORDER APPROVING RUN-OF-RIVER MONITORING PLAN PURSUANT TO
ARTICLE 21

(Issued December 12, 2008)

On October 14, 2008, Alternatives Unlimited, Inc. (exemptee) filed its Run-of-River Monitoring Plan for the exempted Alternatives Project. The project is located on the Mumford River in Worcester County, Massachusetts.

EXEMPTION REQUIREMENTS

Article 21 of the Order Granting Exemption from Licensing (5 MW or less),¹ issued December 8, 2006, lists several plans to be filed for Commission approval that are required as part of the terms and conditions issued by the U.S. Department of the Interior (USDOI) and the Massachusetts Division of Fisheries and Wildlife (MDFW) (collectively: agencies) and are contained in Appendices A and B of the December 2006 order. In article 21, the Commission reserved the right to make changes to any plan submitted and required that the exemptee not implement any plan unless notified by the Commission that the plan has been approved. Upon Commission approval the plan becomes a requirement of the exemption from licensing and the exemptee is required to implement the plan or changes in project operations or facilities, including any changes required by the Commission.

Condition no. 3 of Appendix A and no. 2 of Appendix B require the exemptee to develop and file a plan for maintaining and monitoring run-of-river operation and spillway flows at the project. The plan is to include a description of the mechanisms and structures that will be used, the level of automatic operation, the methods to be used for recording data on run-of-river operation, an implementation schedule, and a plan for maintaining the data for inspection by the agencies and the Commission.

¹ 117 FERC ¶ 62, 219 (2006)

EXEMPTEE'S PLAN

The exemptee's plan provides that flashboard risers will be installed on top of the spillway of the project dam, called the Ring Shop dam, with a top-of-boards elevation of 285.1 feet (ft) North American Vertical Datum (NAVD). The water surface elevation of the headpond will be maintained at elevation 285.2 ft NAVD, thereby discharging a minimum of 0.1 feet of flow over the entire length of the spillway at all times. The flashboards are supplied with a control system that will maintain pond level either automatically or that can be set for local manual control. The control system will use an all-pneumatic water level controller to maintain a constant upstream pool elevation. The monitoring system will be comprised of an electronic transducer and programmable logic controller (PLC) with full Supervisory Control and Data Acquisition (SCADA) controls. This system will allow for continuous closed loop adjustment of the turbine gates and runner blade position such that required bypass reach flow and water surface elevation will be maintained. The PLC will be programmed to open and close the turbine gates in order to maintain the headpond and, when the headpond elevation drops to 285.2 ft NAVD, the turbine gates will close so that all flow will be directed over the spillway. The SCADA will directly measure headpond elevation as well as station generation, instantaneously, with readings averaged and recorded at one-hour intervals by a data logger. All data will be stored and available for inspection by the agencies and the Commission.

The plan also provides measures to be implemented for headpond draw down and refilling during periods when draw down of the headpond is required for maintenance activities or for emergency purposes. During routine maintenance, the flashboards will be lowered in 6-inch increments at 20 minute intervals. Once the flashboards are down, a low level outlet can be opened to stop flow over the spillway crest, equalizing the impoundment level several inches below the crest. During refilling of the impoundment, 90 percent of the instantaneous inflow to the impoundment will be released to the bypass reach or turbine, such that a minimum flow to the bypass reach is met at all times. Once the flashboards are raised, the low level outlet will be closed in 6-inch increments over 20 minute intervals. Full closure of the outlet will not occur until water is flowing over the flashboards. During non-routine draw down of the impoundment (such as for emergency purposes), the exemptee will contact the Town of Northbridge Conservation Commission, arrange for members of the Commission to observe the situation, and then initiate the drawdown sequence. Finally the plan notes that the transducer and staff gages will be installed a minimum of one-month prior to the opening of the turbine gates.

CONSULTATION

On August 18, 2008, the exemptee provided a revised draft run-of-river monitoring plan for review to the USDOI and MDFW. The USDOI and MDFW in

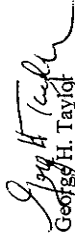
letters dated September 18, 2008, and August 27, 2008, respectively, concurred with the final plan.

DISCUSSION/CONCLUSION

The exemptee's filing includes the details of its run-of-river operation and how flow monitoring will be implemented at the Alternatives Project. The plan was developed with the requisite consultation with the USDOJ and MDFW and meets the requirement of Article 21 of the Order Granting Exemption from Licensing (5 MW or less), issued December 8, 2006. The licensee's run-of-river monitoring plan, filed on October 14, 2008, should therefore be approved.

The Directors orders:

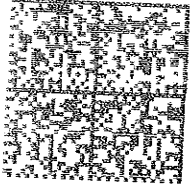
- (A) Alternatives Unlimited, Inc.'s Run-of-River Monitoring Plan for the Alternatives Project, filed on October 14, 2008, pursuant to Article 21 of the Order Granting Exemption from Licensing (5 MW or less), issued December 8, 2006, is approved.
- (B) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 CFR § 385.713.


 George H. Taylor
 Chief, Biological Resources Branch
 Division of Hydropower Administration
 and Compliance

FEDERAL ENERGY REGULATORY COMMISSION
 WASHINGTON D.C. 20426
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P-12608

Kathleen D Herold
 BEALS & THOMAS, INC
 Reservoir Corporate Center
 144 Turnpike Road (Route 9)
 Southborough MA 01772-2104

01772-2104

Low Impact Hydropower Questionnaire

B. Water Quality

MASS DEP Water Quality Standards Letter
401 Water Quality
Certification Waiver Letter

Water Quality Monitoring Plan
(with MA DFW and
US FWS Review Letters)

FERC Order Approving Run of River Monitoring Plan



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

DEVAL L. PATRICK
Governor

TIMOTHY P. MURRAY
Lieutenant Governor

IAN A. BOWLES
Secretary

LAURIE BURT
Commissioner

Kathleen Hervol
Beals and Thomas, Inc.
144 Turnpike Road
Southborough MA 01772-2104

December 22, 2009

Re: Alternatives Unlimited Hydro
Low Impact Hydro Certification
FERC Project #12608

Dear Ms. Hervol,

The Massachusetts Department of Environmental Protection is in receipt of your December 22, 2009 email requesting written confirmation that the above referenced project meets the MA Water Quality Standards.

It is the Department's opinion that the Alternatives Unlimited Hydro Project, FERC Project #12608 does meet MA Water Quality Standards.

If you have any questions, please call me at 508/767-2854.

Sincerely,

A handwritten signature in black ink, appearing to read "R. Kubit".

Robert Kubit, P.E.
Environmental Engineer

Cc: Caleb Slater, MADFW



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

Kathleen Hervol, Project Manager
Beals and Thomas, Inc.
144 Turnpike Road
Southborough MA 01772-2104

August 5, 2005

Re: Alternatives Unlimited Hydro Project

Dear Ms. Hervol,

The Massachusetts Department of Environmental Protection (the Department) is in receipt of your June 21, 2005 letter requesting reconsideration of the requirement for State 401 Water Quality Certification for this project.

After consultation with the Massachusetts Division of Fisheries and Wildlife, it is the opinion of the Department that the requirement for State 401 Water Quality Certification for this project be waived. This decision is based primarily upon the location of the project and the inclusion of needed water quality based conditions in the FERC exemption.

Please note the Department is waiving the requirement to obtain a 401 for this project only and retains the option to require a 401 for any other exemption application.

If you have any questions, please call me at 508/767-2854.

Sincerely,

A handwritten signature in black ink, appearing to read "Robert Kubit".

Robert Kubit, P.E.
Environmental Engineer

Cc: Philip Ingersoll-Mahoney, Alternatives Unlimited
Caleb Slater, MADFW
Robert Kimball, MADEP, CERO
Edward Lee, FERC

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.
<http://www.state.ma.us/dep> • Phone (508) 792-7470 • Fax (508) 791-4131

Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772-2104

Tel. 508-366-0560
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mail@btiweb.com
http://www.btiweb.com

June 21, 2005

Mr. Robert Kubit, PE
Commonwealth of Massachusetts
Department of Environmental Protection
Division of Wastewater Management
627 Main Street, 2nd Floor
Worcester, MA 01608

Via: U. S. Mail

Reference: Comments to Initial Consultation Meeting
Alternatives Unlimited Hydro Project
Northbridge, Massachusetts
BTI Project No. 0968.07

Dear Mr. Kubit:

As discussed, please find enclosed the revised turbine locations plans for the Alternatives Hydro Project for your review. Note that the turbines are now proposed to be located on the downstream side of the waste gate adjacent to the Mumford River and not under the existing mill complex as originally presented. This change was due to structural concerns with the existing tailrace, which runs under the mill buildings.

Based on these revised plans, we are requesting that you reconsider your requirement for a State 401 Water Quality Certification for this project. Under this scenario, the low flow concerns at the base of the dam would be eliminated. As discussed at the December 16, 2004 Initial Consultation meeting, the Department of Fisheries and Wildlife, as well as yourself, indicated concerns of a stagnant pool developing at the base of the dam, since the water would be diverted through the existing tailrace further downstream. With the turbines now proposed to be located at the base of the dam, the turbines will discharge water directly at the base of the dam therefore replenishing the pool and not impacting the water quality. Note that Alternatives still plans to allow a small amount of water to come over the flashboards (dam) for aesthetic purposes.

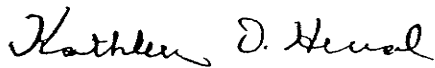
Although you have indicated the 401 Water Quality Certification process should be fairly straight forward. Please note that this state permit will require this project to file an ENF under the MEPA process, thus putting more financial burden on Alternatives, which as you know is a non-profit organization. Also based on our discussion with FERC, a 401 Water Quality Certification is not required for an Exemption from Licensing. Based on your letter dated January 21, 2005, it is our understanding that your office requested an interpretation for FERC regarding this matter, but have not received an official response as yet.

Mr. Robert Kubit, PE
Commonwealth of Massachusetts
Department of Environmental Protection
Division of Wastewater Management
June 21, 2005
Page 2

We appreciate your consideration in this matter. Please do not hesitate to call should you have any comments or questions.

Very truly yours,

BEALS AND THOMAS, INC.



Kathleen D. Herval
Project Manager

cc: Philip Ingersoll-Mahoney, Alternatives Unlimited
Caleb Slater, Commonwealth of Massachusetts, Division of Fisheries & Wildlife
Edward Lee, FERC

Attachments

KDH/cp/096807LT023

BEALS AND THOMAS, INC.

Water Quality Monitoring Plan

The Alternatives Hydro Power Project Mumford River (FERC Project # 12608-00)

**Town of Northbridge
(Village of Whitinsville)
County of Worcester, Massachusetts**

Presented to:

**Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426**

Presented by:

**Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road
Southborough, MA 01772**

On Behalf of:

**Alternatives Unlimited, Inc.
54 Douglas Road
Whitinsville, MA 01586**

October 7, 2008

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- APPENDIX B: DATA COLLECTION SPREADSHEETS
- APPENDIX C: LABORATORY ANALYSIS DOCUMENTATION

1.0 INTRODUCTION

The Alternatives Unlimited (Alternatives) hydroelectric project is located on the Mumford River in the Town of Northbridge, Village of Whitinsville, Massachusetts. The Project Dam was constructed in 1941 and is called Ring Shop Dam. The dam consists of a right concrete abutment with a low level outlet and a left concrete abutment with a hydro-plant intake; a concrete ogee spillway connects the two abutments.

Alternatives will install one 47 kW Kaplan Turbine at the base of the Project Dam. The turbine will be a H11-H Automatically Adjustable Semi-Kaplan, which produces between 15 and 47 kW, depending on the flow conditions of the river. The Project is to be operated strictly "Run-of-River," meaning inflow will equal outflow.

This Water Quality Monitoring Plan (the Plan) was prepared in consultation with the Massachusetts Department of Fish and Wildlife and the U.S. Fish and Wildlife Service as required by Federal Energy Regulatory Commission (FERC), in their Order Granting Exemption from Licensing (the Order). The purpose of the Plan is to determine if project operations are adversely affecting the water quality in the area immediately below the Project Dam.

2.0 METHODOLOGY

2.1 Sampling Locations and Frequency

A total of three (3) surface water-sampling locations are proposed, one upstream of the dam and two downstream of the Project Dam. The first water sampling location (SW-1) is located near the south bank of the river, upstream of the turbine intake. SW-2 is located on the north side of the river, downstream of the Project Dam apron, while SW-3 is located on the south side of the river, directly downstream of the tailrace. Figure 1 depicts the surface water sampling locations. Samples will be collected in early morning (before 8:00 a.m.).

All sampling will occur during July and August to identify baseline conditions upstream and downstream of the Project Dam during low-flow conditions. At a minimum, two separate samples will be collected during dry weather. Dry weather is defined as no precipitation 24 hours prior to the sample collection time.

In the summer immediately following project completion, the same sampling protocol will be repeated to determine the effect of the project on the Mumford River water quality. To best determine the impact of the project on water quality, post-project samples will be taken during a period when inflow is low (i.e. when only the minimum spill is being discharged over the dam).

Water quality is not anticipated to change notably from the pre-construction to post-construction observations. However, should there be a noted difference, additional

sampling may be undertaken, and further actions necessary to improve post-project conditions will be identified.

2.2 Sample Collection and Analysis

The Mumford River is designated as a Class B Stream, which provides habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. It is further classified as a warm-water river. The Department of Environmental Protection 303(d) List has identified the following pollutants as stressors in the river: pH, organic enrichment, low dissolved oxygen (DO), and pathogens. Based on these pollutants and the possible affects that the new turbine in the Project Dam may have on water quality, the following list of monitoring parameters was developed:

Parameter	Testing Method
Water Temperature	On-site with Water Quality Meter
pH	On-site with Water Quality Meter
Conductivity	On-site with Water Quality Meter
Dissolved Oxygen	Laboratory Analysis
Total Suspended Solids	Laboratory Analysis

As shown in the table above, several of these parameters can be measured on-site using a water quality meter provided by a certified laboratory. However, a sample must be collected and transported to the laboratory total suspended solids levels. Dissolved oxygen may be measured on-site with a properly calibrated water quality meter, or tested for at the laboratory. The Bottle Inversion Method, described below, will be utilized to collect surface water samples:

1. Prior to collecting the laboratory sample, a water quality meter will test the pH, temperature, and conductivity of the river water at the sample location.
2. A clean sample bottle provided by the laboratory will be secured to the end of a telescoping extension rod using a beaker clamp. The bottle cap will not be removed until just prior to sampling.
3. While standing on the bank of the stream or river, the rod will be extended out over the water and the sample bottle will be lowered just below the water surface. Care will be taken to not disturb the underlying sediment.
4. After the bottle is capped, a sample label and custody seal will be attached to the bottle and the bottle immediately placed into an ice-packed cooler.
5. A record of every sample collected will be maintained, and every bottle will be clearly marked with a waterproof label. The field record will provide positive sample identification as well as the name of the sample collector, the date, time and exact location of the sample collection point, and results of all field water

quality measurements. Other information such as weather and stream-flow conditions will also be noted.

6. The collected samples will be transported to a certified laboratory in a cooler at a temperature of 4 degrees Celsius. The total time between sample collection and laboratory drop-off will be less than 1 day.

Water quality at the site will be monitored until the requirements of the Order are satisfied.

3.0 DATA ORGANIZATION

Two Data Collection Spreadsheets are included with this Water Quality Monitoring Plan in Appendix A to compile the data collected during the water quality testing. The first spreadsheet is to be used to present the testing results for a single sampling event, while the second spreadsheet compares the results for both the pre- and post-construction sampling rounds. Copies of laboratory analysis documentation will be included in Appendix B as it is received.

Within three months of the post-project water quality sampling, a draft Water Quality Monitoring Report will be compiled and provided to the Massachusetts Department of Fish and Wildlife and the U.S. Fish and Wildlife Service, and the Massachusetts Department of Environmental Protection.

4.0 AGENCY CONSULTATION

A draft of this plan was provided to MA DFW and US FWS. Comment letters were received and are contained in Appendix A.

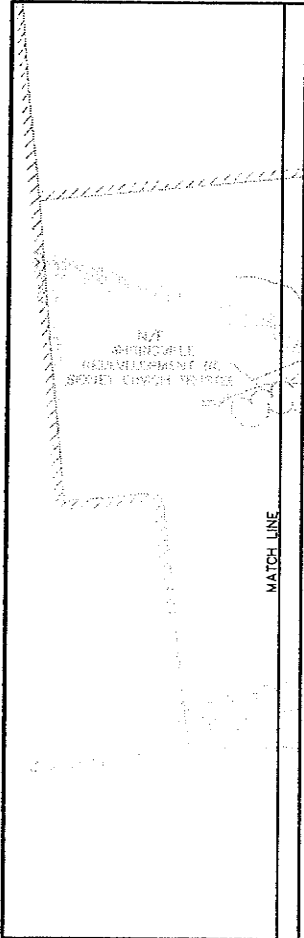
FIGURES

Figure 1: Water Quality Sampling Locations

MATCH LINE - SEE INSET

N/T
WHITINSVILLE REDEVELOPMENT TR.
SUNNEY COWCH TRUSTEE

INSET



MATCH LINE

WHITINSVILLE
SUNNEY COWCH TRUSTEE

WQ2

MEMPHIS STYRE

WQ3

TURNE
BUILDING

N/T
HYDRA JENNER S.
RACELAND E. VANTOL

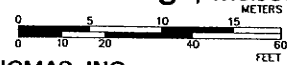
FLETCHER
STREET

T.M.
PLACE

FERC PROJECT NO. 12608-00

Water Quality Monitoring Sample Locations Whitin Mill in Northbridge, Massachusetts

Date: 08/18/08



Scale: 1" = 20'

BEALS AND THOMAS, INC.

Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, Massachusetts 01772
Tel: 508-366-0560

Job No. 0968.10
Sheet No. 1 of 1
File No. 0968P018A-001

LEGEN



- WA
- SEI
- DR
- CA
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- IONERS,
- FL/ILED
- GA
- WA
- HYE
- PO
- ELI
- OV

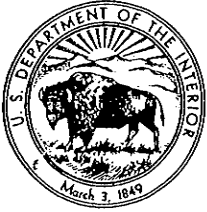
NOTE:

THIS PLAN IS A REDUCED VERSION
OF THE ORIGINAL PLAN AND IS NOT
TO SCALE.

APPENDICES

Appendix A

Comment Letters



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
<http://www.fws.gov/northeast/newenglandfieldoffice>

REF: FERC No. 12608
Alternatives Unlimited

September 18, 2008

Kathleen D. Hervol
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

Dear Ms. Hervol:

This responds to your August 18, 2008 cover letter and accompanying revised monitoring plans for the Alternatives Hydropower Project, located on the Mumford River in Worcester County, Massachusetts. The Run of River and Water Quality Monitoring Plans are required pursuant to mandatory terms and conditions set by this office and the Massachusetts Division of Fisheries and Wildlife.

We have reviewed the revised plans and they appear to address all of the recommendations we provided in our July 16, 2008 letter commenting on the draft plans. Please consider the revised plans as approved by this office for the purpose of fulfilling the pertinent Section 30(c) conditions of the Exemption from Licensing permit for the Alternatives Project.

Thank you for this opportunity to comment. If you have any questions or require further information, please contact Melissa Grader of this office at (413) 548-8002, extension 124.

Sincerely yours,

for William J. Mader

Michael J. Amaral
Acting Supervisor
New England Field Office

Cc: Alternatives Unlimited
54 Douglas Road
Whitinsville, MA 01586
FERC, Secretary
FERC/DHAC
MA DFW, Caleb Slater
MA DEP, Bob Kubit
MA Audubon, Donna Williams
Reading File
ES: MGrader:9-18-08:(603)223-2541



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENERGY & ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Watershed Management, 627 Main Street 2nd Floor, Worcester, MA 01608

DEVAL L. PATRICK
Governor

IAN A. BOWLES
Secretary

TIMOTHY P. MURRAY
Lieutenant Governor

LAURIE BURT
Commissioner

Kathleen Hervol, Project Manager
Beals and Thomas, Inc.
144 Turnpike Road
Southborough MA 01772-2104

September 10, 2008

Re: Alternatives Hydropower Project
FERC Project #12608

Dear Ms. Hervol,

The Massachusetts Department of Environmental Protection (the Department) would like to add comments to the draft Water Quality Monitoring Plan dated August 18, 2008 for the Alternatives Hydropower Project (FERC Project #12608), located on the Mumford River in Northbridge, Massachusetts.

1. Dry weather should be defined as no precipitation 24 hours before the sample is taken.
2. I recommend not sampling after rain events. By doing so, it becomes very difficult to duplicate sampling conditions from one year to the next when considering factors such as rain intensity and time of concentration. Comparing pre-construction to post-construction samples is valid when collected under the same conditions.
3. The statement "A sample must be collected and transported to the laboratory to measure dissolved oxygen" is not true. Dissolved oxygen could be measured with a properly calibrated water quality meter. To be clear, the proposed method in the plan is adequate.

If you have any questions, please call me at 508/767-2854.

Sincerely,

Robert Kubit, P.E.
Environmental Engineer

Cc: Caleb Slater/MADFW
Melissa Grader/USFWS



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

August 27, 2008

Kathleen Hervol
Beals and Thomas, INC.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

RE: Alternatives Hydro Project
FERC No. 12608
Comment on Draft Run-of-River and Bypass Discharge Monitoring Plan
Comment on Draft Water Quality Monitoring Plan

Dear Secretary Bose,

The Massachusetts Division of Fisheries and Wildlife (Division) is the agency responsible for the protection and management of the fish and wildlife resources of the Commonwealth. As such we monitor operations at hydroelectric projects within the Commonwealth. The Division has the following comments in response to the draft "Run-of-River Monitoring Plan" and draft "Water Quality Monitoring Plan", submitted on August 18, 2008 by Alternatives Unlimited Hydro Project (P-12608), Mumford River, Northbridge, Massachusetts.

Background

An Exemption from Licensing for the Alternatives Project was issued on December 8, 2006. The authorized facilities at the project include: (1) the 127-foot-long Ring Shop Dam consisting of a concrete 9.5-foot-high spillway with a crest elevation of 282.6 feet North American Vertical Datum (NAVD), topped with 2.5-foot-high flashboards (2) a 2-acre reservoir with a water surface elevation of 285.2 feet NAVD (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round) (3) an 8-foot-wide headgate intake structure with trashracks; (4) a concrete support structure housing a 6-foot diameter, 24-foot-long penstock; (7) three cross flow turbine generating units with a total installed capacity of 45 kW.

An order amending this exemption was issued on March 21, 2008. The amendment allows the Alternatives to install one 47-kW semi-Kaplan turbine generating unit instead of installing three 15-kW cross flow turbine generating units, as authorized in the exemption. The maximum hydraulic capacity of the project has been decreased from 90 cubic feet per second (cfs) to 70 cfs, and the minimum hydraulic capacity has been increased from 18 cfs to 23.1 cfs.

Draft Run-of-River Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a draft "Run-of-River and Bypass Discharge Monitoring Plan". The Draft Plan states that the project will operate strictly Run-of-River, where outflow equals inflow on an instantaneous basis, and that a minimum of 0.1 foot (1.2 inches) of water will flow over the project spillway at all times.

Comments

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-6301

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

General

The Draft Plan is acceptable. In the final draft the water surface elevation datum sited should be consistent (NAVD or NGVD) or both should be used to avoid confusion. In section 1.0 the project impoundment water surface minimum elevation is described in both NGVD (284.6 feet) and NAVD (286.2 feet). In section 1.1 it is described only in NAVD (286.2 feet), then in the next section (2.0) it is only described in NAVD (286.2 feet) only, this cross reference allows the casual reader to assume that the project impoundment will be drawn down 6 inches (the difference between the two measurements) when in fact they are referring to the same elevation.

The final plan should reference the river flow at which the inflatable flashboards will deflate to allow maximum spillway capacity to pass this high flow and at what river flow they will re-inflate to maintain the project impoundment minimum surface elevation.

Draft Water Quality Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a "Draft Water Quality Monitoring Plan". The Draft Plan describes how the project owner will sample water quality parameters (temperature, pH, conductivity, dissolved oxygen, and total suspended solids) at three locations (project impoundment, bypass reach, and below project tailrace) during the first summer after the project begins to generate.

Comments

General

The Draft Plan is acceptable; the Division expects that the MA DEP may have more specific comments.

Thank you for this opportunity to comment.

Sincerely,



Caleb Slater, Ph.D.
Anadromous Fish Project Leader

cc Bob Kubit, MADEP
Melissa Grater, USFWS



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087
<http://www.fws.gov/northeast/newenglandfieldoffice>

REF: FERC No. 12608
Alternatives Unlimited

July 16, 2008

Kathleen D. Hervol
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772

Dear Ms. Hervol:

This responds to your June 23, 2008, cover letter and accompanying draft Run-of-River and Bypass Discharge Monitoring Plan (ROR Plan) and draft Water Quality Monitoring Plan (WQ Plan) for the Alternatives Hydropower Project, located on the Mumford River in Worcester County, Massachusetts. The plans are required pursuant to mandatory terms and conditions set by this office and the Massachusetts Division of Fisheries and Wildlife (MA DFW). We have reviewed the draft plans and have the following comments.

1. ROR PLAN *PROPOSAL*

Monitoring System

Alternatives Unlimited (Alternatives) proposes to equip the project with a pond leveling device to accurately match the turbine conditions with flow conditions. When inflow becomes too low for efficient operation, the units [sic] will drop off-line. The required spill (0.1 feet) will be monitored using a staff gauge that will be mounted on the southern abutting concrete foundation, immediately downstream of the intake.

Data Collection

All data collected will be compiled on a spreadsheet and maintained for inspection by this office, the MA DFW, and the Federal Energy Regulatory Commission.

COMMENTS

The draft ROR Plan submitted to us lacks sufficient detail. We suggest that Alternatives use the attached plan (Appendix A) as a guide for the components that should be included in the ROR Plan. Below are some specific points that should be addressed in any revised plan submitted for our review:

- Throughout the plan, Alternatives uses the term “bypass” to describe the generating equipment. This terminology is confusing and should be changed, as resource agencies typically use that word to describe the reach of river between the dam and the tailrace discharge.
- The pond leveling device should be described in more detail. In general, new projects typically propose to use headpond level sensors in combination with a Programmable Logic Controller (PLC) and full SCADA controls. This type of system allows for the continuous, closed loop automatic adjustment of the turbine wicket gates and runner blade positions to maintain a specified water level that should ensure run-of-river operation and the required spillway discharge are continuously maintained.
- If a sensor/PLC/SCADA system will be used, the plan will need to specify the target water surface elevations for the Start, Run, and Stop settings of the control system. According to the draft plan, the top-of-boards elevation is 285.1 feet NAVD. In order to meet the spillway discharge condition, the headpond would need to be maintained at or above 285.2 feet NAVD (this elevation may need to be increased depending on the accuracy and operational tolerances of the equipment).
- The plan should contain a discussion of how the monitoring equipment will be calibrated and maintained.
- It appears that Alternatives proposes to manually record turbine discharge and staff gauge readings, then enter them into a spreadsheet that would be available for agency inspection. The staff gauge would be read weekly, while no frequency is specified for taking turbine discharge measurements. Reading and recording measurements at any interval greater than hourly is unacceptable. Typically, PLC-SCADA systems will automatically read and record water surface elevation and station generation at 15- or 30-minute intervals by a datalogger. The automation system does not directly measure turbine or spillway flow; rating curves are used to convert generation (in kW) to turbine flow, and water level elevations are used to calculate spillway discharge. We strongly recommend that Alternatives adopt this type of system (i.e., automatic, electronic, computer-based).
- By letter dated May 16, 2006, we provided mandatory Terms and Conditions for the project. Condition 4 mandates a procedure for refilling the impoundment after any drawdown to perform maintenance activities (including flashboard replacement) or for emergency purposes. The subject plan should contain a discussion of the protocol that will be followed to ensure compliance with Condition 4.
- The implementation schedule should specify when the pond leveling device will be installed.

2. WQ PLAN

PROPOSAL

Sampling Protocol

Alternatives will measure water temperature, pH and conductivity at three locations (headpond, tailwater, and tailrace) during low flow conditions on four occasions (two during dry weather and two after rain events) during July and August. During those sampling events, Alternatives also will collect samples for laboratory analysis of dissolved oxygen (DO) and total suspended solids. This protocol will be followed before the project goes on-line to determine baseline conditions, and then again after the project starts generating to assess if project operations are adversely affecting water quality.

Data Organization

All data collected will be compiled on a spreadsheet that compares the results for both the pre- and post-construction sampling rounds.

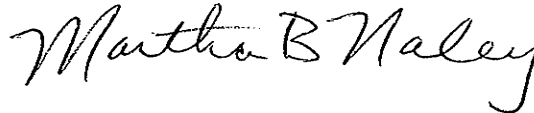
COMMENTS

While we have no objections to the proposed water quality monitoring plan, below we provide comments on the protocol:

- The draft plan does not specify the time of day the samples will be taken. We recommend collecting water samples for DO analysis in the early morning (i.e., before 8:00 a.m.).
- Because our primary interest is to assess the project's impact on water quality, all post-project measurements/samples should be taken during a period when inflow is low, but within the hydraulic capacity of the unit (i.e., only the minimum spill is being discharged over the dam).
- The plan does not describe how monitoring results will be distributed to the resource agencies. We recommend that a draft Water Quality Monitoring Report be provided to this office, the MA DFW and the Massachusetts Department of Environmental Protection within three months of completing the post-project sampling.

Thank you for this opportunity to comment. If you have any questions regarding these comments, please contact Melissa Grader of this office at (413) 548-8002, extension 124.

Sincerely yours,



Martha B. Naley
Acting Supervisor
New England Field Office

Enclosure

cc: Alternatives Unlimited
54 Douglas Road
Whitinsville, MA 01586
FERC, Secretary
FERC/DHAC
MA DFW, Caleb Slater
MA DEP, Bob Kubit
MA Audubon, Donna Williams
Reading File
ES: MGrader:7-16-08:(603)223-2541



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

June 27, 2008

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Alternatives Hydro Project
FERC No. 12608
Comment on Draft Run-of-River and Bypass Discharge Monitoring Plan
Comment on Draft Water Quality Monitoring Plan

Dear Secretary Bose,

The Massachusetts Division of Fisheries and Wildlife (Division) is the agency responsible for the protection and management of the fish and wildlife resources of the Commonwealth. As such we monitor operations at hydroelectric projects within the Commonwealth. The Division has the following comments in response to the "Draft Run-of-River and Bypass Discharge Monitoring Plan" and "Draft Water Quality Monitoring Plan", submitted on June 23, 2008 by Alternatives Unlimited Hydro Project (P-12608), Mumford River, Northbridge, Massachusetts.

Background

An Exemption from Licensing for the Alternatives Project was issued on December 8, 2006. The authorized facilities at the project include: (1) the 127-foot-long Ring Shop Dam consisting of a concrete 9.5-foot-high spillway with a crest elevation of 282.6 feet North American Vertical Datum (NAVD), topped with 2.5-foot-high flashboards (2) a 2-acre reservoir with a water surface elevation of 285.2 feet NAVD (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round) (3) an 8-foot-wide headgate intake structure with trashracks; (4) a concrete support structure housing a 6-footdiameter, 24-foot-long penstock; (7) three cross flow turbine generating units with a total installed capacity of 45 kW.

An order amending this exemption was issued on March 21, 2008. The amendment allows the Alternatives to install one 47-kW semi-Kaplan turbine generating unit instead of installing three 15-kW cross flow turbine generating units, as authorized in the exemption. The maximum hydraulic capacity of the project has been decreased from 90

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 389-6300 Fax (508) 389-6301

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

cubic feet per second (cfs) to 70 cfs, and the minimum hydraulic capacity has been increased from 18 cfs to 23.1 cfs.

Draft Run-of-River and Bypass Discharge Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a "Draft Run-of-River and Bypass Discharge Monitoring Plan". The Draft Plan states that the project will operate strictly Run-of-River, where outflow equals inflow on an instantaneous basis, and that a minimum of 0.1 foot (1.2 inches) of water will flow over the project spillway at all times. The draft plan proposes to monitor and record turbine flow. The Draft plan proposes that flow over the spillway will be visually monitored by a staff gauge installed on the dam crest with spill levels recorded weekly.

Comments

General

There seems to be some misunderstanding of the terminology being used. In the Draft Plan the Alternatives discuss monitoring the "Bypass Discharge". It is unclear if this refers to the turbine flow or the flow in the bypass reach. Flow through the turbine should be referred to as "turbine flow" while flow in the section of the river in between the dam and the tailrace should be referred to as "bypass reach flow".

Section 2.0

The draft plan lacks many important details. What is the "bypass structure" that will be equipped with a "pond leveling device"? What is this "pond leveling device"? How, exactly, will it "accurately match the turbine conditions with flow conditions"? How, exactly, will "all minimum stream flow conditions be maintained"? This project does not have a gate to deliver the minimum flow into the bypass reach, so I must assume that the "bypass structure" is the turbine head gate. Please describe the "pond leveling device" (physical description, proposed location, accuracy). I would propose the use of an electronic transducer located just up stream of the dam to continuously monitor the water surface elevation in the project reservoir. This transducer must be connected to the turbine gates via a Programmable Logic Control Unit (PLC)- both must have a level of accuracy and precision which will maintain a water surface elevation of at least 285.2 feet NAVD in the project reservoir (This elevation is consistent with the U.S. Department of the Interior section 30(c) condition to maintain a minimum of 0.1 foot (1.2 inches) of spill over the spillway year round). A properly programmed PLC system will open and close the turbine gates in order to maintain the minimum project reservoir water surface elevation. Maintaining this minimum reservoir water surface elevation will ensure both Run-of-River operation and delivery if the required bypass reach flow. Electronic records of the water surface elevation and turbine gate settings should be saved to a database at least hourly.

Section 3.1

The Draft Plan proposes installing a staff gauge on the project spillway and reporting gauge readings weekly. Daily (or more frequent) manual monitoring would be useful as a ground truth for the hourly electronic water surface elevation data collected by the transducer in the project reservoir and will help the project operators fine tune the PLC to

be sure that the minimum flow requirements are met during the first few months of operation. Weekly visual monitoring of spillway water elevations is not sufficient by itself to meet the exemption requirements for Run-of-River operation and Minimum Flow monitoring.

Section 3.2

This section should refer to “turbine flow” rather than “bypass discharge flow”. Please describe what parameters of turbine operation will be monitored and recorded (flow, gate setting, and/or generation). As described previously- these parameters should be recorded at least hourly and paired with reservoir water surface elevation data.

Section 4.0

Data collected should include hourly water surface elevation of the project reservoir paired with hourly turbine data (gate settings, flow, and/or generation). This data should be stored in an electronic data base and be available for inspection.

Draft Water Quality Monitoring Plan

As directed by the Order Granting Exemption from Licensing, the Alternatives have filed a “Draft Water Quality Monitoring Plan”. The Draft Plan describes how the project owner will sample water quality parameters (temperature, pH, conductivity, dissolved oxygen, and total suspended solids) at three locations (project impoundment, bypass reach, and below project tailrace) during the first summer after the project begins to generate.

Comments

General

The Draft Plan is acceptable; the Division expects that the MA DEP may have more specific comments.

Thank you for this opportunity to comment.

Sincerely,



Caleb Slater, Ph.D.
Anadromous Fish Project Leader

cc Bob Kubit, MADEP
Melissa Grater, USFWS
Kathleen Hervol, Beals and Thomas, Inc.

Appendix B

Data Collection Spreadsheets

Depth of Water

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

Temperature

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

pH

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

Conductivity

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

Dissolved Oxygen

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

Total Suspended Solids

Sampling Station	Location	Pre-Construction Sampling Dates				Post-Construction Sampling Dates			
		mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy	mm/dd/yy
SW-1	Upstream of Dam, South Bank								
SW-2	Downstream of Dam, North Bank								
SW-3	Downstream of Dam, South Bank								

Appendix C

Laboratory Analysis Documentation

Low Impact Hydropower Questionnaire

E. Threatened and Endangered Species Protection

October 8, 2004 Letter from MA DFW



MassWildlife

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

October 8, 2004

Kathleen D. Hervol
Beals and Thomas, Inc.
Reservoir Corporate Center
144 Turnpike Road (Route 9)
Southborough, MA 01772-2104

Re: Hydroelectric Project
BTI Project No. 0968.07
Northbridge, MA
NHESP File: 04-16618

Dear Ms. Hervol:

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-protected rare species in the vicinity of the above referenced site. At this time we are not aware of any rare plants or animals in the vicinity of the proposed project site.

This evaluation is based on the most recent information available in the NHESP database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered.

If you have any questions regarding this review, please call Joanne Theriault, Conservation Assistant, at ext. 310.

Sincerely,

Thomas W. French, Ph.D.
Assistant Director

www.masswildlife.org