14 Gabriel Drive
Augusta, ME 04330

207.620.3800 PHONE
207.621.8226 FAX

www.TRCsolutions.com

July 31, 2018

Joshua Brown, Regional Representative
Department of Agriculture, Conservation, and Forestry
Land Use Planning Commission
P.O. Box 307
131 Fyfe Road
W. Farmington, ME 04992

RE: Maine Waterways Development and Conservation Act, Land Use Planning Commission, Brookfield White Pine Hydro, Middle Dam, Township C, Maine

Dear Joshua:

Attached is the application for the LUPC Development Permit/Waterways Development & Conservation Act Permit for the proposed Middle Dam Renewal Project proposed by Brookfield White Pine Hydro. The application provides a detailed discussion of the proposed work and addresses those performance standards within the LUPC rules. A CD is included with a PDF of the application and a separate file with the site plans.

TRC completed all the requisite natural resources surveys and initial agency consultations including letters to the Maine Natural Areas Program and the Maine Department of Inland Fish & Wildlife. The Maine Historic Preservation Commission determined in 1997 that the dam was not eligible for listing on the National register of Historic Places relative to archaeological resources. The MHPC also issued a no effects letter relative to the gatehouse in 2010, during the permitting for Upper Dam. I have requested an update from them.

I very much appreciate your input and assistance with road maintenance and laydown areas. Please contact me (620-3844 or 441-4225) with any questions or comments and I will be happy to provide you with any additional information that you need. A copy of this application has been sent to the USACE for their review of Federal Clean Water Act issues. Please issue a draft permit prior to final issuance so that Brookfield may review it and provide any feedback as needed.

Sincerely,

Mark W. Christopher, MS, CWB
Project Manager

Enclosures
cc: Eric Rossignol, Kyle Murphy, TRC File 268038.0000

14 Gabriel Drive
Augusta, ME 04330

207.620.3800 PHONE
207.621.8226 FAX

www.TRCsolutions.com

July 31, 2018

Ms. LeeAnn Neal
Senior Project Manager
U.S. Army Corps of Engineers
Maine Project Office
442 Civic Center Drive Suite 350
Augusta, Maine 04330

RE: Maine General Permit, Category 2, Brookfield White Pine Hydro, Middle Dam, Township C, Maine

Dear LeeAnn:

Attached is the application on behalf of Brookfield White Pine Hydro for the Category 2 General Permit for the Middle Dam Renewal Project located on Lower Richardson Lake and the Rapid River. I have also included a CD with the entire application and the project plans as a separate file. The application provides a detailed discussion of the proposed work and addresses those issues required by the Clean Water Act.

TRC completed all the requisite natural resources surveys and initial agency consultations including letters to the Maine Indian Tribes and the Maine Department of Inland Fish & Wildlife. The Maine Historic Preservation Commission determined in 1997 that the dam was not eligible for listing on the National register of Historic Places relative to archaeological resources. The MHPC also issued a no effects letter relative to the gatehouse in 2010, during the permitting for Upper Dam. I have requested an update from them.

I consulted with the U.S. Fish & Wildlife Service through its IPAC system recently and Brookfield has committed to avoid clearing during northern long-eared bat "pup rearing season" in June and July.

Thanks for your help with addressing several issues while I was pulling together the application. Please contact me with any questions or comments and I will be happy to provide you with any additional information that you need. A copy of this application has been submitted to the Maine LUPC. Please forward a draft permit prior to final issuance so that Brookfield may review and provide any feedback as needed.

Sincerely,

Mark W. Christopher, MS, CWB
Project Manager

Enclosure
cc: Eric Rossignol, Kyle Murphy, TRC File 268038.000

MAINE WATERWAY DEVELOPMENT & CONSERVATION ACT & MAINE GENERAL CATEGORY 2 PERMIT APPLICATION

For the

RENEWAL OF MIDDLE DAM NON-HYDROPOWER STORAGE DAM

Submitted to

MAINE LAND USE PLANNING COMMISSION U.S. ARMY CORPS OF ENGINEERS

Prepared for:

BROOKFIELD WHITE PINE HYDRO, LLC
150 MAIN STREET
LEWISTON, ME 04240

Prepared by:

TRC ENGINEERS LLC
14 GABRIEL DRIVE
AUGUSTA, ME 04330

JULY 2018

APPLICATION
TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

Application Form & Agent Authorization Letter, Deed, and Corporate Standing

Brookfield

Brookfield Renewable
150 Main Street
Lewiston, ME 04240

Tel 207.755.5600
Fax 207.755.5655
www.brookfieldrenewable.com

June 22, 2018

Mr. Mark Christopher
TRC Solutions, Inc.
14 Gabriel Drive
Augusta, Maine 04330

RE: Maine Waterway Development & Conservation Act Permit and Water Quality Certification Permit Application – Middle Dam

Dear Mr. Christopher:

Brookfield White Pine Hydro, LLC (BWPH) submits this letter and hereby authorizes TRC Solutions Inc. of 14 Gabriel Drive, Augusta, Maine to act as its agent for the above referenced permit application.

Should you have any questions regarding this authorization, please contact Mr. Eric Rossignol at (207) 312-1967 or by email at eric.rossignol@brookfieldrenewable.com.

Sincerely,

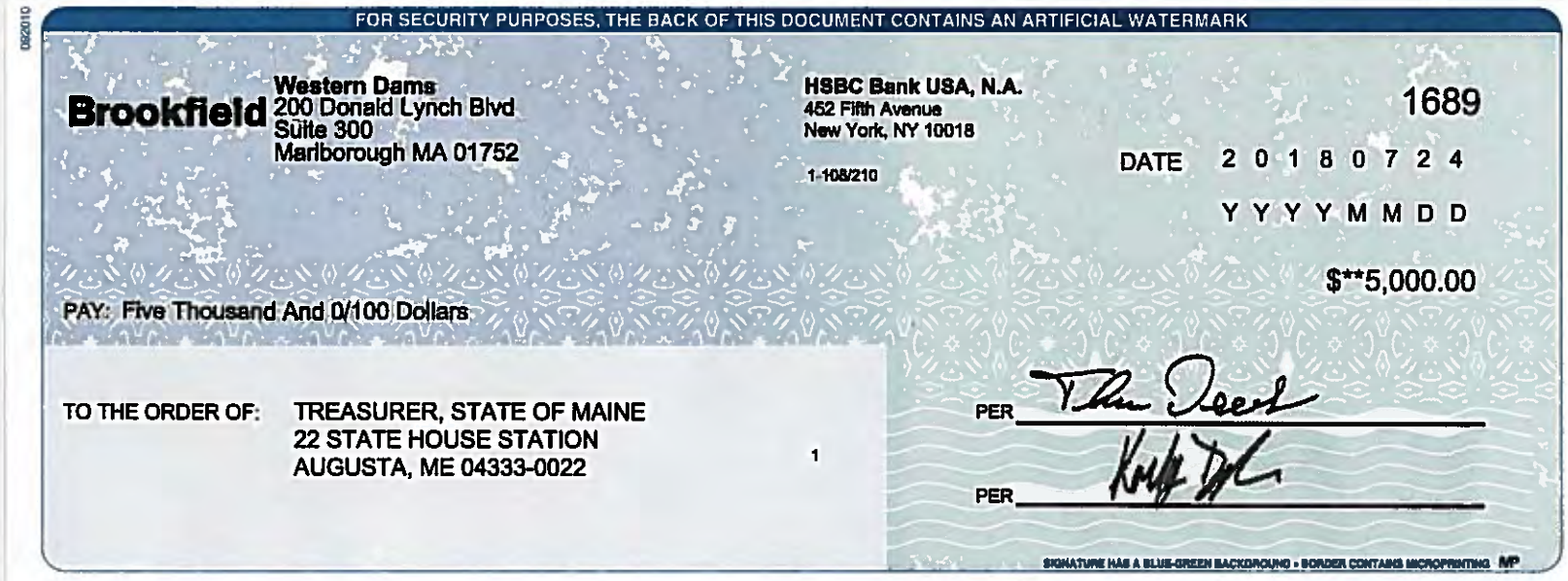
Kyle Murphy for

Kelly Maloney
Manager, Compliance - Northeast

Cc: N. Stevens, K. Pocquette, E. Rossignol, K. Murphy; BWPH

K. Cooley, E. Turgeon; Kleinschmidt

Project File: 11834|01



⑈001689⑈ ⑆021001088⑆ 000197530⑈

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Land and Water Quality
17 State House Station
Augusta, Maine 04333
Telephone: (207) 287-3901

FOR DEP USE

#L-_____
Fees Paid_____
Date Fees Received_____

APPLICATION FOR PROJECT APPROVAL UNDER THE MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT AND WATER QUALITY CERTIFICATION (U.S. P.L. 92-500, SECTION 401)

HYDROPOWER PROJECT CONSTRUCTION/RECONSTRUCTION

This form shall be used to request a state permit and Water Quality Certification for the proposed FERC licensing/relicensing and/or construction, reconstruction or structural alteration of a hydropower generating or storage project.

All required fees must be paid before application processing will begin. Please contact the Department for current fee schedule information. Fees are payable to Treasurer, State of Maine.

(Please Type or Print)

APPLICANT INFORMATION

Name of Applicant: Brookfield White Pine Hydro, LLC

Mailing Address: 150 Main Street, Lewiston, ME 04240

c/o Eric Rossingnol 755-5607

Name of Contact or Agent: TRC Engineers, 14 Gabrield Dr, Augusta, ME 04330

Telephone: Mark Christopher 620-3844

PROJECT INFORMATION

Name of Project: Middle Dam Renewal FERC No. FERC-P-11834-ME

Address (use "911" address, if available):_____

_____

Name of Waterbody Affected: Lower Richardson Lake & Rapid River

Municipality or Township: Township C County: Oxford

GPS Coordinates, if known: 44.775947 -70.920810

REQUIRED INFORMATION

1. Provide all the information requested by this application form.

2. If applicant is a registered corporation, provide either a *Certificate of Good Standing* (available from the Secretary of State) or a statement signed by a corporate officer affirming that the corporation is in good standing.

3. A signed Certification of Publication and a completed Notice of Intent to File an application for Water Quality Certification.

NOTE: All supporting documents summarized above must be attached to this form and sent to the DEP Office listed below:

Department of Environmental Protection
Bureau of Land and Water Quality
17 State House Station
Augusta, ME 04333
Tel: (207) 287-3901

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I authorize the Department to enter the property that is the subject of this application, at reasonable hours, including buildings, structures or conveyances on the property, to determine the accuracy of any information provided herein. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

DATE: July 31, 2018

mchristopher@trcsolutions.com
Digitally signed by mchristopher@trcsolutions.com
DN: cn=mchristopher@trcsolutions.com
Date: 2018.07.31 12:58:44 -04'00'
SIGNATURE OF APPLICANT

(IF SIGNATURE IS OTHER THAN APPLICANT, ATTACH LETTER OF AGENT AUTHORIZATION SIGNED BY APPLICANT)

Mark W. Christopher
PRINTED NAME & TITLE

Project Manager

SECTION I
PROJECT INFORMATION

State law requires that a permit be issued for the construction, reconstruction, or structural alteration of any hydropower project. This section is designed to obtain a thorough description of the proposed physical project, including all existing and proposed physical structures, construction activities, and project operation.

1. **NATURE OF ACTIVITY**. Check appropriate item:

   _____ Construction of new hydropower project.

   X
   _____ Reconstruction or structural alteration of existing hydropower project.

   IF THE PROPOSED PROJECT IS SUBJECT TO FERC JURISDICTION, A COPY OF A COMPLETED FERC APPLICATION FOR LICENSE OR EXEMPTION (THIRD STAGE CONSULTATION) MUST ACCOMPANY THIS FORM.

   NOTE: A copy of any document revising, supplementing, amending, or correcting deficiencies in the application as originally filed with FERC must also be filed with D.E.P.

2. **EXISTING ENVIRONMENT**. Provide a description of the physical environment of the project site and its immediate vicinity. The project site includes all land and water areas affected by the proposed activity.

   REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

3. **PROJECT DESCRIPTION**. Provide a detailed description of the existing project. A hydropower project includes all powerhouses, dams, water conduits, transmission lines, water impoundments, roads, and other appurtenant works and structures that are part of the development. This description must include:

   A. The physical composition, dimensions, and general configuration of all project structures, whether existing or proposed;

   B. The normal maximum surface area and elevation, gross storage capacity, and usable storage capacity of any project impoundments, whether existing or proposed;

   C. The number, type, and rated capacity of any project turbines or generators, whether existing or proposed; and

   D. The number, length, and voltage of any primary project transmission lines, whether existing or proposed.

   REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

4. **CONSTRUCTION ACTIVITIES**. Provide a detailed construction schedule and a description of all proposed construction activities, to include:

   A. Location and physical dimensions of any areas proposed to be temporarily or permanently dredged, excavated or filled (including cofferdam areas, spoils disposal areas, and access roads);

   B. Composition and quantity of any material proposed to be dredged, excavated, or placed as fill on a temporary or permanent basis (including cofferdam, dredged or excavated spoils, and access road materials); and

   C. Proposed commencement and completion dates of any construction, reconstruction or structural alteration of project structures, including any associated dredging, excavation, or filling activities.

   REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

5. **PROJECT OPERATION**. Provide a description of project operation, to include:

   A. The mode of project operation during low, mean, and high water years, including extent and duration of flow release and impoundment fluctuations;

   B. An estimate of the dependable capacity and average annual energy production, in kilowatt hours, of the project;

   C. An estimate of minimum, mean, and maximum flows, in cubic feet per second, at the project site, including a flow duration curve;

   D. An estimate of the maximum and minimum hydraulic capacities, in cubic feet per second, of any power plant; and

   E. A statement of the manner in which the power generated at the project is utilized.

   REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

6. **PROJECT PLANS**. Provide general design drawings showing all major project structures, whether existing or proposed, in sufficient detail to provide a full understanding of the project, including:

   A. Plans (overhead view);

   B. Elevations (front view);

   C. Profiles (side view) and

   D. Sections.

   REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

7. **PROJECT MAPS**. Provide maps of the project showing:

   A. The location of the project structures and features, with reference to local geographic features; and

   B. A project boundary enclosing all principal project structures and features.

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

8. **TITLE, RIGHT OR INTEREST**. The Department's Regulations require that any applicant must possess sufficient title, right or interest in all project lands and waters in order to have standing to seek a permit, license or certification. Please complete the appropriate item(s) below establishing title, right or interest and attach a copy of the indicated document(s):

_X_ Deed.

_____ Option to buy.

_____ Lease.

_____ Valid FERC Preliminary Permit.

_____ Valid FERC License (including all amendments/modifications).

_____ Exercise of flowage rights through operation of the Mill Act (12 M.R.S.A. Section 651).

_____ Exercise of eminent domain under FERC license.

Section II
Review Criteria

The statute requires that seven criteria be satisfied before a permit will be issued. This section is designed to obtain information on these criteria, which require consideration of the following issues; financial capability and technical ability; public safety; public benefits; traffic movement; LURC zoning; environmental mitigation; and specified environmental and energy considerations.

9. **FINANCIAL CAPABILITY**.

A. Provide a statement of the estimated total cost of the project, as proposed in this application, and itemize major categories of expenditures, including estimated costs of activities to be devoted to minimizing or preventing adverse effects on the environment during construction and/or operation of this project.

B. Provide a statement that details plans for the financing of the project. If project costs involve more than normal legal and surveying fees, submit <u>one</u> of the following documents in support of the financing plan <u>or</u> indicate why such documents are unavailable at the present time:

i. A letter from a financial institution, governmental agency, or other funding agency which states a funding commitment or an "intent to fund" specifying the amount of funds and the uses for which the funds may be utilized; or

ii. The most recent corporate annual financial report and any supporting material indicating the availability of sufficient funds to finance the project; or

iii. Copies of financial statements or other evidence indicating availability of funds when the developer will personally finance the project.

NOTE: The state hydro law provides that in the event that an applicant is unable to demonstrate financial capability at the time of filing an application, a conditional permit may be granted requiring a demonstration of financial capability prior to the start of project construction. 38 M.R.S.A. Section 636(1).

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

10. **TECHNICAL ABILITY**.

A. Provide a description of the applicant's prior experience and/or appropriate training related to the nature of the proposed activity.

B. Provide a description of the qualifications of personnel to be employed to install and/or operate and/or maintain the project.

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

11. **PUBLIC SAFETY**.

A. Provide a description of the activities or physical environment anticipated during project construction and/or operation that may constitute a hazard to the safety of the general public.

B. Provide a detailed description of any provisions proposed to protect the safety of the general public during project construction and/or operation.

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

12. **PUBLIC BENEFITS**

Provide a description of the economic benefits and economic costs to the public anticipated as a result of the proposed project.

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

NOTE 1: See the DEP's Administrative Regulations for Hydropower Projects, Chapter 450, Section 5 for an interpretation of the public benefits criteria of the state hydro law and a definition of economic benefits and costs.

NOTE 2: In the event that it is determined that a proposed project involving a new dam would result in substantial economic costs, then the applicant must also provide evidence comparing the benefits of the proposed project against the economic conditions that would otherwise result from any alternative source(s) of energy generation or conservation that might reasonably be pursued in the event that the project is not built. See Chapter 450 Regulations.

13. **TRAFFIC MOVEMENT**.

A. Provide a description of the present condition of the existing condition of the existing public and private access routes to the proposed project area, including the type, condition, and width of road surfaces and number of travel lanes.

B. Provide a description of the anticipated and other possible impacts, if any, of the proposed project on any existing access routes (e.g., location and lengths of any access routes to be flooded by the project).

C. Provide a description of the traffic movement anticipated to be generated by the proposed project, including types and average daily number of vehicles, travel routes, and duration of traffic movement.

REFERENCE: FERC EXHIBIT(S)__INFORMATION CONTAINED HEREIN__

14. **LURC ZONING**.

For any portion of the proposed project which is located within an unorganized territory or organized municipality subject to the jurisdiction of the Land Use Regulation Commission (LURC), provide a description of the applicable zoning designations and standards as adopted by LURC.

REFERENCE: FERC EXHIBIT(S)__INFORMATION CONTAINED HEREIN__

NOTE: In those instances where the project, or portions of the project, are prohibited uses under the zoning designation and standards in effect at the time of consideration, the applicant must file and obtain favorable action from LURC on a rezoning petition or must amend the project to avoid conflicts with LURC's zoning. See Chapter 450 Regulations.

15. **ENVIRONMENTAL MITIGATION**.

Provide a description of any provisions proposed to realize the environmental benefits of the project or to mitigate the adverse environmental impacts of the project.

REFERENCE: FERC EXHIBIT(S)__INFORMATION CONTAINED HEREIN__

NOTE: In-kind or on-site mitigation measures will be preferred. Off-site or out-of-kind mitigation measures may be acceptable where in-kind or on-site measures are demonstrated not to be feasible or desirable. See Chapter 450 Regulations.

16. **WATER QUALITY**.

A. Provide a description of the applicable water quality standards and classification for the upstream and downstream waters which are affected or will be affected by the project.

B. Provide a description of the existing water quality of the waters which are or will be affected by the project, including a description of existing in-stream water uses.

C. Provide a description of the anticipated and other possible impacts the proposed project on existing water quality.

REFERENCE: FERC EXHIBIT(S)__INFORMATION CONTAINED HEREIN__

NOTE: See Maine Water Classification Program, 38 M.R.S.A Sections 464-470.

17. **SOIL STABILITY**.

A. Provide a description of the soils in the project area, including soil types and locations.

B. Provide a description of the anticipated and other possible impacts of the proposed project on soil stability.

REFERENCE: FERC EXHIBIT(S)__INFORMATION CONTAINED HEREIN__

18. **COASTAL/INLAND WETLANDS**.

A. Provide a description of any coastal or inland wetlands located within the project area.

B. Provide a description of the anticipated and other possible impacts of the proposed project on coastal or inland wetlands.

REFERENCE: FERC EXHIBIT(S)____**INFORMATION CONTAINED HEREIN**_____

19. **NATURAL ENVIRONMENT**.

A. Provide a description of the natural environment within the project area, including a description of existing land uses, geological and topographic features, botanical resources, and aesthetic character.

B. Provide a description of the anticipated and other possible impacts of the proposed project on the existing natural environment, including but not limited to impacts on existing land uses, geological and topographic features, botanical resources, and aesthetic character.

REFERENCE: FERC EXHIBIT(S)____**INFORMATION CONTAINED HEREIN**____

20. **FISH AND WILDLIFE RESOURCES**.

A. Provide a description of the existing fish and wildlife resources within the project area.

B. Provide a description of the anticipated and other possible impacts of the proposed project on existing fish and wildlife resources.

REFERENCE: FERC EXHIBIT(S)____**INFORMATION CONTAINED HEREIN**_____

21. **HISTORIC/ARCHAEOLOGICAL RESOURCES**.

A. Provide a description of the existing historic and archaeological resources within the project area.

B. Provide a description of the anticipated and other possible impacts of the proposed project on existing historic and archaeological resources.

REFERENCE: FERC EXHIBIT(S)____**INFORMATION CONTAINED HEREIN**_____

22. **PUBLIC ACCESS AND USES**.

A. Provide a description of the existing public access to and use of the surface waters in the project area for navigation, fishing, fowling, recreation and other lawful public uses, including a description of any existing recreational resources and facilities.

B. Provide a description of the anticipated and other possible impacts of the proposed project on public rights of access to and use of the surface waters in the project area, including the impacts on recreational resources and facilities.

REFERENCE: FERC EXHIBIT(S)____**INFORMATION CONTAINED HEREIN**_____

23. **FLOOD CONTROL**.

A. Provide a description of existing floodways and flood conditions within the project area.

B. Provide a description of any existing flood control projects within the affected drainage basin.

C. Provide a description of the anticipated and other possible flood control benefits or flood hazards of the proposed project.

REFERENCE: FERC EXHIBIT(S) **INFORMATION CONTAINED HEREIN**

24. **ENERGY**. State the following: **Not Applicable**

		Existing	Proposed
A.	Number of generating units:	_____	_____
B.	Installed capacity, in kilowatts	_____	_____
C.	Average annual energy output, in kilowatt hours	_____	_____
D.	Annual plant factor, in percent	_____	_____

E. Identity of proposed purchaser or user of project power:

_____

F. Amount of nonrenewable fuels anticipated to be replaced by the project power:

_____

_____

SECTION III
PUBLIC NOTICE

25. **PUBLIC NOTICE**. The Department requires that an applicant provide public notice describing the location and nature of the activity proposed for approval. The public notice requirements that apply to this application are described in the Certification of Publication below, which must be signed and dated by the applicant or authorized agent.

The following information must be submitted with this form:

- A copy of a completed Notice of Intent to File.
- A list of abutters to whom notice was provided. [For the purposes of public notice of this application, an "abutter" is any person who owns property that is both (1) adjoining and (2) within 1 mile of the delineated project boundary, including owners of property directly across a public or private right of way.]

For the purposes of this application, abutters also include:

A. The owners of all property adjacent to the location of any activity associated with the construction, reconstruction, or structural alteration of a hydropower project as described in this application (including properties adjacent to any proposed dredging, excavating, filling, transmission lines, or access roads); and

B. Where a new impoundment would be created or the full-pond elevation of an existing impoundment would be raised or lowered, abutters shall also include the owners of all property adjacent to the new or existing impoundment; and

C. Where a new or increased diversion of by-pass of flows from their existing channel would be created, abutters shall also include the owners of all property adjacent to the new or existing diversion or by-pass channel.

CERTIFICATION OF PUBLICATION

By signing below, the applicant (or authorized agent) certifies that he or she has:

1. Published a Notice of Intent to File once in a newspaper circulated in the area where the project site is located, within 30 days prior to filing the application;

2. Sent a completed copy of the Notice of Intent to File by certified mail or Certificate of Mailing to abutters, as determined by local tax records or other means, within 30 days prior to filing the application; and

3. Sent a copy of the Notice of Intent to File by certified mail or Certificate of Mailing and filed a duplicate of this application with the town clerk of the municipality(ies) where the project is located, within 30 days prior to filing the application.

mchristopher@trcsolutions.com Digitally signed by mchristopher@trcsolutions.com DN: cn=mchristopher@trcsolutions.com Date: 2018.07.31 12:58:04 -04'00' July 31, 2018

Signature of Applicant Date

Mark W. Christopher

Name and title of applicant

If signature is other than that of the applicant, attach letter of agent authorization signed by the applicant.

MAINE
Department of the Secretary of State
Bureau of Corporations, Elections and Commissions

Corporate Name Search

Information Summary

Subscriber activity report

This record contains information from the CEC database and is accurate as of: Thu Jul 19 2018 16:37:11. Please print or save for your records.

Legal Name	Charter Number	Filing Type	Status
BROOKFIELD WHITE PINE HYDRO LLC	19980126FC	LIMITED LIABILITY COMPANY (FOREIGN)	GOOD STANDING

Filing Date	Expiration Date	Jurisdiction
04/27/1998	N/A	DELAWARE

Other Names	(A=Assumed ; F=Former)
FPL ENERGY MAINE HYDRO LLC	F

Clerk/Registered Agent

CORPORATION SERVICE COMPANY
45 MEMORIAL CIRCLE
AUGUSTA, ME 04330

Back to previous screen | New Search

Click on a link to obtain additional information.

List of Filings	View list of filings
Obtain additional information:	
Certificate of Existence (more info)	Short Form without amendments ($30.00)

You will need Adobe Acrobat version 3.0 or higher in order to view PDF files.
If you encounter problems, visit the troubleshooting page.

Get Acrobat Reader

DEED INDENTURE
Middle Dam Storage Project
Oxford County

THE UNION WATER-POWER COMPANY, a Maine corporation, with a place of business in Augusta, Kennebec County, Maine (hereinafter referred to as "UWP," which word is intended to include, unless expressly stated otherwise, UWP and its successors and assigns), for consideration paid, releases to FPL ENERGY MAINE HYDRO LLC, a Delaware limited liability company, with a mailing address of 100 Middle Street, Portland, Maine 04101 (hereinafter referred to as "FPL," which word is intended to include, unless expressly stated otherwise, FPL and its successors and assigns), certain land and interests in land with the buildings and improvements thereon in the Townships of Richardsontown (T4 R1 WBKP) and Township C, and Magalloway Plantation in Oxford County, Maine, more particularly described in Exhibit A attached hereto and made a part hereof (hereinafter, the "Granted Premises").

EXCEPTING AND RESERVING from the Granted Premises, however, to UWP, its successors and assigns forever, for the benefit of the Land Retained by UWP (as hereinafter defined), the easements and real property in the Townships of Richardsontown (T4 R1 WBKP) and Township C, and Magalloway Plantation in Oxford County, Maine, more particularly described in Exhibit B attached hereto and made a part hereof (hereinafter, "UWP's Reserved Easements").

EXCEPTING AND RESERVING from the Granted Premises, however, to UWP, its successors and assigns forever, the personal property more particularly described in Exhibit C attached hereto and made a part hereof.

This conveyance is made subject to and with the benefit of the terms, covenants, agreements and provisions set forth or referred to in the Upper Androscoggin River Storage Projects Settlement Agreement dated August 28, 1998, as amended (hereinafter, the "Settlement Agreement"), which Settlement Agreement is on file at the offices of UWP, 83 Edison Drive, Augusta, Maine 04336, and at the offices of FPL, 100 Middle Street, Portland, Maine 04101.

Also, EXCEPTING any personal property and fixtures that are owned by the dam operator or his family situated on the Granted Premises.

Also, EXCEPTING any camp docks and fixtures and appurtenances related thereto belonging to third parties, including without limitation camp lot owners, some but not all of which are shown on the Project Plans (as hereinafter defined).

Certain agreements, covenants and understandings of FPL and UWP (hereinafter, individually, a "Party" and collectively, the "Parties") regarding indemnification and insurance are set forth on Exhibit D attached hereto and made a part hereof.

Except as otherwise expressly stated in this Deed Indenture, wherever in this Deed Indenture the consent of one Party is required, the Party from whom the consent is required agrees that it will not unreasonably withhold, delay or condition its consent.

For the purposes of this Deed Indenture, the term "Land Retained by UWP" shall mean and include all of the real property designated on the Project Plans as "Land Retained by UWP" or with words of similar import.

IN WITNESS WHEREOF, the said The Union Water-Power Company has caused this instrument to be executed by Normand V. Rodrigue, its duly authorized Senior Vice President, as of the 7th day of April, 1999.

THE UNION WATER-POWER COMPANY, a Maine corporation

By: Normand V. Rodrigue
Its: Senior Vice President
Printed Name: Normand V. Rodrigue

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

On April 5, 1999, personally appeared the above-named Normand V. Rodrigue, Senior Vice President of The Union Water-Power Company, and acknowledged the foregoing to be his free act and deed in his said capacity and the free act and deed of said The Union Water-Power Company.

Before me,

Sara Oliver
Notary Public
Printed Name:

SARA OLIVER
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES JANUARY 28, 2000

GRANTEE'S ACCEPTANCE

The said FPL ENERGY MAINE HYDRO LLC hereby acknowledges its acceptance of this Deed Indenture and its agreement to the terms, conditions and provisions set forth therein, and has caused this instrument to be executed by FPL Energy Maine, Inc., its sole member, by John W. Stanton, FPL Energy Maine, Inc.'s duly authorized Vice President, as of the 7th day of April, 1999.

FPL ENERGY MAINE HYDRO LLC, a Delaware limited liability company

By: FPL Energy Maine, Inc., its sole member

By: _____
Its: Vice President
Printed Name: John W. Stanton

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

On April 5, 1999, personally appeared the above-named John W. Stanton, Vice President of FPL Energy Maine, Inc., sole member of FPL ENERGY MAINE HYDRO LLC and acknowledged the foregoing to be his free act and deed in his said capacity and the free act and deed of said FPL Energy Maine, Inc. and of said FPL ENERGY MAINE HYDRO LLC.

Before me,

Sonia Levine

Notary Public
Printed Name: Sonia Levine
Commission Expires: 3/19/2006

CMP'S ACCEPTANCE

CENTRAL MAINE POWER COMPANY, a Maine corporation, with a place of business in Augusta, Kennebec County, Maine hereby joins in this Deed Indenture solely for the purposes of acknowledging its acceptance of the terms, conditions and provisions set forth in Exhibit D of this Deed Indenture, and has caused this instrument to be executed by Sara J. Burns, its duly authorized President, as of the 7th day of April, 1999.

CENTRAL MAINE POWER COMPANY, a Maine corporation

By: Sara J Burns
Its: President
Printed Name: Sara J. Burns

STATE OF MAINE
COUNTY OF CUMBERLAND, ss.

On April 5, 1999, personally appeared the above-named Sara J. Burns, President of Central Maine Power Company, and acknowledged the foregoing to be her

free act and deed in her said capacity and the free act and deed of said Central Maine Power Company.

Before me,

Jean A. Charron

Notary Public
Printed Name:

JEAN A. CHARRON
NOTARY PUBLIC, MAINE
MY COMMISSION EXPIRES APRIL 15, 2001

Exhibit A

Granted Premises

Middle Dam Storage Project
Oxford County

Parcel One

Subject to exceptions and reservations set forth on Exhibit B and Exhibit C herein and/or on the Project Plans hereinafter described, the land and interests in land with any improvements thereon (including without limitation all storage reservoir-asset-related and generation-asset-related facilities, structures and equipment, the dam across the outlet of Lower Richardson Lake in Township C, and the flumes, penstocks, gates, gatehouses, spillways, retaining walls, buildings, structures and appurtenances thereto, if any) situated in the Townships of Richardsontown (T4 R1 WBKP) and Township C, and Magalloway Plantation in Oxford County, Maine, more particularly bounded and described as follows:

A. A certain lot or parcel of land, together with all riparian rights appurtenant thereto, located in Township C, Oxford County, Maine; more particularly bound and described as follows:

Commencing at a concrete post on the Northerly line of land of the UWP "Dam Lot" described in paragraph 4 in deed from Josiah G. Abbott, et al. to UWP dated December 5, 1878 and recorded in the Oxford Country Registry of Deeds in Book 181, Page 443 (hereinafter, "UWP Dam Lot"), which concrete post is located S 59° 47' W, of and 706 feet more or less from the Northeasterly corner of the UWP Dam Lot so-called;

Thence S 49° 19' E, 499.4 feet to the POINT OF BEGINNING;

Thence N 70° 11' E, 179.7 feet to a point, which point is 10 feet more or less from the Westerly high water line of Richardson Lake and which point is henceforth designated as point "A";

Thence continuing N 70° 11' E, 10 feet to a point on the Westerly high water line of Richardson Lake;

Thence continuing N 70° 11' E, 362 feet more or less to a point on the Easterly line of land of UWP Dam Lot;

Thence S 30° 13' E, along the line of land of UWP Dam Lot, 627 feet more or less to the Thread of the Rapid River as it flowed prior to the construction of Middle Dam;

Thence along the Thread of the Rapid River about 970 feet to a point which is about 120 feet Northeasterly of the Northeasterly side of the gate-house over Middle Dam;

Thence S 34° 18' E, 300 feet more or less to the westerly high water line of Richardson Lake;

Thence continuing S 34° 18' E, 10 feet to a point, which point is henceforth designated as point "B" ;

The straight line bearing and distance between the designated points "A" to "B" is S 09° 25' E, 1362.8 feet;

Thence continuing S 34° 18' E, 232.9 feet to a point;

Thence N 75° 11' W, 226.7' to a point;

Thence S 55° 42' W, 567.1 feet to a point;

Thence N 34° 18' W, crossing the Rapid River 760 feet to a point;

Thence N 55° 42' E, 607.4 feet to a point;

Thence N 07° 04' W, 378.3 feet to a point:

Thence N 19° 19' E, 415.4 feet to the POINT OF BEGINNING.

Meaning and Intending to describe a parcel of land, which is a portion of the UWP Dam Lot and which contains areas of land which are both above and below the normal high water lines of Richardson Lake and the Rapid River.

All Bearings refer to Grid North, Maine State Plane Control West Zone.

Reference is made to Middle Dam Project Plan, Drawing 696-22-001, Sheet 3 of 3, dated March 26, 1999, and recorded at the Oxford County (Eastern District) Registry of Deeds in Plan File No. 3188.

B. All UWP's right, title and interest, if any, in and to flowage rights, whether acquired by prescription or otherwise, over lands flowed by the dams herein conveyed, including without limitation such flowage rights as have been acquired by UWP or its predecessors in title by virtue of current and/or historic flowage, together with the right to flow the Land Retained by UWP to the extent such land is currently or has been

historically flowed by UWP, and all UWP's right, title and interest to flowage in Lower and Upper Richardson Lakes described in deed from Josiah G. Abbott, et al. to UWP dated December 5, 1878 and recorded in the Oxford Country Registry of Deeds in Book 181, Page 443, and in deed from E.S. Coe and D. Pingree, Trustees under the will of the late David Pingree, and E.S. Coe in his own right, to UWP dated December 10, 1884 and recorded in said Registry of Deeds in Book 208, Page 219, over the land within the "Project Boundary" (hereinafter, the "Project Boundary") depicted on plans entitled "Middle Dam Project Plan," Drawing 696-22-001, Sheets 1 through 3, dated March 26, 1999, which plans are recorded at the Oxford County (Eastern District) Registry of Deeds in Plan File No. 3186, 3187 and 3188 (hereinafter, the "Project Plans"). The normal full pond surface elevation historically has been and currently is maintained at the elevation of 1450 feet above mean sea level.

C. Together with any other right, title or interest of UWP to the extent such right, title or interest exists, and excluding the rights if any of the State of Maine, in the bed of Lower Richardson Lake and Upper Richardson Lake in said Townships of Richardsontown and Township C, and in Magalloway Plantation, all in Oxford County, Maine, more particularly boundary and described as follows:

Beginning at the intersection of the Project Boundary at Normal Full Pond elevation 1,450.0 feet MSL on the southerly side of Lower Richardson Lake in Township C and the northeasterly line of the UWP Dam Lot;

Thence, following said Project Boundary around Lower Richardson Lake in a generally southeasterly direction to South Arm, and continuing along said Project Boundary and along the northeasterly side of Lower Richardson Lake from South Arm in a generally northwesterly direction through Township C to the southerly line of Richardsontown;

Thence, continuing along the Project Boundary through Richardsontown in a generally northerly direction and a generally northeasterly direction along a portion of the lakes known as The Narrows to Upper Richardson Lake;

Thence, northerly along the Project Boundary to the southerly line of the lot of land situated in said Richardsontown (Township 4 in the first range WBKP), being the Upper Dam Lot described in Paragraph 3 of said deed from Josiah G. Abbot, et al., to UWP dated November 5, 1877 and recorded in said Registry of Deeds in Book 181, Page 443 (hereinafter, "UWP's Upper Dam Lot");

Thence, northwesterly along the southerly line of said UWP's Upper Dam Lot to the southwesterly corner thereof;

Thence, northerly along the westerly line of said UWP's Upper Dam Lot to the northwesterly corner thereof;

Thence, easterly along the northerly line of said UWP's Upper Dam Lot to the Project Boundary on the northeasterly side of Upper Richardson Lake at Normal Full Pond elevation of 1,450.0 feet MSL;

Thence, along said Project Boundary in a generally northwesterly direction to the easterly line of Magalloway Plantation;

Thence, in a generally westerly, northerly, westerly, southerly, westerly, easterly and northeasterly direction along said Project Boundary through Magalloway and Richardsontown;

Thence, along said Project Boundary in a generally southerly direction through said Richardsontown and Magalloway;

Thence, along said Project Boundary in an easterly and southeasterly direction to Cranberry Cove;

Thence, along said Project Boundary around Cranberry Cove in a generally westerly, southerly, easterly, northerly and easterly direction to the westerly side of Upper Richardson Lake;

Thence, along said Project Boundary generally southerly along Upper Richardson Lake to The Narrows;

Thence, in a generally southwesterly direction along the northerly portion of The Narrows and along the Project Boundary to Magalloway Plantation;

Thence, continuing along said Project Boundary in a generally southwesterly direction to the northerly line of Township C and the northerly line of the UWP Dam Lot in which Middle Dam is located;

Thence, northeasterly along the northerly line of said UWP Dam Lot to the most northeasterly corner thereof;

Thence, southeasterly along the northeasterly line of said UWP Dam Lot to its intersection with the Project Boundary and the POINT OF BEGINNING.

Meaning and intending to describe a portion of the land in the beds of Lower Richardson Lake, The Narrows, and Upper Richardson Lake.

By the acceptance of this Deed Indenture, FPL hereby acknowledges that UWP makes no representations or warranties as to the nature or quality of the interests, if any, described or conveyed herein.

D. Together with rights of ingress and egress in common with UWP, its successors and assigns, and with others, to and from the Granted Premises to public roads and ways, including without limitation rights, if any, on and over Middle Dam Road, so-called, Sturtevant Pond Road, Beaver Pond Road, and South Mountain Road to Route 16 and Carry Road.

E. All UWP's right, title and interest to have and maintain another dam across the "Run Around" or "Low Run" so-called in Township C, together with a right of way thereto, and the right to flowage as occasioned thereby, all as more fully described in a deed from the said Coe and Pingree to UWP dated February 14, 1885 and recorded in said Registry of Deeds in Book 208, Page 238.

F. Together with UWP's right, title and interest in the garage building located on land leased by Pingree Associates, Inc. and Six River Limited Partnership to UWP by lease dated December 31, 1998 situated in South Arm in Township C, Oxford County, Maine.

Parcel Two: Access Roads Easement

A perpetual, non-exclusive right and easement, subject to the provisions hereof, for ingress and egress by FPL and its employees, agents, contractors, lessees and invitees over, across and through the portions of the following roads located on the Land Retained by UWP in the current locations, being Middle Dam Road, Carry Road and Black Cat Dike Road, all as shown on the Project Plans (hereinafter, collectively, the "Access Roads"). Subject to the limitations set forth herein, such easement (hereinafter, the "Access Roads Easement") shall be for the purpose of providing access on foot and with any vehicles and equipment from Middle Dam Road on and over established roadways that may exist from time to time across the Land Retained by UWP to the Granted Premises and between portions of the Granted Premises, and for all Utility Services defined in accordance with 33 M.R.S.A. Section 458 (provided such Utility Services do not materially interfere with UWP's Reserved Easements). The Access Roads Easement shall provide free access over the Access Roads subject only to any restrictions agreed upon by UWP and FPL and subject to reasonable rules and regulations that UWP may impose, provided that such rules and regulations are applied uniformly and fairly to all users of the Access Roads, including each of UWP's and FPL's own employees, agents, contractors, lessees and invitees.

UWP shall have the right to relocate from time to time the Access Roads at its sole cost and expense. Any such relocation may be done only after at least 90 days prior written notice to FPL, except that only reasonable notice shall be required in exigent situations. Any such relocation shall be undertaken in such a manner and at such time as will minimize the disruption of traffic flow. The relocation of the Access Roads when

completed will not materially impair the rights of FPL granted herein and shall not materially impair the utility of this easement to FPL existing at the time of said relocation.

FPL agrees at its sole cost to maintain the Access Roads in good condition and repair, including snow removal, to the extent of its use. UWP shall have the right but not the obligation to repair and maintain the Access Roads.

Parcel Three: FPL's Crank Phone System Easements

The non-exclusive, perpetual right and easement for the retention, maintenance, operation, repair, and modification of the line, wire, pipes, conduits, poles, and other equipment and facilities for crank telephone service (hereinafter, the "Crank Telephone Line") for the Gatekeeper's House as shown on the Project Plans (hereinafter, the "Gatekeeper's House"), through and across the Land Retained by UWP as the Crank Telephone Line is currently located.

UWP shall have the right to relocate from time to time the portions of the Crank Telephone Line located on the Land Retained by UWP at its sole cost and expense. Any such relocation may be done only after at least 90 days prior written notice to FPL, except that only reasonable notice shall be required in exigent situations. Any such relocation shall be undertaken in such a manner and at such time so as to minimize the disruption of telephone service and shall not materially impair the utility of this easement to FPL existing at the time of said relocation.

FPL shall have the right, but not the obligation to maintain, replace, and repair the portions of the Crank Telephone Line located on the Land Retained by UWP.

Exhibit B

UWP's Reserved Easements

Middle Dam Storage Project
Oxford County

Easement One: Access Ways Easement

A perpetual, non-exclusive right and easement, subject to the provisions hereof, for ingress and egress by UWP and its employees, agents, contractors, lessees and invitees over, across and through the portions of the following roads and ways to the extent situated on the Granted Premises, being Middle Dam Road and the bridge over the outlet of Lower Richardson Lake at the Rapid River (hereinafter, the "Bridge"), Black Cat Dike Road, the road to Camp Lot #6 to benefit Camp Lot #6, Camp Lot #5 and Camp Lot #4, the roads to the Land Retained by UWP, and the road to the Wangan Building (as hereinafter defined), which road may be extended by UWP from time to time, all as shown on the Project Plans (hereinafter, collectively, the "Access Ways"), together with the use jointly with FPL of all appurtenant rights of access to the Granted Premises. Subject to the limitations set forth herein, such easement (hereinafter, the "Access Ways Easement") shall be for the purpose of providing access on foot and with any vehicles and equipment to and from Middle Dam Road on and over established roadways to and across the Granted Premises and to provide access within the Granted Premises to and among UWP's Reserved Easements and Land Retained by UWP. Without limiting the generality of the foregoing, the Access Ways Easement shall include access to and non-exclusive use, for the benefit of the Land Retained by UWP and/or UWP's Reserved Easements, of all parking areas from time to time located on the Granted Premises, other than those parking areas immediately adjacent to the Gatekeeper's House. The Access Ways Easement shall provide free access over and across the established roadways and parking areas on the Granted Premises subject only to any restrictions agreed upon by UWP and FPL and subject to reasonable rules and regulations that FPL may impose, provided that such rules and regulations are applied uniformly and fairly to all users of the Access Ways, including each of UWP's and FPL's own employees, agents, contractors, lessees and invitees.

FPL shall have the right to relocate from time to time the Access Ways at its sole cost and expense. Any such relocation may be done only after at least 90 days prior written notice to UWP, except that only reasonable notice is required in exigent situations. Any such relocation shall be undertaken in such a manner and at such time as will minimize the disruption of traffic flow across and within the Granted Premises. The relocation of the Access Ways when completed will not materially impair the rights of UWP reserved herein and shall not materially impair the utility of this easement to UWP existing at the time of said relocation.

1.0 PROJECT INFORMATION

1.1 Introduction & Overview

Brookfield White Pine Hydro, LLC (BWPH) is required to meet certain dam safety criteria mandated by the Federal Energy Regulatory Commission (FERC) license for the Upper and Middle Dams Storage Project (UMDSP). Over the years numerous upgrades and improvements to both dams in order to meet the FERC dam safety requirements. Upper Dam was completely rebuilt (renewal) due to its age, deteriorating condition, and structural unknowns having gone through a number of upgrades over its 100+ year history. Middle Dam, which was originally built in the 1850's has gone through numerous construction efforts and upgrades that do not meet the current FERC standards for a Probable Maximum Flood (PMF) (largest flood resulting from a combination of the most severe meteorological and hydrologic conditions that could conceivably occur in a given area) condition. In order to meet the PMF conditions and given the patchwork conditions of the current structure of the dam, BWPH has determined that a complete renewal of the dam is the most structurally sound and feasible long-term option.

Middle Dam is located at the southwest portion of Lower Richardson Lake where the lake drains into the Rapid River (Attachment 1-1). Middle Dam supports the water levels of Upper and Lower Richardson Lakes which at Normal High Water Level (NHWL) encompasses 7,751 acres. Middle Dam supports important recreational facilities and opportunities, which are largely reliant upon management of water levels and flows controlled by the FERC license. Continuation of these operational levels is necessary for meeting FERC requirements and maintaining the fishing, whitewater rafting, boating, swimming, hiking, private commercial enterprises, property values, wildlife, and fisheries habitats of Richardson Lake. The harsh winter conditions preclude completing winter construction in safe conditions, as such the construction effort is expanded over five years.

The following provides a discussion of the history and background of Middle Dam, including an overview of the UMDSP. BWPH has gone through a concerted effort over the past three years to engineer a solution for the renewal of the dam, which is summarized below. Overall, the construction is planned to be phased over a four year period with some preparation work preceding construction and restoration efforts following construction.

There are numerous compounding elements that make the construction very challenging and proper planning essential to completing the project. Middle Dam is located in a very remote area of the Maine portion of the White Mountains, with access from one gravel road, roughly 16 miles from Route 16, which is 20 miles from Rangeley. This makes simple logistics such as worker access and bringing materials to the site difficult and inefficient. Of paramount importance is worker and public safety during construction. The design of the cofferdams, pedestrian access, construction phasing, laydown/staging areas is focused on reducing risks to the general public. Completion of the renewal project will provide long term safety for

downstream stakeholders and private homes, businesses and individuals by providing a structurally sound dam that meets the FERC PMF standards.

An important element for the design of the new configuration of the dam is to limit construction to existing previously disturbed areas, both above and below the NHWL. The current location, having been developed to some extent since the mid 1800's, has virtually no natural undisturbed areas. Once complete, the operation of the renewed Middle Dam will not alter upstream or downstream water levels and flows and will completely maintain the current conditions.

1.2 Project Purpose and Need

Upper and Middle Dams were licensed as the by the FERC on December 19, 2002 (FERC P-11834-ME) as the UMDSP. BWPH proposes renewal of Middle Dam, an integral component of the UMDSP, which involves a complete rebuild of the dam with augmentation of the supporting embankments, including Black Cat Dike. The FERC determined it had jurisdiction over the UMDSP in the early 1990's and subsequently required an independent safety inspection of both dams which mandates compliance with FERC safety guidelines. To meet FERC stability guidelines, the proposed renewal must address Potential Failure Mode Analysis (PFMA) recommendations and Inflow Design Flood (IDF) criteria. Renewal of Middle Dam and associated facilities are essential to the continued operation of the dam and a requirement to meet FERC required dam safety. Satisfaction of this requirement is the project purpose and serves as the basis of this permit application.

1.3 Site Characteristics & History

History and Economics

Water management on the Rangeley chain of lakes began in 1836 with the construction of the Rangeley Dam and expanded during the 1850's with the construction of, first, the Upper and Middle Dams (on Mooselookmeguntic Lake and Richardson Lake, respectively) then the Errol Dam (Lake Umabagog). A fifth dam the Aziscohos Dam was built in 1911. The original purpose of the dams was to manage water for moving logs downstream to towns such as Rumford and Lewiston via the Androscoggin River. Eventually log driving was replaced by other means of transportation and the purpose of the dams converted to storage and river flow management for burgeoning industry and hydropower generation.

These dams were originally managed by the Union Water Power Company (UWP), however, the water storage interests and management responsibilities of UWP are currently owned by BWPH. Water level management at Middle Dam is currently performed in accordance with the FERC license, and a 1983 operating agreement with numerous other entities along the Androscoggin River.

Overall, flow management prevents and minimizes flooding downstream. Often the flow level during the spring can be maintained without drawing water. Conversely, low river flow levels during drier periods can be supplemented with water from the storage reservoirs. Hence dramatic natural fluctuations are replaced with more consistent and predictable flows.

Water level management on the Androscoggin River provides benefits not only to hydroelectric power generation and operation of downstream mills. It also serves numerous public benefits including flood control, municipal wastewater treatment, and recreation opportunities including whitewater rafting and boating.

Operating and Settlement Agreements

In 1911, operating agreements were established between the Androscoggin Reservoir Company (ARCO) and other companies, which owned and managed the dams and downstream saw and paper mills on the Androscoggin River. These agreements were modified in 1983, to govern the water levels and flow management of the lakes. The operating agreement for the dams establishes a minimum flow level at Berlin, New Hampshire of 1,550 cfs. The flow levels actually fluctuate between 1,300 and 2,600 cfs based on natural factors prevailing at the time. Spring runoff flows in excess of these levels are stored to bring Richardson Lake up to full pond level around the first of June. Conversely, low river flow levels during drier periods can be supplemented with water from the storage reservoirs**.**

Important provisions of the operating agreement are as follows:

- The regulated flow at Berlin, New Hampshire was mandated to be maintained at 1,550 cfs;
- The seasonal draw from storage was limited to 1/3 from Aziscohos and 2/3 from the other four dams, combined. These rations represent a 72 day supply and 209 day supply, respectively; and
- Maintenance cost sharing was established between the companies.

A settlement agreement was reached as part of the FERC licensing in 1998 between the previous owner of the UMDSP, ARCO, and 20 governmental and nongovernmental entities. The Upper Androscoggin River Storage Projects Settlement Agreement (Settlement Agreement) was filed December 23, 1999. This agreement is binding and includes regulatory requirements that the FERC license is based on. The agreement stipulates operational criteria, non-operational protection, and enhancement measures. These measures include:

- Increased minimum flows to benefit fish;
- More stable reservoir levels during the summer to enhance recreation, tourism, and wildlife;
- Guaranteed whitewater releases for rafting and kayaking;
- Additional recreation amenities; and
- The ability for BWPH to operate the reservoirs similar to historic operation for downstream energy production and the industrial and public benefits described above.

MDEP issued a Water Quality Certification for the continued operation of UMDSP (L-20204-32-I-M; -C-M; -B-N/R) on July 11, 2001.

Project Operations

The UMDSP is operated primarily to benefit downstream hydroelectric generators on the Androscoggin River; but does not directly generate electricity. It is operated to provide uniform and reliable flows during the entire year, which benefits downstream hydropower facilities, industrial and municipal users, recreational users; and communities, which benefit from flood protection. These benefits result from storing water during high flow periods and augmenting flows during low flow periods.

Furthermore, the UMDSP enhances the characteristics that make the watershed unique through increased minimum flows to benefit the fishery; stable reservoir levels in the summer to enhance summer recreation, tourism and to protect wildlife resources. In addition to the operation and maintenance ability of Brookfield Renewables to operate the reservoirs in a manner similar to historic operations and providing consistent flows in the Androscoggin River. The UMDSP guarantees whitewater releases; and additional recreational amenities while preserving the remote, back country character of the region; protection of cultural resources.

The UMDSP consists of two separate storage dams (Upper Dam and Middle Dam), their associated impoundments, Mooselookmeguntic and Richardson Lakes, respectively, and the tailrace area of each dam. Operation of the project is coordinated with the other storage dams (Aziscohos, and Errol dams) in the headwaters of the Androscoggin River.

Middle Dam Development Description

Middle Dam supports water levels and flows released from the 7,470-acre Richardson Lake and maintains a full pond water surface elevation of 1,450 feet through two components. A series of gates are managed to control downstream flow both over and through them. Two earthen dikes provide structural components to impound water. The dam consists of: (1) the 244-foot-long dam structure equipped with a gatehouse containing:

- three 15-foot-wide by 12-foot-deep sluice gates;
- five 7-foot-wide by 10-foot-deep gates;
- six 7-foot-wide by 14.7-foot-deep shoal gates; and
- six 9-foot-wide by 12.3-foot-deep spillway gates.

Two earthen dikes maintain the water levels in the lake. One dike extends 560 feet north of the gatehouse and a second 200 feet south of the gatehouse. A disjointed component known as Black Cat Dike is located 2,000 feet southeast, which is a 180-foot-long earthen dike that prevents flow through a series of wetlands into the Pond in the River.

Upper Richardson Lake and Lower Richardson Lake are impounded by Middle Dam at the outlet to Rapid River on the southwest shore of the lower lake. The Rapid River flows 5 miles to Umbagog Lake headwaters of the Androscoggin River. Primary inflow is discharge over Upper

Dam on Mooselookmeguntic Lake into the eastern shore of the Upper Richardson Lake. Tributaries entering the north end of the upper lake include Mill Brook draining the Richardson Ponds, Fish Brook draining Fish Pond, Beaver Brook draining Beaver Pond, Little Beaver Pond, and Aziscohos Pond. Other tributaries include Rand Brook on the western shore, and Mosquito Brook, Metallak Brook, and Bailey Brook on the eastern shore. The surface area of Upper and Lower Richardson Lakes is approximately 7,751 acres at NHWL with a maximum depth of 108 feet and a mean depth of 44 feet. The Normal High Water Level (NHWL) or normal full pond is an elevation of 1,450 feet and normal low pond is 1,439 feet.

The surrounding area includes two acres of open land maintained as lawn, Middle Dam Road, and a former gate keeper's house and outbuildings. Adjacent to the dam is an undeveloped area of 1.5 acres with a shrub wetland, open maintained areas, and upland forests. A gravel access road extends over the top of each dike with a small generator building along the embankment. Adjacent to and east of the dam is an undeveloped area of shrub wetland, and forested upland community. Between the dam and Black Cat Dike is a gravel road that bisects forested upland communities.

Regulatory and Public Outreach

The UMDSP through its current and previous owners has a long history of coordination of its licensing and permitting efforts with federal and state resource agencies, nongovernmental organizations (NGOs), and the public. NGOs that are considered stakeholders and have regularly provide input and comments on the project consists of: Appalachian Mountain Club, Rangeley Lakes Heritage Trust, Trout Unlimited, American Whitewater, New England Flow, and the Aziscohos Lake Preservation Committee. Governmental agencies that have reviewed and either provided regulatory and technical input include; FERC, Maine Department of Inland Fisheries & Wildlife (MDIFW), US Fish & Wildlife Service (USFWS), US Army Corps of Engineers (USACE), Maine Historic and Preservation Commission (MHPC), Maine Department of Environmental Protection (MDEP), and the Maine Land Use and Planning Commission (LUPC). As discussed above, many of the aforementioned organizations are signatories to the Settlement Agreement.

Recreation and Public Access

The FERC license and Settlement Agreement requires that the licensee provide numerous conservation easements in order to maintain the undeveloped character of the project vicinity, to protect and enhance fish and wildlife resources, wetlands, water quality, aesthetic quality and recreational resources, and to maintain traditional public access points without charge. The following conservation easements are in place at Middle Dams:

- A 250-foot-wide conservation easement on both sides of the Rapid River below Middle Dam;

- A 165 feet strip on both sides of the Rapid River at Middle Dam beginning at the end of the 250 foot conservation easement described immediately above, extending to Lake Umbagog, excluding, privately owned lots;

Richardson Lake has public access from two boat launches with one at South Arm and one at the Mill Stream Maine Public Reserve Land. Furthermore, the lake provides excellent coldwater temperatures, dissolved oxygen levels, and general water quality characteristics for coldwater fisheries, including salmon, brook trout, and lake trout. Surface temperatures in the summer generally are 70 degrees or less and deepwater temperatures can be as low as 45 degrees. The Rapid River is known for its brook trout and landlocked salmon fishing. The river provides excellent recreational opportunities such as whitewater rafting and kayaking.

Photos

Photo 1. Lower lay-down staging area looking south towards dam.

Photo 2. Kiosk looking towards the location of the proposed access trail.

Photo 3. Kiosk area looking towards laydown area with the lower limits at the gravel road and the upper limits near the tree line.

Photo 4. Wetland 3 near the dam where the access trail is proposed.

Photo 5. North embankment looking upstream.

Photo 6. North embankment downstream at the location of the proposed bypass gate.

Photo 7. Looking downstream of the dam into the Rapid River from the north embankment.

Photo 6. Downstream tailrace.

Photo 7. Upstream view at the dam including bridge access.

Photo 8. South embankment looking downstream.

Photo 9. South embankment cross sectional view.

Photo 10. Richardson Lake near the barge landing and crane pad site.

Photo 11. Black Cat Dike downstream embankment.

Photo 12. Black Cat Dike upstream embankment.

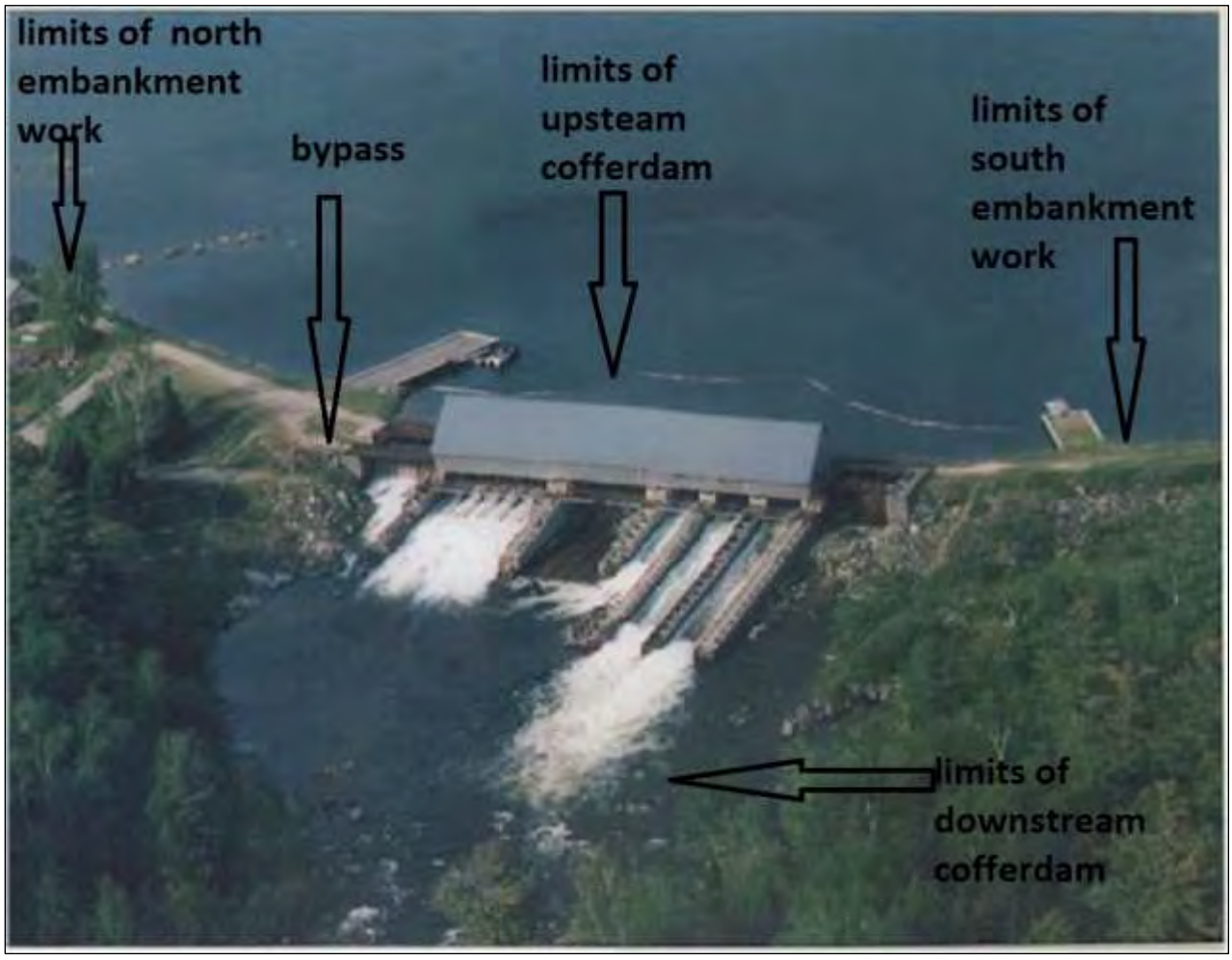


Photo 13. Aerial view.

1.5 Construction

Table 1-1 provides an outline of construction activities that are proposed. Table 1-2 provides a general schedule of each activity. Table 1-3 provides a summary of the surface areas of impacts by the type and area of construction. BWPH must use a phased approach to construction as work cannot be completed in one year. The phases not only reflect the expected time needed to complete the work but provide sufficient time to insure the structural integrity and safe construction of each component.

Preconstruction

Fish Pond and Middle Dam Access Road Maintenance: BWPH is in the process of replacing a number of roadside culverts, reinforcing the roadway surface, adding vehicular "pull-offs", and sightline vegetation trimming. A total of 14 culvert and bridges will be replaced with in-kind facilities. One undersized four-foot diameter corrugated metal culvert that conveys flow from a perennial stream will be replaced with an eight-foot long concrete arched bridge. A total of 17 roadside areas will be modified to create pull offs, which are all in upland areas. Five miles of tree and brush trimming is needed in selected areas mostly along turns. Lastly BWPH will add a depth of nine inches of gravel at numerous locations over five miles of the road.

Upper Laydown Area: A four acre area of woodland will be cleared and graded to create a laydown and materials storage area approximately 0.5 mile from the dam. The site will be setback from the access road by 75 feet leaving a forested buffer. Tree clearing will be completed in August or September 2018. A base material of bank run shale or crushed rock will be placed over the fill grade. This area will be used to store any unusable spoils taken from the construction. Upon completion of the project the rock will be removed and seed and mulch applied over the exposed soil and will not be graded to preconstruction topography.

Lower Laydown: BWPH will create a temporary laydown area adjacent to the lake at the terminus of Middle Dam Road of approximately two acres. The purpose of this area will be to store materials and equipment being used at the construction site. It will be used to store materials and equipment that is brought to the site via a barge over Lower Richardson Lake. It is relatively flat and level and will require a minimum amount of earth work to make it suitable for construction. It is expected that topsoil will be removed and set aside for the duration of construction and will be replaced with compacted bank run shale. Upon completion of construction the shale will be remove and the topsoil replaced, seeded with a conservation grass mix, and a layer of hay mulch applied. The lower edge of the laydown area is generally 60 to 80 feet from the edge of the lake, being separated from the lake by an existing gravel road that has served as the driveway to the Dam Tender's House and other outbuildings. The laydown area will be circled with silt fence and a chain-link security fence with fabric screening.

Recreational Access Permanent: To maintain convenient and safe public access to the Rapid River, a permanent recreational access trail will be constructed from the main kiosk adjacent to

the terminus of Middle Dam Road to the upper portion of the river. This work will include removing and trimming upland shrubs and trees, removing topsoil, and placing gravel over a geotextile fabric creating a four-foot wide trail. The trail will need to cross a wetland area where hydrology will be maintained by placing three 24 by 36 inch diameter culverts, spaced every 50 feet and placed just below ground level.

Phase 1

Crane Pad and Beach Expansion: Due to the remote location and difficulty of getting large equipment to the site, BWPH proposes to use a barge to transport some equipment and materials to the project site. This will reduce the amount of traffic using the Middle Dam Road. To provide a safe access from the lake, a small portion of the beach will be expanded by placing clean gravel and rip rap below the water level, extending 25-30 feet into the lake for a depth of two to three feet. An access trail of bank run shale or gravel will be created from the beach area to the lower lay down area. A temporary gravel pad, approximately 50' x 50' will be created adjacent to the expanded beach to set up a crane for the use of extracting materials and equipment from the barge and to convey them to the laydown area and trucks.

Sediment Basin: A sediment Basin will be excavated adjacent to the proposed bypass spillway. The purpose of the basin is for dewatering the work areas. The basin is expected to be approximately 1,200 square feet and excavated to a depth of approximately 5 feet. The sediment basin will be restored and reclaimed upon completion of work.

Auxiliary Spillway: A main component of the Phase 1 work, will be the creation of an auxiliary (i.e. bypass) spillway including construction of coffer dams that will allow work to be completed in the dry. The final construction could extend into Phase 2 with the final testing and commencement of operation plus the removal of the coffer dams. The purpose of this structure is to allow the continued passage of flow from Lower Richardson Lake to the Rapid River during the construction of the main portion of the dam. Upon completion of the Middle Dam renewal the auxiliary spillway will be part of the normal operation of the dam.

The auxiliary spillway will require excavation and grading of a distance of approximately 150 feet to a depth ranging from a depth of approximately 15 to 30 feet. For the intake approach some modification/dredging of the substrate will be needed to lower and flatten the benthic areas to create a positive flow into the auxiliary spillway. This work will be completed at the location of the existing sheetpile pier, which will be removed, extending 60 feet from the embankment. In order to work "in the dry" cofferdams will be placed on the upstream and downstream portions of the spillway. The cofferdam configuration on the upstream side will include temporary cellular coffers and a sheet pile coffer. The downstream cofferdam will be made of earthen fill. Once the cofferdams are in place the excavation for the spillway can be completed. Prior to excavation a temporary access bridge will be placed over the spillway location to maintain pedestrian and vehicular access across the dam.

The spillway will be 42 feet wide and 120 feet long with a substrate of poured concrete. A portion of the intake area will be excavated to an elevation of 1,435 down to 1,430 feet to allow flow to pass. Both walls of the spillway will be made of poured concrete. The north wall will be reinforced with earth and sloped with approximately ten foot depth of riprap. The area adjacent to the south wall will be filled with earth and riprap. The tailrace will also be heavily reinforced with riprap.

Upon completion of the auxiliary spillway the cofferdams will be removed and those areas restored. Once the spillway is fully functional, the Phase 2 portion of the Middle Dam renewal project can be started.

Erosion and Sedimentation controls: Best Management Practices (BMPs) will be applied throughout the construction of the project and final restoration. The construction plans detail the locations and types of Erosion Control Devices (ECDs) to be used at each location.

Construction traffic has a high potential to create sedimentation along all access roads, as such the reinforcement and stabilization of the Middle Dam access road and access trail adjacent to the dam is important. As discussed above the preconstruction work on the Middle dam access road provides an important BMP including the reinforcement of the road and the replacement of damaged and undersized culverts. The contractor will monitor the access road for sedimentation especially in low spots where sediment puddles form. Additional ECDs may be installed to prevent sediments from flowing or being pumped from the access road into wetlands and streams. Examples of ECDs that are effective along access roads include stone check dams in roadside ditches, silt fence at culvert and bridge crossings of streams, for which there are two that flow under the access road.

The grading and reinforcement, using bank run shale or crushed rock of both lay down areas will eliminate or reduce sediments from being tracked from these areas .

All areas of soil disturbance will be outlined with an ECD such as silt fence or turbidity curtains. There may be situations where silt fence is replaced with erosion control socks or erosion control mulch berms depending on the specific site conditions, traffic, and the discretion of the contractor. Turbidity curtains will be placed on the waterward side of all the areas where there is disturbance at or below the normal high water line.

All areas containing spoils will be covered with hay mulch on a regular basis. Construction crews will be advised to employ proper housekeeping practices such as applying mulch over exposed soils, removing mud and excessive soil from access ways, removing construction debris, daily monitoring of all construction areas, and addressing erosion situations as they arise in a timely basis.

When grading and backfilling is complete at any given area, a conservation seed mix or annual rye grass will be applied over exposed soils and subsequently covered with hay mulch. At the

end of each construction season all areas of disturbed soil will be treated in this fashion. Annual grass seed should be used so that it can germinate over the winter and be established prior to work commencing in the spring. BWPH is proposing to begin construction during each phase in early to mid-May to avoid the worst conditions of the typical Maine mud season, thus reducing the potential for sedimentation.

All dewatering will be conducted into either a silk bag or sediment basin with the perimeter reinforced with an ECD to prevent sedimentation from flowing into any of the protected resources.

Phase 2

Complete Auxiliary Spillway: All disturbed areas will be stabilized and a final as built assessment and testing will be completed. The spillway and gates will be opened and become operational

Upstream Cellular Cofferdam: To complete the construction of the new Middle Dam spillway and gates, a cofferdam will be placed upstream of the existing spillway. Cellular sheet piling will be driven into the substrate to a depth of approximately 30. These interlocking cells will be 30 feet wide and will extend approximately 360 feet from the north embankment to the south embankment. The finished elevation of the cofferdam will be 1,452 feet. The cells will be backfilled to a depth of approximately 12 feet with clean gravel and compacted. A temporary access bridge will be placed over the auxiliary spillway to serve as access to the cellular cofferdam, which will serve as the temporary public access.

Downstream Earthen Cofferdam: A temporary earthen cofferdam will be placed on the downstream portion of the dam to prevent backflow from entering the lower portion of the work space. A turbidity curtain will be placed just downstream of the coffer dam to prevent sediments from coming into contact with backflow. This earthen cofferdam will be approximately 20 feet wide with its crest at an elevation of 1,434 feet. The cofferdam will be reinforced with sheet piling driven below the substrate approximately 10 feet. A temporary access bridge will be placed over the auxiliary spillway so that the cofferdam can also serve as construction access. All construction equipment that needs to access the work area will be through this access. As such, construction and public access will be separate.

Phase 3

Dewatering the Dam Footprint: Once the cofferdams are fully stabilized the dam foot print will be dewatered which will require extensive pumping. All dewater pumping will be into a sediment basin located in upland areas to contain sediments and prevent any sediments from entering the Rapid River.

Existing Structures Demolition: The demolition of the existing gate house, spillways, gates and all structures will be completed after the work area is fully dewatered. All construction and demolition debris will be removed from the site and disposed of in accordance with Maine's solid waste regulations. BWPH and its general contractor will insure that all solid waste generated is handled by licensed disposal or recycling facilities. The general contractor will have procedures in place that address each type of waste that may be generated at the project to ensure that it is handled appropriately and recycled where possible by licensed facilities.

North Embankment: The north embankment needs structural reinforcement on both the upstream and downstream sides (Plans sheet 12 with a cross section D on sheet 13). On the upstream side, a portion of the existing riprap on the lower slope will remain. On the upper slope, riprap will be removed and replaced with a riprap of increased structural capabilities. For the downstream side a portion of the existing boulder and cobble substrate will be removed and replaced with re-compacted glacial till and overlain with a 12 inch thick layer of riprap. An 18 inch thick layer of crushed gravel will be placed on top of the embankment to bring the final grade to 1,455.6 feet. For additional reinforcement new sheetpile will be placed below grade and will reduce seepage from the lake into the downstream portion of the embankment.

South Embankment: The south embankment needs structural reinforcement on both upstream and downstream sides (Plans Sheet 11, cross sections B and C). The angle and composition of the side slopes will be modified using a mixture of techniques and materials. For the upstream side, the lower slope of the embankment will be removed and a portion of it will be replaced with filter soil and a 36 inch layer of riprap (cross section C). This work will not result in an increase in fill within the lake. A portion of the downstream embankment underlain with boulders and cobble will be removed and replaced with re-compacted glacial till and filter soil with a 12 inch thick overlay of riprap (cross section B). A portion of the downstream slope will be reinforced with filter soil and riprap (cross section C) and extend into the existing swale. An 18 inch thick layer of crushed gravel will be placed on top of the embankment to meet the new side slopes and create a wave barrier at a final elevation of 1,455.6 feet. Additional sheetpile will be driven into the existing soil for added stability and to reduce seepage from the lake into the downstream portion of the embankment.

Black Cat Dike: On the downstream side the existing organic soil layer, 12-24 inches thick will be removed and replaced with 36-48 inches of common borrow to reinforce the dike and raise it an elevation of 1,454 feet (plans sheet 14 cross section E). Riprap will be placed on the upstream side of the dike for reinforcement and to support the increased height. This additional fill will not extend below the NHWL of the lake.

Foundation Prep: Each of the structures requires an embedded reinforced concrete foundation. Excavation must be completed to set the lower part of the foundation which will generally be reinforced with rebar and subsequently built up with poured concrete. Each of these foundations will be stabilized prior to pouring which includes grouting or pinning the bottoms to prevent

intrusion of water. As foundations are excavated, dewatering may be necessary which will be pumped into a sedimentation basin.

New Storage & Generator Building: Operation of Middle Dam requires construction of a new storage building and generator building. The purpose of the generator building is to provide electricity for operating the dam and is generally run using a petroleum fuel. Each will have a poured concrete foundation and the generator building will be built with proper containment to prevent possible fuel leakage into the soil.

Phase 4

New Spillway, Piers and Sidewalls: The main structure of the dam includes the concrete spillways, piers and sidewalls. The spillways are the floor of the dam while the piers and sidewalls are the vertical structures that support the gates and the outer portions of the dam. These are generally constructed from reinforced poured concrete. All washout from cement trucks will be contained and removed from the site. There are no areas where freshly poured concrete will come into contact with water from Lower Richardson Lake or the Rapid River.

New Gatehouse, Gates, and Bridges: Once the piers and side walls are built, the gatehouse and new bridge crossing, which provides public access across the dam, will be constructed. The piers and side walls provide the structural support for the gatehouse and bridge. The gates and the mechanical equipment that is used to raise and lower the gates will be installed and preliminarily tested at this time. The new bridge will need to be in place and functional prior to removal of the upstream cofferdam.

Upstream Modifications: For the intake approach, some modification of the substrate is needed to lower and flatten the benthic areas to create a positive flow into the spillways. The upstream approach will be anchored with riprap for long-term stability. The tailrace area will require some modifications and to be armored with riprap. The lower portion of the existing tailrace will be restored to natural grade. All modifications to the dam intake and tailrace areas that are below will be completed in the dry as protected by the cofferdams that will not generate any sedimentation directly into either Lower Richardson Lake or the Rapid River.

During this phase of construction, access for the general public will be provided via a fishing/observation platform at the tailrace that will replace the traditional fishing/observation piers currently present.

Phase 5

Evaluate Construction and As-built: Once all the structures have been installed but prior to removal of the cofferdams, BWPH will complete an “as built” and functional assessment of the

gates and mechanisms. This would include an ongoing effort to document the strength and stability of the concrete and backfilled areas.

Cofferdam Removal and Restoration: The downstream earthen cofferdam will be removed first which requires the removal of fill to an off-site location. The tailrace area will be stabilized and evaluated for the forthcoming releases from the new gates. Once the downstream cofferdam is removed the backfill and cells from the upstream cofferdam can be removed. This will include the excavation and removal of the earth backfill and steel sheetpile working from south to north. This material will be removed to an off-site location to be determined by the contractor. The sheet piling cells will be removed slowly and the gates opened to allow flow to re-establish with minimal sedimentation.

Final Demobilization and Restoration: At the end of each construction season, all areas of exposed soil will be restored including grading and application of seed and mulch. Upon completion of construction the following spring final restoration will be undertaken. This effort will largely include removal of rock from both laydown areas and some minor grading and replacement of topsoil and application of seed and mulch.

Table 1-1. Construction Summary

Upper Laydown	Clear, grade, and stabilize four acre area	Permanent on undisturbed ground, but will be partially restored
Lower Laydown	Grade and create stable base for lower laydown area	Temporary on disturbed ground
	Crane pad and access	Temporary on disturbed ground
	Barge landing	Temporary on disturbed below NHWL
North Embankment	Public access trail & sedimentation basin	Temporary on undisturbed ground
	Public access trail	Permanent on disturbed ground
	Reinforce upstream portion of embankment	Permanent on disturbed ground below NHWL
	Raise top elevation and reinforce downstream portion	Permanent on disturbed ground
	Install coffer dams at bypass gate location	Temporary on disturbed below NHWL
	Excavate and install concrete walls for the bypass gate and add access bridge	Permanent on disturbed ground including upstream for flow path. Tailrace will be below the NHWL within disturbed ground
South Embankment	Reinforce upstream portion of embankment	Permanent on disturbed ground below NHWL
	Reinforce downstream and raise top elevation	Permanent on disturbed ground
Black Cat Dike	Reinforce downstream and upstream embankments	Permanent on disturbed ground
	Raise embankment	Permanent on disturbed ground
North Embankment	Open bypass gate and install permanent access bridge and temporary construction access	Permanent on disturbed ground
Dam Footprint Upstream	Construct cellular cofferdam and seepage trench	Coffer dam and trench are temporary on disturbed ground below NHWL
	Reinforce intake approach	Permanent on disturbed ground below NHWL
Dam Footprint Downstream	Construct earthen cofferdam and temporary access including access to south embankment	Coffer dam is temporary on disturbed ground below NHWL
	Reinforce tailrace	Permanent on disturbed ground below NHWL
Dam Footprint	Demolish and remove existing spillway, piers, gates, and gate house	Permanent on disturbed ground below NHWL

	Construct new dam, spillway, gates, tailrace, control house, and access bridge	Permanent on disturbed ground below NHWL

Table 1-2. Proposed construction schedule

Task	Start Date	End Date
Phase 1 Construction - 2019		
Mobilize to site	5/6/19	5/31/19
Install BMPs, security fence, signage, screening	5/13/19	5/31/19
Construction coffer dams for bypass gate	6/3/19	8/30/19
Excavate bypass spillway and grade and reinforce areas adjacent to bypass gate. Temporary access will be over the upstream coffer dam	9/3/19	11/29/19
Demobilize & complete temporary restoration	12/2/19	12/13/19
Phase 2 Construction- 2020		
Complete bypass spillway and gate, stabilize disturbed areas, evaluate constructed as designed, open bypass spillway and gate. Remove coffer dam	6/1/20	9/11/20
Construct cellular upstream coffer dam. Install temporary upstream public access and temporary construction access (downstream)	9/14/20	10/30/20
Construct earthen downstream coffer dam	11/2/20	12/4/20
Demobilize for 2020 and complete temporary restoration		
Phase 3 Construction – 2021		
Dewater dam footprint	5/17/21	5/28/21
Demolition of existing spillways, gate house, and all other structures	5/31/21	6/25/21
Foundation preparation	6/28/21	8/27/21
New sheetpile cutoff and embankment work	8/30/21	11/12/21
Black Cat Dike – Install BMPs, Install upstream reinforcements, Earthwork to raise dike, removal of BMPs and restoration	7/26/21	9/24/21
Construct new storage and generator building	11/15/21	12/10/21
Demobilize for 2021 and complete temporary restoration	12/13/21	12/17/21
Phase 4 Construction – 2022		
Construct new spillways, piers and side walls	5/16/22	7/29/22
Upstream reinforcements and substrate removal, Stabilize all construction, Evaluate as built	10/31/22	11/18/22
Remove coffer dams and open gates	11/21/22	12/16/22
Demobilize for 2022 and complete temporary restoration	12/19/22	12/22/22
Phase 5 Construction - Final Remediation - 2023		
Construct new gate house, gates, bridges	5/1/23	7/15/23
Finish upstream intake and downstream tailrace	5/1/23	7/15/23
Remove coffer dams	7/15/23	10/15/23
Final demobilization	10/15/23	11/15/23
Final restoration including final road work, loam, seed, removal of BMPs	11/15/23	12/15/23

Table 1-3. Summary of Temporary and Permanent Impacts

Location	Description	Purpose	Surface area square feet (wetland impact)
Embankments: North, South, and Black Cat Dike. Middle Dam footprint. Above NHWL	Permanent above NHWL on existing embankments and adjacent disturbed areas	Reinforce side slopes and raise top	113,064
Wetlands	Permanent fill in existing previously undisturbed area	Fill for access trail, auxiliary embankment, & downstream south embankment	(4,685)
Upland near tailrace	Temporary impact on disturbed ground	Sediment basin for dewatering dam footprint	5,986
Upstream intake and tailrace	Permanent dredging and contouring on previously disturbed benthic areas (below NHWL)	Lower intake and tailrace to create positive flow	38,718
Upstream intake and tailrace	Temporary placement of cofferdams below NHWL; areas to be restored	Cofferdams are used to temporarily block flow to allow construction "in the dry"	16,718
Upper laydown area	Vegetation clearing, grading and stabilizing; area will be partially restored	Area is needed for staging construction materials and creating a temporary cement plant	198,230
Lower laydown area, crane pad, and access from the lake	Temporary grading and stabilizing; areas will be restored	Area is needed for staging construction materials and setting up a crane to off load materials	50,414
Beach expansion at old dam keeper's house	Temporary fill below the NHWL; area will be restored	Needed to facilitate access to barge to off load materials	2,325
Black cat dike	Permanent above NHWL on existing embankments and adjacent disturbed areas	Reinforce side slopes and raise top	7,500 (785)
Total wetland impact			5,470

1.6 OPERATIONS & MAINTENANCE

Overview: The following provides a summary of the operational conditions of Middle Dam, primarily relating to flow and water level management as approved during the FERC licensing and the provisions of the Upper Androscoggin River Storage Projects Settlement Agreement.

The operation of the Middle Dam facility is integral with the operation of the system and requires a balancing of current conditions, long-term needs, weather forecasts, operational and settlement agreements, FERC licensing requirements, natural resources, industrial needs, recreational opportunities, public interest and safety needs.

Maintaining the reservoir near its maximum storage capacity maximizes the surface area of Richardson Lake. Storage of water during periods of high runoff and drawing water during periods of low runoff provides a relatively steady flow of water downstream. During the winter the reservoir can be drawn down to 32% of its capacity to accommodate spring runoff. The amount of drawdown is fluctuated based on predicated runoff. As the last of the spring runoff enters the lake, it is brought to within six inches of its normal full pond elevation. Drawdown during the summer is primarily regulated based on the minimum flow targeted at the Berlin dam, current storage, whitewater releases, and weather.

These conditions are referenced in the FERC license and refer to the current owner, BWPH, as the licensee.

Minimum flows: The following summarizes the minimum and maximum flows released from Middle Dam to the Rapid River:

- From the start of the spring refill of Richardson Lake through September 15 annually, a guaranteed minimum flow of 382 cfs, except that, during those years when the level of Richardson Lake falls to elevation 1444 feet during the period from June 1 through Labor Day, the minimum flow will be reduced to a guaranteed flow of 310;
- From September 16 through the start of the spring refill of Richardson Lake annually, a guaranteed minimum flow of 472 cfs; and
- From July 15 through Labor Day annually, a flow no greater than 1200 cfs, except for whitewater releases.

Richardson Lake Levels: The following summarizes the lake level management for Richardson Lake.

- From July 16 through September 30, the licensee shall maintain Richardson Lake at an elevation greater than 1,444 feet. The lake elevation may be permitted to go below 1,444 feet to meet the minimum flow requirements, including those for whitewater releases;
- From October 1 through May 31, there are no lake level restrictions, except that, after October 15, the licensee shall drop the lake level a minimum of five feet from the

October 1 level. The purpose of this restriction is to preclude togue (*Salvelinus namaycush*) spawning. This annual restriction shall remain in effect until such time as MDIFW determines that this restriction is not needed to control togue populations.

- Notwithstanding the restrictions above, the drawdown of Richardson Lake under ice-in conditions may exceed 13 feet when excessive snowpack (defined as an average water equivalent greater than 8.5 inches as measured at the applicant's principal snow measuring stations during the March 1-15 period) requires an additional drawdown in order to maintain the historic level of flood protection on the Androscoggin River below Errol Dam; and
- From the start of the spring refill through July 15 annually, refill and manage lake levels in general conformity with historic operation of the lake, as defined by the Richardson Lakes-Middle Dam Average Rule Curve, attached hereto as Exhibit 6.

Whitewater releases: From July 15 through Labor Day, the licensee shall not release any flow from Middle Dam greater than 1,200 cfs (as measured at the dam) except for the following whitewater boating releases:

- The licensee shall during the 3rd weekend of July, release from Middle Dam into the Rapid River a whitewater boating flow of 1,300 cfs on Friday and Saturday and a whitewater boating flow of 1,800 cfs on Sunday;
- During the 4th weekend of July, the licensee shall release a whitewater boating flow of 1,300 cfs on Saturday and a whitewater boating flow of 1,800 cfs on Sunday.
- During the 1st weekend of August, licensee shall release a whitewater flow of 1,300 cfs on Saturday and Sunday;
- During the 2nd weekend of August, the licensee shall release a whitewater flow of 1,300 cfs on Friday and Saturday and a whitewater flow of 1,800 cfs on Sunday;
- In those years when the elevation of Richardson Lake recedes to 1,444 feet MSL during the period June 1 through Labor Day, the licensee shall release a maximum whitewater flow of 1,300 cfs for eight days (3rd and 4th weekends in July and 1st and 2nd weekends in August); and
- All whitewater boating flow releases on the Rapid River will start at 6:00 p.m. the day before the first day of the scheduled release and shall end at 12:00 noon on the last day of the scheduled release.

2.0 REVIEW CRITERIA

2.1 Financial Capacity

Brookfield White Pine Hydro, LLC, the owners and licensees for the Upper and Middle Dams Project, FERC No. P-11834-ME, has the financial ability to perform the Middle Dam Renewal Project. Work is planned as part of the required renewal of the facility; Brookfield White Pine Hydro, LLC annually allocates in excess of $8.8M for capital expenditures. The funds for this upgrade have been budgeted and approved through 2022.

Table 2-1. Estimated Project Cost Breakdown

Activity	Labor ($)	Contractor ($)
Engineering, Design, RFP Package Development	950,000	0
Project Management	200,000	0
Operations Support	100,000	0
Safety & Contract Manager	600,000	0
Construction, demolition, & restoration	0	15,000,000
Quality assurance & control & as-built survey & drawings	300,000	0
	2,150,000	15,000,000

2.2 Technical Ability

The Middle Dam renewal project will be managed by BWPH and is an indirect subsidiary of Brookfield Renewable Partners who operates one of the world's largest publicly-traded renewable power platforms. Its portfolio consists of over 16,300 MW of capacity and 843 generating facilities in North America, South America, Europe and Asia. The company is a global leader in hydroelectric power, including 217 hydroelectric facilities. It is also an experienced owner, operator and investor of global wind, solar, distributed generation, and storage facilities. Resumes are provided of key staff that have been involved with the design of the project and have firsthand knowledge of dam operations and maintenance.

2.3 Public Safety and Benefits

The FERC Order cited potential long-term safety concerns of the UMDSP related to maintaining storage and flood control and conformance to the FERC safety guidelines. FERC licensing requirements mandated the proposed renewal in order to maintain the long-term operations, economic benefits, and safety to individuals, municipalities, and businesses downstream of

Middle Dam. Raising the top of the embankments and adding reinforcement reduces the possibility of an overtopping of the embankment or structural failure. Reconstructing the spillways and installing concrete aprons improves structural stability and reduces the potential for dam failure. Replacing the existing gatehouse eliminates the fire hazard. Strengthening Black Cat Dike by adding fill and a filter barrier will provide additional assurance that the structure will not fail during a PMF event.

Renewal of Middle Dam provides the most structural long term option for the continued operation of the dam that provides the opportunity to support the regions recreational and natural resource values. Construction will create some short term economic benefits via employment and the procurement and delivery of materials.

2.4 Traffic: Vehicular and Pedestrian

Public traffic around Middle Dam is very limited due to the remote location. Vehicular traffic is limited to camp owners that are immediately south of the dam. There is no public boat launch at the dam, although hand carry of canoes and kayaks is possible. Pedestrian use is generally restricted to day users and seasonal guests staying at the camps north of the dam. Once construction is complete there will not be any change to the accessibility of the natural areas around the dam.

During construction BWPH has made every effort to accommodate the safe and customary use of the dam and access to adjacent areas. A new permanent foot path from the end of the Middle Dam Road will be established to allow access to the Rapid River. Bridge crossings will be installed for vehicular and pedestrian access to the lake and across the embankments. As such, there should not be any material disruption of access during construction. Maintenance and reinforcement of the Middle Dam access road will provide improved sightlines and turnoffs to allow safe distances for vehicles to pass. While there will be an increase in traffic during construction, BWPH has made important considerations and alterations to the access road for safe public and private use.

2.5 Zoning

The Middle Dam footprint and south embankment are within the P-GP2/SL1 (Semi-remote Lake Protection & zoning classification, while the north embankment and lower laydown area are within P-GP2. Middle Dam predates all zoning designations and regulations. The upper laydown area and the access road are within the M-GN, general district.

Essentially these zoning designations are designed to protect the lake and accommodate natural values such as water quality and human uses, including recreation. The recreational uses and the current shoreline of the lake would not be present in their existing states, if not for the dam. The dam is essential to the continuation of these functions and values. BWPH manages some of the recreational facilities and maintains public access to the area. The continued operation of the dam is also essential to downstream activities such as whitewater rafting.

2.6 Environmental Mitigation

BWPH has made every effort to avoid and minimize impacts to natural resources and recreational uses that are influenced by the operation of the dam. Of specific importance is the implementation of best management practices to prevent sediments from entering Lower Richardson Lake and the Rapid River. Permanent impacts to natural habitats have been limited to a small wetland area on the south downstream area of the dam. BWPH has established a time frame for completion of the work extended over five construction seasons to ensure that construction will be done in a safe and environmentally sound manner. Maintenance of the current operation of the dam, including water levels and flows, is essential to maintaining upstream and downstream aquatic and hydrologic conditions.

2.7 Water Quality

A limited amount of water quality data has been collected for Richardson Lake since the early 1980's (www.pearl.maine.edu [website is not currently available]). In summary, these data show water quality to be good as would be expected in a remote watershed. The lake has Secchi Disk depths to as much as 20 feet. Total phosphorous is low (generally between 7-9 ppb), as is chlorophyll-a (between 2-4 ppb). The lake does not have any records of significant dissolved oxygen depletion. The pH values are slightly acid to neutral at 5.5-7.0.

Construction along the embankments and the dam footprint have the highest potential to create adverse effects to water quality. The use of turbidity curtains and sedimentation basins for watering will minimize the potential for sedimentation. Furthermore, minimizing sedimentation landward, reduces the potential for sedimentation from areas upslope of the lake and river. BWPH and its contractors will employee BMPs, many of which are described in Phase 1 to prevent erosion and sedimentation to all areas outside of construction.

2.8 Soils

The composition of soils around the dam will not affect construction. Existing glacial till soils will be used as backfill where possible otherwise crushed rock or an engineered backfill will be used. The structural components of the dam are largely made out of reinforced poured concrete. Most likely all the soils immediately adjacent to the dam have been disturbed at some point since the construction of the dam in the 1850s. Construction is not expected to adversely affect any native soils under these circumstances.

2.9 Wetlands, Natural Environment, and Fish & Wildlife

Wetlands: Wetland and protected resource surveys were conducted in the vicinity of the proposed project during May 2007 and June 2017. The specific objectives of these surveys were to: 1) identify, delineate, and map wetlands and protected resources located within the proposed project area; and 2) determine their federal and state jurisdictional status. Lakeshore extents were surveyed prior to preparing site plans. This information has also been used to analyze

project development alternatives in order to avoid and minimize impacts to wetlands and protected resources to the maximum extent practicable.

The "Routine On-site Determination Method" described in the Army Corps of Engineers (ACOE) Wetland Delineation Manual was selected as the most appropriate wetland delineation technique. Specific methods for characterizing and evaluating soils, vegetation, and hydrology within each wetland were used. A wetland scientist performed the wetland delineation and reviewed the site for other protected resources. Wetland delineation points were recorded using GPS.

During the delineation effort, three wetlands were identified within 250 feet of Richardson Lake and the Rapid River.

Wetland 1 is a palustrine forested wetland (PFO) with pit and mound topography which was delineated adjacent to Black Cat Dike. Northern white cedar (*Thulja occidentalis*) and balsam fir (*Abies balsamea*) dominate the canopy and midcanopy. Hydrology is evidenced by standing water within the lower portions, (pits), of the wetland with saturated soil in the upper portions (mounds). Hydric soil indicators include a dark A horizon (10YR 2/2) underlain by a depleted matrix (10YR 5/2) with depletions (10YR 6/1). A portion of the wetland immediately adjacent to the dike is disturbed and is maintained as an herbaceous community. Off-road vehicles have driven through this area regularly and disturbed the ground, creating shallow ruts. Vegetation here includes tussock sedge (*Carex stricta*), common cattail (*Typha latifolia*), sensitive fern (*Onoclea sensibilis*), Canada bluejoint (*Calamagrostis canadensis*), and cranberry (*Vaccinium macrocarpon*).

Wetland 2 is a palustrine forested wetland (PFO) along the slope descending towards the Rapid River. Vegetation includes balsam fir, northern white cedar, and red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), American elm (*Ulmus americana*), sensitive fern, and cinnamon fern (*Osmunda cinnamomea*). Hydrology included standing water and saturated soils observed during the delineation. Soils were a shallow dark layer of sapric and mucky mineral textured material overlaying basal till.

Forested uplands lie adjacent to Wetlands 1 and 3; these contained eastern white-pine (*Pinus strobus*), sugar maple (*Acer saccharum*), balsam fir, paper birch (*Betula paperifera*), red spruce *(Picea rubens*), and evergreen woodfern (*Dryopteris intermedia*). These uplands lie within 500 feet of the lake, and are therefore within the Accessible Lake Protection Subdistrict.

Wetland 3 is a disturbed herbaceous and shrub wetland located between the downstream slope of the north embankment and an access road. The wetland is separated into two areas by the access road with a culvert providing a hydrologic connection. Flow through the wetland appears to become subterranean as a surface connection does not exist. Vegetation present includes Canada bluejoint, sensitive fern, soft rush (*Juncus effusus*), red raspberry (*Rubus ideaus*), speckled alder (*Alnus rugosa*), meadowsweet (*Spirea alba*), and willows (*Salix* sp.). Hydrology includes soil

saturation and flow through a shallow channel before going underground. The soils have a dark A horizon underlain by a depleted matrix.

Fisheries & Wildlife: Richardson Lake has many tributaries which provide spawning and nursery areas for coldwater fish. Coldwater conditions and good water quality provide habitat that produces salmon and trout fishing despite the presence of yellow perch, a competing warm water species. Brown trout are rarely taken, as only a small population exists in the lake. The MDIFW has stocked fish for recreational purposes generally being limited to landlocked salmon, brook trout, and lake trout in Richardson Lake.

The lakes and surrounding upland and wetland habitats provide for diverse habitat for an abundance of wildlife. These expansive forests surrounding the lakes have very limited public access with a limited threat of development.

Logging activity provides for diversity through generating various stages of ecological succession. The forests provide opportunities for hunting along existing roads and trails primarily for deer, moose, bear, and grouse. While not common, bald eagle and osprey nesting has been documented in the region. Due to the geographic location the area is a mixture of habitat for temperate and northern forest or boreal species, such as the black-capped chickadee and boreal chickadee, respectively. Birds of prey including barred owl, red-tailed hawk, and goshawk likely occur. Many boreal species migrate south into the forested habitats in the region and areas further south. An abundance of breeding warblers and locally common species, common crow, blue jay, downy woodpecker, likely occur though out the region. The lake provides habitat for aquatic species that are adapted to permanently flooded conditions. Common loons frequent the lake and some, albeit sparse, waterfowl species, typically diving ducks, i.e. scaup and mergansers use the lakes.

Fish Passage: BWHP will manage the construction for the purposes of preventing bass passage from the Rapid River into the Richardson Lake. The timing of the reconstruction of Upper Dam preceding that of Middle Dam was considered as an important component to this strategy. Based on data provided by the MDIFW the maximum swim speed for bass is 12-15 feet per second. Maintaining flow of a minimum of 15 feet per second for a distance of 4-6 feet should prevent bass from swimming upstream and passing through the gates of the temporary bypass. In the event bass ascend into Richardson Lake, BWPH will coordinate with the fisheries agencies on the provision of movement of salmonids for thermal refuge.

Northern Long-eared Bat: In order to avoid any potential impacts to maternity roosts and breeding activity all tree clearing activities, which are minimal, will be avoided from June 1 to July 31. All other construction activities will not interfere with breeding and foraging activities.

Bald Eagle Nest: The proposed construction complies with the Bald and Golden Eagle Protection Act guidelines regarding the bald eagle nest 725 feet from the dam, which is not visible from the dam. These guidelines, which are voluntary, recommend a buffer of 660 feet

from active eagle nests to the proposed construction. In this situation the nearest construction is 725 feet from the nest, as such the project is in compliance with these guidelines.

2.10 Historic and Archaeological Resources

Documentation has been submitted to the Maine Historic Preservation Commission (MHPC) regarding the presence of historic and/or prehistoric resources on the dam site and embankment. As part of the FERC licensing of the Upper and Middle Dam Storage Project, Phase I and II archaeological surveys were conducted in 1996-97. No archaeological sites eligible for the National Register of Historic Places were found in the vicinity of either Upper or Middle Dams. The Middle Dam gatehouse was determined to be eligible for the National Register of Historic Places. Despite the historical status of the gatehouse, to meet safety requirements established within the PFMA and the gatehouse being an integral part of the dam, it must be replaced. The MHPC required an Historic American Buildings Survey and Historic American Engineering Record documentation, which was prepared and submitted to the MHPC. A detailed summary of the history of Middle Dam was prepared and provided to the MHPC and accepted. Subsequently the MHPC completed its consultation with an issuance of a no effects letter.

2.11 Public Use & Access

The FERC license and Settlement Agreement requires that the licensee provide and maintain a variety of recreational facilities for the Upper and Middle Dam Storage Project. Facilities at Middle Dam include; an improved canoe portage trail, recreation signs at public access points, at canoe portage trails, and at primary fishing access points along the Rapid River, flow phone service and posting of flows, access and path maintenance at the Magalloway River whitewater boating put-in, a disabled-access point on the South Arm of Richardson Lake at the Oxford County boat launch area, pit privies, maintain the Oxford County boat ramp, and maintain public access within the project boundary including Richardson Lake and the Rapid River (including Pond in the River). A new access trail will be constructed as part of the renewal project that will provide safe permanent access from the terminus of Middle Dam Road to the Rapid River. Furthermore a permanent angler's fishing platform will be incorporated into the tailrace area of the spillway.

2.12 Flood Control

The operation and functions of the dam are discussed above in Section 1.6. One of the main functions of the dam is to regulate water levels and prevent flooding downstream. The purpose of the renewal of Middle Dam is to implement the FERC mandated safety requirements regarding structural and stability standards and to make the dam capable of passing the PMF. Operational water levels above and below the dam will not be altered. Therefore, the flood prevention functions of the dam will not be altered.

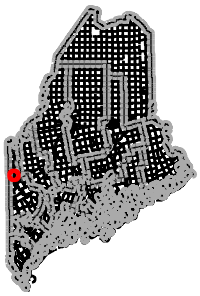
2.13 Energy

Middle Dam does not generate electricity although the UMDSP provides support for downstream generators. The continued operation of Middle dam is essential to the long term management and benefits of the Androscoggin River.

3.0 PUBLIC NOTICE

The public notice form is provided as Attachment 3.0-1. The Public Notice "Notice of Intent to File" was published in the Lewiston Sun Journal newspaper with local distribution in the Lewiston metropolitan area on July 28, 2018. Copies of the Notice of intent to File were mailed via accountable mail to all abutters as determined by the most recent tax assessment records on July 30, 2018. This notice included the time, date, and location of a voluntary public informational meeting held at 6:00 pm on August 14, 2018 at the Rangeley Inn.

Attachment 1-1 Middle Dam Location on USGS Topographic Map



Legend

- Project Area
- Lakes and Ponds
- Intermittent Stream
- Perennial Stream

Base Map:
24k USGS topography.

0.25

Miles

1 inch equals 2,000 feet

FPL Energy Maine Hydro
Middle Dam

TRC 249 Western Ave.
Augusta, ME 04330

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Attachment 1.5-1 Middle Dam Renewal Plans

Attachment 2.2-1 Project Technical Capacity

Eric P. Rossignol

EDUCATION: **UNIVERSITY OF MAINE,** Orono, Maine
Electrical Engineering Technology, BSEET, May 1997

NORTHERN MAINE TECHNICAL COLLEGE, Presque Isle, Maine
Electrical Construction and Maintenance, Associates Degree, May 1993

RELATED EXPERIENCE:

BROOKFIELD RENEWABLE, Senior Project Manager, Lewiston, Maine, March 2013 – Present
Manage multiple capital upgrade and major maintenance hydro projects with a primary focus on safety, regulatory compliance and contractor management. Responsibilities include project specification and RFP development, budgets and cost tracking, safety planning and oversight of project construciton execution. Conduct site safe work observations assessing job plan and tailboard discussion quality and site safety in order to set company safety expectations and coaching on areas of improvement. Collaboration with procurement and legal departments for RFP, contract development and project resolutions. Promote company safety culture by developing procedures and best practice docuements, setting project manager expectations during contactor monitoring training sessions and mentoring of new hires and coaching of current project managers. Developed project filing structure to provide a consistent format for electronic project document filing throughout the region.

NEXTERA ENERGY RESOURCES, Project Manager, Hallowell, Maine, May 2008 – February 2013
Manage capital upgrade and major maintenance hydro projects with a strong focus on safety and environmental awareness. Responsible for developing technical specifications, RFP and procurement documents based on customer requirements and project performance. Plan, execute and finalize projects which include developing yearly/monthly forecast budgets, risk mitigation plans, construction schedules and safety plans and pre-job safety orientations. Ensure regulatory and environmental compliance, as well as internal operations work requests, are approved prior to project start. Maintain continuous communications between hydro operations, contractors and team members to address changing project conditions. Conduct project update meetings and provide status reporting to operations and business leaders.

PROJECTS:

- Upper Dam Renewal – Richardson Township, Maine
- Wyman Tainter Gate Pier and Spillway Rehabilitation – Moscow, Maine
- Weston Dam Concrete Repair – Skowhegan, Maine
- Monty Rubber Dam Installation – Lewiston, Maine
- Hiram Rubber Dam Installation – Hiram, Maine
- Deer Rips Draft Tube Repairs – Auburn, Maine
- Androscoggin Unit Upgrade – Lewiston, Maine
- Aziscohos Dam Concrete Repair – Lincoln Plantation, Maine
- Cataract Tailrace Concrete Rehabilitation – Saco, Maine
- Stillwater Dam Concrete Repair – Stillwater, Maine
- Errol Dam Slide Gate and Operater Replacement – Errol, Maine
- Skelton Tainter Gate Prime Mover Overhaul and Automation – Dayton, Maine
- Williams Unit 1 & 2 Head Gate Overhaul – Solon, Maine
- West Buxton Broome Gate Overhaul – West Buxton, Maine
- Goebel Street Substation – Berlin, New Hampshire
- Wyman Unit 1 & 3 Exciter Upgrade – Moscow, Maine
- Weston Station Transformer Replacement – Skowhegan, Maine
- Wyman Unit 1 Transformer Replacement – Moscow, Maine
- Williams Station PLC Upgrade – Solon, Maine
- Aziscohos Unit Exciter Upgrade – Lincoln, Plantation
- Asiscohos Station PLC Upgrade – Lincoln, Plantation
- Bar Mills Derrick Crane Upgrade – Bar Mills, Maine
- Brunswick Emergency Backup Power System – Brunswick, Maine

COMPUTER SKILLS: Microsoft Project, PowerPoint, Word, Excel, Outlook, SharePoint, Go-To-Meeting
AutoCAD, Adobe Acrobat, IFS, Windows and Mac Operating Systems

MARK W. CHRISTOPHER, MS, CWB

EDUCATION

M.S., Wildlife Ecology, Mississippi State University, 1985
B.S., Wildlife Biology, University of Massachusetts, 1982

AREAS OF EXPERTISE

Mr. Mark W. Christopher has 30 years of experience and progressive responsibility in environmental consulting in the following areas:

- Project scheduling and budgeting and proposal preparation
- Electrical transmission line and substation permitting
- Best Management Practices inspections
- Licensing, permitting, mitigation, agency consultation, and public meetings
- Permit compliance and monitoring
- Rare, Threatened & Endangered Species Surveys and Consultation
- Land Use & Shoreline Management Planning
- Wildlife & Fisheries Management
- NEPA compliance including EA, EIS, FONSI, and FCC

REPRESENTATIVE EXPERIENCE

For the past twelve years Mr. Christopher has worked extensively on Central Maine Power (CMP) Company transmission line and substation projects including permitting the construction of 22 transmission lines and 17 substations. He has represented CMP by making presentations at many public and agency meetings and meeting with individual landowners. Mr. Christopher regular works with CMP staff to assess alternative substation sites and transmission corridor alignments. Recently he worked with CMP staff to develop and create a process for permitting transmission line maintenance work and has obtained Federal approvals for over 150 transmission line maintenance projects.

As part of the State, Federal, and municipal permitting Mr. Christopher coordinates and manages the work of other disciplines including archaeological, historic, visual, soil, and sound studies. Mr. Christopher works closely with TRC transmission, civil, and substation engineers, remediation, and survey staff to solve permitting and engineering issues that affect both permitting and site development. Mr. Christopher regularly advises clients and TRC engineers on options to minimize regulatory exposure and natural resources impacts. Mr. Christopher is very effective at resolving regulatory issues with creativity, communication, technical, and managerial abilities.

TRC Environmental Corporation, Augusta, Maine (Environmental Scientist and Project Manager: 2006 – Present)

Mr. Christopher completed wetland delineations, vernal pool surveys, natural resources permitting, local permitting, and project management for power

transmission, substation, and hydro and wind generation projects. Recent permitting assistance included Natural Resources Protection Act, Site Location of Development, Local, Waterways, Conservation Act Permitting, and Corps of Engineers for energy transmission and generation. Mr. Christopher regularly makes presentations to local governing bodies such as planning boards, boards of appeal, and public informational meetings. Specific project experience is as follows.

Brookfield Renewable Energy, Upper Dam Reconstruction Permitting
Mr. Christopher prepared Clean Water Act and Maine Waterways Development and Conservation Act permit applications for the reconstruction of Upper Dam on Mooselookmeguntic Lake. This effort required several months of working with Brookfield staff, engineers, agency staff, and non-governmental organizations.

Brookfield Renewable Energy, Stillwater Dam Spillway Replacement and Eel Fishway Permitting
Mr. Christopher prepared Clean Water Act and Maine Waterways Development and Conservation Act permit applications for the reconstruction of a spillway and addition of an upstream eel fishway.

Central Maine Power Transmission Line and Substation Permitting
Mr. Christopher completed wetland delineations and prepared natural resource permit applications for federal, state, and local agencies for over 30 transmission lines and substations throughout Maine. During the permitting process for these CMP facilities he has made presentations and coordinated permitting with over 45 communities. The following is a partial summary of transmission lines construction projects Mr. Christopher has permitted on behalf of CMP.

Kenny Construction Corp-CMP Section 388/3023 Transmission Line Rebuild
Mr. Christopher is currently providing environmental inspection services for compliance with State and Federal erosion control and clean water regulations for the 50-mile 345kV rebuild project from Windsor to Orrington. This effort includes communicating directly with construction staff from five companies and providing technical guidance for erosion control, access planning, avoiding & minimizing resource impacts, and restoration.

CMP Lakes Region Phases 1 and 2 Permitting and Support
CMP is currently working towards the design, permitting, and construction of five transmission lines and two new substations for which TRC is providing permitting and engineering support. Mr. Christopher is in the process of preparing and submitting regulatory applications to state, federal, and local agencies for the Phase 1 portion of the project, including completion of all natural resources surveys and management of cultural resources staff. Mr. Christopher completed

Kleinschmidt Overview

Kleinschmidt is headquartered in Pittsfield, Maine, where it was founded in 1966. Kleinschmidt is one of only a few engineering consulting firms in the United States specializing in servicing the hydropower industry and has been doing so for more than five decades. Hydropower related projects account for more than 85 percent of Kleinschmidt's workload. Most of our more than 130 professional, technical, and administrative staff, located in 11 offices throughout North America, are focused on hydropower energy project engineering, regulatory, and supporting services including permitting, fish passage, and ecological services.

Kleinschmidt's primary clients are hydro owners and operators in the United States with assets ranging in size from less than 1 MW up to 125 MW. Kleinschmidt's core business is rehabilitating and modernizing medium-sized assets ranging in age from several decades to more than 100 years old. Kleinschmidt's engineering services include civil / structural / mechanical / electrical design, hydrologic and hydraulic analyses, energy analyses, efficiency testing, automation design, dam engineering, new project and rehabilitation design, operations and maintenance, value engineering, fish passage, and construction services. Our team of engineers routinely works hand in hand with our regulatory and environmental specialists to develop solutions to unique problems that can arise with hydroelectric facilities.

Kleinschmidt's dam engineers provide studies, inspections, and designs to meet the needs of dam owners. Kleinschmidt staff has experience identifying, studying, and preparing solutions to complex dam issues. Since our founding, we have completed thousands of dam inspection, repair, and rehabilitation projects. Our team has experience working on many types of dam structures including stone masonry, concrete, timber crib, earth, and granite block. This team includes several FERC Independent Consultants with upwards of 30 years of dam inspection experience in dam and hydroelectric facilities. We have provided dam engineering services for Brookfield Renewable Energy Group and other dam owners on more than 100 dams in Maine and completed dam modifications and upgrades on many of them.

Kleinschmidt works with our clients to determine the most cost-effective means to help owners ensure the safety of their dams. Appropriate approaches for dam rehabilitation can vary widely depending on the condition of the dam and on the owner's needs. We have pursued a number of solutions, including defining operation and maintenance plans, designing minor or major repairs, or in severe cases, installation of anchoring systems, or even dam removal.

KEVIN J. COOLEY, P.E., V.P

SENIOR MANAGER – ENGINEERING AND DESIGN GROUP

Kevin Cooley specializes in the evaluation, planning, design, and rehabilitation of hydroelectric projects. He oversees more than 40 engineers, designers, and drafters designing hydroelectric facilities. Kevin manages and provides technical support on hydroelectric projects related to powerhouse design and upgrades, gates, rubber dams, concrete repairs, condition assessments, feasibility studies, and energy analyses.

Key Expertise

- Dam Rehabilitation Design
- Dam and Spillway Engineering
- Gates and Water Control Design
- Hydro Feasibility and Planning
- Existing Facility and Equipment Condition Assessments
- Powerhouse Design
- Hydro Due Diligence

Professional Registration

Professional Engineer, ME, MI, OR, WI, and WY

Education

B.S. Civil Engineering, University of Maine, 1997

Years of Experience

With Kleinschmidt: 19
Total: 19

Design Repairs/Construction Monitoring, Pontook Hydro Station
Brookfield New England, Dummer, NH
Served as Project Engineer to design repairs to replace deteriorating timber crib abutment with new concrete crib abutment. Responsibilities also included construction monitoring.

Gate Repair Design, Pontook Dam
Swift River Corporation, Dummer, NH
Served as Project Engineer responsible for design of repairs to deteriorated timber crib gate structure.

Design and Monitoring Repairs, Grand Falls Dam
Domtar, Woodland, ME
Served as Project Engineer for design and monitoring of repairs to concrete spillway crest and new flashboards for "Canadian" spillway. Similar project completed for "American" spillway.

Fishway Replacement, Farm Cove Dam
Domtar Industries, Woodland, ME
Project Manager to design the replacement of a new timber crib fishway at Farm Cove Dam.

Rubber Dam Installation, Hiram Hydroelectric Project
Brookfield Renewable Energy, Hiram, ME
Project Manager for design and permitting for installation of a new rubber dam system to replace existing hinged panel flashboards on two spillway sections.

Rubber Dam Installation, Deer Rips/Andro #3
Brookfield Renewable Energy, Auburn, ME
Project Manager for construction phase of installation of a new rubber dam system to replace existing wood flashboards on four spillway sections.

Rubber Dam Installation, Bonny Eagle Dam
Brookfield Renewable Energy, Hollis, ME
Project Manager for construction phase for installation of a new rubber dam system to replace existing wood flashboards on two spillway sections.

Rubber Dam Installation, Monty Dam
Brookfield Renewable Energy, Lewiston, ME
Project Manager for design of a new rubber dam system to replace existing wood flashboards on four spillway sections.

Rubber Dam Installation, West Buxton Hydroelectric Project
Brookfield Renewable Energy , West Buxton, ME
Project Manager for design of a new rubber dam system to replace existing wood flashboards on three spillway sections.

Rubber Dam Design, Rumford Falls Upper Hydro
Brookfield New England, Rumford, ME
Served as Project Manager to study the feasibility of installing a new rubber dam on two sections of spillway. Subsequent to the study phase, served as Project Manager to design the rubber dam to replace the existing wooden flashboards.

New Rubber Dam System Design, Godfrey Dam
Bancroft Contracting Corp., Berlin, NH
Served as Project Engineer responsible for design of new rubber dam system to replace existing flashboards on municipal water supply dam.

Dam Repairs, Rainbow Dam
Farmington River Power Company, Farmington, CT
Served as Project Manager to design repairs to deteriorated concrete wall. Project included preparation of design drawings, bid assistance, and construction monitoring.

Dam Repair Design, Mill Dam
Monadnock Paper Company, Antrim, NH
Served as Project Manager to design repairs to concrete abutment at Mill Dam. Design included removal of poor quality concrete and replacement with new reinforced concrete.

Crest Gate Design, Woodland Dam
Domtar Industries, Woodland, ME
Served as Project Engineer responsible for overseeing design of two new crest gates to replace an existing flashboard system. The project included construction of new concrete piers, crest demolition with a new concrete overlay, and a new walkway.

Scoping Repairs, Rumford Middle Dam
Brookfield Power New England, Rumford, ME
Served as Project Manager for scoping repairs to Middle Dam gate structure. This included preparation of cost opinions and a report summarizing needed repairs.

Conceptual Powerhouse Design, Bar Mills Hydroelectric Project
Brookfield Renewable Energy, Bar Mills, ME
Project Manager to study potential options to replace existing powerhouse including review of configuration, costs, and generation.

Low Flow Crest Gate Design, Bar Mills Hydroelectric Project
Brookfield Renewable Energy, Bar Mills, ME
Project Manager for design of a new low flow crest gate to replace a short section of hinged flashboards in the log sluice to allow passage of minimum flows.

Powerhouse Design, Higley Redevelopment Project
Orion Power, Edwards, NY
Project Engineer providing design engineering for the new 4.8 MW Higley powerhouse.

Minimum Flow Design, Livermore Falls Project
International Paper Company, Jay, ME
Project Engineer for the conceptual, final design, and construction monitoring services for a new minimum flow unit. The new powerhouse houses a single vertical Kaplan turbine with a generator and required appurtenances and is located on the forebay structure upstream of the existing powerhouse.

Powerhouse Design, Holtwood Hydroelectric Expansion Project
PPL Holtwood LLC, Holtwood, PA
Senior Project Engineer responsible for the design of a 130 MW hydroelectric expansion project. The expansion includes the addition of the two largest completely new vertical Kaplan turbines (23.5-foot-diameter) to be installed east of the Mississippi in the last 25 years.

Hydroelectric Design, Milford, Orono, and Stillwater Projects
Black Bear Hydro Partners, Milford, ME
Project Engineer for two new powerhouses (three units totaling 3.9 MW at Orono and three units totaling 2.7 MW at Stillwater) and two new generating units at a third existing powerhouse (totaling 1.2 MW at Milford).

STEPHEN J. RABASCA, P.E.

SENIOR ENGINEERING CONSULTANT (GEOTECHNICAL)

Steve Rabasca specializes in geotechnical engineering on hydroelectric projects, commercial developments, highway projects, industrial facilities, and solid waste landfills. He designs, implements, and evaluates geotechnical instrumentation programs for many hydroelectric embankment dams and landfills including the installation of inclinometers, vibrating wire piezometers, liquid settlement systems, settlement platforms, strain gages, and total pressure cells. Steve investigates and designs existing and new retaining structures and evaluates shorefront erosion protection. Steve focuses the investigations of existing earth dams on seepage control and static and seismic embankment stability analyses for FERC regulated facilities. He designs sheet pile retaining structures, shallow and deep foundation systems, pavement, seepage control and earth dams, rock anchor systems, and landfill cover systems.

Key Expertise

- Earth Dam Stability Analysis
- Seepage Analysis
- Foundation Engineering
- Dam Instrumentation
- Dam Safety and Surveillance Monitoring Plans
- Subsurface Investigations
- Earth Dam Designs

Professional Registration

Professional Engineer, CT, ME, MA, NH, NJ, and NY

Professional Affiliations

American Society of Civil Engineers

Association of State Dam Safety Officials

Deep Foundations Institute

International Society of Soil Mechanics and Foundation Engineers

International Geosynthetics Society

Education

B.S. Civil Engineering, University of Maine, 1981

A.S. Civil Engineering, University of Maine, 1978

Years of Experience

With Kleinschmidt: 7
Total: 35

Geotechnical Investigation, Upper and Middle Dams
Findlay Engineering/FPLE, Rangeley Lake Region, ME
Conducted subsurface investigations at both FERC regulated dams in support of remedial repairs. The investigations included drilling multiple borings through the crest and downstream toe of the embankments and installation of piezometers for assessing piezometric conditions. Assisted in the preparation of the investigation report and static and seismic slope stability analyses for all embankments. Also performed full-time construction monitoring for installation of a 550-foot-long sheet pile cut-off wall through the southern embankment of Upper Dam.

Churchill Dam Replacement, Churchill Depot, Maine - Bureau of Parks and Recreation, Maine Department of Conservation (1997)
Construction for the Churchill Dam Replacement project was completed in 1998. The existing timber crib structure, built in 1968 was replaced with a new concrete spillway and fishway structures founded on glacial till and earth embankments. Mr. Rabasca was responsible for the geotechnical investigation and he designed the earth embankments for the project which consists of a low permeability glacial till core with high permeability shells and riprap facing. Mr. Rabasca also provided the geotechnical design criteria for the design of the concrete structures, including measures to cutoff seepage beneath the structures with concrete keys, computation of base uplift pressures, sliding stability resistance, and lateral earth pressures for the spillway retaining structures. Construction measures were developed for excavations in the native glacial till subgrade and its protection during construction using lean concrete mud mats. A graded riprap section for protection of the downstream soils against scour was also designed, as well as earth cofferdams for use during construction. All soil borrow materials were obtained from borrow pits near the site, identified by Mr. Rabasca. He prepared geotechnical specifications for construction, and performed periodic inspections in the field during construction of the concrete spillway structure foundations.

No 1, 2 and 3 Paper Machine Projects, SD Warren Co. Skowhegan, Maine Mr. Rabasca was extensively involved in this project over a 10-year period, beginning with the No 1 paper machine where he was responsible for field monitoring of the excavations for the foundations supported on native dense glacial till. This assignment involved full-time inspection of subgrades and protection with lean concrete mud mats to protect the subgrade during construction. His further involvement included field explorations, plate load testing and full-time inspections of the No 2 paper machine foundations. He was the lead geotechnical engineer for the No 3 paper machine and building, paper roll storage building additions, new turbine generator, boiler building, stack and a major expansion of the existing waste treatment facility. For this last phase, he was responsible for planning and coordination of the subsurface investigations, supervising the geotechnical project team during development of shallow foundation support criteria for the settlement sensitive paper machine, and supervision of field engineer during construction monitoring activities.

Geotechnical Investigation, Bulls Bridge Development
FirstLight Power Resources, New Milford, CT
Lead Geotechnical Engineer responsible for the geotechnical investigation, seepage and slope stability analyses, and remedial design for repairs to this aging structure. The dikes were constructed on a hillside with soil (re-compacted glacial till) and open rock fill, with no filters. The remedial design focused on the most critical areas of excessive seepage and low factors of safety. The repairs included graded natural soil filters, and slope flattening. One thousand feet of dike was repaired in 2014, with another area scheduled for repair in 2016. Engineer of record for the design of this project.

Filter Blanket Evaluation and Design, Stewarts Bridge Hydroelectric Project
Brookfield Renewable Power, Hadley, NY
Persistent seepage and high uplift pressures in a confined aquifer at the toe of the left abutment of the Stewarts Bridge project led to investigation and design studies for possible remediation. Engineer of Record for this project which included the removal of an existing geotextile and stone filter blanket and replacement with a native soil filter berm to contain and control shallow uplift pressures. The area under consideration was 2 acres. The project included installation of vibrating wire piezometers to measure uplift pressures, seepage analyses of the left abutment, design of graded filters, and conducting pumping tests to assess aquifer properties for possible dewatering systems during construction.

Spillway Stability Analysis, Prairie du Sac Hydroelectric Facility
Alliant Energy, Prairie du Sac, WI
The Prairie du Sac Hydroelectric facility is a 2,000-foot-long, 100-year-old structure founded on timber piles. Shortly after construction, the tailwater dropped as a result of erosion, and the timber piles became exposed to fluctuating tailwater levels. Mr. Rabasca evaluated the seepage conditions at the spillway and the geotechnical capacity of the piles supporting the structure as individual piles and as pile groups. He performed bearing capacity analyses as well as settlement analyses assuming the structure were no longer supported on the piles. He also performed a sensitivity analysis to assess the loss of individual piles in the pile groups and its impact on overstressing the remaining piles in the group.

Filter Blanket Evaluation and Design, Sherman Island Buttress Dam
Brookfield Renewable Power, Queensbury, NY
The Sherman Island Buttress Dam is founded on bedrock at each abutment and up to 125 feet of clean fine sand in the center. Historical issues with settlement of the structure led to reconstruction of the Buttress dam in the early 1990s. Monitoring since then has indicated that settlement is continuing albeit at a slow rate. Led the investigations into the design and construction of a possible filter blanket at the toe of the structure to mitigate loss of foundation material.

Geotechnical Investigation, Nichols Island Pool and Little Sucker Brook Dike Design
New York Power Authority, Massena, NY
Lead Geotechnical Engineer for this project which involved the design of four new dikes over soft glacial clay soils and water control structures for these two habitat improvement projects. Duties involved the planning and implementation of the geotechnical investigation for all sites, settlement analyses of the dikes, seepage evaluations through the dikes, and general geotechnical recommendations for design and construction of the new dikes and water control structures.

Seismic Stability Evaluation and Remedial Design, Diversion Dam
Reliant Energy, Croghan, NY
Diversion Dam is one dam in the Soft Maple Hydroelectric complex currently owned by Brookfield Renewable Power. The dam was constructed between 1924 and 1925 using hydraulic fill techniques which were common construction practices for that time period. Engineer of Record for a comprehensive seismic stability evaluation and remedial design and repairs of the dam. In collaboration with Findlay Engineering, performed a seismic stability evaluation of the dam involving a Liquefaction Analysis, a Post Earthquake Stability Analysis, and a Deformation Analysis. The results of the seismic stability evaluation and negotiations with the FERC resulted in a requirement for a stability berm located on the downstream slope of the dam to improve the factor of safety under seismic loading.

ERIC M. TURGEON, P.E.

SENIOR ENGINEER (CIVIL/STRUCTURAL)

Eric Turgeon specializes in evaluating and designing dam and hydroelectric project structures including powerhouses, penstocks, trashracks, intakes, spillways, and gates of various types. He completes field observations and condition assessments, designs repairs, and oversees the development of drawings, specifications, and construction documents. Eric develops structural designs using steel, reinforced concrete, aluminum, masonry, and wood. He performs quality control checks of engineering designs and calculations. Eric participates in due diligence efforts and feasibility studies and generates cost opinions. He participates in FERC, U.S. Army Corps of Engineers, and other dam safety inspections. Eric is a SPRAT Level 1 certified rope access technician with experience performing penstock and Tainter gate inspections utilizing industrial rope access climbing and belaying techniques.

Key Expertise

- Dam Safety and Structural Condition Assessment
- Dam Rehabilitation Design
- Gates and Water Control Design
- Penstock Investigation and Design
- Dam Safety Inspections
- Tainter Gate Inspections

Professional Registration

Professional Engineer, KS, ME, MA, NY, and RI

Certification/Training

SPRAT Level 1 Rope Access Technician

Professional Affiliations

American Concrete Institute (ACI)

American Institute of Steel Construction (AISC)

Association of State Dam Safety Officials (ASDSO)

The Structural Engineers Association of Maine (SEAM)

Education

B.S. Civil and Environmental Engineering, University of Maine, 2001

Years of Experience

With Kleinschmidt: 6
Total: 14

Spillway Condition Assessment and Rehabilitation Options, Gorham Hydroelectric Project, Public Service Company of New Hampshire, Gorham, NH

Project Manager and Senior Engineer for the condition assessment of an aging timber crib spillway experiencing increased leakage and maintenance costs. Provided a written assessment based on visual observations and review of data including survey, dive video, maintenance records, photos, and drawings. Comprehensively evaluated five alternatives covering the full range of rehabilitation and replacement options to determine the most beneficial and cost effective solution considering all applicable factors such as maintenance, construction costs, generation, operations, dam safety, and spillway operation. Oversaw the design of temporary and local repairs needed to extend the safe useful life of the structure.

Hydroelectric Project Redevelopment, Troy Hydroelectric Project
Falling Waters Hydropower, Inc., Troy, VT

Lead Project Engineer and Assistant Project Manager for the redevelopment of an 850 kW hydroelectric powerstation. Project included the rehabilitation of an existing intake structure and construction of a new powerhouse. Also responsible for obtaining FERC approvals and environmental construction permits.

Structural Design of New Powerhouses/Fish Passage Facilities, Milford, Orono, and Stillwater Projects, Black Bear Hydro Partners, Milford, ME

Performed structural design for components of new powerhouses and fish passage facilities including debris flume, trashrack, intake modifications, and downstream fish passage flume.

Powerhouse Design, Holtwood Hydroelectric Expansion Project
PPL Holtwood LLC, Holtwood, PA

Senior Project Engineer responsible quality assurance/quality control of structural design elements of a 130 MW hydroelectric expansion project.

Dam Rebuild, Cobbossee Dam Rebuild
Town of Manchester, Manchester, ME

Designed new steel slide gates, operators, and gatehouse. Designed other miscellaneous dam repairs.

Spillway Improvements, Colcord Pond Dam
Town of Porter, Porter, ME

Designed new steel vertical slide gates for spillway control, including steel support structure.

Tailrace Gate Design, Dolby Hydroelectric Project
Brookfield Renewable Power, Millinocket, ME

Lead Engineer and Assistant Project Manager for the design of multi-panel steel tailrace dewatering bulkhead gates to slide vertically within existing concrete pier slots. Gates were designed to replace existing deteriorated wood and steel gates reusing existing steel beams to save on fabrication costs.

Seepage Evaluation and Remediation Design, Gardner Falls Hydroelectric Project
Essential Power, Buckland, MA

Project Manager and Lead Engineer for the evaluation and remediation design to address a long history of seepage and loss-of-ground issues at a hydroelectric project comprised of several structures built at different times upon a poorly graded, non-rock subgrade. Repairs included the reinstallation of a failed tailrace pipe buried beneath the powerhouse and installation of a secant pile cutoff wall within the canal upstream of and connected to various intake structures. Coordinated the evaluation and design efforts with both internal and external subconsulting geotechnical engineers.

Concrete Remediation Design, Hookset Hydroelectric Project
Eversource Energy d/b/a Public Service of New Hampshire, Hookset, NH
Project Manager and Lead Engineer for the design of numerous concrete repairs to various walls and piers upstream and downstream of gated spillway sections. The design also included resurfacing of the downstream face of the spillway. Construction bid documents provided options for both shotcrete and cast-in-place concrete repair methods. Oversaw the development of a construction cost opinion.

Dam Condition Assessment, Head Tide and Coopers Mills Dams,
Inter-Fluve, Inc., Whitefield and Alna, ME
Project Manager and subconsulting engineer supporting the Inter-Fluve team in their work related to two low hazard concrete dams being considered for partial removal and rehabilitation. The proposed dam modifications are to improve fish passage and promote public access, use, and observation. Performed field inspections, oversaw the completion of stability analyses, and wrote a report summarizing a condition assessment, analysis results, and recommendations for repairs and a preferred modification alternative.

Appropriation Grade Hydro Feasibility Study, Lyons Falls Project
Kruger Energy, Lyons Falls, NY
Senior Project Engineer for an appropriation grade, thirty-percent design, feasibility study on an 11.2 MW site redevelopment. Responsibilities include assisting with concept development and evaluation, preliminary structural design and calculations, and detailed construction cost estimating.

Hydroelectric Development, Ball Mountain and Townshend Projects
Blue Heron Hydro, LLC, Jamaica and Townshend, VT
Lead Structural Engineer for design of structures supporting the installation of matrix turbine-generator modules into existing intake structures at two flood control dams owned by the U.S. Army Corps of Engineers. Structures included steel framed towers supporting module lifting equipment and maintenance platforms, as well as modifications to existing concrete structures.

Spillway Resurfacing, Ayers Island Hydroelectric Project
Public Service of New Hampshire, Bristol, NH
Designed reinforced concrete overlay to resurface deteriorated concrete spillway using dry process shotcrete applied to an Ambursen (buttressed) dam.

Draft Tube Gate Design, Alice Falls Hydroelectric Project
Alice Falls Hydro, Keeseville, NY
Designed new steel vertical sliding draft tube gates, including new steel guides attached to the downstream face of an existing concrete powerhouse.

Dam Maintenance and Repairs, Little Falls Hydroelectric Project
SAPPI Fine Paper, Gorham, ME
Evaluated, analyzed, and redesigned flashboards and supporting pins. Designed repairs for displaced and broken granite dam blocks and washed out rut in embankment. Designed reinforced concrete retaining wall.

Powerhouse Cracks and Spillway Cavity Inspection, Saccarappa Hydroelectric Project, SAPPI Fine Paper, Westbrook, ME
Investigated cracks in concrete and masonry powerhouse. Investigated eroded concrete at toe of dam. Developed monitoring plan and action threshold levels.

LAWRENCE K. BROWN

SUMMARY

Mr. Brown is a seasoned project and safety professional with 40 years of experience in construction, nuclear operations, plant decommissioning and hydro dam / hydroelectric projects. Mr. Brown also has an extensive electrical background serving as the electrical foreman and superintendent on large projects.

EXPERIENCE

2012 – Present **TSSD SERVICES, INC.,** Oakland, ME

Seconded to Brookfield Renewable Energy Group, Various Locations ME, NH & TN

Contractor Monitor

Responsible for monitoring contractor performance particularly in the areas of safety, environmental and quality control compliance in the execution of various projects at Brookfield's hydro dams, transmission lines and facilities. Duties include providing contractor orientations as necessary, assisting in the preparation of project safety plans and job safety plans and qualified approver of the JSP's, maintaining all project logs and reports, scheduling and monitoring quality control activities, maintaining project photo log, public relations and communications and acting as the project manager's on site representative.

Notable Projects:

- Androscoggin Station Number 3 – Lewiston, ME
- Aziscohos Dam Repair – Lincoln Plantation, ME
- Bar Mills Fish Passage Cost Estimate – Hollis, ME
- Brunswick Hydroelectric Dam – Brunswick, ME
- Calderwood Dam – Tallassee, TN
- Goebel Street Electrical Substation – Berlin, NH
- Gulf Island – Lewiston/Auburn, ME
- Hiram Dam – Hiram, ME

- Hydro Kennebec New Fish Passage – Winslow, ME
- McKay Station Transmission Line Repairs – Millinocket, ME
- Milford Fishway – Milford, ME
- Monty Dam – Lewiston, ME
- Shawmut Hydroelectric Project – Shawmut, ME
- Smoky Mountain Transmission Tower – Tallassee, TN
- Topsham Hydro – Topsham, ME
- Upper Dam Replacement – Wilson Mills, ME
- Weston Station Hydroelectric Dam – Skowhegan, ME
- Williams Station Hydro Electric Station – Embden, ME

2006 – 2012 **SEABROOK NUCLEAR STATION,** Seabrook, NH

Safety/Electrical Coordinator

Temp Position for the refueling outage. Safety professional as well as the Specialty Tooling Coordinator for the Plants Underground Service Water Project. This project requires specialty contractors to enter and travel several hundred feet in the 23" ID buried pipe to perform inspections and repairs.

Project Coordinator

Responsible for the coordination and installation of complete retro fit of the plants Safety Class 480-volt Unit-sub breakers with new Square-D Masterpact Circuit breakers. This includes the oversight of the engineering subcontractors during the new Engineering Design Change. This was a multimillion dollar project.

Project Coordinator

Upgrade of site electrical infrastructure project. This was for the engineering portion of the project.

Safety Professional

For the Nuclear Projects Group, I was the Safety professional for all work performed by the Major Projects Group.

Subject Matter Expert (SME)
Was asked to make interpretations for the facility in the areas of Safety and Electrical OSHA, NFPA-70 & NFPA-70E

Security /Electrical
Reviewer of the Nuclear Safeguards System electrical installation packages prior to being issued for construction

2004 – 2006 **CONNECTICUT YANKEE ATOMIC POWER PLANT,** Haddam Neck, CT
Site Safety Manager
Responsible for the industrial safety of the entire site during the decommissioning of the nuclear facility. Provided safety training, inspections, guidance, monitoring and technical support to the staff and contractors. I was the primary interface with OSHA and other agencies for industrial safety issues. There were zero lost time accidents and recordable incident rate was well below the industry standards 2004-2006

2001 – 2004 **MAINE YANKEE ATOMIC POWER PLANT,** Wiscasset, ME
Site Safety Manager
Responsible for the industrial safety of the site, providing training, inspections, guidance, monitoring and technical support during decommissioning of the nuclear facility. I was the primary interface with OSHA and other agencies for industrial safety issues. This position reported directly to the Vice President. The lost time and recordable incident rates were well below the industry standards.

1984 – 2001 **CIANBRO CORPORATION,** Pittsfield, ME
Corporate Safety Director (1992 – 1994)
Reduced worker injuries including a lost time incident rate drop from 0.84 to 0.36, reduced worker compensation costs and provided safety training programs for employees at all levels. Served as the primary interface with OSHA in all states from Maine to Virginia as Corporate Safety Director (reporting directly to the president).

THARRYN SMITH

SUMMARY

Mr. Smith is a professional construction manager with over 25 years of experience including all construction disciplines with a concentration in heavy, civil and marine. Mr. Smith has exceptional interpersonal and communication skills and an extensive background in scheduling, cost control, budgeting, estimating, safety and project management.

EDUCATION

University of Maine, Orono, ME
B.S. Construction Management Technology

University of Maine, Orono, ME
A.S. Civil Engineering Technology

EXPERIENCE

10/12 - Present **TSSD SERVICES, INC.,** Oakland, ME
Seconded to Brookfield Renewable Energy Group, Various Locations ME, NH & TN
Contractor Monitor
Responsible for monitoring contractor performance particularly in the areas of safety, environmental and quality control compliance in the execution of various projects at Brookfield's hydro dams and wind farm facilities. Duties include providing contractor orientations as necessary, assisting in the preparation of project safety plans and job safety plans and qualified approver of the JSP's, maintaining all project logs and reports, scheduling and monitoring quality control activities, maintaining project photo log, public relations and communications and acting as the project manager's on site representative.

Notable Projects:

- A3 Stator Rewind – Lewiston, ME
- Bar Mills Fish Passage Cost Estimate – Hollis, ME
- Calderwood Crib Wall Repair – Maryville, TN
- Cataract Hydro Rack Repairs – Saco, ME
- Cheoah Concrete Deck Repair – Robinsville, NC
- Cross Dam Logistics and Constructability Review – Berlin, NH
- Deer Rips Draft Tube – Lewiston/Auburn, ME
- Granite Wind Blade Repair – Dummer, NH
- Gulf Island Crane Set-up – Lewiston/Auburn, ME
- Hydro Kennebec – Wnslow, ME
- Middle Dam Spec Development and Review – Rangeley, ME
- Milford Dam Repair – Milford, ME
- Milford Fishlift – Milford, ME
- Moosehead East Outlet – Rockwood, ME
- North Gorham Hydro – Gorham, ME
- Orono Fishlift – Orono, ME
- Stillwater Spillway Repair – Old Town, ME
- Stillwater Eel Passage – Old Town, ME
- Topsham Hydro – Topsham, ME
- Upper Dam – Richardson Township, ME

06/86 – 07/12 **CIANBRO CORPORATION**, Pittsfield, ME

Manager of Projects / Sr. Project Manager (2009 – 2012)

Responsible for the overall operations of projects in the heavy civil market sector including transportation, power and energy, marine, wind, hydro and parking garages in the northern New England region. Supported project managers and superintendents in decision making, bid reviews, sharing resources, problem solving, and general project management and procedure to ensure 100% customer satisfaction. Ensured project and individual team member performance is consistent and aligned with client expectations and philosophies and practices.

Notable Projects:

- Gulf of Maine Research Institute Pier – Portland, ME
- PNSY Drydock #2 Replacement
- Worumbo Hydro Spillway Replacement – Lisbon Falls, ME
- Little Bay Bridge – Newington, NH
- Bates Bridge Replacement – Haverhill, MA
- PWI Jetport Apron – Portland, ME
- I295 North and Southbound Rebuild – Gardiner to Topsham, ME
- Dundee Dam Concrete Rehabilitation – Windham, ME

Project Manager (2006 – 2009)

Overall project responsibility for numerous concurrent projects in the southern Maine and New Hampshire markets. Responsibilities included complete financial responsibility, safety, quality, estimating, scheduling and business development for clients such as Portland Pipeline, GE Energy Services, Maritimes and Northeast, Tyco Communications and CHI Energy Services. Management and development of onsite teams typically consisting of a superintendent/general foreman and up to 20 craft members.

Notable Projects:

- Natural Gas Compressor Station Expansion – Richmond, ME
- Westinghouse Testing Facility – Newington, NH
- PPL Pier Re-decking and Numerous Other Projects – S. Portland, ME
- Poland Springs Bottling (Numerous Piping and Electrical Projects – Hollis, ME

Senior Project Engineer (2001 – 2006)

Worked in direct support of either the project manager or superintendent performing duties such as procurement, scheduling, cost control, administrative management of staff, estimating, compliance with contract documents and quality control.

Attachment 2.9-1 Resource Agency Correspondence

Christopher, Mark

From:	Christopher, Mark
Sent:	Monday, July 23, 2018 11:50 AM
To:	'lisa.st.hilaire@maine.gov'
Cc:	Rossignol, Eric; Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com)
Subject:	Middle dam Brookfield Renewables Middle Dam
Attachments:	Middle dam foot print of work.kmz

Hi Lisa,

I'm working on a Maine Waterways Permit Application (LUPC) for the rebuild of Middle Dam on Lower Lake Richardson. Brookfield is planning to completely rebuild the dam within the existing footprint, both above and below NHWL. I am requesting any data the MNAP may have regarding rare plants and unusual natural areas that are known to occur or could occur in the project area.

I have a KMZ file of the approximate boundaries of the work (I don't have a GIS file).

Please call or email if you have any questions.

Thanks
Mark

Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell

STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333

PAUL R. LEPAGE
GOVERNOR

WALTER E. WHITCOMB
COMMISSIONER

July 23, 2018

Mark Christopher
TRC Solutions
14 Gabriel Drive
Augusta, ME 04330

Via email: mchristopher@trcsolutions.com

Re: Rare and exemplary botanical features in proximity to: Middle Dam, Lower Richardson Lake, Township C, Maine

Dear Mr. Christopher:

I have searched the Natural Areas Program's Biological and Conservation Data System files in response to your request received July 23, 2018 for information on the presence of rare or unique botanical features documented from the vicinity of the project in Township C, Maine. Rare and unique botanical features include the habitat of rare, threatened, or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to the Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

According to the information currently in our Biological and Conservation Data System files, there are no rare botanical features documented specifically within the project area. This lack of data may indicate minimal survey efforts rather than confirm the absence of rare botanical features. You may want to have the site inventoried by a qualified field biologist to ensure that no undocumented rare features are inadvertently harmed.

If a field survey of the project area is conducted, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features that have been known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all natural areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

MOLLY DOCHERTY, DIRECTOR
MAINE NATURAL AREAS PROGRAM

DEPARTMENT OF Agriculture Conservation & Forestry

PHONE: (207) 287-8044
FAX: (207) 287-8040
WWW.MAINE.GOV/DACF/MNAP

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of $75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for $150.00 for two hours of our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,

Kristen Puryear | Ecologist | Maine Natural Areas Program
207-287-8043 | kristen.puryear@maine.gov

Rare and Exemplary Botanical Features within 4 miles of
Project: Middle Dam, Lower Richardson Lake, Township C, Maine

Common Name	State Status	State Rank	Global Rank	Date Last Observed	Occurrence Number	Habitat
Purple Clematis						
	SC	S3	G5T5	2005-06-22	38	Non-tidal rivershore (non-forested, seasonally wet),Hardwood to mixed forest (forest, upland)

STATE RARITY RANKS

S1 Critically imperiled in Maine because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation from the State of Maine.
S2 Imperiled in Maine because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
S3 Rare in Maine (20-100 occurrences).
S4 Apparently secure in Maine.
S5 Demonstrably secure in Maine.
SU Under consideration for assigning rarity status; more information needed on threats or distribution.
SNR Not yet ranked.
SNA Rank not applicable.
S#? Current occurrence data suggests assigned rank, but lack of survey effort along with amount of potential habitat create uncertainty (e.g. S3?).

Note: **State Rarity Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines State Rarity Ranks for animals.

GLOBAL RARITY RANKS

G1 Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extinction.
G2 Globally imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
G3 Globally rare (20-100 occurrences).
G4 Apparently secure globally.
G5 Demonstrably secure globally.
GNR Not yet ranked.

Note: **Global Ranks** are determined by NatureServe.

STATE LEGAL STATUS

Note: State legal status is according to 5 M.R.S.A. § 13076-13079, which mandates the Department of Conservation to produce and biennially update the official list of Maine's **Endangered** and **Threatened** plants. The list is derived by a technical advisory committee of botanists who use data in the Natural Areas Program's database to recommend status changes to the Department of Conservation.

E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.

NON-LEGAL STATUS

SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

ELEMENT OCCURRENCE RANKS - EO RANKS

Element Occurrence ranks are used to describe the quality of a rare plant population or natural community based on three factors:

- **Size**: Size of community or population relative to other known examples in Maine. Community or population's viability, capability to maintain itself.
- **Condition**: For communities, condition includes presence of representative species, maturity of species, and evidence of human-caused disturbance. For plants, factors include species vigor and evidence of human-caused disturbance.
- **Landscape context**: Land uses and/or condition of natural communities surrounding the observed area. Ability of the observed community or population to be protected from effects of adjacent land uses.

These three factors are combined into an overall ranking of the feature of **A**, **B**, **C**, or **D**, where **A** indicates an **excellent** example of the community or population and **D** indicates a **poor** example of the community or population. A rank of **E** indicates that the community or population is **extant** but there is not enough data to assign a quality rank. The Maine Natural Areas Program tracks all occurrences of rare (S1-S3) plants and natural communities as well as A and B ranked common (S4-S5) natural communities.

Note: **Element Occurrence Ranks** are determined by the Maine Natural Areas Program for rare plants and rare and exemplary natural communities and ecosystems. The Maine Department of Inland Fisheries and Wildlife determines Element Occurrence ranks for animals.

Visit our website for more information on rare, threatened, and endangered species!
http://www.maine.gov/dacf/mnap

Christopher, Mark

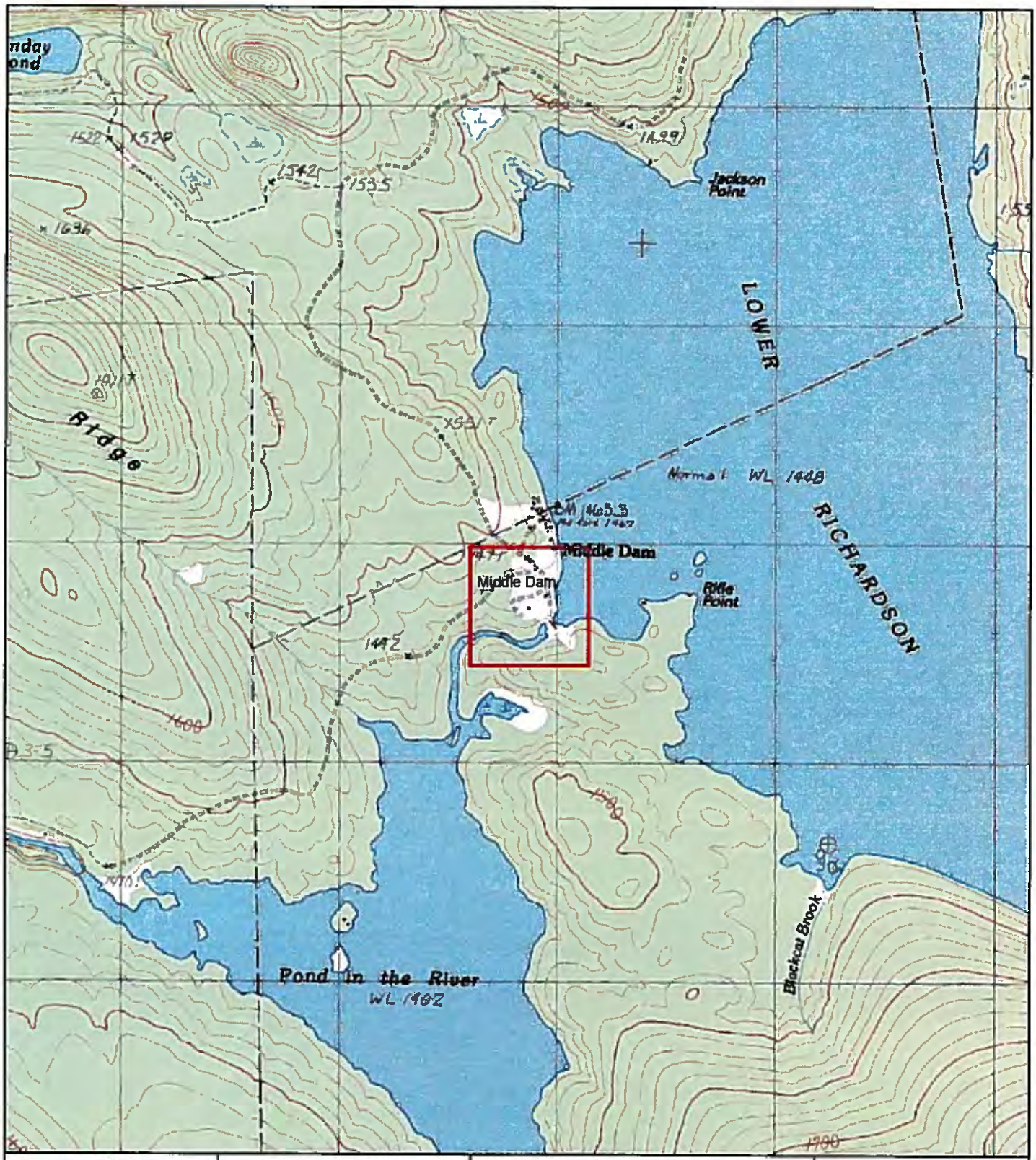
From: Christopher, Mark
Sent: Monday, July 23, 2018 12:53 PM
To: 'Perry, John'
Cc: Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com); Rossignol, Eric
Subject: Middle dam Brookfield
Attachments: Middle dam foot print of work.kmz; MiddleDam_Location.pdf

Hi John,

Brookfield Hydro is planning to rebuild Middle Dam located as the outlet to Lower Richardson Lake and the upper portion of the Rapid River. IFW staff, John Howett and Liz Thorndike, attended an informational meeting in Dec. We are at a point where plans are about ready and we'll submit a Waterways & Conservation Permit application to the LUPC. Attached is a KMZ file of the footprint of the work, both above and below the NWHL. IFW staff and Brookfield staff have put a lot of effort into addressing fish passage, flows, and water level issues. Also attached is a general location figure on a topographic map.

I would like to initiate the normal project consultation process with the MDIFW. Please review the attached maps and KMZ file (I don't have a GIS shapefile) and provide a response regarding significant or valuable wildlife and fishery resources known to occur onsite. I have surveyed for vernal pools and there are none.

Thanks
Mark
Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell



Legend

- Project Area
- Lakes and Ponds
- Intermittent Stream
- Perennial Stream

Base Map:
24k USGS topography.

0.25
Miles
1 inch equals 2,000 feet

FPL Energy Maine Hydro
Middle Dam

TRC 249 Western Ave.
Augusta, ME 04330

N
W E
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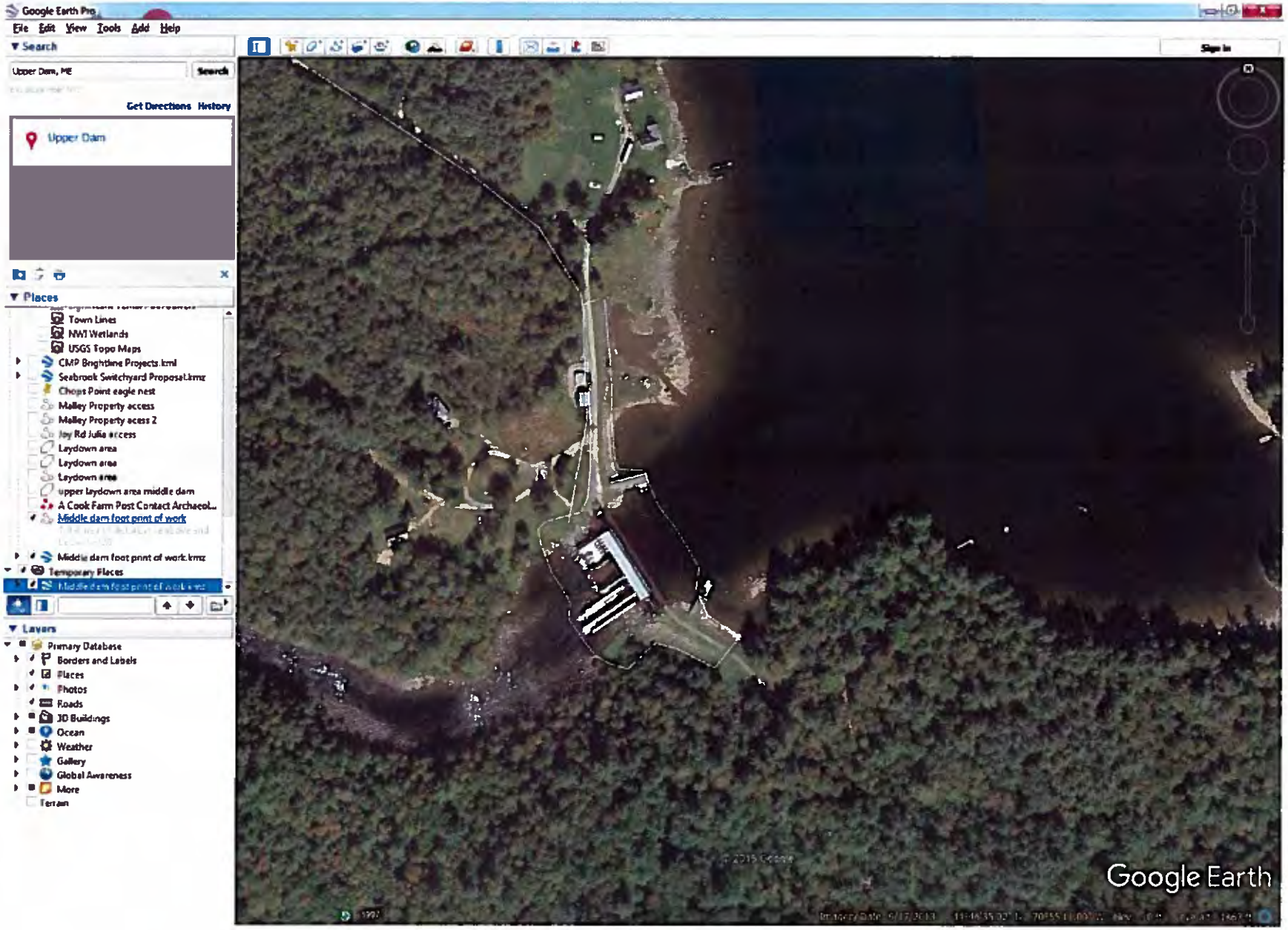

Google Earth Pro
File Edit View Tools Add Help
Search
Upper Dam, ME
Search
Get Directions History
Upper Dam
Places
Town Lines
NWI Wetlands
USGS Topo Maps
CMP Brightline Projects.kml
Seabrook Switchyard Proposal.kmz
Chops Point eagle nest
Malley Property access
Malley Property acess 2
Joy Rd Julia access
Laydown area
Laydown area
Laydown area
upper laydown area middle dam
A Cook Farm Post Contact Archaeol...
Middle dam foot print of work
Middle dam foot print of work.kmz
Temporary Places
Layers
Primary Database
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Terrain
Sign In
Google Earth

PAUL R. LEPAGE
GOVERNOR

STATE OF MAINE
DEPARTMENT OF
INLAND FISHERIES & WILDLIFE
284 STATE STREET
41 STATE HOUSE STATION
AUGUSTA ME 04333-0041

CHANDLER E. WOODCOCK
COMMISSIONER

July 30, 2018

Mark W. Christopher
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330

RE: Information Request – Middle Dam Reconstruction Project, Township C

Dear Mark:

Per your request, we have reviewed current Maine Department of Inland Fisheries and Wildlife (MDIFW) information for known locations of Endangered, Threatened, and Special Concern species; designated Essential and Significant Wildlife Habitats; and inland fisheries habitat concerns within the vicinity of the *Middle Dam Reconstruction Project* in Township C. Per your letter, you indicated that no Significant Vernal Pools were identified during a vernal pool survey.

Our Department has not mapped any Essential or Significant Wildlife Habitats that would be directly affected by your project.

Endangered, Threatened, and Special Concern Species

Bats

Of the eight species of bats that occur in Maine, the three *Myotis* species are protected under Maine's Endangered Species Act (MESA) and are afforded special protection under 12 M.R.S §12801 - §12810. The three *Myotis* species include little brown bat (State Endangered), northern long-eared bat (State Endangered), and eastern small-footed bat (State Threatened). The five remaining bat species are listed as Special Concern: big brown bat, red bat, hoary bat, silver-haired bat, and tri-colored bat.

While a comprehensive statewide inventory for bats has not been completed, based on historical evidence it is likely that several of these species occur within the project area during migration and/or the breeding season. We recommend that you contact the U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex (Wende Mahaney, 207-902-1569) for further guidance, as the northern long-eared bat is also listed as a Threatened Species under the Federal Endangered Species Act. Otherwise, our Agency does not anticipate significant impacts to any of the bat species as a result of this project.

Bald Eagle

There is a mapped bald eagle nest in the vicinity of the project area. Until recently, bald eagles were listed as a Species of Special Concern in Maine. However, eagles continue to be protected under the federal Bald Eagle and Golden Eagle Protection Act ("Eagle Act") as well as other federal laws. Therefore, as there is an eagle nest within 660 feet of your project we recommend that you contact the

U.S. Fish and Wildlife Service--Maine Fish and Wildlife Complex ((207)-902-1570) for further guidance. In addition, please refer to the following link for additional information:

Http://www.fws.gov/midwest/midwestbird/eaglepermits/baeatake/step1.html

Fisheries Habitat

Maine Heritage Fish Waters

Pond In The River is designated as a Maine Heritage Fish Water. Maine Heritage Fish Waters are native and wild brook trout lakes and ponds which represent unique, valuable, and irreplaceable ecological and angling resources. MDIFW recognizes the unrivaled historic and economic importance of Maine's wild and native brook trout resource and focuses on the conservation and protection of this uniquely valuable resource. MDIFW's primary intent for managing wild brook trout in lakes and ponds is the protection and conservation of these self-sustaining fisheries. Historically, both Pond In The River and the Rapid River have been renowned for their brook trout fishery, with anglers from around the country and from around the world traveling to this area to experience these resources.

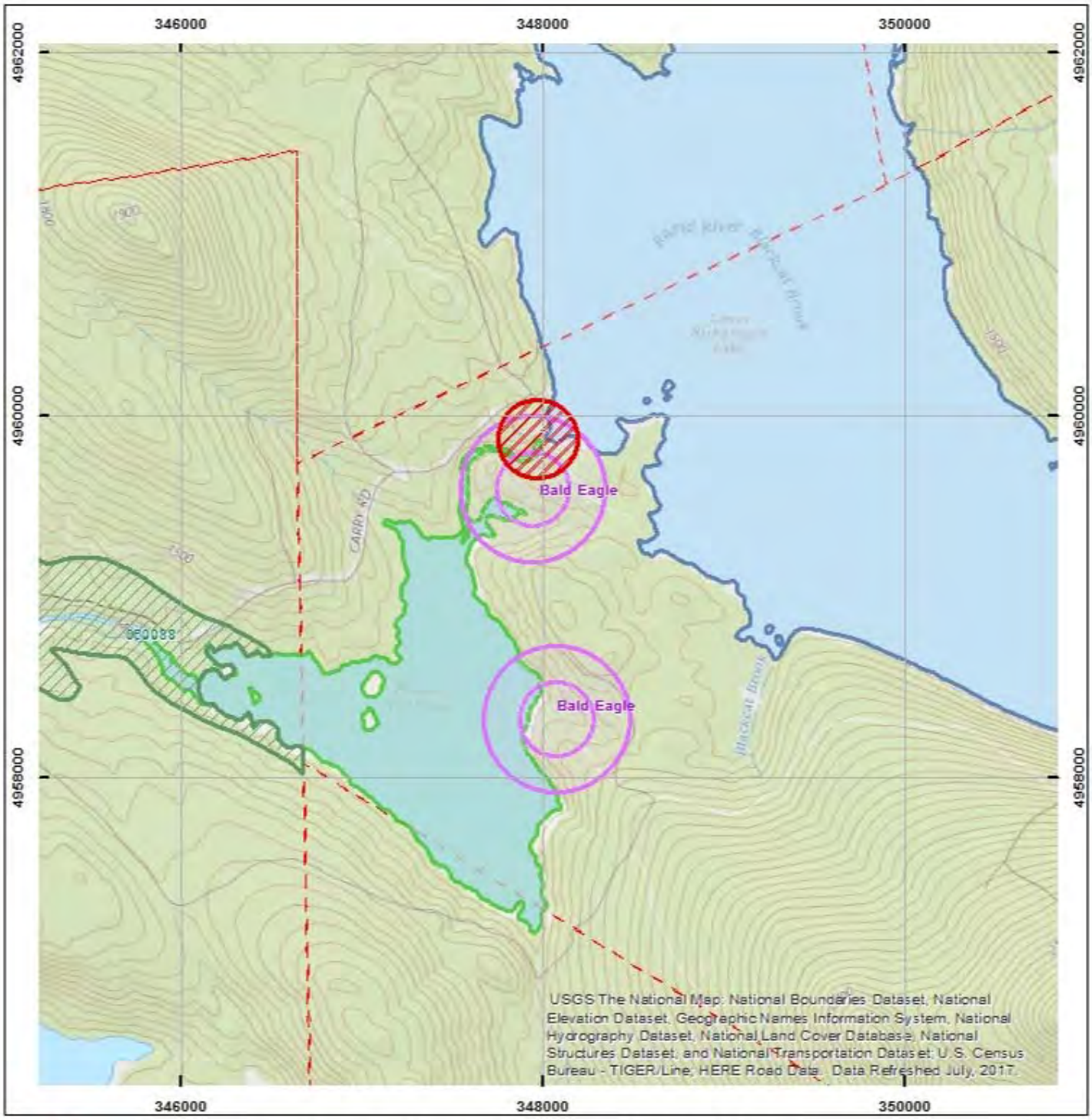
Construction Best Management Practices should be closely followed to avoid erosion, sedimentation, alteration of stream flow, and other impacts as eroding soils from construction activities can travel significant distances as well as transport other pollutants resulting in direct impacts to fish and fisheries habitat. In addition, we recommend that any necessary instream work (i.e. the installation and removal of cofferdams) occur between July 15 and October 1. Finally, Middle Dam is the barrier to preventing the spread of invasive smallmouth bass into the Richardson Lakes, and MDIFW has been working with Brookfield in coordinating pulse flows to suppress bass numbers in the Rapid River. We recommend that you continue to work closely with MDIFW Region D Fisheries staff to prevent the spread of bass as this project continues to move forward.

This consultation review has been conducted specifically for known MDIFW jurisdictional features and should not be interpreted as a comprehensive review for the presence of other regulated features that may occur in this area. Prior to the start of any future site disturbance we recommend additional consultation with the municipality, and other state resource agencies including the Maine Natural Areas Program and Maine Department of Environmental Protection in order to avoid unintended protected resource disturbance.

Please feel free to contact my office if you have any questions regarding this information, or if I can be of any further assistance.

Best regards,

John Perry
Environmental Review Coordinator



Environmental Review of Fish and Wildlife Observations and Priority Habitats

Project Name: ER Tool Test (Version 1)

Maine Department of Inland Fisheries and Wildlife

0 0.15 0.3 0.6 0.9 1.2 Miles

Projection: UTM, NAD83, Zone 19N

Date: 2018-07-24

- Deer Winter Area
- ETSc Environmental Review Polygons
- Maine Heritage Fish Waters
- Wild Lake Trout Habitats

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
Phone: (207) 469-7300 Fax: (207) 902-1588
http://www.fws.gov/mainefieldoffice/index.html

In Reply Refer To:
Consultation Code: 05E1ME00-2017-SLI-0319
Event Code: 05E1ME00-2018-E-01939
Project Name: Middle Dam Renewal

July 24, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies the threatened, endangered, candidate, and proposed species and designated or proposed critical habitat that may occur within the boundary of your proposed project or may be affected by your proposed project. This species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC Web site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the Endangered Species Consultation Handbook at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

This species list also identifies candidate species under review for listing and those species that the Service considers species of concern. Candidate species have no protection under the Act but are included for consideration because they could be listed prior to completion of your project. Species of concern are those taxa whose conservation status is of concern to the Service (i.e., species previously known as Category 2 candidates), but for which further information is needed.

If a proposed project may affect only candidate species or species of concern, you are not required to prepare a Biological Assessment or biological evaluation or to consult with the Service. However, the Service recommends minimizing effects to these species to prevent future conflicts. Therefore, if early evaluation indicates that a project will affect a candidate species or species of concern, you may wish to request technical assistance from this office to identify appropriate minimization measures.

Please be aware that bald and golden eagles are not protected under the Endangered Species Act but are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Projects affecting these species may require development of an eagle conservation plan: http://www.fws.gov/windenergy/eagle_guidance.html Information on the location of bald eagle nests in Maine can be found on the Maine Field Office Web site: http://www.fws.gov/mainefieldoffice/Project%20review4.html

Additionally, wind energy projects should follow the wind energy guidelines: http://www.fws.gov/windenergy/ for minimizing impacts to migratory birds and bats. Projects may require development of an avian and bat protection plan.

Migratory birds are also a Service trust resource. Under the Migratory Bird Treaty Act, construction activities in grassland, wetland, stream, woodland, and other habitats that would result in the take of migratory birds, eggs, young, or active nests should be avoided. Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g.,

cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm and at: http://www.towerkill.com; and at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Maine Ecological Services Field Office
P. O. Box A
East Orland, ME 04431
(207) 469-7300

Project Summary

Consultation Code: 05E1ME00-2017-SLI-0319

Event Code: 05E1ME00-2018-E-01939

Project Name: Middle Dam Renewal

Project Type: DAM

Project Description: Rebuild Middle Dam onsite and within existing footprint

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.776290842935566N70.92058330434108W

Counties: Oxford, ME

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Attachment 2.10-1 Maine Historic Preservation Commission

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE
04333

JOHN ELIAS BALDACCI
GOVERNOR

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

July 1, 2010

Mark W. Christopher, M.S., CWB
Environmental Scientist
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330

Re: MHER documentation for Middle Dam and Upper Dam

Dear Mr. Christopher:

I am writing to acknowledge receipt of the revised Maine Historic Engineering Record (MHER) narratives for Middle Dam and Upper Dam. These narratives are acceptable. Combined with the photographs of these two structures that were previously submitted, the stipulation in the Memorandum of Agreement that pertains to the recordation of these historic properties is satisfied.

If you have any further questions regarding this matter, please feel free to contact me.

Sincerely,

Kirk F. Mohney

Kirk F. Mohney
Deputy State Historic Preservation Officer

PHONE: (207) 287-2132

FAX: (207) 287-2335

ACE-ARC

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
65 State House Station
Augusta, Maine 04333

Earle G. Shettleworth, Jr.
Director

Telephone:
207-287-2132

January 22, 1997

Mr. David Dominie
Central Maine Power Company
North Augusta Office Annex
41 Anthony Avenue
Augusta, Maine 04330

Dear Mr. Dominie:

The Commission has concluded its review of Upper Dam in relation to its eligibility for nomination to the National Register of Historic Places.

According to information which you have submitted to us, the site at Upper Dam (as well as Middle Dam and Lower Dam) was initially developed in the mid nineteenth century with the construction of a dam structure that was used for log driving purposes. In 1878 the Union Water Power Company was incorporated for the purpose of augmenting water flow in the Androscoggin River in order to insure sufficient water for power generation and manufacturing needs. Shortly after its formation, Union Water Power Company acquired Upper and Middle dams and immediately undertook their reconstruction at an increased height. Available information indicates that the existing gate houses were erected at both dams during this period of rebuilding.

As originally constructed, the dams at Upper Dam and Middle Dam were timber crib structures with control gates. The mechanisms that raised and lowered these gates were sheltered in the existing timber frame gate houses. Although the dam structures under these gate houses have been rebuilt several times and the original gates and equipment replaced, the buildings themselves are relatively intact (metal siding and perhaps new window sash have been installed on both). Their integrity of form and method of construction makes them representative examples of first generation structures associated specifically with the control of water resources for industrial purposes as opposed to those for logging. In our opinion, both of these buildings appear to be eligible for nomination to the National Register of Historic Places.

In a letter to you dated May 10, 1990, regarding the National Register eligibility of fourteen hydro facilities, Middle Dam was not included among those properties which the Commission felt were eligible for listing in the Register. During the intervening years, however, we have learned considerably more about the history of water control and use in Maine, as well as the surviving

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333

structures related to it. We have also witnessed the removal of the gate house at Lower Dam, a facility which came under the control of Union Water Power Company at the same time as those at Middle Dam and Upper Dam. Thus, while we recognize that the present review of Upper Dam contradicts our earlier opinion regarding Middle Dam, we believe that our better understanding of these properties justifies our finding. It is also important to understand that this opinion of eligibility extends only to the gate houses. Due to extensive reconstruction in the recent past, the dams themselves at these two locations are not significant.

As you know, the Commission has typically requested a relicensing condition that affords us an opportunity to comment on non-routine maintenance activities for National Register eligible properties. However, the nature of the facilities in those previous cases are considerably different than those at Upper Dam and Middle Dam where the eligible gate houses are located above the ineligible dam structures. The Commission recognizes that any future reconstruction of the dams themselves may render the gate houses obsolete and require their removal. In the event that this decision is made for the dams at Upper Dam and Middle Dam, we request that the effected gate houses be documented to the standards of the Historic American Engineering Record. If both gate houses are to be removed, we believe that their shared history can be explained in a single narrative report accompanied by photographic recordation of each individual building.

If you have any questions relating to this matter, please do not hesitate to contact me.

Sincerely,

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

Meeting Notes
Upper and Middle Dams Repair
March 13, 2007

Attendees:
Kirk Mohney, Maine Historic Preservation Commission
Dave Dominie, TRC

Discussion:
Background
In a letter from dated January 22, 1997, the MHPC had stated:

> *As originally constructed, the dams at Upper and Middle Dam were timber crib structures with control gates. The mechanisms that raised and lowered these gates were sheltered in the existing timber frame gate houses. Although eh dam structures under these gatehouses have been rebuilt several times and the original gates and equipment replaced, the buildings themselves are relatively intact (metal siding and perhaps new window sash have been installed on both). Their integrity of form and method of construction makes them representative examples of first generation structures associated specifically with the control of water resources for industrial purposes as opposed to those for logging. In our opinion, both of these buildings appear to be eligible for nomination to the National Register of Historic Places.*

And,

> *It is also important to understand that this opinion of eligibility extends only to the gate houses. Due to extensive reconstruction in the recent past, the dams themselves at these two locations are not significant.*

And,

> *In the event that this decision [reconstruction of the gate houses] is made for the dams at Upper and Middle Dam, we request that the effected gate houses be documented to the standards of the Historic American Engineering Record. If both gate houses are to be removed, we believe that their shared history can be explained in a single narrative report accompanied by photographic recordation of each individual building.*

At the meeting, I described the repair project to Kirk, focusing on the gatehouse replacement. Kirk then requested that we send him a letter describing the situation including:

- What is driving this project (i.e., FERC mandate that PMF standards be met)
- A description of what alternatives FPL looked at to address FERC's concerns;
- A short historic narrative of the history of the dams; and
- What the proposed mitigation strategy will be (photographic recordation (HABS/HAER standards).

Kirk also asked that we include any historical drawings that might be available.

Finally, Kirk gave me a list of qualified preservation consultants with HABS/HAER experience.

Attachment 2.10-2 Maine Tribal Consultation

Christopher, Mark

From:	Christopher, Mark
Sent:	Monday, July 23, 2018 2:51 PM
To:	'Chris Sockalexis'
Cc:	Rossignol, Eric; Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com)
Subject:	Consultation Middle Dam Oxford County, Maine
Attachments:	Middle dam foot print of work.kmz; MiddleDam_Location.pdf

Hello Chris,

I am representing Brookfield White Pine Hydro for their permitting efforts for the rebuilding of Middle Dam (location map attached), which is located at the outlet of Lower Richardson Lake and at the headwaters of the Rapid River. Brookfield is required by the Federal Energy Regulatory Commission to rebuild the dam to meet probable maximum flood conditions. As part of that process Brookfield will be applying to the Army Corps of Engineers for a Clean water Act permit.

Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023.

I am requesting any data or information regarding any cultural resources of importance to the Penobscot Nation that are known or could occur within the immediate vicinity of the dam. A location figure and KMZ file are attached.

Thanks and please call or email with any questions.

Mark
Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell

Christopher, Mark

From:	Christopher, Mark
Sent:	Monday, July 23, 2018 3:01 PM
To:	'soctomah@gmail.com'
Cc:	Rossignol, Eric; Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com)
Subject:	Consultation Middle Dam Oxford County, Maine
Attachments:	MiddleDam_Location.pdf; Middle dam foot print of work.kmz

Hello Donald,

I am representing Brookfield White Pine Hydro for their permitting efforts for the rebuilding of Middle Dam (location map attached), which is located at the outlet of Lower Richardson Lake and at the headwaters of the Rapid River. Brookfield is required by the Federal Energy Regulatory Commission to rebuild the dam to meet probable maximum flood conditions. As part of that process Brookfield will be applying to the Army Corps of Engineers for a Clean water Act permit.

Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023.

I am requesting any data or information regarding any cultural resources of importance to the Passamaquoddy Tribe that are known or could occur within the immediate vicinity of the dam. A location figure and KMZ file are attached.

Thanks and please call or email with any questions.
Mark

Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell

Christopher, Mark

From:	Christopher, Mark
Sent:	Monday, July 23, 2018 3:14 PM
To:	'Jennifer Pictou'
Cc:	Rossignol, Eric; Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com)
Subject:	Consultation Middle Dam, Oxford County, Maine
Attachments:	Middle dam foot print of work.kmz; MiddleDam_Location.pdf

Hello Jennifer,

I am representing Brookfield White Pine Hydro for their permitting efforts for the rebuilding of Middle Dam (location map attached), which is located at the outlet of Lower Richardson Lake and at the headwaters of the Rapid River. Brookfield is required by the Federal Energy Regulatory Commission to rebuild the dam to meet probable maximum flood conditions. As part of that process Brookfield will be applying to the Army Corps of Engineers for a Clean water Act permit.

Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023.

I am requesting any data or information regarding any cultural resources of importance to the Aroostook Band of Micmacs that are known or could occur within the immediate vicinity of the dam. A location figure and KMZ file are attached.

Thanks and please call or email with any questions.
Mark

Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell

Christopher, Mark

From:	Christopher, Mark
Sent:	Monday, July 23, 2018 2:46 PM
To:	'ogs1@maliseets.com'
Cc:	Rossignol, Eric; Murphy,Kyle (Kyle.Murphy@brookfieldrenewable.com)
Subject:	Attn: Sue Young Consultation Houlton Band of Maliseets Middle Dam Oxford Co, Maine
Attachments:	MiddleDam_Location.pdf; Middle dam foot print of work.kmz

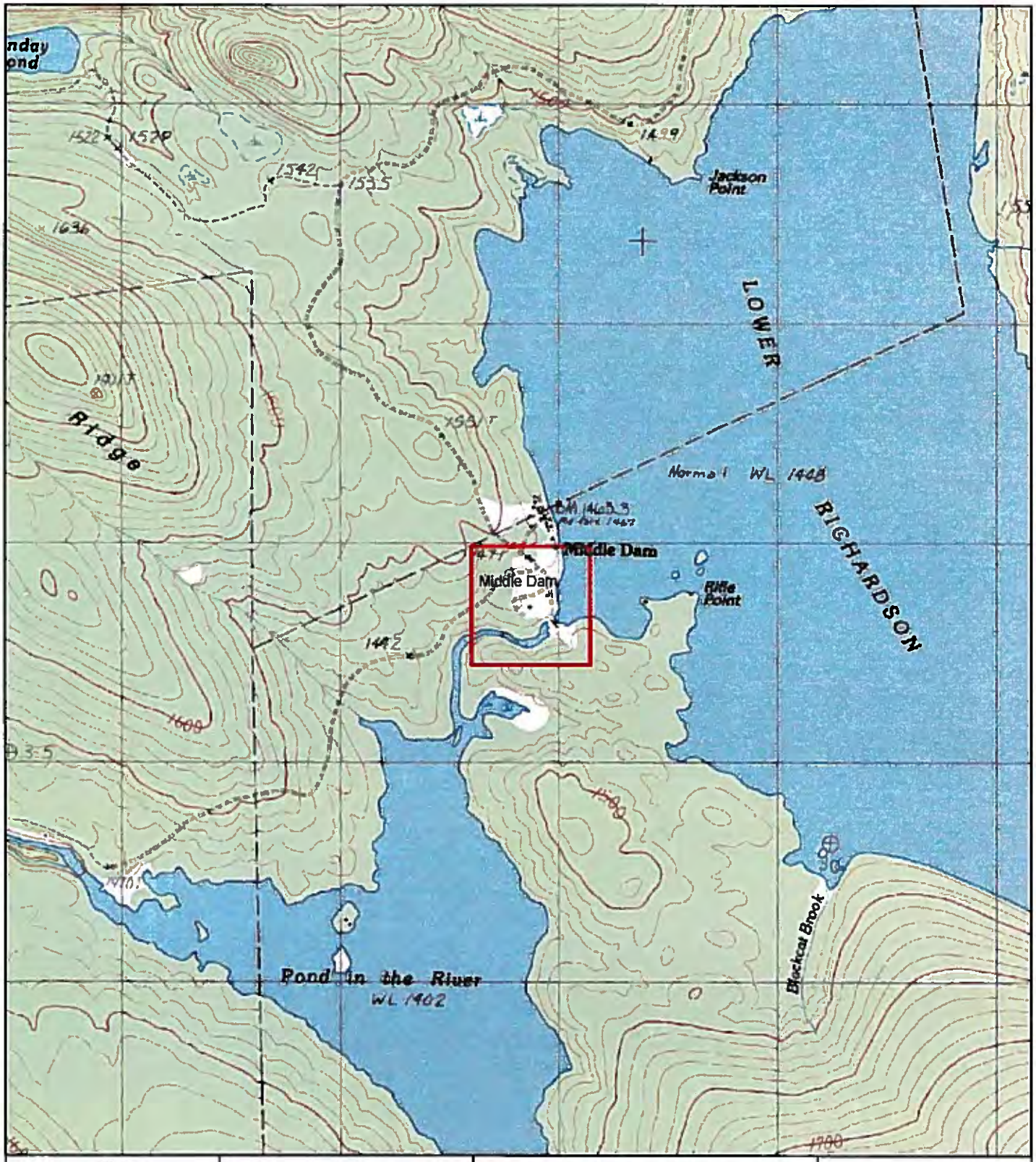
Hello Sue,

I am representing Brookfield White Pine Hydro for their permitting efforts for the rebuilding of Middle Dam (location map attached), which is located at the outlet of Lower Richardson Lake and at the headwaters of the Rapid River. Brookfield is required by the Federal Energy Regulatory Commission to rebuild the dam to meet probable maximum flood conditions. As part of that process Brookfield will be applying to the Army Corps of Engineers for a Clean water Act permit.

Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023.

I am requesting any data or information regarding any cultural resources of importance to the Houlton Band of Maliseets that are known or could occur within the immediate vicinity of the dam. A location figure and KMZ file are attached.

Thanks and please call or email with any questions.
Mark
Mark W. Christopher, M.S., CWB
Project Manager
TRC Solutions, Inc
14 Gabriel Drive
Augusta, ME 04330
207-620-3844 phone
207-621-8226 fax
207-441-4225 cell



Legend

- Project Area
- Lakes and Ponds
- Intermittent Stream
- Perennial Stream

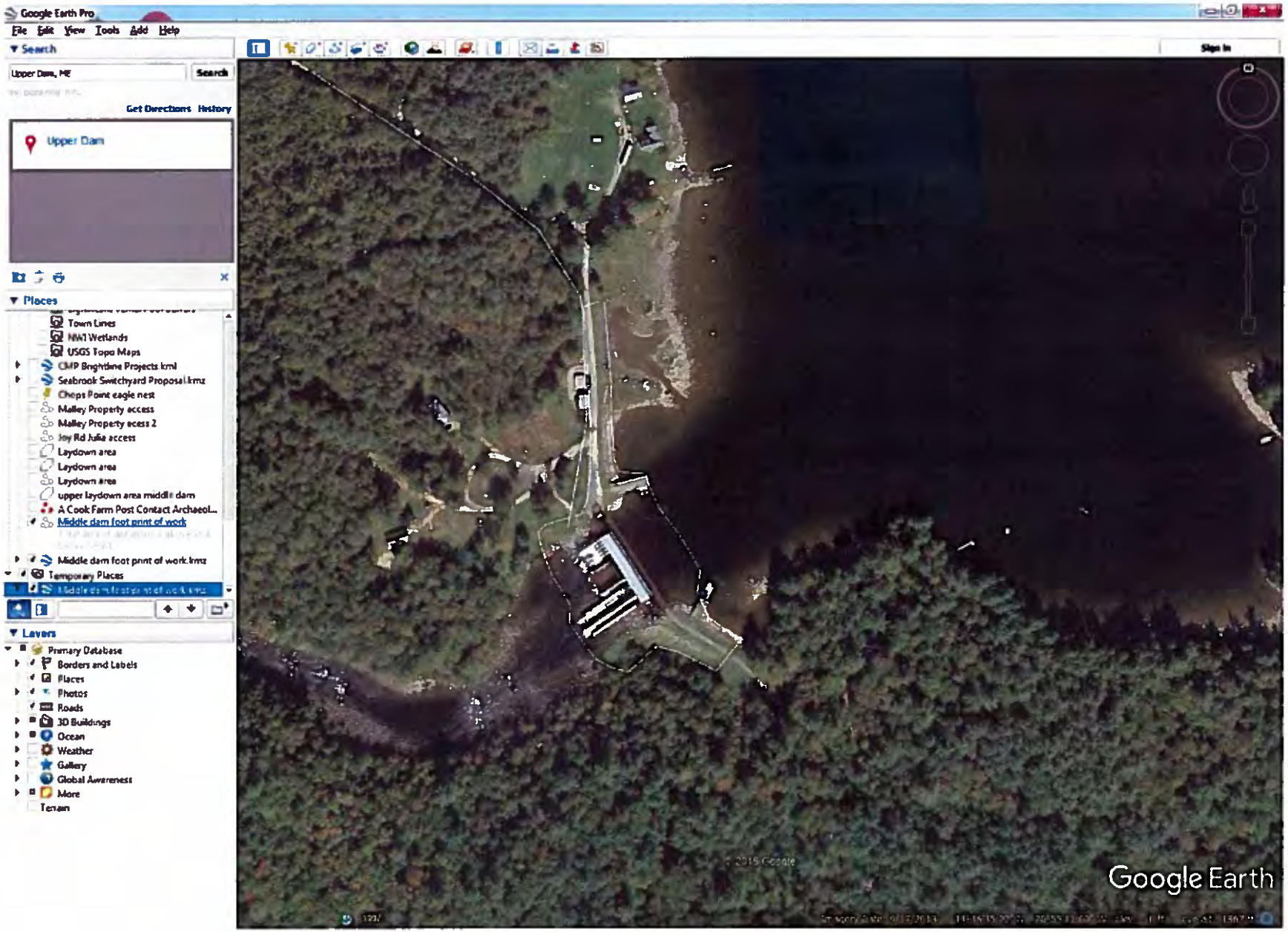
Base Map:
24k USGS topography.

0.25
Miles
1 inch equals 2,000 feet

FPL Energy Maine Hydro
Middle Dam

TRC 249 Western Ave.
Augusta, ME 04330

N
W E
S


Google Earth Pro
File Edit View Tools Add Help
Search
Upper Dam, ME
Search
Get Directions History
Upper Dam
Places
Town Lines
NWI Wetlands
USGS Topo Maps
CMP Brightline Projects.kml
Seabrook Switchyard Proposal.kmz
Chops Point eagle nest
Malley Property access
Malley Property access 2
Joy Rd Julie access
Laydown area
Laydown area
Laydown area
upper laydown area middle dam
A Cook Farm Post Contact Archaeol...
Middle dam foot print of work
Middle dam foot print of work.kmz
Temporary Places
Layers
Primary Database
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Terrain
Sign In
Google Earth

Attachment 3.0-1 Public Notice Documentation

NOTICE OF INTENT TO FILE

MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT APPLICATION

Please take notice that

Brookfield White Pine Hydro, LLC
150 Main Street, Lewiston, Maine 04240
c/o Eric Rossignol 755-5607

is intending to file an application with the Land Use Planning Commission for a permit and Water Quality Certification pursuant to the provisions of the Maine Waterway Development and Conservation Act and the Federal Clean Water Act, Section 401.

This application is for the renewal (i.e. reconstruction) of Middle Dam which impounds Upper and Lower Richardson Lakes and serves as the headwaters for the Rapid River. Renewal is required to meet current Federal Energy Regulatory Commission probable maximum flood conditions. Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023.

Middle Dam is located in "Township C" of Oxford County.

The application will be filed on or about **August 1, 2018** and will be available for public inspection at the **LUPC offices in Farmington (133 Fyfe Road, West Farmington) and Augusta (18 Elkins Lane)** during normal working hours.

A request for a public hearing or a request that the **LUPC** Board assume jurisdiction over this application must be received by the Commission, in writing, no later than 20 days after the application is found by **LUPC** to be complete and is accepted for processing. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act.

Written public comments may be sent to **LUPC, 22 State House Station, Augusta, Maine 04333-0022**.

Brookfield White Pine Hydro will hold a public informational meeting to discuss the upcoming construction project at Middle Dam. All are welcome to attend the informational meeting on Tuesday, August 14, 2018 at the Rangeley Inn from 6-8pm. Representatives from Brookfield, Kleinshmidt Associates, and TRC Solutions will present each phase of the project and expected timeline for completion.

Name and Address of Sender

TRC
14 Gabriel Drive
Augusta ME 04330

Check type of mail or service:

- ☐ Certified
- ☐ COD
- ☐ Delivery Confirmation
- ☐ Express Mail
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- ☐ Return Receipt for Merchandise
- ☐ Signature Confirmation

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Postmark and Date of Receipt

AUGUSTA ME 04330 JUL 30 2018 USPS

Article Number	Addressee *(Name, Street, City, State, & ZIP Code)*	Postage	Fee	Handling Charge	Actual Value if Registered	Insured Value	Due Sender if COD	DC Fee	SC Fee	SH Fee	RD Fee	RR Fee
1.	Rangeley Lakes Heritage Trust P.O. Box 249 Oquossoc, ME 04964											
2.	Seven Islands Attn: Sarah Medina P.O. Box 1168 Bangor, ME 04402											
3.	Lucas Hartford 23 Shepard Lane Litchfield. ME 04350											
4.	Maine Community College Foundation 54 Lighthouse Circle South Portland, ME 04106											
5.	Town of Rangeley Clerk 15 School Street Rangeley . ME 04970											
6.	Union Water Power Attn: Peggy Dwyer P.O. Box 1050 Augusta, ME 04332-1050											
7.	Burt Adelman 210 Old Pickford Road Concord, MA 01742											
8.												

Delivery Confirmation
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See Privacy Act Statement on Reverse

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Name and Address of Sender

TRC
14 Gabriel Drive
Augusta ME 04330

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AUGUSTA ME 04330
JUL 30 2018
USPS

Article Number	Addressee (Name, Street, City, State, & ZIP Code)	Postage	Fee	Handling Charge	Actual Value if Registered	Insured Value	Due Sender if COD	DC Fee	SC Fee	SH Fee	RD Fee	RR Fee
1.	Jeff & Scott Kent 83 Shrine Road Norwell, MA 02061											
2.	Carmen Durso & Rosanne Zuffante 175 Federal St, Ste 1425 Boston, ME 02110-2287											
3.	Oxford County Commissioners Office 26 Western Ave South Paris, ME 04281											
4.	Seven islands Land Co Attn: Pete Johnson P.O. Box 689 Rangeley , ME 04970											
5.	Lakewood Camps 99 Beaver Drive Litchfield, ME 04350											
6.	Michael Abel & Timothy Chadwick 790 Center Road Lyndeborough, NH 03082											
7.	Betsey Hamm & Warren Whitney 145 Pork Pt Road Bowdoinham, ME 04008											
8.												

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7	7	

See Privacy Act Statement on Reverse

PS Form **3877**, February 2002 *(Page 1 of 2)*

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AUGUSTA
40 WESTERN AVE
AUGUSTA
ME
04330-9998
2202550330

07/30/2018 (800)275-8777 1:03 PM

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Product Description	Sale Qty	Final Price
CTOM - Firm - Domestic	14	$5.60
Total		$5.60
Credit Card Remitd		$5.60

(Card Name:AMEX)
(Account #:XXXXXXXXXXX1004)
(Approval #:804939)
(Transaction #:050)
(Entry Mode:Chip)
(AID:A0000000025010801)
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Market Update

Stock questions or requests? Contact Mark Mogensen at mmogensen@sunjournal.com or 689-2805.
Market indicators are at the top of Page B4.

	symb.	close	change		symb.	close	change
3M Company	MMM	207.41	-0.55	J. C. Penney Com-	JCP	2.39	-0.05
ABB Ltd	ABB	22.91	+0.07	JPMorgan Chase	JPM	116.04	+1.19
ACCO Brands Cor-	ACCO	13.90	-0.10	JetBlue Airways Cor-	JBLU	18.05	+0.07
AG Mortgage Invest-	MITT	19.24	-0.02	John Hancock Pre-	PDT	16.00	-0.04
AMG Managers Loo-	MGFIX	26.23	-0.01	Johnson & Johnson	JNJ	131.55	+1.27
AT&T Inc.	T	31.09	+0.74	KCAP Financial, Inc.	KCAP	3.33	+0.02
AbbVie Inc.	ABBV	90.54	-3.40	KKR & Co. Inc.	KKR	27.64	-0.21
Abbott Laboratories	ABT	65.28	-0.38	Kellogg Company	K	71.40	+0.52
Accenture plc	ACN	162.02	-3.15	KeyCorp	KEY	21.28	+0.14
Aetna Inc.	AET	189.69	+0.54	Kinder Morgan, Inc.	KMI	17.91	-0.12
Agree Realty Corpo-	ADC	52.20	-1.19	Kohl's Corporation	KSS	72.51	-1.13
Algonquin Power &	AQN	9.79	-0.06	Koninklijke Ahold Del-	ADRNY	25.07	-0.01
Alphabet Inc.	GOOGL		-32.61	Lam Research Cor-	LRCX	190.02	+12.76
Alphabet Inc.	GOOG		-29.83	Las Vegas Sands	LVS	71.54	+0.24
Altaba Inc.	AABA	74.10	-2.09	Lloyds Banking	LYG	3.30	0.00
Altria Group, Inc.	MO	57.89	+1.79	Lockheed Martin Cor-	LMT	324.07	+1.13
Amarin Corpora-	AMRN	2.63	-0.10	Lundin Mining Cor-	LUNMF	5.43	-0.07
Amazon.com, Inc.	AMZN		+9.27	M&T Bank Corpo-	MTB	175.59	+2.63
Ameren Corporation	AEE	61.94	-0.22	MGM Resorts Inter-	MGM	30.71	-0.51
AmeriGas Partners,	APU	43.12	-0.08	MPLX LP	MPLX	35.80	-0.74
American Airlines	AAL	39.69	-0.33	Magellan Midstream	MMP	70.72	-1.13
American Electric	AEP	71.14	+0.10	Maine Municipal A	MEMUX	10.65	-0.01
American Express	AXP	103.86	+1.36	Manulife Financial	MFC	18.34	-0.11
American Funds	AGTHX	55.83	-0.45	Marathon Oil Cor-	MRO	20.84	-0.40
American Funds In-	IFACX	22.92	-0.04	Marvell Technology	MRVL	21.67	-0.39
American Funds Invmt	AIVSX	41.73	-0.14	Mastercard Incor-	MA	202.96	-4.41
American Funds New	ANWPX	46.69	-0.40	McCormick & Com-	MKC	117.75	-1.03
American Funds	AWSHX	46.13	-0.06	McDonald's Corpo-	MCD	157.47	+1.33
American International	AIG	54.36	+0.11	McKesson Corpo-	MCK	123.89	-3.17
American Outdoor	AOBC	9.46	-0.36	Medical Properties	MPW	14.05	-0.15
American Tower Cor-	AMT	144.37	-0.14	Medtronic plc	MDT	88.67	-0.59
Ameriprise Financial,	AMP	148.75	+0.32	Melco Resorts & En-	MLCO	24.26	-0.60
Amgen Inc.	AMGN	192.44	-1.61	Memorial Production	MEMP	0.13	0.00
Anadarko Petroleum	APC	72.39	-0.94	Merck & Co., Inc.	MRK	63.50	-0.51
Andeavor	ANDV	150.31	+1.35	MetLife, Inc.	MET	45.56	+0.34
Annaly Capital Man-	NLY	10.57	+0.05	Micron Technol-	MU	53.96	+0.20
Anthem, Inc.	ANTM	249.46	+2.38	Microsoft Corporation	MSFT	107.68	-1.94
Apache Corporation	APA	45.01	-0.71	Misonix, Inc.	MSON	16.95	-0.05
Apollo Global Man-	APO	35.02	+0.16	Mondelez Interna-	MDLZ	42.90	-0.37
Apollo Investment	AINV	5.95	+0.01	Morgan Stanley	MS	51.06	+0.07
Apple Inc.	AAPL	190.98	-3.23	Motorola Solutions,	MSI	123.46	-1.69
Applied Materials, Inc.	AMAT	48.30	+1.13	Mueller Water Prod-	MWA	12.06	-0.23
Aqua America, Inc.	WTR	36.81	-0.26	NYSE COMPOSITE	^NYA		-31.853
Archrock, Inc.	AROC	13.10	-0.20	Nabors Industries Ltd.	NBR	6.02	-0.02
Arconic Inc.	ARNC	21.42	+0.04	National Fuel Gas	NFG	52.98	-1.04
Arena Pharmaceuti-	ARNA	38.46	-1.52	National Grid plc	NGG	54.49	-0.19
Ares Capital Corpo-	ARCC	16.84	-0.04	National Retail Proper-	NNN	44.49	-0.39
Arlington Asset Invest-	AI	10.41	+0.02	Natural Resource	NRP	31.70	-0.05
Atmos Energy Cor-	ATO	90.90	-0.41	Nestlé S.A.	NSRGY	81.58	-0.08
Automatic Data Pro-	ADP	137.41	-1.83	NetApp, Inc.	NTAP	79.45	-1.84
Avangrid, Inc.	AGR	49.69	-0.12	Netflix, Inc.	NFLX	355.21	-7.88
Avis Budget Group,	CAR	33.24	-0.22	New York Mortgage	NYMT	6.12	-0.01
B&G Foods, Inc.	BGS	31.23	-0.38	NewMarket Corpo-	NEU	406.76	-3.88
BB&T Corporation	BBT	51.33	+0.27	NextEra Energy, Inc.	NEE	166.96	-1.20
BCE Inc.	BCE	42.15	+0.03	NiSource Inc.	NI	26.18	+0.06
BHP Billiton Limited	BHP	50.76	+0.71	Nokia Corporation	NOK	5.40	-0.15
BP p.l.c.	BP	44.52	-0.01	Nordic American	NAT	2.37	-0.12
Ball Corporation	BLL	38.77	+0.22	Norfolk Southern Cor-	NSC	168.21	-1.36
Banco Santander, S.A.	SAN	5.61	+0.05	Northeast Bancorp	NBN	20.90	-0.30
Bank of America Cor-	BAC	31.07	+0.13	Northrop Grumman	NOC	301.89	+6.58
Barrick Gold Corpo-	ABX	11.23	+0.13	NovaGold Resources	NG	4.37	-0.10
Bassett Furniture In-	BSET	24.10	-0.85	Novavax, Inc.	NVAX	1.17	-0.04
Baxter International	BAX	71.71	-2.00	Nutrien Ltd.	NTR	53.80	+0.06
Best Buy Co., Inc.	BBY	74.68	-1.33	ON Semiconductor	ON	23.15	-0.46
BioRestorative Thera-	BRTX	1.55	-0.12	ONEOK, Inc.	OKE	70.12	-1.17
Biogen Inc.	BIIB	340.40	-4.34	Obsidian Energy Ltd.	OBE	1.05	0.00
Black Hills Corpo-	BKH	59.70	-0.59	Occidental Petroleum	OXY	83.48	-0.68
BlackBerry Limited	BB	9.99	-0.27	Och-Ziff Capital Man-	OZM	2.22	+0.03
BlackRock Municipal	BLE	13.65	-0.03	Olin Corporation	OLN	28.87	+0.05
BlackRock, Inc.	BLK	503.08	-2.03	Omega Healthcare	OHI	29.83	-0.42
BorgWarner Inc.	BWA	45.80	+1.33	Oracle Corporation	ORCL	48.64	-0.23
Boston Properties,	BXP	122.87	-1.65	PACCAR Inc	PCAR	66.07	+0.65
Boston Scientific Cor-	BSX	33.78	-0.55	PPG Industries, Inc.	PPG	109.44	-1.22
Bristol-Myers Squibb	BMY	56.93	-0.99	PPL Corporation	PPL	28.80	-0.16
Broadridge Financial	BR	117.30	-2.08	PVH Corp.	PVH	154.04	-3.46
Buckeye Partners, L.P.	BPL	33.45	-0.74	Paychex, Inc.	PAYX	70.93	-0.76
CBAK Energy Tech-	CBAK	0.85	-0.03	Penn National Gam-	PENN	31.24	-1.26
CBS Corporation	CBS	54.01	-3.52	PepsiCo, Inc.	PEP	114.28	-0.72
CEMEX, S.A.B.	CX	7.45	+0.02	Petróleo Brasileiro	PBR	11.90	+0.31
CSI Compressco LP	CCLP	5.84	-0.05	Pfizer Inc.	PFE	38.42	+0.26
CSX Corporation	CSX	70.27	-0.62	Philip Morris Interna-	PM	85.47	+1.01
CTI BioPharma Corp.	CTIC	2.22	-0.03	Phillips 66	PSX	118.79	+2.79
CVR Energy, Inc.	CVI	37.84	-1.46	Pinnacle West Capital	PNW	80.66	-0.30
CVR Partners, LP	UAN	3.53	-0.19	Pitney Bowes Inc.	PBI	8.69	-0.15
CVR Refining, LP	CVRR	23.75	-0.75	Polaris Industries Inc.	PII	104.08	-1.46
CVS Health Corpo-	CVS	66.67	+0.33	PotlatchDeltic Cor-	PCH	45.85	-0.85
Caladrius Biosci-	CLBS	5.10	-0.32	Principal Financial	PFG	57.74	+2.26
Callon Petroleum	CPE	10.99	-0.41	Principal Global Div	PGBAX	13.72	-0.04
Calumet Specialty	CLMT	7.65	-0.05	Prudential Financial,	PRU	98.90	+0.80
Camden National	CAC	45.70	-0.31	Public Service En-	PEG	51.43	-0.37
Camden Property	CPT	90.32	-0.75	QUALCOMM Incor-	QCOM	62.69	-0.89
Canadian Natural Re-	CNQ	35.81	-0.18	Qorvo, Inc.	QRVO	81.72	-0.48
Cardinal Health, Inc.	CAH	49.33	+0.05	RPM International Inc.	RPM	63.89	-0.17
Caterpillar Inc.	CAT	142.59	+0.01	Rayonier Inc.	RYN	34.21	-0.66
Cedar Fair, L.P.	FUN	56.80	-0.70	Raytheon Company	RTN	196.13	+3.70
Celgene Corporation	CELG	86.43	-1.88	Realty Income Cor-	O	55.03	-0.73
Cenovus Energy Inc.	CVE	9.94	-0.25	Reliv' International,	RELV	4.97	+0.19
Centrus Energy Corp.	LEU	3.19	-0.31	Rite Aid Corporation	RAD	1.94	+0.04
CenturyLink, Inc.	CTL	18.36	-0.03	Rockwell Automa-	ROK	184.07	0.00
Chemical Financial	CHFC	58.21	-0.04	Rockwell Collins, Inc.	COL	138.60	+0.35
Cheniere Energy, Inc.	LNG	63.60	-1.55	SCANA Corporation	SCG	40.94	+0.76
Chesapeake Energy	CHK	4.42	+0.02	SUPERVALU INC.	SVU	32.08	-0.09
Chevron Corporation	CVX	126.00	+2.05	Schlumberger Limited	SLB	67.03	+0.17
Chimera Investment	CIM	18.90	+0.06	Seadrill Limited	SDRL	20.37	+0.39
China Digital TV Hold-	STVVY	0.115	+0.005	Seagate Technol-	STX	54.69	-2.85
China Mobile Limited	CHL	44.62	+0.13	Sears Holdings Cor-	SHLD	1.91	-0.14
Chubb Limited	CB	137.94	+0.68	Sequential Brands	SQBG	2.11	+0.04
Cigna Corporation	CI	177.22	-0.72	Simon Property	SPG	168.57	-2.35
Cisco Systems, Inc.	CSCO	42.57	-0.96	Sirius XM Holdings	SIRI	7.08	-0.12
Citigroup Inc.	C	71.69	+0.35	Snap-on Incorporated	SNA	168.00	-0.81
Coeur Mining, Inc.	CDE	7.20	-0.12	Southern Copper	SCCO	47.87	+0.18
Cognex Corporation	CGNX	45.66	-0.70	Sprint Corporation	S	5.49	+0.01
Colgate-Palmolive	CL	66.68	-0.26	Stanley Black &	SWK	145.86	+1.31
Comcast Corporation	CMCSA	35.08	+0.33	Staples, Inc.	SPLS	10.25	+0.01
Conagra Brands, Inc.	CAG	37.28	+0.19	Star Group, L.P.	SGU	9.51	-0.02
ConocoPhillips	COP	71.46	-0.34	Starbucks Corpo-	SBUX	52.15	+0.70
Consolidated Edi-	ED	78.56	+0.26	State Street Corpo-	STT	87.01	+0.08
Consolidated Water	CWCO	13.65	-0.30	Steel Dynamics, Inc.	STLD	47.99	-0.44
Core Laboratories N.V.	CLB	110.90	-0.37	Stryker Corporation	SYK	169.09	-2.30
Corning Incorporated	GLW	33.56	-0.07	Sturm, Ruger & Com-	RGR	54.35	-1.40
Cracker Barrel Old	CBRL	146.73	+0.77	Suburban Propane	SPH	23.79	+0.08
Cummins Inc.	CMI	138.94	+1.34	Suncor Energy Inc.	SU	41.99	+0.38
D.R. Horton, Inc.	DHI	43.91	+0.07	Sunwin Stevia Interna-	SUWN	0.045	0.00
Daimler AG	DDAIF	68.93	+0.02	Sysco Corporation	SYY	71.50	-0.24
Deere & Company	DE	140.74	-1.99	TOTAL S.A.	TOT	64.00	+0.87
Deluxe Corporation	DLX	58.47	-1.97	Taiwan Semiconduc-	TSM	41.45	+0.63
Devon Energy Cor-	DVN	44.55	-0.60	Target Corporation	TGT	80.13	+0.27
Diebold Nixdorf, In-	DBD	10.88	-0.02	Telefónica, S.A.	TEF	8.97	+0.02
Digital Realty Trust,	DLR	121.03	+4.03	Templeton World A	TEMWX	17.35	0.00
Discover Financial	DFS	73.16	+1.22	Tesla, Inc.	TSLA	297.18	-9.47
Dollar Tree, Inc.	DLTR	87.99	-1.23	Teva Pharmaceutical	TEVA	23.13	-0.57
Dominion Energy, Inc.	D	71.26	-0.24	Texas Instruments	TXN	112.60	-0.70
Dow Jones Industrial	^DJI		-76.01	The Allstate Corpo-	ALL	94.65	-0.11
Duke Energy Corpo-	DUK	81.09	-0.05	The Bank of New York	BK	53.41	+0.01
Duke Realty Corpo-	DRE	28.69	-0.39	The Blackstone	BX	35.28	-0.14
Dupont Fabros Tech-	DFT	66.31	-1.57	The Boeing Company	BA	360.59	+1.27
Dynex Capital, Inc.	DX	6.48	+0.02	The Carlyle Group L.P.	CG	24.00	+0.25
Eaton Corporation plc	ETN	80.56	+0.60	The Clorox Company	CLX	132.72	+0.96
Eaton Vance En-	EOI	15.65	-0.03	The Coca-Cola	KO	46.21	-0.03
Eaton Vance Glbl Macr	EAGMX	8.88	+0.01	The Goldman Sachs	GS	237.66	+0.55
Eaton Vance Michigan	EMI	13.03	+0.01	The Hanover Insur-	THG	124.57	-1.78
Eaton Vance Senior	EVF	6.40	0.00	The Hershey Com-	HSY	96.99	-2.67
Eaton Vance Tax-	ETG	17.84	-0.08	The Home Depot, Inc.	HD	197.11	-2.29
Eaton Vance Tax-	EXG	9.52	-0.03	The Kraft Heinz	KHC	60.26	-0.22
eBay Inc.	EBAY	33.81	-0.62	The Mosaic Company	MOS	29.79	-0.08
Eli Lilly and Company	LLY	96.61	+1.43	The PNC Financial	PNC	144.36	+1.77
Emerson Electric Co.	EMR	71.27	+0.01	The Procter & Gamble	PG	80.59	+0.50
Enbridge Inc.	ENB	34.95	-0.20	The Sherwin-Williams	SHW	443.76	-5.27
Encana Corporation	ECA	13.12	-0.04	The Southern Com-	SO	47.98	-0.10
Energy Transfer Eq-	ETE	18.02	-0.22	The St. Joe Company	JOE	17.15	-0.30
Entergy Corporation	ETR	80.56	+0.13	The Toronto-Dominion	TD	58.77	+0.19
Enterprise Products	EPD	29.39	-0.52	The Travelers Compa-	TRV	130.74	+1.25
Eversource Energy	ES	60.09	-0.27	The Walt Disney	DIS	112.63	-0.88
Exelon Corporation	EXC	42.21	-0.06	The Wendy's Com-	WEN	16.71	-0.22
Express Scripts Hold-	ESRX	79.45	-0.03	Toyota Motor Cor-	TM	134.43	+1.10
Exxon Mobil Corpo-	XOM	81.92	-2.32	Transocean Ltd.	RIG	12.90	-0.11
Facebook, Inc.	FB	174.89	-1.37	TravelCenters of	TA	4.30	-0.05
Farmer Bros. Co.	FARM	28.15	-0.40	Twitter, Inc.	TWTR	34.12	-8.82
Farmland Partners Inc.	FPI	6.52	-0.26	U.S. Bancorp	USB	52.62	+0.26
FedEx Corporation	FDX	240.85	-0.39	U.S. Silica Holdings,	SLCA	26.74	+1.03
Federal Home Loan	FMCC	1.52	-0.04	USA Compression	USAC	16.10	-0.35
Federal National Mort-	FNMA	1.44	-0.01	USG Corporation	USG	43.15	+0.06
Ferrellgas Partners,	FGP	3.08	+0.02	Ulta Beauty, Inc.	ULTA	249.99	-1.89
Fidelity Asset Man-	FASGX	23.19	-0.01	Union Pacific Cor-	UNP	148.54	+0.82
Fidelity Balanced	FBALX	25.02	-0.09	United American	UAHC	0.2494	+0.0273
Fidelity Capital &	FAGIX	10.11	-0.01	United Parcel Ser-	UPS	118.65	-0.22
Fidelity Contrafund	FCNTX	137.69	-2.55	United States Natu-	UNG	22.82	+0.20
Fidelity Government	FGOVX	9.93	-0.01	United States Oil	USO	14.31	-0.16
Fidelity Growth &	FGRIX	39.32	+0.09	United Technologies	UTX	134.54	-1.30
Fidelity New Markets	FNMIX	15.24	+0.05	UnitedHealth Group	UNH	255.92	-1.08
Fidelity Value	FDVLX	12.27	+0.03	Unitil Corporation	UTL	51.34	-0.45
Fidelity® Strategic	FSICX	10.77	0.00	Universal Health Re-	UHT	65.25	-0.15
First Eagle Global C	FESGX	56.81	+0.08	Unum Group	UNM	38.80	+0.30
FirstEnergy Corp.	FE	35.01	-0.20	V.F. Corporation	VFC	91.97	-1.83
Flowers Foods, Inc.	FLO	20.18	+0.01	Vale S.A.	VALE	14.435	+0.325
Fly Leasing Limited	FLY	14.09	+0.21	Valero Energy Cor-	VLO	116.35	-0.48
Foot Locker, Inc.	FL	47.35	-1.25	Vanguard 500 Index	VFIAX	262.24	-0.79
Ford Motor Company	F	9.94	+0.05	Vanguard Capital Op-	VHCOX	74.20	-0.01
Fortune Brands Home	FBHS	57.38	+3.41	Vanguard Dividend	VDIGX	27.75	0.00
Frontier Communica-	FTR	4.83	-0.31	Vanguard Equity-	VEIPX	37.75	+0.20
Gabelli Utilities C	GAUCX	6.17	+0.05	Vanguard Health	VGHCX	215.06	-0.97
Garmin Ltd.	GRMN	62.93	-0.68	Vanguard Mid Cap	VIMSX	44.57	+0.16
General Dynamics	GD	198.61	-1.87	Vanguard Selected	VASVX	30.28	+0.10
General Electric	GE	13.06	-0.09	Vanguard Wellesley	VWIAX	64.06	+0.17
General Mills, Inc.	GIS	44.99	+0.82	Vanguard Wellesley	VWINX	26.44	+0.06
General Motors	GM	37.53	+0.78	Vanguard Welling-	VWELX	42.32	+0.04
General Steel Hold-	GSIH	0.03	0.00	Vector Group Ltd.	VGR	18.13	-0.13
Genuine Parts Com-	GPC	96.70	-0.91	VeriSign, Inc.	VRSN	150.26	-1.69
Genworth Financial,	GNW	4.62	-0.03	Verizon Communica-	VZ	52.01	+0.83
Gerdau S.A.	GGB	4.48	+0.17	Verso Corporation	VRS	21.17	-0.33
GlassBridge Enter-	GLAE	1.00	0.00	Viacom, Inc.	VIAB	29.35	+1.29
GlaxoSmithKline plc	GSK	40.75	+0.39	Visa Inc.	V	140.71	-1.79
Golden Star Re-	GSS	0.69	+0.01	Vodafone Group Plc	VOD	23.81	+0.34
Great Plains Energy	GXP	31.99	-0.99	W&T Offshore, Inc.	WTI	6.93	-0.47
HCP, Inc.	HCP	25.45	-0.90	WEX Inc.	WEX	192.67	-4.70
HP Inc.	HPQ	23.24	-0.22	Walgreens Boots Alli-	WBA	68.64	+1.10
Halliburton Company	HAL	41.80	+0.49	Walmart Inc.	WMT	88.15	-0.08
Harley-Davidson, Inc.	HOG	44.38	-0.22	Walter Energy, Inc.	WLTGQ	0.015	+0.005
Hecla Mining Com-	HL	3.15	-0.09	Waste Management,	WM	89.66	+1.14
Hess Corporation	HES	63.61	-0.72	Wells Fargo & Com-	WFC	58.63	+0.32
Hi-Crush Partners LP	HCLP	15.20	-0.60	Western Asset Pre-	WEA	12.63	-0.02
Hologic, Inc.	HOLX	42.48	-0.13	Western Digital Cor-	WDC	71.13	-5.96
Honda Motor Co., Ltd.	HMC	30.34	+0.35	Western Gas Part-	WES	50.36	-1.15
Honeywell Interna-	HON	159.34	+0.22	Weyerhaeuser Com-	WY	33.83	-1.08
Hugoton Royalty Trust	HGT	0.55	-0.02	^WFM	^WFM	118.57	0.00
Huntington Banc-	HBAN	15.51	+0.20	Wheaton Precious	WPM	20.95	-0.23
IDEXX Laboratories,	IDXX	241.27	-6.71	Whirlpool Corporation	WHR	127.89	+0.25
Illinois Tool Works Inc.	ITW	140.22	-1.03	Winnebago Indus-	WGO	38.35	-0.60
ImmuCell Corporation	ICCC	7.20	+0.20	WisdomTree Emerging	ELD	34.79	+0.13
Intel Corporation	INTC	47.68	-4.48	World Wrestling Enter-	WWE	81.76	-2.08
InterDigital, Inc.	IDCC	81.40	-1.00	Wyndham Worldwide	WYN	108.44	-2.38
International Business	IBM	145.15	-1.56	Wynn Resorts, Limited	WYNN	163.39	-1.87
International Paper	IP	52.03	-0.01	Xcel Energy Inc.	XEL	46.59	-0.29
International Speed-	ISCA	42.95	-0.90	YUM! Brands, Inc.	YUM	78.91	-0.04
Intuitive Surgical, Inc.	ISRG	519.21	-7.75	Yamana Gold Inc.	AUY	3.04	+0.28

GOLD AND SILVER

NY Handy & Harman Gold	1223.95	NY Handy & Harman Silver	15.5400

Class on understanding youth mental health offered in Jay

JAY — The class, Youth Mental Health First Aid, will be held from 8 a.m. to 4:30 p.m. Friday, Aug. 10, at Spruce Mountain Middle School, 23 Community Drive. This class is open to the public.

Youth Mental Health First Aid is designed to teach adults how to help a youth or teen, ages 12-18, who is experiencing a mental health or substance use challenge or crisis using a five-step action plan that covers how to assess a situation; listen non-judgmentally; give appropriate reassurance and information; encourage appropriate professional help; and encourage self-help and other support strategies.

Other topics that will be covered include the most common adolescent mental health diagnoses; differentiating between typical development and signs of a struggle; risk factors and warning signs; the impact mental illness has on adolescents; and how to intervene with an adolescent who's experiencing challenges.

Earn eight continuing education credits and a three-year national certification from the National Council for Behavioral Health. This training meets the state mandate for school staff in suicide awareness.

To register: www.namimaine.org/events or call 207-622-5767.

Library seeks donations for basket fundraiser

TURNER — Turner Public Library is seeking donations for its second annual Bountiful Baskets of Turner fundraiser through Aug. 8.

Donations themed gift baskets, single items and gift certificates may be dropped off at the library or by contacting the library directly at 207-225-2030. Proceeds will be used for library equipment, reading materials and technology.

This year's baskets will be auctioned online, allowing bidders to place their bids remotely between Saturday, Aug. 18, and Saturday, Sept. 8.

"We looked at how successfully other area libraries conduct annual online auctions and felt that the ability to browse and bid from home, from work, even on a cell phone, was a real convenience that we should offer," said Connie Maloney, who is helping to coordinate the event for a second year.

The baskets will be displayed in the library, and assistance for those who want to place a bid will be available during library hours.

Details on the bidding process, bidding window and the celebratory community gathering will be announced in the near future. The event organizers may be reached through TPL at info@turnerpubliclibrary.org or by phone at 207-225-2030.

CNA training offered in Paris

PARIS — The Oxford Hills/Nezinscot Adult Education will be holding a CNA training class beginning Monday, Sept. 17.

This is a Maine state certified course and exceeds the 180 hours required by the state of Maine.

Requirements for participants include a reading test, interview session, physical within the last year, immunization records, and the willingness to dedicate time to a 12-week commitment.

Call Jeanna Packard at 207-743-8842, ext. 1538, for information. VA funding will be approved and scholarships and other funding will be available to eligible students.

Salway speaks to Hebron Society

HEBRON — Author Norma Salway of Portland recently recounted her book "The Attic and Me" to the Hebron Historical Society.

She reflected on the numerous artifacts in the old boxes, tins and suitcases found in the attic of her Albany homestead. From her father's syrup tins and tools to her mother's patchwork quilts and various work aprons, each item had a story to tell about the owner.

Her stories examine the ways of stimulating child's development through "making do" in the less technical era of the 1940s.

Maine Wildlife Park featuring fairy houses

GRAY — The Maine Wildlife Park in Gray is offering a special event, Enchanted Forests and Fairy Houses, from 11 a.m. to 2 p.m. Saturday and Sunday, Aug. 4-5. Visitors will be able to meet and have their pictures taken with 'real' fairies and elves.

Fairies take over a corner of the picnic area with decorations, a build-your-own fairy house workshop and a beautifully decorated life-size fairy house. After building their very own fairy house, using a diverse collection of forest materials, participating children can take their creations home with them.

Enchanted Forests is made possible by long-time park volunteers who work throughout the year to prepare for this popular event, attended by both residents and tourists alike. Thistle, the now famous wildlife park fairy, will again be at the park for the whole event.

Additional fairy-making and decorating materials will be for sale at the fairy house.

For more information about this or other programs, call the Maine Wildlife Park at 207-657-4977 ext. 0 or visit www.mainewildlifepark.com, www.mefishwildlife.com or Facebook.

Cary Memorial Library to hold auction

WAYNE — The Cary Memorial Library will host its traditional Silent Auction from Aug. 2 to 11 at the newly renovated Williams House, across from the library, at 17 Old Winthrop Road off Route 133.

The opening reception is from 5 to 7 p.m. Aug. 2. Bids close at noon Aug. 11.

The library's auction is well known for its display of vintage treasures from the camps and cottages of Wayne, as well as many handcrafted and distinct offerings. There will be a Sunfish sailboat with restored hull and fairly new sails and Red Sox tickets for Sept. 12.

Glassware, pottery, jewelry, framed art, furniture and needlework will be on display. Children's items include collectible dolls and handmade American Girl doll outfits. Harry Potter wands will be back.

This year's featured handmade children's book, written by Pat Rochkind, introduces frogs, Felix and Flo, handcrafted by Jo Moore. The whimsical story relates the adventures of two polliwogs developing first into tadpoles, and then frogs, as they search for their new home.

"The Cary Library's annual auction is a great way to catch up with neighbors and friends, support the library, and go home with some treasures," Janet Adelberg, director of the Cary Memorial Library, said.

On Aug. 4, a Bake & Book Sale will be held at 10 a.m. and a lobster roll lunch from 11:30 a.m. to 1 p.m. on the library lawn.

For information call the library at 207-685-3612 or go to cary-memorial.lib.me.us/.

LEWISTON HOUSING AUTHORITY
Flooring Replacement: Hillview Community Center
77 Rideout Ave., Lewiston, Maine
IFB # 20180725

The Lewiston Housing Authority (LHA) invites sealed bids for removal of old flooring and installation of approximately 900 square feet of new finish flooring products and base cove at its Hillview Community Center, 77 Rideout Ave.., Lewiston, Maine.

Bids are subject to State Law and will be received at LHA's office at One College St., Lewiston, Maine 04240 until **2 PM. on August 7, 2018** and publicly opened.

Bid packets are available at 207-783-1423 beginning July 25, 2018 after 10 AM. Digital packets will be sent via email free of charge; printed packets are $5 each.

A voluntary pre-bid meeting and site tour occurs at **10 AM on July 30, 2018 at 77 Rideout Ave.** Attendance is encouraged as measurements should be taken & individual tours will not be conducted.

As an "Equal Opportunity Employer," LHA encourages bids from minority, women's, and Section 3 business concerns.

Contacts: Gail Wilkerson, **gwilkerson@lewistonhousing.org**, or Dan Warren, **dwarren@lewistonhousing.org**, Lewiston Housing Authority, (207) 783-1423.

LHA reserves the right to waive any informalities and reject any and all proposals, or to accept any proposals. LHA is exempt from sales tax.

NOTICE OF INTENT TO FILE MAINE WATERWAY DEVELOPMENT AND CONSERVATION ACT APPLICATION

Please take notice that

Brookfield White Pine Hydro, LLC
150 Main Street, Lewiston, Maine 04240
c/o Eric Rossignol 755-5607

is intending to file an application with the Land Use Planning Commission for a permit and Water Quality Certification pursuant to the provisions of the Maine Waterway Development and Conservation Act and the Federal Clean Water Act, Section 401.

This application is for the renewal (i.e. reconstruction) of Middle Dam which impounds Upper and Lower Richardson Lakes and serves as the headwaters for the Rapid River. Renewal is required to meet current Federal Energy Regulatory Commission probable maximum flood conditions. Brookfield intends to rebuild the spillways, gates, and gatehouse, build a new auxiliary spillway, and reinforce the earthen embankments. Cellular and earthen cofferdams will be used to manage water levels around the construction site. Public access to the lake, and river will be maintained throughout construction. Normal flows and releases as required by the FERC license will be maintained. Work will begin in the spring of 2019 and should be completed by the summer of 2023. Middle Dam is located in "Township C" of Oxford County.

The application will be filed on or about **August 1, 2018** and will be available for public inspection at the **LUPC offices in Farmington (133 Fyfe Road, West Farmington) and Augusta (18 Elkins Lane)** during normal working hours.

A request for a public hearing or a request that the **LUPC** Board assume jurisdiction over this application must be received by the Commission, in writing, no later than 20 days after the application is found by **LUPC** to be complete and is accepted for processing. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act.

Written public comments may be sent to **LUPC, 22 State House Station, Augusta, Maine 04333-0022**.

Brookfield White Pine Hydro will hold a public informational meeting to discuss the upcoming construction project at Middle Dam. All are welcome to attend the informational meeting on Tuesday, August 14, 2018 at the Rangeley Inn from 6-8pm. Representatives from Brookfield, Kleinshmidt Associates, and TRC Solutions will present each phase of the project and expected timeline for completion.

STATE OF MAINE
SUPERIOR COURT DISTRICT COURT
Location: Lewiston
Docket No. FA-17-66

Joseph L. Harrison
Plaintiff
v.
Ryanne M. Brown
Defendant

ORDER FOR SERVICE BY ALTERNATE MEANS
(M.R. Civ. P. 4(g)

This court has reviewed the motion of the defendant for service by altenate means. The type of action is post judgment family matter. Property or credits of the defendant may be affected, which include income.

The name and address of the defendant (or attorney) if known: Confidential

The Moving Party has demonstrated:

1. Due diligence in attempting to obtain personal service of process prescribed by M.R. Civ. P.4.
2. The address of the party to be served is unknown and cannot be ascertained by reasonable diligence
3. The requested method of service is reasonable calculated to provide actual notice of the pendency of the action to the party to be served and is the most practical manner of effecting notice of the suit.

It is ORDERED that Service be made upon the party by:

Publishing a copy of t his Order once a week for three (3) consecutive weeks, in the Lewiston Sun Journal, a newspaper of general circulation in the county or municipality most reasonably calculated to provide actual notice of the pencency of the action AND, if the defendant's address is known, mailing a copy of this Order as published to that address.

Adequate safeguards shall be used to assure that service by alternate means can be authenticated and will be received intact, with all relevant documents and information.

It is FURTHER ORDERED that the party being served appear and serve an answer to the complaint or post-judgment motion to the serving party at the address listed above. The answer must be filed with teh court within twenty-one (21) days of service. If service is made by puglication in a newspaper, the answer must be filed with the court within forty-one (41) days after the first publication in the newspaper. Failure to serve an answer will cause judgment by default to be entered, granting relief sought in the motion or complaint.

PRELIMINARY INJUNCTION; IT IS FURTHER ORDERED that the above-named parties be:

1. Prohibited from transferring, emcumbering, concealing, selling or otherwise disposing of any property of either or both of the parties, except in the usual course of business or for the necessities of life, without the written consent of the parties or the permission of the court.
2. Prohibited from imposing any restraint on the personal liberty of the other party or on any natural or adopted child of either or both of the parties.
3. Prohibited from voluntarily removing the other party or any child or childre of the parties from any policy of health insurance that provides coverage for the other party or the child or children of the parties.

WARNING: This Preliminary Injunction ir an official court Order. If you disobey this Order, the court may fine you in contempt of court. This court Order is effective until the earliest of the following: 1) The court revokes or modifies it; 2) A final judgment is entered in the matter before the court; or 3) The action is dismissed.

This order is incorporated into the docket by reference at the specific direction of the court.

Date: 7/10/18 R.E. Lawrence, Judge

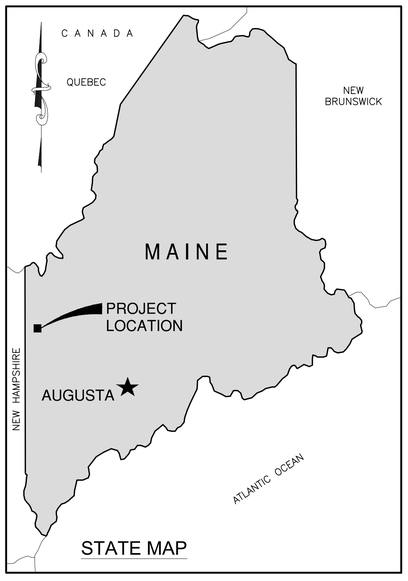
Public Notices are a permanent and independent record of government and court actions. These include state and local government meetings, rule making, available contracts, zoning changes, and many more, as required by law. In addition, parties to some court proceedings, such as foreclosures, probate, and estate actions are required to publish notices to ensure notification of affected parties, as well as the general public. These notices also alert business owners, large and small, to potential government contractual jobs, helping to ensure economic activity across a level playing field. Public notices have existed to ensure transparency in all levels of government since the founding of the United States.

State and local notices are published in Maine newspapers and are also recorded at mainenotices.com, where anyone can browse or search notices, and sign up to receive email alerts when relevant notices appear.

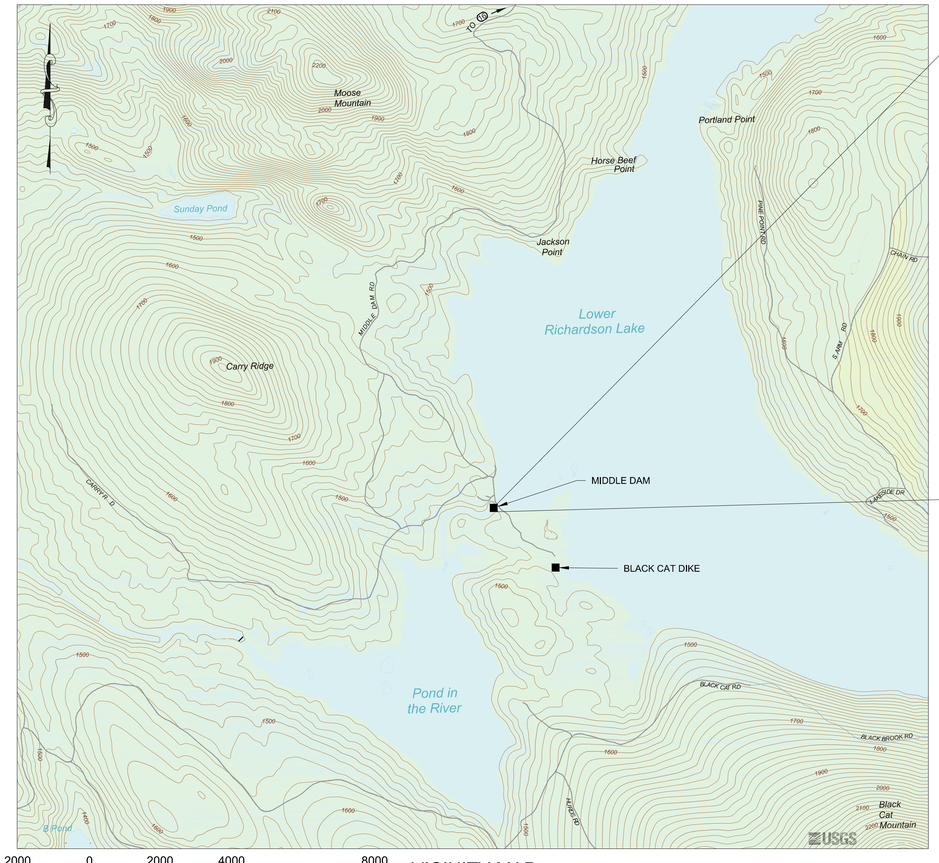
BROOKFIELD RENEWABLE ENERGY GROUP

LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT



STATE MAP



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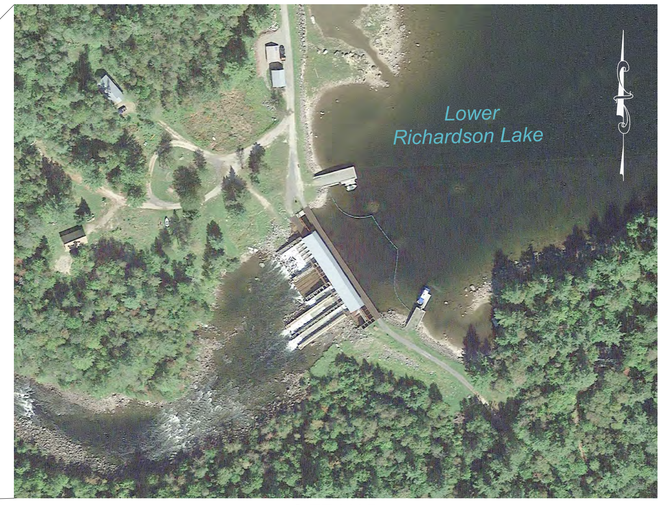
SCALE IN FEET

VICINITY MAP



SITE MAP

Brookfield

AGENCY CONSULTATION
7-24-18

Kleinschmidt

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DRAWING LIST

SHEET No.	DRAWING DESCRIPTION	DATE	REVISION	STATUS
1	DRAWING INDEX	7/24/2018	D	AGENCY CONSULTATION
2	EROSION & SEDIMENT CONTROL NOTES & DETAILS	7/24/2018	D	AGENCY CONSULTATION
3	ANGLERS ACCESS PATH & SWALE DETAIL	7/24/2018	D	AGENCY CONSULTATION
4	EXISTING & TEMPORARY CONDITIONS OVERALL GENERAL SITE PLAN	7/24/2018	D	AGENCY CONSULTATION
5	EXISTING & TEMPORARY CONDITIONS CONTRACTOR LAYDOWN PLAN	7/24/2018	D	AGENCY CONSULTATION
6	EXISTING CONDITIONS SITE PLAN	7/24/2018	D	AGENCY CONSULTATION
7	TEMPORARY CONDITIONS OVERALL SITE PLAN - PHASE 1	7/24/2018	D	AGENCY CONSULTATION
8	TEMPORARY CONDITIONS PHASE 1	7/24/2018	A	AGENCY CONSULTATION
9	TEMPORARY CONDITIONS PHASE 2	7/24/2018	A	AGENCY CONSULTATION
10	TEMPORARY CONDITIONS PHASE 3	7/24/2018	A	AGENCY CONSULTATION
11	TEMPORARY CONDITIONS PHASE 4	7/24/2018	A	AGENCY CONSULTATION
12	FINAL GRADING PLAN PHASE 5	7/24/2018	D	AGENCY CONSULTATION
13	NEW CONDITIONS OVERALL SITE PLAN	7/24/2018	D	AGENCY CONSULTATION
14	NEW CONDITIONS SOUTH EMBANKMENT PLAN	7/24/2018	D	AGENCY CONSULTATION
15	NEW CONDITIONS NORTH EMBANKMENT PLAN	7/24/2018	D	AGENCY CONSULTATION
16	NEW CONDITIONS NORTH EMBANKMENT	7/24/2018	A	AGENCY CONSULTATION
17	BLACK CAT DIKE PLAN AND NOTES	7/24/2018	D	AGENCY CONSULTATION

24x36 = FULL SCALE

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NOT FOR CONSTRUCTION

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

DRAWING INDEX

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

Kleinschmidt
888-224-5942
KleinschmidtGroup.com

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
-	TLT	KJC	3758023	7-23-18	1

EROSION AND SEDIMENT CONTROL NOTES

1. EROSION PREVENTION AND SEDIMENT CONTROL SHALL BE IN ACCORDANCE WITH LOCAL AND STATE STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE START OF EARTHWORK. THE CONTRACTOR SHALL ENSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED.

2. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE PROPER CONSTRUCTION, STABILIZATION AND MAINTENANCE OF ALL EROSION AND SEDIMENTATION CONTROLS AND RELATED ITEMS INCLUDED WITHIN THIS PLAN. THE CONTRACTOR SHALL SCHEDULE AND CONDUCT HIS OPERATIONS TO MINIMIZE EROSION OF SOILS AND TO PREVENT SILTING AND MUDDYING OF STREAMS, RIVERS AND DRAINAGE SYSTEMS.

3. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE CONTRACTOR SHALL IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES TO ELIMINATE THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

4. POLLUTANTS SUCH AS FUELS, LUBRICANTS, BITUMENS, RAW SEWAGE AND OTHER HARMFUL MATERIALS SHALL NOT BE DISCHARGED INTO OR NEAR RIVERS, STREAMS AND IMPOUNDMENTS OR INTO NATURAL OR MANMADE CHANNELS LEADING THERETO. WASH WATER OR WASTE FROM OPERATIONS SHALL NOT BE ALLOWED TO ENTER LIVE STREAMS.

5. THE CONTRACTOR SHALL NOT STOCKPILE EQUIPMENT, TOPSOIL, MATERIALS, ETC. IN OTHERWISE UNDISTURBED LAWN AREAS AND AREAS INDICATED FOR THE PRESERVATION OF EXISTING VEGETATION.

6. UNTIL THE SITE ACHIEVES FINAL STABILIZATION, THE CONTRACTOR SHALL ENSURE THAT THE EROSION AND SEDIMENT CONTROL MEASURES ARE IMPLEMENTED, OPERATED, AND MAINTAINED PROPERLY AND COMPLETELY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION & SEDIMENT CONTROL MEASURES.

7. ALL SEDIMENT REMOVED FROM EROSION AND SEDIMENT CONTROL MEASURES AS A PART OF MAINTENANCE SHALL BE DISPOSED OF IN AN AREA THAT IS:

   A. LESS THAN 5% IN SLOPE.

   B. AT LEAST 100 FT. FROM ANY DOWNSLOPE WATER BODY OR CONVEYANCE TO A WATER BODY (INCLUDING STORM DRAIN INLET OR DITCH).

   C. VEGETATED.

8. CONTRACTOR SHALL PLACE ALL EXCESS CUT SOIL IN A SOIL PLACEMENT LOCATION APPROVED BY THE OWNER.

9. PERMANENT STABILIZATION OF SOIL SHALL BE IMMEDIATELY IMPLEMENTED FOLLOWING DISPOSAL.

10. DISTURBED AREAS BORDERING AND DRAINING TO WATERWAYS SHALL HAVE AN APPROPRIATE SEDIMENT BARRIER SPANNING THE EDGE OF THE DISTURBANCE TO PREVENT WASHING OF SEDIMENT ONTO WATERWAYS.

11. SEDIMENTATION BASIN: SEDIMENT LADEN WATER SHALL NOT BE RELEASED INTO ANY WATERWAY. CONTRACTOR SHALL PROVIDE APPROPRIATELY SIZED SEDIMENTATION BASIN, WATER FILTERING BAGS OR OTHER APPROVED SEDIMENT REMOVAL DEVICES FOR ALL DEWATERING OR WATER DIVERSION ACTIVITIES.

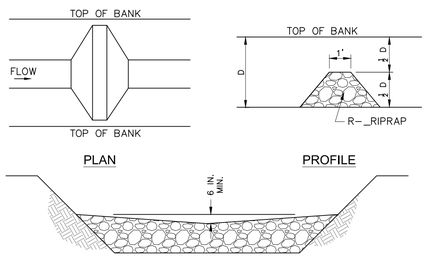
12. DE-SILTING BASINS OR WATER FILTERING BAGS OR OTHER APPROVED SEDIMENT REMOVAL DEVICES ON SHORE SHALL HAVE A VEGETATIVE BUFFER FOR DISCHARGE. BASINS NEED TO BE ACCESSIBLE FOR MAINTENANCE BUT OUT OF THE WAY OF LAYDOWN AND CONSTRUCTION ACTIVITIES.

13. DEWATERING & WATER MANAGEMENT PLAN TO BE APPROVED BY OWNER'S ENGINEER.

14. TURBIDITY CURTAIN SHALL BE A.H. HARRIS PRODUCT # TCMADOT06 OR APPROVED EQUIVALENT.

15. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED, UNLESS OTHERWISE AUTHORIZED.

16. EROSION CONTROL BLANKET SHALL BE NORTH AMERICAN GREEN ERONET S150 DOUBLE-NET STRAW BLANKET, OR AN APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED ON THE PLANS



ELEVATION

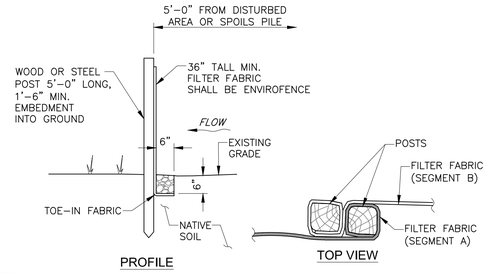
NOTES:

1. INSTALL BY PLACING APPROPRIATELY SIZED RIPRAP IN SPECIFIED LOCATION AS SPECIFIED IN THE DETAIL.
2. SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF CHECK DAM.
3. IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK CHECK DAMS, AND STABILIZE DISTURBED AREAS.
4. FOR D $\geq$ 3 FT. – USE R-4, FOR D $\geq$ 2 FT. TO D < 3 FT. – USE R-3, NOT APPLICABLE FOR D < 2 FT.
5. CHECK DAM SPACING (SEE PLANS FOR SWALE LOCATIONS):

SWALE 1: NONE, SWALE 2: 20' INTERVALS, SWALE 3: 30', INTERVALS, SWALE 4: 30' INTERVALS, SWALE 5: 50' INTERVALS, SWALE 6: 50' INTERVALS, SWALE 7 – NONE

TEMPORARY ROCK CHECK DAMS

N.T.S.

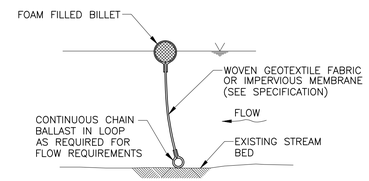


NOTES:

1. POST SPACING SHALL BE 10 FT. CENTER TO CENTER IF WIRE REINFORCED SILT FENCE IS USED OR 6 FT CENTER TO CENTER IF NO WIRE REINFORCEMENT IS USED.
2. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/3 THE ABOVE GROUND HEIGHT OF THE FENCE.
3. SEE ADDITIONAL SILT & SUPER SILT FENCE NOTES THIS SHEET.

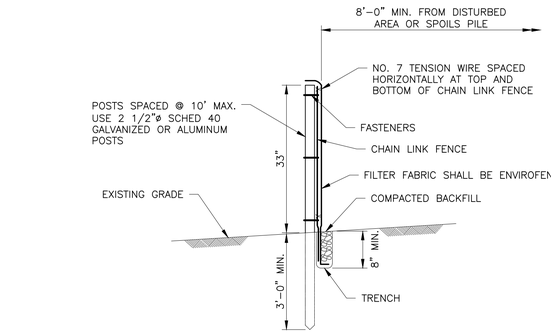
SILT FENCE DETAIL

N.T.S.



TURBIDITY CURTAIN DETAIL

N.T.S.



NOTES:

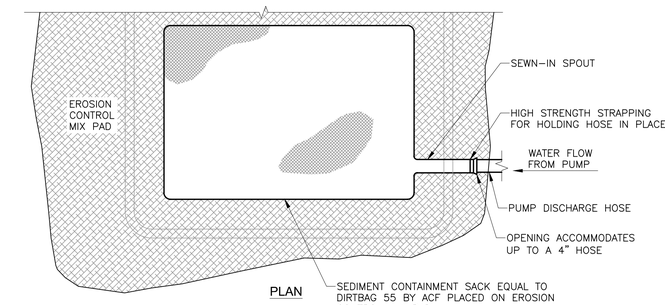
1. CHAIN LINK TO POST FASTENERS SPACED AT 14" MAX. USE NO. 6 ALUMINUM WIRE OR NO. 9 GALVANIZED STEEL PRE-FORMED CLIPS. CHAIN LINK TO TENSION WIRE FASTENERS SPACED AT 60" MAX. USE NO. 10 GA. GALVANIZED STEEL WIRE. FABRIC TO CHAIN FASTENERS SPACED AT 24" O.C. MAX.
2. CHAIN LINK SHALL BE GALVANIZED No. 11.5 GA STEEL WIRE WITH 2 1/4" OPENING. No. 7 GA TENSION WIRE SHALL INSTALLED HORIZONTALLY THROUGH HOLES AT TOP AND BOTTOM OF CHAIN LINK FENCE.
3. SEDIMENT MUST BE REMOVED WHERE ACCUMULATIONS REACH 1/2 THE ABOVE GROUND HEIGHT OF THE FENCE.
4. SEE ADDITIONAL SILT & SUPER SILT FENCE NOTES THIS SHEET.

SUPER SILT FENCE DETAIL

N.T.S.

ADDITIONAL NOTES FOR SILT FENCE AND SUPER SILT FENCE

1. SILT FENCE SHALL BE ENVIROFENCE AS MANUFACTURED BY MIRAFI INC, PROPEX SILT STOP AS MANUFACTURED BY AMOCO FABRICS CO. OR APPROVED EQUAL.
2. PROVIDE SILT FENCE CONFORMING TO THE FOLLOWING:
   A. EQUIVALENT OPENING SIZE OF A U.S. STANDARD SIEVE SIZE OF 40 (MAX.), 70 (MIN.).
   B. MULLEN BURST STRENGTH = 200 PSI
   C. GRAB STRENGTH = 120 LBS (MIN.)
   D. SPUN BONDED NYLON FABRIC REINFORCED WITH POLYESTER NETTING, OR POLYPROPYLENE FABRIC WITH 2" X 4"- 12 GA. WOVEN WIRE BACKING FENCE.
3. LOCATE DOWN-GRADIENT OF ALL DISTURBED AREAS AND TEMPORARY STOCKPILES. PLACE ALONG CONTOURS AT UNIFORM ELEVATION. BOTH ENDS OF EACH FENCE SECTION MUST BE EXTENDED AT LEAST 8 FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT
4. SILT FENCE TO BE INSPECTED AFTER EACH RUNOFF EVENT AND AT LEAST WEEKLY AND REPAIRED & MAINTAINED AS NEEDED.

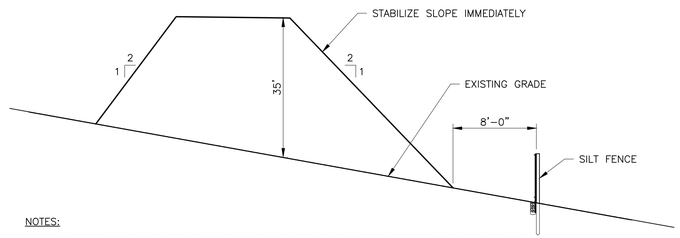


NOTES:

1. WATER PUMPED FROM EXCAVATIONS SHALL BE DISCHARGED INTO SEDIMENT CONTAINMENT BAGS.
2. CONSTRUCT PADS FOR SEDIMENT CONTAINMENT BAGS OF EROSION CONTROL MIX AS SPECIFIED IN THE EROSION CONTROL MIX SEDIMENT BARRIER DETAIL.
3. GRADE THE EROSION CONTROL MIX PAD SO THE SURFACE IS SLOPED SLIGHTLY (1%-2%) AWAY FROM THE HOSE OPENING.
4. PLACE LIFTING STRAPS OR ROPES OVER THE EROSION CONTROL MIX PAD PRIOR TO SETTLING THE BAG IN PLACE TO FACILITATE REMOVAL OF THE FULL BAG.
5. SET BAG IN PLACE AND CONNECT HOSE FROM DEWATERING PUMP. TIE OFF THE NECK OF THE BAG TO THE HOSE TIGHT ENOUGH TO PREVENT WATER FROM FLOWING OUT AROUND THE HOSE UNFILTERED.
6. INSPECT THE BAG PERIODICALLY AND REPLACE WHEN NO LONGER EFFECTIVE.
7. ACCUMULATED SEDIMENT MAY BE USED TO BACKFILL EXCAVATIONS EXCEPT WHERE SPECIFIC MATERIALS OTHER THAN NATIVE SOILS ARE SPECIFIED.
8. PROPERLY DISPOSE OF SPENT BAGS.

SEDIMENT CONTAINMENT BAG DETAIL

N.T.S.



NOTES:

1. INSTALL SILT FENCE AROUND PERIMETER OF STOCKPILE, OR ON DOWNSLOPE OF AREA OF STOCKPILE.
2. PLACE STOCKPILE IN AREAS WITHOUT BLOCKING NATURAL DRAINAGE PATTERNS.
3. FOLLOW DIMENSIONS SHOWN ABOVE. HEIGHT SHOULD NOT EXCEED 35 FT. SIDE SLOPES SHOULD NOT BE STEEPER THAN 2(H):1(V).
4. STABILIZE IMMEDIATELY PER THE "SEEDING SPECIFICATIONS."
5. CONTRACTOR SHALL VERIFY REQUIRED SIZE(S). REQUIREMENTS FROM THE STANDARDS DETAIL MUST BE FOLLOWED FOR STOCKPILES.
6. PERFORM WEEKLY INSPECTIONS, ROUTINE MAINTENANCE AND REGULAR SEDIMENT REMOVAL.

TEMPORARY STOCKPILE DETAIL

N.T.S.

NOT FOR CONSTRUCTION

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

EROSION & SEDIMENT CONTROL
NOTES & DETAILS

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

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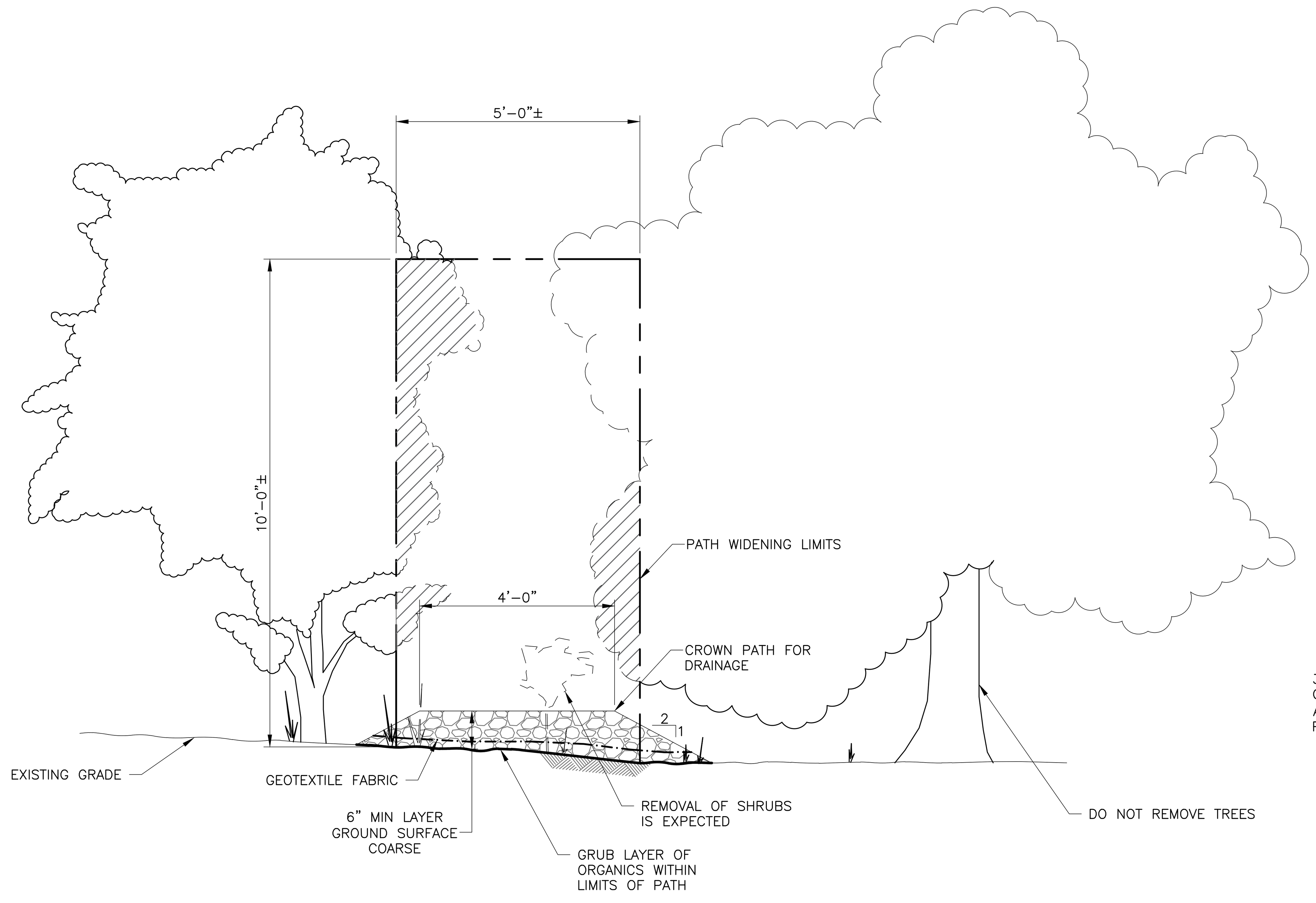
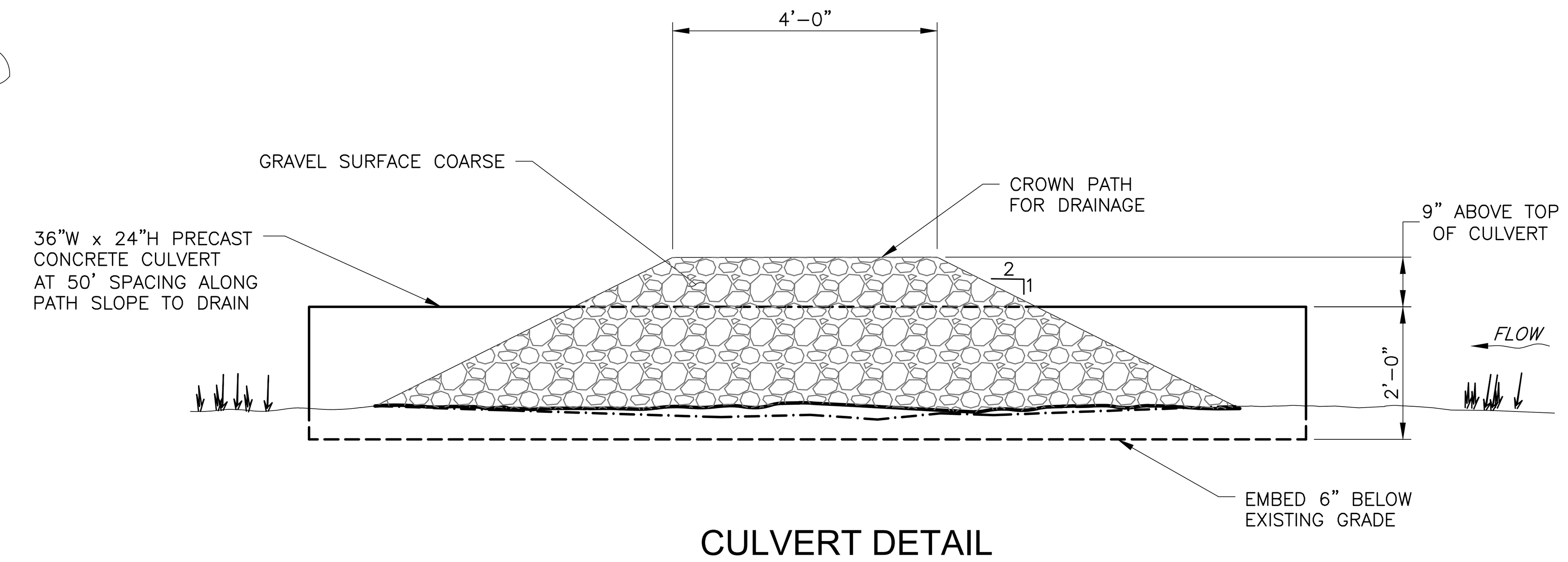
Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
-	TLT	KJC	3758023	7-23-18	2

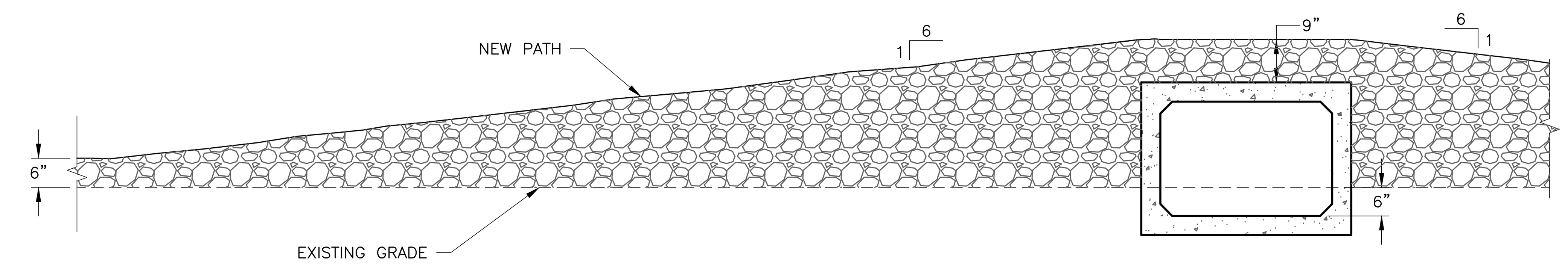
24x36 = FULL SCALE



GRUBBING & TREE TRIMMING DETAIL



CULVERT DETAIL

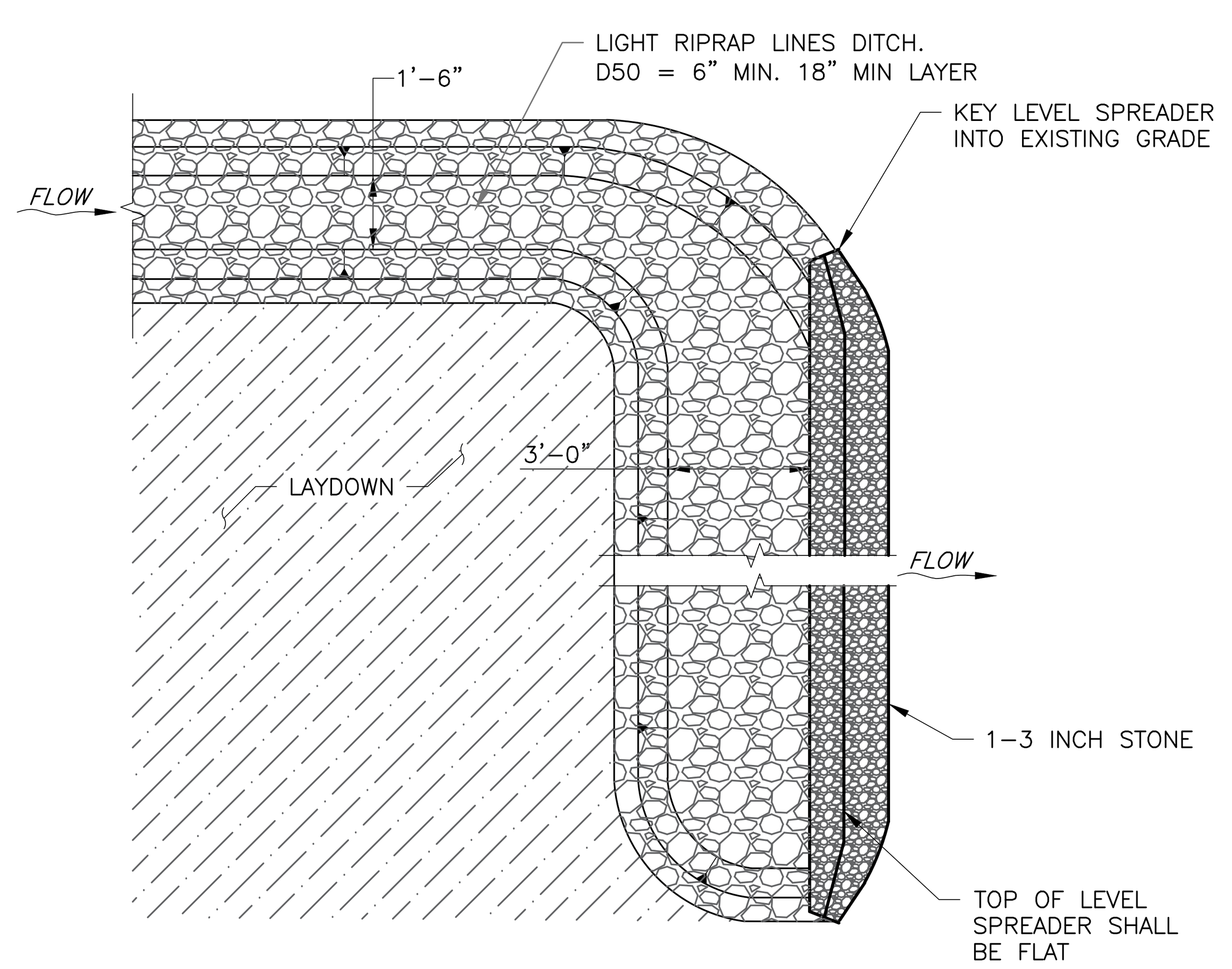


PATH AND CULVERT PROFILE VIEW

1/2" = 1'-0"

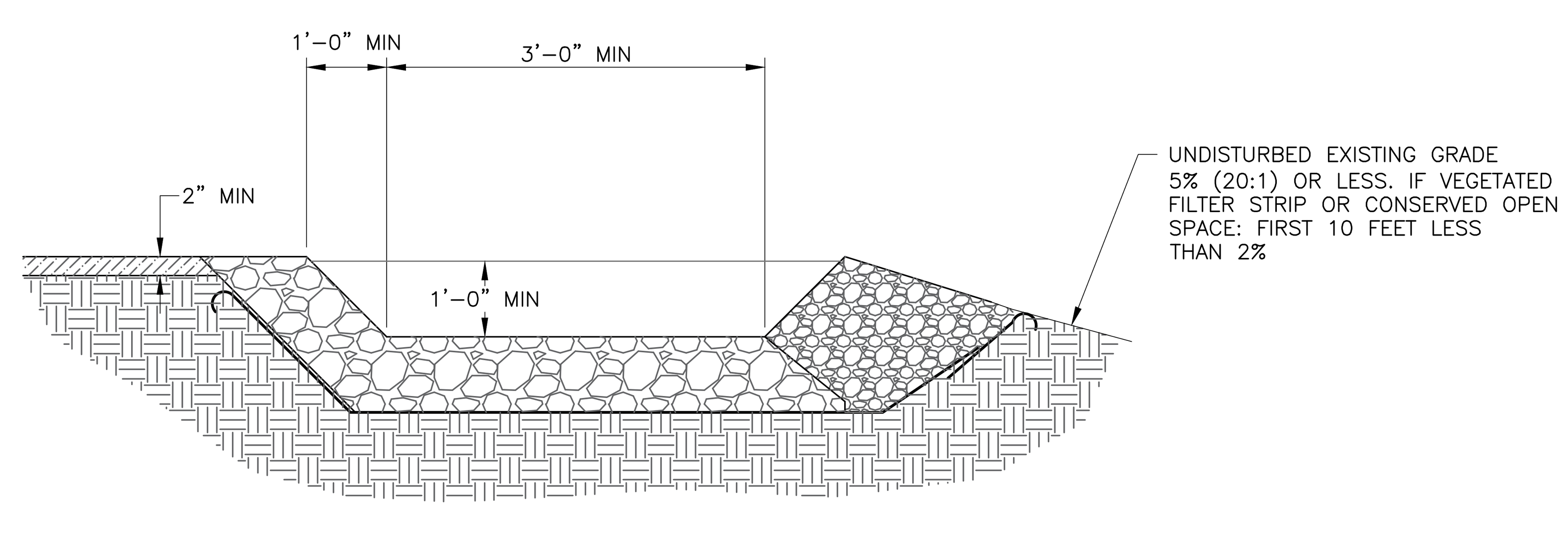
ANGLERS ACCESS PATH DETAIL

NTS



PLAN

NTS



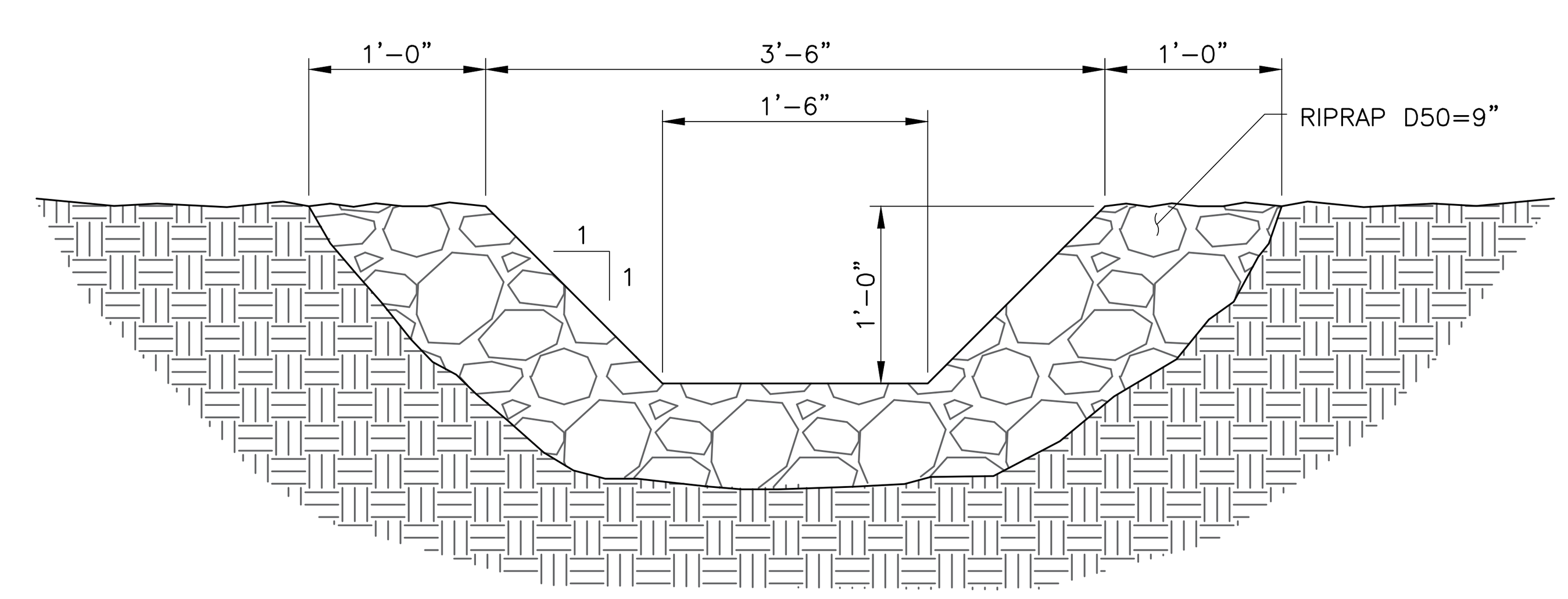
SECTION

NTS

CONTRACTOR LAYDOWN LEVEL LIP SPREADER DETAIL

NTS

SEE SHEET 5



DRAINAGE SWALE SECTION

NTS

SEE SHEET 5

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LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

ANGLERS ACCESS PATH & SWALE DETAILS

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	ZJA	KJC
C	AGENCY CONSULTATION	5-29-18	ZJA	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
-	TLT	KJC	3758023	7-23-18	3

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24x36 = FULL SCALE

SEE DRAWING 5

CONTRACTOR LAYDOWN AREA

TO ROUTE 16

MIDDLE DAM RD

SEE DRAWING 5

SEE DRAWING 6 & 7

FLOW

LOWER RICHARDSON LAKE

TEMPORARY BEACH EXPANSION TO FACILITATE EQUIPMENT ACCESS DURING CONSTRUCTION. MATERIAL TO BE RECLAIMED AND AREA RESTORED AFTER CONSTRUCTION.

TEMPORARY GRAVEL CRANE PAD (~50'x50')

CONTRACTOR LAYDOWN AREA

TEMPORARY 4' WIDE GRAVEL BASE FOOTPATH FOR ANGLER ACCESS DURING CONSTRUCTION. FIELD LOCATED TO AVOID TREE REMOVAL. BRUSH REMOVAL ANTICIPATED.

GATED SPILLWAY DAM

GRAVEL ROAD

SEE DRAWING 17

BLACK CAT DIKE

1560 1560 1580 1560 1540 1520 1500 1480 1460 1440 1420 1460 1440 1420 1420 1440 1460 1480 1500 1520 1500 1480 1460 1440 1420 1420 1440 1460 1480 1500

250 0 250 500
SCALE IN FEET

NOT FOR CONSTRUCTION

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

Designed	Drawn	Checked
-	TLT	KJC

BROOKFIELD RENEWABLE ENERGY GROUP
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MIDDLE DAM
RENEWAL PROJECT

EXISTING & TEMPORARY CONDITIONS
OVERALL GENERAL SITE PLAN

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Project No.	Date Revised	Drawing No.
3758023	7-23-18	4

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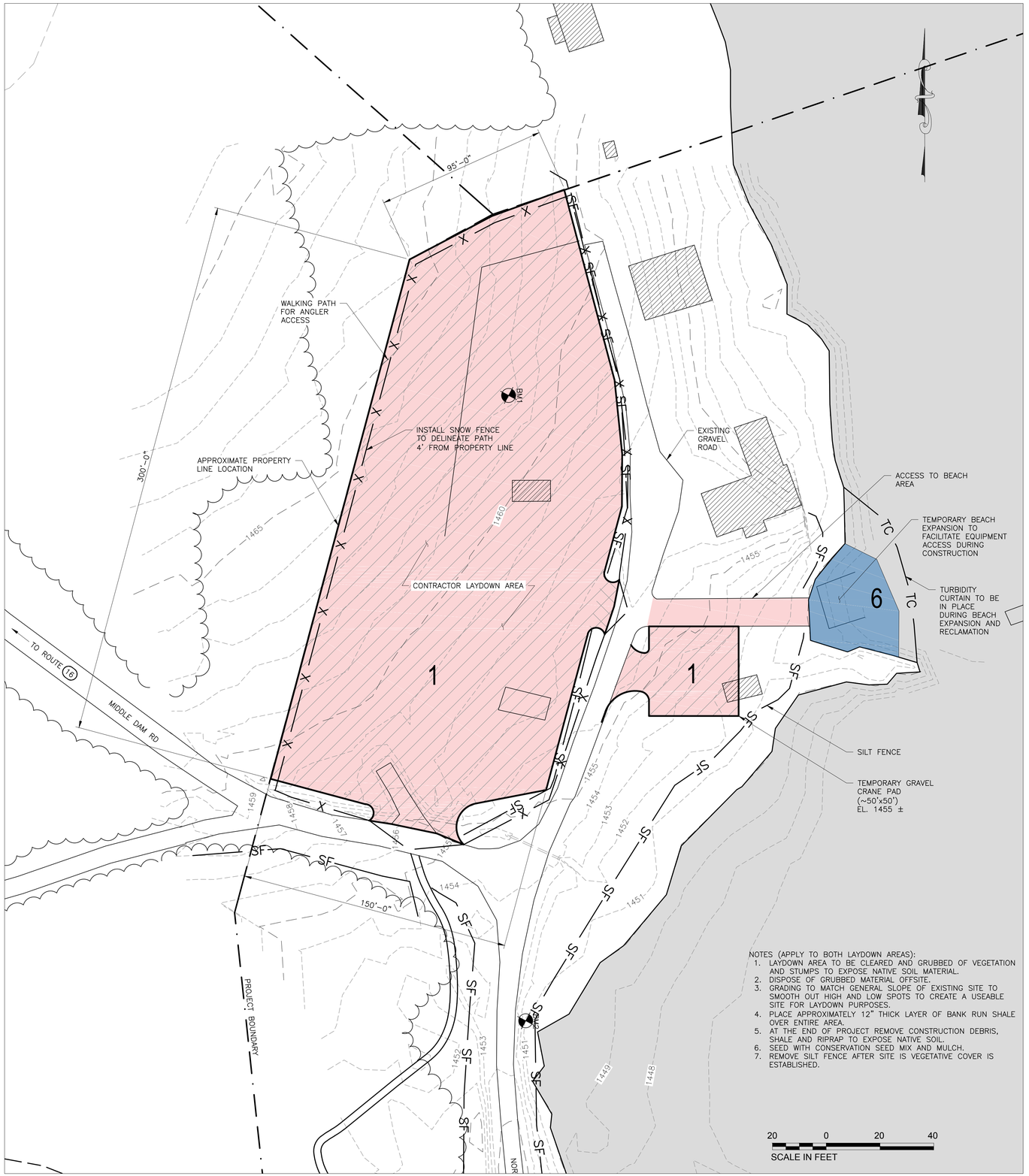
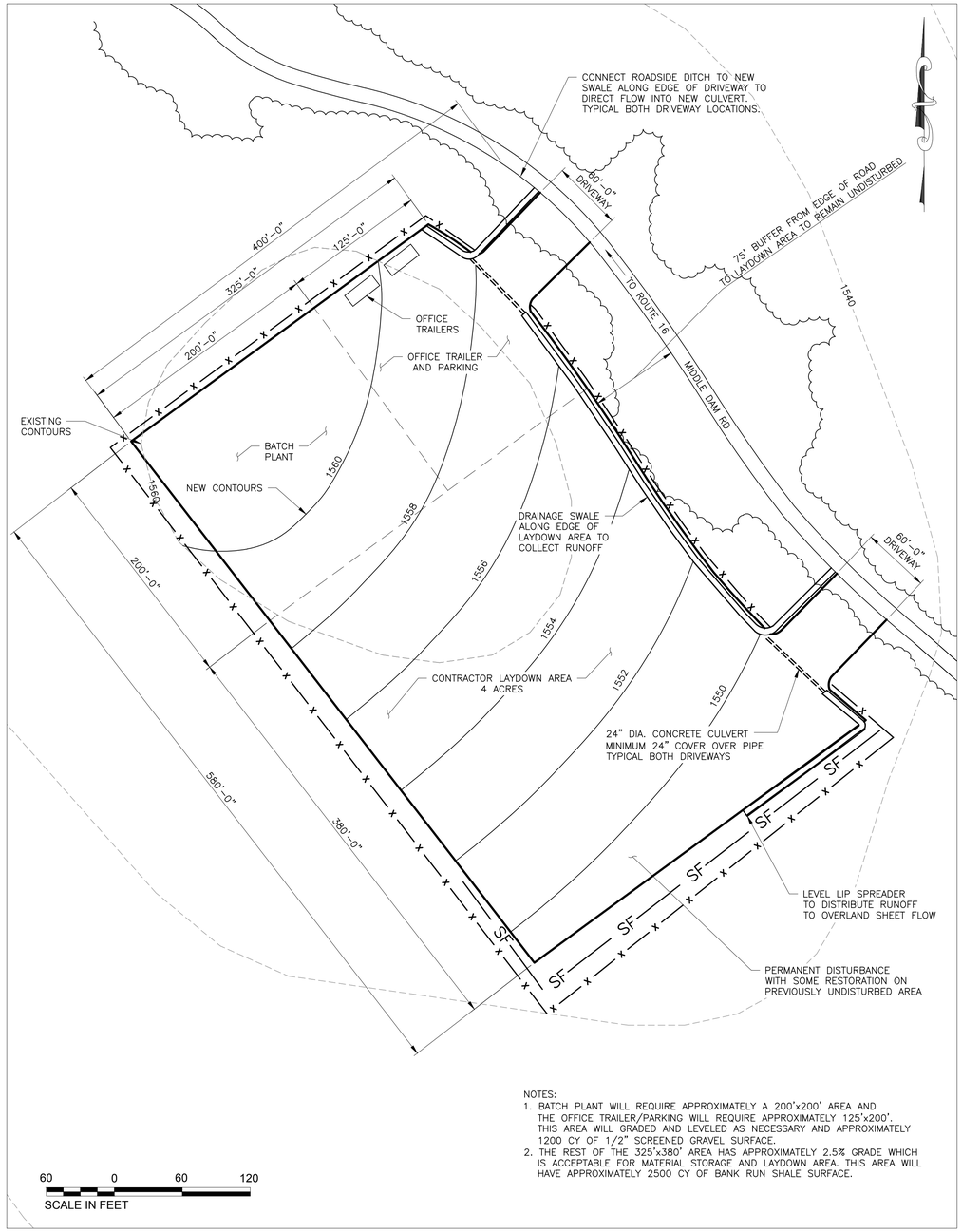
24x36 = FULL SCALE



NOTES (APPLY TO BOTH LAYDOWN AREAS):
1. LAYDOWN AREA TO BE CLEARED AND GRUBBED OF VEGETATION AND STUMPS TO EXPOSE NATIVE SOIL MATERIAL.
2. DISPOSE OF GRUBBED MATERIAL OFFSITE.
3. GRADING TO MATCH GENERAL SLOPE OF EXISTING SITE TO SMOOTH OUT HIGH AND LOW SPOTS TO CREATE A USEABLE SITE FOR LAYDOWN PURPOSES.
4. PLACE APPROXIMATELY 12" THICK LAYER OF BANK RUN SHALE OVER ENTIRE AREA.
5. AT THE END OF PROJECT REMOVE CONSTRUCTION DEBRIS, SHALE AND RIPRAP TO EXPOSE NATIVE SOIL.
6. SEED WITH CONSERVATION SEED MIX AND MULCH.
7. REMOVE SILT FENCE AFTER SITE IS VEGETATIVE COVER IS ESTABLISHED.



NOTES:
1. BATCH PLANT WILL REQUIRE APPROXIMATELY A 200'x200' AREA AND THE OFFICE TRAILER/PARKING WILL REQUIRE APPROXIMATELY 125'x200'. THIS AREA WILL GRADED AND LEVELED AS NECESSARY AND APPROXIMATELY 1200 CY OF 1/2" SCREENED GRAVEL SURFACE.
2. THE REST OF THE 325'x380' AREA HAS APPROXIMATELY 2.5% GRADE WHICH IS ACCEPTABLE FOR MATERIAL STORAGE AND LAYDOWN AREA. THIS AREA WILL HAVE APPROXIMATELY 2500 CY OF BANK RUN SHALE SURFACE.

LEGEND

1. TEMPORARY IMPACT ON PREVIOUSLY DISTURBED ABOVE NHW. AREA 50,414 SQ. FT.

6. TEMPORARY IMPACT ON PREVIOUSLY DISTURBED BELOW NHW. AREA 2,325 SQ. FT.

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LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

EXISTING & TEMPORARY CONDITIONS
CONTRACTOR LAYDOWN PLAN

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	5

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24x36 = FULL SCALE

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LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

EXISTING CONDITIONS
SITE PLAN

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
-	TLT	KJC	3758023	7-23-18	6

24x36 = FULL SCALE
CONSTRUCTION LAYDOWN
TO ROUTE 16
LOWER RICHARDSON LAKE
APPROX. WATERLINE AT EL. 1450
SEE SHEETS 8 THRU 12 FOR PHASING PLANS
EXISTING SHEETPILE PIER TO BE RE REMOVED
NORTH EMBANKMENT
PROPERTY BOUNDARY
EXISTING BUILDING FOUNDATION
EXISTING GENERATOR BUILDING TO BE REMOVED
PERMANENT 4' WIDE GRAVEL BASE FOOTPATH FOR ANGLER ACCESS DURING CONSTRUCTION. FIELD LOCATE TO AVOID TREE REMOVAL. BRUSH REMOVAL ANTICIPATED.
EXISTING SHEETPILE CUTOFF
EXISTING CONCRETE CORE WALL
WETLAND
24x36" CULVERTS REQUIRED EVERY 50' WITHIN WETLAND
SILT FENCE (TYP.)
EXISTING GATED SPILLWAY DAM TO BE DEMOLISHED
ACCESS BRIDGE
GATEHOUSE
SOUTH EMBANKMENT
TO BLACK CAT DIKE
EXISTING SHEETPILE CUTOFF
EXISTING RIPRAP SLOPE
TEMPORARY SEDIMENTATION BASIN
PROVIDE PERMANENT ANGLERS ACCESS PATH
APPROX. WATERLINE AT EL. 1428
EXISTING LOG CABIN
40 0 40 80
SCALE IN FEET

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MIDDLE DAM
RENEWAL PROJECT

TEMPORARY CONDITIONS
OVERALL SITE PLAN - PHASE 1

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No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	ZJA	KJC
C	AGENCY CONSULTATION	4-11-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
-	TLT	KJC	3758023	7-23-18	7

TEMPORARY CELLULAR COFFERDAM EL. 1453.0'
OUTLINE OF FINAL GRADING
CELLULAR COFFERDAM
SHEETPILE CUTOFF
NORTH EMBANKMENT
TEMPORARY BARRIERS
RETAINING WALL FOOTING
NEW UPSTREAM RETAINING WALL
EXISTING CONCRETE CORE WALL TO BE REMOVED
EXISTING SHEETPILE CUTOFF TO BE REMOVED
NEW RETAINING WALL FOOTING
SEEPAGE TRENCH
TOE OF CUT
TOP OF CUT
TURBIDITY CURTAIN
FLOW
NORTH SPILLWAY SEAL TO PIER No. 6
NORTH SPILLWAY DOUBLE WALL COFFERDAM TO SUPPORT PIER 6
SOUTH EMBANKMENT
NEW CONCRETE SEEPAGE CUTOFF
CONSTRUCTION ACCESS ROAD
40'-0" NEW CONCRETE AUXILIARY SPILLWAY
NORTH SPILLWAY
EXISTING ACCESS BRIDGE
EXISTING GATE HOUSE
SOUTH SPILLWAY
EXISTING SHEETPILE CUTOFF
WETLAND
SHOAL GATES
DEEP GATES
SLUICE GATES
PIER 6
SINGLE WALL SHEET PILE AGAINST PIER 6
NEW DOWNSTREAM RETAINING WALL
SEDIMENTATION BASIN AREA
TEMPORARY EARTHEN COFFERDAM EL. 1432.0'
ANGLER'S FOOT PATH
TEMPORARY SILT FENCE
SCALE IN FEET
24x36 = FULL SCALE

NOT FOR CONSTRUCTION

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

TEMPORARY CONDITIONS
PHASE 1

No.	Revision	Date	Drawn	Checked
A	AGENCY CONSULTATION	7-24-18	TLT	KJC

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	8

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24x36 = FULL SCALE
OUTLINE OF FINAL GRADING
PHASE 2 CELLS
(JUNE THRU AUGUST)
PHASE 2 CLOSURE CELLS
& ENCLOSURE BERM W/
SHEETPILE
FALL BARRIER/FENCE
FLOW
NORTH EMBANKMENT
NEW UPSTREAM
RETAINING WALL
PHASE 1/2
COMMON
CELL
"T" SHEETPILE
CONNECTION AT
CELLULAR
COFFERDAM
TEMPORARY SILT FENCE
SOUTH EMBANKMENT
GATE
NEW GUARDRAILS
TEMPORARY
ACCESS
BRIDGE
PHASE 2 CLOSURE CELLS
NEW
SHEETPILE
CUTOFF
PHASE 2 DOUBLE SHEET PILE WALL W/ TIE RODS
EXISTING
SHEETPILE
CUTOFF
CONSTRUCTION ACCESS ROAD
TEMPORARY
BARRIERS
AUXILIARY SPILLWAY
ACCESS BRIDGE
NEW OPERATOR
ENCLOSURE
NEW TAINTER GATE
(FULLY OPERATIONAL)
PIER 6
WETLAND
OUTLINE OF EXISTING
SPILLWAY STRUCTURE
(TO BE DEMOLISHED)
AREA REGRADED
SEDIMENTATION
BASIN AREA
TEMPORARY EARTHEN COFFERDAM WITH
SHEETPILE CUTOFF. SHEETPILES SHALL BE
EMBEDDED 5 FEET INTO GLACIAL TILL.
EXISTING BOULDERS IN TAILRACE WILL
REQUIRE PRE-EXCAVATION AHEAD OF
SHEETPILE DRIVING TO ENABLE REQUIRED
EMBEDMENT
TOP OF COFFERDAM EL. 1432.0'
TURBIDITY CURTAIN
ANGLER'S
FOOT PATH
TEMPORARY ACCESS BRIDGE
TEMPORARY SILT FENCE
SCALE IN FEET
20 0 20 40

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MIDDLE DAM
RENEWAL PROJECT

TEMPORARY CONDITIONS
PHASE 2

No.	Revision	Date	Drawn	Checked
A	AGENCY CONSULTATION	7-24-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	9

OUTLINE OF FINAL GRADING
PHASE 2 CELLS (JUNE THRU AUGUST)
PHASE 2 CLOSURE CELLS & ENCLOSURE BERM W/ SHEETPILE
FALL BARRIER/FENCE
FLOW
NORTH EMBANKMENT
NEW UPSTREAM RETAINING WALL
PHASE 1/2 COMMON CELL
NEW GUARDRAILS
TEMPORARY ACCESS BRIDGE
PHASE 2 CLOSURE CELLS
SEEPAGE TRENCH
TEMPORARY SILT FENCE
SOUTH EMBANKMENT
GATE
NEW SHEETPILE CUTOFF
EXISTING SHEETPILE CUTOFF
CONSTRUCTION ACCESS ROAD
TEMPORARY BARRIERS
FALL BARRIER
AUXILIARY SPILLWAY ACCESS BRIDGE
TOP OF CUT
NEW OPERATOR ENCLOSURE
NEW TAINTER GATE (FULLY OPERATIONAL)
TOE OF CUT
WETLAND
AREA REGRADED
SEDIMENTATION BASIN AREA
TEMPORARY EARTHEN COFFERDAM WITH SHEETPILE CUTOFF. SHEETPILES SHALL BE EMBEDDED 5 FEET INTO GLACIAL TILL. EXISTING BOULDERS IN TAILRACE WILL REQUIRE PRE-EXCAVATION AHEAD OF SHEETPILE DRIVING TO ENABLE REQUIRED EMBEDMENT
TOP OF COFFERDAM EL. 1432.0'
TURBIDITY CURTAIN
TEMPORARY ACCESS BRIDGE
TEMPORARY SILT FENCE
ANGLER'S FOOT PATH
20 0 20 40
SCALE IN FEET
24x36 = FULL SCALE
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MIDDLE DAM
RENEWAL PROJECT

TEMPORARY CONDITIONS
PHASE 3

No.	Revision	Date	Drawn	Checked
A	AGENCY CONSULTATION	7-24-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	10

24x36 = FULL SCALE

3" 2" 1" 0

OUTLINE OF FINAL GRADING
PHASE 2 CELLS (JUNE THRU AUGUST)
PHASE 2 CLOSURE CELLS & ENCLOSURE BERM W/ SHEETPILE
FALL BARRIER/FENCE
FLOW
NORTH EMBANKMENT
NEW UPSTREAM RETAINING WALL
PHASE 1/2 COMMON CELL
NEW GUARDRAILS
TEMPORARY ACCESS BRIDGE
NEW SHEETPILE CUTOFF
SEEPAGE TRENCH
NEW RETAINING WALL
155'-0" NEW CONCRETE SPILLWAY STRUCTURE
NEW CONCRETE SEEPAGE CUTOFF
NEW SHEETPILE CUTOFF
RETAINING WALL FOOTING
SOUTH EMBANKMENT
TEMPORARY SILT FENCE
GATE
EXISTING SHEETPILE CUTOFF
TOP OF CUT
CONSTRUCTION ACCESS ROAD
FALL BARRIER
AUXILIARY SPILLWAY ACCESS BRIDGE
NEW OPERATOR ENCLOSURE
NEW TAINTER GATE (FULLY OPERATIONAL)
NEW RETAINING WALL & FOOTING
TOE OF CUT
WETLAND
DOUBLE WALL SHEETPILE MIN 50FT FROM CONNECTION TO AUXILIARY SPILLWAY RETAINING WALL
NEW RETAINING WALL
AREA REGRADED
SEDIMENTATION BASIN AREA
TOP OF COFFERDAM EL. 1432.0'
TEMPORARY EARTHEN COFFERDAM WITH SHEETPILE CUTOFF. SHEETPILES SHALL BE EMBEDDED 5 FEET INTO GLACIAL TILL. EXISTING BOULDERS IN TAILRACE WILL REQUIRE PRE-EXCAVATION AHEAD OF SHEETPILE DRIVING TO ENABLE REQUIRED EMBEDMENT
CONSTRUCTION ACCESS ROAD
ANGLER'S FOOT PATH
TEMPORARY ACCESS BRIDGE
TEMPORARY SILT FENCE
TURBIDITY CURTAIN
1445
1440
1435
1430

20 0 20 40
SCALE IN FEET

NOT FOR CONSTRUCTION

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

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MIDDLE DAM
RENEWAL PROJECT

TEMPORARY CONDITIONS
PHASE 4

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	11

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24x36 = FULL SCALE

20 0 20 40
SCALE IN FEET

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BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

FINAL GRADING PLAN
PHASE 5

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	12

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LEGEND

2. PERMANENT IMPACT ON PREVIOUSLY DISTURBED ABOVE NHW. AREA 113,064 SQ. FT.

3. PERMANENT IMPACT ON PREVIOUSLY DISTURBED BELOW NHW. AREA 38,718 SQ FT.

4. PERMANENT IMPACT ON PREVIOUSLY UNDISTURBED WETLAND. AREA 4,685 SQ. FT.

5. TEMPORARY IMPACT ON PREVIOUSLY UNDISTURBED ABOVE NHW. AREA 4,986 SQ. FT.

6. TEMPORARY IMPACT ON PREVIOUSLY DISTURBED BELOW NHW. AREA 16, 718 SQ FT.

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BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

NEW CONDITIONS
OVERALL SITE PLAN

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
EMT	TLT	KJC	3758023	7-23-18	13

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24x36 = FULL SCALE

PC: 0+00.00
NORTHING: 708936.65
EASTING: 2756979.75

PC: 0+40.02
NORTHING: 708909.77
EASTING: 2757008.74

PC: 1+16.28
NORTHING: 708877.44
EASTING: 2757077.82

PT: 1+33.41
NORTHING: 708868.89
EASTING: 2757092.63

PC: 2+08.73
NORTHING: 708825.81
EASTING: 2757154.41

PT: 2+36.75
NORTHING: 708806.78
EASTING: 2757174.86

EP: 2+80.00
NORTHING: 708773.20
EASTING: 2757202.11

EXTENT OF NEW CREST RAISING EL. 1455.6'

EL. 1455.6'

NEW SHEETPILE CUTOFF

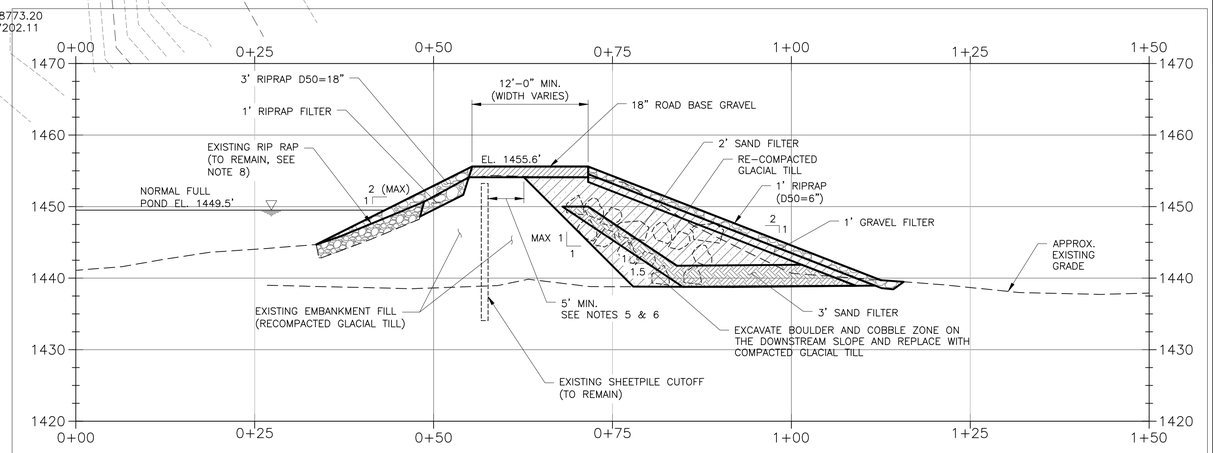
EXISTING SHEETPILE CUTOFF

EXTEND NEW SHEETPILE CUTOFF 20' MIN. BEYOND EXISTING SHEETPILE CUTOFF

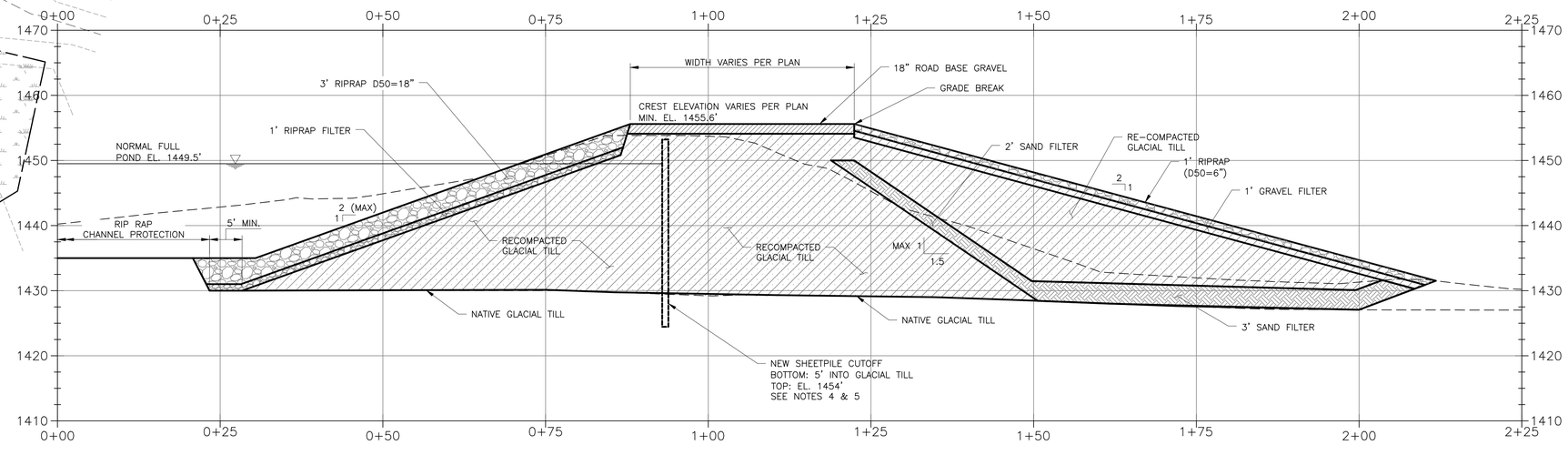
NEW ANGLER'S FOOT PATH

WETLAND

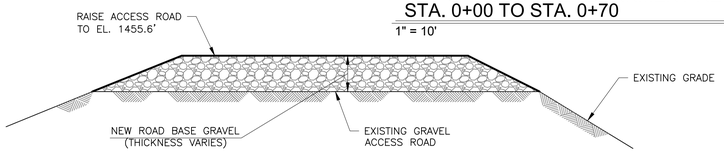
PLAN
1"= 20'
SCALE IN FEET



TYPICAL SOUTH EMBANKMENT REPAIR SECTION
STA. 0+70 TO STA. 1+70
1" = 10'
B



TYPICAL SOUTH EMBANKMENT RECONSTRUCTION SECTION
STA. 0+00 TO STA. 0+70
1" = 10'
A



TYPICAL SOUTH EMBANKMENT
ACCESS ROAD GRADE RAISE
STA. 1+70 TO STA. 2+80
1" = 2'
C

2 0 2 4
SCALE IN FEET

NOT FOR CONSTRUCTION

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	EMT

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

NEW CONDITIONS
SOUTH EMBANKMENT PLAN

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
SJR	TLT	EMT	3758023	7-23-18	14

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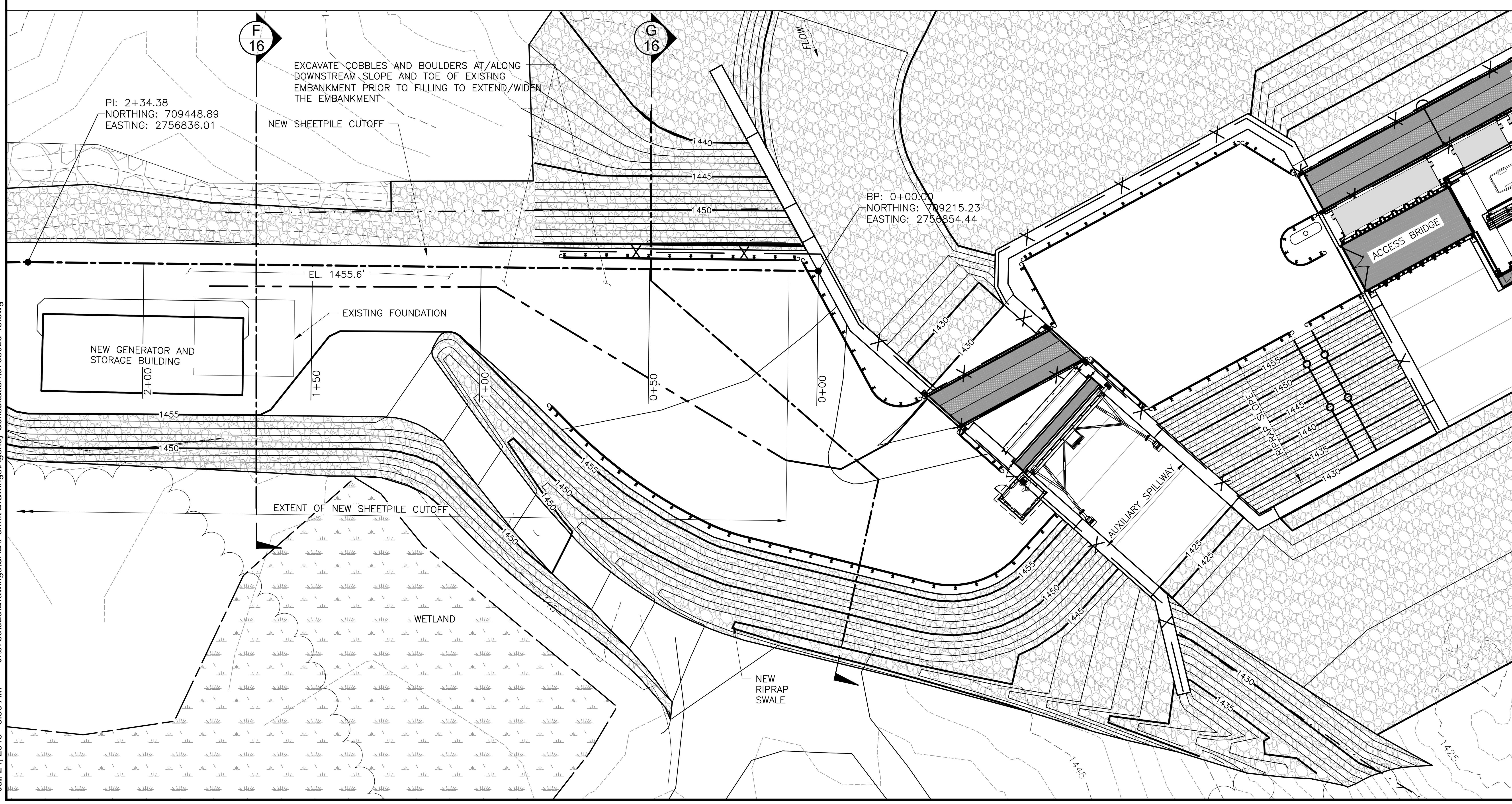
24x36 = FULL SCALE

EP: 6+50.00
NORTHING: 709856.94
EASTING: 2756854.72
EXTENT OF NEW CREST RAISING TO EL. 1455.6'
PT: 5+83.03
NORTHING: 709794.15
EASTING: 2756831.45
D
16
Mid: 5+14.39
NORTHING: 709727.63
EASTING: 2756815.14
EXTENT OF NEW SHEET PILE CUTOFF
PC: 4+45.76
NORTHING: 709659.15
EASTING: 2756814.34
EXISTING RIPRAP
E
16
NEW RIPRAP
PI: 2+34.38
NORTHING: 709448.89
EASTING: 2756836.01
F
16
NEW SHEETPILE CUTOFF
EXCAVATE COBBLES AND BOULDERS AT/ALONG DOWNSTREAM SLOPE AND TOE OF EXISTING EMBANKMENT PRIOR TO FILLING TO EXTEND/WIDEN THE EMBANKMENT
G
16
FLOW
EXISTING CULVERT
EL. 1455.6'
NEW RIPRAP
EXISTING RIPRAP
NEW GENERATOR AND STORAGE BUILDING
EXISTING FOUNDATION
EXTENT OF NEW CREST RAISING TO EL. 1455.6'
EXTENT OF NEW SHEETPILE CUTOFF
WETLAND
PLAN
1"= 20'
20 0 20 40
SCALE IN FEET



F
16
G
16
EXCAVATE COBBLES AND BOULDERS AT/ALONG DOWNSTREAM SLOPE AND TOE OF EXISTING EMBANKMENT PRIOR TO FILLING TO EXTEND/WIDEN THE EMBANKMENT
PI: 2+34.38
NORTHING: 709448.89
EASTING: 2756836.01
NEW SHEETPILE CUTOFF
FLOW
BP: 0+00.00
NORTHING: 709215.23
EASTING: 2756854.44
EL. 1455.6'
EXISTING FOUNDATION
NEW GENERATOR AND STORAGE BUILDING
ACCESS BRIDGE
AUXILIARY SPILLWAY
EXTENT OF NEW SHEETPILE CUTOFF
WETLAND
NEW RIPRAP SWALE

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BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

NEW CONDITIONS
NORTH EMBANKMENT PLAN

No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	TLT	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	EMT

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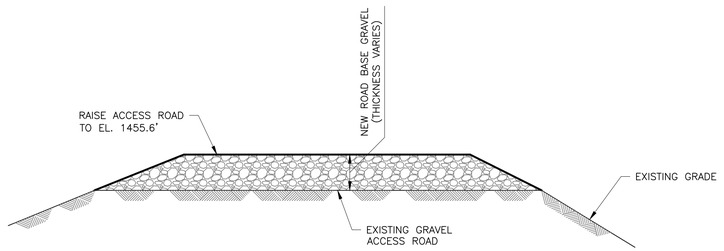
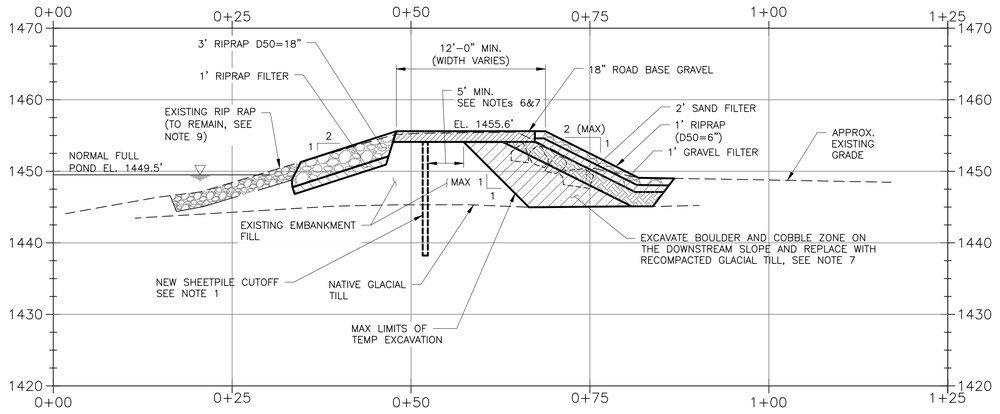
Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
SJR	TLT	EMT	3758023	7-23-18	15



TYPICAL NORTH EMBANKMENT
ACCESS ROAD GRADE RAISE
STA. 5+15 TO STA. 6+50

D
15

1" = 2'

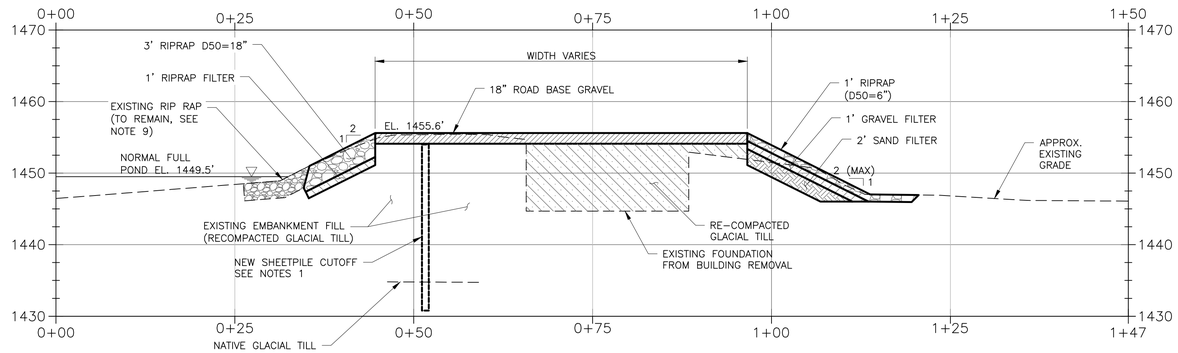


TYPICAL NORTH EMBANKMENT REPAIR SECTION
STA. 2+75 TO STA. 5+15

E
15

1" = 10'

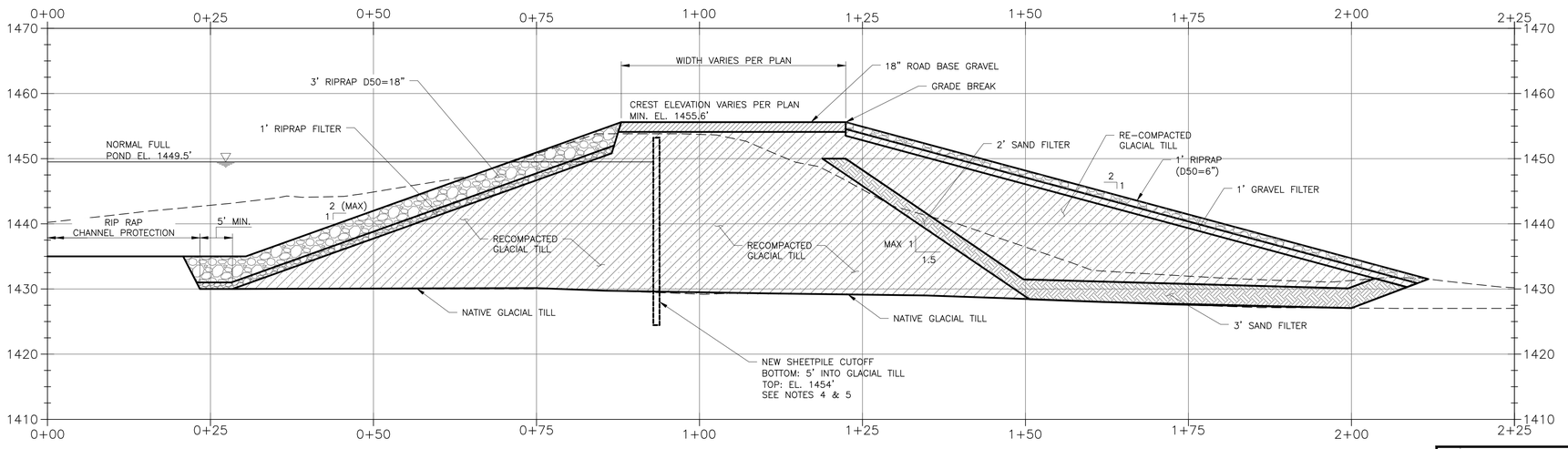
2 0 2 4
SCALE IN FEET



TYPICAL NORTH EMBANKMENT REPAIR SECTION
STA. 1+55 TO STA. 1+85

F
15

1" = 10'



TYPICAL NORTH EMBANKMENT RECONSTRUCTION SECTION
STA. 0+75 TO STA. 1+55

G
15

1" = 10'

10 0 10 20
SCALE IN FEET

NOT FOR CONSTRUCTION

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

NEW CONDITIONS
NORTH EMBANKMENT

No.	Revision	Date	Drawn	Checked
A	AGENCY CONSULTATION	7-24-18	TLT	KJC

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Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
SJR	TLT	EMT	3758023	7-23-18	16

3"
2"
1"
0
24x36 = FULL SCALE

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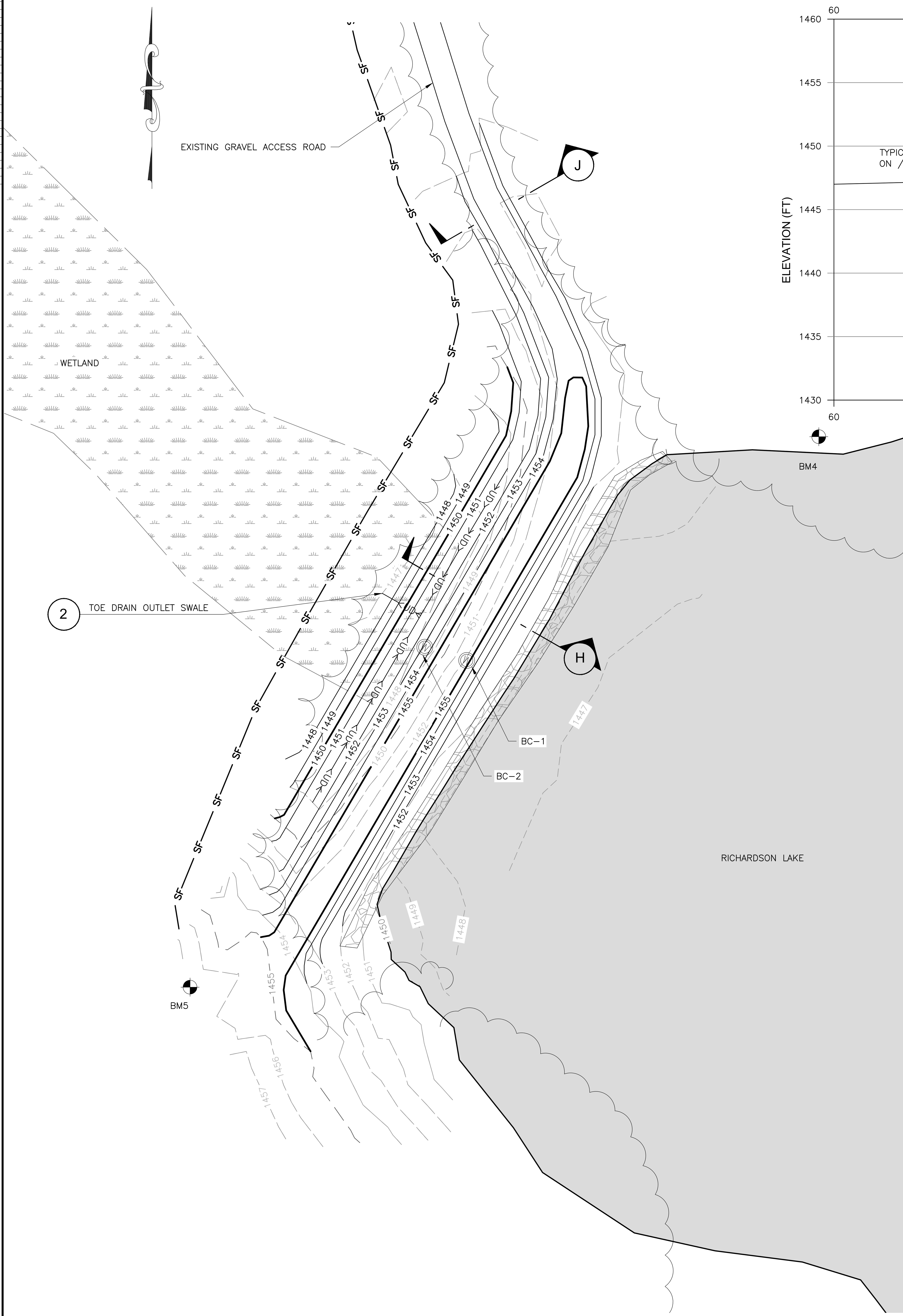
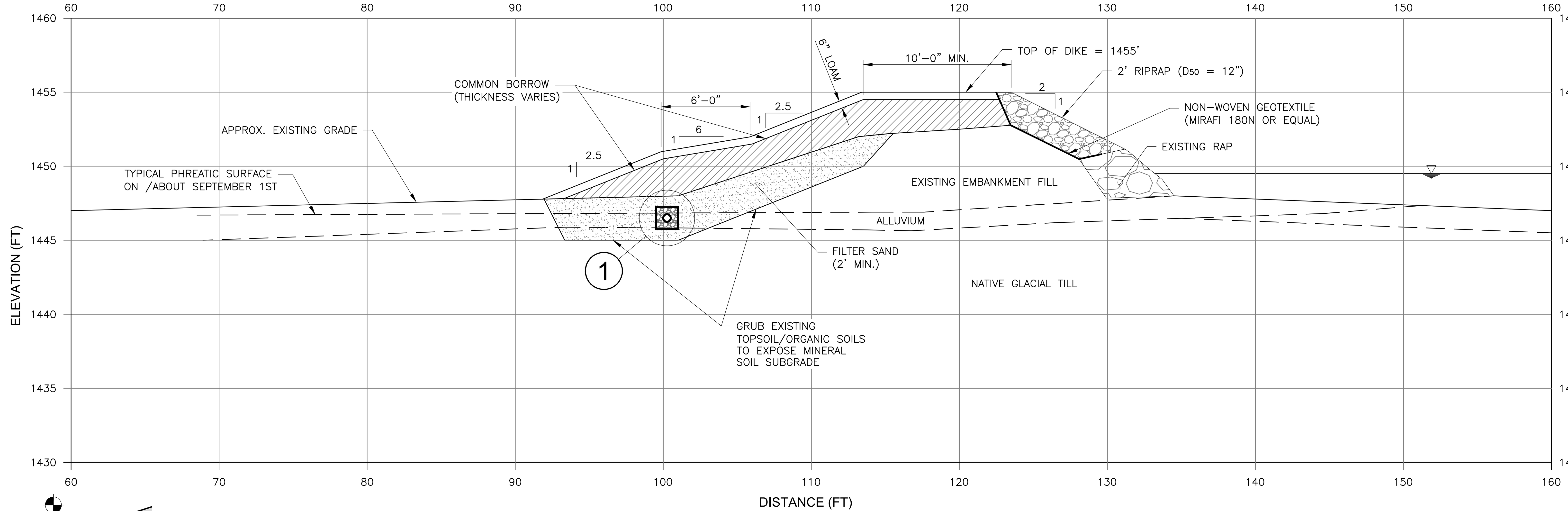
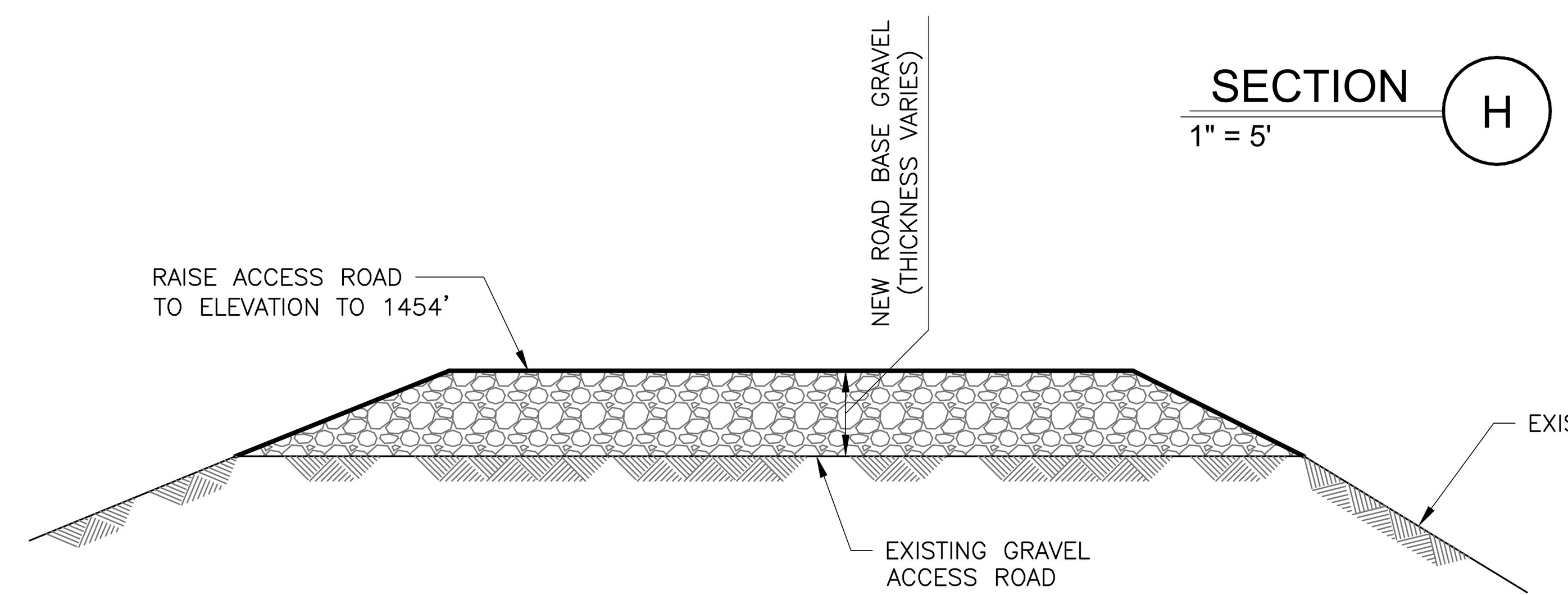


PLAN
1"= 20'

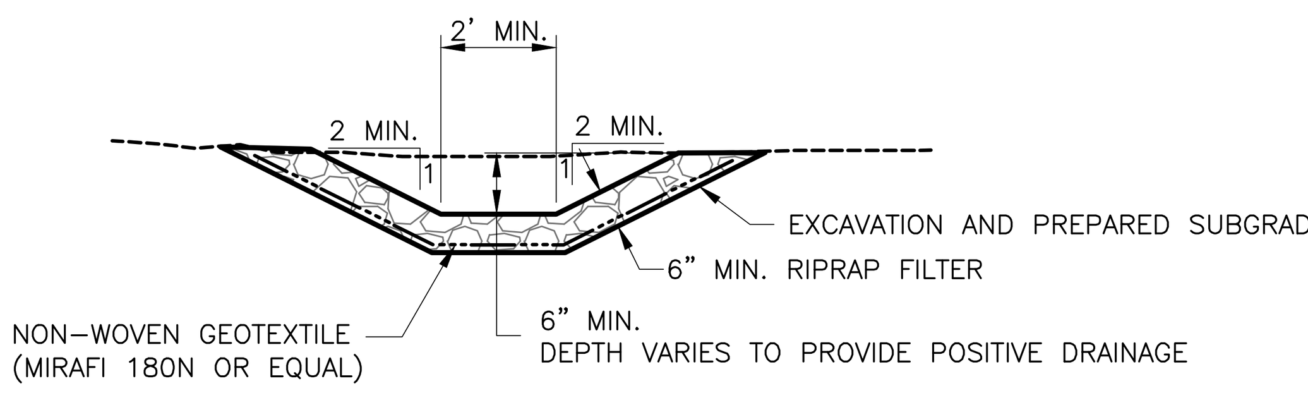
20 0 20 40
SCALE IN FEET



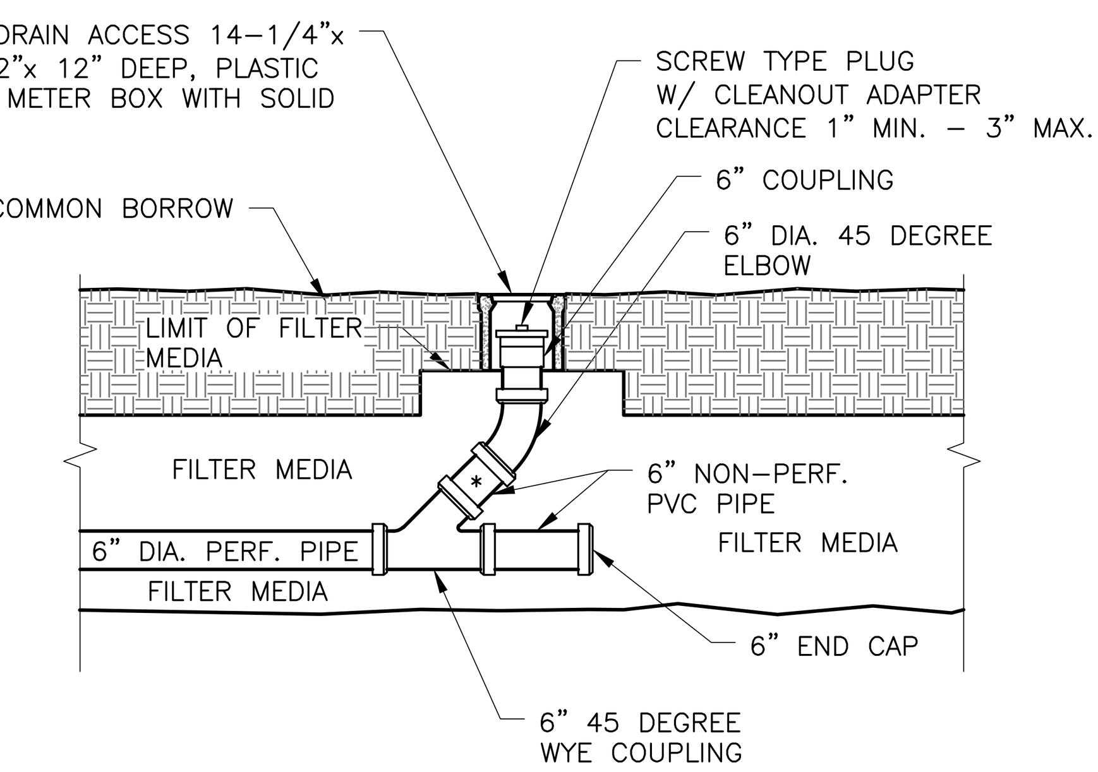
SECTION H
1" = 5'



SECTION J
1" = 2'



TOE DRAIN OUTLET SWALE DETAIL 2
N.T.S.

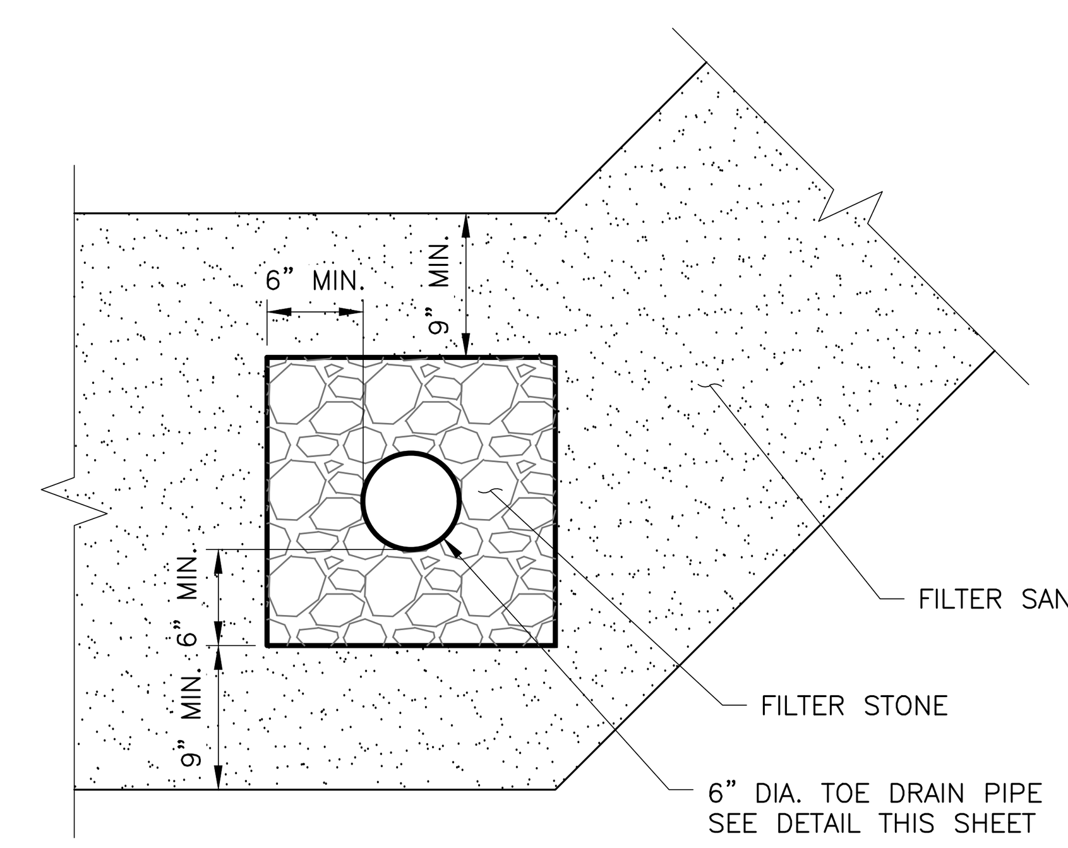


NOTES: * COUPLING PIPE LENGTH TO BE FIELD ADJUSTED.

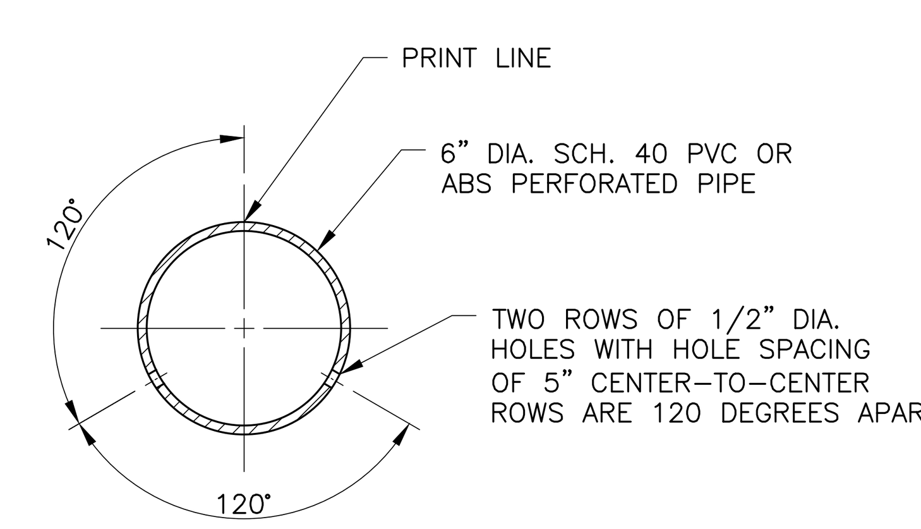
TYPICAL CLEANOUT DETAIL
N.T.S.

NOTES:

1. WIDTH OF RAISED ACCESS ROAD SHALL MATCH EXISTING AT A MINIMUM.
2. PLACE/COMPACT ROAD BASE GRAVEL IN LIFTS IN ACCORDANCE WITH THE SPECIFICATIONS.



DETAIL 1
1" = 1'



TOE DRAIN PIPE DETAIL
N.T.S.

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No.	Revision	Date	Drawn	Checked
D	AGENCY CONSULTATION	7-24-18	TLT	KJC
C	AGENCY CONSULTATION	5-29-18	ZJA	KJC
B	25% DESIGN SUBMITTAL	2-21-18	TLT	KJC
A	25% DESIGN SUBMITTAL	2-09-18	TLT	EMT

Designed	Drawn	Checked	Project No.	Date Revised	Drawing No.
SJR	TLT	EMT	3758023	7-23-18	17

BROOKFIELD RENEWABLE ENERGY GROUP
LEWISTON, ME

MIDDLE DAM
RENEWAL PROJECT

BLACK CAT DIKE
PLAN AND NOTES

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24x36 = FULL SCALE

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