

126 FERC ¶ 62,052
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

TransCanada Hydro Northeast, Inc.

Project No. 1904-066

ORDER APPROVING EROSION MONITORING PLAN
PURSUANT TO ARTICLE 405

(Issued January 23, 2009)

On January 18, 2008, and supplemented on April 21, 2008, TransCanada Hydro Northeast, Inc. (TransCanada, licensee) filed its Erosion Monitoring Plan (plan) for the Vernon Hydroelectric Project, pursuant to article 405 of the project license.¹ The project is located on the Connecticut River, in Cheshire County, New Hampshire and Windham County, Vermont.

BACKGROUND

On March 1, 2006, TransCanada filed an application for amendment of its license to replace certain generating units. The amendment approved the replacement of four existing 2.0 megawatt (MW) turbine/generator units with four new 4.0 MW units.

Article 405 requires the licensee to file for Commission approval several plans outlined in the Water Quality Certificate (WQC) issued by the New Hampshire Department of Environmental Services (NHDES), contained in Appendix A of the license. Condition E-6 of the WQC requires the licensee to develop a plan to monitor erosion at the project. The plan is to be developed in consultation with and be approved by the NHDES. The licensee must conduct the monitoring according to the approved plan and submit all monitoring results every other year, not later than December 31. After agency approval, the plan is required to be submitted to the Commission and upon Commission approval, the licensee would implement the plan.

¹ See ordering paragraph (O) and condition E-6 of Appendix A of the Order Amending License, issued July 28, 2006 (116 FERC ¶62,078).

PROPOSED PLAN

The scope of the licensee's plan is to develop a program for monitoring erosion in the Vernon tailrace area subsequent to the installation of the four new generating units. The plan provides a framework for the comparison of erosion protection immediately downstream of the project before and after installation of the new units. This will be done by using an existing monitoring program, which addressed concerns along a cove area on the East Bank, raised by the Commission's New York Regional Office (NYRO) Division of Dam Safety in 1995. The plan also addresses the potential for erosion impacts associated with the units to the downstream alluvial island noted in the WQC.

The proposed erosion monitoring program focuses on continued biennial monitoring and evaluation of changes in the East Bank. The program will remain consistent with the field methods used in prior surveys since 1995 for the NYRO. These methods include topographic and hydrographic surveys performed by licensed surveyors and are tied to established benchmarks that have known latitude, longitude and elevation. In addition to the topography of the East Bank, cross-sectional surveys of the submerged toe are also performed and provided to assess the submerged footing of the embankment. Visual observations of bank condition (e.g. gullies, slumping and presence of vegetation) will also be noted. Survey results will be provided in a letter report with associated topographic survey maps. With respect to the alluvial island, the licensee proposes only a visual assessment of the island on the same frequency as the East Bank surveys for a period of at least two cycles to determine if any active erosion is occurring as a result of operational flows. The results of this assessment will be included in the letter report.

CONSULTATION/COMMENTS

The NHDES provided comments on the licensee's initial plan by letter dated December 19, 2007. The NHDES requested that the licensee provide the methods used in prior surveys. The licensee addressed these comments in its supplemental filing of April 21, 2008.

DISCUSSION

The purpose of the plan is to monitor erosion downstream of the project at two areas known as the East Bank and a downstream alluvial island. The licensee's plan was developed in consultation with the NHDES. The licensee has incorporated the comments from NHDES into its plan and the plan was approved by NHDES as required by article 405. The plan includes a discussion of the results from prior erosion surveys and an

assessment of factors influencing bank changes over time; a description of the proposed monitoring methodology; and a schedule for future program implementation and reporting of survey results. This program will be consistent with surveys that have been ongoing since 1995 in coordination with the Commission's NYRO. Therefore, the licensee's plan for monitoring erosion at the project should be approved.

The Director orders:

(A) TransCanada Hydro Northeast, Inc.'s (licensee) Erosion Monitoring Plan for the Vernon Hydroelectric Project, filed on January 18 and supplemented on April 21, 2008, is approved.

(B) The licensee shall continue to provide biennial reports to the Commission's New York Regional Office as well with the New Hampshire Department of Environmental Services by December 31 of the year following the surveys.

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

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

Erosion Monitoring Plan

Vernon Hydroelectric Project
FERC Project No. 1904

December 2007

TransCanada Hydro Northeast Inc.
4 Park Street
Concord, NH 03301

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	SCOPE OF THE PLAN.....	2
3.0	HISTORICAL FRAMEWORK.....	4
4.0	MONITORING PROGRAM	5
5.0	IMPLEMENTATION SCHEDULE.....	5

APPENDIX A – HISTORICAL MAPS AND PHOTOGRAPHS

APPENDIX B – 2006 BIENNIAL SURVEY REPORT

APPENDIX C – 2006 BASELINE HYDROGRAPHIC SURVEY

APPENDIX D – 2006 PHOTOGRAPHS OF ALLUVIAL ISLAND FLOODING

APPENDIX E – AGENCY COMMENTS

APPENDIX F – RESPONSE TO AGENCY COMMENTS

1.0 INTRODUCTION

This Erosion Monitoring Plan is being submitted by TransCanada Hydro Northeast Inc. (TransCanada) to the New Hampshire Department of Environmental Services (NHDES, or DES) and to the Federal Energy Regulatory Commission (FERC) for review and approval, in accordance with:

- Condition E-6 of the New Hampshire Clean Water Act Section 401 Water Quality Certificate (WQC) issued on July 3, 2006; and
- Article 405 of the Federal Energy Regulatory Commission (FERC) Order amending the FERC License for the Vernon Hydroelectric Project, FERC No. 1904 (the Project) issued on July 28, 2006.

Condition E-6 of the New Hampshire Water Quality Certificate states:

“The Applicant shall continue to monitor for erosion at the Vernon Hydroelectric Project. The Applicant shall submit an erosion monitoring plan to DES...for review and approval by DES. The plan shall include provisions for monitoring erosion consistent with the methods used from 1996-2005. The Applicant shall conduct monitoring according to the approved plan, and shall submit all monitoring results every other year, not later than December 31.

Article 405 of the FERC Order states:

“The licensee is subject to the conditions of the Water Quality Certificate, issued by the New Hampshire Department of Environmental Services, pursuant to Section 401 of the Clean Water Act. The Water Quality Certificate is set forth in Appendix A to this order and is incorporated in the license. The Water Quality Certificate requires the licensee to prepare the following plans for approval by the New Hampshire Department of Environmental Services. After agency approval, these plans shall be submitted to the Commission for approval 120 days after the issuance date of this order.

<i>Condition</i>	<i>Description</i>
<i>E-3</i>	<i>Operations Plan</i>
<i>E-4</i>	<i>Flow Release Monitoring Plan</i>
<i>E-5</i>	<i>Dissolved Oxygen and Water Temperature Monitoring Plan</i>
<i>E-6</i>	<i>Erosion Monitoring Plan</i>
<i>E-9</i>	<i>Debris Removal Plan</i>

The licensee shall submit to the Commission documentation of its consultation, copies of comments and recommendations made in connection with each plan, and a description of how each plan accommodates the comments and recommendations. If the licensee does not

adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information. The Commission reserves the right to make changes to any plan submitted. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission."

2.0 SCOPE OF THE PLAN

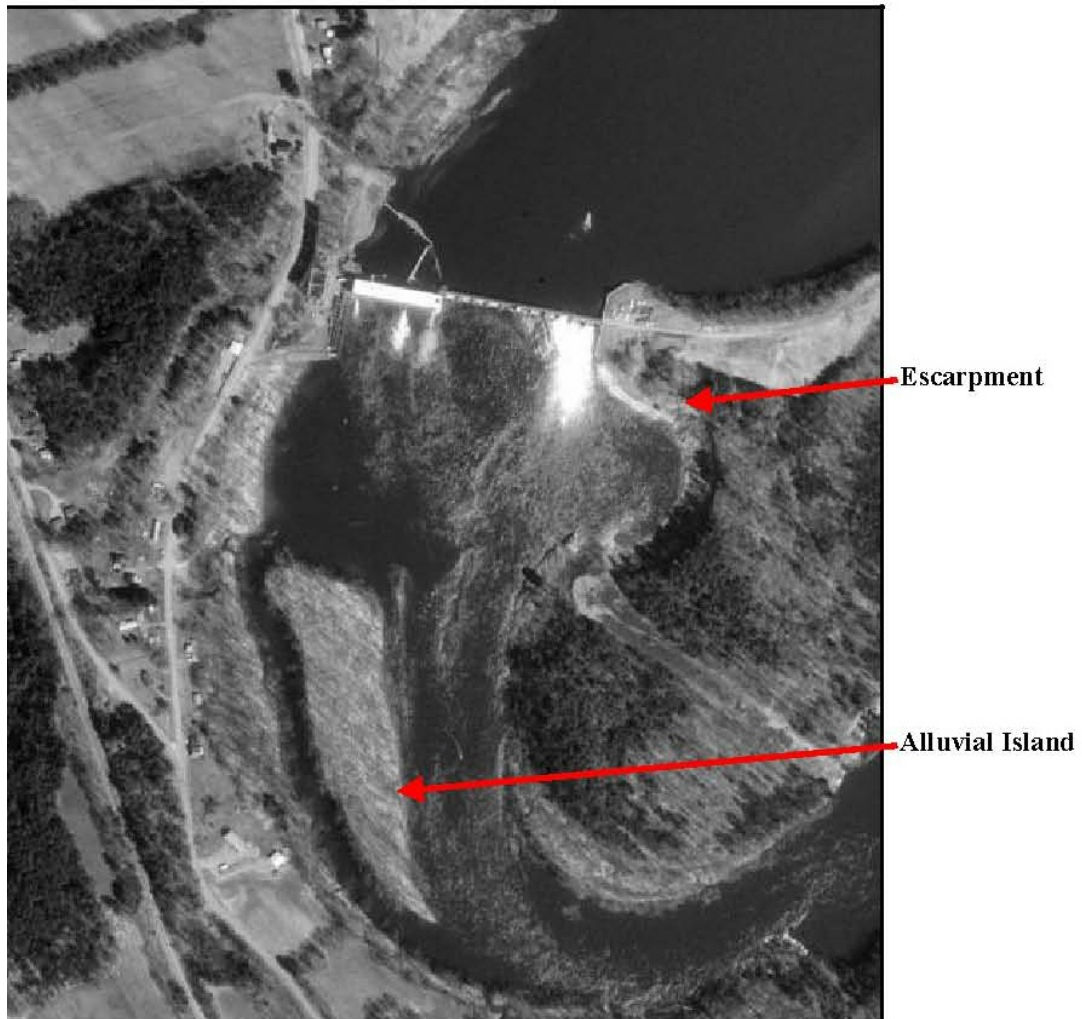
This Plan describes TransCanada's proposed program for continued monitoring of erosion of in the Vernon Project tailrace area, subsequent to the installation of four new 4.0 MW generating turbines. The purpose of the Plan is to provide a framework for the comparison of erosion potential immediately downstream of the Vernon Project before and after installation of four new generating turbines by utilizing the existing monitoring program, which addresses concerns raised by the FERC Division of Dam Safety and Inspection in 1995. The Plan also addresses the potential for erosion impacts associated with these units to the downstream alluvial island noted in Finding D-14 of the WQC. The Plan includes a discussion of the results from prior erosion surveys and an assessment of factors influencing bank changes over time; a description of the proposed monitoring methodology; and a schedule for future program implementation and reporting of survey results.

The Connecticut River immediately below the Vernon Dam is within the FERC Project Boundary of the Turners Falls Project No. 1889, and also serves as the lower impoundment of the Northfield Mountain Pump Storage Project No. 2485 and thus fluctuates on a regular basis due in large part to the operation of these projects. The operation of the new turbines will not increase peak discharges through the spillway, but rather, will serve to decrease both spill volume and frequency from the Dam. By simply diverting flows from the spillway to the powerhouse, it is unlikely that the new operations will have any adverse impact on the historical, naturally-occurring changes in erosion potential which are due primarily to high flood flows.

The location of primary concern for erosion is the cove along the "East Bank", located directly downstream of the spillway on the New Hampshire side of the Connecticut River. This area has been surveyed since 1996 on a biennial basis, at the request of FERC, with survey results and conclusions submitted to the FERC New York Regional Office. TransCanada also acknowledges a continued concern on the part of the NHDES relative to the alluvial island that was noted in Finding D-14 the WQC. Figure 1 shows the location of the East Bank and the alluvial island located just downstream of the Vernon Project.

Figure 1

Location of Vernon East Bank Escarpment and Alluvial Island



3.0 HISTORICAL FRAMEWORK

The East Bank has been prone to erosion since prior to the construction of the Vernon Project in 1907. The bank is steep and consists of a range of alluvial deposits with a grain size ranging from silty sand to coarse sand. Historical maps and photographs included in Appendix A of this Plan document the shifting of the bank over time. Vernon Project licensees have monitored this site for erosion since construction of the Project.

Results of more recent detailed biennial field surveys conducted between 1996 and 2006 indicate that major changes in the bank are most likely to have occurred from two primary causes. First, naturally occurring high (flood) flows have been directed toward the bank from coarse gravel and bedrock deposits in the river channel below Vernon Dam that existed prior to construction of the Project. The second major cause appears to be due to the higher interface between the bank and the river created as a result of the mid-1070's increase in reservoir elevation of First Light Power's Turners Falls Project (FERC Project No. 1889). This reservoir serves as the lower impoundment for their Northfield Mountain Pump Storage Project (FERC Project No. 2485). That increase in water level created a new soil and water interface on a previously stable but susceptible slope; and inundated the sand bar at the base of the slope that protected and contributed to the stabilization of the bank during normal flow conditions.

The biennial surveys have also indicated that the East Bank remains relatively stable, with only minor and normal settling in the location and configuration of the top of the bank and the toe-of-slope observed over time. River bottom hydrography conducted since 1999 has also not shown significant erosion or bottom scouring, despite periodic flood flow events having occurred between surveys. A copy of the most recent (2006) biennial survey report and maps is included in Appendix B.

Based upon concerns raised with regard to other erosion occurring downstream of the project, in particular the alluvial island directly downstream of the Vernon Project, a detailed bottom hydrographic mapping of the entire river channel immediately downstream of the Dam was conducted in 2006 in order to document baseline (prior to new turbine installation) conditions in the river bottom (refer to Appendix C). A hydrologic analysis of the area was also conducted in 2006. That analysis concluded that (1) effects from the operations of turbines at Vernon Station (both before and after installation of the new units) are inconsequential to channel-forming processes downstream of the Dam; and (2) the dynamic movement of soils and observed erosion along the East Bank and at the alluvial island located adjacent to the west bank of the river is consistent in both cases, with typical geomorphic processes in the Connecticut River watershed (Woodlot Alternatives, 2006).

Observations made on July 29, 2006 during a high water event clearly contrasts with the conditions normally observed during regular generation periods. At that time flows between 35,000 and 38,000 cfs were observed to inundate much of the island except for the tree growth. Clearly, flood flows affect erosion on the island significantly. Generation flows do not cause inundation. Photographs showing these conditions are provided in Appendix D.

4.0 MONITORING PROGRAM

The proposed erosion monitoring program focuses on continued biennial monitoring and evaluation of changes in the East Bank. The program will remain consistent with the field methods used in prior surveys since 1995 for the FERC NY Regional Office. These methods include topographic and hydrographic surveys performed by licensed surveyors and are tied to established benchmarks that have known latitude, longitude and elevation. The surveys of the East Bank not only show the location and topography of the existing bank but prior surveyed locations of top of bank are included in the finished survey plan. In addition to the topography of the East Bank, cross-sectional surveys of the submerged toe are also performed and provided to assess the submerged footing of the embankment. Visual observations of bank condition (e.g. gullies, slumping, presence of vegetation) will also be noted. Survey results will be provided in a letter report with associated topographic survey maps.

With respect to the alluvial island, TransCanada proposes a visual assessment only of the island on the same frequency as the East Bank surveys for a period of at least two cycles to determine if any active erosion is occurring as a result of operational flows. The results of this assessment will be included in the letter report.

5.0 IMPLEMENTATION SCHEDULE

The most recent biennial survey was conducted in late summer of 2006. A copy of the letter report and associated topographic survey maps submitted to the FERC NY Regional Office is included in Appendix B of this Plan. The next biennial survey is therefore scheduled for summer 2008 with submittal of the survey report by December 31, 2008.

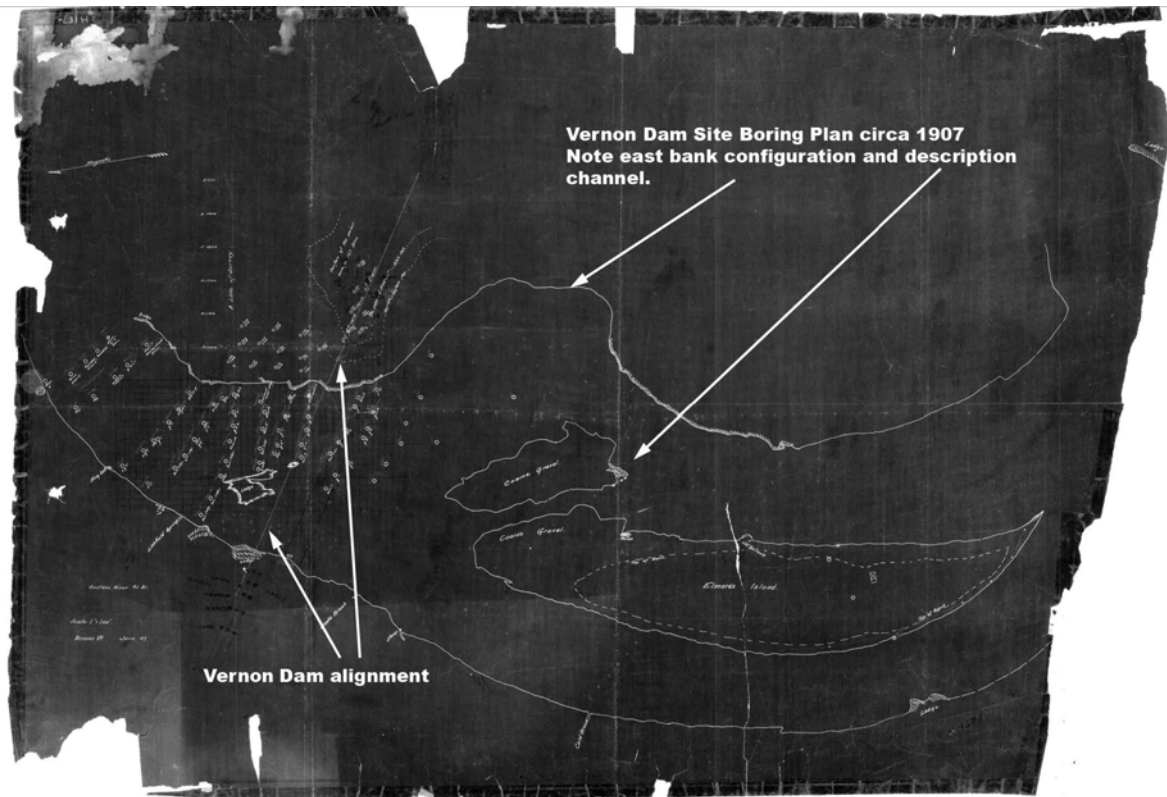
Table 1

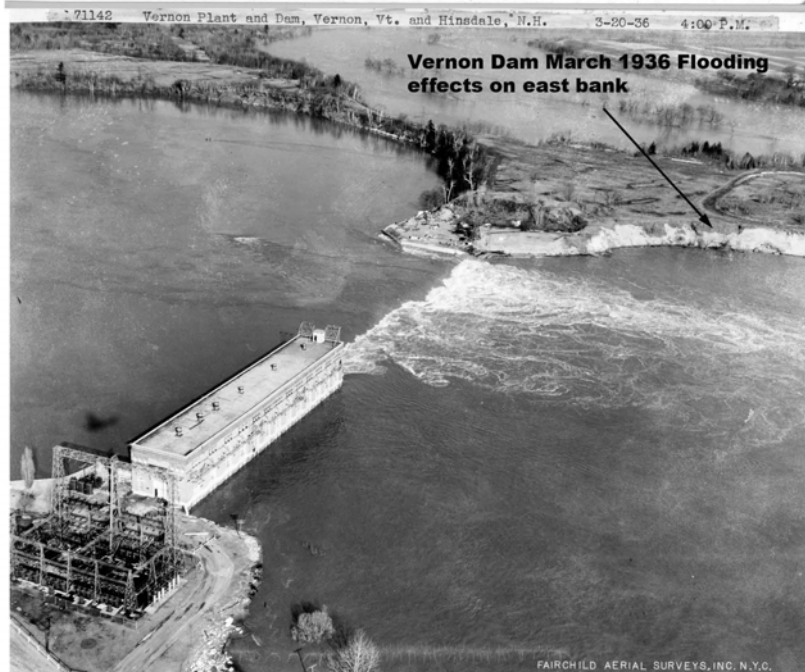
Implementation Schedule

Implementation Task	Targeted Date
Conduct East Bank survey and soundings	Summer 2008, and every 2 years thereafter
Conduct visual assessment of alluvial island	Summer 2008 and Summer 1010
Submit Survey Report to NHDES and FERC NYRO	By December 31, 2008, and every 2 years thereafter

APPENDIX A

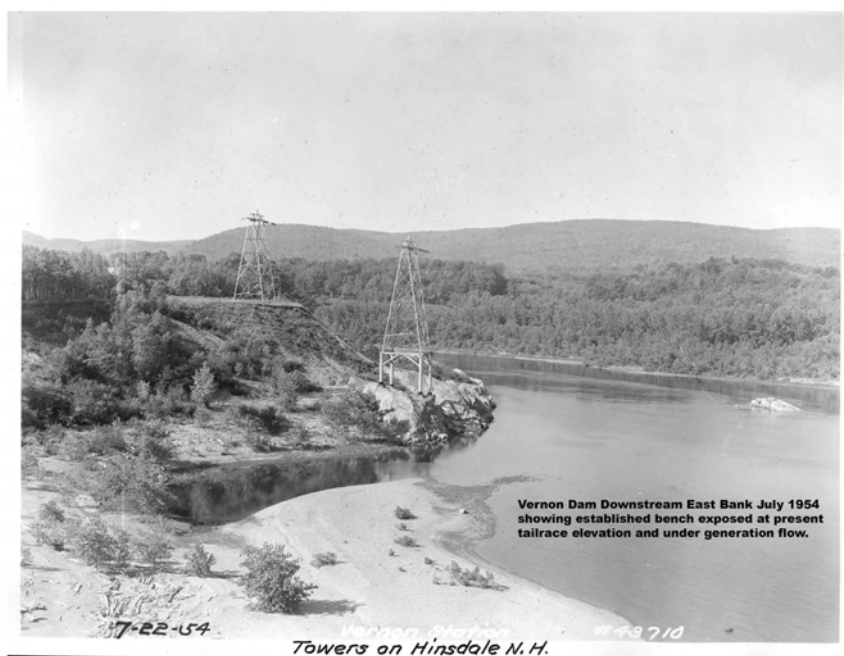
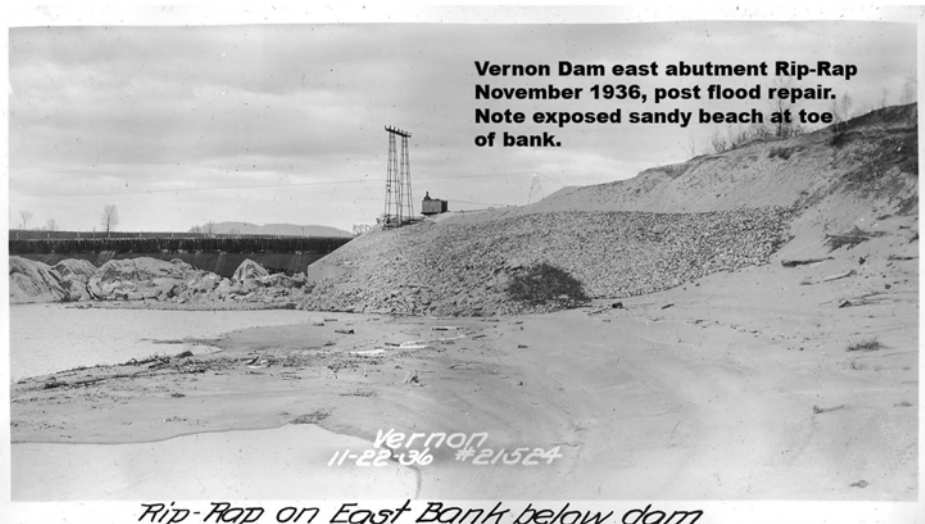
HISTORICAL MAPS AND PHOTOGRAPHS

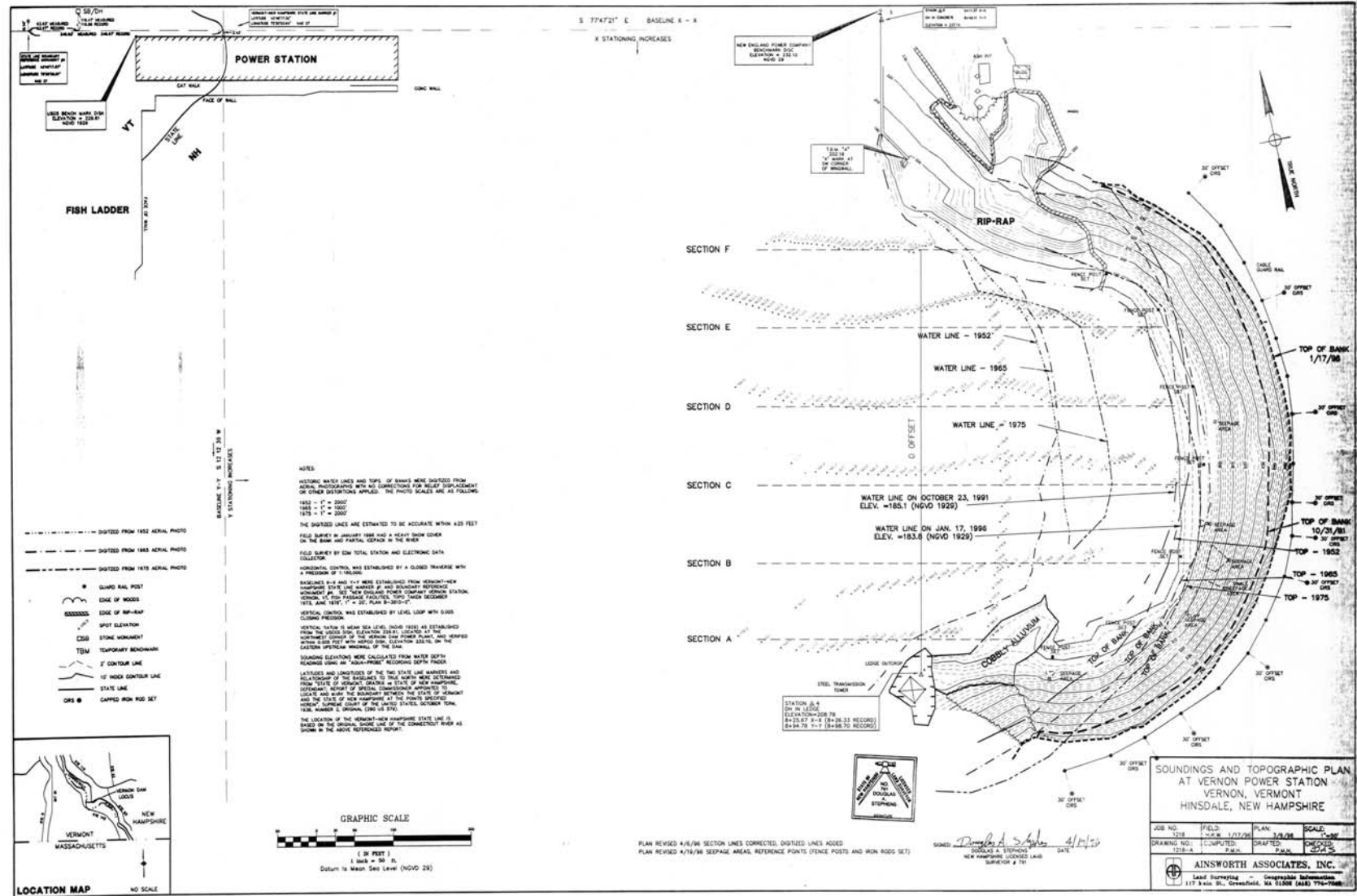


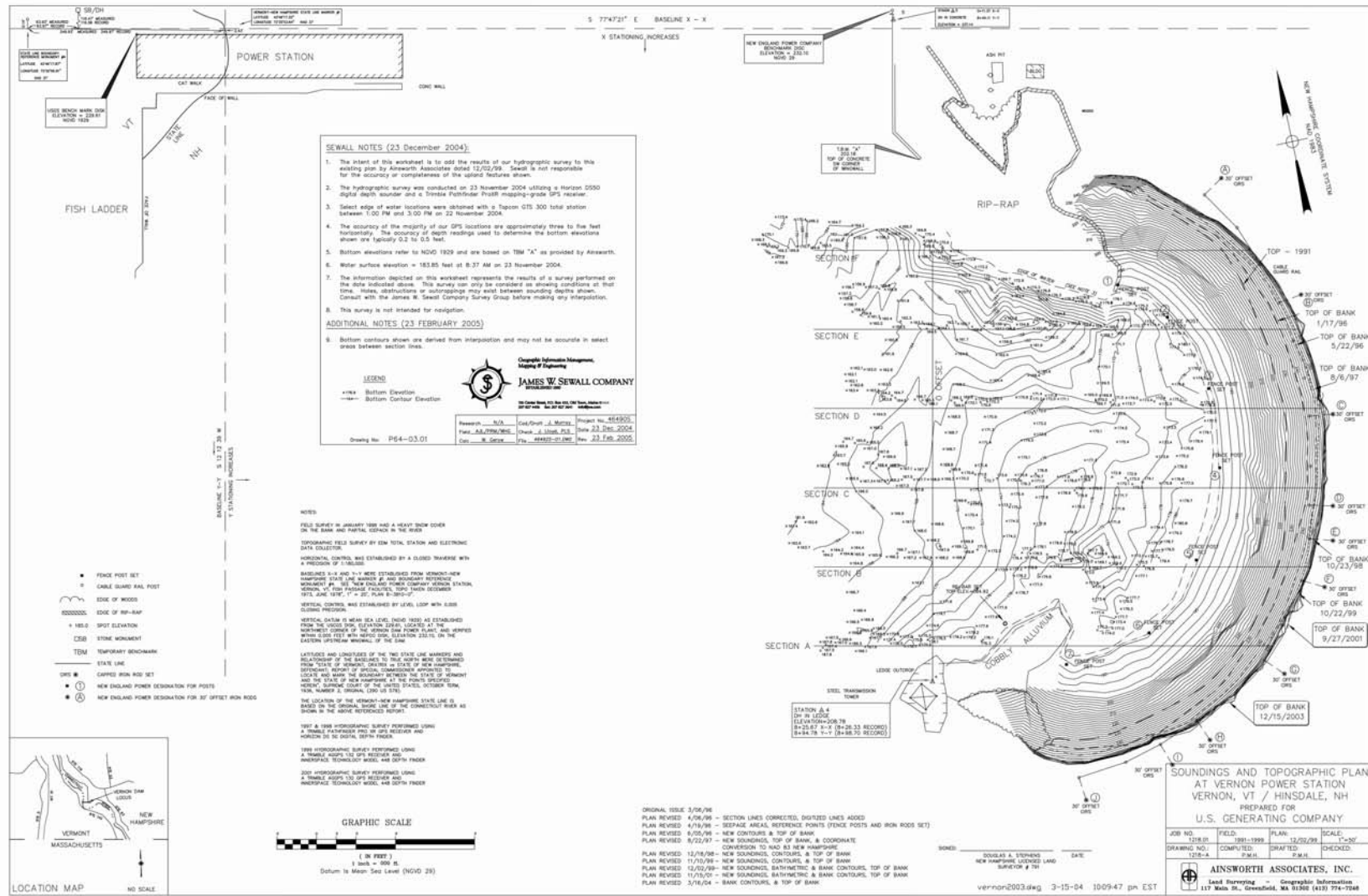


**Vernon East Bank Nov. 1936, post-flood condition
Note sandy beach exposed at tailrace elevation**









APPENDIX B

2006 BIENNIAL SURVEY REPORT



US Northeast Hydro Region

Concord Hydro Office
4 Park Street, Suite 402
Concord NH 03301-6373

tel 603.225..5528

fax 603.225.3260

web www.transcanada.com

June 23, 2007

Mr. Charles Goggins, Regional Engineer
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street - Suite 400
New York, NY 10001

**Re: TransCanada Hydro Northeast Inc.;
Vernon Project P-1904**

Dear Mr. Goggins:

TransCanada Hydro Northeast Inc. ("TransCanada"), licensee for the Vernon Project respectfully submits its erosion monitoring report originally due December 31, 2006. The delay on completing this survey was in part due to additional surveys performed at the same time in conjunction with an Erosion Monitoring Plan required by Ordering Paragraph O of the July 28, 2006 Amendment concerning the re-powering of units 5-8. This plan is required by the NH Water Quality Certificate also associated with the re-powering project. The final Erosion Monitoring Plan FERC deadline was extended to December 31, 2007 by letter Order dated May 1, 2007. Your office will receive a copy of this report in addition to those filed with the Secretary.

The surveys were performed by James W. Sewall and Co. of Old Town, ME. Three copies of the survey called "Soundings and Topographic Plan at Vernon Power Station" are provided. Three copies of the 3-drawing sets of cross-section drawings are also provided for your review.

River Flow and Gate Operation

During the 2004 – 2006 period there were no extreme "ice out" events at Vernon Station. "Ice out" presented no appreciable threats or concerns for the station or downstream areas due to a gradual ice melt over the course of the spring freshet. Unusual flow events are considered to be any station discharge above 70,000 cfs. There were sustained spill events throughout the of 2004-2006 timeframe but not unusually high.

2006 Site Observations

The top-of-bank survey conducted in December 2006 indicate little change in the location of the top of bank in 2003 which had deviated slightly from both the 1999 and 2001 top-of-bank measurements as noted in our February 28, 2005 report. There does not appear to be any significant or specific active erosion in this survey. Erosion has remained uniform and slight along the entire length of bank. Principal indicators of seepage in the bank, i.e. gullies and slumping were not observed in 2006. When compared to the prior survey, the toe-of-slope appears to show little change along the entire length of the base of the bank. The bottom hydrography appears to confirm the bench first observed three surveys prior to this one. The bench or shallow sloping bottom does not show significant erosion, and appears to be an established feature.

Factors Affecting Erosion

The results of the field survey did not reveal significant shifts in bank material or any extensive newly eroded areas. There were no major slumps, seepage, or undercuts at the water surface observed that would indicate significant erosion or loss of bank material.

Hence, only minor erosion forces which are common along and in rivers, and which may have influenced the east bank since the last report include:

- angle of repose adjustment between the top-of-bank and toe-of-slope
- minor surface runoff over the top-of-bank and on areas of unstable sandy bank face lacking vegetative cover
- mild wind erosion in unstable sandy soil areas lacking vegetative cover
- minor wave action at the toe-of-slope causing minor gouging in unstable areas.

Overall Assessment

The field observations, soundings and topographic survey measurements indicate that Vernon's east bank continues to experience relatively minor and normal settling along the base of the bank, a common phenomenon in open sloped areas composed primarily of sandy soils.

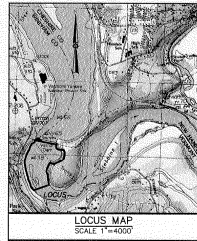
If there are further questions regarding this matter, please contact me at 603-498-2851 to discuss things further. Thank you for your consideration.

Sincerely,



John L. Ragonese
FERC License Manager

Enclosed: Drawing "Soundings and Topographic Plan at Vernon Power Station" and Cross-Sections (3)



LOCUS MAP
SCALE 1"=4000'

NOTES

For additional notes, references and information refer to our Dep. No. PB4-24.01 (Sheet 1 of 5).

REFERENCES

James W. Sewall Company
Drawing No. PB4-03.02 "Cross-Section Worksheet at Vernon Power Station Vernon, VT / Hinsdale, NH" dated 17 February 2005

COORDINATE AND ELEVATION LIST				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
915	99109.85	757331.11	208.62	DN IN LEDGE
916	99936.97	757448.02	237.10	DN IN CONC.

LEGEND

- ▽ 176.6 Blue Bottom Elevation
- 172.0 — River Bottom Contour elevation
- △ Traverse Station
- ▽ 198.7 Upland Spot Elevation
- 230 — Upland Contour Elevation

LEDGE

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP

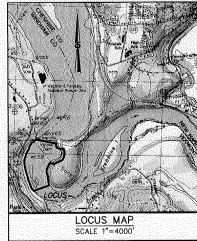
LEDGE OUTCROP

LEDGE OUTCROP

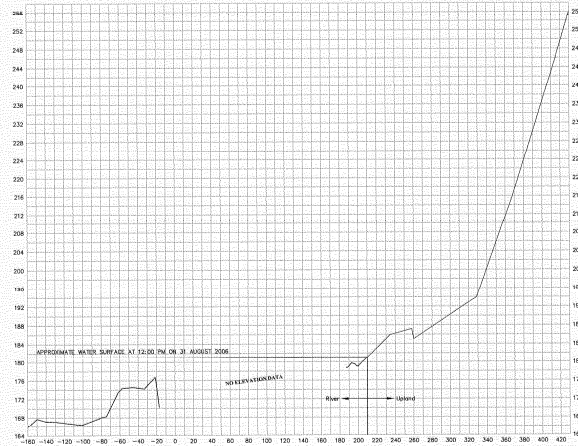
LEDGE OUTCROP

LEDGE OUTCROP

LEDGE OUTCROP



SECTION A
(LOOKING NORTH)



NOTES

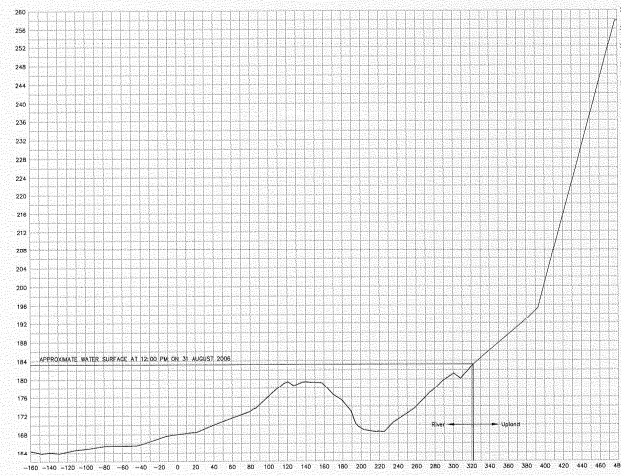
1. Cross-sections shown are based on hydrographic and topographic data by Sewall, as shown on our Dep. No. P64-24.01. These cross-sections should only be used in conjunction with the source drawing.
2. For additional notes, references and information refer to our Dep. No. P64-24.01.

REFERENCES

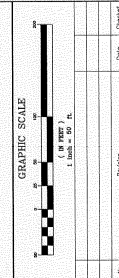
Seiwass, J., Sewall, J. Company
Drawing No. P64-24.01, "Cross-Section Worksheet at Vernon Power Station, Vernon, VT / Hinsdale, NH," dated 17 February 2005.
Drawing No. P64-24.02, "Soundings and Topographic Plan at Vernon Power Station, VT / Hinsdale, NH," dated 28 April 2007 (Sheet 2 of 3).

VERTICAL
SCALE
1 inch = 20 ft.

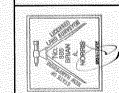
SECTION B
(LOOKING NORTH)



VERTICAL
SCALE
1 inch = 20 ft.

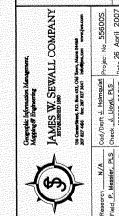


BRIAN A. JONES, L.L.S. #985
2.3 APR 2007
DATE

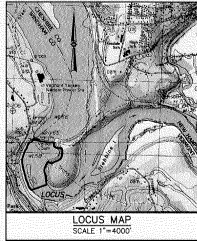


CROSS-SECTION WORKSHEET
AT
VERNON POWER STATION
VERNON, VT / HINSDALE, NH

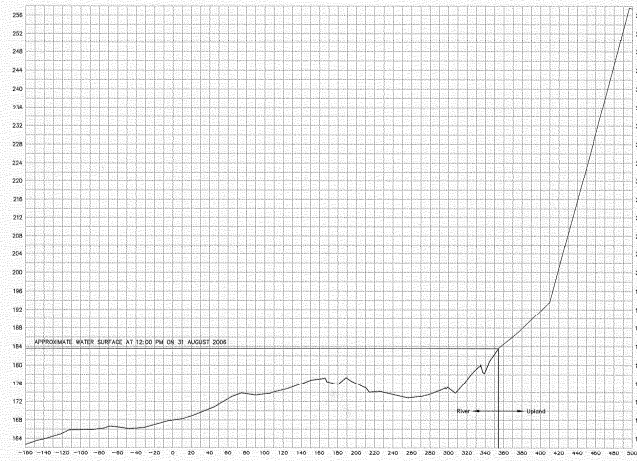
Prepared for: TransCanada



Scale 1" = 50'
Sheet 3 of 5
Drawing No: P64-24.03



SECTION C
(LOOKING NORTH)



NOTES

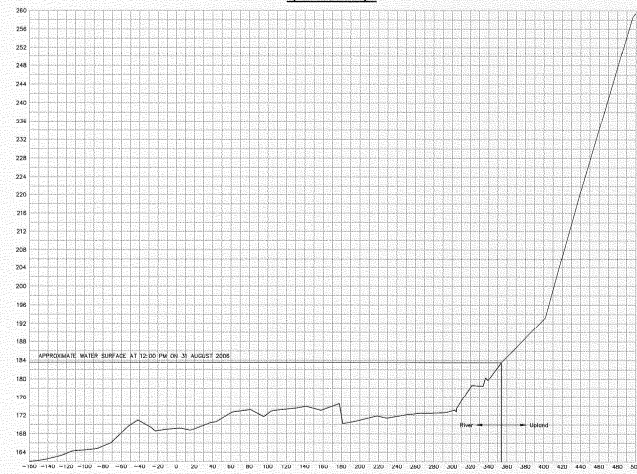
1. Cross-sections shown are based on hydrographic and topographic data by Sewall, as shown on our Dwg. No. P64-24.01. These cross-sections should only be used in conjunction with the source drawing.
2. For additional notes, references and information refer to our Dwg. No. P64-24.01.

REFERENCES

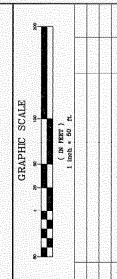
James W. Sewall Company
Drawing No. P64-24.02 "Cross-Section Worksheet at Vernon Power Station, Vermont, VT / Hinsdale, NH," dated 17 February 2005.
Drawing No. P64-24.02 "Soundings and Topographic Plan at Vernon Power Station, VT / Hinsdale, NH," dated 26 April 2007 (Sheet 2 of 5).

VERTICAL
SCALE
1 inch = 20 ft.

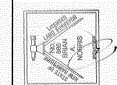
SECTION D
(LOOKING NORTH)



VERTICAL
SCALE
1 inch = 20 ft.



BRIAN V. JORDIS, L.L.S. #685
27 APR 2007
DATE

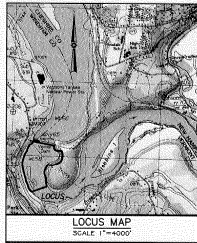


CROSS-SECTION WORKSHEET
AT
VERNON POWER STATION
VERNON, VT / HINSDALE, NH

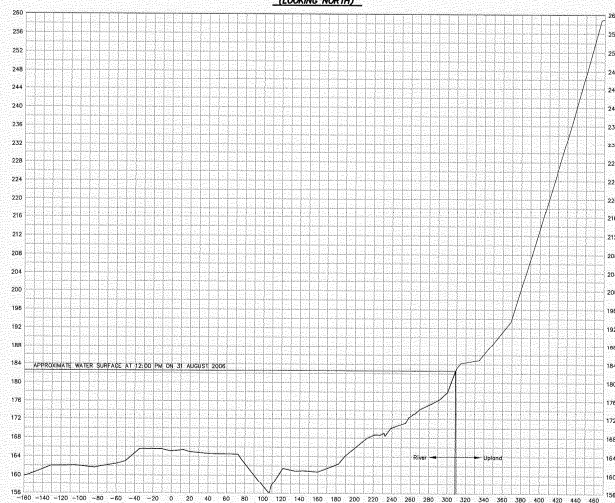
Prepared for: TransCanada



Scale 1" = 50'
Sheet 4 of 5
Drawing No: P64-24.04



SECTION E
(LOOKING NORTH)



NOTES

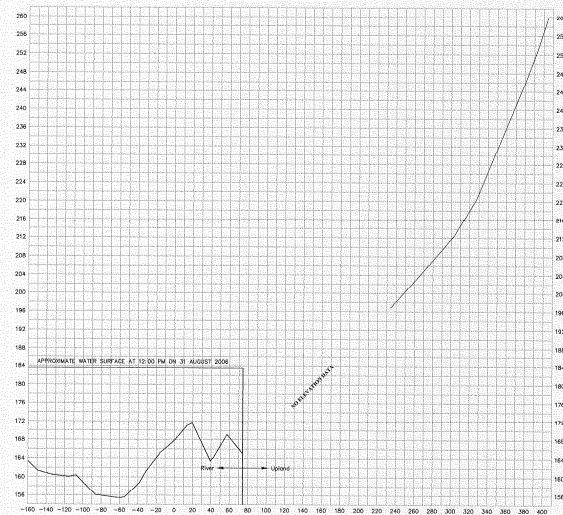
1. Cross-sections shown are based on hydrographic and topographic data by Seidel, as shown on our Dwg. No. P64-24.01. These cross-sections should only be used in conjunction with the source drawing.
2. For additional notes, references and information refer to our Dwg. No. P64-24.01.

REFERENCES

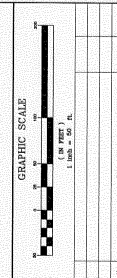
James W. Seidel Company
Drawing No. P64-03.02 "Cross-Section Worksheet of Vernon Power Station Vernon, VT / Hinsdale, NH," dated 17 February 2005.
Drawing No. P64-24.02 "Soundings and Topographic Plan at Vernon Power Station, VT / Hinsdale, NH," dated 25 April 2007 (Sheet 2 of 5).

VERTICAL SCALE
1 Inch = 20 ft.

SECTION F
(LOOKING NORTH)



VERTICAL SCALE
1 Inch = 20 ft.



BRAND, J. J. & SONS, L.L.C. #655
21 APR 2007
DATE



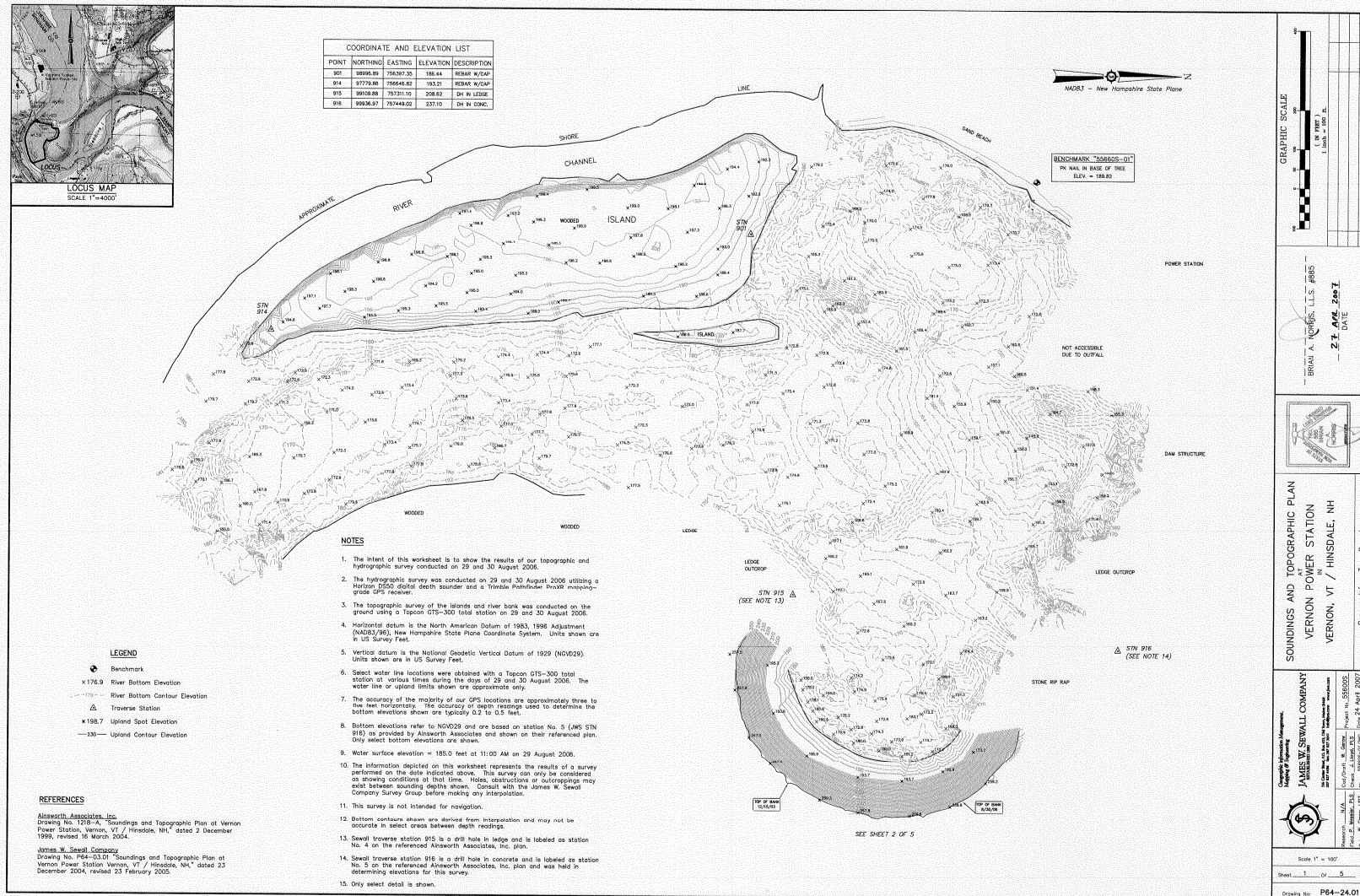
CROSS-SECTION WORKSHEET
VERNON POWER STATION
VERNON, VT / HINSDALE, NH

James W. Seidel Company
Professional Engineer
State of Vermont
No. 10000
Project No. 10000
Date 25 April 2007

Scale 1" = 40'
Sheet 5 of 5
Drawing No. P64-24.05

APPENDIX C

2006 BASELINE HYDROGRAPHIC SURVEY



APPENDIX D

2006 PHOTOGRAPHS OF ALLUVIAL ISLAND FLOODING

Downstream end of alluvial island under 35,000 cfs flow July 29, 2006



Upstream end of alluvial island under 35,000 cfs flow July 29, 2006



APPENDIX E

AGENCY COMMENTS

2. Section 5.0 describes the use of erosion and runoff controls to prevent discharges to the environment. Please provide examples of potential erosion and runoff controls and secondary containment structures.
3. Section 6.0 notes "New Hampshire...wetland authorities." Please revise as New Hampshire Department of Environmental Services Wetlands Bureau. Further, the text states that sediment sampling will occur if sediment contamination is suspected. Please revise the text to state that sampling will be conducted for all sediments dredged, particularly if the sediments are to be used on dry land as fill.

Erosion

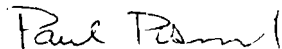
Section 4.0 notes that the proposed monitoring program will remain consistent with the methods used in prior surveys. Please provide additional details on those methods.

Operations

1. The document does not describe specific statements relative to the avoidance, minimization, or control of lag times, nor were any contingency plans discussed relative to non-compliance with minimum flows. Please include a discussion of contingency plans and avoidance, minimization, and control of lag times, as required pursuant to 401 Certification 2006-008.
2. Please include provisions for changes to operations should violations of water quality standards for dissolved oxygen occur at the Project. This is required pursuant to Condition E-5 of 401 Certification 2006-008.
3. Page 3, Section 3.3 describes reservoir WSEL relative to the past eight years. Please discuss the representativeness of the eight years relative to future operations.
4. Please address the comments by the Vermont Department of Environmental Conservation via electronic mail dated December 19, 2007.

Thank you for providing the draft plans for WMB review. Please feel free to contact me if you have questions or wish to further discuss these comments. Thank you.

Very truly yours,



Paul Piszczek
Watershed Management Bureau

cc: Jeff Cueto, VANR (via electronic mail)
Gabe Gries, NH F&G (via electronic mail)
John Warner, USFWS (via electronic mail)

APPENDIX F

RESPONSE TO AGENCY COMMENTS

**Vernon Hydroelectric Project
Erosion Monitoring Plan**

Summary of Responses to Agency Comments

Agency Comment	Response
NHDES_1: Section 4.0 notes that the proposed monitoring program will remain consistent with the methods used in prior surveys. Please provide additional details on those methods.	Additional details on the methods used in prior surveys have been made to Section 4.0 in the final Plan.