

TO: Federal Energy Regulatory Commission
Office of Energy Projects
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By electronic filing

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RE: **Wilder Project, FERC No. 1892-026**
Bellows Falls Project, FERC No. 1855-045
Vernon Hydroelectric, Project No. 1904-073

Great River Hydro
ILP Study 2 and Study 3
Riverbank Transect and Riverbank Erosion

**Supplement to Final Study Report dated November 15, 2017*

**Letter from John Ragonese to FERC dated January 16, 2018*

DATE: April 18, 2018

CONTENTS: Landowner's comments re the above referenced documents submitted by Great River Hydro on November 15, 2017, and a letter from Mr. John Ragonese of Great River Hydro to FERC dated January 16, 2018.

To the reader:

My comments include pictures and references to land along the Connecticut River that my family has owned since 1962. Anyone wishing to visit these fields and see the extensive erosion should contact me.

— *John Mudge*

To the Federal Energy Regulatory Commission:

As of this date there have been study requests, studies, supplements to studies, and responses to studies all related to the erosion on the Connecticut River and all related to the Wilder Dam, the Bellows Falls Dam, and the Vernon Dam.

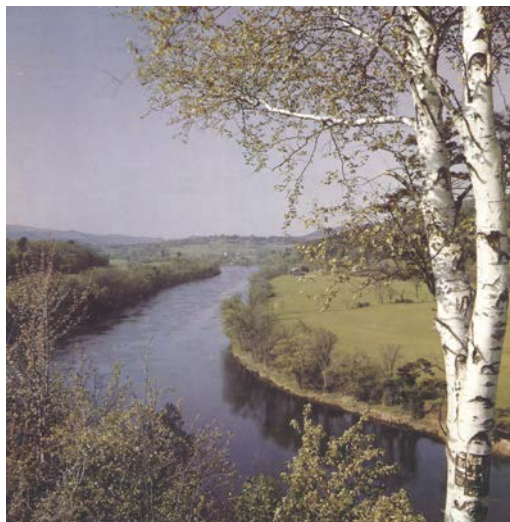
On July 8, 2013, when FERC issued its “Updated Study Plan” for these three projects, FERC stated on page 26 that one of the objectives of Study 3 was to “ascertain the likely causes of erosion.”

“To ascertain” is defined as— “to make certain, exact, or precise, to find out or learn with certainty.”

I do not believe that either Great River Hydro, TransCanada before that, or their consultants have satisfied the objective that FERC established for them— “to ascertain the likely causes of erosion.”

Mr. Ragonese in his letter of January 18, 2018, writes (page 7): “The erosion events and bank failures... are not attributable to Project operations, but rather are attributable to specific high flow events or storms with significant precipitations.” However, Mr. Ragonese cites no “specific high flow events” that would cause the tremendous and ongoing erosion of the riverbank.

When one looks historically at “high flow events” on the Connecticut River, the greatest such event was probably the Hurricane of 1936 when both bridges in Lyme, New Hampshire, to East Thetford, Vermont, and to North Thetford, Vermont, were washed out. Pictures taken after that storm of the land located *between those two bridges* and now owned by my family show a strong riverbank with a strong riparian buffer— all of which survived the storm of June 1936. The man-made bridges failed, but the riverbank survived.



Above: Left, April 1943 National Geographic. Right by Winston Pote about 1940.

The soils found here in 1936 are the same soils that are found here today. In the Field Study of February 4, 2017, (page 124) the soil in this valley is described: “The character of sediments in the study area creates banks with limited resistance to erosion. The bank sediments at the monitoring sites, representative of the study area as a whole, are nearly ubiquitously comprised of fine-grained and unconsolidated floodplain or glaciogenic sediments that are particularly prone to erosion.” (Emphasis added.)

Therefore, GRH and its consultants want to argue that the soil in this valley is “prone to erosion” but the erosion that we see here is caused by unspecified “high flow events,” yet when we look at the highest flow event of the past century, there was no visible erosion as a result of that storm. Does it make sense that the erosion that we see today is the result of mysterious and unidentified high water events? No, this does not make sense.

Furthermore, to try and prove their arguments, GRH and its consultants use both the Erosion Ratio and computer modeling in their reports. As for the Erosion Ratio: In PrincetonHydro’s letter of May 2, 2017, to the Connecticut River Conservancy they wrote: “... the revised study still utilizes and makes conclusions based on the ‘erosion ratio’. This approach is not an accepted scientific practice... No citation or reference is provided for this metric, and the metric is not used, to our knowledge, in the extant fluvial geomorphic scientific literature.” (Emphasis added.) Furthermore, Mr. John Field, who used this ratio in his study, has acknowledged that the erosion ratio is neither a standard methodology nor has it been peer reviewed. In its computer modeling, the studies fail to address the soils that are, as described by the company, “particularly prone to erosion.” The fluctuations in the water level are what should now be described as *daily* high water events, and a *daily* high water event will have a very different affect on the riverbank, soils prone to erosion, than a seasonal storm or two. Very specifically, the daily fluctuations inhibit the growth of vegetation on the “beach” that the study describes. Therefore today there is no natural riparian buffer as there was before construction of the Wilder Dam.

The Connecticut River, with the numerous dams that control it, is not a *model* river as all of the dams on this river result in it being a very manipulated river. In that situation, when asking questions about erosion, it is necessary to look at more than ratios and models that are not found in textbooks and literature. It is necessary to make just plain observations and to take into account the manipulated flow of the river, the daily changes in water elevation, and the impact on the soil types of these flows and daily water elevation changes. Direct visual observation may be much better than the “modeling” included in the different studies. I believe that is what the residents of this valley have done, and their work and their observations and opinions correctly describe the cause of the erosion that GRH and its consultants deny exists. Furthermore, I believe that is what the residents of this valley requested be studied in the different Study Requests. I do not believe that anyone asked for a study of entrainment, the movement of soil particles in the bed of the river. Study the riverbank.

During the March 8, 2018, meeting held in Wilder, Vermont, (that I attended by teleconference), Dr. O. Ross McIntyre of Lyme, New Hampshire, asked about studies of the water “coming out of the soil,” he described how the water saturating the river bank “mobilized” the soil particles and that this results in a “changed structure of the riverbank.” He further commented that, “a very small amount of particles mobilized daily will create a hole and erosion.”

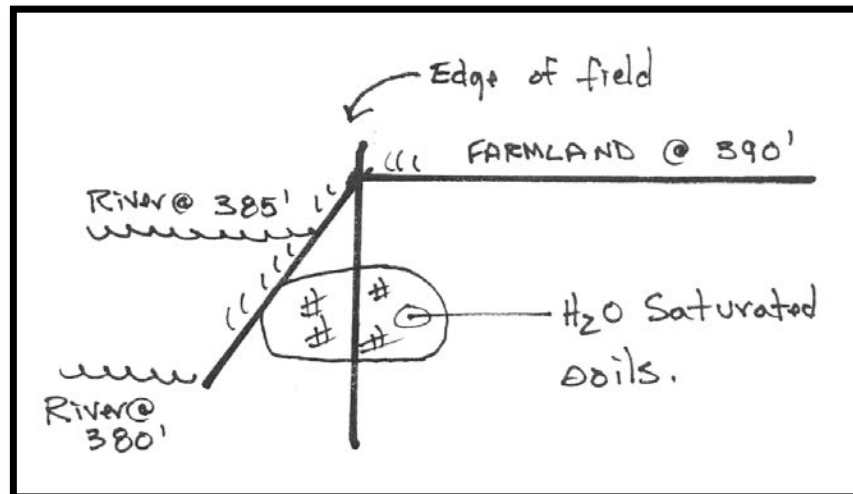
I heard Mr. Rangonese’s response that this “has been addressed and identified previously.” I believe that Mr. Ragonese was being very dismissive of a very large problem.

I, and many others, do not believe that this process has been addressed.

In her letter to FERC of March 16, 2018, Mrs. Kathleen Waste of Lyme wrote, “the relicensing of the Wilder Dam should not proceed until the erosion issues caused by the lowering and raising of the water levels are addressed fully and in a timely manner.”

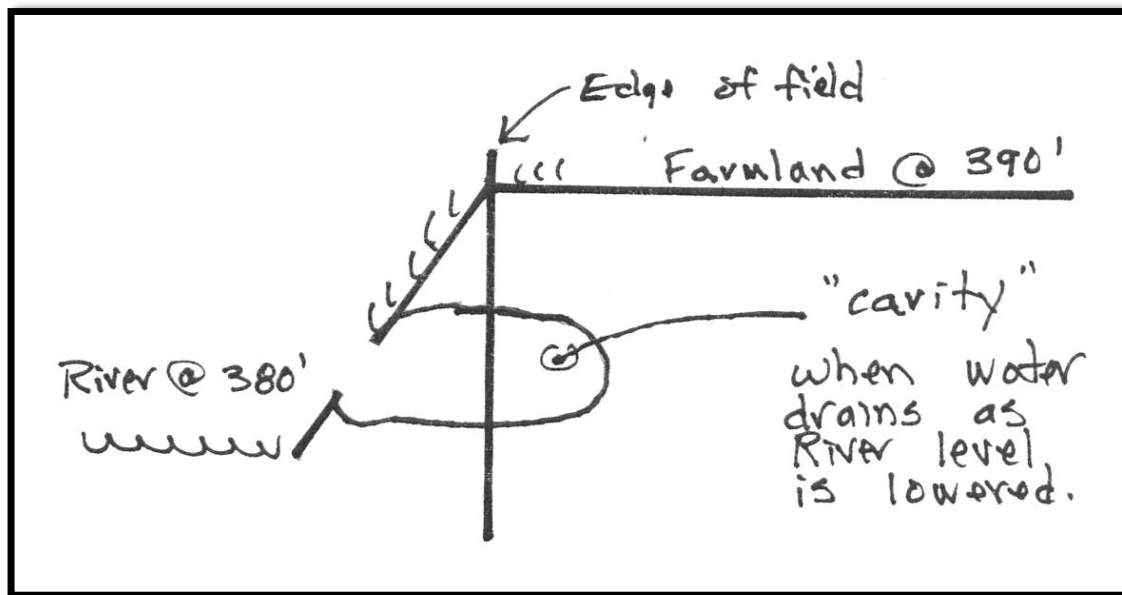
In his letter to FERC of March 15, 2018, Mr. Timothy Cook, a resident of Lyme who has lived on the river for forty years, described how he has “watched the accelerated eroding of the river bank,” and he wrote, “When the level is lowered, soil is sucked out of the River Banks.”

You only have to make observations as you walk along the riverbank to realize that there is a tremendous amount of erosion here. I first illustrated my observations in the Study Request that I submitted five years ago, on February 25, 2013. On page 14 of that document I included the below diagram:



In this diagram, the water level has been raised to 385’ and the river water has saturated the soil, now described by GRH as “*fine-grained*” and “*particularly prone to erosion.*”

The water level is lowered and, as Mr. Cook has written, "soil is sucked out of the river bank." I illustrated this in my 2013 study request, reprinted below:

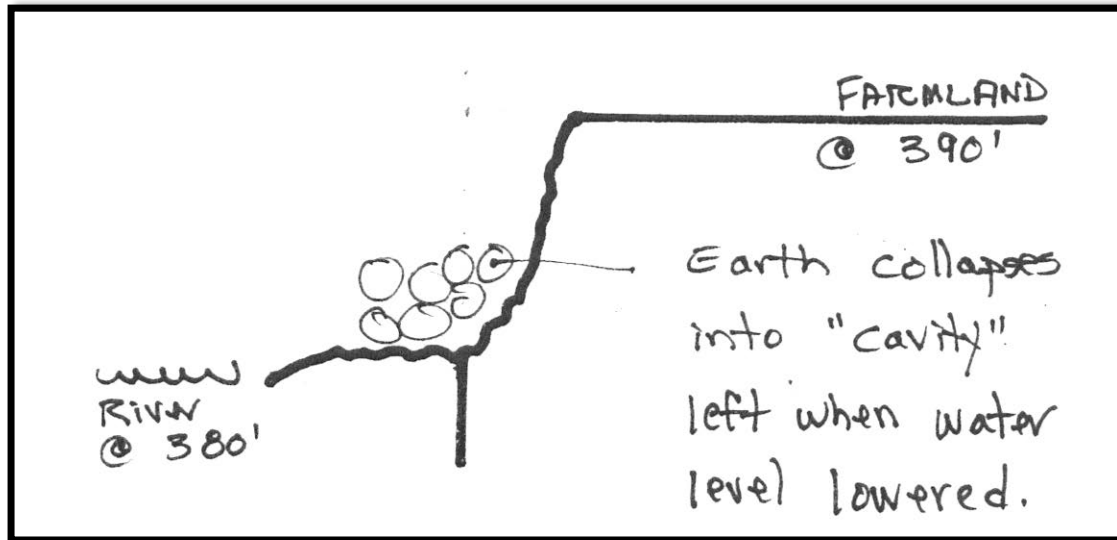


How do we know this happens? Below is a picture of at least a four-foot hole in the riverbank that has been caused by "sucking" the soil out of the riverbank when the water was lowered as the result of "project operations." It happens.



This is the very situation that Dr. McIntyre described and asked about on March 8, 2018, but his question and comments were dismissed by Mr. Ragonese.

We now have a “cavity” in the riverbank and it collapses, taking valuable farmland with it. Again, I diagrammed this in my February 25, 2013, Study Request:



Below is a picture from page 52 the August 1, 2016, Study Report prepared for TransCanada, now part of the GRH application:



The caption for this picture reads: “Figure 5.4.2-5 Bank collapse and recession in 2015...” *This “Bank collapse and recession” is on land owned by my family.*

Does GRH offer an explanation for the “Bank collapse?” No, GRH offers no explanation for the “Bank collapse.”

I used the word, “collapse,” in my 2013 Study Request. They use it in 2016.

Bank collapse is erosion caused by the operations of the Wilder Dam.

And finally, this same location today, April 14, 2018:



Today, there is a “collapsed” area that extends twenty feet from the river into the farmland. When I first showed this location to John Field, GRH’s erosion consultant, in 2015 he commented: “I don’t know what is going on here.”

To almost every other observer it is very clear what is going on here: There is tremendous erosion as the result of “project operations,” the daily raising and lowering of the water level by the Wilder Dam which, when the water is raised causes the soils to be saturated, and when the water is lowered, to produce electricity, the fine grained soils are “sucked” out of the riverbank which results in collapses and additional erosion.

No erosion ratio or modeling of entrainment is necessary to recognize this.

There has never been any mention in any study of how the raised water saturates the riverbank and then, when the water level is lowered, how the soil, *fine-grained* and *particularly prone to erosion*, is “sucked” out of the riverbank.

I believe that simple observations of the changing water levels in the river and the examination of the fine soils that are found here will lead anyone to conclude that the changing water levels, caused by project operations, are responsible for the erosion.

Therefore, I believe that it should be concluded that the Erosion Study #3, and its Supplement, dated August 1, 2016, and November 5, 2017, respectively, have not *ascertained* the likely causes of erosion— a very specific and clearly stated objective in FERC’s July 8, 2013, Updated Proposed Study Plan.

On page 2 of his letter of January 16, 2018, Mr. Ragonese writes: “Mr. Mudge alleges that 60 percent of the riverbank around the reservoir is eroding and that Great River Hydro should address the susceptibility to erosion of different soil types when subjected to changes in water elevation.”

Yes, on page 7 of my letter of July 10, 2017, I state that: “Today 60% of the riverbank is eroding.” As shown below, I believe that statement is correct based on the work done for GRH in the different studies.

In ILP Study 2 & 3 dated February 4, 2017, it is written page ES-1, “Nearly 40 percent of the riverbanks in the study area were mapped as unstable during bank stability mapping completed in 2014.” That statement is wrong based on other information in that same report.

Page 80 of the same report reads: “Considering bank stability for the study area as a whole, 11% of the banks were mapped as eroding, 22% as vegetated eroding, and 6% as failing armor, resulting in a total 39% of bank length that can be considered unstable (Figure 5.6.4-2).” Page 79 of the ILP Study 2 & 3 dated August 1, 2016, reads: “Considering bank stability for the study area as a whole, 11% of the banks were mapped as eroding, 22% as vegetated eroding, and 6% as failing armor, resulting in a total 39% of bank length that can be considered unstable (Figure 5.6.4-2).” (Note that the August 1, 2016 and February 4, 2017 sentences are exactly the same.)

I put this data together in a table, page 5 of my letter of May 8, 2017:

Erosion category	August 2016 study, p. 79	February 2017 study, p. 80
Eroding	11%	11%
Vegetated eroding	22%	22%
Failing armor	6%	6%
Sub-total	39% (Approx. 40%)	39% (Approx. 40%)
Armored	15%	15%
No longer eroding	4%	4%
Total	58% (Approx. 60%)	58% (Approx. 60%)

Ragonese and the different studies *exclude* “Armored” and “No longer eroding” riverbank as being erosion. Both of those categories must be included in any accounting of the extent of the erosion.

Consider the following: Below left shows erosion and below right shows the same location after being “Armored” in 2012 with a cost-sharing project with the U. S. Department of Agriculture.



When “Armored” and “No longer eroding” areas are considered to be “erosion,” then 58% of the riverbank is eroding, and I round that to 60%. Personally, I believe that more than 60% of the riverbank is eroding, but right now I will use the figures in the different studies and I again conclude that at least 60% of the riverbank is eroding. As I wrote on May 8, 2017: “No property owner has ever “armored” their property if there was no erosion. Land that is “no longer eroding” was once eroding. Therefore, there is evidence of much more erosion on the riverbank than the company and its consultant want to acknowledge.”

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It may be time for FERC to again visit this valley for additional or supplemental “Environmental Site Reviews” along the impacted parts of the Connecticut River and to examine the erosion that landowners and towns are talking and writing about. FERC did hold “Environmental Site Reviews” in October 2012. [October 1 at Wilder, October 2 at Bellows Falls, and October 3 at Vernon.] As a landowner along the river, I did not receive any notice of the October 2012 meetings. The Environmental Site Reviews were held nearly five months *before* the Scoping meeting on January 28, 2013, held in West Lebanon. The notice that I received of the January 2013 meeting was dated December 21, 2012, nearly four months *after* the Environmental Site Reviews. The reason given for the October visit was “winter weather” and the “onset of winter.”

Six winters have come and gone since the October 2012 Site Reviews.

In that time period there have been Study Requests, Studies, Supplemental Studies, and numerous letters addressed to FERC about these projects and the erosion problems. I believe that FERC should again visit this area for the sole purpose of visiting landowners who believe that the erosion of their land has been caused by the operations of the different dams.

FERC has visited the dams. FERC should now walk the land.

In planning such a trip, FERC could work with the Connecticut River Joint Commission (CRJC) and its Local Advisory Committees and with the Connecticut River Conservancy. Sites in both Vermont and New Hampshire should be visited, and FERC would be able to meet with affected landowners.

As the owners of $\frac{3}{4}$ mile of river frontage, my family invites FERC to visit our property. On our land FERC would be able to stand on the eroding riverbank where I have described the loss of forty feet of land, documented with surveys, pages 7-10 of my Study Request of February 25, 2013, and in my letter of September 25, 2016. On our land FERC would be able to visit the site of the Archaeological work done by the Public Archaeology Laboratory and described in their report dated August 2016. On our land FERC would be able to visit one of the monitoring sites, 02-W09.

I would be glad to have this be an official FERC meeting that is open to the public.

I am sure that there are other landowners in both Vermont and New Hampshire who would welcome a visit from FERC in order to show FERC how the operations of the dams has caused a great amount of erosion of their lands.

Document Content(s)

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