Managing Sediment on Construction Sites

Aquatic Barrier Removal Workshop
Presented by Zapata Courage
State of VT Wetlands Program

VT Wetland Definition

- "Those areas of the state that are **inundated by surface or ground water** with a frequency sufficient to support significant vegetation or aquatic life that depend on saturated or seasonally saturated soils conditions for growth and reproduction." ~ 2-weeks of VT's growing season

- **Note:** When adjacent to any lake, pond or reservoir that is a public water a wetland's boundary shall extend to the maximum extent of a prevalence of surface, emergent, or woody vegetation at any time during the growing season. For all other lakes, ponds or reservoirs, **a wetland's boundary shall extend to a depth of two meters at mean water level.**

Wetland Identification: Three (3) Parameters

Hydrology

Hydrophytic Vegetation

Hydric Soils

Jurisdictional Wetlands

Regulated by and under the VT Wetland Rules

Mapped or unmapped

50-ft buffers

Wetlands that are 2500 sq ft or larger along streams=Class II

Vermont's Wetlands Provide

10 Wetland Functions & Values

Does the Project Need a Wetland Permit?

YES

- Activity occurs in a Class I or II wetland or buffer zone and is not considered an allowed use:
  - Grading, filling, ditching or dredging
  - Removal of vegetation such as tree cutting or conversion
  - Construction of buildings, roads, buried utilities or infrastructure

NO

- Activity proposed outside of Class II or Class I wetland and buffer
- Activity occurs in a Class III wetland
- Activity qualifies as an allowed use

Impact Considerations: Culverts and Dams

- Temporary crossings needed for construction access, detour of local traffic, or additional impacts needed for utilities, additional stabilization.

  Temporary construction impacts may require a wetland permit.

- Staging areas, where vehicles will be parked, dewatering equipment will be set up, and areas of vegetation clearing.

  Temporary construction impacts may require a wetland permit.

- Storage of removed materials- Is there an off-site disposal location?

  These areas need to be evaluated for potential wetland or buffer impacts.

Wetland Permitting- Culverts and Bridges

There are 4 tiers of permitting/permissions:

- Allowed Use (no permit required):
  - replacing in-kind
  - up to one-time 250 sq ft of new impact area

- NRGP (Non-Reporting General Permit) – FREE with registration
- GP (General Permit- fee based)
- INDIV Permit (Individual permit- fee based)

Upgrading existing infrastructure resulting in a larger footprint than previously existed may require a permit.


GOOD PASSAGE vs. OBSTRUCTED PASSAGE

Dam Removals

- Allowed Use (no permit required):
  - With the approval of a plan submitted to the Wetlands Program
  - Use of timber/swamp mats
  - **Sediment disposal location identified and cleared**

Remember Impact Considerations: Access, Staging, Sediment Disposal

- GP (General Permit- fee based)
- INDIV Permit (Individual permit- fee based)

Plans can be approved even if there is expected loss of wetland due to the removal of the structure

Stick to the plan and manage your sediment so that you don’t end up with a discharge event that results in a violation.

CASE STUDIES

Sediment Use, Management, and Control

BEFORE:

- ❑ Review access points and options for access
- ❑ Review Limits of Disturbance
- ❑ Review methods of dewatering
- ❑ Review methods of Erosion and Sediment Controls on site and at disposal locations
- ❑ Review sediment disposal locations
- ❑ Review conditions for sediment disposal: invasive species, contaminants
- ❑ Consider timeframe and contingency

DURING:

- ❑ Dewatering levels
- ❑ Amount of open area at one time, stabilize as you go
- ❑ Weather forecast
- ❑ Maintain Erosion and Sediment Controls
- ❑ Stabilize Access
- ❑ Identify potential emerging issues such as headcuts, areas of unexpected erosion

AFTER:

- ❑ Seed and stabilize

Every aspect of the project involves sediment

BID RESULTS	Item Cost					
Contractor	A. MOBILIZATION / SITE PREPARATION	B. DAM AND WALLS REMOVAL	C. CHANNEL WORK	D. STONE INSTALLATION	E. SITE RESTORATION / DEMOBILIZATION	TOTAL
	$ 42,000	$ 20,000	$ 136,000	$ 14,000	$ 12,000	**$ 224,000**
	$ 75,000	$ 15,000	$ 158,000	$ 20,000	$ 30,000	**$ 298,000**
	$ 25,000	$ 27,000	$ 215,000	$ 35,000	$ 36,000	**$ 338,000**
	$ 17,100	$ 33,900	$ 207,325	$ 53,280	$ 27,500	**$ 339,105**
	$ 64,045	$ 21,582	$ 240,312	$ 24,205	$ 51,637	**$ 401,781**
	$ 40,000	$ 35,000	$ 288,000	$ 55,000	$ 60,000	**$ 478,000**
	$ 266,000	$ 56,700	$ 293,220	$ 32,200	$ 101,500	**$ 749,620**

STATISTICS						
Min	$ 17,100	$ 15,000	$ 136,000	$ 14,000	$ 12,000	**$ 224,000**
Max	$ 266,000	$ 56,700	$ 293,220	$ 55,000	$ 101,500	**$ 749,620**
Mean	$ 75,592	$ 29,883	$ 219,694	$ 33,384	$ 45,520	**$ 404,072**
Standard Deviation	$ 86,376	$ 13,892	$ 59,837	$ 15,844	$ 29,328	**$ 171,822**

Engineer's Construction Estimate	$ 30,000	$ 25,000	$ 174,500	$ 26,250	$ 23,850	**$ 279,600**

TRAFFIC MANAGEMENT NOTES

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. ALL CONSTRUCTION SIGNS SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

WATER CONTROL PLAN

1. THE PROPOSED WATER CONTROL PLAN IS PROVIDED AS A RECOMMENDED APPROACH TO DEWATER THE WORK AREA TO MINIMIZE THE RELEASE OF SEDIMENTS. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED WATER CONTROL PLAN TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION
2. BEGIN WORK DURING LOW WATER.
3. RIPRAP FILTER BERM SHALL BE INSTALLED PRIOR TO IN-CHANNEL WORK AND MAINTAINED THROUGH END OF PROJECT.
4. AS MUCH WORK AS POSSIBLE TO BE COMPLETED IN THE DRY TO MINIMIZE RIVER CHANNEL DISTURBANCE.
5. INSTALL DEWATERING BASIN OR OTHER APPROVED DEWATERING DEVICE TO RECEIVE WET SEDIMENT IF NOT IMMEDIATELY REMOVED FROM THE SITE. NO PERMANENT DISTURBANCE SHOULD TAKE PLACE DUE TO DEWATERING BASIN PLACEMENT.
6. FLOW TO BE MAINTAINED IN A COMBINATION OF THE EXISTING AND PROPOSED CHANNELS DURING SEDIMENT REMOVAL.
7. COFFERDAMS MAY BE USED TO DIRECT WATER AWAY FROM CURRENT WORK AREAS. ALL COFFERDAMS NEED TO BE REMOVED AT END OF PROJECT.
8. REMOVE DEWATERING BASIN AND RIPRAP FILTER BERM AND DISPOSE OF COLLECTED SEDIMENT IN LEGAL AREA OUTSIDE OF FLOODPLAIN OR WETLAND AREAS.
9. PUMPING IS NOT EXPECTED TO BE NECESSARY FOR THIS PROJECT. SHOULD THE CONTRACTOR FEEL PUMPING IS BENEFICIAL, PRIOR APPROVAL WILL BE REQUIRED, AND PUMPING WILL BE PERFORMED AT THE CONTRACTORS EXPENSE. DIRTY WATER SHOULD BE DISCHARGED TO A DEWATERING DISCHARGE BASIN OR OTHER DEVICE APPROVED BY THE PROJECT ENGINEER.

CONSTRUCTION SEQUENCE NOTES

THIS PROPOSED DAM REMOVAL SEQUENCE IS PROVIDED AS A RECOMMENDED APPROACH. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED SEQUENCE TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION.

A STEP A: PRE-CONSTRUCTION ACTIVITIES:

1. SUBMIT A SCHEDULE, SEDIMENT AND EROSION CONTROL PLAN, CONSTRUCTION SEQUENCE, AND WATER CONTROL PLAN TO THE PROJECT ENGINEER FOR REVIEW SEVEN (7) DAYS PRIOR TO INITIATION OF CONSTRUCTION.
2. OBTAIN ANY NECESSARY WORK PERMITS AND SUBMIT SCHEDULES, PLANS, AND PRODUCT INFORMATION, INCLUDING THE EMERGENCY OPERATION PLAN TO THE PROJECT ENGINEER FOR REVIEW SEVEN (7) DAYS PRIOR TO INITIATION OF CONSTRUCTION.
3. CONTRACTOR SHALL PARTICIPATE IN A PRE-CONSTRUCTION SITE WALK WITH THE PROJECT ENGINEER AND OTHERS TO REVIEW ENVIRONMENTAL PERMIT REQUIREMENTS, CONTRACT PROVISIONS, PROJECT LIMITS, AND CONSTRUCTION DETAILS.

B STEP B: CONSTRUCTION SETUP ACTIVITIES:

1. INSTALL CONSTRUCTION WARNING SIGNS AND SAFETY FENCING. INITIATE TRAFFIC CONTROL, AS NEEDED.
2. STAKE OUT LIMITS OF WORK AND INSTALL SEDIMENT AND EROSION CONTROLS, SAFETY FENCING, TEMPORARY CONSTRUCTION ACCESS, STAGING AND STORAGE AREAS. ALL TO BE REVIEWED BY PROJECT ENGINEER.
3. WAIT FOR LOW FLOW TO BEGIN IN-CHANNEL WORK.

C STEP C: STONE CHECK DAM AND TREE REMOVAL:

1. INSTALL STONE CHECK DAM (SEE DET-1), OR APPROVED EQUAL, PRIOR TO CONSTRUCTION.
2. MAINTAIN STONE CHECK DAM DURING CONSTRUCTION.
3. REMOVE ACCUMULATED SEDIMENT REGULARLY, ONCE MACHINES CAN ACCESS AREA.
4. REMOVE TREES FROM DAM EMBANKMENT.

D STEP D: DAM EMBANKMENT CUT AND FILL:

1. REMOVE DRY HYDRANT EQUIPMENT AND STOCKPILE FOR TOWN.
2. EXCAVATE DAM EMBANKMENT AND USE MATERIAL TO FILL DESIGNATED AREAS. SEE SHEET STR1 FOR DAM ELEVATION.
3. ESTABLISH RIVULET CHANNELS THROUGH FILL AREA ON EAST SIDE OF RIVER.

E STEP E: CHANNEL RESTORATION AND SEDIMENT REMOVAL:

1. INCREMENTALLY LOWER DAM ALTERNATING WITH UPSTREAM SEDIMENT REMOVAL/CHANNEL RESTORATION.
2. REMOVE SEDIMENT FROM LOWER IMPOUNDMENT. SPREAD REMOVED FINE SEDIMENT ON FILL SLOPES AS TOP SOIL.
3. ESTABLISH PILOT CHANNEL THROUGH LOWER IMPOUNDMENT.
4. INSTALL REMOVED TREES WITH ROOT BALLS AND BOULDERS IN PROPOSED PILOT CHANNEL AS SOON AS PROPOSED CHANNEL IS EXCAVATED.

F STEP F: CHANNEL EXCAVATION THROUGH DAM:

1. COMPLETE CHANNEL EXCAVATION THROUGH DAM EMBANKMENT TO FINAL GRADE. REMOVE AND DISPOSE OF ALL OUTLET STRUCTURES.
2. REMOVE STONE CHECK DAM.

G STEP G: POST-CONSTRUCTION ACTIVITIES:

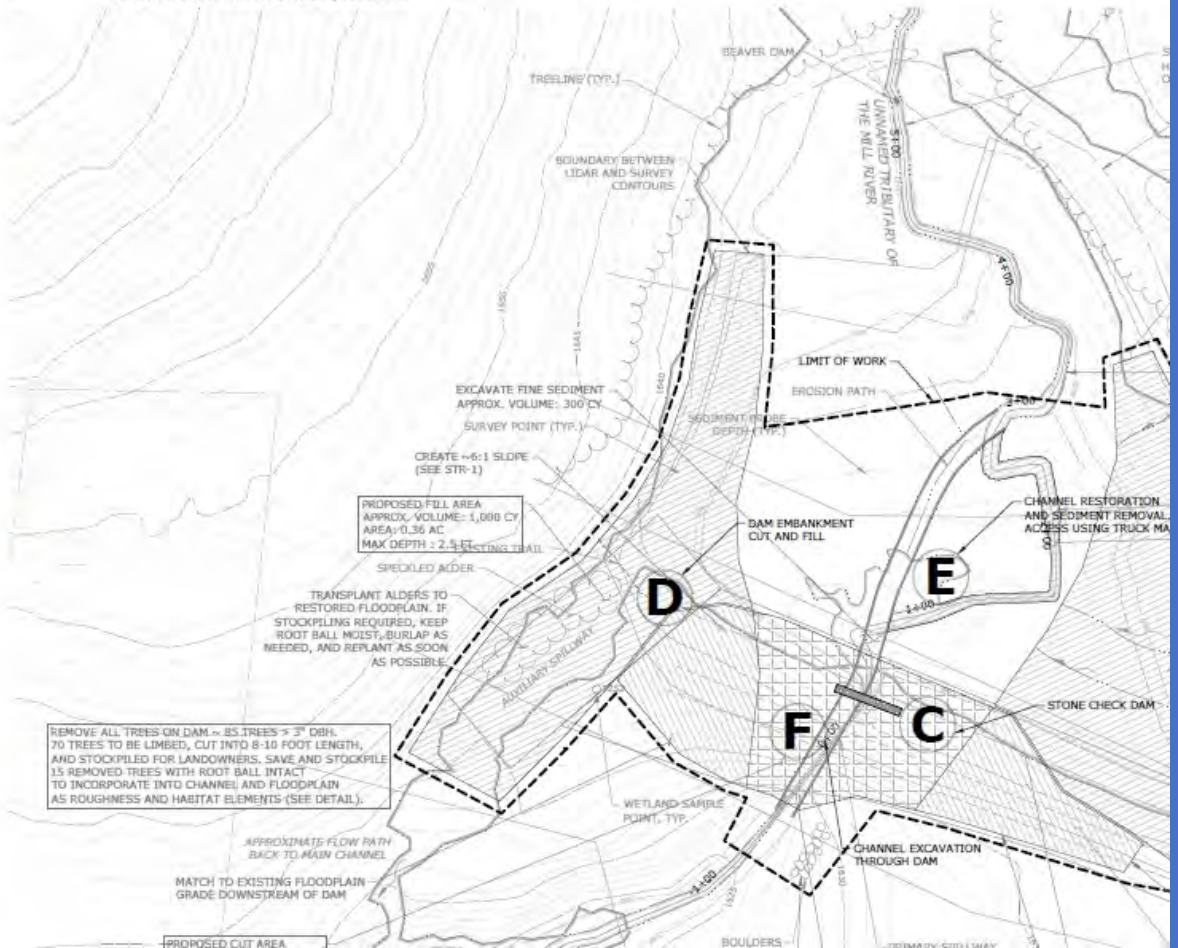
1. PERFORM SITE RECOVERY. REMOVE ALL ACCESS ROADS AND CONSTRUCTION ENTRANCES, AND STABILIZE AND RESTORE ALL DISTURBED AREAS. COMPLETE SITE RESTORATION. RESTORE TO ORIGINAL CONDITION, OR AS INDICATED ON THE PLANS.

EROSION CONTROL NOTES

1. THE SEDIMENT AND EROSION CONTROL PRACTICES IMPLEMENTED AS PART OF THE PROJECT SHALL BE IMPLEMENTED AND MAINTAINED ACCORDING TO "THE LOW RISK SITE HANDBOOK FOR EROSION PROTECTION AND SEDIMENT CONTROL" GUIDANCE DOCUMENT FROM THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WHERE APPLICABLE IN CONSULTATION WITH PROJECT ENGINEER.
2. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
3. CLEARING OF NATIVE VEGETATION FOR CONSTRUCTION ACCESS SHOULD BE MINIMIZED.
4. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR WILL VERIFY THE MAINTENANCE WEEKLY AND AFTER RAIN EVENTS AND REPORT IN WRITING TO PROJECT ENGINEER.
6. THE PROJECT ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF EXCESSIVE SEDIMENT EROSION TAKES PLACE, IF SIGNIFICANT FINE GRAINED SEDIMENT IS ENCOUNTERED OR IF POTENTIALLY CONTAMINATED SEDIMENTS ARE ENCOUNTERED (OILY, DARK COLOR, CHEMICAL ODOR).
7. PERFORM WORK DURING LOW FLOW PERIODS. IF A LARGE FLOOD IS PREDICTED, STOP WORK, STABILIZE THE SITE AND REMOVE EQUIPMENT FROM FLOOD PRONE AREAS.
8. STOCKPILE AND STAGING LOCATIONS AS INDICATED ON THE PLANS AND AS APPROVED BY THE PROJECT ENGINEER, SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE. WETLANDS OUTSIDE OF THE PROJECT AREA SHALL BE PROTECTED AND REMAIN UNDISTURBED THROUGHOUT THE DURATION OF THE PROJECT.
9. NO DISTURBED EARTH WILL REMAIN EXPOSED FOR MORE THAN SEVEN (7) CONSECUTIVE DAYS WITHOUT APPLYING TEMPORARY OR PERMANENT STABILIZATION MEASURES AT DIRECTION OF ENGINEER.
10. EXPOSED AREAS SHALL BE SEEDED AND MULCHED OR PROTECTED WITH EROSION CONTROL MATTING WITHIN 48 HOURS OF ACHIEVING FINAL GRADE.
11. ANY DISTURBED SLOPES 2:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL BLANKET PER DIRECTION OF PROJECT ENGINEER, SEE DETAIL.

INVASIVE SPECIES HANDLING NOTES

1. THESE NOTES PROVIDE BEST MANAGEMENT PRACTICES FOR PREVENTING TH
ON HANDLING AND IDENTIFICATION OF INVASIVE SPECIES CAN BE FOUND A
2. LOCATE AND USE STAGING AREAS THAT ARE FREE OF INVASIVE SPECIES TO
3. PLAN WORK SEQUENCE SO CONSTRUCTION EQUIPMENT IS MOVED FROM ARE
AREAS INFESTED WITH INVASIVE SPECIES WHENEVER POSSIBLE.
4. ALL EQUIPMENT, MACHINERY, AND HAND TOOLS USED IN AREAS WHERE INV
SOIL AND PLANT MATERIALS BEFORE LEAVING THE SITE OR MOVING TO ARE
WITHIN THE AREA ALREADY INFESTED. ACCEPTABLE CLEANING METHODS IN
4.1. PORTABLE WASH STATION THAT CONTAINS RUNOFF FROM WASHED EQU
4.2. HIGH PRESSURE AIR
4.3. BRUSH, BROOM, OR HAND TOOLS USED WITHOUT WATER.
5. EXCAVATED MATERIAL TAKEN FROM SITES THAT CONTAIN INVASIVE PLANTS
UNTIL ALL VIABLE PLANT MATERIAL IS RENDERED NONVIABLE. EXCAVATED
INFESTATION.
6. ANY EXTRA EXCAVATED MATERIAL CONTAINING INVASIVE PLANT MATERIAL
VIABLE PLANT MATERIAL IS DESTROYED OR DISPOSED OF BY BURYING 5 FE
FEET FOR OTHER SPECIES.
7. SOIL AND OTHER MATERIALS CONTAINING INVASIVE PLANT MATERIAL MUST
8. INVASIVE SPECIES CAN BE RENDERED NONVIABLE BY THE FOLLOWING METH
8.1. BURNING NOXIOUS WEEDS THAT ARE NOT SEEDING OR FLOWERING IS
DESIGNATED BURN PILE. MAKE SURE THAT ANY REMAINING ROOTS OR
PERMITS BEFORE BURNING.
8.2. BURYING NOXIOUS WEEDS IS ACCEPTABLE. SOME WEEDS SUCH AS JAPA
IDEALLY WOULD HAVE A BARRIER ON TOP OF THE DISPOSAL SITE.
8.3. CHEMICAL TREATMENT BY A CERTIFIED APPLICATOR WHO FOLLOWS THE
9. INVASIVE SPECIES INCLUDING PHRAGMITES, AND PURPLE LOOSESTRIFE WIL
ACOE MONITORING REQUIREMENTS AND ANY OBSERVATIONS AND/OR PROP
REPORT.



WHAT'S GOING ON WITH CONNOLLY POND?

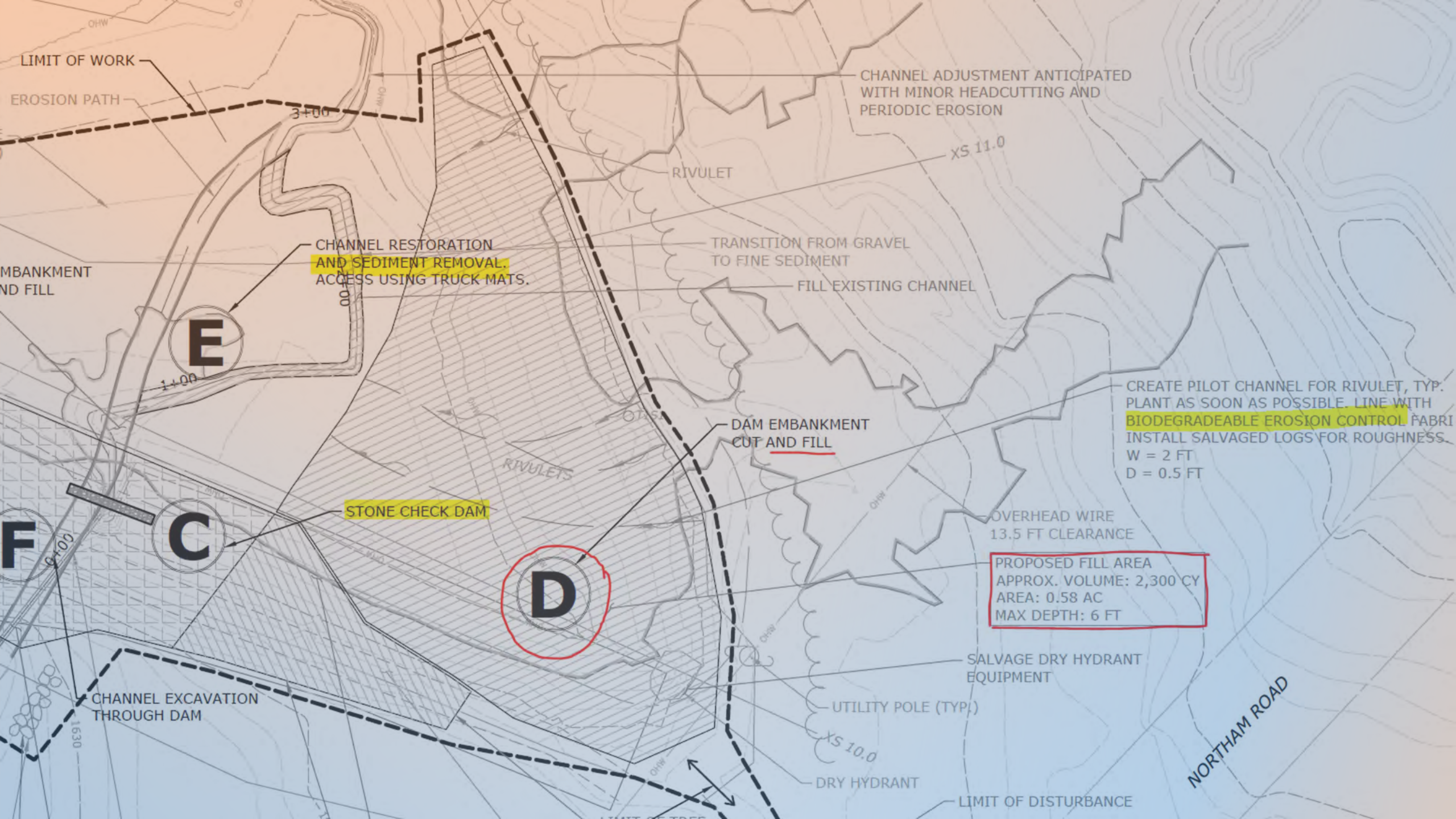
Fellow Shrewsberries, as you may have noticed while driving by Connolly Pond on Northam Rd. recently, there is no longer water filling up the basin. For those who are curious, I will do my best to fill you in as to why that is.

First, a very brief history. Built around 1966, this type of man-made, in-stream pond was a popular design, typically built for recreation, agricultural needs, and fire-suppression. According to a 1966 Rutland Herald article, the pond was built by the Connolly family, at least in part, as a fire pond. Since then, the pond has been used by the town for fire-suppression throughout Shrewsbury.

Jump forward 60 years or so, and what we now understand is that these once popular in-stream ponds are actually eco-

that there seemed to be a hole in the outflow creating erosion both around the pipe itself and behind it, as well as creating extreme fluctuat depth. Second, that the dam had not been prop tained, and that trees and shrubs had been allowe over the entire length of the dam itself as well a emergency spillway area. This, we discovered, is n ducive to dam health as the tree roots can create tu and weakness within the dam itself that may eventually to a catastrophic dam failure.

We realized, that as the new owners, we were now respor sible for the water that was being held back by this improp-erly cared for dam. That water, if it were to breach the dam, had the potential to cause huge damage


LIMIT OF WORK
EROSION PATH
3+00
CHANNEL ADJUSTMENT ANTICIPATED
WITH MINOR HEADCUTTING AND
PERIODIC EROSION
RIVULET
XS 11.0
CHANNEL RESTORATION
AND SEDIMENT REMOVAL.
ACCESS USING TRUCK MATS.
TRANSITION FROM GRAVEL
TO FINE SEDIMENT
FILL EXISTING CHANNEL
MBANKMENT
ND FILL
E
1+00
2+00
CREATE PILOT CHANNEL FOR RIVULET, TYP.
PLANT AS SOON AS POSSIBLE. LINE WITH
BIODEGRADEABLE EROSION CONTROL FABRI
INSTALL SALVAGED LOGS FOR ROUGHNESS.
W = 2 FT
D = 0.5 FT
DAM EMBANKMENT
CUT AND FILL
RIVULETS
STONE CHECK DAM
F
C
D
OVERHEAD WIRE
13.5 FT CLEARANCE
PROPOSED FILL AREA
APPROX. VOLUME: 2,300 CY
AREA: 0.58 AC
MAX DEPTH: 6 FT
SALVAGE DRY HYDRANT
EQUIPMENT
UTILITY POLE (TYP.)
XS 10.0
DRY HYDRANT
LIMIT OF DISTURBANCE
CHANNEL EXCAVATION
THROUGH DAM
NORTHAM ROAD
OHW

Construction Observation Report

Schedule

- The anticipated schedule is 3-4 weeks to complete the project. Below is the schedule submitted by the contractor.
- 6/19-6/23
  - Mobilize
  - Tree clearing and chipping
  - Stockpile twenty 10-12' trees with root balls
  - Install erosion control measures including silt fence and stone check dam
  - Strip organics layer from fill area and stockpile
- 6/26-6/30
  - Strip organics layer from fill area and stockpile
  - Dam removal
- 7/3-7/7
  - Dam removal
- 7/10-7/14
  - Spread stockpiled organics over fill areas
  - Relocate channel
  - Seed and mulch
  - Demobilize

Aug 9

Construction Observation Report

Date: June 30, 2023 **Time On Site:** 10:00 AM **Time Off Site:** 12:30 PM

Project: Connolly Pond Dam Removal

Observed By: Roy Schiff and Doug Osborne

Weather: Sunny, site saturated and drying after recent heavy rains, 80°F

Construction Activity

- Site idle due to soil saturation.

Compliance Notes

- No turbidity observed even during and after heavy rains, outside of disturbance from walking in the stream.
- Sediment filter berm properly installed just downstream of culvert through dam. Clear water on downstream side.

Construction Observation Report

Date: July 13, 2023 **Time On Site:** 10:00 AM **Time Off Site:** 12:00

Project: Connolly Pond Dam Removal

Observed By: Doug Osborne, Jessica Louisos, and Elizabeth Richards

Weather: Sunny, site saturated after flooding, 70°F

Construction Activity

- Site idle due to flooding and continued wet conditions.
- The mini-excavator and the dozer have been removed from the site.

Design / Construction Notes

- A large flooding event passed through the project site Monday and Tuesday. SLR, VNRC, and Birdseye met at the site this morning to assess conditions. Overall the site is in good condition and work will continue in the coming days. Birdseye left the site well prepared for the flooding event.

Compliance Notes

- Sediment moved downstream during the flooding event, primarily from the avulsion around the culvert. The downstream settling pool created by the filter berm is full of gravel and cobble. The contractor will clean out the pool when they remobilize or come to move the excavator in the next couple days.
- No turbidity present during visit.
- Sediment filter berm properly installed just downstream of culvert through dam. Water is running clear.

Good Communication; prepared


Preconst. meeting
Vermont State Department of Fish & Wildlife
BEGIN CHANNEL RESTORATION STATION 21+28
INSTALL ROCK STEP STRUCTURE (TYP. OF 6) SEE DETAIL SHEET 12
MATURE TREES AND NATIVE VEGETATION IN THE FLOODPLAIN SHOULD BE AVOIDED WHERE POSSIBLE (TYP.)
REGRADE CHANNEL AND CREATE FLOODPLAIN BENCHES PER CONTOURS THIS SHEET, SECTIONS ON SHEETS 9 & 10 AND TYPICAL SECTION ON SHEET 12 (TYP.)
FINAL GRADING IN FLOODPLAIN BENCHES TO BE COARSE, TO MAINTAIN FLOODPLAIN ROUGHNESS COORDINATE FINAL GRADING WITH ENGINEER
APPLY SEED AND MULCH ON ALL DISTURBED SURFACES INCLUDING FLOODPLAIN BENCHES (TYP.) SEE NOTES THIS SHEET
CONSTRUCT POOL (TYP. OF 3)
Ferraro, Michael
PROPOSED HAUL ROUTE SEE SECTION THIS SHEET
PROVIDE CONVEYANCE FOR SMALL FLOODPLAIN CHANNEL THROUGH FLOODPLAIN BENCH AND TO MAIN CHANNEL
STABILIZE WITH FASCINES SEE DETAIL SHEET 12
LIMITS OF ON-CONTOUR FASCINE & LIVE STAKE PLANTINGS SEE SHEET 12 FOR DETAILS
INSTALL LARGE WOOD IN BANKS SEE DETAIL SHEET 12
APPLY SEED AND MULCH ON ALL DISTURBED SURFACES INCLUDING FLOODPLAIN BENCHES (TYP.) SEE NOTES THIS SHEET
OSES ONLY

A variety of techniques can be used on site, and one or more might be used for a single project.

Rutland Herald
https://www.rutlandherald.com › news › local › vermon...

Vermont celebrates dam removal at Dunklee site in ...

Oct 27, 2022 — The **Dunklee Pond Dam** was removed last year. It was built on the Tenney Brook sometime around 1792 and served a linseed oil mill, then later a ...

Missing: ~~dunkee~~ | Show results with: dunkee

VTDigger
https://vtdigger.org › 2021/10/11 › centuries-old-dam-r...

Centuries-old dam removed in Rutland, pleasing safety ...

Oct 11, 2021 — The **Dunklee Pond Dam** is gone, bringing relief to safety officials and the local ecosystem. Where a pond once was, a section of the Tenney Brook now trickles ...

Missing: ~~dunkee~~ | Show results with: dunkee

Vermont Agency of Natural Resources (.gov)
http://anr.vermont.gov › content › secretary-moore-hig...

Secretary Moore to Highlight the Importance of Dam Removal ...

Oct 24, 2022 — Secretary Moore will host a press conference near the site of the **Dunklee Pond Dam removal** site. The secretary will be joined by Todd Menees ...

Missing: ~~dunkee~~ | Show results with: dunkee

WCAX
https://www.wcax.com › 2021/10/07 › historic-dam-re...

Historic dam removed in Rutland

Oct 7, 2021 — The **dam** was partially ...

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Zap

Please see the following assessments for each of the locations. This will narrow down what others need to review as a wetland permit will not be issued for sediment storage:

1. College of St Joe: Class II wetlands on both sides of the clearing and partially overlapping it. See attached (Wetland classifications). This area is NOT APPROVED.
2. Georgetti Park: If the sediment stock pile can be located exactly where indicated, to the north and east of the drainage swale/channel and to the west side of the drive, up against the existing parking lot then I can sign off the site as an APPROVED site. I have done a desktop review and can confirm that this location is outside wetlands and their 50-ft buffers. BUT: there may be wetlands behind the skating rink or alongside East Creek so we would want to keep the stockpiling out of the wetland buffer if there are occurring.
3. Meadow Street Park: No wetland concerns: Location APPROVED with no conditions.
4. 62 Pierpont Avenue: No wetland concerns: Location APPROVED with no conditions.

Sediment disposal, storage, and management for erosion control

SLR 5/17/2022

Removing sediment

SLR

Sediment-reshaping

- Using sediment on site to direct waterflows.
- Isolate work areas.
- Stabilizing as you go!

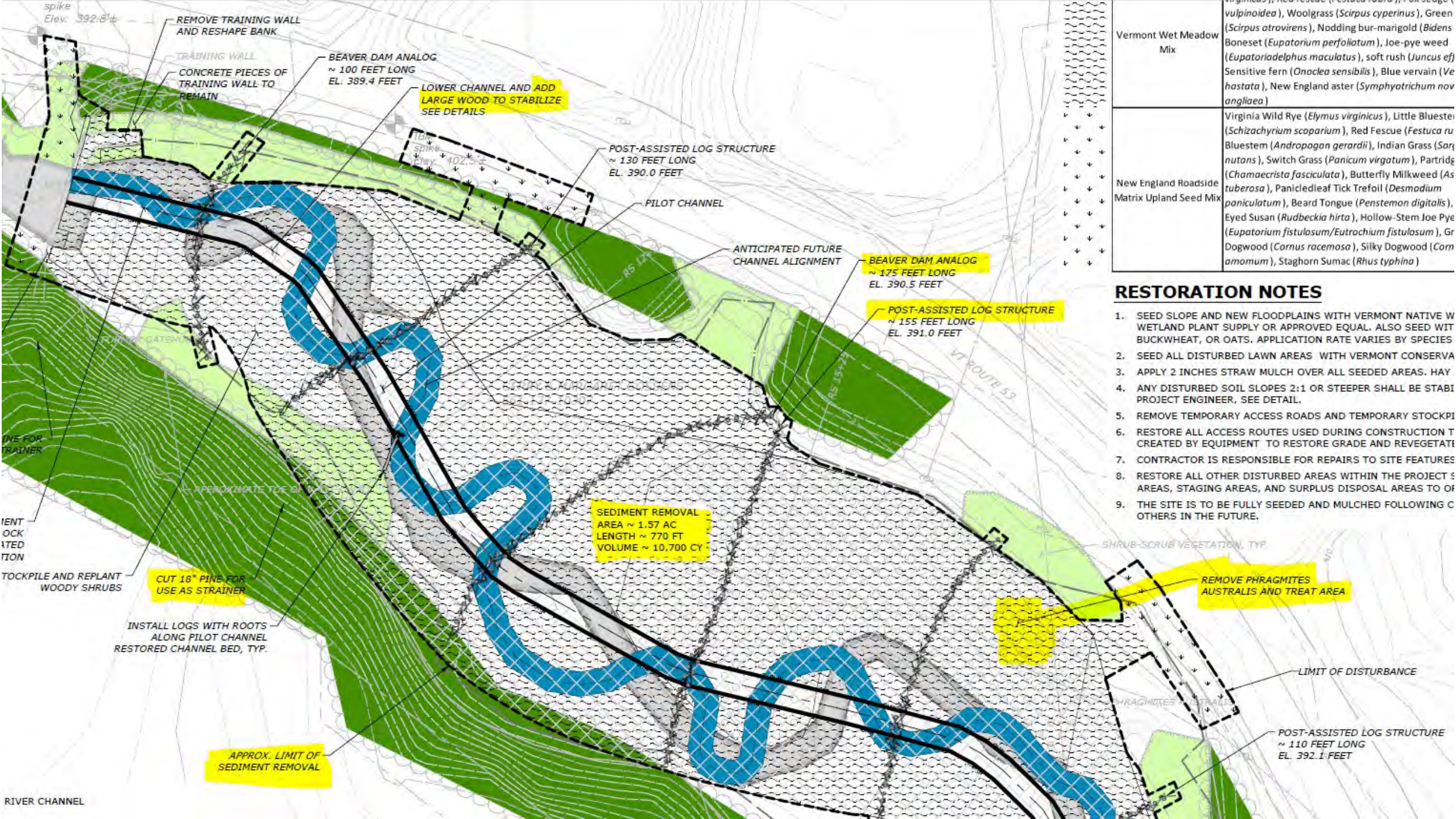
SLR

Photo-Documentation
Dunklee Pond Dam Removal Project, Rutland, Vermont
Location G, Looking Downstream

Pre-construction (Source: SLR)

Post-construction (Source: SLR)

One Year Post-construction (Source: SLR)



Vermont Wet Meadow Mix	vulpinoidea), Woolgrass (*Scirpus cyperinus*), Green (*Scirpus atrovirens*), Nodding bur-marigold (*Bidens* Boneset (*Eupatorium perfoliatum*), Joe-pye weed (*Eupatoriadelphus maculatus*), soft rush (*Juncus ef* Sensitive fern (*Onoclea sensibilis*), Blue vervain (*Ve hastata*), New England aster (*Symphyotrichum nov angliaea*)
New England Roadside Matrix Upland Seed Mix	Virginia Wild Rye (*Elymus virginicus*), Little Bluester (*Schizachyrium scoparium*), Red Fescue (*Festuca ru* Bluestem (*Andropogon gerardii*), Indian Grass (*Sorg nutans*), Switch Grass (*Panicum virgatum*), Partridg (*Chamaecrista fasciculata*), Butterfly Milkweed (*As tuberosa*), Panicledleaf Tick Trefoil (*Desmodium paniculatum*), Beard Tongue (*Penstemon digitalis*), Eyed Susan (*Rudbeckia hirta*), Hollow-Stem Joe Pye (*Eupatorium fistulosum/Eutrochium fistulosum*), Gr Dogwood (*Cornus racemosa*), Silky Dogwood (*Corn amomum*), Staghorn Sumac (*Rhus typhina*)

RESTORATION NOTES

1. SEED SLOPE AND NEW FLOODPLAINS WITH VERMONT NATIVE W WETLAND PLANT SUPPLY OR APPROVED EQUAL. ALSO SEED WIT BUCKWHEAT, OR OATS. APPLICATION RATE VARIES BY SPECIES
2. SEED ALL DISTURBED LAWN AREAS WITH VERMONT CONSERVA
3. APPLY 2 INCHES STRAW MULCH OVER ALL SEEDED AREAS. HAY
4. ANY DISTURBED SOIL SLOPES 2:1 OR STEEPER SHALL BE STABI PROJECT ENGINEER, SEE DETAIL.
5. REMOVE TEMPORARY ACCESS ROADS AND TEMPORARY STOCKPI
6. RESTORE ALL ACCESS ROUTES USED DURING CONSTRUCTION T CREATED BY EQUIPMENT TO RESTORE GRADE AND REVEGETATE
7. CONTRACTOR IS RESPONSIBLE FOR REPAIRS TO SITE FEATURES
8. RESTORE ALL OTHER DISTURBED AREAS WITHIN THE PROJECT S AREAS, STAGING AREAS, AND SURPLUS DISPOSAL AREAS TO OR
9. THE SITE IS TO BE FULLY SEEDED AND MULCHED FOLLOWING C OTHERS IN THE FUTURE.


Looking from dam location upstream: large boulders and woody debris helps to stabilize use of PALS/Beaver analogs also helps with sediment management and will encourage the beavers to move up and downstream.

White pine tree used to help with sediment filtering

Beaver analogs and PALS help with sediment filtering

Maintaining established woody vegetation helps with erosion control.

Don’t let it Happen to You!

Permit Number: 2016-182.03 **Name:** GoshenDamRepair Goshen

Type: Amendment (Major) **Final Action:** 12/16/2021 Issued

DEC ID:

Description: temporary and emergency measures necessary to cease the sediment discharge

Select **Wetland Label:** 2016-182.03

Description: Emergency procedures to prevent sediment discharge to wetland 2018-1

Classification:

Total Wetland Impacts: 4024

Total Buffer Impacts: 2663


Suckers Brook


Sugar Hill Reservoir
Sugar Hill Reservoir

2. Detailed project description and previous permit number *Provide overall project description as well as details of proposed changes and purpose of those changes.*

Refinements to #2016-182.02, and this 'Emergency Measures and Sediment Deposit Removal" amendment request will include all temporary and emergency measures necessary to cease the sediment discharge and meet water quality standards as directed by ANR under a Notice of Alleged Violation (NOAV) dated July 13, 2021.

To maintain water quality by mitigating sediment from the site as Project construction advances, three upstream and three downstream stone settling-basin check-dams have been installed to allow additional space and time for sediment to settle out of the water. The upstream check-dams are formed of crushed stone placed on the reservoir floor upstream from the pump intakes and the existing fabric-lined channel, sumps, and pump basins, at a narrow point where the channel flows between two cobble and gravel bars, to reduce risk of being bypassed by the flow. The downstream check-dams are located immediately downstream of the project outfall into Sucker Brook, and were constructed by placing gabions and crushed stone/blocks with sandbags at each end, to slow the flow velocity and impound water, allowing sediment to settle. Downstream flows were not interrupted during installation, as the structures are permeable to water. Accumulated sediment has been and will continue to be removed routinely to maintain sediment-settling capacity. A temporary access for installing and maintaining the basins was built using construction timber matting.

In addition, accumulated sediment has been removed from the site. Sediment was principally removed from the reservoir and the banks of Sucker Brook, and has been removed to restore the native streambed conditions in the brook. Sediment was removed from the brook by an excavator stationed on the temporary timber mats, and streamflow was temporarily bypassed around the sediment-removal area via sandbags/gravity culvert and pumping during removal to reduce risk of mobilizing turbidity downstream. The removed sediment was placed in a bunker in an upland area on-site for draining and dewatering. The access and temporary sediment settling-basins will remain in place until Project completion in 2022 in case additional round(s) of sediment removal are

STATE OF VERMONT

SUPERIOR COURT
ADDISON UNIT

CIVIL DIVISION
CASE NO.

STATE OF VERMONT, AGENCY OF NATURAL RESOURCES,
Plaintiff,

v.

GREEN MOUNTAIN POWER CORPORATION,
Defendant.

$57,000

CONSENT ORDER AND FINAL JUDGMENT ORDER