

MEMORANDUM

DATE: February 25, 2011

TO: Orlando Pacheco, Town of Lancaster

FROM: Allen R. Orsi, PARE

RE: **Bartlet Pond Dam Phase II Evaluation** Additional Dam Removal Information PARE Project No.: 10177.00

After receipt of the draft Phase II Evaluation, the Town of Lancaster inquired about the level of effort required to implement a dam removal program. The following information is being provided for the Town's reference. The Phase II Report has also been amended to include conceptual costs for completing construction activities associated with dam removal. A detailed breakdown of construction costs is attached to this memorandum and will be appended to the Phase II Report.

The scope and costs associated with permitting and implementing a dam removal project can vary substantially based upon conclusions reached as part of feasibility phase studies. It should be noted in reviewing these costs that the costs presented are for construction activities only and do not include a provision for excavation and disposal of sediment within the impoundment, if required. The costs also do not consider impacts associated with contaminated sediment, if encountered within the pond.

The Executive Office of Energy and Environmental Affairs has prepared a guidance document entitled "Dam Removal in Massachusetts: A Basic Guide for Project Proponents" (the "Guide"). This document outlines the eight general steps that the proponent will need to complete in order to evaluate, design, and permit dam removal projects in Massachusetts. Please note that because each project is site-specific, not all of these steps are required for every dam removal.

- 1. <u>Initial Reconnaissance</u>: Collect basic information to determine the overall breadth of the project and the likely project challenges. Specific issues that should be investigated include history of the dam (including past modifications) and land ownership; current uses of the dam; potential infrastructure that could be impacted by the dam removal; rare species; quality of the sediment trapped by the dam and potential for contaminants; community concerns that may be raised by the dam removal; and funding possibilities.
- 2. <u>Site Visit and Planning Meeting</u>: Conduct a site visit with project proponent, dam owner, local, state and federal agencies to plan the next steps of the project.
- 3. <u>Fundraising:</u> Develop fundraising strategies, gather letters of support, and apply for funding. See Appendix A of the Guide for details.

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4. <u>Feasibility Study:</u> Select a team of consultants to provide concept-level plans and quantitative information on environmental and engineering feasibility. The scope of a feasibility study frequently includes the following general items: Data Collection, Survey and Base Mapping, Sediment Management Plan, Hydrology and Hydraulics Assessment, Channel and Riparian Restoration Plan, Fisheries, Preliminary Structure Removal Plan, Pre-Project Monitoring, and identification of Site Specific Conditions. From the above analyses, a Technical Memorandum, Conceptual Drawings, and a Cost Estimate will be produced.

This step may be extensive, minimal or unnecessary depending on the breath of work identified during the initial reconnaissance. The Guide specifies that in most cases, local, state and federal agencies will require a good-faith effort to consider project alternatives that would avoid, minimize, and mitigate environmental impacts, including a no-action alternative. Feasibility studies have cost between \$15,000 and \$145,000 in Massachusetts.

As part of this study, sediment within the impoundment should be characterized to determine the extent of sedimentation, implications of any identified contamination, and potential costs associated with sediment excavation and disposal, if required.

- 5. <u>Working with the Community:</u> Develop a plan for community presentations and participation based on the findings of initial assessment of community interest in the dam. Stakeholder meetings will work toward obtaining local support for a preferred alternative, and community meetings will use creative visioning to frame effective messages and gain support from the town. Pre-permitting meetings with local, state, and federal officials may be helpful to clarify and confirm regulatory review requirements.
- 6. <u>Final Engineering Design:</u> Develop an Engineering Design Plan with project specifications. Prepare a Technical Memorandum describing the analysis that goes into the project and the rationale behind the project approach (this may have been prepared during the Feasibility Study stage). The design team should develop an itemized cost estimate, or Engineer's Opinion of Probably Cost. Final Engineering and Design has cost between \$10,000 and \$100,000 for Massachusetts projects.
- 7. **Permitting:** After completing the feasibility study (discussed in Section 8.6.2 of the Phase II Report) and identifying and addressing issues with the local community through public workshops and other meetings, but prior to completing the final engineering, the following determinations and filings should be made:

Project Notification Form (PNF) with the Mass Historic Commission with required materials to determine whether the project will affect historic or archaeological resources.

Massachusetts Environmental Policy Act (MEPA) Environmental Notification Form if the structure is a jurisdictional dam and/or one or more thresholds is exceeded. It is likely that this dam removal will require a mandatory EIR. A waiver can be requested in the ENF Once design is complete, additional permit applications should be prepared. Permits required depend on the size of the dam and degree of environmental impacts. Based on site-specific conditions, it is anticipated that the following may be required for this dam removal.

7a. LOCAL APPROVALS

Notice Of Intent/Order of Conditions: An NOI will be filed with the local Conservation Commission to obtain an Order of Conditions for work within wetlands. The NOI is submitted to DEP, who responds to the proponent outlining which specific DEP permits will be required. As part of the permitting process, the project will be required to be presented at a public hearing to review the project impacts.

The project may exceed one or more thresholds requiring a Wildlife Habitat Evaluation under the Wetlands Protection Act. If more than twice this threshold is exceeded (i.e., greater than 100 linear feet of bank is impacted), a Detailed Wildlife Habitat Evaluation (Form B) may be required.

Other Local Permits: The applicant should check with the Town to check whether specific local permits are required for the dam removal. The following Town officials/departments should be consulted to determine if any additional municipal permits are applicable to the project.

- Building Inspector Building Permit and other applicable permits
- Planning Board Site Plan Review Permit
- Historic District Commission Certificate of Appropriateness (Bartlet Pond Dam is not in a historic district, however Historic Commission would alert the applicant to historical or archaeological resources on the site.)
- Historical Commission
- Open Space and Recreation Committee

7b. STATE APPROVALS

MEPA Environmental Impact Report (EIR): An EIR is required for any structural alteration of an existing dam that results in a decrease in impoundment capacity. A waiver of an EIR threshold would follow review of the preliminary ENF filing, and may be granted if the project is likely to cause no Damage to the Environment.

MassDEP 401 Water Quality Certificate (WQC): Projects involving fill in Waters of the United States require a Water Quality Certification (WQC) issued by the Massachusetts Department of Environmental Protection. Most dam removal or breaching projects include these activities. A 401 Water Quality Cert for dredging is classified as minor or major activities based on whether the project will dredge over 5,000 cubic yards. Dredging under 100 cubic yards may not require a dredge certificate. The NOI will notify DEP of the project and DEP will indicate whether the certificate is required.

MassDEP Chapter 91 Waterways License: A License under Chapter 91, the Public Waterfront Act, is required for work on "Any non-tidal river or stream on which public funds have been expended for stream clearance, channel improvement, or any form of flood control or prevention work, either upstream or downstream within the river basin, except for any portion of any such river or stream which is not normally navigable during any season, by any vessel including canoe, kayak, raft, or rowboat". The Owner should coordinate with the Waterways office and determine whether Chapter 91 applies to this project. Should the brook be found to be navigable, then the

MassDEP Beneficial Use of Solid Waste Permit: Materials from a dam can be reused for bank stabilization or on-site use. Uncontaminated earthen materials can be reused without requiring solid waste approvals, however reuse of certain materials such as concrete and masonry are subject to regulation under DEP as specified in 310 CMR 16.05(3)(e). If any proposed reuse of materials does not qualify for an exemption, a Beneficial Use Determination (BUD) is required. Permit is only required if specified threshold or condition is exceeded.

application for a Waterways License would be required. Permit is only required if

DCR Office of Dam Safety: The structure is a jurisdictional dam, therefore removal of the dam structure will require issuance of a Chapter 253 Permit from the MADCR Office of Dam Safety.

7c. FEDERAL APPROVALS

specified threshold or condition is exceeded.

US Army Corps of Engineers (ACOE) Approval: Any project that involves the discharge of dredge or fill material to a Water of the United States, including wetlands at dams, requires approval from the ACOE under Section 404 of the Clean Water Act. General Condition 21 specifies that any stream work that temporarily or permanently impacts upstream or downstream flood conditions would be reviewed as a Category II (screened) activity. An Individual Permit would be required for direct and secondary impacts (including areas drained) greater than 1 acre or under the discretionary authority of the ACOE. It is anticipated that the water level impacts resulting from this project would exceed 1 acre and that an Individual Permit may be required. Early coordination with ACOE will determine which permit will be required.

EPA National Pollutant Discharge Elimination System (NPDES): NPDES permits are required for projects that disturb greater than 1 acre. This project is likely to exceed 1 acre in size and therefore a NPDES permit is anticipated.

8. <u>Project Implementation and Construction</u>: According to the Guide, construction has cost between \$35,000 and \$290,000 for Massachusetts dam removal projects.



PROJECT : Bartlet Pond Dam	PROJECT NUMBER: 10177.00						
SUBJECT: Opinion of Probable Cost							
COMPUTATIONS BY: ACJ	DATE: February 2011						
CHECK BY: ARO	DATE: February 2011						

Dam Removal

Item	Qty	Unit	U	nit Price		Total	Source	Notes
General Bid Items Portable Toilets Project Superintendent QC Plans Submittals Schedules Meetings	2 40 20 20 14 8	MON DAY HRS HRS HRS FA	\$ \$ \$ \$ \$ \$	150.00 460.00 75.00 75.00 75.00 150.00	\$ \$ \$ \$ \$ \$	300 18,400 1,500 1,500 1,050 1 200	Engineers Judgment	Assume \$45/hr labor & \$100/d per diem
Subtotal	0		Ŷ	100100	\$	23,950		
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Quality Control Proctor Tests Concrete Sampling/Testing Concrete Compression Tests Sieve Analyses Field Density Testing Chemical Soil Tests Subtotal	0 0 0 0 1	TEST SET TEST TEST DAY TEST	\$\$\$\$	225.00 400.00 30.00 100.00 500.00 1,000.00	\$\$ \$\$ \$\$ \$\$ \$	- - 1,000 1,000	Laboratory Quote plus markup Recent project bids Laboratory Quote plus markup Laboratory Quote plus markup Recent project bids Recent project bids	
Mobilization & Demolition								
Mobilization Access Improvements Demobilization Subtotal	1 1 1	LS DAY LS	\$ \$ \$	7,000.00 1,400.00 4,000.00	\$ \$ \$	7,000 1,400 4,000 12,400	Engineers Judgment Means Crew B-7 Engineers Judgment	Site Access
Erosion Control								
Hay bales	150 300	EA	\$ ¢	12.00	\$ ¢	1,800 2,550	Mass Weighted Bid Prices 767.8	
Turbidity Barrier Subtotal	40	LF	\$	30.00	\$ \$	1,200 5,600	Recent project bids	
Dewatering/Control of Water								
Temporary Cofferdam	1	LS	\$	35,000.00	\$	35,000	Engineer's Estimate	
Bypass Piping	1	LS	ф \$	10.000.00	ф \$	10.000	Engineer's Judgment	
Subtotal				,	\$	60,000	<u> </u>	
R and D Existing Spillway								
Demolition	150	CY	\$	150.00	\$	22,500	Engineer's Estimate	Removal of existing dam
Disposal Earth Excavation & Backfill	300 200	CY	\$ \$	40.00 30.00	ծ \$	12,000	Engineer's Estimate	Around existing
Subtotal					\$	40,500		-
Slope Protection								
Armor Stone	100	TON	\$ ¢	50.00	\$ ¢	5,000	Recent Project Costs	3H:1V Sides, 5ft Crest (1 ft High)
Geotextile Filter Fabric	120	SY	э \$	43.00	ф \$	2,300		
Subtotal					\$	8,300		
Sediment Removal Sediment Excavation Sediment Disposal	0 0	CY TON	\$ \$	-	\$ \$	-	NOTE: Extent of sedimentation within the po contamination (if any) to be determined as p with these items are currently unknown and	and and implications associated with art of the feasibility study. Costs associated not included in this opinion of cost
Subtotal					\$	-		
	SUBTOTAL Contract Bonds 30% Contingency Engineering & Design Feasibility Study Permitting Permitting Contingency				\$ \$ \$ \$ \$ \$ \$ \$	152,000.00 5,000.00 46,000.00 50,000.00 50,000.00 50,000.00	(Rounded to the nearest \$1,000) NOTE: Scope of permitting to be determined	3% of Project Subtotal
					\$	200,000.00	can vary substantially	. , , , , , , , , ,
Construction Observation CONCEPTUAL OPINION OF TOTAL PROJECT COST				\$ \$	30,000.00 583,000.00			