

SUMMARY REPORT

**HISTORIC PROPERTIES SURVEY AND
ARCHAEOLOGICAL RECONNAISSANCE SURVEY
GREEN RIVER ECOSYSTEM RESTORATION PROJECT**

Greenfield, Massachusetts

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Submitted to:

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TABLE OF CONTENTS

1.0	INTRODUCTION	4
2.0	PROJECT AREA DESCRIPTION	4
3.0	PROJECT AREA OF POTENTIAL EFFECT (APE)	5
4.0	SCOPE AND AUTHORITY	7
5.0	AGENCY AND NATIVE AMERICAN CONSULTATION	8
6.0	CULTURAL RESOURCE INVESTIGATIONS	8
6.1	HISTORIC ARCHITECTURAL SURVEY RESULTS AND RECOMMENDATIONS	8
6.2	ARCHAEOLOGICAL SURVEY RESULTS AND RECOMMENDATIONS	15
7.0	SUMMARY	17

LIST OF FIGURES

Figure 1.	Currently proposed direct impact areas (January 2010) corresponding to the archaeological resources APE, Green River Ecosystem Restoration Project	6
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LIST OF TABLES

Table 1.	Resources in Greenfield, MA within project APE that are Listed, Determined, or Recommended Eligible for the National Register of Historic Places	10
Table 2.	Summary of Recommendations of Effect for Historic Resources in the Green River Ecosystem Restoration Project APE	14

APPENDICES

Appendix A.	Project Correspondence	18
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1.0 Introduction

The National Oceanic and Atmospheric Administration Restoration Center (NOAA), in collaboration with the Connecticut River Watershed Council (CRWC), Town of Greenfield, American Rivers, United States Fish and Wildlife Service (USFWS), and other local, state, and federal agencies, is proposing to restore native diadromous fish passage and other riverine functions to the Green River by removing the Wiley & Russell Dam and Mill Street Dams in Greenfield, Massachusetts. PAL Inc., an independent, non-profit corporation with offices and laboratories located in Pawtucket, Rhode Island, was contracted by the project partners to conduct a historic reconnaissance and intensive survey and archaeological reconnaissance survey for the Green River Ecosystem Restoration Project, in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended. PAL Inc. is a leading authority in cultural resource management and specializes in terrestrial and marine archaeology, architectural history, research and documentation, and preservation planning throughout the Northeast.

The following report is a summary of PAL's cultural resources survey findings. Due to the sensitive nature of some of the material contained within the full technical report prepared by PAL in February 2011, it has not been released to the general public pending review by the Massachusetts State Historic Preservation Office/Historical Commission (MHC), in accordance with Section 304 of the NHPA as amended, 16 U.S.C. 470W-3(a) to (c) and MGL C.9, S.26A(1) and 27C Under 950 CMR 70.13(7).

Comments on the summary report (or the full report – pending response by MHC) should be submitted by April 30, 2011 to:

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2.0 Project Area Description

The Project involves the removal of the two most down gradient dams on the Green River in Greenfield: the Wiley & Russell Dam just north of Meridian Street and the Mill Street Dam (Figure 1). Both dams are run-of-river, meaning all the water flowing into the impoundments above the dams is the same as the flow from the dams. The goals of the dam removals are to restore fish passage through this section of the River, provide an opportunity for recreational boating, and to eliminate the maintenance and repair requirements of the dam owner, the Town of Greenfield. Preliminary design for the Project has been completed by Fuss & O'Neill (January 2010) and included a survey of the river channel and analysis of predicted river changes, sediment sampling and analysis, and evaluation of potential upstream wetland impact. The Wiley & Russell Dam (also known as the Greenfield Tap and Die Plant #1 Wood Crib Dam) is the most downstream dam on the Green River. It is a complete barrier to migratory fish passage and complete removal is proposed. The Mill Street Dam is located approximately 1,500 feet upstream of the Wiley & Russell Dam. It extends partially beneath the Mill Street Bridge at its left end and shares the bridge abutment structurally. Complete removal of the dam is proposed. The removal of the Mill Street Dam is expected to lower the river somewhat adjacent to the pond on the upstream side of the dam, increasing the groundwater gradient toward the river from the pond. Approximately 3 to 4 acres of land underwater are expected to become exposed riverbank following the dam removal (Fuss & O'Neill 2010:28).

The dam removals, per Fuss & O’Neill’s January 2010 preliminary design plan set, will require the use of temporary access and staging on town-owned land and on private property as well as the potential construction of three pumping settling basins, one at the Mill Street Dam and two at the Wiley & Russell Dam. Access to the Wiley & Russell Dam is proposed on both sides of the river and will extend into the riverbed following dewatering through the use of a coffer dam extending from the upstream to the downstream side of the dam. Proposed pumping settling basins may be built on the upland shorelines adjacent to both sides of the dam. Proposed access to the Mill Street Dam may be on paved and unpaved sections of Meade Street and across adjacent riverbank. The river bed access will follow dewatering through the use of a coffer dam that will extend from the upstream to the downstream side of the dam. An anti-tracking apron is proposed at the west end of Meade Street for construction entrance. A pumping settling basin is proposed on the opposite (Green River Cemetery) side of the river.

Potential upstream impacts due to changes in water flow include existing bridge foundation scour and scour around utility crossings. Utility crossings include two pipes (sewer and water line) near the Route 2A Bridge and one just upstream of the Colrain Street Bridge. Bridges that cross the project study area include the Mill Street Bridge, the Route 2A Bridge, the Railroad Bridge, the Meridian Street Bridge, and the Colrain Street Bridge. The current project plans include leaving the sewer and water line pipes that cross in the river between the Route 2A bridge and the Railroad Bridge in place and providing additional protection at this crossing. The protection may be in the form of a grade-control (or riffle) structure placed in the river immediately downstream of the pipes. The structure would consist of cobble-sized stones that are natural to the river and will allow fish passage over the cobbles upstream. Temporary access would be from River Street into the riverbed on the west shoreline during Phase I and then from a former trailer park into the riverbed on the east shoreline during Phase 2, following dewatering through the use of a coffer dam. The use of an enlarged staging area within the former trailer park is contemplated, although not indicated on the current plan sets.

3.0 Project Area of Potential Effect (APE)

As defined in the Advisory Council on Historic Preservation’s (Council) regulations, the APE for a project is the “geographic area or areas within which an undertaking may directly or indirectly cause changes in the character of or use of historical properties, if any such properties exist” (36 CFR 800.16[d]). The APE is defined based upon the *potential* for effect, which may differ for aboveground resources (historic structures and landscapes) and subsurface resources (archaeological sites). In addition to the actual site of the undertaking, the APE also includes other areas where the undertaking could cause changes in land use, traffic patterns, or other aspects that could affect historic properties. Different project factors may produce more than one APE for a given undertaking. Factors with potential to cause changes are noise, vibration, visual (setting), traffic, atmospheric, construction, indirect, and cumulative.

For archaeological resources, the APE is defined as the direct project impact area depicted on preliminary design plans dated January 2010. For historic aboveground resources, the recommended APE was defined as the dams and the immediately surrounding area where the project has the potential to have a direct physical or indirect, such as visual, effect on significant historic resources. The Green River is situated within steeply-sloping river banks ranging from approximately 6–20 feet in height. Dense urban construction patterns, bridge crossings, and, in some cases, riverine corridor tree growth often limit the visibility of the two project dams and river within the project area. For these reasons, PAL recommended that a distance of 200 ft from the project area boundaries (direct impact areas), staging areas, and affected areas of the river channel between and upstream of the two dams is sufficient to capture resources that may be impacted by the proposed undertaking. The resulting recommended APE is a 4,600 ft-long curvilinear corridor ranging from approximately 500–600 ft in width and encompassing the Green River between and including the Mohawk Trail (Route 2A) to the north and Meridian Street to the south. The recommended APE accounts for the possibly enlarged staging area within the former trailer park.

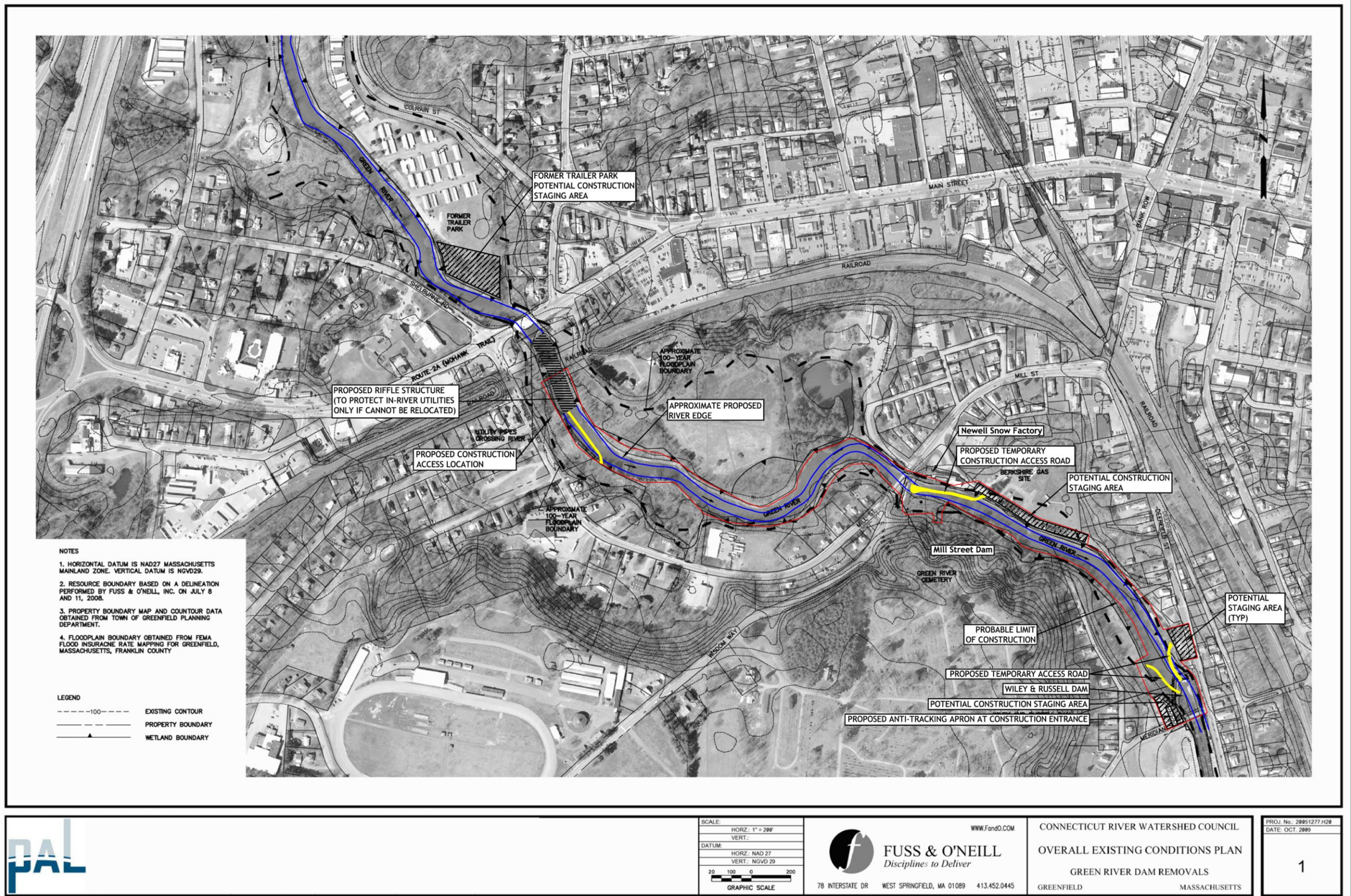


Figure 1. Currently proposed direct impact areas (January 2010) corresponding to the archaeological resources APE, Green River Ecosystem Restoration Project.

4.0 Scope and Authority

Section 106 of the NHPA requires federal agencies, including the NOAA, as the lead federal agency for the Project, to take into account the effect of the undertaking (e.g., the removal of the two dams) on cultural resources listed or eligible for listing in the National Register of Historic Places (National Register) and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. The Section 106 process is coordinated at the state level by the State Historic Preservation Office (SHPO), represented in Massachusetts by the Massachusetts Historical Commission (MHC). In May 2009, the MHC reviewed the project information provided by NOAA, and requested that NOAA undertake additional identification and evaluation efforts; study the project's direct and indirect effects to identified historic properties; and consider alternatives to avoid, minimize, or mitigate any adverse effects to historic properties (MHC letter dated May 19, 2009). At that time, the MHC determined that only one of the direct impact areas required a locational (intensive) level archaeological survey (950 CMR 70) to determine if construction of a proposed access road east of Mill Street may affect archaeologically sensitive areas. No other direct project impact areas were determined by the MHC to require archaeological investigations in the form of a reconnaissance or intensive level survey. For historic (aboveground) resources, the MHC requested additional research and evaluation of the two direct impact areas at the Mill Street Dam and the Wiley & Russell Dam and their component elements to evaluate the historical significance of the two dams and the adjacent areas that may be directly and indirectly affected by their proposed removal. The MHC, however, did not specify the horizontal extent of the direct and indirect Areas of Potential Effect (APEs) for the project.

By January 2010 the project design plans had advanced to approximately 20–30 percent completion, and the project partners provided the MHC and potential consulting parties with a revised plan set for review. A meeting was held at the MHC on February 25, 2010 with NOAA, the Connecticut River Watershed Council, and American Rivers to discuss the revised plans and the scope of the cultural resources investigations in accordance with Section 106 of the NHPA. At the meeting, it was determined that an archaeological reconnaissance survey would be undertaken for the direct project impact areas as depicted on the January 2010 project plans. The archaeological reconnaissance survey would be conducted concurrent with the historic reconnaissance and intensive survey, previously requested by the MHC and approved by NOAA and the project partners. The scope of the archaeological reconnaissance survey took into account comments received from potential consulting parties, including the Greenfield Historical Commission, the Museum of Our Industrial Heritage, and Historic Factories LLC. The reconnaissance surveys were designed to collect the information needed to assist NOAA, as the lead federal agency, in determining the project APEs for inventoried archaeological resources and sensitive areas; and aboveground historic resources including buildings, structures, districts, and landscapes, and further survey and evaluation efforts that may be needed.

The primary goals of cultural resource investigations conducted as part of the Section 106 review process are to:

- ◆ locate, document, and evaluate buildings, structures, objects, landscapes, and archaeological sites that are listed, or eligible for listing, in the National Register;
- ◆ assess potential impacts of the Project on those resources; and
- ◆ provide recommendations for subsequent treatment, if necessary, to assist with compliance with Section 106.

PAL's cultural resources investigations will assist the NOAA and the project partners in fulfilling the Section 106 consultation process for the project as outlined in the regulations at 36 CFR 800.4 to 800.6. The archaeological investigations were conducted under state archaeological permit number 3166, issued on March 19, 2010 by the MHC/State Archaeologist under 950 CMR 70 for the reconnaissance survey

(see Appendix A). The cultural resources surveys were also conducted in compliance with Massachusetts General Laws, Chapter 9, Sections 26–27C, as amended by Chapter 254 of the Acts of 1988 (950 CMR 70/71). PAL has prepared a technical survey report for historic and archaeological resources for the Project, which was filed with the Project Partners and consulting parties in February 2011.

5.0 Agency and Native American Consultation

In addition to the consultation with the MHC described above, NOAA, as the Lead Federal Agency, has initiated Section 106 consultation with various local agencies, individuals, and Native American groups. All correspondence related to the cultural resources survey for the Green River Ecosystem Restoration Project are included in Appendix A of this summary document.

Under Section 106, federally recognized Native American tribes and other interested parties must be consulted regarding their concerns for cultural resources in the project area. NOAA sent out written notification letters to the appropriate tribal authorities including the Wampanoag Tribe of Gay Head/Aquinnah, the Mashpee Wampanoag Tribe, the Narragansett Tribe, and the Stockbridge-Munsee Tribe. To date, only the Stockbridge-Munsee Tribe has responded with a letter of no archaeological interest in the project (see Appendix A).

PAL’s reconnaissance survey also included a thorough review of information provided on the two mill privileges at Mill and Meridian streets, and on the historical land ownership of the Newell Snow Factory and surrounding areas provided by the Museum of Our Industrial Heritage, Historic Factories LLC, and the Greenfield Historical Commission. Additional information about the historic archaeological potential of the dam work areas was obtained through a site meeting held on April 19, 2010 with James Terapane, Member Manager of Historic Factories LLC; Albert Shane, curator and principal historian of the Museum of Our Industrial Heritage and Member Manager of Historic Factories LLC; and Marcia Starkey, member of the Greenfield Historical Commission. Elizabeth Chilton, associate professor of Anthropology at the University of Massachusetts-Amherst, whose Center for Heritage and Society is planning potential future educational collaboration efforts with the Museum of Our Industrial Heritage, was also interviewed for information regarding the archaeological sensitivity of the area based on an informal visit she made to the museum’s riverfront area in the fall of 2009.

6.0 Cultural Resource Investigations

Cultural resource investigations are conducted in accordance with federal and state SHPO guidelines. Suzanne Cherau of PAL serves as Principal Investigator for archaeological investigations conducted for Project, assisted by Erin Timms (industrial archaeologist). Matthew Kierstead serves as Senior industrial historian for the historic architectural investigations conducted for the Project, assisted by John Daly (industrial historian). Ms. Cherau, Mr. Kierstead, Mr. Daly, and Ms. Timms meet or exceed all requirements set forth by the Secretary of Interior at 36 CFR Part 61.

6.1 Historic Architectural Survey Results and Recommendations

The PAL industrial historian performed a reconnaissance survey for historic aboveground resources on December 30, 2009 and an intensive survey on January 11–12, 2010. The reconnaissance survey consisted of a walkover/drive-over to become familiar with the project area and surrounding environment, establish a recommended project APE, confirm the presence of previously inventoried resources, and identify all previously undocumented resources more than 50 years of age in the project APE. High-resolution digital photographs were taken; basic notes about the style, condition, and integrity of the resources were recorded; and the resources were located on project maps. During both the reconnaissance

and intensive surveys, where resource areas extended outside of the recommended APE, PAL staff included those portions of the area outside of the APE within the survey.

Following the reconnaissance survey, PAL staff evaluated the field results using historical and project information to identify resources requiring additional study in an intensive survey. Properties were recommended for intensive survey on the basis of their current or potential eligibility for the National Register, the level of available historical information characterizing the characteristics of significance of the resource, and the likelihood that the resource might be subject to impacts from the proposed undertaking. Resources recommended for intensive survey included:

- The Mill Street Dam (no MHC No.);
- The Wiley & Russell Dam (Greenfield Tap & Die Dam, GRE.936);
- The Mill Street Area (GRE.L);
- The Deerfield Street Area (GRE.Q);
- The Newell Snow Factory (GRE.015); and the
- Meridian Street Bridge (Bridge No. G-12-26, GRE 921).

The intensive field survey for recommended properties consisted of additional high-resolution digital photography; detailed notes on the setting, style, condition, integrity, structural or architectural details, and the water power landscapes; and measurements and/or sketch plans to document significant engineering features of the two dams. Detailed background research on the histories of the intensive survey properties or areas was also undertaken, as described above. The collected data were used to make National Register recommendations for those properties that have not been evaluated. Recommendations regarding the potential effects of the Project are made for properties that are listed, determined eligible, or recommended by PAL as eligible for listing in the National Register. The National Register criteria for evaluation were applied to ensure that all properties that appeared to have some potential for listing in the National Register were considered during the assessment of Project effects.

PAL identified a total of 2 areas and 173 individual properties over 50 years of age within the project APE during the reconnaissance survey. Of these resources, one area (the Mill Street Area) and three individual properties (Newell Snow Factory, Green River Cemetery, and Meridian Street Bridge) have previously been determined as eligible for the National Register by the MHC. One additional property, (the Wiley & Russell Dam), has previously been determined eligible for the National Register as a contributing resources a National Register-eligible area. PAL recommends one previously-surveyed area (the Washington Street Area) and one new property (the Mill Street Dam) as eligible for the National Register individually or as contributing elements within National-Register Eligible Districts. A summary of the historic resources determined or recommended as eligible for the National Register is presented in Table 1.

Six properties were selected for intensive survey in order to make recommendations of eligibility or to better evaluate the nature of potential impacts and effects to these properties from the proposed project. Properties selected for such intensive survey included the Mill Street Dam (no MHC No.); the Wiley & Russell Dam (Greenfield Tap & Die Dam, GRE.936); the Mill Street Area (GRE.L); the Washington Street Area (GRE.Q); the Newell Snow Factory (GRE.015); and the Meridian Street Bridge (Bridge No. G-12-26, GRE 921). Updated or new MHC Forms and MHC Criteria Statement Forms, where applicable, for select intensive survey properties (the Mill Street Dam (no MHC No.); the Wiley & Russell Dam (GRE.936); the Mill Street Area (GRE.L); the Deerfield Street Area (GRE.Q); and the Meridian Street Bridge (Bridge No. G-12-26, GRE 921) are included in PAL technical report for the project.

Table 1. Resources in Greenfield, MA within project APE that are Listed, Determined, or Recommended Eligible for the National Register of Historic Places.

Resource No.	Photo No.	Property Name	Resource Type	Street No.	Street	Style/Form	Est. Date	MHC No.	MHC Area	NR Status
A	001 - 004	Mill Street Area	District		Mill Street	Residential / Industrial	Late 19th century		GRE.L	MHC-DOE
B	005 - 008	Washington Street Area	District		Washington Street	Residential	1836-1920		GRE.Q	RNRE
C	001 - 008	Green River Industrial Corridor Area	District		Mill and Washington Streets	Residential / Industrial	1850-1920			RNRE
001	009	Mill Street Dam / Greenfield Electric Light & Power Dam	Structure		Mill Street	Concrete oggee-profile dam	1912		GRE.L	MHC-DOE-C
043	051, 052	Green River Cemetery	Cemetery	56	Wisdom Way	Rural Cemetery	1851	GRE.806, .004, .906	GRE.T	MHC-DOE
044	053, 054	Newell Snow Factory / Greenfield Steel Stamp Factory	Building		Mead Street	Industrial	1879-80	GRE.015	GRE.L	MHC-DOE
102	112	Wiley & Russell Bridge / Bridge No. G-12-26	Structure		Meridian Street	Reinforced concrete arch bridge	1917	GRE.921	*	MHC-DOE

National Register Status Key:

MHC-DOE Property that has been determined eligible by MHC

MHC-DOE-C Property that is contributing to an area that has been determined eligible by MHC

RNRE Property that has been evaluated as eligible by PAL

* Proposed addition to GRE.Q

Two properties (the Newton Street School and a Bungalow at 22 Conway Drive) were identified as potentially eligible for the National Register but were not evaluated because the project is not likely to impact the characteristics of significance of these properties. Three resources; the Greenfield Tap & Die Plant No. 1 (GRE.X), a house at 98 Deerfield Street (GRE.18), and the Mill Street Bridge (GRE.923); are within the project APE and included in the MHC Inventory files but were found to be demolished in the field.

The historic resources intensive survey determined that the direct and indirect project APE contains seven historic resources that are determined or recommended eligible for the National Register. PAL's evaluations of the potential impacts and effects that may result to these resources from the proposed undertaking are provided below.

Projects determined to have an adverse effect on historic properties will require consultation to seek ways to avoid, minimize, or mitigate the effect in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). Specific recommendations of possible means to avoid, minimize, or mitigate any adverse effects to historic properties are also provided. These conclusions and recommendations are summarized in Table 2.

Mill Street Dam

The Mill Street Dam (no MHC No., Dam ID no. 2-6-114-4; PAL resource no. 1) is not recommended individually eligible for the National Register and therefore will not be directly impacted as an historic resource. PAL recommends that the Mill Street Dam is a contributing element of the Mill Street Area (GRE.L), which was determined eligible for the National Register as a potential district through a consensus determination of eligibility between the MHC and the Massachusetts Highway Department (MassHighway) in 2009 (Brona Simon, MHC, to Lisa Cavallaro, NOAA, letter May 19, 2009). Potential impacts resulting to this area are discussed below.

The Wiley & Russell Dam (a/k/a Greenfield Tap & Die Plant No. 1 Wood Crib Dam)

The Wiley & Russell Dam (GRE.936, Dam ID No. 2-6-114-3; PAL resource no. 2) was included as a resource in the Greenfield Tap & Die Plant #1 Area (GRE.X), which was determined eligible by the MHC for the National Register in 2001 and subsequently demolished (Steinitz 2001). The dam cannot be considered as contributing to the significance of a resource that is now demolished. However, the dam is recommended as individually eligible at the local and state levels for the National Register and is also recommended for inclusion in the expanded Washington Street Area (GRE.Q) discussed below.

The proposed undertaking would result in a direct adverse effect (demolition) on the qualities of significance and integrity of the Wiley & Russell Dam, a potentially significant historic property. The project proponents should consider ways to avoid, minimize, or mitigate adverse effects. Possible measures could include any or all of the following:

- Historic written and photographic documentation of dam structure before and during demolition, including collection of cross-section, plan, and elevation drawings after impoundment drawdown and coffering and during demolition; and
- Public education/interpretation of the history of the mill privilege with specific emphasis on the significance of John Russell & Co. and Wiley & Russell & Co.

Demolition of the dam would also directly impact the Washington Street Area, as discussed below.

Mill Street Area

PAL recommends that the Mill Street Dam is a contributing element of the Mill Street Area (GRE.L, PAL Area A), which the MHC determined eligible for the National Register as a potential district.

The proposed undertaking would have a direct adverse effect on the qualities of significance and integrity of a significant potential historic district by demolishing a resource (Mill Street Dam) that contributes to the district as a collection of commercial and industrial resources related to Greenfield's manufacturing economy. The project proponents should seek ways to avoid, minimize, or mitigate adverse effects. Possible measures could include:

- Public education/interpretation of the history of the mill privilege; and
- Photographic and written documentation of the Greenfield Power company dam, including history of GLE&P and its significance in the Town of Greenfield.

Newell Snow Factory

The Newell Snow Factory (GRE.015; PAL resource no. 28) was determined individually eligible for the National Register by the MHC in 2007.

No direct impacts to the Newell Snow Factory are anticipated as a result of the proposed undertaking. Indirect (visual) impacts to the factory will result from the demolition of the Mill Street Dam. These indirect impacts will result in adverse effects to this significant historic property. The Mill Street Dam is an important visual component in the setting of the Newell Snow Factory, which historically derived a portion of its energy for manufacturing from the fall of water at the mill privilege. Although the current Mill Street Dam did not provide this power, the dam was constructed within the factory's period of significance on the same location of an earlier dam that did provide water power to the Newell Snow Factory. As a visual analogue for the earlier dams at the privilege, the Mill Street Dam helps to interpret the factory's historic function as a water-powered industrial facility. It is a characteristic of the property that qualifies it for inclusion in the National Register.

The project proponents should seek ways to avoid, minimize, or mitigate adverse effects that will result to the Newell Snow Factory. Possible measures could include:

- Public education/interpretation of the history of the mill privilege, as discussed in the Mill Street Area section above.

Green River Cemetery

The Green River Cemetery (GRE.T; GRE.806; GRE.004; and GRE.906; PAL resource no. 072) was determined eligible for the National Register by the MHC in 2001 (Petrisko 2001). PAL recommends that no direct impacts or indirect (visual, noise, or vibration) impacts will result to the property as a result of the proposed undertaking. The property's physical remoteness and intervening tree cover shield it from any of these potential impacts.

The project's consulting parties have expressed concern that dam removal may result in direct adverse effects to the Green River Cemetery because of potential accelerated erosion along the Green River's west bank and intervening bluff between the Green River and cemetery. PAL does not have sufficient expertise to assess potential impacts to the cemetery resulting from changes in river hydrology. PAL recommends that the project proponents provide data about projected river levels after dam removal and

their potential to result in a direct adverse effect to the Green River Cemetery by means of accelerated erosion.

Meridian Street Bridge

The Meridian Street Bridge (a/k/a Wiley & Russell Bridge), Bridge No. G-12-26, GRE.921; PAL resource no. 117) was determined eligible for the National Register in 1987 (Smith 1987). The characteristics of significance noted in this determination included the bridge's length and high level of integrity as a Neoclassical concrete arch structure. The current survey also indicates that the bridge crossing is also significant for its associations with the Wiley & Russell and Greenfield Tap & Die companies, whose physical plant is now demolished.

No direct impacts to the Meridian Street Bridge are anticipated from the proposed undertaking. Indirect visual impacts to the property may result from the change in the bridge's setting after the demolition of the Wiley & Russell Dam. However, PAL recommends that effects resulting from these impacts will be neutral, not adverse. The bridge's significance as derived from its association with the Wiley & Russell/Greenfield Tap & Die plant has already been compromised by the demolition of the industrial complex.

Washington Street Area

PAL recommends that the enlarged Washington Street Area (GRE.Q, PAL area B) is eligible for listing in the National Register under Criteria A and C at the local level for its associations with Greenfield's cutlery and precision tool industries, and as a homogenous collection of late-nineteenth-century Greek Revival and Vernacular Victorian Style worker housing. The Wiley & Russell Dam is a contributing resource to this potential district.

The proposed undertaking would have a direct adverse effect on the qualities of significance and integrity of this potentially significant historic district. The project would demolish a contributing resource (Wiley & Russell Dam) to the area that conveys the historical relationship between the residential neighborhood and manufacturing at the John Russell & Co. and Wiley & Russell industrial complexes. The project proponents should seek ways to avoid, minimize, or mitigate these adverse effects. Possible measures could include any or all of the following:

- Public education/interpretation of the history of the Washington Street neighborhood and its relationship to the Wiley & Russell Dam; and
- Historic written and photographic documentation of the Wiley & Russell Dam, as discussed above.

Table 2. Summary of Recommendations of Effect for Historic Resources in the Green River Ecosystem Restoration Project APE.

Historic Property	Recommendation of Impacts and Effects	Recommended Action
The Mill Street Dam (no MHC No., Dam ID no. 2-6-114-4; PAL resource no. 1)	No direct impacts to the individual resource. Direct impacts to the Mill Street Area, as discussed below.	Consider ways to avoid, minimize, or mitigate adverse effects to the Mill Street Area, as discussed below.
The Wiley & Russell Dam (GRE.936, Dam ID No. 2-6-114-3; PAL resource no. 2)	Direct impacts resulting in an adverse effect (demolition).	Consider ways to avoid, minimize, or mitigate adverse effects, including: <ul style="list-style-type: none"> • Historic written, photographic, and architectural documentation of the dam; and • Public education/interpretation of the history of the mill privilege.
Mill Street Area (GRE.L, PAL Area A)	Direct impacts resulting in an adverse effect (demolition of a contributing resource, the Mill Street Dam).	Consider ways to avoid, minimize, or mitigate adverse effects, including: <ul style="list-style-type: none"> • Public education/interpretation of the history of the mill privilege; and • Photographic and written documentation of the Mill Street Dam and the history of GLE&P.
Newell Snow Factory (GRE.015; PAL resource no.028)	Indirect (visual) impacts resulting in an adverse effect.	Consider ways to avoid, minimize, or mitigate adverse effects, including measures as recommended for the Mill Street Area above.
The Green River Cemetery (GRE.T; PAL resource no. 072)	No direct impacts or indirect (visual, noise, or vibration) impacts.	Complete hydrological study of projected river levels following dam removal to determine possibility of adverse effects resulting from erosion.
Meridian Street Bridge (Bridge No. G-12-26, GRE.921; PAL resource no. 117)	Indirect (visual) impacts resulting in no adverse effect.	No action recommended.
Washington Street Area (GRE.Q, PAL area B)	Direct impact (demolition of a contributing resource) resulting in an adverse effect.	Consider ways to avoid, minimize, or mitigate adverse effects, including: <ul style="list-style-type: none"> • Public education/interpretation of the history of the Washington Street neighborhood and its relationship to the Wiley & Russell Dam; and • Historic written and photographic documentation of the Wiley & Russell Dam, as discussed above.

6.2 Archaeological Survey Results and Recommendations

The archaeological reconnaissance survey consisted of archival research and a walkover survey conducted from January to May 2010. The archival research included a review of local geography, ecology, soils, and Native and EuroAmerican history of the project vicinity in order to develop and help support predictive statements for archaeological sites that may be present and assist in the interpretation/significance of any identified resources. MHC site files, cultural resource management memoranda and reports, and other data on known or expected cultural resources within the project vicinity were reviewed. The archival research was used to provide sufficient environmental and cultural contextual information for the survey and any resource National Register eligibility recommendations. Available literature and historical maps specifically related to the Mill Street Dam, Wiley & Russell Dam, and the Green River were also reviewed. Environmental and cultural (pre-contact, contact, and post-contact period) contexts were developed using information collected during the archival research. These contexts are included in the PAL technical survey report dated February 2011.

Field survey, conducted on April 19, 2010, consisted of a walkover with close ground surface inspection followed by existing conditions photography, detailed notes, and mapping. The field survey was designed to locate and record any visible archaeological deposits within the project work areas including embankments at the river's edge and in the river channel. PAL took notes on the physical attributes of identified resources along with digital photographs. PAL analyzed the results of the walkover survey in the context of the archival research to provide an assessment of the archaeological sensitivity of these areas and make recommendations for avoidance or further survey if project impacts are planned in testable ground surfaces.

Information collected during the archival research and walkover survey was used to develop a predictive model of potential archaeological site types and their cultural and temporal affiliation. The development of predictive models for locating archaeological resources has become an increasingly important aspect of cultural resource management planning. The predictive model considers various criteria to rank the potential for the Green River Restoration Project APE to contain archaeological sites. The criteria are proximity of recorded and documented sites, local land use history, environmental data, and existing conditions. The project APE was stratified into zones of expected archaeological sensitivity to determine which areas are sensitive for the presence of significant Native American and Euro-American archaeological resources. The reconnaissance survey determined that sensitive archaeological resources are present in the project APE including the two dam removal work areas.

There are no recorded archaeological sites in the state archaeological inventory files within the direct project APE. There are, however, four recorded Native American archaeological sites within 1 mile to the south along both sides of the Green River. These sites consist of pre-contact period Native American cultural deposits identified through town histories and avocational collector activities. In addition to this cluster of recorded Native American sites, two post-contact period industrial site areas have been reported adjacent to the project dams by members of the Greenfield Historical Commission and Our Museum of Industrial Heritage. The historic Newell Snow Factory property, located just downstream of the Mill Street Dam, formerly contained structures and waterpower landscape features associated with a sawmill and gristmill that date to the late 1600s and early 1700s, and a series of factories including blacksmiths, iron furnaces and foundries, and machine shops that operated from the early 1800s through early to late 1900s. Structural remains and artifacts have been reported in this area. Structural remains are also reported just upstream of the Wiley & Russell Dam at the site of the documented mid-nineteenth century John Russell & Company and later the Wiley & Russell Company and Greenfield Tap and Die Corporation. However, no state inventory archaeological site forms have been filled out to date for these reported historic site areas, so they are not yet included in the state archaeological site inventory.

The archaeological reconnaissance survey identified archaeologically sensitive areas within the Project APE. The sensitive areas have the potential to contain pre-contact Native American and post-contact (Euro-American) industrial archaeological resources. The presence of the Green River combined with well-drained soils and nearly level terrain on both shorelines indicates that archaeological resources associated with Native American use of the area may exist in the project work areas. Expected resources could include habitation and resource processing sites on the shorelines and stone or wood stake fish weirs for the trapping of cold water fish at the natural bends and fall lines of the river. The extant site database for the area suggests that site types would most likely constitute seasonally occupied temporary or task-specific camps, but isolated and multiple Native American burials are also possible. The river may have been navigable for small, shallow vessels through this area, and the presence of dugout canoes used both by Native Americans during the pre-contact and contact periods and by European traders during the early historic period is considered possible in unexcavated portions of the river channel below accumulated sediments.

The post-contact Euro-American archaeological resources expected in the project work areas are related to the documented mill privileges at the present-day Mill Street dam and the Wiley & Russell dam locations. The riverbank on the east side below the Mill Street Dam contains surface evidence of structural features (e.g., stone support pier, stone walls, depressions) and artifacts (e.g., files, nails, sheet metal litter, industrial waste) that date from the documented factories including blacksmiths, iron furnaces and foundries, and machine shops that operated from the early 1800s through early-mid-1900s. The Newell Snow Factory (MHC #GRE.15) (ca. 1823 with later additions) at Meade Street is the last surviving building related to the nineteenth-century factory businesses at this mill privilege.

The shorelines to the south at Meridian Street are documented to have contained the mid-nineteenth-century John Russell Cutlery Co. and later the Wiley & Russell Manufactory Company complex, which included buildings and structures primarily on the east side of the dam (all now demolished). The Greenfield Tap and Die Corporation also used the dam's water power, and all buildings and structures that were located on the west and south sides of the river and Meridian Street have all been demolished. The shorelines on both sides of the river adjacent to the Wiley & Russell Dam contain the remains of waterpower infrastructure and building foundations related to these mill sites.

Meade Street, which runs parallel to the river, was historically part of a yard or work area between the two mill complexes. It is presently paved and packed dirt and gravel, and is assessed as sensitive for mill-related archaeological deposits below the pavement and road bed fill at the locations of the documented mill complexes.

Avoidance or additional walkover, subsurface testing, mapping, and artifact collection as part of an intensive (locational) archaeological survey (950 CMR 70/71) are recommended for the archaeologically sensitive portions of the project work areas based on the 2010 design plans. The goal of the intensive survey would be to locate, identify, and evaluate any significant belowground resources that may be present in project impact areas. The survey would be designed to collect the data needed to make recommendations regarding the significance and National Register eligibility of any identified Native American and/or Euro-American industrial-related archaeological resources. The intensive survey would be completed prior to the start of the dam removal excavations. Mitigation measures for the dam structures and associated work areas are also recommended, in the form of mapping, recordation, and monitoring for archaeological resources exposed along the shoreline and in the river during dam removal excavations. The archaeological mitigation measures at the dam sites assume National Register-eligibility of the Newell Snow Factory archaeological site (component of the NR eligible building historic property) under Criterion D, and the Wiley & Russell Dam complex, under Criterion A and C (discussed above for the recommended NR eligible Washington Street Area) and Criterion D. Criterion D pertains to archaeological sites that have the potential to yield important information related to prehistory and

history. In the case of both the Newell Snow Factory property including riverbank and riverbed and the Wiley & Russell mill and dam complex, both sites have the potential to contribute to an understanding of the evolution of the Green River mill industries, including the cutlery technology and manufactory processes that promoted the development of Greenfield in the nineteenth century.

7.0 Summary

The PAL technical historic properties survey and archaeological reconnaissance survey report, dated February 2011, for the Green River Ecosystem Restoration Project has been submitted to the Massachusetts SHPO, Greenfield Historical Commission, Native American groups, and all other consulting parties. The technical report will provide the baseline cultural resources information for any additional investigations that may be needed as design plans are advanced. All comments regarding the cultural resources component of the Project are included in Appendix A of this summary document.

NOAA, the Massachusetts SHPO, and the consulting parties will seek ways to avoid, minimize, or mitigate any adverse effects of the Project to historic properties in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800).

APPENDIX A
PROJECT CORRESPONDENCE