

## TOWN OF BROWNFIELD

April 2, 2016

William Laflamme  
State House Station #17  
28 Tyson Drive  
Augusta, ME 04333



Dear Mr. Laflamme:

Enclosed please find the Town of Brownfield's application for funding to replace the undersized twin culverts on Porter Road. Brownfield is requesting \$95,000.

The culverts were installed on an emergency basis eight years ago when the bridge that had stood there had deteriorated so badly that it was about ready to fall into the brook. The two culverts are sound but tend to trap ice during the winter in this low-gradient area. Three times in the last nine years, ice jams have blocked the undersized culverts diverting the brook north, making the road impassable and flooding cellars in nearby homes. We expect that the increased number of major rain events associated with climate change can only make this worse. Porter Road routes traffic north to Hampshire Road, the major route to/from New Hampshire. When the road is flooded, traffic and emergency vehicle travel times are greatly increased for most areas of the southwestern part of town. We need a more serviceable solution.

The Maine Stream Habitat Viewer shows the crossing as a potential barrier. It is a barrier under low to moderate flow conditions. It would be much more passable by our wild brook trout if replaced by an open bottom structure like the waste concrete block bridge design that we are proposing. The bridge will pass ice, high flows, and trout much more effectively than the double culvert does.

Brownfield prides itself on its wild trout waters. The Eastern Brook Trout Joint Venture Project gives our Shepards River watershed its highest habitat rating, and MDIFW Region A says that the stream has "abundance of juvenile brook trout, indicative of spawning habitat present." Our waters come with a high price. Brownfield has nine bridges and a number of large culverts to maintain. With a population of only 1,597, we are seriously challenged to do so, especially given cuts to State funding to towns. This grant program offers us hope to be able to maintain our failing infrastructure, and do so in a way that can help the wild brook trout that we so enjoy. This project would greatly improve access from the upper brook to over 27 miles of downstream habitat - you can't say that about many projects.

This grant program was designed to help towns in our situation. Please fund our proposal for an open-bottom structure so that we can replace the culverts and keep the road open and water out of our residents' cellars. The waste concrete block design is simple and we hope to be able to complete a portion of the work with town equipment.

Thank you for your consideration.

*Frank Day*

Frank Day  
Brownfield Public Works Director

**APPENDIX 1**

NOTE: Please refer to the full RFP instructions before completing this application. Specific details and explanations are included on pages 7 thru 9 of the application.

<b>Maine Department of Environmental Protection</b> <b>Request for Proposals for Stream Crossing Public Infrastructure Improvement Projects</b> <b>Proposal Application Form - 2016</b> <b>RFP# 201601017</b>			
<b>I. Applicant Information</b>			
Applicant Name <b>Town of Brownfield - ATTN: Frank Day - Director of Public Works</b>			
Applicant Mailing Address <b>231 Spring Street</b>	City <b>Brownfield</b>	State <b>ME</b>	Zip <b>04010</b>
Applicant Phone # <b>207 935-2152</b>		Applicant Email Address <b>brownfieldpw@fairpoint.net</b>	
<b>II. Agent/Consultant Information, if applicable</b>			
Agent Name			
Agent Mailing Address	City	State	Zip
Agent Phone #	Agent Email Address		
<b>III. Culvert/Stream Crossing Location (please attach a map(s) of the project location and a photo of the existing culvert/crossing to this application as described in Section IV):</b>			
Municipality or Unorganized territory where project will take place: <b>Brownfield</b>		GPS Location in Digital Format: <b>43.9169411,-70.9793568</b>	
Culvert/crossing location. Name of the road on which the culvert/crossing is located and distances to the nearest road intersections. <b>Eaton Center Rd/Hampshire Rd 100 feet northeast of its intersection with Porter Road. Additionally, it is less than 100 yards south of its intersection with Fire Lane 26, less than 100 yards north of the intersection of Porter Road and Thurston Road. This is a key node for traffic in western Brownfield, and is on the chief route from Brownfield into New Hampshire.</b>			
Watershed Location: List the name of the stream, brook, or the water body the culvert is located on, and the downstream, brooks streams, rivers, lakes, ponds, bays, etc. <b>The Shepards River feeds the Saco River. The watershed is one of Maine's classic small-water brook trout fisheries.</b>			
Required Maps and Photos: Include the following photos and maps (in color if possible). <input checked="" type="checkbox"/> Map marking culvert/crossing location and showing road names. <input checked="" type="checkbox"/> Map showing satellite view with culvert/crossing location marked. <input checked="" type="checkbox"/> Optional - Map showing culvert/crossing location on Maine Stream Habitat Viewer. Note – All photos should be dated. <b>All photos taken 7/22/2015</b> <input checked="" type="checkbox"/> Photo(s) showing condition of culvert/crossing. <b>Same as outlet photo</b> <input checked="" type="checkbox"/> Photo(s) showing downstream side of culvert/crossing (including water level at end of culvert). <input checked="" type="checkbox"/> Photo(s) showing inlet side of culvert/crossing (including water level at end of culvert/crossing). <input type="checkbox"/> Photo(s) showing safety conditions such as sinkholes, collapsing structures, erosion undermining, etc. <input type="checkbox"/> Photo(s) showing downstream erosion impacts, if any.			
<b>IV. Scoring Criteria for Public Infrastructure Information: (25 Points total):</b>			
Has the culvert/crossing washed out, flooded, overtopped the road, or failed in the past 20 years due to storm events? If yes, please describe how often, and the approximate dates of culvert/crossing failure. (Include pictures if available.) <b>No.</b>			

What is the current condition of the culvert/crossing? **Poor - see below.**

Discuss current safety concerns of the existing culvert/crossing? **Significant route from Brownfield to/from New Hampshire. State imposition of weight restrictions or closure are real possibilities if deterioration continues.**

In how many years from now do you estimate the culvert/crossing would likely have a complete failure, a complete collapse, or total washout?

1 year    3 years    5 years    10 years    15 years    20 years    25 years

**This is a rough estimate. Visual inspection does not reveal serious problems, State engineers say otherwise. We must assume that deterioration is continuing.**

Has the culvert/crossing been inspected by the Maine Department of Transportation? If so, what is the date of the last inspection and condition classification by Maine DOT? **MaineDOT inspection September 27, 2011. Channel Condition: Poor; Culvert Condition: Serious; Approach Condition: Fair; Federal Sufficiency Rating: 46.7**

Discuss what sort of impacts would occur if the culvert/crossing were to fail? For instance, are there critical public services (fire or police station, hospital, school, public works facility) located on this road that would be cutoff or required to detour? **Five road segments join within 100 yards of the culvert. Its loss would cause major travel and transportation problems in the entire western portion of Brownfield Township.**

If the culvert/crossing fails would homes, businesses, or infrastructure be cut off or required to detour?

#Cut off: **2** year round homes

#Cut off: **1** seasonal homes

#Cut off: **0** businesses (list type and size)

#Cut off: **2** infrastructure **Fire Department, town services**

#Cut off: **0** other (list)

**Note: Emergency services would be forced to travel through New Hampshire to access these homes.**

How many miles, and how many of each would be required to detour?

# **2** year round homes required to detour **5.4 miles** n

# **1** seasonal homes required to detour **5.4 miles**

# **0** businesses (see attached) **N/A**

# **2** infrastructure (list type) required to detour **31.2 miles - Fire Department, town services inc. snow plowing in Brownfield**

# **0** other (list) required to detour **N/A** miles

**Note: The culvert is on the major route to/from Brownfield and New Hampshire. Failure or closure would cause all the traffic on this route to detour to the north. Looking back toward town, this could affect some 50 households. Truck traffic (>12 tons) would be forced to detour up to 31.2 miles through Fryeburg, Maine and Conway, New Hampshire.**

Private roads only: If the culvert or crossing is located on a private road and directly impacts a lake or pond, is public access to the lake or pond prohibited or highly restricted to foot access or carry in only? **N/A**

What is the annual maintenance fee per landowner per year for the private road? **N/A**

<b>V. Scoring Criteria for Proposed Culvert/Crossing Cost &amp; Budget Information (25 Points total):</b>				
Existing culvert/crossing material: Circle One ( <del>Plastic pipe, concrete pipe, corrugated metal pipe, concrete box culvert, stone/granite culvert, pipe arch, bridge, or Other type</del> ) (describe):				
Length: <b>86.4 feet</b>	Diameter: <b>13 feet</b>	Width:	Height:	Approximate Age: <b>68 years</b>
Proposed culvert/crossing material: Circle One ( <del>Plastic pipe, concrete pipe, corrugated metal pipe, concrete box culvert, stone/granite culvert, pipe arch, bridge, or Other type</del> ) (describe): <b>aluminum arch with reinforcing ribs on concrete abutments</b>				
Length: <b>100 feet</b>	Diameter:	Width: <b>26 Feet</b>	Height:	Amount Requested: <b>\$95,000.</b>
Population of <u>town</u> , group or association funding project: <b>1,597</b>		Total cost of project (including in kind costs): <b>\$307K</b>		
Discuss approximate funds spent on physical repairs within the last 10 years on the culvert/crossing (exclude normal maintenance costs such as painting). <b>None</b>				
What are the estimated construction costs for the culvert/crossing replacement? Include estimated items for mobilization of equipment, erosion control and stream diversion, existing culvert removal, installation of the new culvert, permanent stabilization, and engineering design costs. <b>Mobilization of equipment \$5K, erosion control and stream diversion \$15K, existing culvert removal \$12K, installation of the new culvert \$155K, permanent stabilization \$10K and engineering design cost \$16K.</b>				
Do you have engineered design plans and construction specifications for the replacement culvert/crossing? If yes, describe who designed the plans, and when the plans were completed. <b>Proposed design based on Wright-Pierce Engineering Preliminary Study. Lower cost Stream Smart solutions will continue to be sought by the town.</b>				
What is the estimated construction schedule for the proposed project? Include estimated start and completion dates, and include any time of year restrictions from state or federal permitting agencies. Do you have permits? Yes, No, or Application Submitted <b>If funded by this program, construction would start summer of 2017. Permit applications have not yet been filed.</b>				
<b>VI. Environmental Scoring Criteria for Proposed Culvert/Crossing Information (50 Points total):</b> <b>(See Section V.B. on pages 10-11 for more detail.)</b>				
<b>Climate Resiliency (10 Points)</b> Explain how the new culvert/crossing has been sized appropriately for the watershed. Discuss any watershed studies or hydrology studies that have been conducted, if any. <b>Proposal designed to withstand 100-year flood event</b>				
Please describe what provisions for addressing climate resiliency were used/will be used in designing the replacement culvert/crossing. Will the design meet the 100 year flood criteria data, if not explain the rationale for not meeting this criteria. Discuss any watershed studies or hydrology studies that have been conducted, if any. <b>Flow based on USGS Regression Equations.</b>				
<b>Habitat (25 Points)</b> If the existing culvert/crossing was to be replaced, how much habitat (i.e., miles of stream, or acres of wetland habitat) would be opened up to fish passage and other aquatic life? <b>Over 6 miles of known brook trout habitat upstream will be connected to 27.6 miles of habitat downstream, the entire run of the Shepards River beyond its confluence with the Saco River.</b>				

List the type of fish, aquatic life, or wildlife affected by the project.

Brook Trout    Brown Trout    Rainbow Trout    Landlocked Atlantic Salmon  
 ~ Atlantic Salmon (present today)    Atlantic Salmon (potential modeled habitat)  
 Rainbow Smelt    Alewives    Other: \_\_\_\_\_  
 American Eel    Sea-run Brook Trout    Sea-run Brown Trout

Has the presence of these fish been confirmed by Maine IF&W, Maine DMR, or USFWS?  Yes    No  
 Please list agency confirming and the species they have identified: **MDIFW Region A confirms presence of wild brook trout above the culvert. Wild brook trout are abundant below it. Region A also states that Juvenile Atlantic salmon may be present there.**

Is the existing habitat active spawning habitat today? If so, discuss. **The presence of wild brook trout indicates that spawning is occurring.**

Is the culvert identified by the Maine Stream Habitat Viewer or by an Agency as a Barrier? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Barrier Identification # <b>10028</b>	Type of Barrier <b>water velocity and depth</b>	Estimate how many months per year is Barrier a Full Barrier preventing any fish passage? <b>11 - this culvert likely requires "Goldilocks" conditions for any fish to pass it other than those that are washed downstream.</b>
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Is the Culvert undersized? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Width of Culvert: <b>13 feet - the culvert is not embedded into the substrate</b>	Width of natural stream (not pool at culvert): <b>18 feet</b>
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Is the new crossing/culvert 1.2 times the stream bed (bank full) width? If not, please explain the rationale for a smaller size. **Yes**

How many miles would open <u>upstream</u> to the next Barrier? <b>6 miles</b>	How many miles <u>downstream</u> to the next Barrier? <b>27.6 miles all the way downstream to Hiram Dam via the main stem of the Shepards River and the Saco River. It is rare to be able to reconnect to so much downstream habitat.</b>
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Connectivity: Describe significant adjacent fisheries or habitats such as heritage ponds impacted by this project. Include distances from the project to these other areas.  
**The Eastern Brook Trout Joint Venture Project gives the Shepards River watershed the highest possible scores for watershed priority and habitat quality. This watershed is worth restoring to its full potential.**

Please provide other information about the proposed project that you believe is important:  
 - **Although rated as a potential barrier, we believe the problem is worse than that due to water velocity and depth. The culvert is not embedded, and the outlet is over three feet lower than the inlet due to its slope.**  
 - **There are also problems with double culvert to the south on Porter Road. Connectivity with New Hampshire to the west is threatened. Dealing with both of these problem is extremely challenging for the Town of Brownfield, population 1,597, annual budget \$3.2M.**

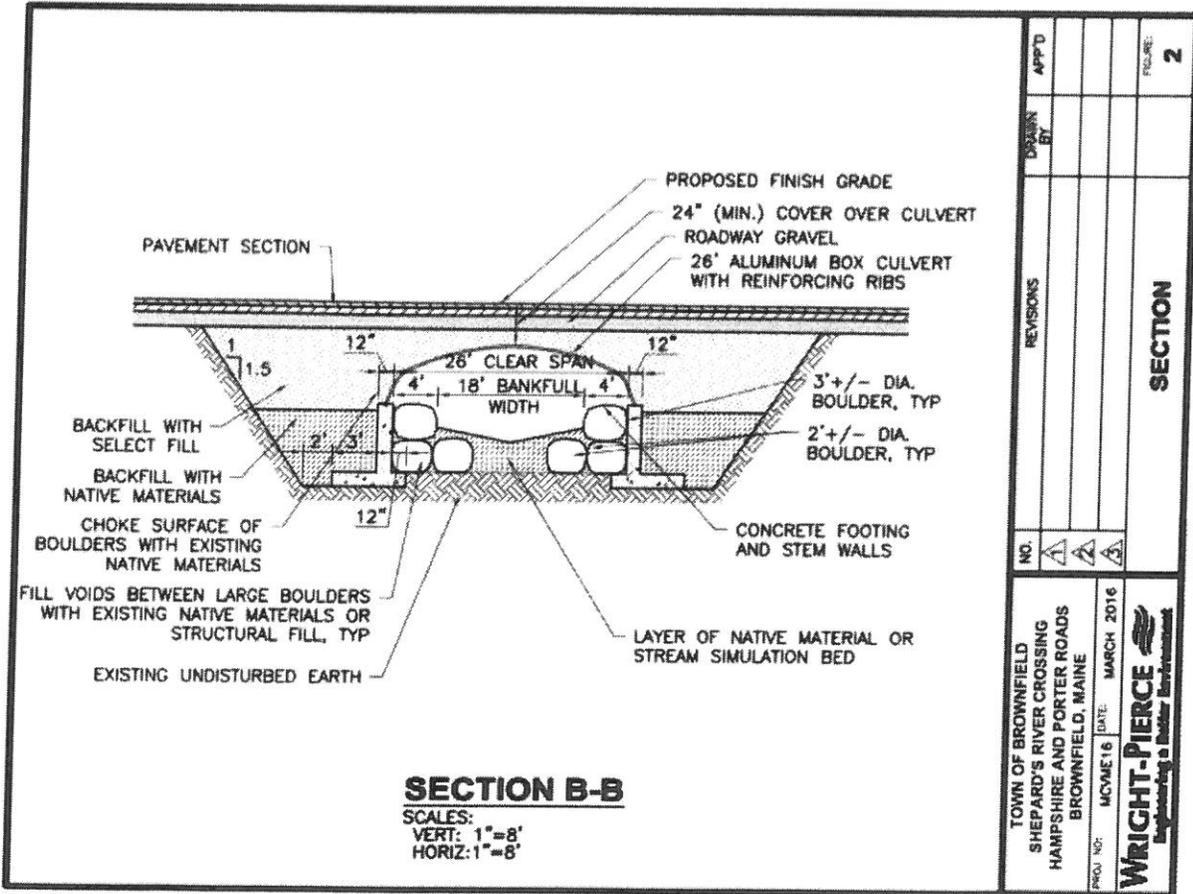
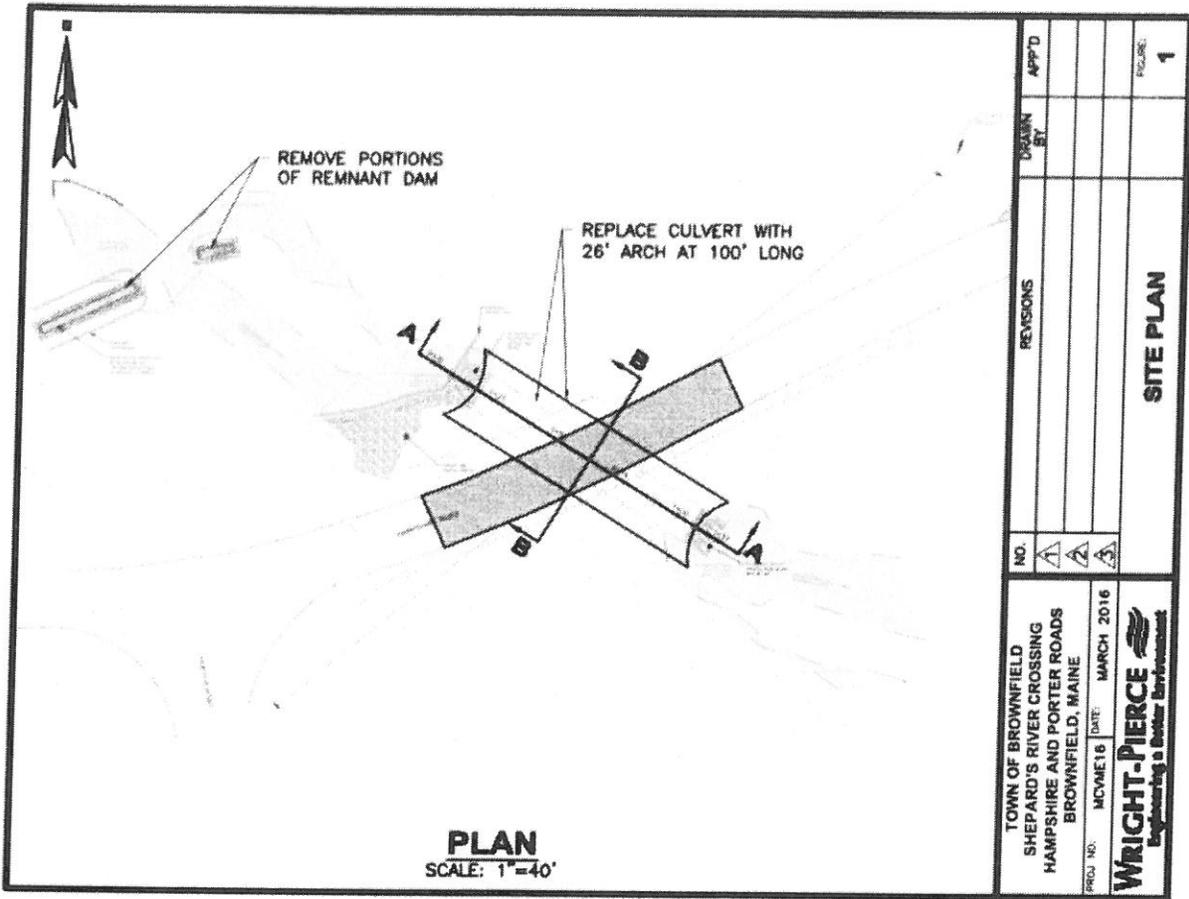
**State of Maine**  
**Department of Environmental Protection**  
*Bureau of Land and Water Quality*  
**DEBARMENT, PERFORMANCE and NON-COLLUSION CERTIFICATION**  
**RFP# 201601017**  
**2016 Grants for Stream Crossing Public Infrastructure Improvements**

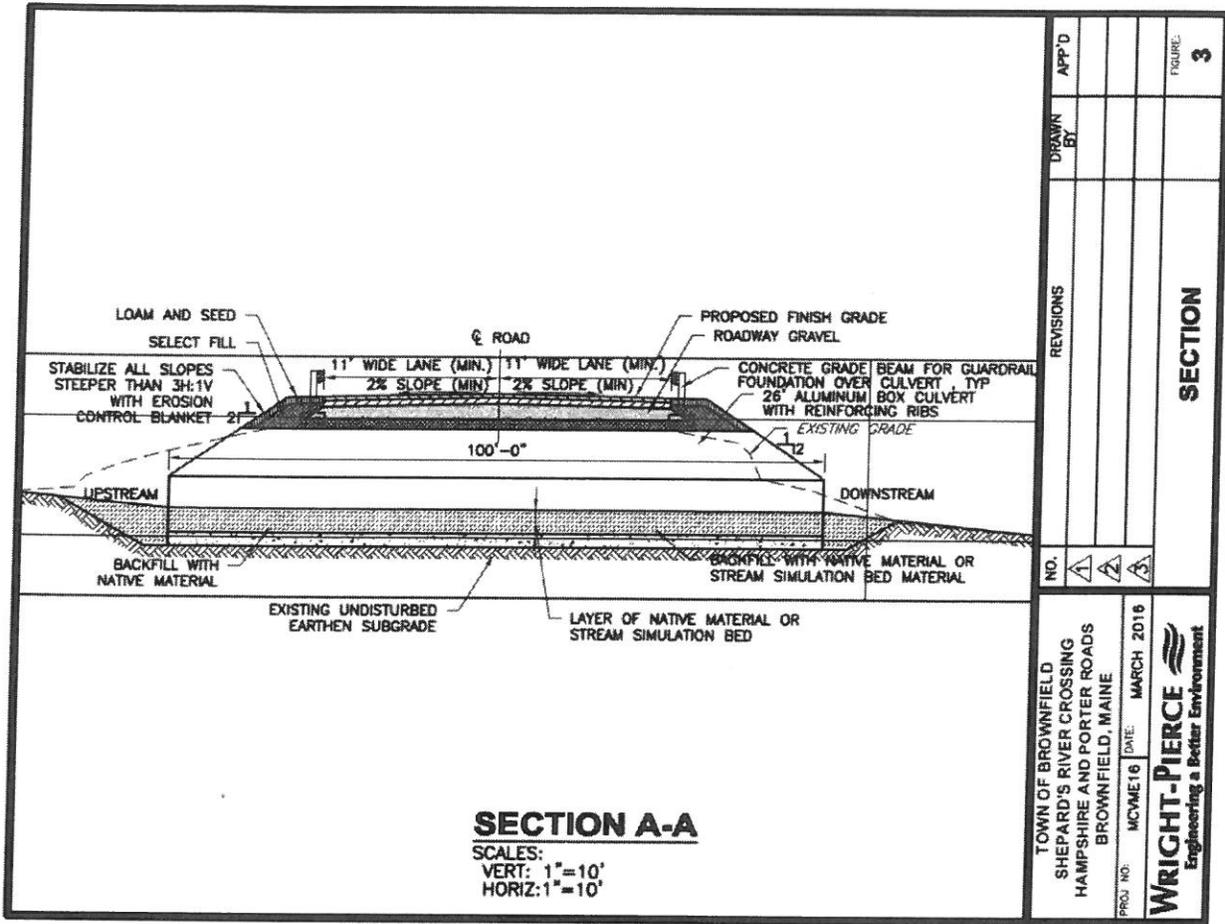
*By signing this document I certify to the best of my knowledge and belief that the aforementioned organization, its principals, and any subcontractors named in this proposal:*

- a. Are not presently debarred, suspended, proposed for debarment, and declared ineligible or voluntarily excluded from bidding or working on contracts issued by any governmental agency.*
- b. Have not within three years of submitting the proposal for this contract been convicted of or had a civil judgment rendered against them for:
 
  - i. fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government transaction or contract.*
  - ii. violating Federal or State antitrust statutes or committing embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;*
  - iii. are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or Local) with commission of any of the offenses enumerated in paragraph (b) of this certification; and*
  - iv. have not within a three (3) year period preceding this proposal had one or more federal, state or local government transactions terminated for cause or default.**
- c. Have not entered into a prior understanding, agreement, or connection with any corporation, firm, or person submitting a response for the same materials, supplies, equipment, or services and this proposal is in all respects fair and without collusion or fraud. The above mentioned entities understand and agree that collusive bidding is a violation of state and federal law and can result in fines, prison sentences, and civil damage awards.*

**Failure to provide this certification may result in the disqualification of the Bidder's proposal, at the discretion of the Department.**

Name: <b>Frank Day</b>	Title: <b>Brownfield Public Works Director</b>
Authorized Signature: <i>Frank Day</i>	Date: <b>April 3, 2016</b>





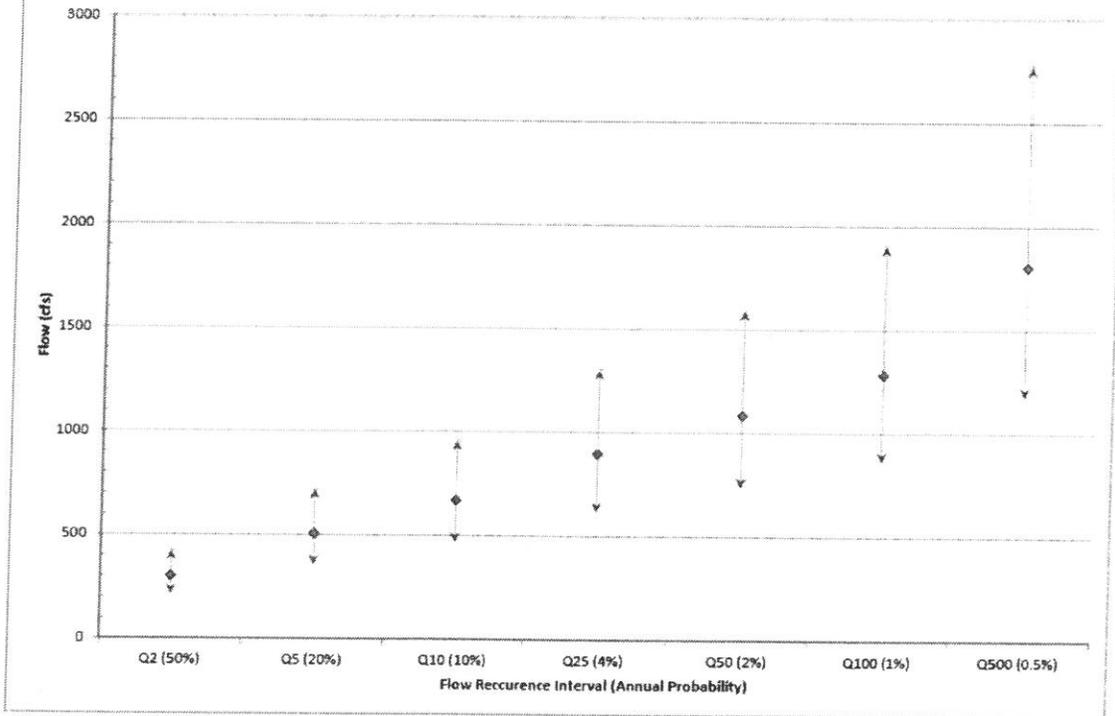
## USGS Regression Equations for Rural Unregulated/Ungaged Streams in Maine (USGS Publication 99-4008)

Project Number: MCVME  
 Stream Name: Shepards Brook  
 Stream Point of Interest: Hampshire Road Culvert  
 Stream Location: Brownfield, ME

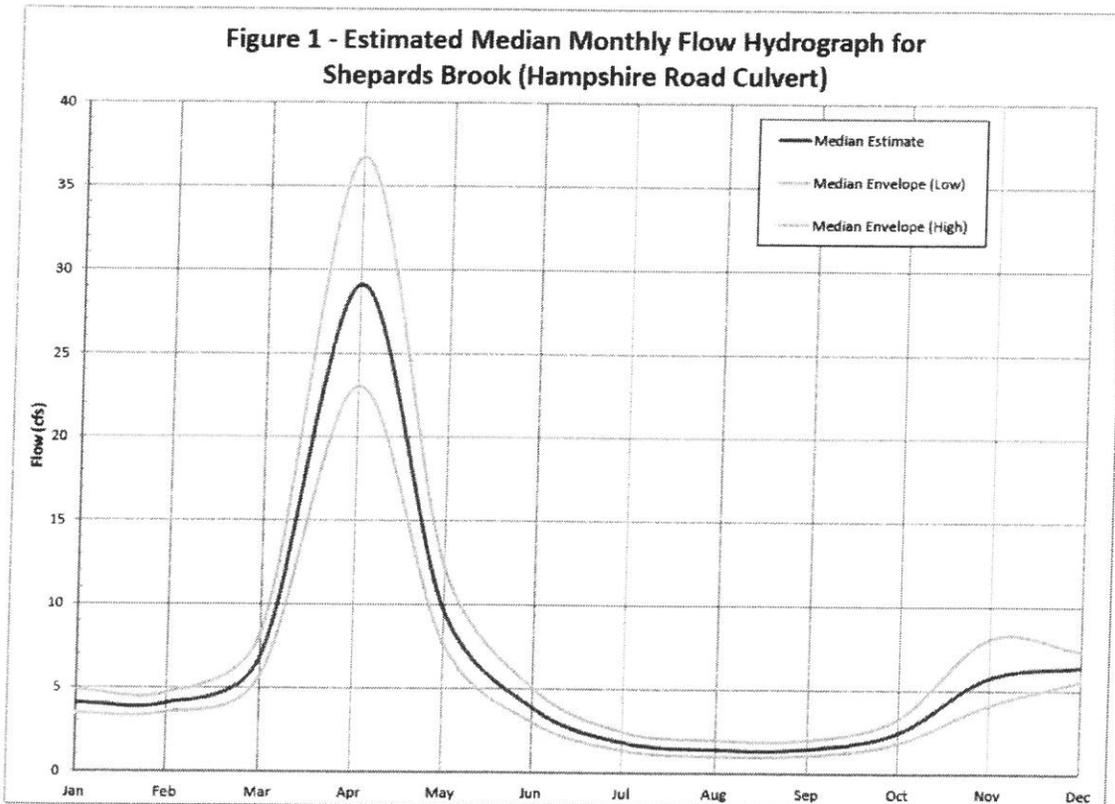
Drainage Area (Km<sup>2</sup>): 12.1207  
 NWI Wetlands w/in Drainage Basin (Km<sup>2</sup>): 0.0945  
 Areal Percentage of Wetlands: 0.7800

Recurrence	Cubic Meters per Second (cms)			Cubic Feet per Second (cfs)		
	Calculated Flows	Average Error Range		Calculated Flows	Average Error Range	
Q <sub>2</sub> (50%)	8.50	11.95	6.04	300.23	422.12	213.46
Q <sub>5</sub> (20%)	14.34	20.35	10.11	506.37	718.54	356.99
Q <sub>10</sub> (10%)	18.93	27.05	13.25	668.41	955.16	467.89
Q <sub>25</sub> (4%)	25.38	36.85	17.49	896.36	1301.52	617.59
Q <sub>50</sub> (2%)	30.65	45.02	20.87	1082.40	1590.05	737.12
Q <sub>100</sub> (1%)	36.34	54.00	24.46	1283.40	1907.14	863.73
Q <sub>500</sub> (0.5%)	51.13	78.48	33.33	1805.54	2771.51	1177.21

**Figure 2 - Extreme Flow Estimates for Shepards Brook  
(Hampshire Road Culvert)**



**Figure 1 - Estimated Median Monthly Flow Hydrograph for  
Shepards Brook (Hampshire Road Culvert)**



**USGS Regression Equations for  
Estimating Monthly, Annual, and Low 7-day, 10-year  
Streamflows for Ungaged Rivers in Maine  
(USGS Publication 2004-5026)**

Project Number: MCVME  
 Stream Name: Shepards Brook  
 Stream Point of Interest: Hampshire Road Culvert  
 Stream Location: Brownfield, ME

Watershed Area 4.68 sq. mi.  
 Sand and Gravel Aquifers 0.1615 decimal fraction within watershed  
 Distance from Coast 68.850 miles  
 Mean Annual Precipitation 51.110 inches  
 Mean Winter Precipitation 11.180 inches

**General Regression Estimates**

	Flow (cfs)	ASEP		Ave. EYR
Q <sub>7,10</sub>	0.36	0.24	0.55	2.9
Q <sub>annual mean</sub>	9.60	8.90	10.37	9.9
Q <sub>annual median</sub>	4.90	4.28	5.60	6.9

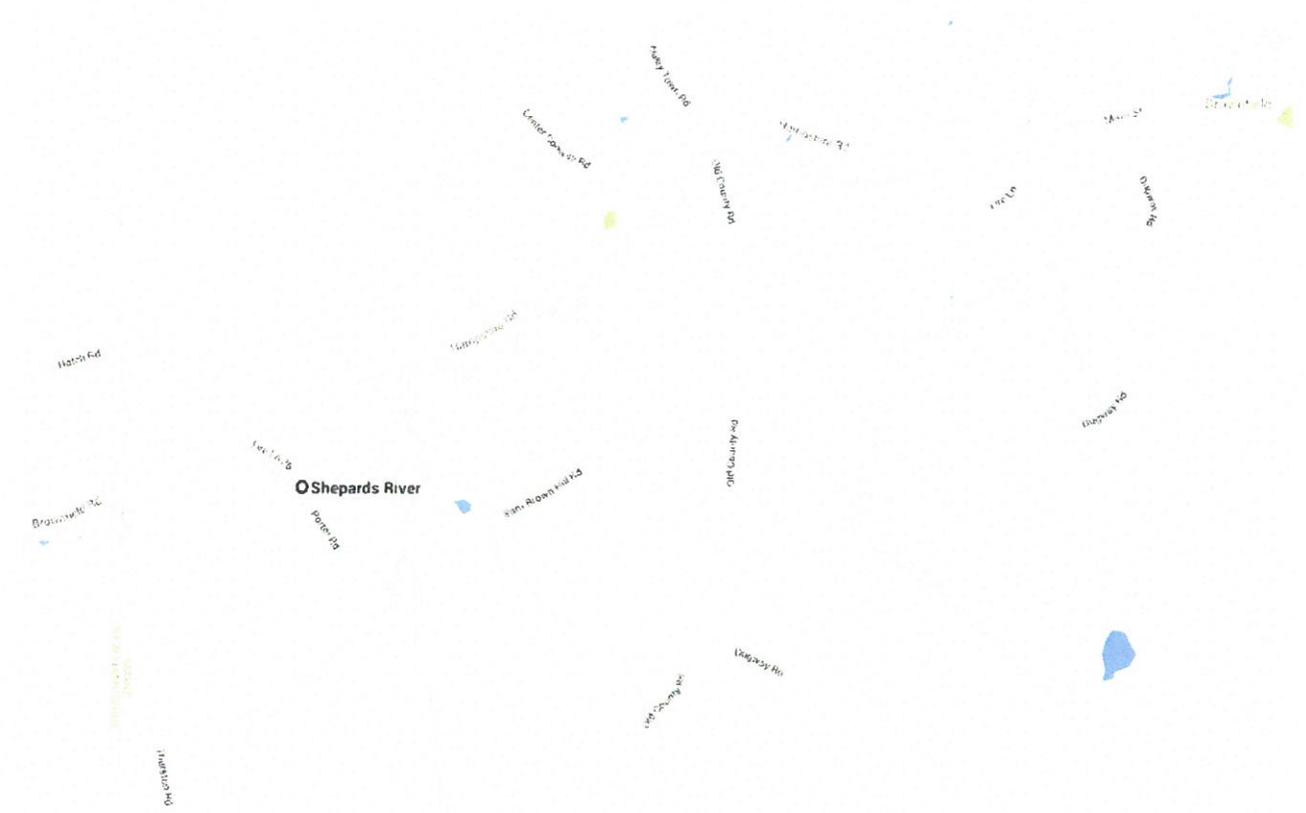
**MEDIAN ESTIMATES**

Month	Flow (cfs)	ASEP		Ave. EYR
Jan	4.07	3.42	4.86	8.9
Feb	4.06	3.52	4.69	17.5
Mar	6.84	5.68	8.23	13.3
Apr	29.11	23.06	36.74	3.8
May	9.61	7.65	12.17	3.9
Jun	3.86	2.99	5.05	4.3
Jul	1.81	1.34	2.45	3.6
Aug	1.39	1.00	1.95	3.9
Sep	1.45	1.06	1.99	5.4
Oct	2.43	1.81	3.28	8.3
Nov	5.75	4.09	8.09	4.4
Dec	6.41	5.57	7.37	21.6

**MEAN ESTIMATES**

Month	Flow (cfs)	ASEP		Ave. EYR
Jan	6.58	5.91	7.34	29.9
Feb	6.47	5.83	7.17	41.2
Mar	14.93	11.79	18.90	7.3
Apr	29.71	25.07	35.17	4.9
May	13.52	11.38	16.06	7.0
Jun	6.73	5.74	7.88	13.1
Jul	3.22	2.60	4.00	8.4
Aug	2.52	1.96	3.23	8.6
Sep	2.99	2.39	3.73	13.9
Oct	5.79	4.67	7.17	17.0
Nov	10.78	8.78	13.25	11.9
Dec	10.23	8.96	11.67	28.9

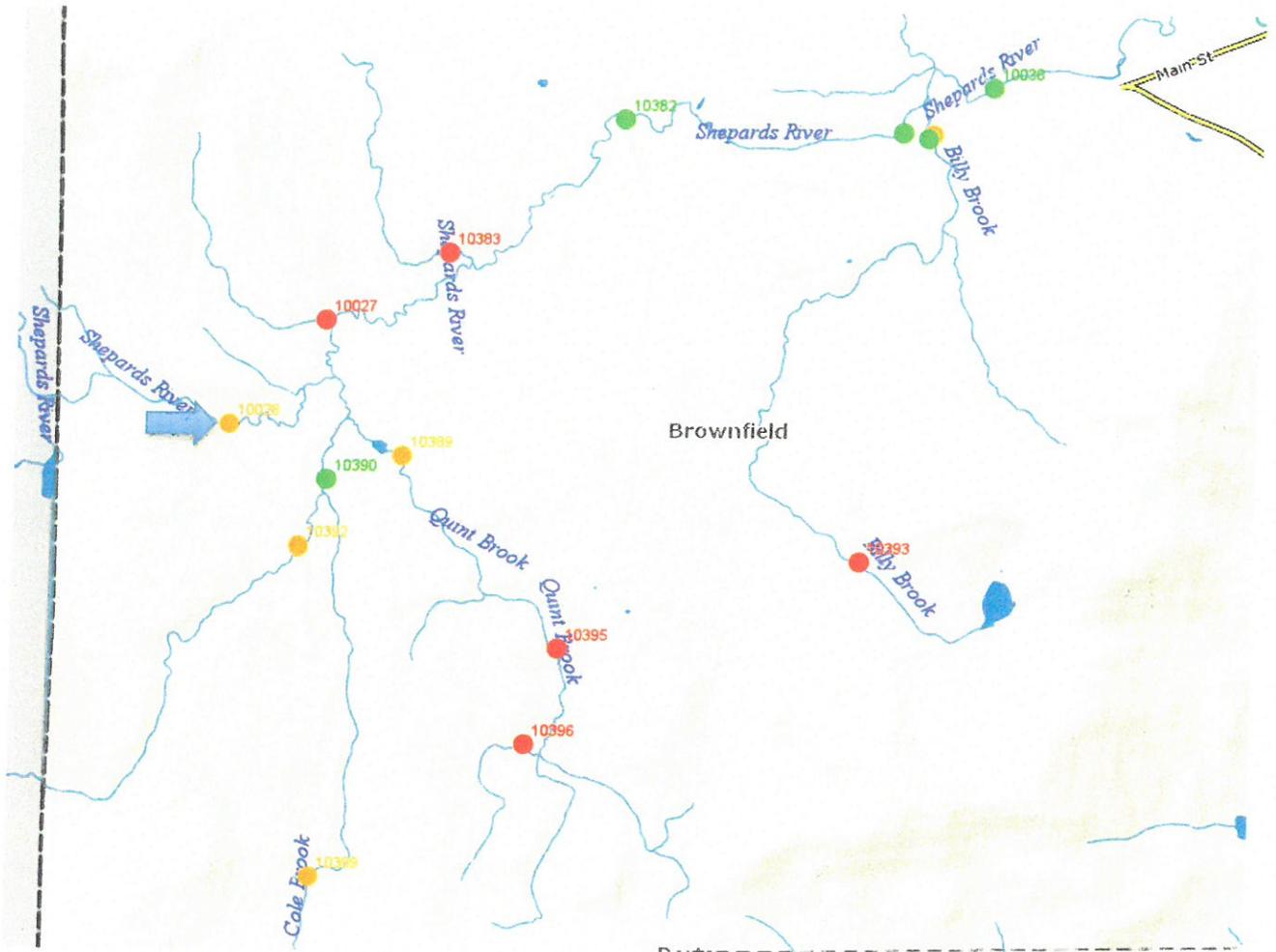
# Map with street names



# Overhead Map



# Map from Stream Habitat Viewer



Inlet photo



Outlet photo

