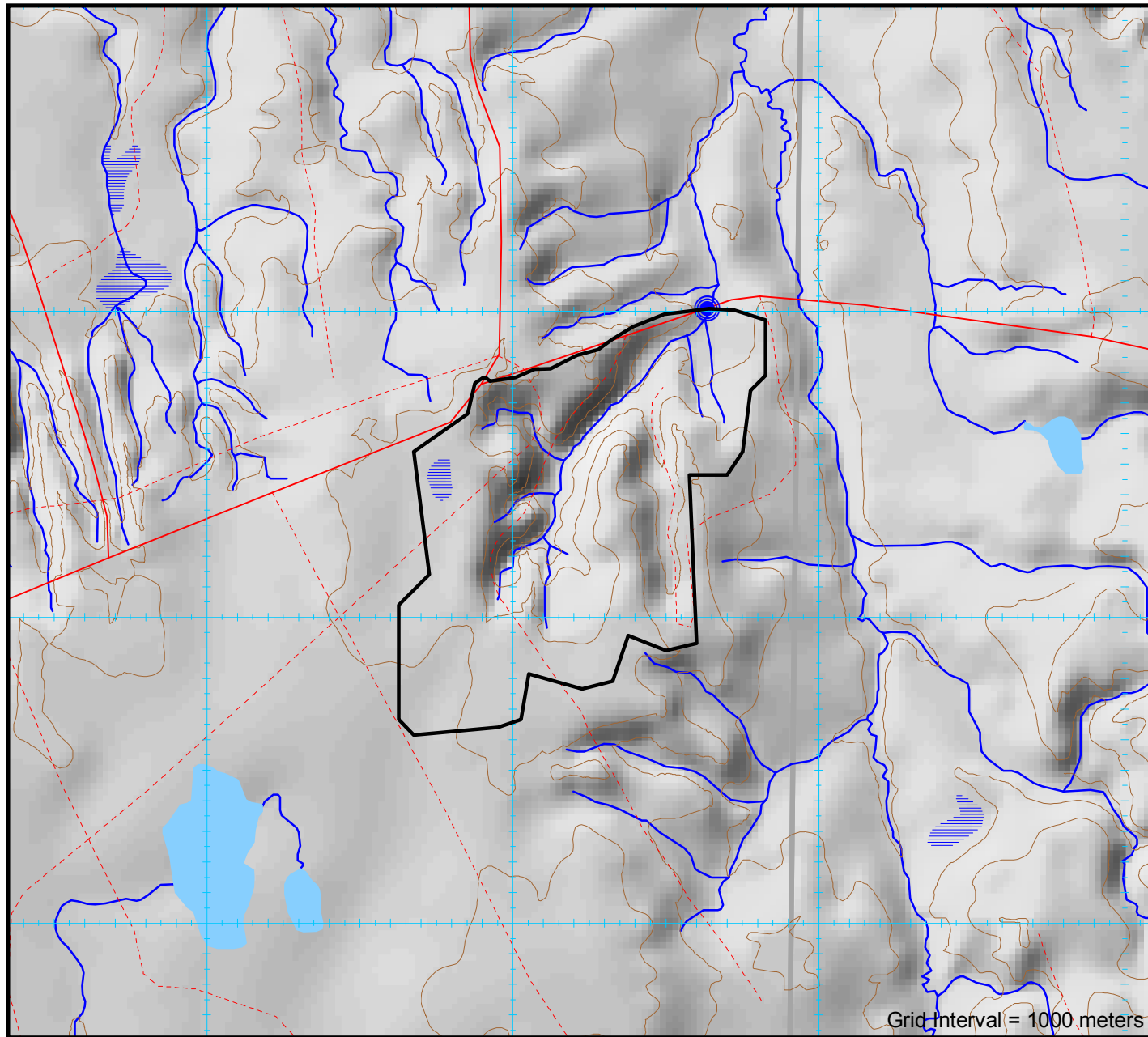


# Abitibi River Forest Appendix 1: Form for Submission of Information on a Proposed Crossing

Shaded Area for Office Use Only	ARFMI Road Network No. <b>0</b>	Distance Along Road Segment	Crossing Evaluation Reference Number <b>830</b>
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**Publication Date: February 20, 2020**

Abitibi River Forest - S.F.L. # 551832	Fisheries Operational Management Zone (OMZ):
Proponent: Rayonier AM c/o P.O. Box 867 New Liskeard, Ontario P0J 1P0 (705) 680-0033	Standard for Self-assessed Water Crossing Construction, Removal and/or Decommissioning: <b>Single, Small Closed-Bottom Round Culvert</b>
Plan Term: 2012-2022	Previous Assessment Year (incl. SA): <b>2017</b>
AWS Year: 2020-21	SAR species likely to be impacted: <b>NO</b>
	Preconstruction photos available: <b>NO</b>
	Within 500m of Brook Trout stream: <b>NO</b>



Watershed Characteristics	
Watershed Area :	<b>1.08 km<sup>2</sup></b>
Lake Area :	<b>0.00 km<sup>2</sup></b>
Swamp Area :	<b>0.01 km<sup>2</sup></b>
Retention Area :	<b>0.01 km<sup>2</sup></b>
Retention Factor :	<b>0.78 %</b>
Base Class :	<b>7.14</b>
Watercourse Type :	<b>Permanent</b>

Crossing Location Characteristics	
NOTE: See current AWS Tables 1 and 2 and AWS maps for approved AWS details for year of installation.	
Evaluation ID No. :	<b>830</b>
Geographic Township :	<b>Pinard</b>
UTM Coordinates (NAD83) :	<b>465636E, 5530011N</b>
Road Type :	<b>Primary</b>
Stream Gradient :	<b>0%</b>
Slope > 30% (17°) :	<b>NO</b>
Installer Experience :	<b>As Per Approved Implementation Toolkit</b>

Company Name \_\_\_\_\_ (Print)

Company Signature \_\_\_\_\_

Operator Name \_\_\_\_\_ (Print)

Operator Signature \_\_\_\_\_

Date \_\_\_\_\_

Proposed Structures			
	Structure 1	Structure 2	Structure 3
Structure Type	<b>Culvert</b>		
Design Flow	<b>Q25</b>		
Fill Material	<b>Pit Run Gravel</b>		
Dates for In Water Work (if required)	Start	<b>June 16</b>	
	Finish	<b>August 31</b>	
Removal Timeframe	<b>&gt;2 Years</b>		

Culvert Design Options	Q <sub>25</sub>	Q <sub>10</sub>	Q <sub>5</sub>	Q <sub>2.33</sub>
<b>Design Flow</b>	1.430 m <sup>3</sup> /sec	1.201 m <sup>3</sup> /sec	1.001 m <sup>3</sup> /sec	0.772 m <sup>3</sup> /sec
<b>1 Round</b>	1200mm	1200mm	1000mm	900mm
<b>2 Round</b>	900mm	800mm	800mm	800mm
<b>3 Round</b>	800mm	800mm	800mm	600mm
<b>1 Arch (BxD)</b>	1390x970mm	1390x970mm	1390x970mm	1150x820mm
<b>2 Arch (BxD)</b>	1030x740mm	1030x740mm	910x660mm	910x660mm
<b>3 Arch (BxD)</b>	910x660mm	910x660mm	800x580mm	800x580mm

• Required Opening for bridges is calculated as per the Crown Land Bridge Management Guidelines.

### Conditions on Culvert Design Options

- Initial Fisheries Review based on one pipe. Two or more pipes requires a re-assessment.
- Round culvert calculations assume 10% fill. For 20% fill, increase diameter to next highest standard diameter.
- For 40% fill, use a round culvert diameter of the Base distance of the corresponding Arch style culvert.

### General Standards

- No watercourse realignment, nor use of explosives is permitted.
- Minimize loss or disturbance to riparian vegetation. Restrict removal of riparian vegetation to the disturbance footprint required for construction, maintenance and decommissioning of the water crossing.
- Install erosion and sediment control measures prior to commencement of construction or decommissioning to prevent release of sediment or other deleterious substances into watercourse.
- Fill material placed below the normal high water mark must be erosion-resistant and/or protected from erosion.
- Direct storm water runoff from bridge decks, side slopes, road approaches and ditches away from the watercourse and into a retention pond or vegetated area.
- Ensure erosion and siltation in ditch lines adjacent to the watercourse crossing approaches are controlled using sediment traps such as rock/soil dams or log jams as site conditions warrant.
- Do not block or impede the free passage of water and fish at any time of year up and down stream, with the exception of potential and temporary blockage due to water crossing construction/decommissioning activities.
- Abide by fisheries in-water timing windows in the approved FMP and/or forest management guides. Where fishery communities are not well documented, the most restrictive in-water timing window must be used.
- Complete all in-water construction and decommissioning activities in an uninterrupted fashion and in an appropriate timeframe to minimize potential for site disturbance.
- If installation requires in-water work, do not locate within 100m of spawning or sensitive fish habitat eg. rapids, riffles, known overwintering areas.
- Maintain machinery free of fluid and fuel leaks. Wash, refuel and service machinery at least 30m from watercourse. Store fuel and other materials for machinery a minimum of 30m from the watercourse.
- Operate machinery on land with tracks/wheels above the normal high water mark, or on ice in a manner that avoids disturbance to the banks of the watercourse and adjacent riparian vegetation areas.
- Remove all debris from construction and decommissioning work from the site following completion of the undertaking.
- If machinery fording is required, limit to a one-time event (over and back) per piece of equipment essential to implementing the project, and only if using an existing crossing at another location is not available or practical.
  - If minor rutting is likely, watercourse bank and bed protection methods (e.g., swamp mats, pads) are to be used provided they do not constrict flows or block fish passage;
  - Grading of the watercourse banks for the approaches is not permitted;
  - If the watercourse bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion or degradation is likely, use a temporary crossing structure or other practice to protect them;
  - The one-time fording must adhere to the appropriate in-water timing windows; Forging must occur under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

- All calculations are for projecting ends. Total pipe length normally not to exceed 20m.
- All calculations assume a Headwater Depth of 1.0.
- MP = Multi-Plate (i.e. SPCSP)

### Standards for Single, Small Closed-Bottom Round Culverts

- This standard applies to single, round, corrugated, closed-bottom steel, aluminum, or plastic culverts less than or equal to 1200mm in diameter that do not require site-specific engineering approval per MNR's Crown Land Bridge Manual.
- This standard only applies if the project does not:
  - Replace an existing open-bottom crossing (e.g., clear span bridge, arch culvert);
  - Replace an existing closed-bottom culvert larger in diameter than that being installed; or
  - Involve the installation of more than one closed-bottom culvert at the crossing location.
- Locate, design and construct to minimize likelihood of ongoing outlet scour, culvert undermining or erosion of fill in order to provide stable, non-perched culverts that provide for fish passage.
- Do not locate on meander bends, braided streams, or any other area inherently unstable that may result in alteration of natural stream functions or erosion and scouring of the structure.
- Size to a minimum Q25 design flow. If an unmapped stream is encountered and proper analysis cannot be completed to determine Q25, size to ensure it spans from bank to bank.
- Do not install where channel slope at crossing location is of a gradient greater than 2.0%.
- Do not install where slope of road approaches or either bank approach is greater than 30% (17°).
- Locate where culvert can be embedded below grade of stream bed.
- Use site-specific mitigation measures to ensure no ongoing erosion of fill. As a minimum:
  - Stabilize both inlet and outlet ends with appropriately sized non-erodible material;
  - Rock used is clean, free of fine materials and of sufficient size to resist peak flood events;
  - Place rock at original bank grade to ensure no infilling or narrowing of watercourse;
  - Fill material placed below normal high water mark must be erosion resistant and/or protected from erosion.
 The Forest Management Guide for Conserving Biodiversity at the Stand and Site Scales refers to the normal high-water mark as the edge of vegetation communities capable of providing an effective barrier to the movement of sediment.
- Do not locate within 100 metres of fisheries spawning or sensitive habitat.
- Do not locate within 500 metres of any brook trout spawning or upwelling areas.
- Do not locate on watercourses that flow into, and are within 500m of, known naturally reproducing brook trout lakes.
- Mix of size, length, slope & drainage area must not increase flows to consistently & predictably impede fish passage.
- Install under low-flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
- Both interior and exterior of culverts must be corrugated to ensure structural stability and facilitate fish passage.
- The grade of the culvert must reflect the grade of the natural watercourse bed.
- Compact backfill adequately around the culvert. Use only clean sand or gravel and compact around the culvert in layers.
- Length of culverts must permit banks to be sloped at an angle of 2:1 or a stable angle of repose for the materials used.

## Reviewed by MNR. Follow standard(s) as well as any Appendix 2 conditions.

### MNR Appendix 2: Biologist Risk Evaluation Concerns and Conditions on Construction

Watershed Thermal Code : UF MNR Assigned Thermal Code at Crossing **UF**

The crossing is proposed at a previously approved and existing crossing site. Installation is suggested at this site rather than creating new approaches, abutments, landings, etc. This ranking does not authorize any undertaking that results in serious harm to fish, but suggests a low risk of causing serious harm to fish in compliance with the Fisheries Act following best practices such as those described in the DFO measures to avoid causing harm to fish and fish habitat and the standard mitigation techniques outlined in the FMP. — Prior to installation the installer must assess their ability to install this crossing correctly without the removal of any large channel rock or cutting of the pipe bottom. If this is not possible an alternative crossing type should be proposed.

	Structure 1	Structure 2	Structure 3
Risk Evaluation:	<b>LOW</b>		
Site Inspection Required:	<b>NO</b>		



# ARFMI Crossing Installation Report (Must be completed for each crossing location)

Shareholder: \_\_\_\_\_ Block ID: \_\_\_\_\_

Contractor: \_\_\_\_\_ Road Name: \_\_\_\_\_

## SITE CONDITIONS ENCOUNTERED

Crossing Located By:	Date Measurements Taken:
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Stream Measurements (meters)			Foundation Soil Description :	
Flood Plain Width :	A		Sand <input type="checkbox"/>	Muck <input type="checkbox"/>
Bankful Width :	B		Silt <input type="checkbox"/>	Rubble <input type="checkbox"/>
Channel width :	C		Clay <input type="checkbox"/>	Gravel <input type="checkbox"/>
Depth - 25% of Channel :	D (l)		Channel Type:	
Depth - 50% of Channel :	D (c)		Ephemeral <input type="checkbox"/>	
Depth - 75% of Channel :	D (r)		Intermittent <input type="checkbox"/>	
Depth - Bankful Flow :	E		Permanent <input type="checkbox"/>	
Depth - Floodplain :	F	ARFMI Notification Provided :		
Stream Velocity :	m/sec	(ARFMI Advised- 'Change to Operation' made)		
		FRI Incorrect <input type="checkbox"/>		
		Unmapped <input type="checkbox"/>		

Notes:

## INSTALLATION CONDITIONS

Installation Supervised By:	Date of installation:
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<b>Crossing Permanency :</b> Refer to Structure Removal Timeframe specified in AWS 4 and 5 Month / Year Permanent <input type="checkbox"/> Temporary <input type="checkbox"/> Decommissioned Date: _____ <small>Note: Measurements (*) must be included for all structures which remain in place beyond date of inspection</small> Scheduled Removal Date: _____	<b>Erosion Prevention and Control (X):</b> <small>(Indicate applicable measures taken)</small> Stable slopes on stream banks and drainage ditch banks <input type="checkbox"/> Course, clean rock to high water mark <input type="checkbox"/> Re-vegetate or seed slopes (stream banks and ditch banks) <input type="checkbox"/> Divert drainage ditches to green belt <input type="checkbox"/> Line drainage ditches with rock <input type="checkbox"/> Use rock weirs in drainage ditches to impede water flow <input type="checkbox"/> Use filter cloth on upstream side of culverts <input type="checkbox"/> No grubbing or stripping of ground vegetation <input type="checkbox"/> Use filter cloth (On top of ice if fill is used for Winter Crossings) <input type="checkbox"/> Other: <input type="checkbox"/>
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<b>Crown Land Bridge</b> <input type="checkbox"/> Bridge Record Form submitted (i.e. MNR /ARFMI)	<b>NAD 83 (Record Actual Crossing Location on Stream Segment):</b> E _____ N _____
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New Crossing Type:	Structure Description:	Type of Fill:
Box Culvert <input type="checkbox"/>	Steel <input type="checkbox"/>	Sand <input type="checkbox"/>
Arch Culvert <input type="checkbox"/>	Plastic <input type="checkbox"/>	Gravel <input type="checkbox"/>
Round Culvert <input type="checkbox"/>	Wood <input type="checkbox"/>	Rock Rubble <input type="checkbox"/>
Portable Bridge <input type="checkbox"/>	Concrete <input type="checkbox"/>	Other <input type="checkbox"/>
Steel Stringer Bridge <input type="checkbox"/>	Ford (Engineered) <input type="checkbox"/>	
Winter Snow Pack <input type="checkbox"/>		

## WATER CROSSING OPERATIONS CHECKLIST

Only certified inspectors are allowed to conduct Forest Operations Inspections for submission to the FOIP database

Inspector Name: \_\_\_\_\_

FOIP Report Number : \_\_\_\_\_

<b>CULVERT</b>	* 'As Built' Culvert Installation Measurements (meters)		<b>4 Photos must be Attached</b> <input type="checkbox"/> Approaches <input type="checkbox"/> Inlet <input type="checkbox"/> Outlet <input type="checkbox"/> Inside Pipe  <input type="checkbox"/> Remedial action required
	Installed Diameter :		
	Structure Length :		
	Road Width :		
	Depth of Cover:		
	Water Depth in Pipe :		
Number of Culverts :			
Spacing Between Pipes :			

<b>BRIDGE</b>	* 'As Built' Bridge Installation Measurements (meters)		<b>5 Photos must be Attached</b> <input type="checkbox"/> Approaches <input type="checkbox"/> Deck <input type="checkbox"/> Underside <input type="checkbox"/> Upstream (Inlet) <input type="checkbox"/> Downstream (Outlet)  <input type="checkbox"/> Remedial action required  <input type="checkbox"/> Verified 'As Built' measurements consistent with proposed bridge dimensions on 'Bridge Site Data Form'	
	Bridge length :			G
	Clear Opening Width :			H
	Freeboard (min 0.5m) :			I
	Flood Rise :			J
	Fill Height :			K
	Left Slope Length :			L
	Left Slope Rise :			M
	Right Slope Length :			N
	Right Slope Rise :			O
Crib Width :	P			
Crib Height :	R			

<b>Verification :</b> <input type="checkbox"/> I have confirmed that the final crossing condition satisfies the mandatory water crossing standards and will not impede future transfer of responsibility Notes: _____	<b>Water Crossing Activity (X):</b> <input type="checkbox"/> Water crossing location same as AWS submission <input type="checkbox"/> Installation of culvert and size same as described in AWS water shed calculations. <input type="checkbox"/> No sediments or woody debris left in water body or streams <input type="checkbox"/> Construction materials removed from site <input type="checkbox"/> Embankment sloped properly (e.g. 2:1) with no possibility of slumping <input type="checkbox"/> Timing restriction met <input type="checkbox"/> Culvert properly installed (i.e. refer to FMP Standards ) <input type="checkbox"/> Sediment Control Plan in AWS followed <input type="checkbox"/> No Erosion or Sedimentation present (e.g. filter cloth used to prevent material from entering waterway) <input type="checkbox"/> No signs of equipment or machinery in stream (i.e. culvert installed before equipment progresses past crossing) <input type="checkbox"/> Coarse clean rock used on all culvert crossings <input type="checkbox"/> Natural vegetation protected <input type="checkbox"/> Additional measures used to prevent erosion (e.g. seed, filter cloth, rip rap etc.) <input type="checkbox"/> Drainage ditches properly installed <input type="checkbox"/> Crossing removed before March 31 unless left for silviculture activities <input type="checkbox"/> Road right of way width through unallocated stands , no larger than FMP requirement <input type="checkbox"/> Road right of way width through AOC's (reserves), no larger than FMP requirement
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Note: All of the above activities must be checked. ✓ - Verified to be within acceptable limits ✗ - Outside of acceptable limits. Refer to comments for additional details N/A - Not applicable

I certify that the activities inspected are fully compliant based on an inspection appropriate to support this decision. Signature: \_\_\_\_\_ Date: \_\_\_\_\_