

Information Package

Watercourse Crossing Management Directive

June 2019

Disclaimer

The information contained in this information package is provided for general information only and is in no way legal advice. It is not a substitute for knowing the AER requirements contained in the applicable legislation, including directives and manuals and how they apply in your particular situation. You should consider obtaining independent legal and other professional advice to properly understand your options and obligations. Despite the care taken in preparing this information package, the AER makes no warranty, expressed or implied, and does not assume any legal liability or responsibility for the accuracy or completeness of the information provided.

For the most up-to-date versions of the documents contained in the appendices, use the links provided throughout this document. Printed versions are uncontrolled.

Revision History

Name	Date	Changes Made
Jody Foster	enter a date.	Finalized document.
	enter a date.	
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	enter a date.	
	enter a date.	

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Watercourse Crossing Remediation Directive

Overview

Poorly constructed watercourse crossings result in fragmented fish habitat, disrupting the ability of fish to feed, spawn and seek cover from predators.

Several species such as Athabasca rainbow trout, bull trout, westslope cutthroat trout and arctic grayling, are particularly sensitive to habitat fragmentation caused by poorly constructed crossings and are considered at risk in Alberta. Recovery plans are underway for these species with an expectation of correcting habitat fragmentation resulting from watercourse crossings.

The goal of the Watercourse Crossing Remediation Directive (WCRD) is to inspect crossings and remediate fish passage issues at a watershed level, in cooperation with regulators with overlapping mandates. The focus of this work is to eliminate fish passage problems caused by poorly designed and maintained watercourse crossings in Alberta.

The WCRD is a component of an integrated provincial fisheries management approach, linked to a number of other fish species recovery and aquatic habitat conservation initiatives.

How the Program Works

The approach utilizes a single coordinated system of inspection standards and watershed level crossing management that meets the needs of regulators while providing industry with the incentive and the flexibility needed to minimize non-compliance through first focusing remediation efforts on priority crossings.

Erosion causing sediment deposition or imminent to cause deposition into fish habitat is an urgent environmental issue directly affecting fish health and reproduction. All sediment deposition is high priority and must be stopped and remediated upon discovery.

The WCRD is coordinated across regulators and crossing owners through a system of governance that includes:

- regulatory steering committee
- stakeholder advisory committee
- project-specific task teams
- development of a shared data management solution

The WCRD supports and enables the development of self-inspection systems by crossing owners, and regular compliance reporting, as the Regulators transition from a system of inspections to a role as auditors.

For further information on this initiative, please contact the Alberta Energy Regulator at AER.WCC@aer.ca.

FAQs: What you need to know if you are a crossing owner

Q: What is the scope of the Watercourse Crossing Remediation Directive (WCMD)?

A: The [WCMD](#) provides information for all crossing owners in Alberta, who are governed by various pieces of legislation, (e.g., *Public Lands Act*, *Water Act*, and the *Code of Practice for Watercourse Crossings*). Crossing owners are required to conduct regular inspections and report crossings that do not comply. The WCMD requires regular inspections be completed on all crossings within each HUC 8 watershed. All of the inspection data is required to be submitted to the appropriate regulator to help with watershed remediation planning.

Q: As a crossing owner, how do I get involved?

A: Read the [WCMD](#) (currently under review in 2019) and decide if you want to participate through a third-party service provider or if your company will develop an in-house inspection and remediation program. Next, send an email confirmation to the AER on how your company will participate. You will also need to state in your email that your company will follow the intent of the directive (see Appendix 8 for the template). Confirmation can be sent to AER.WCC@aer.ca.

Q: How do I get started on developing an inspection program?

A: Determine if your organization has the interest and capacity to conduct the inspections by trained individuals on the inspection protocol, or if you wish to utilize a third-party service provider. Service providers must be recognized by the AER (contact information provided in the appendices). Questions should be directed to the third-party service provider before contacting the AER.

Q: Is there an inspection standard?

A: All inspections must adhere to the [Roadway Watercourse Crossing Inspection Manual](#) (Appendix 2). To be able to conduct inspections, a person must be trained. This training can be completed internally by a qualified instructor, or by a third-party service provider.

Q: Does the inspection standard apply to all crossings across the province?

A: The inspection standard was developed for watercourse crossings that exhibit fluvial characteristics (flowing water) in the Foothills area. The AER is currently developing an inspection form (Appendix 4) that accounts for non-fluvial, boreal, and wetland watercourse crossings. In the interim, crossing owners should use the standard inspection form.

Q: How do I report my inspection results?

A: A reporting portal and data management system is currently being developed. It is expected that data for each HUC 8 watershed submitted to the AER in a spatial format that includes all of the information that is on the inspection form.

Q: Will the regulator use my submitted inspection data to start a compliance action?

A: Non-compliant crossings are required to be reported to the AER. It is expected that crossing owners will complete the necessary remediation plans within an appropriate timeframe to be compliant.

Q: If I am voluntarily participating as per the WCMD, submitting my inspection information to the regulator, and contributing to submission of watershed remediation plans, will my crossings be inspected by the regulator?

A: The [WCMD](#) outlines a regulatory strategy to remediate watercourse crossings. This work is completed in a priority sequence with clear consideration of watershed conservation and management goals. Remediation efforts must be undertaken on a scheduled basis dependent on a risk assessment. The AER may conduct random inspections of crossings to ensure crossing owners are following the inspection manual protocol and accurately collecting data. Inspections may take place during the remediation activity and/or shortly after construction to ensure the crossing(s) meets regulatory requirements. At any time, watercourse crossings are inspected for erosion because sediment deposition into water is an urgent environmental concern that must be managed proactively and repaired upon discovery.

Q: How can I ensure my new, or replacement crossings are acceptable?

A: All crossings, throughout their lifecycle (e.g., installation, maintenance, replacement or removal) must adhere to legislation and have all the necessary approvals in place. This may include the *Public Lands Act* and associated dispositions, the *Water Act*, *Water Act* Approvals, the *Code of Practice for Watercourse Crossings* and associated notifications as well as all other relevant legislation. The requirements in the [Roadway Watercourse Inspection Manual](#) must also be met.

Q: How do I submit my inspection data to the AER and in what format does the data have to be in?

A: Watercourse crossing inspection data must be submitted to the AER in shapefile format. The data must contain all of the information referenced in the [Roadway Watercourse Inspection](#)

[Manual](#) and its associated inspection form. The data must be available in the attribute table for all crossings. Both compliant and non-compliant crossings must be included to ensure that remediation activities can be planned for on a watershed-based scale. At the present time, the spatial data can be e-mailed to AER.WCC@aer.ca in a zipped folder (.zip) that the Regulator can then upload into *ArcGIS*.

Q: How do we know where to focus our inspection or remediation efforts based on risk?

A: There are two facets to risk based on location. The Foothills area has HUC 8 watersheds prioritized by risk from 2015–2020 (Appendix 5). The AER is developing a tool to risk-rank the rest of the province with a high, moderate and low priority watershed ranking system (Appendix 6B). This risk ranking will apply to both inspections and remediation efforts. Look for more information in the future!

Q: Is there additional data to be submitted with the remediation plan?

A: Yes. Along with the one-page remediation plan document (Appendix 7) that gives an overview of each HUC 8 watershed for all crossing owners, there is an additional set of data that needs to be included. It is best to include this data as additional columns on the original spatial inspection dataset that was submitted. This remediation data includes requirements that are under the *Code of Practice for Watercourse Crossings* (COP). Documenting the data according to the COP will enable crossing owners to quickly reference their noncompliant crossings and submit their COP notification forms to the Regulator when they are planning on conducting remediation activities. See below for additional data sets.

Strahler Order	¹ CoP Waterbody Class	² Sedimentation / Erosion	³ Fish species	Fish passage assessment	Current crossing type	Proposed remediation type	⁴ Timing/RAP	Date remediated
		no		no concerns				
		yes		some concerns				
				serious concerns				
				remediated				
				not assessed				

¹ Code of Practice for Watercourse Crossings notification must be submitted and all requirements met during remediation activities

² Sedimentation and erosion fall outside of the Directive, must be reported within 7 days and be remediated immediately

³ Fish species present or likely to be present (based on sampling data or FWMIS); a non-fish bearing status must be supported by sufficient data (FWMIS does not suggest absence)

⁴ Timing / Restricted Activity Period (RAP) - note if working within RAPP may be additional requirements under the CoP for watercourse crossings for a QAES

Q: What are my next steps?

A: Your next steps are:

1. To read through this information package and associated documents.
2. Contact a third-party service provider and/or associated members (Appendix 8) to learn about participating in the Directive.
3. The AER needs to obtain confirmation that you wish to participate via email by an authorized company representative or by a qualified third-party service provider. An acknowledgment letter template is available in Appendix 9.
4. If you require further assistance, please email AER.WCC@aer.ca.

Appendix 1: Copy of the Watercourse Crossing Remediation Directive

See next page

Title:	Roadway Watercourse Crossings Remediation Directive
Number:	ESRD, Compliance, 2015, No. 1
Program Name:	Fish and Wildlife - Compliance
Effective Date:	March 4, 2015
This document was updated on:	

Purpose

The intent of the Directive is:

- To uphold Alberta Environment and Sustainable Resource Development (ESRD) and the Alberta Energy Regulator's (AER) regulatory mandate
- To protect or restore fisheries habitat through effective stream crossing practices
- To promote and support a watershed-based approach to effective, collaborative watercourse crossing inspection, monitoring, management and remediation.

This Directive outlines a new regulatory strategy to identify and commence remedial watercourse crossing work to provide fish passage and regulatory compliance in priority order and with clear consideration of watershed conservation and management goals. Remedial efforts will be undertaken on a scheduled basis dependent on risk assessment.

Background

Alberta's roadways have many watercourse crossing structures that do not meet regulatory requirements and which impede fish passage and fragment fish habitat. Declines in fish populations are a result. This limits Alberta's ability to meet its overall fisheries management goal as stated in the *Fish Conservation and Management Strategy for Alberta*: "to ensure the conservation of healthy, productive fish habitats and sustainable fish populations."

- [Fish Conservation and Management Strategy for Alberta](#)

Crossing owners, who for the purpose of this Directive are defined as holders of formal dispositions, approvals, or authorizations (hereafter referred to generically as authorizations) for a watercourse crossing under, but not limited to the *Public Lands Act*, *Forests Act*, and/or *Water Act*, must conduct regular inspections of crossings for which they are responsible, and report crossings that do not comply with the legislation and/or authorizations to ESRD and AER. Crossing owners must take the necessary steps to comply with all applicable legislation and operating terms and conditions of authorizations. Other crossing owners include municipalities, sand and gravel operations, railroads, and others, and are equally responsible for compliance with regulatory standards for stream crossings they own.

Sedimentation of fish-bearing watercourses is also an important aspect of roadway watercourse crossing management. As erosion and sedimentation issues are identified, they must be immediately addressed by crossing owners. Separate and apart from this Directive, mandatory reporting and remediation requirements for sedimentation must be undertaken in accordance with the general provisions of the *Water Act*, the *Environmental Protection and Enhancement Act*, and the *Public Lands Act*, their regulations, and authorizations issued pursuant to the named legislation.

Crossing owners have not historically established a watershed-based approach to inspections and remediation of non-compliant crossings. Because of the lack of a planned approach where crossing owners undertake these actions solely to comply with the existing regulatory scheme, any benefit accrued largely occurs at the site level with little consideration of priorities within the larger watershed. This Directive advocates a pro-active watershed-based approach in assessing priority, as opposed to the historically reactive approach in which non-compliant crossings identified by ESRD or the AER must immediately be remediated in the interest of regulatory compliance.

It is evident to both regulators and crossing owners that the historical regulatory approach is not highly supportive of the needs of either regulators or crossing owners in effective remediation for stream crossings, and a new strategy based on engagement through a third-party service provider is being implemented.

Participation in this new regulatory strategy creates a cooperative approach to planning remediation priorities between crossing owners and regulators. The new strategy is expected to optimize compliance performance, fiscal management, and enhance environmental stewardship by prioritizing the order and rate at which watercourse crossings are inspected and restored within a watershed.

Responsibilities

Service Providers

At present, there is only one service provider capable of delivering the necessary elements outlined in this Directive – the Foothills Stream Crossing Partnership (FSCP). The FSCP is a self-funded and voluntary cooperative composed of watercourse crossing owners for whom the FSCP acts regarding the responsibilities outlined below. The FSCP has been actively engaged in proactive inspections, data acquisition, planning and crossing remediation for nearly a decade.

Any reference to the FSCP does not imply exclusivity in delivery of the objectives outlined in the Directive. Other organizations that are professionally capable of delivering on the inspection, data management, reporting and remediation requirements outlined in the Directive are eligible to participate as a service provider in this new regulatory strategy. ESRD is presently engaged with other external non-governmental organizations such as the Alberta Conservation Association and Ducks Unlimited to advance initiatives that are being led or supported by ESRD, and the relationship with the FSCP is consistent with those other undertakings.

For the purpose of this Directive, the FSCP will:

- Inspect member crossings, as per the *Roadway Watercourse Crossing Inspection Manual*, to ensure compliance and to monitor deficiencies and improvements within the proposed area of implementation. As the area of implementation grows, the members will inspect

crossings and add to the existing inventory. Inspection data will be stored by the FSCP within a developed database;

- [Roadway Watercourse Crossing Inspection Manual](#)
- Sequence of all watersheds in a defined area for remediation planning.
- Prioritize candidate sites for remediation. Areas selected for remediation planning will be based on watershed units provided by the regulators. The FSCP will collaborate with ESRD and AER to establish remediation priorities. The function performed by the partner companies, as represented by the FSCP and as described within this Directive, will satisfy the regulatory requirements of both ESRD and AER per inspection and remediation of non-compliant stream crossings where fish passage has been impaired. This presumes that FSCP members carry out their respective remediation obligations as identified in remediation plans submitted to, and approved by, the regulators.
- Report to the member crossing owners non-compliance related to stream crossings at a level of frequency and detail that allows the crossing owners to fulfill their statutory obligations for immediate reporting where a crossing inspection for fish passage has identified restrictions to passage and non-compliance with the legislation.
- Create watershed remediation plans. The plans will include outputs from the inspection process, such as fish passage ratings and other concerns by crossing, watershed-level priority, details of planned remedial work, and a projected timeline for remediation the crossing.
- Report annually to ESRD and AER on crossings mitigated, timelines met, and any changes to the watershed remediation plans. Any deviation from an approved watershed remediation plan must be approved by the regulators.

The regulatory bodies (ESRD & AER)

For the purpose of this Directive, ESRD and AER will:

- Maintain their existing statutory authority and oversight on all surface water features throughout Alberta
- Collaborate with and provide direction to the FSCP or other service providers to set watershed-based remediation priorities for fish passage and review and approve submitted remediation plans in conjunction with the other regulatory body.
- Receive and review the annual report of the FSCP to verify that the progress of remedial activity for identified non-compliant crossings is proceeding in accordance with approved remediation plans and perform audit inspections on crossings where remedial actions have been taken.
- Use the criteria as outlined in the *Roadway Watercourse Crossing Inspection Manual* when performing audit inspections to ensure consistency for the parameters against which compliance will be measured.
 - [Roadway Watercourse Crossing Inspection Manual](#)

Procedure

The Directive will be implemented in phases in three broad geographic regions of the province, including the Foothills, Boreal, and White Area regions. The first phase of implementation for the Directive will be in the Foothills geo-region of Alberta. (Figure. 1)

Each implementation phase will require engagement with a variety of stakeholders including but not limited to forest products companies, energy resource companies, owners and operators of railroads, and municipal and provincial roadways and highways.

The FSCP will be the central point of delivery for developing annual plans of inspection, site assessments, remediation plan development, execution of remediation plans, and annual reporting to the regulators. Remediation schedules will be established to span multiple years, based on assessment of priority for restorative efforts as endorsed by the regulators. Remediation plans will be reviewed annually by the regulators in conjunction with the inspections service providers. The regulators will undertake annual audit programs that evaluate efficacy of remediation programs in the field for mutually agreed upon audit inspection targets between both ESRD and AER.

A steering committee, including at minimum the regulators and FSCP, will be established to provide governance in overseeing implementation. A data sub-committee to be formed to work through details and this will also involve FSCP.

Crossing owners not participating in this new regulatory strategy will continue to be subject to the existing regulatory compliance regime in which crossing owners will be required to take immediate restorative action for non-compliant crossings. However, if non-participatory crossing owners undertake proactive measures that align with assessment, remediation and reporting for stream crossing remediation efforts consistent with this Directive, the new watershed-based priority-setting strategy will be available to non-participatory crossing owners.

The new strategy will only be available to crossing owners who are willing and committed to participate in a program of proactive inspection, watershed assessment, annual reporting and risk-based scheduled remediation activities in connection with their respective non-compliant crossings where impediment to fish passage is evident.

Reporting and Data Management

Data will be held by FSCP and they will spend the monies and effort to collect, maintain and share data through their IT system at no cost to regulators. Data collected by industry often exceeds the needs for the compliance requirements of the regulators and the regulators may only be interested in certain attributes of that data. Crossing owners are statutorily obligated to comply with all reporting requirements imposed by legislation.

For the purpose of this Directive, reporting and data management will take place as follows:

- The FSCP or other service providers will report non-compliant crossings with a specified level of detail to participating crossing owners, sufficient for the crossing owners to fulfill their statutory obligations and report on their own behalf to the regulators.
- Information reported to the regulators by crossing owners about non-compliant stream crossings will be sufficiently detailed so as to fulfill the statutory requirements for mandatory reporting for non-compliant stream crossings, and the information will be reported according to the legislation.
- Data acquired by the regulators via the annual reporting function performed by the FSCP or other agents for crossing owners will be used to:
 - Support the evaluation, review, and approval of watershed remediation plans.
 - Perform regulatory audits to ensure inspection performance meets the standards set out in the *Roadway Watercourse Crossing Inspection Manual*.

- Identify participating crossing owners that are not meeting their obligations as outlined in this Directive or otherwise failing to meet their statutory obligations so that corrective action can be undertaken by the regulators.

The FSCP is currently maintaining and augmenting a database that will meet the information management needs of the new regulatory strategy.

Compliance and Enforcement

Compliance responses under the applicable legislation will be undertaken directly with the crossing owner.

Crossing owners, who choose to manage stream crossings as they have historically, are subject to the provisions of the applicable legislation and any authorization issued pursuant to the legislation to remediate non-compliant crossings. Any enforcement action undertaken by either ESRD or AER may be subject to proactive disclosure by way of quarterly or annual reports and media releases. Additionally, the content of any investigation file, once concluded, is subject to the provisions of the *Freedom of Information and Protection of Privacy Act* and may be released to a requesting party.

Any crossing owner who does not meet their obligations will be subject to the provisions of the applicable legislation and any authorization issued pursuant to the legislation as administered by either ESRD or AER. Participation in this strategy is not a shield against all possible enforcement activity which may be undertaken by ESRD or the AER for matters arising from non-compliant watercourse crossings.

Review and Revision

The Directive should be viewed as a living document which may be modified after subsequent review and revision cycles to reflect emerging priorities, technological advancements or refinement for elements such as data management, changes to the contingent of service providers actively engaged in inspection, reporting and remediation activities, and other changes that reflect the evolution of the Directive over time. The Directive will be opened for review and revision one year from the date of ratification by the Policy Committee and amended as appropriate, and at minimum annually thereafter.

Contact Information

Alberta Environment and Sustainable Resource Development

Main Floor, Great West Life Building

9920 – 108 Street

Edmonton, AB T5K 2M4

Phone: 1-877-944-0313

Email: ESRD.Info-Centre@gov.ab.ca

Alberta Energy Regulator

Fourth Floor, Twin Atria Building

4999 – 98 Avenue

Edmonton, AB T6B 2X3

Phone: 1-855-297-8311

Email: inquiries@aer.ca

Foothills Stream Crossing Partnership

Website: <https://fscp.foothillsri.ca/>

Email: fscpcontact@gmail.com

Authorities

Environmental Protection and Enhancement Act (EPEA)

Public Lands Act

Public Lands Administration Regulation

Public Lands Administration Regulation

*Responsible Energy Development Act, and Specified Enactments
(Jurisdiction) Regulation*

Water Act

Code of Practice for Watercourse Crossings

Alberta Timber Harvest Planning and Operating Ground Rules

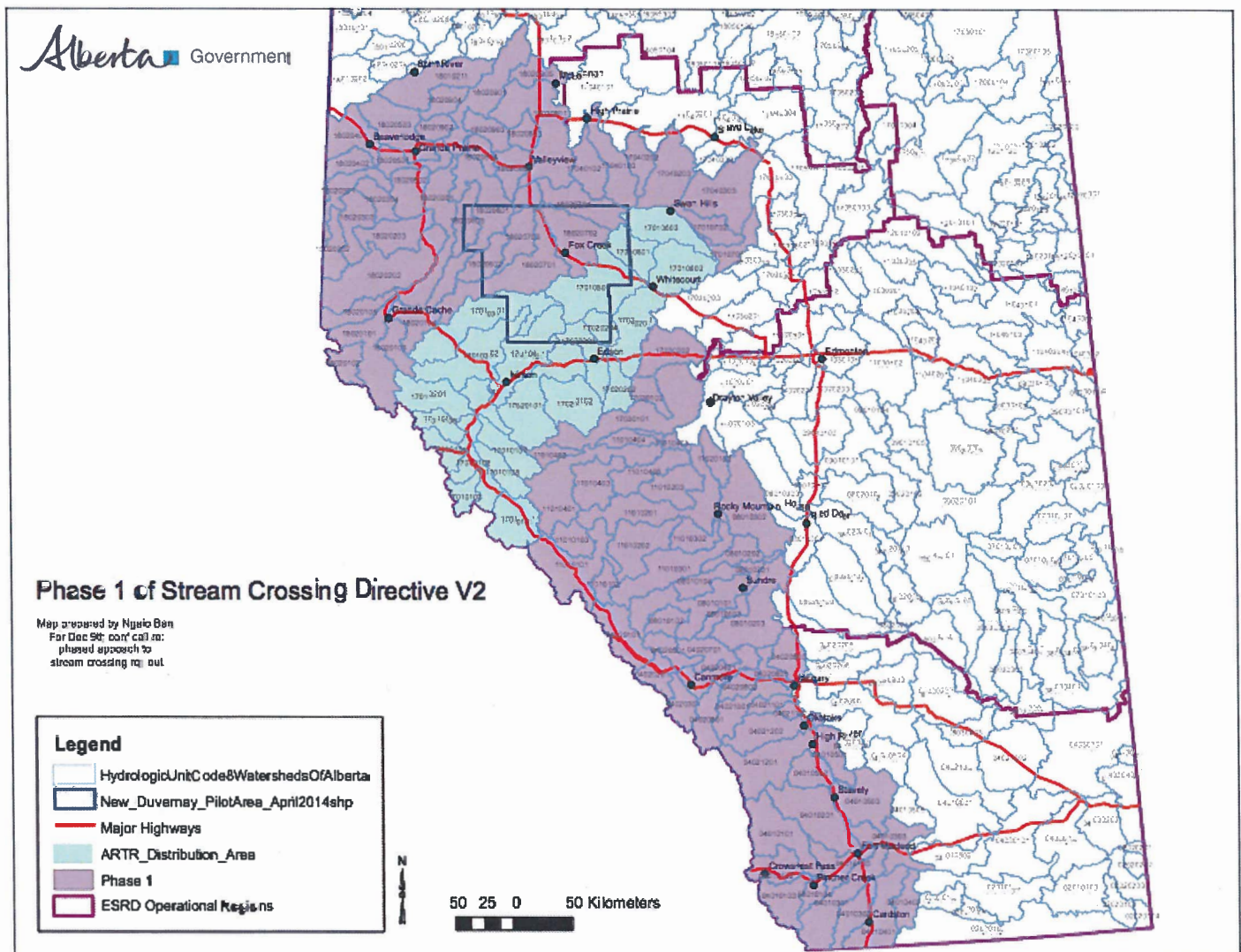
EAP Integrated Standards and Guidelines, Approval Standards

Approved

Original Signed by

Heather von Hauff, Executive Director, Policy Integration Branch
Alberta Environment and Sustainable Resource Development

Figure 1



Appendix 2:
Copy of GoA Roadways Watercourse
Crossing Inspection Manual

See next page

Appendix 3: Copy of the Roadway Watercourse Crossing Inspection Form



Environment and
Sustainable Resource Development

Watercourse Crossing Inspection Form

Roadway Watercourse Crossing Inspection Manual

Water Crossing Name of ID (ex. # spray painted on or around culvert)			
Watercourse Name:		Disposition No.	
GPS Co-ordinates (UTM):	Easting:	Northing:	

Stream Classification:	<input type="checkbox"/> Ephemeral	<input type="checkbox"/> Non-Fluvial (in non-fluvial, omit shaded section)
<input type="checkbox"/> Fluvial & either:	<input type="checkbox"/> Intermittent, or	<input type="checkbox"/> Permanent – Small, or <input type="checkbox"/> Permanent - Large
Bankfull width: _____m	<input type="checkbox"/> measured	or <input type="checkbox"/> estimated to nearest metre)

Crossing Type:	<input type="checkbox"/> Bridge – Permanent	<input type="checkbox"/> Bridge – Temporary	<input type="checkbox"/> Culvert - Single
	<input type="checkbox"/> Culvert - Multiple	<input type="checkbox"/> Culvert – Open Bottom	
	<input type="checkbox"/> Fill - Log	<input type="checkbox"/> Ford	<input type="checkbox"/> Suspended <input type="checkbox"/> Reclaimed

Erosion at site?	<input type="checkbox"/> Yes <input type="checkbox"/> Potential <input type="checkbox"/> No	<input type="checkbox"/> Inlet <input type="checkbox"/> Outlet <input type="checkbox"/> Both
If Yes or Potential, identify source (check all that apply):		
<input type="checkbox"/> Ditch Gully <input type="checkbox"/> Bank Slump <input type="checkbox"/> Fill Slope <input type="checkbox"/> Road Surface <input type="checkbox"/> Bridge Deck <input type="checkbox"/> Other		
Extent:	<input type="checkbox"/> Low <input type="checkbox"/> High-unsatisfactory	Total Erosion Area (m ²) _____

Culvert(s) diameter: _____m _____m _____m _____m (primary)

Greater than 10 % of diameter blocked by debris?	<input type="checkbox"/> Yes <input type="checkbox"/> No (note cause in comments)
Substrate in the culvert?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown
If yes, what type?	<input type="checkbox"/> Sand <input type="checkbox"/> Gravel <input type="checkbox"/> Cobble <input type="checkbox"/> Boulder <input type="checkbox"/> Other:
For what length of culvert?	<input type="checkbox"/> 25% or less <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 100%
What proportion has backwater?	<input type="checkbox"/> 0% <input type="checkbox"/> 25% <input type="checkbox"/> 50% <input type="checkbox"/> 75% <input type="checkbox"/> 100%
Culvert slope:	<input type="checkbox"/> Level and Uniform <input type="checkbox"/> Slope > or Vertically Bent
Outlet Gap:	_____m (for lowest, if more than one culvert) <input type="checkbox"/> Embedded
+Pool Depth:	_____m = Score: _____ Scour pool apparent? <input type="checkbox"/> Yes <input type="checkbox"/> No

Fish Passage Assessment (use 10.1: Fish Passage Evaluation Criteria for Culvert Stream Crossings)

<input type="checkbox"/> No Concerns	<input type="checkbox"/> Some Concerns	<input type="checkbox"/> Serious Concerns
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Inspector's Name:	Inspection Date:
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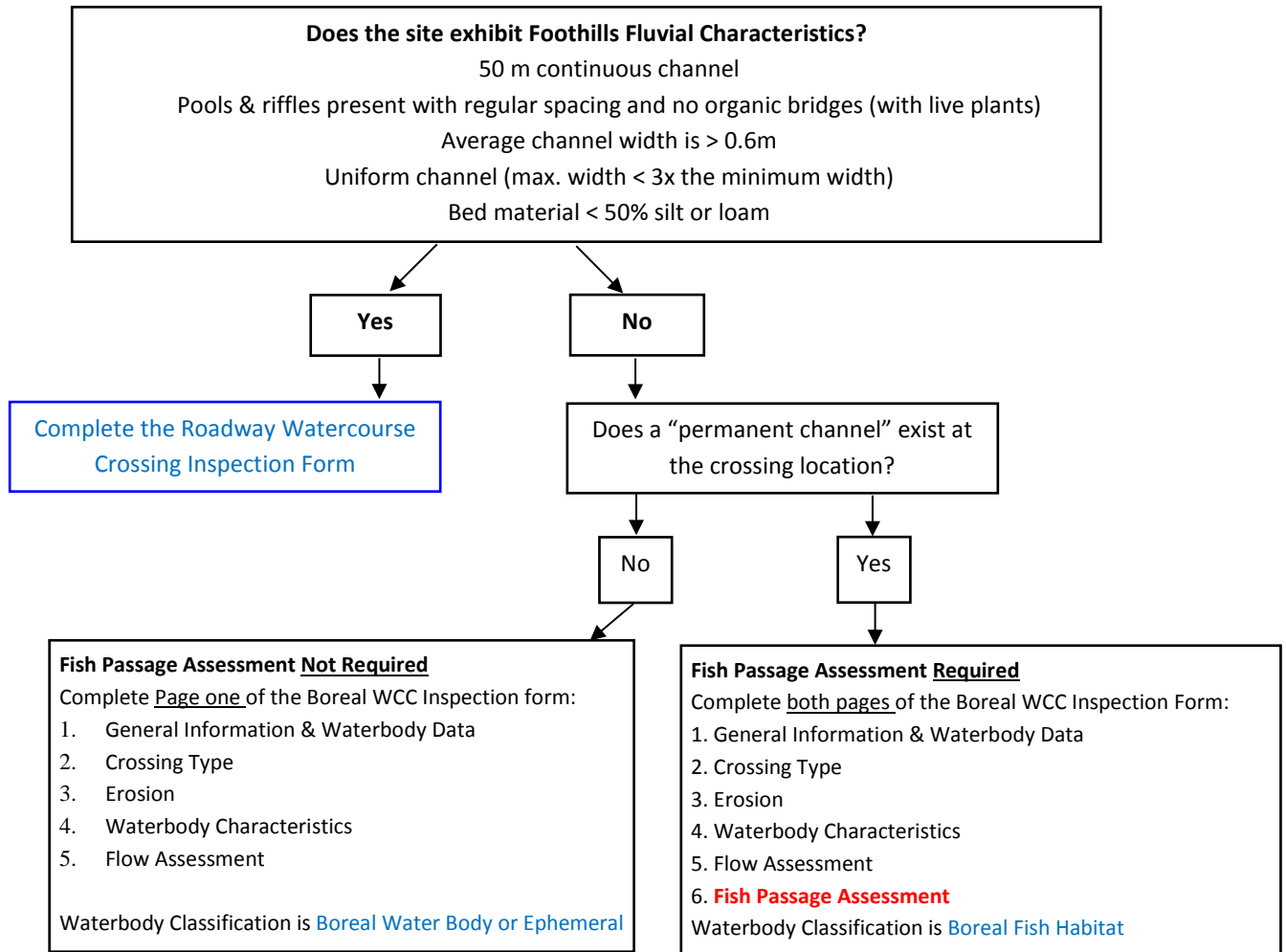
Comments: (if photos taken of inlet and outlet, please record image numbers)

Appendix 4: Draft Boreal Watercourse Crossing Inspection Form

See next page

Boreal Watercourse Crossing Inspection Flow Chart and Form

Boreal Inspection Flowchart



Instructions:

Use the above flow chart and inspection form only for crossings within the Boreal.

- First step is to assess the water body for fluvial characteristics as identified in the ESRD/ Roadway Watercourse Crossing Inspection Manual (RWCCIM).
 - If the crossing is identified as fluvial then the RWCCIM inspection form is to be completed.
 - If the crossing does NOT exhibit fluvial characteristics then the Boreal Watercourse Crossing Inspection Form (BWCCIF) is to be completed.
- Second step is to assess if the water body has a permanent channel.
 - If the water body does not have a permanent channel only complete the General Site Information found on page one of the BWCCIF.
 - A permanent channel is indicative of potential fish habitat and thus the entire BWCCIF must be completed. This includes the second page of the BWCCIF – “Fish Passage”.



Boreal Watercourse Crossing Inspection Form

General Site Information (to be completed at each crossing location)

Inspection date/time:	Field Centre:	Inspector:	
Water Body Name:	Watercourse ID:	HUC 8 Watershed Name:	Strahler Order Number:
Public Lands Disposition Number: (if applicable: LOC,MSL,ROE)		Private Land if no disposition exists: (Enter: white area)	
Well/Facility Licence Number:		Crossing Owner:	
GPS Coordinates NAD 83 (zone):	11 (West of Calgary)	Easting:	
	12 (East of Calgary)	Northing:	

Crossing Type

<input type="checkbox"/> Bridge – permanent	<input type="checkbox"/> Bridge – temporary	<input type="checkbox"/> Culvert – open bottom
<input type="checkbox"/> Culvert – single	<input type="checkbox"/> Fill – log	<input type="checkbox"/> Suspended
<input type="checkbox"/> Reclaimed		
Culverts – multiple (multiple culverts installed within a defined active channel) _____ m (primary) _____ m _____ m _____ m		<input type="checkbox"/> Causeway – multiple (additional culverts installed outside the active channel) _____ m (primary) _____ m _____ m _____ m

Erosion

Erosion at Site:	<input type="checkbox"/> Yes (yes if there are signs of earth movement at the crossing site. Typical erosion in boreal is caused by high water levels saturating fill slope and road surface) <input type="checkbox"/> Water flowing over road top?	<input type="checkbox"/> Potential (no evidence of movement, but there is exposed earth on fill slopes and ditches leading to the waterbody)	<input type="checkbox"/> No (no erosion present. Site is well vegetated and stabilized)
Erosion Location:	<input type="checkbox"/> Inlet (upstream end of culvert)	<input type="checkbox"/> Outlet (downstream end of culvert)	<input type="checkbox"/> Both
Erosion Source:	<input type="checkbox"/> Road surface - subsidence <input type="checkbox"/> Fill slope	<input type="checkbox"/> Ditch gully <input type="checkbox"/> Bridge deck	<input type="checkbox"/> Bank slump <input type="checkbox"/> Other:
Erosion Extent:	<input type="checkbox"/> Low (low = sedimentation / erosion NOT in imminent contact with stream channel or temporarily impeded by erosion control)	<input type="checkbox"/> High (high = sedimentation/erosion in direct or imminent contact)	

Water Body Characteristics

Bankfull width (Rooted width of woody vegetation): (measure the "rooted width" distance between woody vegetation. RW is the point where the rooted non-grass, terrestrial type vegetation begins. (Example: black spruce and willow))	Upstream: <input type="checkbox"/> 0-50m <input type="checkbox"/> 50-100m <input type="checkbox"/> 100m-250m <input type="checkbox"/> >250m	Downstream: <input type="checkbox"/> 0-50m <input type="checkbox"/> 50-100m <input type="checkbox"/> 100m-250m <input type="checkbox"/> >250m
Open water channel (meters): (measure open water zone not constricted by aquatic vegetation outside the Zone of Influence – ZOI)	Upstream:	Downstream:

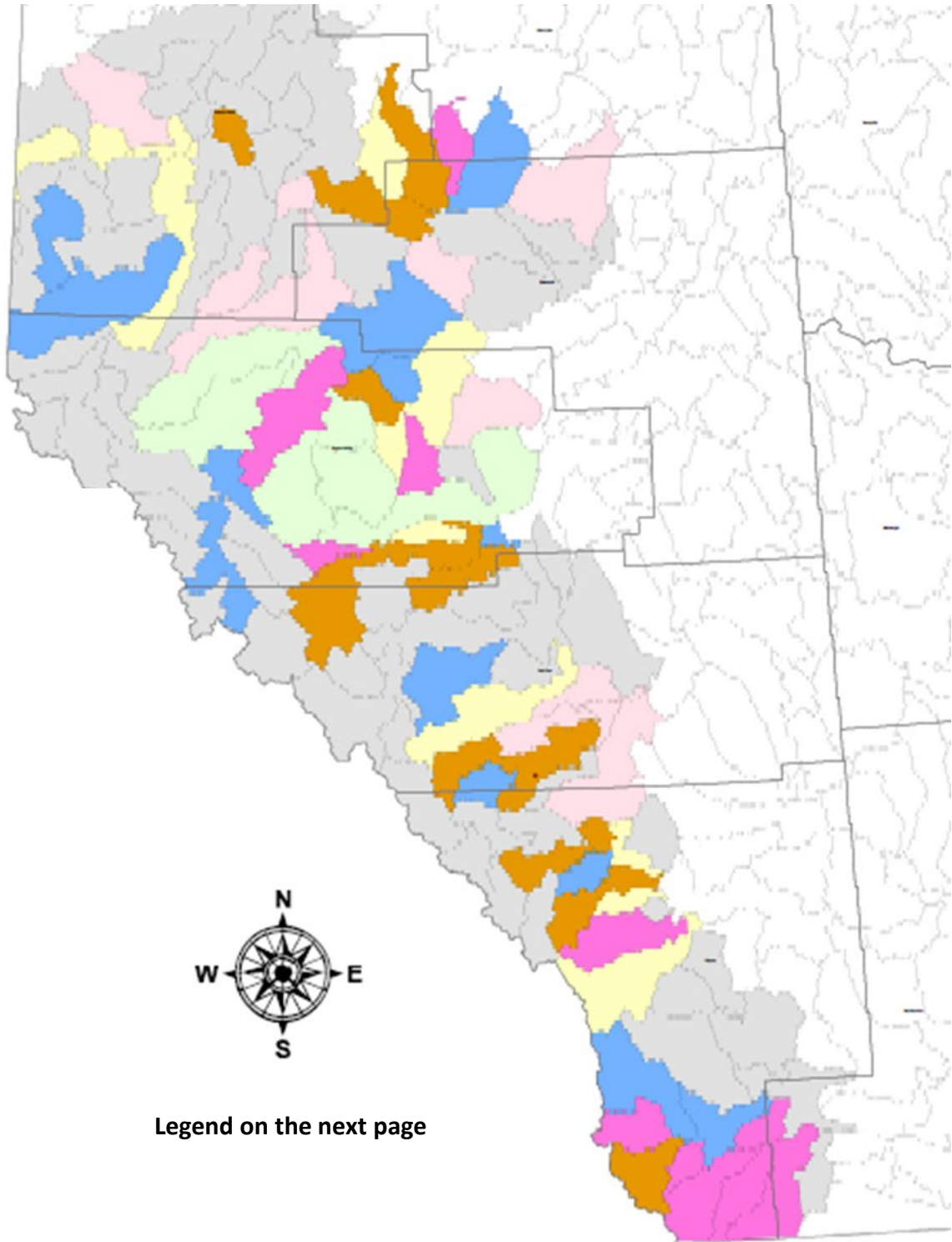
Flow Assessment

Water Elevation: (estimate the difference of the water level between upstream and downstream of crossing)	Is there significant difference causing water impoundment? <input type="checkbox"/> Yes <input type="checkbox"/> No	If you answered yes: estimate vertical difference: _____m and fill out source of blockage sections below
Debris Blockage:	<input type="checkbox"/> Trash racks influencing blockage (indicate if trash racks are becoming plugged and causing the blockage)	<input type="checkbox"/> Beaver/muskrat activity (is beaver activity at the immediate ends of the inlet or outlet causing the obstruction of flow/passage?)
Debris Blockages at Culvert Ends:	<input type="checkbox"/> Culvert damaged (is the culvert crushed or bent to the point it is obstructing flow/passage?)	<input type="checkbox"/> Beaver dam (is there a beaver dam upstream of the crossing blocking flow?)
Channel Blockage Outside of ZOI:	<input type="checkbox"/> Natural causes (natural process, other than beaver dams that has changed the flow location. Example: bank slumping outside ZOI)	<input type="checkbox"/> Natural debris accumulation


Water Body Classification

<input type="checkbox"/> Boreal Fish Habitat (Non-fluvial) (if the site exhibits an active channel, complete the Fish Passage assessment)	<input type="checkbox"/> Ephemeral (seasonal flow; bed is vegetated with no channel development)	<input type="checkbox"/> Boreal Water Body (site not identified with inspection tool, and does not meet the RWCCIM definition of Fluvial)
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Appendix 5: Foothills Watershed HUC 8 Watershed Priority Map



Legend - HUC 8 Foothills Priorities



2015_Wildhay_River
2015_Berland
2015_Embarras
2015_Upper_McLeod
2015_Upper_Pembina
2016_Wolf_Creek
2016_Belly_River
2016_Cardinal_River
2016_Crowsnest_River
2016_Driftpile_River
2016_Pincher_Creek
2016_Sheep_River
2016_StMary_River
2016_UpperAthabasca_OldmanCreek
2016_Waterton_River
2017_BowRiver_GhostReservoir
2017_Brazeau
2017_Castle_River
2017_Cornwall_Creek
2017_EastPrairie_River
2017_Edson_River
2017_Elbow_River
2017_Goose_River
2017_Nordegg_River
2017_UpperRedDeer_River
2018_UpperOldman_River
2018_AthabascaRiver_AboveWhitecourt
2018_Brazeau_Canal
2018_Jumpingpound_Creek
2018_Kakwa_River
2018_Nose_Creek
2018_OldmanRiver_Below_OldmandRiverReservoir
2018_Panther_River
2018_Ram_River
2018_Swan_River
2018_Trout_Creek
2018_UpperAthabasca_BruteLake
2019_WestPrairie_River
2019_BowRiver_BighillCreek
2019_Clearwater_river
2019_Elk_River
2019_Fish_Creek
2019_Highwood_river
2019_Lower_Wapiti_River
2019_LowerMcLeod_River
2019_Middle_Smoky_River
2019_Red_Willow_River
2020_Upper_Little_Smoky_River
2020_Bear_River
2020_Deep_Valley_Creek
2020_James_River
2020_Little_Red_Deer_River
2020_Lobstick_River
2020_Raven_River
2020_Red_Deer_River_and_Gleniffer_Lake
2020_Sakwatamau_River
2020_Saulteaux_River

Appendix 6a: List of Foothills HUC 8 Watersheds

See next page

Detailed List of Foothills HUC 8 Priority Watersheds							
FID	HUC 8	WSC CODE	NAME	BASIN	SHAPE STLe	SHAPE STAr	PRIORITY YEAR
101	17010301	07AC	BERLAND RIVER	ATHABASCA	509429.206	3058988178	2015
415	17010302	07AC	WILDHAY RIVER	ATHABASCA	406398.3683	2622580002	2015
93	17020101	07AF	UPPER MCLEOD RIVER	ATHABASCA	437667.2509	3061938625	2015
74	17020102	07AF	EMBARRAS RIVER	ATHABASCA	240192.6727	1857275690	2015
76	17030101	07BA	UPPER PEMBINA RIVER	ATHABASCA	537325.3778	3522562477	2015
44	04010102	05AA	CROWSNEST RIVER	SOUTH SASKATCHEWAN	183919.0399	1032421233	2016
388	04010104	05AA	PINCHER CREEK	SOUTH SASKATCHEWAN	129791.5416	434734234.4	2016
420	04010301	05AD	BELLY RIVER	SOUTH SASKATCHEWAN	337986.9861	1651368748	2016
421	04010302	05AD	WATERTON RIVER	SOUTH SASKATCHEWAN	252120.4071	1527015726	2016
32	04010401	05AE	ST. MARY RIVER	SOUTH SASKATCHEWAN	282947.2805	1798344835	2016
28	04021202	05BL	SHEEP RIVER	SOUTH SASKATCHEWAN	268980.5878	1595089815	2016
184	11010402	05DD	CARDINAL RIVER	NORTH SASKATCHEWAN	156047.2899	494521826.8	2016
91	17010401	07AD	UPPER ATHABASCA AND OLDMAN CREEK	ATHABASCA	356481.9443	2381990563	2016
107	17020202	07AG	WOLF CREEK	ATHABASCA	179789.0534	833542255.5	2016
80	17040202	07BH	DRIFTPILE RIVER	ATHABASCA	193470.5252	847076712.5	2016
45	04010103	05AA	CASTLE RIVER	SOUTH SASKATCHEWAN	214513.1637	1225782112	2017
23	04020401	05BE	BOW RIVER & GHOST RESERVOIR	SOUTH SASKATCHEWAN	286629.0255	1203390877	2017
26	04021001	05BJ	ELBOW RIVER	SOUTH SASKATCHEWAN	287436.2102	1231105139	2017
148	08010101	05CA	UPPER RED DEER RIVER	RED DEER	465045.7172	2413788749	2017
211	11010401	05DD	BRAZEAU RIVER	NORTH SASKATCHEWAN	572415.9878	3117998935	2017
186	11010406	05DD	NORDEGG RIVER	NORTH SASKATCHEWAN	257505.9412	1175614347	2017
106	17020203	07AG	EDSON RIVER	ATHABASCA	153430.5436	733223089.7	2017
79	17040103	07BF	EAST PRAIRIE RIVER	ATHABASCA	285196.4471	1592744283	2017
236	18020604	07GF	CORNWALL CREEK	PEACE	125542.6074	547727243.2	2017
241	18020704	07GG	GOOSE RIVER	PEACE	273668.1754	1593855802	2017
43	04010101	05AA	UPPER OLDMAN RIVER	SOUTH SASKATCHEWAN	310970.0853	2114918433	2018
15	04010105	05AA.05AB	OLDMAN BELOW OLDMAN RIVER RESEVOIR	SOUTH SASKATCHEWAN	271351.8399	1158503172	2018
39	04020802	05BH	JUMPINGPOUND CREEK	SOUTH SASKATCHEWAN	158220.0712	598089053.4	2018
146	08010102	05CA	PANTHER RIVER	RED DEER	149465.1639	653775832.5	2018
181	11010202	05DC	RAM RIVER	NORTH SASKATCHEWAN	283751.8376	1880063081	2018
203	11010301	05DB	CLEARWATER RIVER	NORTH SASKATCHEWAN	421187.9616	2332063924	2018
177	11010405	05DD	BRAZEAU CANAL	NORTH SASKATCHEWAN	112281.997	219121914.9	2018
409	17010102	07AA	UPPER ATHABASCA & BRULE LAKE	ATHABASCA	527280.4843	2307326667	2018
102	17010501	07AE	ATHABASCA RIVER ABOVE WHITECOURT	ATHABASCA	335235.1541	2890932132	2018
75	17020204	07AG	TROUT CREEK	ATHABASCA	119747.9459	626537956.1	2018
96	17040203	07BJ	SWAN RIVER	ATHABASCA	275538.4668	2044464377	2018
225	18020202	07GB	KAKWA RIVER	PEACE	407041.3883	3509605230	2018
230	18020303	07GC	NOSE CREEK	PEACE	216210.9875	1233554243	2018
41	04020801	05BH	BOW RIVER AND BIGHILL CREEK	SOUTH SASKATCHEWAN	169062.2789	468727696	2019
27	04021101	05BK	FISH CREEK	SOUTH SASKATCHEWAN	143366.1199	451560915.4	2019
29	04021201	05BL	HIGHWOOD RIVER	SOUTH SASKATCHEWAN	375773.352	2386103902	2019
180	11010404	05DD	ELK RIVER	NORTH SASKATCHEWAN	133140.5236	496385276.7	2019
95	17020201	07AG	LOWER MCLEOD RIVER	ATHABASCA	416267.7463	2577620009	2019
78	17040102	07BF	WEST PRAIRIE RIVER	ATHABASCA	231136.7483	1167582312	2019
227	18020201	07GB	MIDDLE SMOKY RIVER	PEACE	436262.4293	2117318222	2019

407	18020402	07GD	REDWILLOW RIVER	PEACE	175799.3718	700801004.5	2019
233	18020501	07GE	LOWER WAPITI RIVER	PEACE	265287.5695	948518200	2019
145	08010104	05CA	JAMES RIVER	RED DEER	210433.2414	872392685.2	2020
150	08010201	05CB	RED DEER RIVER & GLENIFFER LAKE	RED DEER	194982.1704	370814965.9	2020
151	08010202	05CB	RAVEN RIVER	RED DEER	193847.5971	774426440.5	2020
149	08010203	05CB	LITTLE RED DEER RIVER	RED DEER	383909.4097	2581405678	2020
108	17010601	07AH	SAKWATAMAU RIVER	ATHABASCA	187565.3215	1171169144	2020
77	17030202	07BB	LOBSTICK RIVER	ATHABASCA	228851.2403	1640618925	2020
131	17040303	07BK	SAULTEAUX RIVER	ATHABASCA	346536.3612	2742832151	2020
235	18020503	07GE	BEAR RIVER	PEACE	270290.188	2028571271	2020
237	18020602	07GF	DEEP VALLEY CREEK	PEACE	181536.6202	964457301	2020
243	18020701	07GG	UPPER LITTLE SMOKY RIVER	PEACE	573964.4908	3469362849	2020

Appendix 6b: List of Non-Foothills HUC 8 Watersheds

See next page

Detailed List of Foothills HUC 8 Priority Watersheds							
FID	HUC 8	WSC CODE	NAME	BASIN	SHAPE STLe	SHAPE STAR	PRIORITY LEVEL
0	17050202	07CB	CALLING LAKE	ATHABASCA	273053.3748	1823299710	
306	02010101	11AA(05AF)	MIDDLE COULEE CREEK	MILK	155590.1866	626880024.7	
384	02010102	11AA(05AF)	CROW INDIAN LAKE	MILK	445276.2966	2574945980	
383	02010103	11AA(05AF)	MANYBERRIES CREEK	MILK	293693.8696	1853125838	
311	02020101	11AA	VERDIGRIS LAKE	MILK	146410.3624	431233131.6	
310	02020102	11AA	MILK RIVER	MILK	561686.6313	4054903339	
307	02020103	11AA	SAGE CREEK	MILK	165389.5809	682530734.2	
309	02020104	11AA	CUTBANK CREEK	MILK	83626.23362	314156807.7	
385	02020201	11AB	BATTLE CREEK	MILK	62495.81396	148730245	
308	02020202	11AB	MIDDLE CREEK	MILK	92539.54438	349744835.3	
312	02020203	11AB	LODGE CREEK	MILK	194768.8951	875281248.2	
16	04010201	05AB	WILLOW CREEK	SOUTH SASKATCHEWAN	301619.9832	2534557679	
18	04010303	05AB,05AD	OLDMAN BELOW BELLY RIVER	SOUTH SASKATCHEWAN	391551.9259	1641250732	
382	04010402	05AE	POTHOLE CREEK	SOUTH SASKATCHEWAN	191672.2338	768693489.9	
17	04010501	05AC	UPPER LITTLE BOW RIVER	SOUTH SASKATCHEWAN	197912.0987	964300560.5	
387	04010502	05AC	MOSQUITO CREEK	SOUTH SASKATCHEWAN	199036.7433	985874349.7	
393	04010503	05AC	MIDDLE LITTLE BOW RIVER	SOUTH SASKATCHEWAN	286901.1688	2043592766	
386	04010504	05AC	SNAKE CREEK	SOUTH SASKATCHEWAN	175974.6861	1046192399	
394	04010505	05AC	LOWER LITTLE BOW RIVER	SOUTH SASKATCHEWAN	159638.9115	825854888.2	
34	04010601	05AG	LOWER OLDMAN RIVER	SOUTH SASKATCHEWAN	464974.3256	3432840819	
33	04010602	05AG	CHIN LAKES	SOUTH SASKATCHEWAN	282780.1204	1381100775	
19	04020101	05BA	UPPER BOW RIVER	SOUTH SASKATCHEWAN	228601.9412	1463118070	
20	04020201	05BB	BREWSTER CREEK	SOUTH SASKATCHEWAN	175446.9333	755611618.7	
21	04020301	05BC	SPRAY LAKES RIVER	SOUTH SASKATCHEWAN	166238.7312	781914542.2	
22	04020501	05BD	CASCADE RIVER	SOUTH SASKATCHEWAN	181802.9059	722734396.7	
24	04020601	05BF	KANANASKIS RIVER	SOUTH SASKATCHEWAN	190496.3452	926104627	
25	04020701	05BG	GHOST RIVER	SOUTH SASKATCHEWAN	212184.169	944438320.9	
40	04020803	05BH	NOSE CREEK	SOUTH SASKATCHEWAN	171971.7045	977864408.3	
392	04020901	05BM,05BK	MIDDLE BOW RIVER	SOUTH SASKATCHEWAN	518554.4912	2958449436	
31	04020902	05BM	WEST ARROWWOOD CREEK	SOUTH SASKATCHEWAN	210401.5071	1103268618	
30	04020903	05BM	CROWFOOT CREEK	SOUTH SASKATCHEWAN	232564.2824	1464916863	
389	04021102	05BK	PINE CREEK	SOUTH SASKATCHEWAN	70011.18083	205312269.5	
391	04021301	05BN	LOWER BOW RIVER	SOUTH SASKATCHEWAN	401065.1724	2583118258	
390	04021302	05BN	LOWER BOW & TWELVE MILE COULEE	SOUTH SASKATCHEWAN	277822.5554	2738416863	
37	04030101	05AH,05AJ	SOUTH SASKATCHEWAN BELOW BOW RIVER	SOUTH SASKATCHEWAN	528333.914	3436758394	
35	04030201	05AH	SEVEN PERSONS CREEK	SOUTH SASKATCHEWAN	346012.5692	2331089183	
36	04030202	05AH	ROSS CREEK	SOUTH SASKATCHEWAN	209377.25	1458541351	
38	04030301	05AK	LOWER SOUTH SASKATCHEWAN RIVER	SOUTH SASKATCHEWAN	525770.3142	5004571274	
399	04030401	05HA	BOXELDER CREEK	SOUTH SASKATCHEWAN	244090.2905	1454175358	
398	04030501	05HA	UNNAMED	SOUTH SASKATCHEWAN	67838.99145	206545151	
42	04030601	05HB	ALSASK	SOUTH SASKATCHEWAN	185867.23	556605643.9	
317	07010101	05GA	KIRKPATRICK LAKE	SOUNDING	161674.5917	668472116.5	
372	07010102	05GA	UPPER SOUNDING CREEK	SOUNDING	407676.6032	1880425018	
404	07010103	05GA	LOWER SOUNDING CREEK	SOUNDING	510013.5904	2387387109	
374	07010104	05GA	UNNAMED	SOUNDING	93117.32104	197215157.6	
314	07010105	05GA	UNNAMED	SOUNDING	61772.85243	188798255.5	
313	07010106	05GA	MONITOR CREEK	SOUNDING	230839.1799	1503888860	
373	07010107	05GA	EYEHILL CREEK	SOUNDING	293012.2947	1619540553	
315	07010108	05GA	UNNAMED	SOUNDING	153888.6446	508287455.2	
316	07010109	05GA	KILLARNEY LAKE	SOUNDING	216017.937	1349868417	
147	08010103	05CA	FALLENTIMBER CREEK	RED DEER	179087.6869	527986571.9	
152	08010301	05CC	RED DEER RIVER AND SYLVAN LAKE	RED DEER	238653.3033	1230838378	
153	08010302	05CC	MEDICINE RIVER	RED DEER	347725.5066	2768996078	
400	08010303	05CC	BLINDMAN RIVER	RED DEER	252642.1588	1795292703	
154	08020101	05CD	RED DEER RIVER BELOW RED DEER	RED DEER	364219.0088	2399304474	

155	08020102	05CD	BUFFALO LAKE	RED DEER	301265.4502	2013881877	
156	08020103	05CD	BIG VALLEY CREEK	RED DEER	173103.1187	559532663.9	
157	08020201	05CE	RED DEER RIVER ABOVE ROSEBUD RIVER	RED DEER	90167.48293	188168169.2	
158	08020202	05CE	THREEHILLS CREEK	RED DEER	254247.2003	2206591410	
159	08020203	05CE	KNEEHILLS CREEK	RED DEER	318782.3478	2453624840	
160	08020204	05CE	MICHICHI CREEK	RED DEER	195041.3426	1164200708	
396	08020205	05CE	ROSEBUD RIVER	RED DEER	468340.5171	2853081748	
395	08020206	05CE	SERVICEBERRY CREEK	RED DEER	270487.8061	1384341088	
163	08030101	05CG	RED DEER ABOVE BULLPOUND CREEK	RED DEER	227790.7696	1619720717	
162	08030102	05CG	BULLPOUND CREEK	RED DEER	240158.819	1298060591	
169	08030201	05CJ	MIDDLE RED DEER RIVER	RED DEER	427495.2639	1899080339	
167	08030202	05CJ	MATZHIWIN CREEK	RED DEER	297017.0137	2374629754	
168	08030203	05CJ	ONETREE CREEK	RED DEER	205728.9011	902943241.6	
164	08030301	05CH	BERRY CREEK	RED DEER	392957.8661	2383726913	
166	08030302	05CH	PLOVER LAKE	RED DEER	126382.8943	563366373.7	
165	08030303	05CH	EAST BERRY CREEK	RED DEER	183912.5814	919263102.8	
170	08030401	05CK	LOWER RED DEER RIVER	RED DEER	544010.9223	3184286873	
172	08030402	05CK	BLOOD INDIAN CREEK	RED DEER	198184.3434	733950778.4	
171	08030403	05CK	ALKALI CREEK	RED DEER	197044.959	635414583.8	
375	08030404	05CK	UNNAMED	RED DEER	206848.941	1323702794	
161	08040101	05CF	DOWLING AND SULLIVAN LAKES	RED DEER	329950.4702	3143356250	
401	09010101	05FA	UPPER BATTLE RIVER	BATTLE	612734.8146	3282264494	
47	09010102	05FA	WOLF CREEK	BATTLE	144102.0274	555575657.9	
48	09010103	05FA	PIPESTONE CREEK	BATTLE	226169.6765	1634992074	
49	09010104	05FA	CAMROSE CREEK	BATTLE	134894.767	552135041.1	
50	09010105	05FA	DRIEDMEAT CREEK	BATTLE	245896.3308	1222412985	
58	09020101	05FC	MIDDLE BATTLE RIVER	BATTLE	513295.084	3131239717	
51	09020102	05FC	MEETING CREEK	BATTLE	345291.0168	1487622719	
56	09020201	05FB	BATTLE RIVER AND GRATTAN CREEK	BATTLE	403268.6372	1639636060	
52	09020202	05FB	IRON CREEK	BATTLE	371771.2169	3588231105	
59	09030101	05FF	LOWER BATTLE RIVER	BATTLE	439627.5233	1978683681	
53	09030102	05FF	BUFFALO CREEK	BATTLE	194585.9096	986638703.7	
54	09030103	05FF	GRIZZLY BEAR CREEK	BATTLE	170093.9786	709739786.1	
57	09030104	05FF	BLACKFOOT CREEK	BATTLE	146746.771	498690545.7	
46	09030201	05FD	RIBSTONE CREEK	BATTLE	619938.0017	3814138749	
55	09030202	05FD	BLACK CREEK	BATTLE	148710.0475	510284155.6	
358	11010101	05DA	NORTH SASKATCHEWAN ABOVE ABRAHAM	NORTH SASKATCHEWAN	454886.2237	2525358242	
182	11010102	05DA	SIFFLEUR RIVER	NORTH SASKATCHEWAN	135420.0491	514200381.1	
183	11010103	05DA	CLINE RIVER	NORTH SASKATCHEWAN	150226.1202	834948292.9	
178	11010201	05DC	NORTH SASKATCHEWAN BELOW ABRAHAM	NORTH SASKATCHEWAN	589725.5108	2998184740	
185	11010203	05DC	BAPTISTE RIVER	NORTH SASKATCHEWAN	235729.5947	1352575161	
204	11010302	05DB	PRAIRIE CREEK	NORTH SASKATCHEWAN	196194.4964	866673192.5	
179	11010403	05DD	BLACKSTONE RIVER	NORTH SASKATCHEWAN	243500.0846	1401276426	
205	11020101	05DE	NORTH SASKATCHEWAN ABOVE WABAMUN	NORTH SASKATCHEWAN	450480.8619	2311235002	
187	11020102	05DE	WOLF CREEK	NORTH SASKATCHEWAN	153128.1845	667030123.3	
188	11020103	05DE	BUCKLAKE CREEK	NORTH SASKATCHEWAN	205777.3653	1253986034	
201	11020104	05DE	WABAMUN CREEK	NORTH SASKATCHEWAN	140438.2209	503930913.2	
189	11020201	05DF	NORTH SASKATCHEWAN BELOW STRAWBERRY	NORTH SASKATCHEWAN	267686.3551	1335617285	
176	11020202	05DF	STRAWBERRY CREEK	NORTH SASKATCHEWAN	138417.2923	601116831.9	
175	11020203	05DF	WHITEMUD CREEK	NORTH SASKATCHEWAN	196078.3106	1071549766	
200	11020301	05EA	STURGEON RIVER	NORTH SASKATCHEWAN	519938.2439	2980008725	
190	11020302	05EA	ATIM CREEK	NORTH SASKATCHEWAN	126397.2306	468640573.4	
209	11030101	05EB	NORTH SASKATCHEWAN ABOVE BEAVERHILL	NORTH SASKATCHEWAN	273918.4254	1482326894	
173	11030102	05EB	BEVERHILL CREEK	NORTH SASKATCHEWAN	349747.2483	2922732514	
208	11030201	05EC	NORTH SASKATCHEWAN BELOW REDWATER	NORTH SASKATCHEWAN	394224.6761	2185632998	
174	11030202	05EC	REDWATER RIVER	NORTH SASKATCHEWAN	259381.8871	1612982960	
191	11030203	05EC	NAMEPI CREEK	NORTH SASKATCHEWAN	163589.035	747489017.5	
192	11030204	05EC	EGG CREEK	NORTH SASKATCHEWAN	191908.6384	707446827.5	

193	11030205	05EC	WHITE EARTH CREEK	NORTH SASKATCHEWAN	205556.3235	1065870642	
207	11040101	05ED	NORTH SASKATCHEWAN AND MANN LAKES	NORTH SASKATCHEWAN	584590.4679	3052611834	
202	11040102	05ED	SADDLE LAKE	NORTH SASKATCHEWAN	263262.1326	1246649833	
194	11040103	05ED	SLAWA CREEK	NORTH SASKATCHEWAN	187185.9481	931211321.4	
195	11040104	05ED	FROG CREEK	NORTH SASKATCHEWAN	171531.8936	771879887	
210	11040201	05EE	UPPER VERMILION RIVER	NORTH SASKATCHEWAN	690376.5806	3728259666	
196	11040202	05EE	UNNAMED	NORTH SASKATCHEWAN	140335.8819	707236356.9	
197	11040203	05EE	BIRCH CREEK	NORTH SASKATCHEWAN	243832.2786	1292148875	
206	11040204	05EE	LOWER VERMILION RIVER	NORTH SASKATCHEWAN	329051.5145	1780963677	
199	11040301	05EF	LOWER NORTH SASKATCHEWAN RIVER	NORTH SASKATCHEWAN	149025.4686	623574576	
198	11040302	05EF	BIG GULLY CREEK	NORTH SASKATCHEWAN	148977.7082	528761549.8	
69	12010101	06AA	UPPER BEAVER RIVER	BEAVER	372176.2994	2541190189	
70	12010102	06AA	AMISK RIVER	BEAVER	387776.7072	2636645160	
64	12010201	06AB	SAND RIVER	BEAVER	535956.6098	3466253797	
62	12010202	06AB	CANOE LAKE	BEAVER	134408.927	492579129.7	
63	12010203	06AB	WOLF RIVER	BEAVER	211075.2857	1028272493	
68	12020101	06AC	MIDDLE BEAVER RIVER	BEAVER	271592.5963	823829474.1	
71	12020102	06AC	MOOSE LAKE	BEAVER	255737.4221	970393194.2	
65	12020103	06AC	JACKFISH CREEK	BEAVER	184493.2793	600744063.8	
66	12020104	06AC	MARIE CREEK	BEAVER	225423.1998	837405265.3	
61	12020105	06AC	MURIEL CREEK	BEAVER	219661.4901	990129010	
72	12020201	06AD	LOWER BEAVER RIVER	BEAVER	221392.2988	934290951.1	
67	12020301	06AF	MEDLEY RIVER AND COLD LAKE	BEAVER	228903.0323	808438957.8	
60	12020302	06AF	CALDER RIVER AND PRIMROSE LAKE	BEAVER	258044.256	872434649.9	
14	13010101	06BA	DILLON RIVER	CHURCHILL	119847.0027	457659307.6	
405	15010101	06BA	GARSON LAKE	CHURCHILL	122121.0463	242987559	
321	16010101	10CA	FONTAS RIVER	FONTAS	197128.4538	934299198	
410	17010101	07AA	UPPER ATHABASCA RIVER	ATHABASCA	206062.4106	1552005587	
116	17010103	07AA	WHIRLPOOL RIVER	ATHABASCA	165310.707	599839410.3	
114	17010104	07AA	MIETTE RIVER	ATHABASCA	164943.5083	656963016.1	
73	17010105	07AA	MALIGNE RIVER	ATHABASCA	176537.4261	890112332.7	
115	17010106	07AA	SNARING RIVER	ATHABASCA	160554.1226	713890433.9	
416	17010107	07AA	ROCKY RIVER	ATHABASCA	202981.5767	1136017030	
408	17010201	07AB	SNAKE INDIAN CREEK	ATHABASCA	243325.8637	1598906673	
92	17010602	07AH	ATHABASCA RIVER ABOVE FREEMAN RIVER	ATHABASCA	236095.4115	1897880929	
129	17010603	07AH	FREEMAN RIVER	ATHABASCA	270146.3591	1690068916	
105	17010701	07BD	ATHABASCA RIVER AND SALTWATER CREEK	ATHABASCA	278380.9973	867210267.9	
125	17010702	07BD	TIMEU CREEK	ATHABASCA	204528.7689	881985453.2	
94	17010703	07BD	ATHABASCA RIVER AND ROURKE CREEK	ATHABASCA	202852.8696	1176665431	
109	17030102	07BA	RAT CREEK	ATHABASCA	142015.3336	618042977	
1	17030201	07BB	LOWER PEMBINA RIVER	ATHABASCA	391425.3564	2116496603	
130	17030203	07BB	PADDLE RIVER	ATHABASCA	342578.2562	2463514524	
104	17030301	07BC	PEMBINA RIVER	ATHABASCA	402419.5809	1881122861	
128	17030302	07BC	DAPP CREEK	ATHABASCA	180010.2191	665537352	
143	17030303	07BC	SHOAL CREEK	ATHABASCA	168135.1979	677381404.1	
127	17030304	07BC	FRENCH CREEK	ATHABASCA	176966.4112	711029815.1	
136	17040101	07BF	SOUTH HEART RIVER	ATHABASCA	568599.9753	4015922638	
137	17040201	07BG,07BH,07BJ	LESSER SLAVE LAKE	ATHABASCA	487392.9732	3850123946	
81	17040301	07BK	LESSER SLAVE RIVER	ATHABASCA	296891.7572	1238241810	
142	17040302	07BK	OTAUWAW RIVER	ATHABASCA	183908.5173	570308551.9	
138	17040304	07BK	FAWCETT RIVER	ATHABASCA	264165.1705	2110373535	
82	17050101	07BE	ATHABASCA ABOVE TAWATINAW RIVER	ATHABASCA	339632.003	2310385988	
97	17050102	07BE	TAWATINAW RIVER	ATHABASCA	218663.4498	745559599.1	
103	17050201	07CB	ATHABASCA ABOVE HOUSE RIVER	ATHABASCA	608938.6701	3655860450	
124	17050203	07CB	PARALLEL CREEK	ATHABASCA	186135.4618	847881962.9	
111	17050204	07CB	PELICAN RIVER	ATHABASCA	252470.4601	1481854447	
98	17050205	07CB	HOUSE RIVER	ATHABASCA	340111.6888	2759223443	
132	17050301	07CA	LA BICHE RIVER	ATHABASCA	588762.1821	4246914608	

123	17050302	07CA	PICHE RIVER	ATHABASCA	211763.6305	1058826612	
110	17050303	07CA	PINE CREEK	ATHABASCA	379669.8108	1881645266	
83	17050304	07CA	WANDERING RIVER	ATHABASCA	221794.9004	1459733135	
139	17050401	07CC	ATHABASCA ABOVE HORSE RIVER	ATHABASCA	496055.6787	3134233885	
113	17050402	07CC	LOON CREEK	ATHABASCA	131313.4433	613787371.4	
84	17050403	07CC	HORSE RIVER	ATHABASCA	293373.3538	2182637589	
119	17060101	07CE	CHRISTINA RIVER	ATHABASCA	556069.4895	4429824529	
117	17060102	07CE	GOOSE RIVER	ATHABASCA	226527.7376	662666690.8	
126	17060103	07CE	MAY RIVER	ATHABASCA	178885.7867	732300306.1	
118	17060104	07CE	JACKFISH RIVER	ATHABASCA	235476.7608	1425963619	
381	17060105	07CE	WINEFRED RIVER	ATHABASCA	485926.5081	3984743157	
120	17060106	07CE	GORDON RIVER	ATHABASCA	151073.5751	798998891.5	
85	17060107	07CE	GREGOIRE RIVER	ATHABASCA	171528.4159	1007044917	
140	17060201	07CD	CLEARWATER RIVER	ATHABASCA	339888.8785	1708474996	
121	17060202	07CD	SUTTON CREEK	ATHABASCA	201648.8533	994481031.8	
133	17060203	07CD	HANGINGSTONE RIVER	ATHABASCA	210531.9559	1064087569	
135	17070101	07DA	ATHABASCA ABOVE FIREBAG RIVER	ATHABASCA	567000.6898	2852504731	
112	17070102	07DA	BEAVER RIVER	ATHABASCA	114453.1318	522456977.6	
89	17070103	07DA	STEEPBANK RIVER	ATHABASCA	266581.1577	1351770100	
88	17070104	07DA	MUSKEG RIVER	ATHABASCA	209950.0985	1427851849	
141	17070105	07DA	ELLS RIVER	ATHABASCA	401410.5132	2706152196	
134	17070201	07DB	DUNKIRK RIVER	ATHABASCA	297107.8153	1627982443	
86	17070202	07DB	MACKAY RIVER	ATHABASCA	479239.2481	3002393915	
87	17070203	07DB	DOVER RIVER	ATHABASCA	213958.183	975876096.3	
100	17070301	07DC	FIREBAG RIVER	ATHABASCA	488974.4674	3496875589	
99	17070302	07DC	MARGUERITE RIVER	ATHABASCA	264278.1177	2264139928	
144	17070401	07DD	LOWER ATHABASCA AND DELTA	ATHABASCA	717882.5956	3701673812	
90	17070402	07DD	RICHARDSON RIVER	ATHABASCA	395401.5956	1464538537	
122	17070403	07DD	MAYBELLE RIVER	ATHABASCA	319494.9311	1676901922	
305	18010101	07FC	DOIG RIVER	PEACE	210407.2217	1640380496	
367	18010201	07FD	PEACE RIVER AND POUCE COUPE RIVER	PEACE	396597.2881	2670555947	
216	18010202	07FD	POUCE COUPE RIVER	PEACE	215915.012	1715266465	
366	18010203	07FD	EUREKA RIVER	PEACE	204704.8191	1364531272	
219	18010204	07FD	CLEAR RIVER	PEACE	203841.099	1680342049	
212	18010205	07FD	MONTAGNEUSE RIVER	PEACE	151362.2635	530641359.4	
214	18010206	07FD	HAMELIN CREEK	PEACE	145483.346	695346158.1	
215	18010207	07FD	KSITUAN RIVER	PEACE	160070.4084	797595220.9	
217	18010208	07FD	HINES CREEK	PEACE	228132.366	1666410808	
368	18010209	07FD	PEACE RIVER ABOVE SMOKY RIVER	PEACE	463454.1209	2008068442	
213	18010210	07FD	LEITH (LITTLE BURNT) RIVER	PEACE	161019.5294	576437437.9	
218	18010211	07FD	SADDLE (BURNT) RIVER	PEACE	318200.0707	2213148180	
251	18010301	07HA	PEACE RIVER AND CARMON CREEK	PEACE	241634.2807	1481514172	
253	18010302	07HA	NORTH HEART RIVER	PEACE	319672.234	2263125721	
252	18010303	07HA	WHITEMUD RIVER	PEACE	449048.399	3308138865	
257	18010401	07HB	CADOTTE RIVER	PEACE	283397.304	1450000687	
254	18010402	07HB	MARTEN RIVER	PEACE	139103.75	505215681.9	
255	18010403	07HB	OTTER RIVER	PEACE	221504.9829	927890923.1	
256	18010404	07HB	LITTLE CADOTTE RIVER	PEACE	318753.8916	1290939300	
224	18020101	07GA	UPPER SMOKY RIVER	PEACE	424293.4988	2379956991	
220	18020102	07GA	JACKPINE RIVER	PEACE	176948.3462	717631431.1	
221	18020103	07GA	SULPHUR RIVER	PEACE	190321.6262	815463319.9	
223	18020104	07GA	MUSKEG RIVER	PEACE	196701.1655	1006042474	
222	18020105	07GA	SHEEP CREEK	PEACE	209063.6147	892959757.3	
226	18020203	07GB	CUTBANK RIVER	PEACE	251410.6252	1499247154	
231	18020301	07GC	UPPER WAPITI RIVER	PEACE	309053.9852	993428475.9	
229	18020302	07GC	NARRAWAY RIVER	PEACE	190026.2664	869811585.6	
228	18020304	07GC	PINTO CREEK	PEACE	153509.616	718168115.3	
232	18020401	07GD	BEAVERLODGE RIVER	PEACE	242506.057	1458432852	

234	18020502	07GE	BIG MOUNTAIN CREEK	PEACE	174609.4165	1187741366	
239	18020601	07GF	SIMONETTE RIVER	PEACE	586281.113	2898054242	
238	18020603	07GF	LATORNELL RIVER	PEACE	214105.1346	980022201.4	
242	18020702	07GG	IOSEGUN RIVER	PEACE	271171.2076	1967144395	
240	18020703	07GG	WASKAHIGAN RIVER	PEACE	205181.6375	1031390955	
246	18020801	07GH	LOWER LITTLE SMOKY RIVER	PEACE	474141.8467	3501491641	
245	18020802	07GH	STURGEON LAKE	PEACE	179749.0212	959382694.8	
244	18020803	07GH	WABATANISK CREEK	PEACE	115992.3915	590638390	
250	18020901	07GJ	LOWER SMOKY RIVER	PEACE	436934.6822	2252756836	
247	18020902	07GJ	KLESKUN CREEK	PEACE	110954.6137	564991140.9	
249	18020903	07GJ	PUSKWASKAU RIVER	PEACE	158894.7621	799182679.6	
248	18020904	07GJ	BAD HEART RIVER	PEACE	153527.1991	726642957.4	
2	18020905	07GJ	HUNTING CREEK	PEACE	204955.7231	796158029.9	
258	18030101	07HC	PEACE RIVER AND BUCHANAN CREEK	PEACE	358821.9256	2934517738	
376	18030102	07HC	NOTIKEWIN RIVER	PEACE	633975.7665	5592682182	
364	18030103	07HC	HOTCHKISS RIVER	PEACE	262328.5502	1306645938	
365	18030104	07HC	MEIKLE RIVER	PEACE	296689.3215	2571874444	
259	18030201	07HD	PEACE RIVER AND SCULLY CREEK	PEACE	264515.1528	1763266766	
263	18030301	07HE	WOLVERINE RIVER	PEACE	384521.887	1924543704	
262	18030302	07HE	CACHE CREEK	PEACE	241747.4686	1522773558	
261	18030303	07HE	BUFFALO RIVER	PEACE	308604.722	1711382792	
260	18030304	07HE	UNNAMED	PEACE	209160.7679	1052411343	
265	18030401	07HF	PEACE RIVER AND STEEPHILL CREEK	PEACE	386990.6103	2042158670	
264	18030402	07HF	KEG RIVER	PEACE	275305.1868	1752060038	
369	18040101	07JF	BOYER RIVER	PEACE	596336.5795	3395275955	
363	18040102	07JF	BEDE CREEK	PEACE	283195.786	2330697294	
379	18040103	07JF	BUSHE RIVER	PEACE	279483.736	1399568326	
362	18040104	07JF	PONTON RIVER	PEACE	443719.589	2487989957	
287	18040105	07JF	PEACE RIVER ABOVE VERMILION CHUTES	PEACE	322440.628	1472543166	
288	18040106	07JF	CARIBOU RIVER	PEACE	194911.8849	814770385	
286	18040107	07JF	BEAVER RANCH CREEK	PEACE	130747.5152	662759923.2	
289	18040108	07JF	LAWRENCE RIVER	PEACE	188243.2889	851839554.8	
285	18040201	07JE	MIKKWA RIVER	PEACE	712987.8589	4690041663	
283	18040202	07JE	BURNT RIVER	PEACE	130543.1453	602002515.9	
284	18040203	07JE	OWL CREEK	PEACE	199101.03	809203415.9	
290	18040301	07KA	PEACE RIVER BELOW VERMILION CHUTES	PEACE	453306.6367	2042544598	
293	18040302	07KA	WENTZEL RIVER	PEACE	303924.7994	2375003254	
292	18040303	07KA	PAKWANUTIK RIVER	PEACE	142568.6025	638407118.7	
291	18040304	07KA	GARDEN CREEK	PEACE	140485.9	531300929.4	
267	18050101	07JA	WILLOW RIVER	PEACE	222457.4989	1149819328	
266	18050102	07JA	UPPER WABASCA RIVER	PEACE	380330.002	2600496156	
268	18050103	07JA	DROWNED HORSE CREEK	PEACE	122232.7433	531910815.6	
359	18050104	07JA	UTIMUMA RIVER	PEACE	458435.4774	4222310499	
360	18050105	07JA	NIPISI RIVER	PEACE	221529.2574	1162388550	
377	18050106	07JA	MUSKWA RIVER	PEACE	256352.6003	1075472979	
361	18050107	07JA	PASTECHO RIVER	PEACE	192410.1394	923543279.9	
274	18050201	07JB	MIDDLE WABASCA RIVER	PEACE	613132.242	4590372928	
273	18050202	07JB	TROUT RIVER	PEACE	326422.0302	2592187176	
269	18050203	07JB	WOOD BUFFALO RIVER	PEACE	186334.2761	871648261.4	
272	18050204	07JB	CHIPEWYAN RIVER	PEACE	266340.9099	1969011093	
270	18050205	07JB	LIEGE RIVER	PEACE	240313.6172	1397624718	
271	18050206	07JB	PANNY RIVER	PEACE	227713.2206	1548876469	
278	18050301	07JC	LOON RIVER	PEACE	535522.082	3072493582	
277	18050302	07JC	LUBICON RIVER	PEACE	290803.4292	2323023252	
276	18050303	07JC	REDEARTH CREEK	PEACE	159369.3439	734599998.6	
275	18050304	07JC	UNNAMED	PEACE	154257.0891	713916142.5	
281	18050401	07JD	LOWER WABASCA RIVER	PEACE	594032.2771	3412023255	
279	18050402	07JD	SENEX CREEK	PEACE	160832.1714	693047890.9	

280	18050403	07JD	MUDDY RIVER	PEACE	160085.3614	847734942.5	
282	18050404	07JD	BEAR RIVER	PEACE	370664.4771	2002011191	
380	18050405	07JD	JACKPINE CREK	PEACE	196854.9888	689686232.2	
297	18060101	07KC	LOWER PEACE RIVER	PEACE	775898.6633	5470093107	
403	18060102	07KC	TRIDENT CREEK	PEACE	168803.8867	743345562.7	
295	18060201	07KB	JACKFISH RIVER	PEACE	399076.3066	2785053732	
296	18060202	07KB	ISIDORE LAKE	PEACE	179515.9709	584798225.8	
294	18060203	07KB	BERRY CREEK	PEACE	150546.3742	752741891.7	
299	18060301	07KD	UPPER BIRCH RIVER	PEACE	531365.5865	3078180234	
402	18060302	07KD	HARPER CREEK	PEACE	344449.8375	3045288172	
298	18060303	07KD	BOLTON CREEK	PEACE	198122.8937	1683498917	
302	18060401	07KE	LOWER BIRCH RIVER	PEACE	516094.5633	2989860257	
301	18060402	07KE	ALICE CREEK	PEACE	204653.6028	739488972.3	
300	18060403	07KE	MODERE CREEK	PEACE	108646.5618	500674924.8	
304	18060501	07KF	MCIVOR RIVER	PEACE	246934.2188	1633188687	
303	18060502	07KF	BUCKTON CREEK	PEACE	224334.5551	1257284634	
397	18060503	07KF	LAKE CLAIRE	PEACE	537035.9537	5423077906	
412	18060504	07KF	CHENAL DES QUATRE FOURCHES	PEACE	280071.819	1303951279	
345	19010101	07OA	UNNAMED	HAY	252046.3844	1046496595	
346	19010102	07OA	RAINBOW LAKE	HAY	415688.1256	2272524580	
350	19010103	07OA	SHEKILIE AND HAY RIVERS	HAY	257639.9198	1636740550	
419	19010104	07OA	LITTLE HAY RIVER	HAY	164024.9516	792960657.2	
351	19010105	07OA	HAY RIVER	HAY	355433.5212	1022554771	
371	19010106	07OA	AMBER RIVER	HAY	284863.2226	847593050.9	
370	19010107	07OA	OMEGA RIVER	HAY	218466.9388	1575894372	
378	19010108	07OA	ZAMA RIVER	HAY	214926.126	1529273589	
353	19010109	07OA	SOUSA CREEK	HAY	288829.0108	2265691715	
336	19010201	07OC	TANGHE CREEK	HAY	227581.1111	1329768432	
338	19010202	07OC	WERNIUK CREEK	HAY	142411.0704	646423252.1	
349	19010203	07OC	CHINCHAGA RIVER	HAY	738860.9318	4560249376	
337	19010204	07OC	OSLAND LAKES	HAY	156424.0918	882365792	
339	19010205	07OC	VADER CREEK	HAY	130573.4132	625308490.2	
355	19010206	07OC	THORDARSON CREEK	HAY	161621.5998	680427638	
340	19010207	07OC	WANIANDY CREEK	HAY	137512.4781	581189986.3	
417	19010208	07OC	HAIG RIVER	HAY	214143.6136	987463847.5	
352	19010301	07OB	ROE AND HAY RIVERS	HAY	943475.2154	3974523034	
347	19010302	07OB	NEGUS CREEK	HAY	178313.3512	776967480.1	
335	19010303	07OB	MEANDER RIVER	HAY	202547.5748	1287495162	
341	19010304	07OB	ADAIR CREEK	HAY	226185.4942	940347228.9	
342	19010305	07OB	MELVIN RIVER	HAY	232442.1691	919537806.8	
343	19010306	07OB	SLAVEY CREEK	HAY	199005.1218	689475336	
344	19010307	07OB	LITTLE RAPIDS CREEK	HAY	238327.4023	562137956.3	
334	19010308	07OB	STEEN RIVER	HAY	295138.4193	2730169576	
356	19010309	07OB	DIZZY CREEK	HAY	312125.3634	951935238.5	
354	19010310	07OB	JAMES CREEK	HAY	345221.8222	1896486742	
348	19010311	07OB	JACKPOT CREEK	HAY	212207.6153	1419075298	
318	20010101	10DA	UPPER PETITOT RIVER	PETITOT	166810.7232	1129787920	
322	20010102	10DA	PETITOT RIVER	PETITOT	646784.9398	4809460506	
319	20010103	10DA	UNNAMED	PETITOT	171356.7788	1015701924	
320	20010104	10DA	UNNAMED	PETITOT	122307.2572	544340119.1	
413	21010101	07MA	HARRISON RIVER	LAKE ATHABASCA	156227.6779	720587983	
3	21010102	07MA	OLD FORT RIVER	LAKE ATHABASCA	217674.0946	750847295.5	
411	21010103	07MA	CROWN CREEK	LAKE ATHABASCA	139221.5988	408823007.7	
4	21010201	07MD	COLIN LAKE	LAKE ATHABASCA	176207.9067	829137766	
414	21010202	07MD	LAKE ATHABASCA	LAKE ATHABASCA	455932.2638	3774017264	
357	22010101	07UC	KAKISA RIVER	KAKISA	143431.6339	466398874	
331	23010101	07PA	WHITESAND RIVER	BUFFALO	402734.9887	1651137093	
327	23010102	07PA	HOOHEY CREEK	BUFFALO	159629.1608	1105933606	

326	23010103	07PA	UNNAMED	BUFFALO	132957.6882	721708470.3	
323	23010104	07PA	TOURANGEAU CREEK	BUFFALO	136531.8453	595703431.4	
328	23010105	07PA	YATES RIVER	BUFFALO	406393.7698	2368405915	
324	23010106	07PA	UNNAMED	BUFFALO	86005.32948	197179544.4	
330	23010107	07PA	UNNAMED	BUFFALO	67539.19358	135741764.5	
329	23010108	07PA	COPP RIVER	BUFFALO	96081.17112	246603309.2	
325	23010201	07PB	LITTLE BUFFALO RIVER	BUFFALO	359831.6278	3798783755	
333	23010301	07PC	BUFFALO RIVER	BUFFALO	510294.7789	2782262448	
332	23010302	07PC	MERIDIAN LAKES	BUFFALO	254457.6985	1672343302	
12	24010101	07NA	UPPER SLAVE RIVER	SLAVE	489654.9917	2518414267	
6	24010102	07NA	MURDOCH CREEK	SLAVE	159961.8086	813522241.1	
9	24010103	07NA	LA BUTTE CREEK	SLAVE	260187.605	1064192750	
7	24010104	07NA	HOMADAY RIVER	SLAVE	194490.1656	984910311.7	
5	24010105	07NA	BOCQUENE RIVER	SLAVE	178790.0345	667362090.5	
8	24010201	07NB	LOWER SLAVE RIVER	SLAVE	180670.1411	651309853.1	
10	24010202	07NB	DOG RIVER	SLAVE	320500.941	2158013158	
11	24010203	07NB	SALT RIVER	SLAVE	306878.4466	3081032592	
406	25010101	07QA	TETHUL RIVER	TALTSON	179440.3697	1050035161	
418	25010102	07QA	SCHAEFER LAKES	TALTSON	91525.33866	185884720	
13	25010301	07QC	HUGHES LAKE	TALTSON	8867.599597	5172626.761	

Appendix: 7

HUC 8 Remediation Plan Summary

See next page

Remediation Plan Summary for Each HUC 8 Watershed

HUC 8: 3rd Party Service Provider / Company:	YEAR:
Phone:	Contact:
	E-mail:

This remediation plan can be submitted with the attached detailed crossing remediation activities as well as the full spatial data set for the HUC 8 watershed. The spatial data should depict:

All member crossings		Non-compliant crossings color-coded as per Provincial inspection form	
Inspected crossings		Crossings planned for remediation	

Summary of watershed crossings:

Total # of Member Crossings in HUC 8	Total # Member Crossings Inspected	Total # Member Crossings Non-compliant	Total # Member Crossings Remediated

Briefly describe the benefits to remediating the chosen crossings:

Requirements

Required remediation pace is calculated by subtracting one year from the term, allowing development and implementation of a self-inspection program, and dividing the number of non-compliant crossings by the remaining years. For example, for a crossing owner of 100 crossings in a watershed, in which 40 are out of compliance:

High Risk Watershed – maximum term 3 years:

3 yr – 1 yr (inspection) = 2 yrs/40 crossings = 20 crossings annually

Moderate Risk Watershed – maximum term 5 years:

5 yr – 1 yr (inspection) = 4 yrs/40 crossings = 10 crossings annually

Low Risk Watershed – maximum term 10 years:

10 yr – 1 yr (inspection) = 9 yrs/40 crossings = ~ 4 crossings annually

All crossing owners and third-party service providers are responsible for meeting all applicable pieces of legislation such as, but not limited to the following:

Public Lands Act

Water Act – (Water Act Approvals, Water Act term licences / temporary diversion licences (TDLs) and Codes of Practice

Environmental Protection and Enhance Act

Fisheries Act

Remediation Plan Summary for Each HUC 8 Watershed

Online applications:

For crossing owners all tools for applicable applications or notifications can be found at:

AEP: <https://www.alberta.ca/environmental-approvals-system-onestop.aspx>

AER: <https://www.aer.ca/systems-and-tools>

Submission Checklist:

- ✓ Spatial Data as outlined in the inspection form (100% of data) in .zip format
- ✓ Remediation Plan Summary for Each HUC 8 Watershed
- ✓ Spatial data for remediation plan detailed activities (additional columns to inspection data) in .zip format

Contact the appropriate regulator to determine how to submit your spatial data and remediation plan summaries:

Alberta Energy Regulator:

- ✓ Jody Foster
Water and Fisheries Technical Specialist
Alberta Energy Regulator
Email: AER.WCC@aer.ca

Alberta Environment & Parks:

- ✓ Wendy Giamberardino
Consequence Manager ASERT & Division Coordinator
Alberta Environment & Parks
Email: Wendy.Giamberardino@gov.ab.ca

**Appendix 8:
Contacts for third-party service providers
and list of members**

See next page

Contacts for Regulators and Third-Party Service Providers

Alberta Energy Regulator:	Jody Foster E-mail: AER.WCC@aer.ca
Alberta Environment & Parks:	Wendy Giamberardino E-mail: Wendy.Giamberardino@gov.ab.ca

Third-Party Service Providers:

Foothills Stream Crossing Partnership: Ngaio Baril Phone: 780-315-9819 E-mail: ngaio.baril@gmail.com	Woodlands North Inc.: Bruce Nielsen Phone: 780-720-2402 E-mail: bruce@woodlandsnorth.co
Altus Group, Geomatics Adrienne Maskalyk Phone: 780-930-8321 E-mail: adrienne.maskalyk@altusgroup.com	

FSCP Members Under AER		Woodlands North Members under AER	
1	Devon	1	Canadian Natural Resources Limited
2	Repsol	2	Accel Energy Canada Ltd.
3	Seven Generations	3	Tourmaline Oil Corp.
4	Cenovus Energy	4	Kelt Energy
5	Paramount Resources	5	Bonavista Energy
6	Shell Canada	6	N7 Energy
7	Chevron	7	Sinopec Daylight
8	Hammerhead Resources	8	Pine Cliff Energy
9	Husky	9	Whitecap Resources
10	Strath Resources		
11	Outlier Resources	Altus Group, Geomatics Members under AER	
12	Cardinal Energy	1	XTO Energy
13	Cabot Energy		
14	Tidewater Midstream & Infrastructure		
15	Modern Resources		
16	Torc Oil		
17	Tangle Creek Energy		
18	Taqa North		
19	Canlin Energy		
20	Jupiter Resources		
21	Baytex Energy		
22	Peyto Exploration & Development		
FSCP Members under AEP			
1	Canfor		
2	Millar Western		
3	West Fraser - HWP, Slave Lake & Blue Ridge		
4	Weyerhaeuser Pembina Timberlands		

Appendix 9: AER Acknowledgement Letter of Participation

See next page

Acknowledgment Letter Watercourse Crossing Management Directive

Voluntary participation of companies under the jurisdiction of the
Alberta Energy Regulator

We,
have agreed to voluntarily participate as an active member in the GoA Watercourse Crossing
Management Directive (WCMD). We will follow the intent of the program acting (choose one):

as a stand-alone member OR,

under

as our third-party service provider.

We will follow the intent of the Directive through the lifecycle of all watercourse crossings
under our care and control. We agree to engage with other members of the WCMD through the
established Advisory Group and work collaboratively with all crossing owners and Regulators
within each HUC 8 watershed. We agree to follow the provincial inspection protocol outlined in
the Roadway Watercourse Crossing Inspection Manual (Alberta Government, March 13, 2015).

If we choose to no longer voluntarily participate, we understand we will be subject to the
standard compliance approach taken by the appropriate Regulator and may not be permitted to
participate in the WCMD in the future. This will be determined on a case by case basis by the
Regulator.

Membership (join) date:

Name & Title:

Company:

Form Completion Date:

Signature:

Send the completed form to AER.WCC@aer.ca.