Environmental Protection and Management Guideline

VERSION 3.2: September 2025

About the Regulator

The BC Energy Regulator (Regulator) is the single-window regulatory agency with responsibilities for regulating energy resource activities in British Columbia, including exploration, development, pipeline transportation and reclamation.

The Regulator's core roles include reviewing and assessing applications for industry activity, consulting with First Nations, ensuring industry complies with provincial legislation and cooperating with partner agencies. The public interest is protected by ensuring public safety, protecting the environment, conserving petroleum resources and ensuring equitable participation in production.

Vision, Mission and Values

Vision

A resilient energy future where B.C.'s energy resource activities are safe, environmentally leading and socially responsible.

Mission

We regulate the life cycle of energy resource activities in B.C., from site planning to restoration, ensuring activities are undertaken in a manner that:

- Protects public safety and the environment
- Supports reconciliation with Indigenous peoples and the transition to low-carbon energy
- Conserves energy resources
- Fosters a sound economy and social well-being

Values

Respect is our commitment to listen, accept and value diverse perspectives.

Integrity is our commitment to the principles of fairness, trust and accountability.

Transparency is our commitment to be open and provide clear information on decisions, operations and actions.

Innovation is our commitment to learn, adapt, act and grow.

Responsiveness is our commitment to listening and timely and meaningful action.

Additional Guidance

As with all Regulator guides, this document does not take the place of applicable legislation. Readers are encouraged to become familiar with the acts and regulations and seek direction from Regulator staff for clarification.

The Regulator publishes both application and operations manuals and guides. The application manual provides guidance to applicants in preparing and applying for permits and the regulatory requirements in the planning and application stages. The operation manual details the reporting, compliance, and regulatory obligations of the permit holder. Regulator manuals focus on requirements and processes associated with the Regulator's legislative authorities. Some activities may require additional requirements and approvals from other regulators or create obligations under other statutes (e.g., Federal Fisheries Act, Transportation Act, Highway Act, Workers Compensation Act and Wildlife Act). It is the applicant and permit holder's responsibility to know and uphold all legal obligations and responsibilities.

Throughout the document there are references to guides, forms, tables, and definitions to assist in creating and submitting all required information. Additional resources include:

- Glossary and acronym listing on the Regulator website.
- Documentation and guidelines on the Regulator website.
- Frequently asked questions on the Regulator website.
- Advisories, bulletins, reports and directives on the Regulator website.
- Regulations and Acts listed on the Regulator website.

In addition, this document may reference some application types and forms to be submitted outside of the Application Management System but made available on the Regulator's website. Application types and forms include:

- Heritage Conservation Act, Section 12
- Road use permits
- Water licences
- Master licence to cut
- Certificate of restoration
- Waste discharge permit
- Experimental scheme application
- Permit extension application

Manual Revisions

The Regulator is committed to the continuous improvement of its documentation. Revisions to the documentation are highlighted in this section and are posted to the Energy Professionals section of the Regulator's website. Stakeholders are invited to provide input or feedback on Regulator documentation to servicedesk@bc-er.ca.

Version	Posted Date	Effective Date	Chapter	Summary of Revision(s)
3.2	September 5, 2025	September 5, 2025	Section 1.8, Section 5.10 and Appendices	Update High Priority Wildlife to include all Red and Blue Listed Species. Remove High Priority Wildlife lists from the Appendices. For more information, refer to Technical Update 2025-14 on the Regulator's website.

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Preface

About

The Environmental Protection and Management Guideline (EPMG) is a reference document for energy resource activity applicants and permit holders. The guideline assists energy resource companies and those potentially effected by energy resource activities to understand the requirements of the Environmental Protection and Management Regulation (EPMR). This guideline does not take the place of the applicable legislation. It outlines the minimum legal requirements for environmental protection and management. Users are encouraged to read the full text of legislation applicable to each section.

The guideline has been prepared to be as comprehensive as possible; however, it is not all encompassing and may not cover all situations. Where circumstances or scenarios arise that are not covered by this guideline, contact Regulator staff for clarification and assistance.

Guideline Scope

The EPMR, and guidance herein, applies only to Crown land and does not apply to subsurface oil and gas activities associated with an operating area. As defined in the Energy Resource Activities Act (ERAA), an operating area means an area, identified in a permit, within which a permit holder is permitted to carry out an energy resource activity (i.e., geophysical exploration, wellsite, facility area, road, pipeline, activities prescribed by regulation). While the regulation applies directly to surface crown land, it is advisable to consider this guidance as it relates to sensitive environmental features that may be located on private land as well.

The EPMR is a results-based regulation, operating under the professional-reliance model of ERAA. ERAA and its associated regulations specify the requirements that must be followed in applying for and conducting energy resource activities. It is the responsibility of applicants and their Qualified Professionals (QP) (see definition, Appendix A) to identify relevant environmental risks related to the proposed activity and apply the best available practices under the mitigation hierarchy to meet the requirements.

This guideline is limited in scope to the Regulator's application processes, and the authorities and requirements established within ERAA, or specified enactments established thereunder. Carrying out energy resource related activities may require additional approvals from other regulators or create obligations under other statutes. It is the permit holder's responsibility to know and uphold all their legal obligations. A list of additional regulatory requirements can be found in Appendix D.

Compliance and Enforcement

This document does not replace legislation or affect legislative requirements. All permit holders are responsible for ensuring they understand and meet all requirements of ERAA, its regulations and their permits. Should a person not comply with ERAA, its regulations or their permits, the Regulator may take compliance and enforcement actions. For more information regarding the Regulator's Compliance and Enforcement (C&E) processes, please refer to the Compliance and Enforcement Manual.

Chapter 1: EPMR Part 2: Permit Considerations and Directions

1.1 Government's Environmental Objectives

The EPMR provides the statutory authority to the Regulator for the management and protection of environmental values. Key environmental values requiring management and protection under this legislation are identified as Government's Environmental Objectives (GEOs) under Part 2, Division 1 of the EPMR.

The GEOs guide the Regulator in making determinations on permit applications and for permit conditions. It is the duty of the Regulator's Statutory Decision Maker (SDM) to consider and apply the GEOs before issuing permits and authorizations. Section 25(1) of ERAA states that the Regulator, after considering the GEOs, may issue permits and authorizations to an applicant if they meet the requirements including those prescribed under Part 2 of the EPMR. In issuing a permit, the Regulator must specify the energy resource activity(ies) (the activity), the person permitted to carry out the activity, and, in accordance with ERAA Section 25(2), may impose any conditions on the permit that the Regulator considers necessary to meet the intent of GEOs.

Through applying the GEOs to a permitting decision, the SDM must be satisfied that the proposed activity meets the objectives set out under Part 2, Division 1 of the EPMR. Applicants must demonstrate adherence to the GEOs by following the EPMG, utilizing the Regulator's Environmental Information Management System (EIMS), considering cumulative effects, and submitting information through the Regulator's Application Management System (AMS).

It is the responsibility of the applicant to satisfy the Regulator's SDM that the proposed activity will not create a material adverse effect, as outlined in Sections 4 through 7 of the EPMR. Consideration of a material adverse effect or change to an environmental value, whether material or adverse, is determined based on all available information. The SDM may request additional information if they do not have the information needed to make a decision. In most instances, adherence to planning and operational measures for each environmental value should satisfy the GEOs.

1.2 Planning and Operational Measures

Planning and Operational Measures (POMs) define the Regulator's expectations for energy resource activities in environmentally sensitive areas. POMs incorporate key steps from the Mitigation Hierarchy to avoid, minimize, mitigate and restore impacts to each environmental value. Additional information regarding the Mitigation Hierarchy can be found in Appendix B. POMs include both planning measures and operational practices. POMs are listed in the EPMG and in the Regulator's online EIMS.

During the planning phase of the application, the first steps of the mitigation hierarchy (planning measures) apply to avoid and minimize potential effects to GEOs. This may include consideration of placement, routing, and timing. Applicants should seek input from a QP early in the planning phase, so that projects can be designed to minimize adverse effects to environmental values. When applied on a regional level, planning actions can help to identify and avoid cumulative effects.

During the construction and operational phase of an activity, specific site level mitigations, such as operational monitoring, use of minimal disturbance technology, and interim restoration, should be applied to reduce the risk to the GEOs. These operational measures may be mandated via permit condition.

Applicants are required to indicate in AMS if their application adheres to the EPMG. If the recommended POMs have been incorporated into the application, to effectively mitigate effects, no additional rationale is required. Where an application is unable to comply with the POMs, or where the risk of potential adverse effects to GEO's is not mitigated, a rationale is required.

1.2.1 Rationale Requirements

A rationale is required when an applicant is unable to plan and/or operate the proposed activity in accordance with the POMs.

Rationales must:

- Be prepared by a QP.
- Include an explanation of why the energy resource activity cannot be planned in accordance with the POMs provided by the Regulator.
- Provide a detailed description of the alternate measures planned for the activity. Describe how the stated objectives specified in the POMs will be achieved.
- Rationales must be completed to the satisfaction of the SDM. Where there is a high-risk to environmental values, the SDM may require a mitigation plan.

1.2.2 Mitigation Plan Requirements

Mitigation Plans are required where an activity occurs in designated or sensitive environmental areas. Appendix B includes a list of areas that require Mitigation plans, including Wildlife Habitat Areas (WHAs), Ungulate Winter Ranges (UWRs) and Old Growth Management Areas (OGMAs).

Mitigation plans must be prepared by a QP (see QP definition in Appendix A) in accordance with Appendix B of this document.

1.3 Material Adverse Effect

A Material Adverse Effect (MAE) refers to a change to an environmental value established by the GEOs that is both material (i.e., lasting, serious, of consequence) and adverse (i.e., injurious, damaging, unfavourable).

The consideration of MAE is rooted in what an informed person could reasonably consider based on the available information. A potential effect must be both material and adverse (i.e., injurious or damaging, with an appreciable consequence) to be found inconsistent with the GEOs. Initial consideration should be given to whether an adverse effect is likely to occur, as a result of the proposed operating area or practice. If an adverse effect is likely, the consequences of that effect must be assessed.

It is the responsibility of Regulator's SDM to evaluate the likelihood of a material adverse effect and the responsibility of the proponent to ensure a material adverse effect does not occur. Consideration of material adverse effect can be informed by a QP in a mitigation plan. The QP should clearly indicate if the material adverse effect test was evaluated and list any specific measurable mitigations that will be implemented to prevent a material adverse effect.

Consideration of MAE should evaluate the strength of interaction between a proposed activity and the GEO of concern, the combined effects of the proposed activity in the context of other existing activities (i.e., the cumulative effect), and the risk of adverse effects that could result.

1.4 EPMR Section 4 – Water Values

Section 4 of the EPMR outlines objectives with respect to water quality, quantity, and timing of flow to meet the GEOs for water. All energy resource activities must be planned and undertaken in accordance with Section 4 of the EMPR. The following sections of this EPMG provide supplemental information for interpretation and adherence to Section 4 of the EPMR.

Information regarding authorizations for water withdrawal, instream works, temporary transportation or storage of water for the purposes of conducting an energy resource activity is available on Regulator's Water Information webpage and Documentation section.

1.4.1 Water Works and Water Supply Wells

Applicants are expected to identify all known waterworks, water supply wells, and mapped groundwater capture zones for water supply wells within 100 metres (m) of a proposed operating area (excluding geophysical applications) as part of the activity application.

Energy resource operating areas should not be planned within 100 metres of known waterworks, water supply wells, and identified groundwater capture zones for water supply wells. If it is not practicable to locate the activity more than 100 metres away, the Regulator requires that the proponent submit a mitigation plan.

The mitigation plan should include (1) an assessment of any potential risks to waterworks, water supply wells, water storage reservoirs or ground water capture zones that may result from the proposed activity, (2) associated proposed mitigation measures, and (3) documentation addressing why it is not practicable to stay more than 100metres away. Additional guidance regarding mitigation plans is provided in Appendix B.

Water works and water supply well information should be obtained directly from private landowners adjacent to operating areas. Domestic water wells may be registered with the Province and information regarding registered water wells is available through the following spatial data tools:

- The Regulator's Groundwater Review Assistant
- Guidance for Technical Assessments in Support of an Application for Groundwater use in BC
- Groundwater Wells and Aquifers Groundwater Well Search
- iMAP BC

1.4.2 Identified Groundwater Recharge Areas and Identified Aquifers

The Minister responsible for administering the Water Sustainability Act (WSA) may, by order, identify an aquifer and/or a groundwater recharge area, under Section 34 of the EPMR . As of the publication date of this document, there are no orders for identified aquifers or groundwater recharge areas.

Operating areas should not be located within a groundwater recharge area or on top of an identified aquifer. If this is not practicable, the Regulator requires that the applicant submit a mitigation plan with their application. The mitigation plan should include an assessment of risks to the aquifer/recharge area as a result of the proposed activity, associated proposed mitigation measures, and rationale for why it is not practicable to relocate outside the identified aquifer/recharge area.

1.4.3 Designated (Community) Watersheds

A community watershed (designated watershed) is the drainage area above a stream used to provide drinking water to a community under a water licence. Community watersheds are designated to protect drinking water from the impacts of resource use in the area.

A community watershed is defined under the Forest & Range Practices Act (FRPA) as all or part of the drainage area that is upslope of a point from which water is diverted for human consumption by a licensed waterworks. Special management is required to protect water diverted for human consumption to:

- Conserve the quality, quantity, and timing of water flow.
- Prevent cumulative hydrological effects having a material adverse effect on water.

Several designated community watersheds have been established in BC under Section 35 of the EPMR by the minister responsible for administering the Water Sustainability Act. Legal orders are available on the FLNRORD website. There are currently no designated watersheds in NEBC. Spatial data is referenced in Section 5.16 of this document.

Operating areas should not be located within a designated community watershed. A mitigation plan must be included with any application proposing activity within a designated watershed. The mitigation plan should contain a statement by a QP as to the likelihood of a material adverse effect, and if applicable, measures that will be taken to address the material adverse effect. It is the responsibility of the applicant to ensure, and demonstrate to the Regulator, that an operating area does not cause a material adverse effect to a designated watershed.

1.5 EPMR Section 5 - Riparian Values

Section 5 of the EPMR outlines objectives with respect to riparian values to meet the GEOs for water, aquatic habitat, and ecosystem integrity. All energy resource activities must be planned and undertaken in accordance with Section 5 of the EPMR, in alignment with EPMR Part 4 Division 1 – Riparian Classification. This section of the EPMR outlines when an energy resource activity is permitted within lakes, streams, wetlands, and their associated riparian areas.

Under the EPMR, operating areas are not to be located within a Riparian Reserve Zone (RRZ) except to facilitate a crossing. Activities are permitted within a Riparian Management Zone (RMZ) to facilitate a crossing, or when the operating area will not have a material adverse effect on the ability of the RMZ to protect the RRZ and its function in conserving fish habitat, wildlife habitat, biodiversity, and water values. Energy resource activities, must be planned in a manner to maintain and protect functional stream channel processes, water quality and quantity, fish and wildlife habitat.

Energy resource activity applications refer to the EPMR definition of a “stream”. EPMR defines a stream as “a watercourse, including a watercourse that is obscured by overhanging or bridging vegetation or soil mats, that

contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that (a) has a continuous channel bed that is 100m or more in length, or (b) flows directly into (i) a fish bearing stream or a fish bearing lake or wetland, or (ii) a waterworks".

Other applications, such as major projects and associated energy resource activities, must consider the WSA definition of a "stream". The WSA defines a stream as "(a) a natural watercourse, including a natural glacier course, or natural body of water, whether or not the stream channel of the stream has been modified, or (b) a natural source of water supply, including, without limitation, a lake, pond, river, creek, spring, ravine, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer".

The POMs in Table 1.1 capture the Regulator's expectations for energy resource activities proposed within riparian areas. Applications that adhere to POMs do not require a rationale or mitigation plan.

Please refer to Section 1.2 of this document for further information on POMs, and requirements for rationale statements and mitigation plans in permit applications.

Table 1.1: Planning and Operational Measures to Meet Government's Environmental Objectives for Riparian Areas.

Objectives: • Maintain a fully functioning riparian management area. • Minimize impacts to vegetative cover, large woody debris, stream temperature, fish and fish habitat, ground water flow, water quality, bank stability, channel characteristics, pool depth and volume, hydrology, wildlife habitat and biodiversity.		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**

All	• Plan energy resource activities to avoid RRZ and RMZ except where there is a requirement for a crossing.
	• Those activities with locational flexibility (camps, borrow pits, storage, temporary workspaces) should be located outside RMA.
	• Where a crossing cannot avoid a RMA:
	  • Plan to utilize existing disturbance and limit new cut.
	  • Mark/flag sensitive areas and avoid.
	  • Minimize width of Right of Way (ROW). ROW to cross perpendicular to creek where stream banks are low and stable.
		• Minimize clearing and limit removal of timber and vegetation.
		• Minimize disturbance to root mat and duff layer.
		• Measures must be taken to limit and control erosion and sedimentation (such as run-off control, riprap, vegetation retention, sediment trapping, timing, surface roughening and infiltration measures). These must be appropriately prescribed and installed under the supervision of a QP.
		• Employ minimal disturbance techniques that facilitate rapid deactivation and natural regeneration.
		• Schedule activities to minimize adverse effects. Construction should favor winter when there is snow cover and frozen ground, or dry periods.
		• Upon completion of construction, undertake measures to promote natural or assisted regeneration on cleared areas that are not required for operations to re-establish the pre-existing ecological trajectory. Ensure that erosion and

	• Incorporate applicable Least Risk Timing windows. • Follow to joint professional practice guidelines for erosion and sediment control. • Follow the provincial guidance for changes in and about a stream. • Adhere to DFO Standards and Codes of Practice	sediment control structures are removed in a timely manner/when no longer deemed necessary or functional. • Upon completion of activity, undertake measures to control access and promote natural or assisted regeneration. These measures are to encourage re-establishment of pre-existing ecological trajectory. • Monitor the site of a stream crossing installation to ensure successful erosion control and restoration.
Linear Features (roads, pipelines, seismic)	**Seismic** • Minimize the number of stream crossings. • Dead-end the majority of seismic lines at the RRZ.	**Seismic:** • Employ minimal impact seismic methods. • Upon completion of activity, undertake measures to control access and promote natural or assisted regeneration. These measures are to encourage reestablishment of pre-existing ecological trajectory.
Source: Department of Fisheries and Oceans (DFO) Standards and Codes of Practice. Standards and Best Practices for Instream Works. EGBC Joint Professional Practice Guidelines for Erosion and Sediment Control. A Users Guide for Changes in and about a stream in BC.		

If energy resource activities cannot adhere to these practices, a mitigation plan must be included with the permit application. This rationale must include site-specific information regarding the guidelines not followed, an explanation of why they cannot be followed, and the proposed plan and mitigations the permit holder proposes to implement in lieu of the POMs.

The Regulator considers any works within the high-water mark of any stream to be “changes in and about a stream”. Changes in and about a stream require approval under Section 11 of the WSA. Refer to Chapter 4.8 of the Oil and Gas Activity Application Manual for requirements regarding changes in and about a stream.

1.6 EPMR Section 6 – Wildlife and Wildlife Habitat

Section 6 of the EPMR includes the GEOs related to the management and protection of wildlife and wildlife habitat. All energy resource activities must be planned and undertaken in accordance with Section 6 of the EPMR. The following sections provide supplemental information for interpretation and adherence to Section 6.

1.7 Section 6 (a) – Wildlife Habitat Areas, Ungulate Winter Range and Fisheries Sensitive Watersheds

Section 6(a) of the EPMR states that energy resource activities should not be located within the following designated wildlife habitats; Wildlife Habitat Areas (WHA); Ungulate Winter Range (UWR) and Fisheries Sensitive Watershed (FSW). WHAs, UWRs and FSWs are the highest level of protection afforded under ERAA and every effort should be made to avoid and minimize potential effects to these areas when planning energy resource activities.

EIMS lists environmental objectives and POMs for WHA and UWR in NEBC. The POMs in EIMS have been adapted from General Wildlife Measures (GWMs) in FRPA Orders. Where timing windows are stated within an Order, they are listed in the POMs. Data for WHA, UWR and FSW can be found in Chapter 5 of this document.

The Regulator expects applicants to satisfy the environmental objectives and apply the POMs to mitigate any potential adverse effects.

For activities intersecting a WHA, UWR or FSW, the applicant must submit a mitigation plan with their application. QP are required to consider if activity will have a material adverse effect on the areas capacity to provide for the survival of the species in that area for which the area was established. This review should include consideration of current disturbance metrics in the area, as reported by the BCER Annual Status Reports.

In addition to the guidance provided in EIMS, it is the permit holder's responsibility to know and uphold all of their legal obligations associated with other applicable legislation.

Harassment or disruption of wildlife is prohibited under the Wildlife Act; as such, applicants are advised to be mindful to avoid harassment and disruption of wildlife regardless of the timing of development or operations.

The *Fisheries Act* provides comprehensive protection for all fish and fish habitat, and prohibits the harmful alteration, disruption, or destruction of fish habitat.

1.7.1 Fisheries Sensitive Watersheds

To assist applicants in understanding the Regulator's expectations for energy resource activities proposed within FSWs, POMs for FSWs has been included below in Table 1.2. Please refer to Section 1.2 of this document for further information on POMs, and requirements for rationale statements and mitigation plans in permit applications.

Table 1.2 Planning and Operational Measures Applicable to All Fisheries Sensitive Watersheds.

Objectives: • Maintain natural hydrological conditions, natural streambed dynamics, and stream channel integrity. • Maintain the quality, quantity, and timing of water flow consistent to protect downstream fisheries and watershed values. • Protect the habitat of salmonid fishes including Bull Trout, Chinook, Coho, Kokanee, Rainbow Trout, Sockeye & Westslope Cutthroat.		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• During the planning phase, the operator should have a QP complete a field-based pre-construction site assessment during snow-free conditions to determine stream class and fish presence. • Field information, including fish and fish habitat assessment data, should be submitted to the province. • Identify and avoid key habitat areas such as spawning and overwintering sites. • Plan activity to maintain natural stream bed dynamics, channel integrity, the quality, quantity and timing of water flow, and the natural hydrological conditions of the watershed. • Mark/flag sensitive areas and avoid. • The operator should maintain all the natural watercourses within the FSW. • Utilize existing disturbance, limit new cut, and minimize width of ROW in riparian areas. • Avoid in-stream crossing methods.	• Limit removal of timber and vegetation. • Minimize disturbance to root mat and duff. • Site specific, measurable actions must be taken to control erosion and prevent sediment from entering streams (such as run-off control, riprap, vegetation retention and sediment trapping). • Employ minimal disturbance techniques in the riparian area that facilitate rapid deactivation and natural regeneration. • Time activities to minimize adverse effects (dry periods, or periods with snow cover and frozen ground are favorable). • Apply fish/wildlife least risk timing windows where applicable. • Upon completion of construction, undertake measures to promote natural or assisted regeneration on cleared areas that are not required for operations to re-establish the pre-existing ecological trajectory. • Monitor stream crossing site during construction and operational activities to ensure successful erosion control and restoration.

	• Avoid clearing forested areas on gentle slopes located above steep terrain.	
Linear Features (roads, pipelines, seismic)	**Seismic** • Limit number of crossings.	**Seismic:** • Employ minimal impact seismic methods.
Source: DFO Operational Statements, MOE legal orders for FSW, MOE General POMs and Standard Project Considerations, MOE Fisheries Sensitive .Watersheds		

1.8 Section 6(b) - High Priority Wildlife

Government's Environmental Objective for Wildlife includes avoidance of physical disturbance to High Priority Wildlife and their habitat. Categories of wildlife are established under Section 29 of the EPMR and compose the term 'High Priority Wildlife.' Further information on this process can be found in Section 5.10.

The Regulator expects projects to avoid High Priority Wildlife and their habitat. If complete avoidance is not feasible, applicants must minimize and mitigate impacts through incorporation of species-specific timing windows, planning and operational measures, and/or QP developed mitigations into construction and operational planning. A mitigation plan is required for any activity planned within High Priority Wildlife habitat with the potential to cause disturbance. Planning and Operational Measures for many High Priority Wildlife in NEBC can also be found in EIMS.

The Regulator recommends the following additional guidance for High Priority Wildlife:

- Accounts and Measures for Managing Identified Wildlife (species accounts), developed by Ministry of Environment (MOE) under the Identified Wildlife Management Strategy.
- A Compendium of Wildlife Guidelines for Industrial Projects in the North Area, BC.
- Red and Blue Listed Species (BC Species and Ecosystems Explorer)

In addition to the guidance noted above, it is the permit holder's responsibility to know and uphold all their legal obligations associated with other applicable legislation. Examples include, but are not limited to:

- Harassment or disruption of wildlife is prohibited under the Wildlife Act; as such, applicants are advised to be mindful to avoid harassment, harm and disruption of wildlife regardless of the timing of development or operations.
- The Fisheries Act provides comprehensive protection for all fish and fish habitat, and prohibits the harmful alteration, disruption, or destruction of fish habitat.

1.8.1 Critical Timing Windows

The EPMR Section 6 (b) refers to "at a time and in a manner", which the Regulator interprets to mean the use of timing windows and best practices to avoid physically disturbing High Priority Wildlife species or their habitat.

Timing windows for select High Priority Wildlife species are listed in EIMS. Timing windows must be considered during both project construction and operation, to avoid or minimize potential adverse effects to High Priority Wildlife during critical periods.

Applicants must also consider and plan riparian works and/or stream crossings within "least risk windows" for aquatic species.

Application of specific timing windows may be subject to revision or refinement by the Regulator, as well as Provincial and Federal agencies. Project- or site- specific guidance and direction, developed by a QP, is expected when a mitigation plan is required and/or BCER POMs are not available or applicable. Reference documents for region-specific timing windows are found in Table 1.3 and Table 1.4.

Table 1.3 Timing Window Guidance - Peace Region (NEBC).

Type of Guidance	Description
Environmental information Management System (EIMS)	Guidance for considering impacts to wildlife and wildlife habitat in the Peace Region (NEBC)
Interim Operating Practices for Oil and Gas Activities in Identified Boreal Caribou Habitat in British Columbia	Specific timing windows and management practices for boreal caribou
Peace Region Selected Terrestrial and Aquatic Wildlife Least-Risk Windows	Least-risk timing windows for aquatic species in the Peace Region

Table 1.4 Timing Window Guidance for Application Areas Outside of the Peace Region (NEBC).

Type of Guidance	Description
Accounts and Measures for Managing Identified Wildlife	Species Accounts-various summaries of the status, life history, distribution and habitats of Identified Wildlife, and specific guidelines for management of their habitats.
A Compendium of Wildlife Guidelines for Industrial Development Projects in the North Area, British Columbia – Interim Guidance.	Guidance for considering and mitigating impacts to wildlife and wildlife habitat in the Skeena, Omineca and Peace Regions.
Omineca Reduced Risk Timing Windows for Fish and Wildlife	Instream reduced risk work windows for the Omineca Region.

Skeena Region Reduced Risk In-stream Work Windows and Measures	Instream reduced risk work windows for the Skeena Region.
Working around water: Regional Timing Windows	Regional Timing Windows for BC.

1.8.2 Culturally Sensitive Species

Caribou are a keystone species in NEBC that are managed through a number of mechanisms. Provincial datasets such as the Caribou Herd Locations and Boreal Caribou Core Habitat Areas identify caribou habitat. Regulatory and policy guidance for caribou is determined by the ecotype and location. Geographic designations and protections for caribou include:

- WHA and UWR for Boreal Caribou and Northern Caribou
- Interim Moratorium Areas for Caribou Recovery / Intergovernmental Partnership Agreement for the Conservation of the Central Group of the Southern Mountain Caribou
- Caribou Herd Locations

Table 1.5 below lists the expectations and guidance for caribou in NEBC. Localized specific guidance, such as WHA, UWR and Interim Moratorium Areas (Intergovernmental Partnership Agreement, supersede more generalized guidance within the identified boundaries.

Table 1.5 Summary of Caribou Guidance in NEBC

Species	Designatable Unit	Guidance (defined by location)
Boreal Caribou	DU6	Boreal Caribou Protection and Recovery Plan Interim Operating Practices for Oil and Gas Activities in Identified Boreal Caribou Habitat in British Columbia EIMS
Northern Mountain Caribou	DU7	EIMS
Southern Mountain Population – Central Group	DU8	Interim Moratorium for Caribou Recovery Partnership Agreement for the Conservation of the Southern Mountain Caribou Intergovernmental Partnership Agreement for the Conservation of the Central Group of the Southern Mountain Caribou

		Overview of the Draft Partnership Agreement between British Columbia, Canada, West Moberly First Nations, and Saulteau First Nations to Recover the Central Group of Southern Mountain Caribou. Draft Partnership Agreement Shapefiles (Caribou Recovery) EIMS (for WHA/UWR) South Peace Northern Caribou Standardized Industry Management Practices
Note there are some differences between federal and provincial nomenclature for caribou at this time. The province still uses the term *Northern Caribou* in BCGW and legal orders for Central Mountain Caribou.		

Interim Operating Practices for Oil and Gas Activities in Identified Boreal Caribou Habitat in British Columbia (IOPs) were developed by the Ministry of Environment (MOE) to convey guidance targeted at reducing adverse effects to boreal caribou populations and their habitat. The IOPs were transmitted to the Regulator by MOE as operational policy that must be followed for all energy resource activities within identified Boreal Caribou habitat. For activity in identified Boreal Caribou habitat, the Regulator considers adherence to the IOPs as a satisfactory requirement for mitigation.

1.9 Section 6(c) - Wildlife Tree Retention Area

Wildlife Tree Retention Areas (WTRAs) are valuable components of stand-level biodiversity. An example of a WTRA is a wildlife tree patch (WTP), a patch of trees excluded from harvesting within or adjacent to a forestry cutblock. Chapter 5 of this document provides links to spatial data for WTRA.

All energy resource activities must be planned and undertaken in accordance with of the EPMR which states that “no portion of an operating area be within a wildlife tree retention area”. This prohibition precludes energy resource activity from WTRAs. WTRAs must not be harvested until the related cutblock area develops mature seral condition attributes. For practical purposes, the end of the rotation will be a main consideration.

In circumstances where avoidance of a WTRA cannot be accomplished, a mitigation plan as per Section 1.2 of this document is required. Within the mitigation plan, the applicant must document how efforts to avoid were taken, and if the WTRA is entered how impacts will be effectively mitigated.

1.10 Section 6(d) - Wildlife Habitat Feature

Energy resource activities must be planned and undertaken in accordance with Section 6 (d) of the EPMR, which states that ‘oil and gas activities not damage or render ineffective a wildlife habitat feature’. The identification and establishment of Wildlife Habitat Features (WHF) is enabled through Section 26 of the EPMR. To date, the Minister

responsible for the Wildlife Act has not identified any features, however the Regulator has established Regulator-identified WHF that are considered by policy in the application review process.

1.10.1 Management of Regulator Identified Wildlife Habitat Features

Applicants are required to plan operations in such a manner that they not damage or render ineffective a WHF. Regulator identified WHF are listed in Section 5.7 of this document.

It is the responsibility of the proponent to identify WHFs in proximity of proposed energy resource activities. WHF identified in the ordinary course of planning (including during consultation with First Nations communities, stakeholder engagement and/or fieldwork) should be listed in the application. Applicants are expected to use a QP (see Appendix A) to complete a pre-work field assessment, to identify WHFs within 500 metres of well sites or facilities, and 250 metres of linear disturbances, in WHA, UWR and Conservation Data Centre(CDC) polygons.

WHFs and their associated setbacks should be included on construction plans submitted to the Regulator. Setback requirements are listed in Table 1.6 and indicated in Figure 1.1. Any deviation from these guidelines requires a rationale from a QP (see definition in Appendix A). Where a proposed energy resource activity intersects an WHF, the Regulator expects the applicant to follow the POMs listed in Table 1.7.

Table 1.6: Setback requirements for WHFs

WHF	Context	Setback Requirements
Heron Nest	Urban	200m setback 1 Sept - 14 Feb 400m setback 15 Feb – 31 Aug
Heron Nest	Rural	300m setback 1 Sept - 14 Feb 500m setback 15 Feb – 31 Aug
Mineral lick or Wallow	Multiwell pads and facilities	500m setback at all times
Mineral lick or Wallow	Linear disturbances and Associated Oil and Gas Activity	100m setback at all times
Dens and High-Fidelity Nests (including Bald Eagle and Osprey)	Multiwell pads and facilities	500m setbacks at all times

Dens and High-Fidelity Nests (including Bald Eagle and Osprey)- during critical timing window	Linear disturbances and Associated Oil and Gas Activity	250m setback when occupied: Fisher March 15-June 30 Grizzly Bear Nov 1 – April 15 Wolverine Feb 1 – June 30 Bald Eagle March 1 – Aug 15 Osprey April 21 – Sept 5 Swainson Hawk – May 1 – Aug 15 Northern Goshawk April 1 – Aug 15
Dens and High-Fidelity Nests (including Bald Eagle and Osprey) - outside critical timing window	Linear disturbances and Associated Oil and Gas Activity	100m setback when unoccupied Fisher July 1- March 14 Grizzly Bear April 16 – Oct 31 Wolverine July 1 – Jan 31 Bald Eagle Aug 16 – Feb 28 Osprey Sept 6 – April 20 Swainson Hawk Aug 16 – April 30 Northern Goshawk Aug 16 – March 31

Figure 1.1: The application of setbacks and survey distances for oil and gas activities proposed within areas requiring WHF survey.

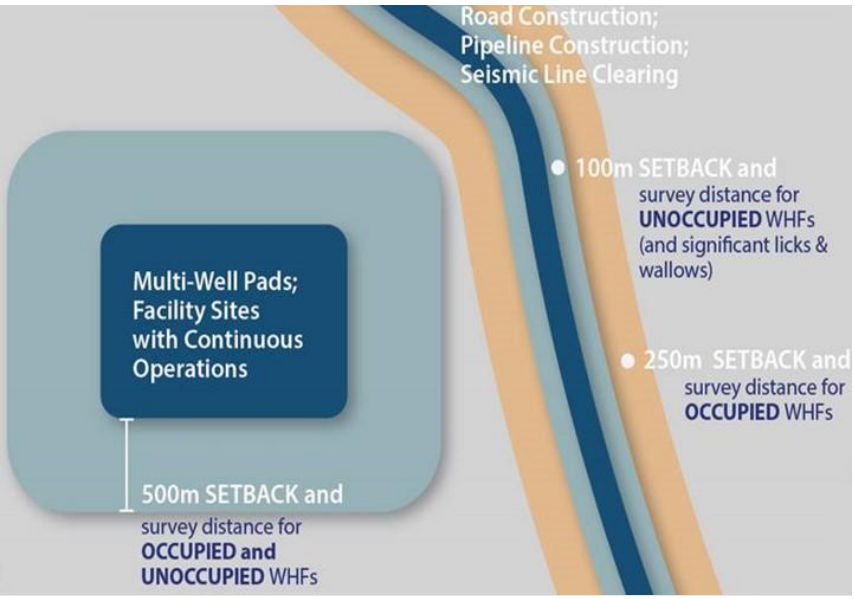


Table 1.7: Planning and Operational Measures for Regulator-Identified Wildlife Habitat Features.

Objectives: Not damage or render ineffective a wildlife habitat feature.		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
Multiwell pads and facilities	• During the early planning stages of an activity, identify WHFs potentially impacted by the proposed activity. • Plan activity so that adverse effects to wildlife habitat features are avoided (WHF are not damaged or rendered ineffective). • In a WHA/UWR/CDC polygon, conduct a pre-work survey to identify WHF within the 500m setback distance. • Map WHF and setback on construction plan	• Apply setback.
Linear disturbances and Associated Energy Resource Activity	• During the early planning stages of an activity, identify WHFs potentially impacted by the proposed activity. • Plan so that adverse effects to WHF are avoided (WHF are not damaged or rendered ineffective).	• Apply setback.

	• In a WHA/UWR/CDC polygon, conduct a pre-work survey to identify WHF within the 250m setback area. • Map WHF and setback on construction plan.	

1.11 Section 7(a) - Old Growth Management Areas

Section 7(a) of the EPMR prescribes GEOs with respect to OGMAs as defined in Section 1(2) of ERAA. All energy resource activities must be planned and undertaken in accordance with Section 7(a). OGMAs are essential for the maintenance of ecological diversity, wildlife habitat and old forest at a landscape level. There are currently 240 OGMAs in NEBC. OGMA are identified spatially in Section 5.13 of this document.

A Managed Development Allowance (MDA) is in effect to limit disturbance to OGMAs in NEBC. The MDA allows for 10% disturbance in OGMA that are less than 100 hectares, and 5% or 10 hectares, whichever is greater, in OGMAs that are greater than 100 hectares. The BCER reports disturbance statistics for each OGMA in the BCER Annual Status Reports. Any applications intersecting an OGMA requires a mitigation plan.

Where a proposed energy resource activity intersects an OGMA, the Regulator expects the applicant to follow the POMs listed in Table 1.8 below. Please refer to Section 1.2 of this document for further information on POMs, and requirements for rationale statements and mitigation plans in permit applications.

Table 1.8: Planning and Operational Measures to Meet Government's Environmental Objectives for Old Growth Management Areas.

Objectives: • Maintain the old seral stage forest representation within the OGMA (including high value growth features such as large diameter trees, coarse woody debris, remnants, standing dead trees, stumps, nursery logs and structurally complex forest stands). • Maintain disturbance levels below the Managed Development Allowance (MDA).		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Plan energy resource activities to avoid OGMAs. • Activities with locational flexibility should be planned to be outside of OGMAs (camps, borrow pits, storage, temporary workspaces). • Where avoidance is not practicable: • Determine the current level of disturbance in the OGMA and consider if this exceeds the Managed Development Allowance.	• Modify/Minimize operational footprint to avoid high value old growth features such as large diameter trees, coarse woody debris, remnants, standing dead trees, stumps, nursery logs and structurally complex forest stands. • Employ minimal disturbance techniques that facilitate rapid deactivation and natural regeneration. • Limit removal of timber and vegetation, and disturbance to root mat and duff.

	• Coordinate access with other users. • Plan activity to minimize adverse effects to old seral stage forest. Utilize existing disturbance such as recently harvested areas or natural openings. • Minimize width of ROW. ROW to cross at the narrowest section and to limit fragmentation. • Safely retain wildlife trees by following the safety guide for qualified persons for Managing Wildlife/Dangerous Trees.	• Retain and redistribute coarse woody debris following operational activity. • Upon completion of construction, undertake measures to promote natural or assisted regeneration on cleared areas that are not required for operations to re-establish the pre-existing ecological trajectory.
Linear Features (roads, pipelines, seismic)	**All:** • Minimize clearing width for new linear disturbances within OGMAs.	**Seismic:** • Employ minimal impact seismic techniques within OGMAs. • Use meandering avoidance. • Minimize depth of mulch layer to allow regeneration.
Source: FLNRO expectations for Oil and gas Activities in OGMA 2014		

1.12 Section 7(b) - Resource Features

All energy resource activities must be planned and undertaken in accordance with Section 7(b) of the EPMR: 'that oil and gas activities will not damage or render ineffective a resource feature'. The Regulator's SDM has the duty to consider the activity proposed with respect to Section 7(b).

Applicants are encouraged to advise the Regulator of any resource features (as defined in the EPMR) as early as possible, even prior to application submission, to allow the Regulator time to consider and facilitate any required engagement with other government agencies and avoid delays in application processing. Resource features and their associated BCGW datasets are identified in of this document.

All resource features defined in Section 25 of the EPMR must be identified on construction plans. Where resource features are identified, energy resource activities must be planned and operated in a manner that will ensure that resource features are not damaged or rendered ineffective. See Chapter 5 of this document for identification and spatial data.

If a permit holder carrying out an oil and gas activity, finds a resource feature that was not identified on an approved operational plan or permit, the permit holder must stop and/or modify the activity that is in the immediate vicinity of the feature to the extent necessary to avoid any potential adverse effect. The permit holder must then promptly advise the Regulator of the existence and location of the resource feature.

To assist applicants in understanding the Regulator's expectations for avoiding and minimizing potential effects to resource features, a table of POMs is provided below in Table 1.9. Please note that additional requirements exist for karst features in and recreation features in Section 1.12.1 and 1.12.5 below. Please refer to of this document for additional information on POMs, and requirements for rationale statements and mitigation strategies.

Table 1.9: Planning and Operational Measures to Meet Government's Environmental Objectives for Resource Features.

Objective: • Maintain continued use and physical integrity of resource features.		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Plan the location of energy resource activities to avoid resource features. • Plan activities so that resource features continue to be readily used and serve the same value and purpose that they did prior to the proposed development. • In situations where an activity must be located in close proximity to a resource feature with adjacency concerns (i.e., a recreation site), minimize adverse effects to the resource feature by utilizing existing disturbances and minimizing the footprint.	• Operational setbacks should be applied to minimize adverse effects and maintain the integrity of resource features. • Time activity to occur outside high usage periods, as adverse effects may be more significant during these times. • Upon completion of construction, undertake measures to promote natural or assisted regeneration on cleared areas that are not required for operations to re-establish the pre-existing ecological trajectory. • Upon completion of activity, undertake measures to control access and promote natural or assisted regeneration across the area. These measures are to encourage re-establishment of pre-existing ecological trajectory.
Linear Features (roads, pipelines, seismic)	• Avoid generating new linear disturbances that create new or alternate access to resource features.	• Install access control measures to limit use by motorized traffic in areas where a resource feature may be adversely affected by new access. • Use low impact seismic methods.

1.12.1 Karst

Karst is recognized as a valuable, non-renewable resource that can be highly sensitive to disturbance. It is a distinctive topography that develops as a result of the dissolving action of water on soluble bedrock, which produces

a landscape characterized by fluted and pitted rock surfaces, vertical shafts, sinkholes, sinking streams, springs, subsurface drainage systems and caves. The unique features and three-dimensional nature of karst landscapes result from a complex interplay between geology, climate, topography, hydrology, and biological factors over long timescales.

Reconnaissance karst potential mapping has been completed for the province and is available through BCGW (see Section 25). It should be recognized that this mapping is not inclusive of all karst features in the province, but is intended as a document for areas where karst is likely to be encountered.

Applicants are encouraged to advise the Regulator of any karst features as early as possible, even prior to application submission. Where an activity has been proposed in an area identified as having karst potential the applicant must employ a QP to conduct pre-site assessments in order to confirm presence/absence of karst. The results of the pre-site assessment must be submitted to the Regulator in the form of a report.

The pre-site assessment report must be prepared in accordance with mitigation plan requirements and include:

- Justification for project placement.
- Location(s) of identified karst formation(s).
- Mitigation measures that will be employed to ensure retention of karst formation integrity.

Proponents are encouraged to use the Karst Management Handbook for British Columbia when preparing mitigation measures as to how the activity will not damage or render ineffective the karst resource.

Please refer to Appendix B of this document for further information on mitigation plan requirements.

1.12.2 Range Development

This resource feature includes any range development as defined under FRPA. A range development includes a structure, an excavation, or a livestock trail identified in a range use plan or a range stewardship plan. It also includes an improvement to forage quality or quantity on an area that results from the application of seed, fertilizer or prescribed fire to the area, or the cultivation of the area. If a person removes, or renders a range development feature ineffective, they must construct a replacement before livestock are turned-out.

1.12.3 Research/Experimental Crown Land

This includes any Crown land used for research or experimental purposes. Information on experimental, trial and research site locations and characteristics can be found by contacting the local forest district office or the major licensees within the district, who may be conducting field experiments. Some spatial data for experimental areas and research sites is available, see Section 5.6 of this document for details. The provincial universities and colleges are

also sources of information on Crown Land used for research. Under Section 7 (b) of the EPMR a person must not damage or render crown land designated for research or experiments ineffective.

1.12.4 Permanent Sample Site

Specifically, this is defined as a permanent sample site used as a snow course by or on behalf of the Federal or Provincial government to measure the water content of the snowpack on a given area. Snow is an important water resource that cannot be accurately measured by snow depth alone. Permanent Sample Sites used as snow courses by or on behalf of the Federal or Provincial government have been established to measure snow water equivalence. Under EPMR Section 7 (b) a person must not damage or render a permeant sample site ineffective. See Section 5.6 Resource Features Identified for spatial data.

1.12.5 Recreation Features

Recreation features include:

- An interpretive forest site, a recreation site or a recreation trail (single, linear, or a network of trails within a recreation polygon) established or continued under FPRA.
- A recreation facility that is authorized under FRPA.
- A recreation feature identified under FPRA.
- Recreational features established for commercial ventures through the Land Act.

Applicants are encouraged to advise the Regulator of any recreation feature (as defined in the EPMR) as early as possible, even prior to application submission, to allow the Regulator time to consider and facilitate any required engagement with other government agencies and avoid delays in the application processing. All business or industrial activity on legally established recreation sites, trails or interpretive forests, as defined in Section 16 of the under FRPA, requires authorization by the District Recreation Officer (FLNRORD).

Section 5.6 of this guide provides additional information for the identification and mapping recreation features.

POMs are provided in Table 1.10 for recreation features; however, compliance with the POMs does not negate the proponent's responsibility to communicate with the Regulator to facilitate any necessary engagement. Where a proponent does not adhere to the POMs, they must submit a rationale with their application.

Refer to Section 1.2 of this document for additional information on POMs, and requirements for rationale statements and mitigation plans in permit applications.

Table 1.10: Planning and Operational Measures for Recreation Features.

Objectives: • Maintain continued use and the physical integrity of recreation features. • Ensure that industrial activity does not impose safety concerns for the public.

Activity Type	Planning Measures (Avoidance and Minimization Techniques)	Operational Measures (Mitigation and Restoration Techniques)
All	• Plan activity to maintain a 500m setback to retain of the integrity and use of the resource feature. Avoid/minimize potential adverse effects to a recreation feature. • Risks to recreation features caused by noise, light, aesthetics, odor, traffic, and hydrogen sulfide potential must be evaluated and mitigated by a QP. • Minimize adverse effects to the resource feature by utilizing existing disturbances and minimizing the footprint. • Minimize the size and number of any crossings. • Avoid locating industrial camps or water withdrawal locations in proximity of recreation sites.	• Plan activity to occur outside of high usage periods. • Keep shared access free of debris and road maintenance obstructions (for example plowed snow, gravel, culverts). • Use visible signage for crossing locations with recreation trails. • Within 500m of a recreation feature, undertake measures to control access and promote natural or assisted regeneration, upon the completion of construction. These measures are to encourage re-establishment of pre-existing ecological trajectory on non-operating areas of the development site.
Linear Features (roads, pipelines, seismic)	**All:** • Avoid creating new linear disturbances that create access to recreation features. • Minimize the size and number of crossings. **Roads:** • Access should be designed to avoid the developed portions of a recreation site.	**Seismic and Pipelines:** • Install access control measures where a resource feature intersects energy resource activity. • Keep travel portions of trails, free of debris and/or obstructions, where proposed activities and existing trails share a right of way. **Roads:** • Retain or establish treed buffers between recreation site/trails and access roads, to minimize visual impacts.

1.13 Section 7(c) - Cultural Heritage Resources

The EPMR defines a Cultural Heritage Resource as an object, a site or the location of traditional societal practices, that is not regulated under the Heritage Conservation Act, and is of historical, cultural or archaeological significance to aboriginal people. Section 7 prescribes objectives with respect to cultural heritage resources to meet the GEOs as defined in Section 1(2) of ERAA. All energy resource activities must be planned and undertaken in accordance with Section 7(c) of the EPMR.

Applicants contemplating energy resource activities are expected to engage potentially affected First Nations early in the planning process. As part of engagement, proponents should work proactively with First Nations to develop

datasets cataloguing cultural heritage resources and special management measures for important areas identified. Please refer to Guidance for Pre-engaging with Indigenous First Nations for further information on pre-engagement.

It is the responsibility of the applicant to identify any cultural heritage resources as defined under the EPMR through discussions with First Nations communities and ensure energy resource activities will conserve, or if necessary, protect the identified cultural heritage resource. A mitigation plan is required when a cultural heritage resource is located within the operating area of an energy resource activity; refer to Appendix B of this document for mitigation plan requirements. The Regulator encourages applicants to work with the affected First Nation(s) in developing the mitigation plan.

In the event a heritage site, heritage object, or any other feature, place or material that may contain historical or archaeological value as defined by the Heritage Conservation Act is encountered, the permit holder must cease disturbance activities and immediately notify the Regulator's Heritage Conservation Branch.

Chapter 2: Operating Area Requirements

Part 3 Division 1 of the EPMR contains the legal environmental requirements that a permit holder conducting an energy resource activity must comply with in all cases; often referred to as "operator requirements". The following sections expand on the specific legal requirements on operating areas.

2.1 Section 9 - Water Quality

The requirement under Section 9(1) of the EPMR requires that there is no material adverse effect on the quality, quantity or flow of the water to waterworks or a water supply well located within an operating area as a result of conducting an energy resource activity.

If it is not practicable to comply with sub-section (1), applicants must demonstrate adherence with all qualifying criteria in Section 9(2) of the EPMR, which requires operators to minimize any adverse effects to water supply wells and water works within operating areas. Should there be potential for an activity to impact a water supply for a new operation, operators should identify this at the application stage, and a mitigation plan must be submitted with the application. The mitigation plan must outline how the mitigation measures will result in effective minimization of the adverse effect. A notice to water users or owners is also required in this event. The Regulator's SDM may use the proposed mitigations as conditions on permit.

If an operator may cause a temporary disturbance to a water supply system, they are required to provide 72 hours notice to the owner(s) or user(s) of the system before adversely affecting the water supply and provide them with an alternate supply of water of equal or better quality. Should an incident occur during energy resource operations, which is reasonably believed to have a potential adverse impact on a water supply, the operator must notify the well owner immediately and provide them with an alternate source of water as soon as practicable.

To demonstrate adherence with respect to Section 9(2) operators should document all incident information and incident response actions taken respecting its requirements.

Any spills or incidents that could impact water quality should be reported to the regulator in accordance with

- The BCER Incident Reporting Instructions and Guidelines.
- The BCER Incident Classification Matrix
- The Spill Reporting Regulation

Please Note:

Section 9, Water Quality, refers to conditions where the water works or water supply well is located on the operating area, whereas Section 20, Water Quality, refers to conditions where waterworks or water supply wells are adjacent to an operating area.

2.2 Section 10 - Aquifers

Under Section 10 of the EPMR, it is the responsibility of the permit holder to ensure that activities on an operating area do not cause a material adverse effect on the quality, quantity, or natural timing of flow of water in an aquifer.

An aquifer as defined in the EPMR means "a geological formation, a group of geological formations, or a part of one or more geological formations, that contains water with up to 4,000 milligrams per litre of total dissolved solids and is capable of storing, transmitting and yielding that water". Regulatory requirements for construction and operation of facilities and wells include requirements relevant to the protection of aquifers.

Data regarding aquifers can be found in Section 5.15 Aquifers and Groundwater Recharge Areas Identified of this document.

The applicant or the operator (for permitted activities) must take measures to prevent adverse effects on the quality, quantity, or natural timing of flow of water in an aquifer. If risks are identified at the application stage, a mitigation plan should be submitted and implemented.

If any substances that have the potential to cause adverse effects on groundwater quality are released to the ground surface or subsurface at a site, it is the applicant's / permit holder's responsibility to know and comply with all applicable legislation including regulations for spill reporting (e.g., BC Spill Reporting Regulation). Remediation or mitigation measures may be required to ensure compliance with Section 10 of the EPMR.

Quantity and timing of flow: ERAA water source wells require a water authorization under the Water Sustainability Act. The application for a water authorization includes a technical assessment prepared by a QP to assess the effects of groundwater extraction on the aquifer. Information on the technical assessment requirements is available in the province's Guidance for Technical Assessments in Support of an Application for Groundwater Use in British Columbia.

Information regarding groundwater licence applications is provided in the Regulator's Water Licence Application Manual.

2.3 Section 11 - Crossing Streams, Wetlands & Lakes

In general, it is only acceptable for an operating area to be located within a stream, lake, or wetland where it is required to cross the stream, lake, or wetland. When crossing a stream, wetland, or lake, or when "works" as defined under the Water Sustainability Act (WSA), are proposed 'in and about a stream', the applicant may require additional authorization under the WSA. Applicants can find additional information on the requirements regarding stream, lake or wetland crossings within the Oil and Gas Activity Application Manual, Section 4.8.

Section 11 of the EPMR requires that crossings are constructed and maintained in a manner that is unlikely to harm fish, or destroy, damage, or harmfully alter fish habitat. The crossing must not prevent or impede the movement of fish and must protect the bank of the stream at the crossing. It is the responsibility of the operator to inspect crossings over time to ensure compliance with this section of the EPMR, and to make information available to the Regulator upon request.

Where the crossing of a stream, wetland, or lake is proposed, applicants must provide crossing information in the AMS. Applicants should adhere to the planning and operational measures in Table 2.1 and meet the requirements of Section 11 of the EPMR.

Where a Qualified Professional has determined the proposed activities may adversely affect fish habitat or water values through direct or indirect means, a Fish Habitat Assessment (FHA) must be completed in the potentially affected area. The FHA should include specific measurable mitigations from a QP that align with guidance provided in Appendix B.

Table 2.1: Planning and Operational Measures for Stream Crossings.

Objectives: • Maintain natural hydrological conditions, natural streambed dynamics, and stream channel integrity. • Prevent impacts to aquatic and riparian habitats, water quality and quantity, fish, and wildlife species		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Operators through use of a QP are required to determine the class of all streams and wetlands associated with a crossing. • All streams should be assumed to be fish bearing except (a) where there is a marked fish barrier that would impede the movement of fish, or (b) where the stream class is verified by a QP. • A FHA is required for any instream activities on a fish bearing stream, or where there may be an adverse effect on fish/fish habitat. This assessment should be conducted during	• The original rate of water flow in the stream must be maintained upstream and downstream of the worksite during all phases of instream activity. • The permanent removal of naturally occurring material from a fish-bearing stream, or stream channel, is not permitted. • The channel width must not change because of the crossing. • Construction must not result in channel instability or increase the risk of deleterious material entering the watercourse.

	snow-free conditions by a QP following provincial fish inventory guidelines. • Fish-bearing stream crossings should be constructed during least risk timing windows. • Plan construction when stream channels are naturally dry and/or frozen to the bottom and apply least risk timing windows. • Crossings are to be located perpendicular to creek where stream banks are low and stable. • Crossing design to include measures to minimize future sediment transport from ROW into stream channel. • Follow the professional practice guidelines for erosion and sediment control. • Follow the provincial guidance for changes in and about a stream.	• Where practicable equipment should be located outside the channel and work should be conducted from dry land. • Apply risk timing windows where applicable. • The operator must prevent the entry of any substance, sediment, debris, or material into the stream to prevent harm to fish, wildlife, or the aquatic ecosystem. • Erosion and sediment control material must be onsite at all times during construction. • Monitor erosion and sediment control. • Vegetation disturbance must be minimized. Any exposed soil must be promptly revegetated and stabilized to prevent future erosion and sedimentation. • The crossing must be maintained to ensure it does not prevent the movement of fish. • Crossing inspections to be retained for future reference.

The following documents provide additional guidance for stream crossings:

- FLNRORD Terms and Conditions Water Sustainability Act for Changes in and about a Stream as specified by FLNRO Habitat Officers, Northeast Region, including least risk timing windows, for NEBC.
- Timing windows can also be found in Peace Region Selected Terrestrial and Aquatic Wildlife Least-Risk Windows and Regional Timing Windows.
- The Canadian Association of Petroleum Producers (CAPP) provides guidance on pipeline-associated watercourse crossings: Pipeline-Associated Watercourse Crossings.
- Fish-stream Crossing Guidebook (published by the FLNRORD, the MOE, DFO) for more information on planning stream crossings on fish bearing streams.
- For many types of proposed works, relevant standards and best practices are found at the following MOE link: Standards and Best Practices for Instream Works.
- Government of BC Working Around Water.
- Department of Fisheries and Oceans: Codes of Practice
- The professional practice guidelines for erosion and sediment control.
- Provincial guidance for changes in and about a stream.

2.4 Section 12 - No Deleterious Materials into Streams, Wetlands or Lakes

Section 12 of the EPMR states that oil and gas activities must not result in deleterious material entering into a stream, wetland or lake. A deleterious material includes any material that could cause harm or damage to the environment or habitat, including sediment from roads or activity areas, spills of sewage, oil, fuel, or any release of drilling fluid from a horizontal directional drill.

It is an offence to put debris or other foreign matter into a stream or well. It is also an offence to allow debris or foreign matter to fall, spill, drain, or otherwise get into a stream or well. It is the duty of the applicant or permit holder carrying out the oil and gas activity to ensure and demonstrate compliance with this requirement. Appropriate measures may include:

- Provisions to manage erosion and limit sediment entering into streams channels.
- Storing materials and equipment away from the watercourse.
- Avoiding areas that may result in significant erosion (steep gradients, gentle over steep areas, meanders, alluvial fans, floodplains, braided streams).
- Retaining an emergency spill kit and erosion control on site during construction.
- Development and implementation of an erosion and sediment control plan.
- Regularly inspecting and maintaining erosion and sediment control measures.
- Vegetate and stabilise disturbed ground to reduce erosion.
- Limit activity during wet, windy, and rainy periods that may result in high flow volumes and/or increased erosion and sedimentation.
- Contain sediment laden water to prevent dispersal.
- For additional measures see the professional practice guidelines for erosion and sediment control.

This requirement applies to all streams, wetlands, or lakes within or adjacent to an operating area. The requirement also applies to downstream waterbodies via runoff. EPMR Section 20 – Water Quality also requires no material adverse effect on the quality, quantity, and timing of flow to adjacent areas.

2.5 Section 13 - Operations within Wetlands

To operate in a wetland, the GEOs in Section 5 of the EPMR must first be met. If the GEOs are met, and there will be operations within a wetland, Section 13 of the EPMR states that the operator must, to the extent practicable, maintain the natural flow of water in the wetland. Section 5.3.2 of this guideline provides additional information on wetland classification and operations. Table 2.2 below summarizes planning and operational measures for wetlands.

Table 2.2: Planning and Operational Measures for Wetland Crossings.

Objectives: • Maintain natural hydrological conditions. • Protect and maintain aquatic and riparian habitats, water quality and quantity, vegetation and wildlife species		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Use a QP to determine the class of all wetlands associated with a crossing. Wetlands are defined in Section 5.3. • Use a QP to delineate wetland boundaries RMA, RRZ and RMZ must be established using these identified boundaries based on widths stated in EPMR Section 23(2). • Avoid placing activities within the RRZ and RMZ, except for crossing. Activities with locational flexibility should be placed outside of RMA. • Wet areas that do not meet the size criteria for a W2 wetland should be identified in planning and confirmed by a QP. Avoid draining wetlands regardless of size. • Where possible, include upland wetland buffers during project planning.[1] • Plan route to minimize the area impacted by construction and operation. New crossings should be perpendicular to the direction of water flow to the degree practical.[2] • Design roads to follow the natural contour of the land to avoid extensive cut and fill. • Identify, flag, and provide protection for specialized habitats, such as areas of concentrated wildlife use, breeding areas, coarse woody debris, travel corridors, etc.[1] • Plan construction when wetlands are dry or frozen.	• Ensure that drainage systems continue to function during construction. Restore natural drainage volumes and locations as near as possible to the pre-existing natural state.[2] • Store fuel or other toxic fluids at least 100 m from wetlands. Provide containment so spills or other leakage will not be transported to wetlands. • Equipment should be washed before moving into a wetland area. • Apply risk timing windows for applicable wildlife species. • Locate or manage constant noise generators to minimize the effects of continuous noise on sensitive bird populations, particularly during the bird nesting season.[2] • The operator must prevent the entry of any substance, sediment, debris, or material into the wetland to prevent harm to wildlife or the aquatic ecosystem. • Minimize vegetation disturbance. Any exposed soil must be promptly revegetated and stabilized to prevent erosion and sedimentation. • Limit recreational access to the wetland by maintaining natural boundaries and line-of-sight barriers. • Monitor the effectiveness of erosion and sediment control measures. • Crossing inspections to be retained for future reference.

	• Crossing design to include measures to minimize future sediment transport from ROW into wetland. • Follow the professional practice guidelines for erosion and sediment control and watershed assessment.	
Sources: Government of British Columbia's Wetland Ways: Interim Guidelines for Wetland Protection and Conservation in British Columbia (Chapter 2 General[1] and Chapter 7 Oil and Gas[2]), North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide		

2.6 Section 14 - Range Barriers

A natural range barrier is a body of water, rock or other naturally occurring feature that stops or significantly impedes livestock movement to or from an adjacent area. It is the duty of the permit holder carrying out the energy resource activity to ensure the requirements of Section 14 of the EPMR are met. Wherever possible, applicants and permit holders must avoid removing or rendering ineffective natural range barriers. Breaching of a natural range barrier and the adverse effect on livestock confinement is of particular concern to range tenure holders.

During the planning of an energy resource activity, the applicant needs to identify any range barriers that could be adversely affected by the proposed energy resource activity. The application should include a plan for establishing a replacement range barrier if the activity will remove or render the natural range barrier ineffective. Discussions with a range tenure holder during the consultation and notification of the energy resource activity will help to identify an appropriate time and manner to replace or avoid impacting the natural range barrier.

Where natural range barriers are encountered during the construction of the energy resource activity that were not previously identified, it is the responsibility of the permit holder carrying out that energy resource activity to mitigate for the breach and ensure that the requirements of EPMR Section 14 are met.

2.7 Section 15 - Invasive Plants

A person carrying out an energy resource activity on an operating area must do so in accordance with Section 15 of the EPMR. Invasive species are plants not native to B.C. or are outside their natural distribution area. They can spread rapidly, outcompete native species, dominate natural and managed areas, and alter biological communities. Invasive species can adversely affect B.C.'s environment, people, and economy. Invasive plants are identified under Section 5.14 of this document and in Appendix F.

Applicants are responsible under the BC Weed Control Act and the Weed Control Regulation (WCR) to ensure noxious weeds are controlled on their operating areas. The WCR also addresses the prevention and spread of noxious weeds by transport from construction or other equipment.

When planning or undertaking energy resource activities, the applicant or permit holder must minimize the establishment of invasives in their operating area and the spread of invasives to or from their operations. Controlling invasives is a requirement during all phases of operations - transport, construction, cleanup, operations, abandonment, and restoration.

In 2023, amendments were made under regulations to the OGAA (now ERAA) to strengthen invasive plants management through the introduction of a requirement that permit holders prepare and maintain an invasive plant compliance record. See Technical Update TU 2023-10 for details.

Table 2.3 lists Planning and Operational Measures for Invasive Species.

Table 2.3: Planning and Operational Measures for Invasive Species.

Objectives: • Ensure that seed, plant parts or propagules of an invasive plant are not transported into the area while carrying out energy resource activities. • Prevent invasive plants from becoming established.		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Use a QP to identify any existing, new, or potential invasive species at the planning phase. • Operators must have an invasive plant monitoring and treatment program in place, and must prepare and maintain an invasive plant compliance record. • Ensure there is a strategy to prevent the establishment of invasive species, including methods to intercept invasive species at the point of entry. • Identify high risk pathways for invasives (sources may include contaminated soil, cultivation, mowing, machinery and equipment, wind, water, birds and animals, farm produce, etc.).	• Minimize unnecessary disturbance of surface soils. • Stored topsoil and subsoil that will not be rolled back within 12 months should be vegetated with an appropriate seed mix to prevent invasive encroachment. • Revegetate disturbed areas as soon as practicable after disturbance, including temporary use areas such as campsites, decking sites and workspaces. • Operators must adhere to their invasive plant monitoring and treatment program and maintain their invasive plant compliance record. • Record and report invasives at www.reportaweedbc.ca. • Remove any invasive plants before they set seed. Dispose of plants at a designated disposal site (e.g. North Peace Regional Landfill).

	• Foster awareness of invasive plant issues. Train field crews to identify and respond to invasives. • Plan to minimize disturbance and retain native plant communities. • Work with contractors that have an invasive species management strategy. • Where applicable, communicate with landowners and locals about invasive species in and around the operating area.	• Do not use aggregate, borrow and other soil material containing invasives. Regularly inspect all gravel and borrow pit sources. • If invasives are found to establish on the operating area implement measures to control, contain and eradicate them. • Keep equipment clean to minimize transportation of invasives. • Do not transfer organic materials between sites. Where additional soil is required for reclamation, screen soil prior to spreading, seed with an appropriate seed mix and monitor for invasives. • Avoid moving equipment through areas that are infested with invasive species. Wash and inspect equipment for soil and seeds prior to moving to a non-infested area if this is not possible. • Dispose of soil containing invasive plants at a designated disposal site. • Remove all invasives before restoration seeding. • Use seeds that have a certificate of seed analysis to ensure they are noxious weed free.
Sources: Invasive Species Council Best Practices for Managing Invasive Plants on Oil and Gas Operations (2013),		

Additional information for managing invasives can be found here:

- Best Practices for Managing Invasive Plants on Roadsides. It is published by BC Ministry of Transportation and Infrastructure and is available as a pocket guide. It contains best practices for roadside workers that are equally applicable to road users in the oil and gas sector.
- The Best Practices for Managing Invasive Plants on Oil and Gas Operations is a pocket guide developed for BC's oil and gas workers that contains information on key aquatic invasive species as well.
- Ministry of Agriculture, Seven Steps to Managing Your Weeds. A Guide for Integrated Weed Management in British Columbia.
- Invasive Species Council of BC Resource Library
- Guide to Weeds in BC is a comprehensive listing of invasive plants found in BC and relevant information for their control.
- The Pest Control Products Act is Federal Government of Canada legislation regulating the use of herbicides. Herbicide labels indicates which plant species can be treated, application rates, and what types of restrictions apply, such as buffer zones around sensitive habitats.

2.8 Section 16 - Forest Health

All energy resource activities must be carried out in accordance with of the EPMR. Applicants and permit holders must not create conditions for the spread of insects that may be harmful to forest health. Compliance with Section 16 supports efforts to reduce the spread of insects and disease harmful to forest health.

Applicants should work with a QP to identify forest health agents that could be harmful to forest health and ensure that energy resource activities do not cause the spread of such agents. Prolonged decking of harvestable timber or storage piles of unmerchantable timber (slash) can provide extended congregation sites for harmful insects to breed and/or shelter. In some cases, measures must be implemented to ensure forest health agent populations do not inadvertently increase or spread because of timber management activities.

Applicants are also encouraged to visit the Provincial Forest Health website for additional information.

2.9 Section 17 - Conserving Soil

Section 17 of the EPMR requires that any person carrying out an energy resource activity must not cause the soil to become unstable and must minimize alteration to the natural surface drainage patterns. Compliance with Section 17 supports the strong interrelationships between soil conservation, invasive plants, and site restoration. Applicants must demonstrate careful planning with regards to soil conservation. Where soil is disturbed through the carrying out of permitted energy resource activity, operators must ensure they are in compliance with Section 17 at all times.

Soil conservation practices focus on maintaining slope stability, soil productivity and natural drainage patterns, while minimizing erosion. It is an expectation for permit holders to consult with QPs, where appropriate, to achieve soil conservation requirements as outlined in Section 17 of the EPMR.

The requirements for maintaining slope stability include the necessity to understand and plan accordingly for soil type, soil structure, slope, and terrain characteristics, where they exist in association with an energy resource activity. Permit holders should consider and manage risks associated with natural slope characteristics, and how the energy resource activity may affect slope stability. High-risk areas include land on steeper slopes, at the breaks in slope, along the base of slopes and land on colluvial and alluvial fans. Applicants are encouraged to visit the MOE's Terrain and Soil Standards, Manual and Guideline website for information on understanding and mapping terrain hazards. Table 2.4 below lists Planning and Operational Measures for Soil Conservation:

Table 2.4: Planning and Operational Measures for Soil Conservation

Objectives: • Prevent soil instability and erosion • Minimize alteration to natural surface drainage patterns • Protect soil quality and minimize admixing		
Activity Type	**Planning Measures (Avoidance and Minimization Techniques)**	**Operational Measures (Mitigation and Restoration Techniques)**
All	• Soil assessments should be completed by a QP. • Where practicable assessments should be completed during snow-free conditions to accurately profile soil and vegetation. • Plan construction and ground disturbance activities during dry or frozen ground conditions. • Soil salvage and replacement should be directed and monitored by a QP. • The design and installation of erosion and sediment control (ESC) measures must be supervised by a QP. • Soil stockpiles must be set back from classified watercourses according to sections 22-24 of the EPMR. They should not be in an upstream area where sediment transport may occur. • Plan topsoil replacement after contouring of subsoil is complete and subsistence is no longer a concern. • Soil relocation must be done in accordance with the Environmental Management Act and Contaminated Sites Regulation. • Follow the professional practice guidelines for erosion and sediment control.	• All equipment, including mats, must be clean and free of soil or vegetative debris prior to use on site. • Topsoil, subsoil, and any overburden must be salvaged and stored separately. Separation between salvage piles is to be a minimum of 1 metre apart to avoid admixing. • Soil stockpiles should be limited in height (1 metre maximum preferably). Piles must not exceed a 3H:1V slope (horizontal: vertical). • Soil piles must be windrowed and located in an area where they will not be disturbed or impact drainage. • Soils must be decompacted before topsoil replacement. • Monitor soil moisture conditions and utilize contingency measures such as rig mats where appropriate to minimize compaction and rutting. • Soils which are stored for a longer period of time (e.g. wellsites) must be contoured and seeded with appropriate vegetation cover to stabilize soils, prevent erosion and invasive plant encroachment. • Monitor effectiveness of ESC measures and document corrective actions. • Soils susceptible to erosion or cut or fill slopes must be stabilized. • Natural drainage patterns must be reestablished post-disturbance.

Sources: Treaty 8 Planning and Mitigation Measures, Ministry of Environment's Terrain Mapping Standards & Guidelines, BC Soil Information Finder Tool, BCER Site Remediation and Reclamation Manual; Soil Relocation

Appendix C of this document contains additional guidance for soil conservation and restoration practices for areas with disturbed soils.

2.10 Section 18 - Seismic Lines

Geophysical programs must be carried out in accordance with Section 18 of the EPMR. Enclosed uplands (as defined in Part 1 of the EPMR), RRZ, WHF and resource features must not be damaged or rendered ineffective by a seismic line. Permit holders carrying out geophysical operations must use Low Impact Seismic (LIS) techniques.

Additional information concerning geophysical activities can be found in the Geophysical Exploration Regulation, Oil and Gas Activity Application Manual and Oil and Gas Activity Operations Manual.

2.11 Section 19 - Areas to be Restored

A permit holder must carry out energy resource activities in accordance with Section 19 of the EPMR. Appendix C of this document outlines steps that must be taken to restore an operating area upon completion of energy resource activities. A QP can propose alternative restoration methods to the Regulator that meet the regulatory requirements of Section 19.

2.11.1 Additional or Concurrent Regulatory Requirements

- Energy Resource Road Regulation: Section 19(1) (a and b) of the EPMR does not apply to an operating area that is a road ROW. There are specific deactivation requirements for roads in Section 24 of the Energy Resource Road Regulation.
- When operating in identified boreal caribou habitat, there are restoration and reclamation requirements contained within the Interim Operating Practices for Oil and Gas Activities in Identified Boreal Caribou Habitat in British Columbia.
- Muskwa Kechika Management Area (MKMA) reclamation requirement: Pre-tenure Plans are a legislative requirement that must be followed when operating, or applying to operate, in the MKMA. Pre-tenure Plans and MKMA guidelines are available on the MKMA website.
- Land and Resource Management Plans (LRMP) and Sustainable Resource Management Plans developed for various areas of the province provide some guidance for end land use goals. The specific end land use for the site should be consistent with general LRMP direction and that of adjacent land.
- The Certification of Restoration (CoR) process is outlined in the Regulator's Certificate of Restoration Application Manual.
- Oil and Gas Activity Application Manual Chapter 5.3. Completing Application Information Details: Agriculture Land Reserve : provides industry with the reclamation assessment requirements for lands within the ALR, administered by the Regulator.

Chapter 3: Adjacent Areas

3.1 Section 20 - Water Quality

The requirement under Section 20(1) of the EPMR requires that there is no material adverse effect on the quality, quantity or flow of the water to the waterworks or water supply well located adjacent to an operating area as a result of conducting energy resource activity.

If it is not practicable to comply with Section 20(1), applicants must demonstrate adherence with all qualifying criteria in EPMR Section 20(2), which requires operators to minimize any adverse effects to water works within operating areas. Should there be potential for an activity to impact a water supply, operators should identify this in the application stage. A mitigation plan must also be submitted with the application, outlining how the mitigation measures will result in effective minimization of the adverse effect. A notice to water users or owners is also required in this event. The Regulator's SDM may use the proposed mitigations as conditions on a permit.

If a permit holder may cause a temporary disturbance to a water supply system during operations, they are required to provide 72 hours notice to the owner or user of the system before adversely affecting the water supply and provide them with an alternate supply of water of equal or better quality (EPMR Section 9).

Should an incident occur during energy resource operations, which is reasonably believed to have a potential adverse impact on a water supply, the operator must notify the well owner immediately and provide them with an alternate source of water as soon as practicable.

Any spills or incidents that could impact water quality should be reported to the regulator in accordance with

- The BCER Incident Reporting Instructions and Guidelines.
- The BCER Incident Classification Matrix
- The Spill Reporting Regulation

Please Note:

Section 9 of the EPMR, Water Quality, refers to conditions where the water works or water supply well is located on the operating area, whereas Section 20, Water Quality, refers to conditions where waterworks or water supply wells are adjacent to the operating area.

Chapter 4: Exemptions and Deviations

4.1 Section 21 - Exemptions by the Regulator

The Regulator may exempt a person or a class of persons, from one or more of the environmental protection and management requirements for an operating area or an adjacent area (Sections 9-20 of the EPMR), if satisfied that, in the circumstances, it is not reasonably practicable for the person to comply with the requirement. Exemption requests must be formally submitted to the Regulator, to be reviewed and approved by the Executive Director, Responsible Development, or the Vice President Responsible Development and Stewardship.

4.1.2 Deviations

Deviations differ from exemptions, in the context of the EPMR and this guideline. Exemptions occur where permit holders are pursuing approval to be exempt from a specific regulation, as described above. A deviation is issued in reference to guidance. Deviations to guidance are requested as part of a mitigation plan, whereby the QP presents acceptable mitigation strategies demonstrating how the proposed work avoids and minimizes potential adverse effects to environmental values.

Chapter 5: Classification, Identification and Establishment

Part 4 of the EPMR contains the classification, identification and establishment criteria for areas and features that have unique management and protection requirements. These areas and features have been identified elsewhere in the regulation (i.e. through the EPMR Part 2 GEOs or the EPMR Part 3 Operating Area Requirements). It is the responsibility of the applicant to identify these areas and features as defined within the EPMR.

5.1 Riparian Classification

Stream, wetland and lake riparian classifications are described in Sections 22, 23 and 24 of the EPMR. The applicant and their QPs are responsible for waterbody classification. Spatial data for waterbody classification in British Columbia is available through the Freshwater Atlas. For additional guidance and detailed steps on classifying streams, refer to the Forest Practices Code Fish Stream Identification Guidebook, 2nd Edition, Version 2 (1998). If the proposed energy resource activity, or permitted activity, is authorized under the (e.g. Section 11 WSA Authorizations), operators are also required to comply with the relevant sections of that legislation. Operators should also consult the Oil and Gas Activity Application Manual.

5.2 Section 22 - Stream Riparian Classes

All streams are subject to classification as defined in Section 22 of the EPMR. Energy resource activities in or about streams must be carried out in accordance with Section 5 of the EPMR, and with Section 11 of the WSA.

The applicant must determine the stream class and associated riparian area of any stream that may be potentially affected by the energy resource activity. Stream classes S1-S4 are fish streams or streams located within a Designated Community Watershed, and classes S5-S6 are non-fish streams located outside a Community Watershed. Figure 5.1 below illustrates the basic steps to follow in determining stream class.

Each stream receives a riparian classification based on stream class (S1-S6). Stream class is defined by regulation and relates to average channel width, the presence or absence of fish, connection to a fish-bearing stream or lake, or location within a community watershed.

Please Note:

The definition of a stream differs under EPMR and WSA. The definition of a stream under EPMR is limited to a stream that has a continuous channel bed of 100 metres or more in length or a stream that flows into a fish stream, a fish bearing lake or wetland, or a waterworks. The WSA definition of a stream is broader, and so their associated riparian areas will reflect all streams. The WSA definition of a stream is "a natural watercourse, including a natural glacier course, or a natural body of water, whether or not the stream channel of the stream has been modified, or a natural source of water supply, including, without limitation, a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer."

The estuarine portion of a stream should be classified as the same as the stream that has formed the estuary.

Riparian Management Areas (RMA) are transitional areas adjacent to a stream, wetland, or lake where there is a distinct shift in vegetation from aquatic to upland communities, as illustrated in Figure 5.2. Special management is required in RMAs to conserve fish or wildlife habitat, biodiversity, and water values of the area. RMAs are determined based on the riparian stream class, as per Section 22(4) of the EPMR and Table 5.1 ("Classification criteria and corresponding RMA widths for classified streams", Forests, 1995).

Figure 5.1: Key to stream riparian classification (Forests, 1995)

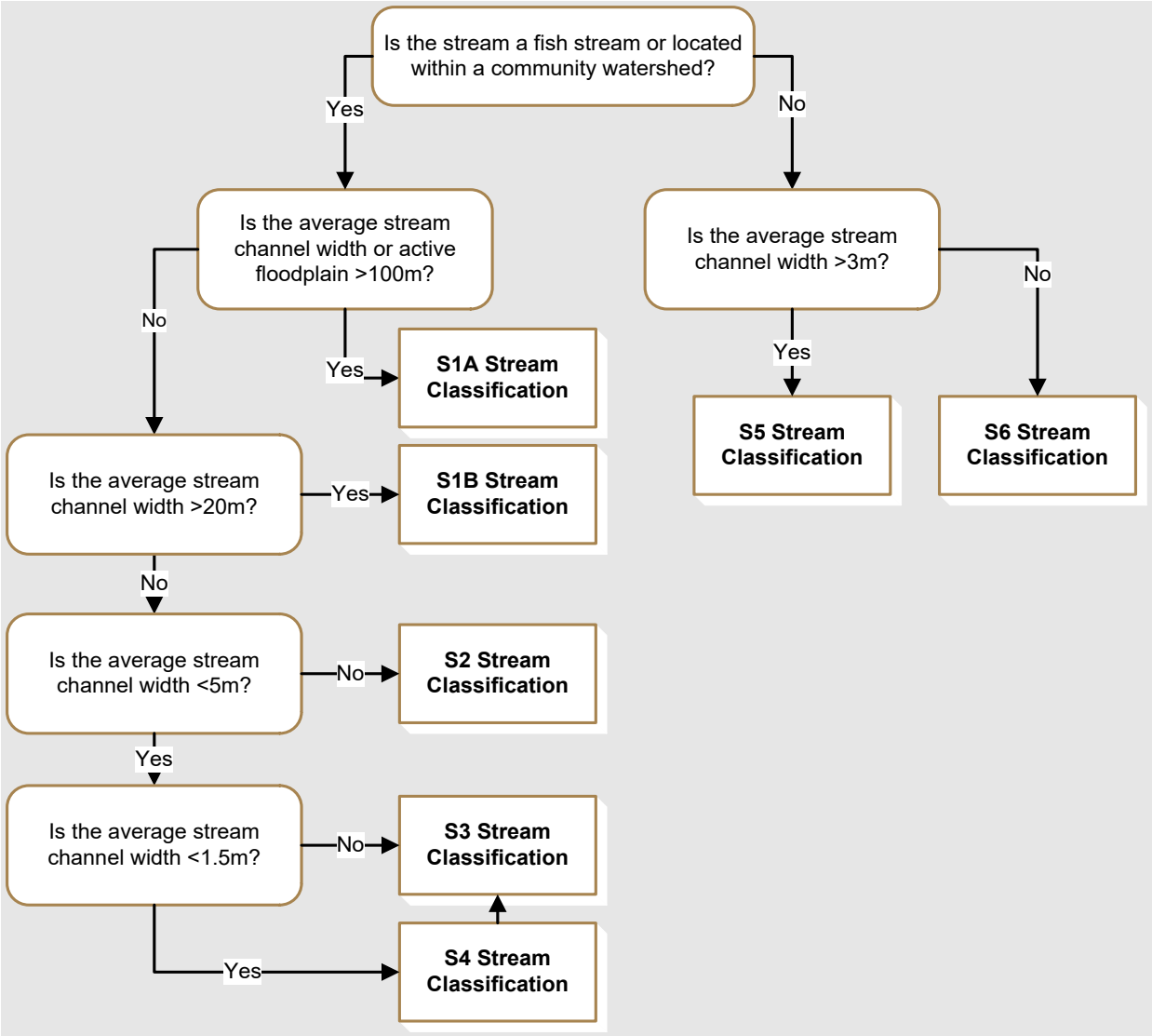


Figure 5.2: The division of the Stream Riparian Management Area into Riparian Reserve Zone (RRZ) and Riparian Management Zone (RMZ).

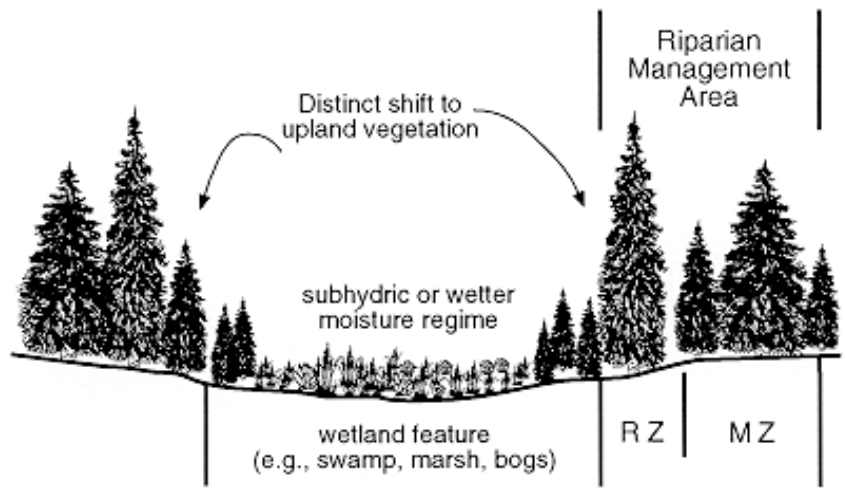


Table 5.1: Classification criteria and corresponding RMA widths for classified streams

Riparian Class	Riparian Management Area(metres)	Riparian Reserve Zone (metres)	Riparian Management Zone (metres)
S1-A	100	50	50
S1-B	70	50	20
S2	50	30	20
S3	40	20	20
S4	30	0	30
S5	30	0	30
S6	20	0	20

5.2.1 Determining Fish Presence

Applicants are required to determine fish presence and complete a Fish Habitat Assessment (FHA) for fish streams, to ensure compliance with GEO's. Acceptable methods to evaluate fish presence are found in the Forest Practices Code Fish Stream Identification Guidebook. Refer to the provincial Standards and Guidelines for Fish and Fish Habitat website and the Overview Fish and Fish Habitat Inventory Methodology for additional guidance on FHAs.

BCGW includes some spatial information about fish, where inventories have been completed and reported to the province (WHSE_FISH.FISS_FISH_OBSRVTN_PNT_SP).

5.2.2 Non-Classified Drainage

A Non-Classified Drainage (NCD) is an ephemeral or intermittent watercourse having a continuous defined channel that is less than 100 metres in length, and at some points may spread over a level area without defined banks, before flowing again as a defined channel.

A NCD is usually a stream under the WSA, and as such, may require authorization under the WSA (in the case of Canadian Energy Regulator (CER) or related activities) prior to any works in it.

If a feature depicted as a stream on the Freshwater Atlas coverage is not evident during field survey, the construction plan submitted in conjunction with an application for energy resource activity should note “No Watercourse Evident” or “No Watercourse Visible” (or something similar). These features should not be listed as NCDs in AMS.

5.3 Section 23 - Wetland Riparian Classes

All energy resource activities in or about wetlands must be carried out in accordance with Section 5 of the EPMR and Section 11 of the WSA.

A wetland is a swamp, marsh, bog, fen, or other similar area that supports natural vegetation, which is distinct from the adjacent upland areas and may have up to two metres of standing water. The WSA definition of a stream includes reference to a wetland and swamp, but not a bog (“includes a natural watercourse or source of water supply, whether usually containing water or not, and a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier”).

Wetlands of British Columbia, A guide to Identification (Mackenzie and Moran, 2004) further defines wetlands as areas where soils are water-saturated for a sufficient length of time such that excess water and resulting low oxygen levels are principal determinants of vegetation and soil development. Wetlands will have a relative abundance of hydrophytes in the vegetation community and/or soils featuring ‘hydric’ characters.

Wetlands may or may not be treed, but when trees are present, the canopy is generally relatively open. Growth rates are much reduced compared to those on the surrounding uplands, and the soil surface is usually hummocky. Wetlands must have both:

- Hydrophytic vegetation, characterized by the predominance of plant species that normally grow in standing water or in soils that are water-saturated for all or a major portion of their growing season; and

- Subhydric or hydric soils, distinguished by free water or prolonged saturation, evidenced by dull gray gleyed horizons, within 30 centimetres of the mineral surface or by sedge or moss peat over mineral soils.

5.3.1 Hydrophytic Vegetation

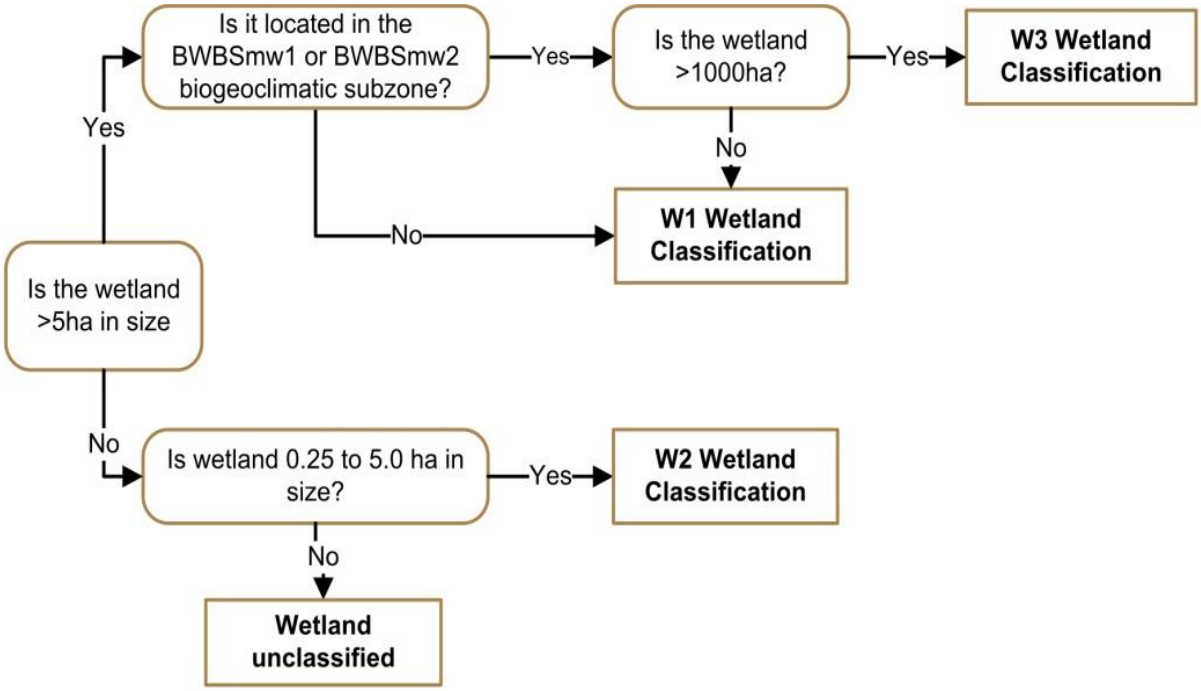
To be considered hydrophytic, vegetation should include shrub or herbaceous species that occur only on organic soils or soils that are water-saturated for a major portion of the growing season. These species should make up 20 per cent or more of the combined cover of low shrub (less than two metres) and herbaceous vegetation. The remaining vegetation should mostly consist of species that are able to establish and grow on water-saturated soils, even though they may not be restricted to these soils (at least 80%).

5.3.2 Classifying Wetlands

There are three riparian classes of wetlands (W1 to W3) defined in Part 1 and of the EPMR based on wetland size and the biogeoclimatic unit in which the wetland occurs. Spatial data for biogeoclimatic ecosystem classification is available in BCGW.

The applicant is responsible for determining the riparian class of all wetlands potentially effected by the energy resource activity. A key to riparian classification of wetlands is illustrated in Figure 5.3 below and should be used along with the Wetlands of British Columbia. A Guide to Identification.

Figure 5.3: Key to Wetland Classification



5.3.3 Establishing Wetland RMA Boundaries

Table 5.2: Classification criteria and corresponding RMA widths for classified wetlands

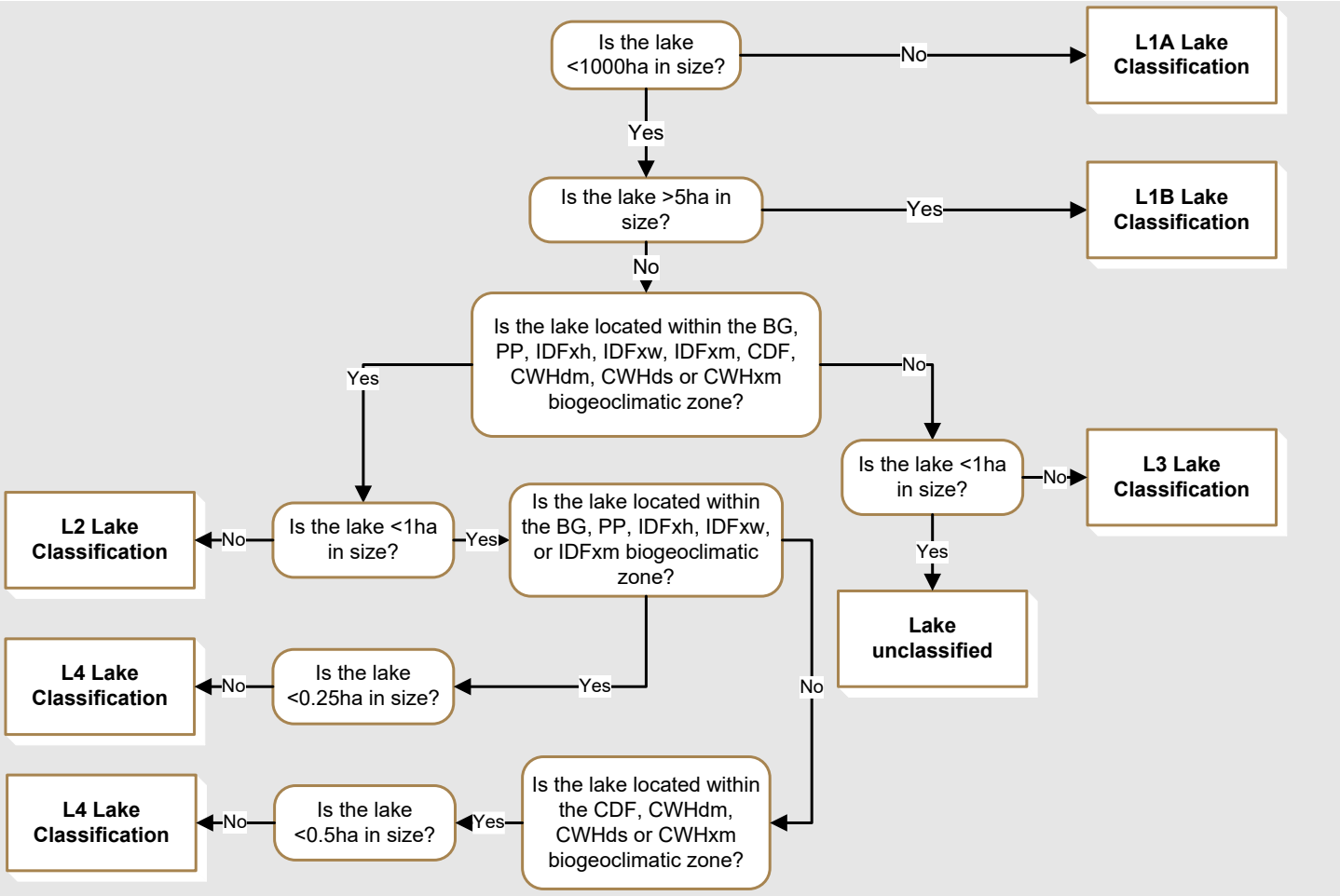
Riparian Class	Riparian Management Area (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)
W1	50	10	40
W2	30	10	20
W3	0	0	0

5.4 Section 24 - Lake Riparian Classes

All lakes within or adjacent to proposed energy resource operations must be classified. There are five riparian classes of lakes (L1-A to L4) as determined by biogeoclimatic ecosystem classification (BEC) zone or subzone and lake size. The applicant is responsible for determining the riparian class of all lakes that may be potentially affected by the proposed energy resource activity. See Figure 5.4.

All energy resource activities in or about lakes must be carried out in accordance with Section 5 of the EPMR and Section 11 of the WSA.

Figure 5.4: Key to Classification of Lakes



5.4.1 Establishing Lake RMA Boundaries

Table 5.3: Classification criteria and corresponding RMA widths for classified lakes

Riparian Class	Riparian Management Area (m)	Riparian Reserve Zone (m)	Riparian Management Zone (m)
L1-A	70	50	20
L1-B	40	20	20
L2	30	10	20
L3	30	0	30
L4	30	0	30

5.5 Identification and Establishment

Part 4, Division 2 of the EPMR identifies and enables the establishment of areas of special management to meet the GEOs outlined in Part 2. The following sections provide additional information regarding the identification and establishment of these features or areas as they relate to implementation of Part 2.

5.6 Section 25 - Resource Features Identified

Resource features are identified in Section 25 of the EPMR as:

a. A surface or subsurface element of a karst system.
b. A range development as defined under the FRPA, including:
    i. A structure.
    ii. An excavation.
    iii. A livestock trail indicated in a range use plan or range stewardship plan.
    iv. An improvement to forage quality or quantity.
c. Crown land used for research or experimental purposes.
d. A permanent sample site used as a snow course by or on behalf of the federal or provincial government to measure the water content of the snowpack on a given area.
e. An interpretative forest site, a recreation site or a recreation trail established or continued under FRPA.
f. A trail or other recreation facility that is authorized under the FRPA.

g. A recreation feature identified under FRPA.

Resource features can be found in the following spatial layers in BCGW:
Karst
WHSE_LAND_USE_PLANNING.RKPM_KARST_POTENTIAL_AREA_SP

Research or experimental areas can be found in the following spatial layers in BCGW:
WHSE_FOREST_VEGETATION.RESPROJ_RSRCH_INSTLTNS_SVW
WHSE_FOREST_VEGETATION.GRY_PSP_STATUS_ACTIVE

Permanent sample site (snow course) can be found in the following spatial layers in BCGW:
WHSE_WATER_MANAGEMENT.SSL_SNOW_MSS_LOCS_SP

Interpretive forest site, recreation site or recreation trail, trail, recreation facility or recreation feature can be found in the following spatial layers in BCGW:
WHSE_FOREST_TENURE.FTEN_RECREATION_POLY_SVW
WHSE_FOREST_TENURE.FTEN_RECREATION_LINES_SVW

Range developments can be found in the following spatial layers in BCGW:
WHSE_FOREST_VEGETATION.RANGE_PASTURE_POLY_SVW
WHSE_FOREST_VEGETATION.RANGE_IMP_FEATURE_LINE_SVW
WHSE_FOREST_VEGETATION.RANGE_ IMP_FEATURE_PNT_SVW

Rangeland natural range barriers (see Section14 if EPMR) can be found in BCGW:
WHSE_FOREST_VEGETATION.RANGE_NATURAL_BARRIER_LINE_SVW

5.7 Section 26 - Wildlife Habitat Features Identified

At this time, the Minister responsible for administering the Wildlife Act has not identified WHFs under EPMR. However, the Regulator has identified WHFs by policy, which require consideration in the review and determination process. Regulator identified WHFs include:

- HPW dens;
- Significant mineral licks and wallows;
- Bald Eagle, Osprey or Great Blue Heron nests; and

- The nest of HPW that exhibits nest fidelity.

In order for a mineral lick or wallow to be considered 'significant', there should be evidence of use over several years by multiple animal species. A lick/wallow that is not used every year or that is used by a single animal should not be considered 'significant'.

Additional information regarding Wildlife Habitat Features can be found in the Wildlife Habitat Features Field Guide.

5.8 Section 27 - Fisheries Sensitive Watersheds Identified

Fisheries Sensitive Watersheds can be found in the following layer in BCGW:
WHSE_WILDLIFE_MANAGEMENT.WCP_FISH_SENSITIVE_WS_POLY
WHSE_WILDLIFE_MANAGEMENT.WCP_FISH_SENS_WS_PROPOSED_SP

5.9 Section 28 - Temperature Sensitive Streams

No Temperature Sensitive Streams have been established under Section 28 of the EPMR at this time. As these areas are established, guidance with respect to operations will be developed.

5.10 Section 29 - Categories of Species of Wildlife Established and Species Considered High Priority Wildlife

Categories of wildlife species are legally established by the Minister responsible for the Wildlife Act, and may include:

- Species at risk
- Regionally important wildlife
- Species of Ungulates that may require winter ranges for overwintering survival

Wildlife species established under Section 29 are considered High Priority Wildlife. At the time of publication, legal (ministerial) orders have been established for categories of species at risk and of ungulate species.

The Regulator also considers Red and Blue Listed species as High Priority Wildlife given their conservation priority in British Columbia. Red and Blue Listed species may be vertebrate, non-vertebrate animal species, and plant communities.

Information regarding provincial species at risk, including species lists and their ranking, can be found in the BC Species Explorer System.

High Priority Wildlife is associated with the following spatial layers in BCGW:

Conservation Data Center (CDC)

WHSE_TERRESTRIAL_ECOLOGY.BIOT_OCCR_NON_SENS_AREA_SVW

WHSE_TERRESTRIAL_ECOLOGY.BIOT_OCCR_MASKED_SENS_AREA_SP

Other

WHSE_WILDLIFE_INVENTORY.GCPB_CARIBOU_POPULATION_SP

REG_LAND_AND_NATURAL_RESOURCE.WLD_CARIBOU_CORE_HAB_PEACE_SP

Draft Partnership Agreement Shapefiles (Habitat for Central Gorup of Southern Mountain Caribou)

5.11 Section 30 - Wildlife Habitat Area Established

WHA can be found in the following spatial layers in BCGW:

WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY

WHSE_WILDLIFE_MANAGEMENT.WCP_WHA_PROPOSED_SP

5.12 Section 31- Ungulate Winter Ranges Established

UWR can be found in the following spatial layers in BCGW:

WHSE_WILDLIFE_MANAGEMENT.WCP_UNGULATE_WINTER_RANGE_SP

WHSE_WILDLIFE_MANAGEMENT.WCP_UNG_WNTR_RNG_PROPOSED_SP

5.13 Section 32 - Old-Growth Management Areas Established (and Wildlife Tree Retention Areas)

It is the responsibility of the minister responsible for administering the Land Act to establish OGMAs under Section 32 of the EPMR. In NEBC, OGMAs are currently established in the Dawson Creek Timber Supply Area (See order M007/2015). The Regulator considers all OGMA that are established under FRPA and EPMR by policy.

OGMAs can be found within the following spatial layer in BCGW:

WHSE_LAND_USE_PLANNING.RMP_OGMA_LEGAL_ALL_SVW

Wildlife Tree Retention Areas (WTRA) can be found within the following spatial layer in BCGW:

WHSE_FOREST_VEGETATION.RSLT_FOREST_COVER_INV_SVW

Note: Spatial analysis should apply the definition query: SILV_RESERVE_CODE IS NOT NULL and SILV_RESERVE_CODE <> 'N' to identify WTRA.

5.14 Section 33 - Invasive Plants Identified

In 2018, invasive plants were established under Section 33 of the EPMR by Ministerial Order No. M152. This order recognizes the plants listed in Schedule A Part I and Part 2 of the Weed Control Regulation as noxious weeds. See Industry Bulletin INDB 2018-08 for details.

In addition, the Regulator recognises the following as invasive species in NEBC:

The Regulator's list of invasive species featured in Industry Bulletin (INDB 2017-05).

The Peace Region Regional District's Profile of Invasive Plant Species.

Please see Appendix F for a complete list of Invasive Species recognised by the Regulator.

The Invasive Species Council of BC provides resources on practices to aid in stopping the spread of invasive species.

5.15 Section 34 - Aquifers and Groundwater Recharge Areas Identified

At this time, there are no orders for identified aquifers or groundwater recharge areas under the EPMR. The guidance herein will be updated as identification occurs, and orders are subsequently established.

Provincially mapped aquifers should however be considered under Section 10 of the EPMR to ensure no material adverse effect on the quality, quantity or natural timing and flow of water in the aquifer. These aquifers can be found in the BCGW:

WHSE_WATER_MANAGEMENT.GW_AQUIFERS_CLASSIFICATION_SVW

Additional data regarding aquifers may be available using the following provincial aquifer and water well information:

- The Regulator's Groundwater Review Assistant Tool;
- BC Groundwater Wells and Aquifers
- Provincial Groundwater Wells and Aquifers information.
- A hydrogeological assessment conducted by a QP.

Known waterworks information, including water licences, locations of water supply wells and mapped water supply well capture zones, can be obtained from the BCGW.

WHSE_WATER_MANAGEMENT.GW_WATER_WELLS_WRBC_SVW

WHSE_WATER_MANAGEMENT.GW_WELL_CAPTURE_ZONES_SP

WHSE_WATER_MANAGEMENT.WLS_WATER_APPROVALS_SVW

WHSE_WATER_MANAGEMENT.WLS_WATER_LICENCED_WRK_LINE_SP

WHSE_WATER_MANAGEMENT.WLS_WATER_LICENCED_WRK_LOC_SP

WHSE_BASEMAPPING.FWA_MANMADE_WATERBODIES_POLY

WHSE_WATER_MANAGEMENT.WLS_RESERVOIR_PMT_LICENSEE_SP

WHSE_WATER_MANAGEMENT.WRIS_DAMS_PUBLIC_SVW

WHSE_WATER_MANAGEMENT.WLS_WATER_RIGHTS_LICENCES_SV

WHSE_WATER_MANAGEMENT.WLS_WATER_RIGHTS_APPLICTNS_SV

WHSE_MINERAL_TENURE.OG_WATER_SOURCE_PERMIT_SP

WHSE_MINERAL_TENURE.OG_ASSOC_ANCILLARY_PERMIT_SP (SITE_TYPE=WASD)

5.16 Section 35 - Designated Watersheds Established

Spatial data for designated community watersheds can be found in the following layer in BCGW:
WHSE_WATER_MANAGEMENT.WLS_COMMUNITY_WS_PUB_SVW

5.17 Section 36 and 37 - Review and Comment, and Notice of Consultation

Section 36 and 37 of the EPMR refer to government's responsibility to consult with affected parties and stakeholders when establishing new legal orders under the EPMR. This duty to consult, and to provide a period for review and comment, does not apply to orders that were legal under FRPA when the Energy Resource Activities Act came into effect in 2010. These are the orders that were originally legal under FRPA and were "grand parented" under this Act and are thus now legal considerations in the EPMR.

The Regulator is regularly given the opportunity by the Minister to review and comment on new proposed legal EPMR designations.

Appendix A: Definitions

Clarification of EPMR Definitions

Definitions provided in the EPMR are linked to specific references in the Regulation.

In addition, the following definitions may be applicable in the context of this guideline.

Agriculture Land Commission (ALC)	The Provincial Agricultural Land Commission (ALC) is an independent administrative tribunal of appointed Commissioners (and staff) who administer the Agriculture Land Reserve (ALR). The Regulator has been delegated authority to administer the permitting process for oil and gas activities on land within the ALR in the Peace Region of BC, through the ALC Delegation Agreement.
Agriculture Land Reserve (ALR)	The Agricultural Land Reserve (ALR) is a provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are regulated and limited.
Aquifer	An aquifer means a geological formation, a group of geological formations, or a part of one or more geological formations, that contains water with up to 4,000 milligrams per litre of total dissolved solids and is capable of storing, transmitting, and yielding that water. See also identified aquifer.
Biogeoclimatic Ecosystem Classification (BEC)	The Biogeoclimatic Ecosystem Classification (BEC) is an ecological framework and language for ecosystem management in BC. BEC provides a multi-scale classification framework to describe broad biogeoclimatic zones used for applications such as protected area and land management planning, forest pest risk and wildlife habitat management. The BEC program, managed by the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD), is continually being updated and as such, the biogeoclimatic zones, names and spatial distribution may change from time to time. The EPMR references the BEC zones at the time the regulation was created; however, the names and distribution of the zones have changed and the new zones should be used when applying the requirements in the EPMR.
Bog	A bog is a wetland that has organic soils with a water table at or near the surface. Soils are predominantly poor to moderately decomposed sphagnum moss peats. The bog surface is usually unaffected by groundwater and thus waters are generally acid and low in nutrients. Bogs are usually carpeted by sphagnum mosses and ericaceous shrubs. They may be treed or treeless. Bogs with an open growth of scrubby trees are commonly referred to as muskeg.

Cavity Tree	A tree that is generally larger and older, and that has holes, hollows or cavities along its trunk or main limbs that are used by wildlife species for foraging, roosting, nesting, or denning.
BC Conservation Data Center (CDC)	BC Conservation Data Center (CDC) is part of Ministry of Environment (MOE) that collects and disseminates information on rare and endangered plants, animals and plant communities of BC.
Categories of Species	Categories of Species are established by Order of the Minister of Environment, and include: Species at Risk, Regionally Important Wildlife, and Ungulate Species. Establishment of species categories is the prerequisite step before being able to legally establish, by Minister's Order, a habitat area for management and conservation of wildlife, such as a Wildlife Habitat Area (WHA) or an Ungulate Winter Range (UWR).
Certificate of Restoration (COR)	A certificate of restoration is a certificate issued by the Regulator under Section 41 of the Energy Resource Activities Act (ERAA) to confirm that site restoration has been completed in a manner that meets provincial standards.
Diameter Breast Height (DBH)	The stem diameter of a tree measured at breast height (~1.3m above the ground)
Deleterious Material	Deleterious materials are materials or operating techniques that could cause harm or damage to the environment or habitat.
Environmental Information Management System (EIMS)	Environmental Information Management System (EIMS) is a web-based system that lists environmental planning and operational measures associated with wildlife.
Environmental Value	An element of the natural environment that the people and Government of British Columbia care about and see as important for assuring the integrity and well-being of the province's ecological systems over time.
Environmental Protection and Management Regulation (EPMR)	Environmental Protection and Management Regulation
Fen	A fen is a wetland that has organic soils and a water table at or above the surface. Soils are primarily moderately to well-decomposed sedge and non-sphagnum moss peats. Waters are mainly nutrient rich with a near neutral to slightly acid pH. The vegetation consists primarily of sedges, grasses, reeds, mosses, and some shrubs. Scattered trees may be present.
Fish Salvage	Fish salvage is the authorized capture of fish species present in an isolated worksite or dewatered area.
High Priority Wildlife (HPW)	High Priority Wildlife (HPW) are wildlife species requiring specific management or protection, including species listed as categories of species at risk and categories of ungulates under Governments Action Regulation.

High Water Mark	The high-water mark is the point on a stream bank usually indicated by a clearly visible change in vegetation and sediment texture. This border is sometimes shown by the edges of rooted terrestrial vegetation. Above this border, the soils and terrestrial plants appear undisturbed by recent stream erosion. Below this border, the banks typically show signs of both scouring and sediment deposition.
Identified Aquifer	Under the EPMR, an "identified aquifer" means an aquifer identified in an order by the Minister responsible for administering the Water Sustainability Act (WSA).
Identified Habitat	Identified habitat is known wildlife habitat associated with HPW. It includes habitat identified in WHAs, UWRs, and CDC polygons and habitat that has been identified in the ordinary course of planning an energy resource activity (including consultation with First Nations communities, stakeholder engagement and/or fieldwork).
Key Habitat Features	Key habitat features are the specific features and habitat attributes within identified habitat that are essential for the survival of the species, such as areas associated with nesting, calving, winter forage, breeding, security, and hibernation.
Lek	An area in a large opening where birds (e.g., grouse) gather to court, display, and mate.
Marsh	A marsh is a wetland that has mineral or sometimes well-decomposed peat soils. When peat soils are present, they are often enriched with mineral materials. Waters are nutrient rich with near-neutral to basic pH. Surface water levels typically fluctuate seasonally, with declining levels exposing matted vegetation or mudflats. Emergent vegetation includes grasses, cattails, sedges, rushes, and reeds, which cover more than 25 per cent of the wetland surface.
Material Adverse Effect (MAE)	A material adverse effect refers to a change to an environmental value established by Government's Environmental Objectives (GEO) that is both material (i.e., serious, of consequence) and adverse (i.e. injurious, damaging, unfavourable). The consideration of material adverse effect is rooted in what an informed person could reasonably consider based on the available information. A potential effect must be both material and adverse (i.e., injurious or damaging, with an appreciable consequence) to be found inconsistent with GEOs.
Mineral Lick	A mineral lick is an area used on a habitual basis by ungulates to obtain dietary microelements, such as sodium, calcium, and phosphorous, and trace elements such as manganese, copper, or selenium. A significant mineral lick means a naturally occurring mineral lick that is used at least annually by one or more species as evidenced by; well-established trails or braided trail systems leading to the mineral lick site; extensive excavation or trampling; and/or teeth marks, pellets, tracks, and hair.
Mitigate	Mitigation is the action of reducing the severity or seriousness of the adverse effect.
Mitigation Plan	A mitigation plan is a project specific report completed by a qualified professional that addresses the elimination, reduction, and control of adverse environmental

	effects, including restitution of any damage to the environment through avoidance, mitigation, and restoration. See Appendix B for mitigation plan requirements.
Natural Range Barriers	A natural range barrier is a body of water, rock or other naturally occurring feature(s), which stops or significantly impedes livestock movement to or from an adjacent area.
Non-Classified Drainage (NCD)	A non-classified drainage (NCD) is an ephemeral or intermittent watercourse having a defined channel that is less than 100 metres in length and at some points may spread over a level area without defined banks, before flowing again as a defined channel. They are generally defined as streams under the WSA, but do not meet the criteria for the definition and classification of stream under the EPMR.
Northeast British Columbia (NEBC)	The geographic region in the northeast corner of British Columbia consistent with the Western Canadian Sedimentary Basin. The area is delineated under the full extent of the BCER Watershed Management Basins. The term "NEBC" is frequently used in Regulator documentation to describe where specific guidance/requirements apply.
Energy Resource Activity	Energy resource activity as defined in Section 1(2) of ERAA includes: geophysical exploration; the exploration for and development of petroleum; natural gas or both; the production, gathering, processing, storage or disposal of petroleum, natural gas, or both; the operation or use of a storage reservoir; the construction or operation of a pipeline; the construction or maintenance of a prescribed road; and the activities prescribed by the regulation.
Energy Resource Activities Act (ERAA)	Energy Resource Activities Act.
Old Growth Management Area (OGMA)	Designated areas established under Section 32 of the EPMR to manage and protected old forest and biodiversity.
Operational Measures	Operational measures are measures that are employed during the operational phases of an activity, which may be mandated via permit condition (i.e., timing and restoration requirements), to minimize potential adverse effects to specific environmental values.
Planning Measures	Planning measures are measures that the applicant incorporates into the planning phase to avoid and minimize potential adverse effects to specific environmental values including, but not limited to, activity placement, layout, and avoidance.
Practicable	Practicable means capable of being effective, done or put into practice. Feasible.
Prescriptions	Operating area specific implementation plans to address limiting factors and achieve end land use targets. This may include recontouring, invasive species management, soil placement, revegetation, drainage, and erosion control measures.
Qualified Professional (QP)	A Qualified Professional (QP) means an individual who:

	1. Is registered in British Columbia with a professional organization, is acting under that organization's code of ethics and is subject to disciplinary action by that organization; and; 2. Has suitable education, training, experience, accreditation, and knowledge, which may be relied on to provide advice within their area of expertise. The Professional Governance Act (PGA) currently governs the six regulatory bodies overseeing agrologists, applied biologists, applied science technologists and technicians, architects, engineers and geoscientists, and forest professionals. QPs under the act must be registered with their applicable organization under the PGA and act in accordance with their regulatory body's standards and practices.
Range Development	A range development is a structure, excavation, trail or cultivated area created for the purpose of rangeland or livestock management.
Rationale	A rationale is a brief explanation of the fundamental reasons, or logical basis, for a proposed course of action. A rationale is required when an applicant is unable to plan and/or operate the proposed activity in accordance with the POMs. A rationale must describe how the stated objectives will be achieved and why the POMs cannot be followed. Rationales must be prepared by a QP.
Reach	A reach is a relatively homogeneous section of a stream having a sequence of repeating structural characteristics (or processes) and fish habitat types. The key physical factors used to determine reaches in the field are channel pattern, channel confinement, gradient, and streambed and bank materials. Stream reaches generally show uniformity in those characteristics and in discharge.
Reclamation	Redistribution of soils and revegetation to return to pre-disturbance land capacity
Regionally Important Wildlife	Regionally important wildlife includes species considered important to a region of British Columbia, relies on habitat not otherwise protected under legislation, and may be adversely affected by industrial activity.
Remediation	Complete clean up of contaminated soil and groundwater.
Restoration	The overall process of returning an operating area to equivalent land capacity, including deactivation, decommissioning, remediation, and reclamation.
Shallow Open Water Wetland	A shallow open water wetland is intermittently or permanently flooded with open expanses of standing or moving water up to 2 metres deep. Open water with no emergent vegetation covers 75 per cent or more of the wetland surface.
Site Decommissioning	Removal and salvage/disposal of equipment.
Soil	Soil is the upper layer of earth in which plants grow. A black or dark brown material typically consisting of a mixture of organic remains, clay, and rock particles.
Species at Risk	Species at Risk are a Category of Species that represent those species that had been previously list as Species At Risk under the FRPA, and are designated as Species at Risk by Order under Section 29 (a) of the EPMR.

Stream (definition under EPMR)	Under the EPMR a stream means a watercourse, including a watercourse that is obscured by overhanging or bridging vegetation or soil mats, that contains water on perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and that (a) has continuous channel bed that is 100 metres or more in length, or (b) flows directly into a fish stream, a fish bearing lake or wetland, or a waterworks.
Stream (definition under WSA)	Under the WSA, a stream means (a) a natural watercourse, including a natural glacier course, or a natural body of water, whether or not the stream channel of the stream has been modified, or (b) a natural source of water supply, including, without limitation, a lake, pond, river, creek, spring, ravine, wetland or glacier, whether or not usually containing water, including ice, but does not include an aquifer.
Stream channel width	Stream channel width is the horizontal distance between the streambanks on opposite sides of the stream, measured at right angles to the general orientation of the banks. The point on each bank from which width is measured is the high-water mark.
Swamp	A swamp is a wetland that has mineral or occasionally peat soils with a water table at or near the surface. There is pronounced internal water movement from adjacent mineral areas, making the waters nutrient rich. If peat is present, it is mainly well-decomposed wood and occasionally sedges. The vegetation is typically dominated by coniferous or deciduous trees, dense shrubs, and herbaceous species.
Least Risk Timing Windows	Least risk timing windows are periods of time when energy resource activities can be conducted with reduced risk to fish, wildlife, and associated habitat. Least risk timing windows are specific to fish and wildlife species and the geographic area within which the work is conducted.
Ungulate	A hoofed mammal. Under EPMR, mule deer, black-tailed deer, white-tailed deer, elk, mountain goat, caribou, bighorn sheep, thinhorn sheep and moose are defined as ungulates in the Categories of Ungulate Species Order.
Ungulate Winter Range (UWR)	Habitat that is important for providing forage, security, and thermal protection for ungulate species during winter.
Wallow	An area of mud or shallow water where mammals go to welter, typically developing into a depression in the ground over continued usage.
Well Decommissioning	Permanently plugging and cutting/capping the wellbore.
Wildlife Habitat Area (WHA)	A Wildlife Habitat Area (WHA) is a habitat unit designated for the maintenance, enhancement, or restoration of identified wildlife, threatened, and endangered habitats, and those species identified as being species at risk.
Wildlife Tree Retention Area (WTRA)	Wildlife Tree Retention Area (WTRA) is a forest retention area associated with a silvicultural system where forest patches or individual trees are retained to provide habitat biodiversity scenic or other value.

Appendix B: Mitigation Plan

The Regulator requires a mitigation plan to be submitted with an energy resource activity application to ensure the applicant addresses adverse impacts to environmental values, when an application is:

- Located within 100 metres away from known waterworks, water supplies or water wells.
- Located within a groundwater recharge area or an identified aquifer.
- Located within a designated watershed under Section 35 of the EPMR and FRPA.
- Located within a UWR/WHA/FSW.
- Located in an area with identified High Priority Wildlife.
- Located in the Interim Moratorium Areas for the Central Group of Southern Mountain Caribou.
- Located in an Old Growth Management Area.
- Located in an area containing Karst.
- Located in a Wildlife Tree Retention Area
- Where a Cultural Heritage Resource has been identified.
- Located within the setback distance of a Wildlife Habitat Feature.
- Where triggered by Treaty 8 Mitigation Measures.

An activity that is determined, by a QP, to be for the improved health and safety, or is for regular maintenance of a site, and/or provides an overall benefit to the environment, does not require a mitigation plan. It is deemed that the potential impact of no action would be greater than the impact of the activity, and therefore would not have a material adverse effect.

This guideline is based in part on BC Ministry of Environment's Policy for Mitigating Impacts on Environmental Values, 2014. ERAA operates in a model of professional reliance, whereby the professional must present and uphold the appropriate mitigation. Mitigation plans must be completed by a Qualified Professional (QP), in accordance with the Professional Governance Act. Where the mitigation plan is being submitted as part of the requirements to satisfy a material adverse effect test, the Regulator expects a material adverse effect statement from the QP upholding the proposed mitigations. For an action or measure to be considered "mitigation," an applicant must sign the mitigation plan acknowledging that they accept responsibility for implementation of appropriate mitigation measures.

The Mitigation Hierarchy

A Pre-Construction Site Assessment is an important step in developing a mitigation plan. When a Pre-Construction Site Assessment has been completed, inclusion of the Operational Modification and Mitigation section in the report

will satisfy the Mitigation Plan requirement. It is preferred that in these cases the Pre-Construction Site Assessments are uploaded as a Mitigation Plan in the Application Management System.

When an application is located in the Agricultural Land Reserve and on Crown Land and the Schedule A assessment has been completed, the Mitigation Plan can be comprised of only the Operational Modifications and Mitigation section with reference to the Schedule A assessment.

In all other situations, the mitigation plan must be comprised of the following minimum information requirements:

1. **Project Overview:** A detailed description of energy resource activity planned for the site.

2. **Location Information:** Provide description of legal location of proposed development.

3. **Area Assessment:** To document current land use in the vicinity of the proposed development, depict development impacts, and provide planning and rationale for the proposed the development site.

   The area assessment consists of a 1:20,000 scale or larger recent air photo, satellite imagery base, or better, showing the surface land use and on which the following features are plotted:

   a) Government's Environmental Objectives" (GEOs) (refer to EPMR Part 2 Division 1 Governments Environmental Objectives).
   b) Surface water features and other significant terrain features that may limit development.
   c) Linear features, including roads and pipelines.
   d) Existing energy resource activities and ancillary activities.
   e) Location of the proposed activities

4. **Predevelopment Site Assessment:** To document predevelopment site information and identification of environmental values on, or in the immediate vicinity of the site. Site assessments should be completed in snow-free conditions to obtain reliable information regarding pre-construction conditions. The presence of snow can limit the ability for a meaningful assessment to take place, for example, snow may hamper an assessor's ability to confirm the presence/absence of species, habitat areas, natural drainage courses and stream characteristics, among others. When assessments must be completed in snow covered conditions, it is to be at the discretion of the QP, noted in the mitigation plan and rationale for the timing must be provided.

   The site assessment at a minimum must include:

   a. Site descriptions.

   b. Environmental Values:
      Identify the species, features, or values that may potentially be impacted by the proposed activity. Examples of values, in the context of proposed oil and gas and related activities, could include water works and water supply wells, Riparian Areas, Old Growth Management Areas (OGMAs), Ungulate Winter Ranges (UWRs), Wildlife Habitat Areas (WHAs), Fisheries Sensitive Watersheds (FSWs), etc.

c. Potential Impacts:

Identify the potential impacts on the environmental values associated with the proposed activities. Environmental objectives for environmental values identified in the EPMR can be found in EIMS and/or EPMG.

d. Landscape form and function:
BEC zone, slope, aspect, site stability, drainage patterns, course woody material presence.

e. Vegetation:
Community composition – overstory and understory, woody species density, noxious/invasive plants.

f. Wildlife and Human Use:
Based on signs from site – tracks, burrows, nests, camera traps, and based on information received in pre-engagement.

g. Waterbodies
Streams, wetlands, lakes (riparian classification).

h. Potential impacts to environmental values identified in site assessment.

i. An overview of site assessment methodology and any sampling procedures utilized to gather site information.

j. Figures, photos, and field logs as appropriate to support information listed above.

5. **Operational Modifications and Mitigations:** Provide planning and operational strategies that will be incorporated in the activity lifecycle to minimize any potential impacts to the identified values. Provide these operational modifications and mitigation commitments in the context of the Mitigation Hierarchy:

Avoidance: What measures that will be taken to avoid impacts to the identified values? Where avoidance is not practicable, the applicant must include an explanation as to why a potential impact is unavoidable.

Minimize: List planning and operational strategies that will be incorporated in the activity lifecycle to minimize any potential impacts to the identified values. How will these measures reduce risk and minimize potential impacts?

Mitigate: List specific measurable mitigation measures and actions that will be undertaken by the operator to reduce any potential adverse or residual impacts. These measures may include erosion control, least-risk timing windows, onsite QP and monitoring during construction, use of matting, use of minimal-disturbance

equipment, line-of-sight management, access control, retention of vegetation, re-establishment of security cover or habitat features. In addition, the plan should include post construction effectiveness monitoring.

Restore: List site specific commitments to expedite the restoration of the site

Please Note:

The Mitigation Plan must identify site specific and measurable commitments for the planning, construction and operational phase that are recommended to conserve and/or provide for efficient restoration and monitoring of the identified values.

Mitigation plan commitments **must** be provided in a clear and concise table format as below.

Table Appendix B1 Example Table of Site-Specific Measurable Commitments

Environmental Value(s)	Planned actions for Avoidance	Planned actions for minimizing	Planned actions for mitigation	Planned actions for Restoration	Planned Monitoring
Fisher WHA	Relocate activity outside of WHA	Utilize existing disturbance in these cases and why not others, Work within established timing windows for the WHA.	Leave the five trees identified by QP as suitable for denning	Place coarse woody debris ground cover in areas 1 and 4 to enable safe travel through site	Camera traps at denning sites to determine they are still in use after
Fish bearing stream	Relocate crossing. HDD crossing method will be utilized at crossings 6 & 8 to avoid surface disturbance to riparian values	Working with in designated timing window Minimizing row width at stream crossing	Sedimentation and erosion control measures And monitoring of those measures) (QP on site) No grubbing of workspaces near or in riparian areas	Restore disturbance back to predevelopment state. Begin restoration and reclamation asap following construction. Specific revegetation commitments	Monitoring at first freshet following construction of sedimentation and erosion. Revegetation monitoring of success at X

If the minimum information requirements have not been appropriately addressed within the mitigation plan, additional information will be requested, and the application will not be processed until the mitigation plan is completed to the satisfaction of the Regulator.

It is the responsibility of the applicant to review the MP with First Nations as part of the pre-engagement process.

It is the Regulator's SDM who determines whether the risks to the environmental values and associated components are acceptable.

Appendix C: Restoration and Reclamation

Legal Context for Restoration

Restoration is required:

- Upon completion of an energy resource activity as per Section 19 EPMR
- After construction of a pipeline as per Section 5 of the Pipeline Regulation
- Deactivation of an energy resource road as per Section 24 of the Energy Resource Road Regulation
- LNG facilities when operations cease, as per Section 21 of the Liquefied Natural Gas Facility Regulations.
- Interim restoration on non-operating areas of well sites under Section 28 of the Drilling and Production Regulation

In addition to meeting the requirements of the EPMR, permit holders must meet the decommissioning, abandonment and/or restoration requirements of the individual activity regulations, as well as any conditions in their permits, including:

- Contaminated Sites Regulation
- Drilling and Production Regulation
- Environmental Management Act
- Geophysical Exploration Regulation
- Pipeline Regulation
- Dormancy and Shutdown Regulation
- Energy Resource Road Regulation

The Ecological Suitable Species Guideline (ESSG) is a guideline for reclamation practitioners to consider when evaluating reclamation options to apply within a specific restoration area, supporting site preparation and revegetation techniques that support a minimum threshold of established ecologically suitable species. The guideline clarifies the Regulator's minimum expectations around achieving short term reclamation objectives (e.g., performance metrics) intended to relate to longer term ecological restoration outcomes.

The use of ecologically suitable species is a key element in promoting ecological function. The reclamation of all energy resource surface disturbance should comply with the intent of Section 19, which is to promote the re-establishment of vegetation communities ecologically relevant to the surrounding conditions, and to not hinder the benefits of natural revegetation processes. Considering that reclamation is made up of activities that combine to promote the transition of disturbed land to a productive and ecologically functioning state, it is recognized that the restored outcome may be less complex or structurally diverse than the pre-disturbance condition.

Successful revegetation of an energy resource disturbance is defined as the establishment of a suitably diverse plant community that can develop a self-sustaining successional trajectory that is ecologically appropriate to local operating area conditions. In the longer term, a successfully restored site would be able to support a climax vegetation community (a restoration outcome) that would be consistent with the range of ecosystem units expected in a given region.

Aligning ecological restoration objectives with cultural interests and promoting the conservation and protection of treaty rights is an important consideration. When these complementary restoration objectives are applied at large spatial scales, cumulative benefits may be realized with respect to wildlife populations, habitat connectivity, and cultural continuity in the context of the exercise treaty rights by Indigenous communities.

Restoration Requirements under EPMR 19

Restoration under Section 19 of requires:

- Stabilizing any cut and fill slopes, and re-contouring to re-establish pre-disturbance drainage patterns and minimize erosion potential.
- Restoring surface soil to similar, pre-disturbance productivity.
- Establishing a healthy, self-sustaining, and ecologically appropriate vegetative cover, preferably using native species locally found and adapted to site conditions to encourage supporting natural regeneration processes.

Important Considerations

- Effective soil salvage and retention is a critical factor enabling ecological restoration outcomes and expectations for site closure.
- Progressive reclamation and restoration are required on portions of operating areas that are no longer necessary for the energy resource activity, promoting the early re-establishment of soil function (e.g., nutrient cycling) and invasive species prevention.
- Additional site-specific restoration objectives should be considered in identified wildlife habitat. Consult the Regulator for additional guidance if planning restoration activities within wildlife habitat associated with HPW, species identified under legal EPMR Order, or habitat(s) associated with a Species at Risk.
- Activities located within the ALR must adhere to the restoration requirements, standards and timelines defined in the OGC-ALC Delegation Agreement. This includes the requirement for a Schedule A and a Schedule B.

Qualified Professionals

A QP, as defined in , and in the Reclamation and Remediation Manual, is required for the planning, implementation, and assessment of all energy resource restoration. The QP must have specific experience, knowledge and expertise related to energy resource reclamation and ecological restoration.

Please Note:

The Site Remediation and Reclamation Manual refers to such a specialist as a Qualified Reclamation Specialist (QRS).

The QP should complete an on-site evaluation of the site before prescribing the required restoration activities. If available, the QP should have access to the permit holder's pre-construction reclamation plan (or Schedule A on ALR land). A detailed final restoration plan should be developed by the QP, addressing any on-site limitations (soil moisture / nutrient regimes), adjacent site conditions, restoration objectives and the appropriate seed mix design. This plan is intended to inform reclamation success in the future and is anticipated to inform CoR Part 2 revegetation success metrics.

Important Reclamation Considerations

Soil Handling

Soil handling during reclamation, as during initial construction, should focus on re-establishing long-term slope stability, soil productivity and natural drainage patterns, while minimizing erosion. Consideration of erosion and compaction during reclamation operations is required to ensure stable and productive soils. Do not work in wet conditions and minimize heavy equipment use. Keep topsoil separate from underlying soil layers to improve reclamation.

Where no topsoil has been salvaged then supplemental soil material can be added. A substitute soil may be created from a mixture of subsoil material and available organic material (for example, straw, roots, duff material), to create suitable topsoil conditions for re-vegetation. Replacement soil should be tested for pH, salinity, sodicity, consistency, $CaCO_3$, and nutrients (nitrogen, potassium, phosphorus) to determine whether soil limitations require mitigation.

Site Preparation

Site preparation is an important factor in determining the success of re-vegetation projects. Inadequate site preparation or identification of site risks and limiting factors is a common reason for re-vegetation failure. The following measures will help to enhance any re-vegetation project:

- Topsoil and subsoil should be conserved and replaced.

- Reduce any compaction that could inhibit root growth prior to seedbed preparation.
- Control persistent weeds/problem plants.
- Where needed, use equipment that produces ridges, hollows, and mounds to create microsites to enhance diversity and support plant survival.
- Soil moisture and nutrient regimes are influencing factors that determine appropriate species mix designs and ecological restoration success.

Species Mix Considerations

Seed mix diversity should consider forbs, shrubs, and tree species to promote the long-term development of ecological conditions equivalent to the immediate surroundings. The focus of a revegetation plan should be on common local trees, shrubs, and forbs. Burton & Burton (2003) recommend that a seed mix should include:

- Approximately five to ten species
- A mixture of species with various mature heights and growth habits
- A mixture of establishment rates for early erosion control and longer-term diversity
- Consideration of a nitrogen fixing species to improve soil quality (e.g., alder, fireweed)
- Consideration of palatability to wildlife
- Up to 20% short-lived, non-persistent, annual agronomic species, where applicable, to manage for erosion or invasive species.

The restoration plan should consider both the soil moisture and soil nutrient regime of the site when selecting suitable vegetation. In particular, the regional edatopic grid, in combination with the site-series vegetation table, should be considered to select appropriate species for each site's physiography and soil character. For additional information, please refer to the Biogeoclimatic Ecosystem Classification Program website where mapping and assessment methodology is found.

The Government of BC has developed a series of tools to guide tree seed sourcing, collection, and deployment on Crown lands. Resources include seed planning references, maps of seed planning zones, maps of seed planning units, species plans, and sowing guidelines. Although these practices are specific to tree seeds and Crown lands, the best practices outlined in these resources should be considered for private land as well. See https://www2.gov.bc.ca/gov/content/industry/forestry/managing-our-forest-resources/tree-seed/seed-planning-use).

Commercially sourced seed mixtures must have a “certificate of seed analysis” that confirms no invasive plant species are present as outlined under the Canada Seeds Act. If tree seed with commercial forest value is to be collected or deployed on Crown Land, the seed must meet the requirements of the and the Chief Forester’s Standards for Seed Use (FLNRO 2005).

The Native Plant Society of BC (NPSBC) website provides a list of native plant nurseries and seed suppliers in BC that may be a source for required native plant seeds https://npsbc.files.wordpress.com/2017/12/nativeplantnurseriesandseedsuppliersinbc.pdf.

Monitoring and Final Restoration Assessment

The length of time necessary to monitor and successful meet restoration requirements is dependent of multiple biogeoclimatic factors and site limitations that can be determined prior to implementing a reclamation plan, in addition to factors that are difficult to foresee (e.g. prolonged drought, heavy browsing pressure, etc.).

The site should be assessed at the end of the establishment period to determine whether specific issues that may limit reclamation success and site closure require interim mitigation. In many cases it will take several growing seasons to achieve the desired plant community.

Within the ALR, when sites are no longer required for energy resource activities, then a Schedule B Assessment is required before a CoR can be issued. Refer to the OGC ALC Delegation Agreement for more information.

Please refer to the Regulator's restoration website for additional information regarding restoration and reclamation requirements.

Appendix D: Relevant Legislation and Regulatory Requirements

This guideline is limited in scope to the Regulator's application processes and the authorities and requirements established within ERAA or specified enactments established thereunder. Carrying out energy resource and related activities may require additional approvals from other regulators or create obligations under other statutes. It is the permit holder's responsibility to know and uphold all their legal obligations.

List of Relevant Legislation and Regulations

BC Legislation and Regulations:

Agricultural Land Commission Act
Dam Safety Regulation
Dormancy and Shutdown Regulation
Drilling and Production Regulation
Emergency Management Regulation
Environmental Assessment Act
Environmental Management Act
Environmental Protection and Management Regulation
Forest Act
Forest Planning and Practices Regulation
Forests & Range Practices Act
Geophysical Exploration Regulation
Geothermal Operations Regulation
Geothermal Resources Act
Geothermal Geophysical Exploration Regulation
Geothermal Resources General Regulation
Groundwater Protection Regulation
Heritage Conservation Act
Integrated Pest Management Act
Integrated Pest Management Regulation
Land Act
Liquefied Natural Gas Facility Regulation
Mines Act

Muskwa-Kechika Management Area Act
Energy Resource Activities Act
Energy Resource Road Regulation
Oil and Gas Waste Regulation
Petroleum and Natural Gas Act
Petroleum and Natural Gas General Regulation
Pipeline Crossings Regulation
Pipeline Regulation
Professional Governance Act
Riparian Areas Protection Act
Riparian Areas Protection Regulation
Surface Lease Regulation
Wildlife Act
Water Sustainability Act
Water Sustainability Regulation
Weed Control Act
Weed Control Regulation

Federal Legislation and Regulations:

Canadian Environmental Protection Act

Canadian Navigable Waters Act

Migratory Birds Convention Actthttps://laws-lois.justice.gc.ca/eng/acts/m-7.01/

Migratory Birds Regulations

Species at Risk Act

Fisheries Act

Appendix E: References and Information

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Appendix F: Designated Noxious Weeds

Invasive Species

COMMON NAME	SCIENTIFIC NAME
Invasive Species	
Annual Bluegrass	*Poa annua*
Annual Sow Thistle	*Sonchus oleraceus*
Baby's Breath	*Gypsophila paniculata*
Big Headed Knapweed	*Centaurea macrocephala*
Blueweed	*Echium vulgare*
Bohemian Knotweed	*Fallopia x bohemica*
Brown Knapweed	*Centaurea jacea*
Bur Chervil	*Anthriscus caucalis*
Burdock	*Arctium spp.*
Canada Thistle	*Cirsium arvense*
Cheat Grass	*Bromus tectorum*
Chicory	*Cichorium intybus*
Comfrey	*Symphytum spp.*
Common Crupina	*Crupina vulgaris*
Common Reed	*Phragmites australis subspecies australis*
Common Tansy	*Tanacetum vulgare*
Common Toadflax	*Linaria vulgaris*
Creeping Bell Flower	*Campunaula rapunculiodes*
Cypress Spurge	*Euphorbia cyparissias*
Dalmatian Toadflax	*Linaria dalmatica*
Dame's Rocket	*Hesperis matronalis*
Dense-flowered Cordgrass	*Spartina densiflora*
Diffuse Knapweed	*Centaurea diffusa*
Dodder	*Cuscuta spp.*
English Cordgrass	*Spartina anglica*
Field Scabious/Blue Button	*Knautia arvensis*
Flowering Rush	*Butomus umbellatus*
Garlic Mustard	*Alliaria petiolata*
Giant Hogweed	*Heracleum mantegazzianum*
Giant Knotweed	*Fallopia sachalinensis*
Giant Mannagrass/Reed Sweetgrass	*Glyceria maxima*
Goat's-beard or Salsifly	*Tragopogon spp*

Gorse	*Ulex europaeus*
Green Foxtail	*Setaria viridis*
Himalayan Balsam	*Impatiens glandulifera*
Himalayan Knotweed	*Polygonum polystachyum*
Hoary Alyssum	*Bereroa incana*
Hoary Cress	*Cardaria draba*
Hound's-tongue	*Cynoglossum officinale*
Invasive Knotweeds	*Fallopia spp.*
Invasive Yellow Hawkweeds	*Pilosella spp.*
Japanese Knotweed	*Fallopia japonica*
Jointed Goatgrass	*Aegilops cylindrical*
Knotweed Species	*Fallopia spp*
Kochia	*Kochia scoparia*
Leafy Spurge	*Euphorbia esula*
Marsh Plume Thistle	*Cirsium palustre*
Meadow Goat's-beard	*Tragopogon pratensis*
Milk Thistle	*Silybum marianum*
Mountain Bluet	*Centaurea montana*
Mustard, Dog	*Eruscasfrum gallicum*
Night-flowering Catchfly	*Silene noctiflora*
Nodding Thistle	*Carduss nutans*
North Africa Grass	*Ventenata dubia*
Orange Hawkweed	*Hieracium aurantiacum*
Oxeye Daisy	*Chrysanthemum leucanthemum*
Perennial Pepperweed	*Lepidium latifolium L.*
Perennial Sow Thistle	*Sonchus arvensis*
Plumeless Thistle	*Carduus acanthoides*
Purple Loosestrife	*Lythrum spp.*
Purple Nutsedge	*Cyperus rotundus*
Rush Skeletonweed	*Chondrilla juncea*
Russian Thistle	*Salsola kali*
Saltmeadow Cordgrass	*Spartina patens*
Scentless Chamomile	*Matricaria maritima*
Scotch Broom	*Cytisus scoparius*
Shasta Daisy	*Leucanthenum x superbum*
Smooth Cordgrass	*Spartina alterniflora*
Sow Thistles	*Sonchus spp.*
Spotted Knapweed	*Centaurea maculosa*
Spurge	*Euphorbia spp.*
St. John's Wort	*Hypericum perforatum*
Stinking Mayweed	*Anthemis cotula*

Sulphur Cinquefoil	*Potentilla recta*
Tall (meadow) Buttercup	*Ranunculus acris*
Tansy Ragwort	*Senecio jacobeae*
Tartary Buckwheat	*Fagopyrum tataricum*
Velvetleaf	*Abutilon theophrasti*
White Cockle	*Lychnis alba*
Wild Caraway	*Carum carvi*
Wild Mustard	*Sinapsis arvensis*
Wild Oats	*Avena fatua*
Wild Parsnip	*Pastinaca sativa*
Wormwood or Absinthium	*Artemisia absinthium*
Yellow Clematis	*Clematis tangutica*
Yellow Flag Iris	*Iris pseudacorus*
Yellow Hawkweed	*Heiracium pratense*
Yellow Nutsedge	*Cyperus esculentus*
Yellow Starthistle	*Centaurea solstitialis*