Clean Energy Project Development Plan Information Requirements (DPIR)

BRITISH COLUMBIA

Ministry of
Water, Land and
Resource Stewardship

November 2011

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Disclaimer

This document provides information and advice for those involved in the coordinated review of authorizations for clean energy projects. Although references are made to legal requirements, the content of this guide should not be interpreted as legal instructions or legal advice. Users of this guide should refer directly to official copies of the legislation to determine legal requirements and seek qualified legal counsel when case-specific interpretations are needed.

Document Change Control

Version	Date	Notes
V1	November 2011	Document created
V2	July 2016	Administrative update
V2.1	March 2024	Administrative updates to links and outdated information.

INTRODUCTION TO THE DEVELOPMENT PLAN INFORMATION REQUIREMENTS

Using the Development Plan Information Requirements

The intent of the Development Plan Information Requirements (DPIR) is to provide a provincially consistent suite of information requirements to support provincial decision-making on authorizations for clean energy projects. It is also intended to encourage consistent use of terms, language, wording, and format for all clean energy project Development Plans.

Proponents will use the generic information requirements to build a project-specific Development Plan (DP). A draft version of the Development Plan (the draft DP) will be submitted to the Regional Clean Energy Project Team (RCEPT) for review and refinement. Once RCEPT is satisfied that all information required for the project is captured in the draft DP, the project Lead will inform the proponent that the draft DP has been endorsed by RCEPT. The proponent will then commence the work needed to complete the final DP. The DP is intended to address all provincial information requirements needed to assess the project and make decisions in accordance with provincial statutes, regulations, and policies.

Detailed advice on how to use the DPIR and develop a project-specific DP can be found in the Clean Energy Production in BC Inter-Agency Guidebook for Project Development. Prior to initiating work on a draft DP it is strongly recommended that proponents arrange a meeting with the appropriate provincial staff person to discuss the project.

Links, References, and Other Jurisdictions

Throughout this document, links are provided to information that proponents and their qualified professionals will need when preparing a DP. A list of relevant references, guidelines, and procedures can also be found in Attachment 2.

This document is focused on providing the proponent with information necessary to obtain provincial authorizations required for clean energy projects occurring on Crown land. Where there is known guidance or information on project requirements from other jurisdictions (i.e. federal government), these links are provided for convenience. There is also information provided pertinent to projects occurring on private land. The information from other jurisdictions is current at the time of the last update to the document (March 2024), but proponents are advised to contact other levels of government directly to discuss the project and the specific requirements that may apply.

There are both appendices and attachments found at the end of this document. The **appendices** are intended to be completed by the proponent and submitted as part of the DP. The **attachments** are intended as information and guidance only and are not expected to be included in the final DP submission.

Additional Considerations

The purpose of the DP is to provide project-specific information to support provincial decision-making. When building the DP, it may be is useful to consider the types of questions that will be asked by statutory decision makers during project review. Decision makers are generally interested in information that will allow them to determine the following[1]:

1. What encumbrances exist within the area under application? Have the encumbrances been addressed? Are land agreements in place with all private and federal landowners?
2. Has consultation with First Nations been adequate? Have the interests of all affected First Nations been identified and accommodated appropriately?
3. Is the area of land being applied for reasonable for the proposed works? Has justification/rationale been provided for the size of the application area?
4. Is the volume of water that has been applied for reasonable for the proposed works/water source/project area?
5. Have environmental, social, and economic values been addressed through the referral to agencies, consultation with First Nations, and public advertising/staking?
6. After reviewing staff recommendations in the supporting project reports, have the issues raised been mitigated and/or addressed? If not, is the rationale reasonable?
7. Is the proposal consistent with existing provincial government direction, legislation, regulations, and policies?

[1] This list is not exhaustive and is intended only to provide a general sense of what types of questions may arise during the decision-making process.

CONTENTS

Note: This Table of Contents for the DPIR also provides the core structure for organizing information in the Development Plan and should be followed as much as possible. Deviations, other than additional subheadings, should be discussed with the Project Lead.

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LETTER OF TRANSMITTAL

Proponents will include a cover letter with their DP that briefly outlines the project proposal and **provides a list of the provincial authorizations being requested** as part of the application process. The letter must include contact information for the proponent and reference any pertinent project specific components of the development such as plans to connect with other clean energy projects, known BC Hydro transmission line upgrades, etc.

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DEVELOPMENT PLAN INDEX

This index will be used by proponents to identify what information is provided in the DP and to provide rationale for any information not included. Where a project triggers a formal review by the provincial or federal Environmental Assessment (EA) agencies, proponents will provide a cross reference to the information provided in the EA application documents.

Proponents must use the items listed in this index in their DP. Doing so will give agency staff confidence that the project proponent and their qualified professionals will review and address all the key issues that provincial staff anticipate with the project. Using the Provided (Y/N/P) column, proponents can indicate which information requirements will be included in their DP by specifying yes (Y), no (N) or partially provided (P). If the proponent selects partially provided or no, they must indicate the rationale for excluding the information in the Comments column. If the project is also undergoing an assessment through the BC Environmental Assessment Office list the equivalent section in the EA application in the EA Reference column.

It is recommended that the proponent use the table provided below to develop their draft DP.

Section	Information Requirement	Provided (Y/N/P)	Comment	EA Reference
1	**PROJECT SUMMARY**			
1.1	Project Proponent			
1.2	Overview of Proposed Project			
1.3	Summary of Non-Provincial Agency Authorizations/ Approvals			
1.4	Summary of Provincial Authorizations			
2	**PROJECT DESCRIPTION**			
2.1	Project Planning and Design Approach			
2.1.1	Project Background and Rationale			
2.1.2	Location of Project and Mapping			
2.1.3	Project Facilities			
2.1.4	Labour Pool Requirements			
2.2	Environmental Setting			
2.3	Energy Production and Market for the Product			
2.4	Description of Land Requirements			

Section	Information Requirement	Provided (Y/N/P)	Comment	EA Reference
2.5	Project Activities			
2.5.1	Construction and Commissioning			
2.5.2	Operations and Maintenance			
2.5.3	Future Project Phases			
2.5.4	Decommissioning Activities			
2.6	Schedule for Development			
3	**SCOPE OF THE ASSESSMENT**			
3.1	Scope of Issues & Valued Components			
3.1.1	Spatial Boundaries			
3.1.2	Temporal Boundaries			
3.1.3	Baseline Conditions			
3.2	Environmental Assessment methodology			
4	**ENVIRONMENTAL ASSESSMENT**			
4.1	Aquatic Environment			
4.1.1	Aquatic Habitat			
4.1.2	Aquatic Fauna			
4.1.2.1	Fish and Fish Habitat			
4.1.2.2	Other Aquatic Species			
4.1.3	Aquatic Vegetation			
4.1.4	Water quality			
4.2	Atmospheric Environment			
4.3	Geophysical Environment			
4.3.1	Surface Hydrology and Hydrogeology			
4.3.2	Geotechnical / slope stability			
4.3.3	Geomorphology			
4.3.4	Geology and Geochemistry			
4.4	Terrestrial Environment			
4.4.1	Wildlife and Wildlife Habitat			
4.4.2	Rare Plants, Plant communities and Ecosystems at			

Section	Information Requirement	Provided (Y/N/P)	Comment	EA Reference
	Risk			
4.4.3	Forest and Range Considerations			
4.4.3.1	Forest Health			
4.4.3.2	Invasive Plants			
4.4.3.3	Forest Resource Features			
4.4.3.4	Range and Forage			
4.5	Summary of Environmental Effects, Mitigation, and Significance			
5	**SOCIO-ECONOMIC ASSESSMENT**			
5.1	Regional Economy			
5.2	Resource Objectives, Land Use Plans or Other Designations			
5.3	Implications for Adjacent or Overlapping Crown land and Resource Values			
5.3.1	Wildfire Protection			
5.4	Navigation, Transportation, and Access			
5.4.1	Roads, Bridges and Railroad			
5.4.2	Flight Path			
5.4.3	Public Access			
5.5	Water Rights			
5.6	Human Health and Safety			
5.7	Summary of Socio-economic Effects, Mitigation, and Significance			
6	**PROJECT ENGAGEMENT ACTIVITIES**			
6.1	Record of Engagement Activities			
7	**FIRST NATION INFORMATION REQUIREMENTS**			
7.1	Consultation Obligations of the Province			
7.2	Identification of First Nations			
7.3	Project Setting – Traditional Use and Aboriginal Rights/Title Issues in the Project Area			
7.4	Project Setting - Archaeological Resources			

Section	Information Requirement	Provided (Y/N/P)	Comment	EA Reference
7.5	Consultation with First Nations			
7.6	Potential Project Effects on First Nation Interests			
7.7	Commitments to First Nations			
8	**MONITORING PROGRAMS**			
8.1	Construction Environmental Monitoring			
8.2	Operational Environmental Monitoring			
9	FEDERAL REQUIREMENTS			
10	SUMMARY OF COMMITMENTS AND CONCLUSIONS			
10.1	Summary of Project Commitments			
10.2	Concluding Remarks			
	APPENDICES			
1	Private/Federal Land Requirements			
2	Additional Considerations for Crown Land Resources			
3	Matrix of Project Activities and VCs			
4	Residual Impact Assessment Table Template			
5	Region-Specific Requirements			

PROFESSIONAL CERTIFICATION

Every qualified professional (QP) contributing to the DP must be listed in the Professional Certification table. Each QP is to provide a signed statement specifying the section(s) of the DP for which they are responsible and confirming that the required information has been provided and is true and complete based on their professional knowledge.

QPs involved in the environmental assessment of clean energy projects must belong to a recognized professional association/college (e.g. Forest Professionals BC, Engineers and Geoscientists BC, etc.) and be governed by their association/college with a code of ethics. These codes of ethics provide guiding principles and detailed interpretations of these principles, explaining how and why QPs must conduct themselves with competence, independence, and integrity.

Please note that all assessments are to be completed and supported by an appropriate QP. Assessment information is to be collected using consistent, repeatable sampling methods following provincial standards or referenced guidelines. This will ensure that assessment information is suitable for use as baseline data in monitoring programs and project reviews or audits.

Qualified Professional				**Section(s) of Development Plan Responsible for: Title(s)/ Page number(s)**
Name	**Accreditation and Professional Association #**	**Area of Expertise**	**Signature**	

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EXECUTIVE SUMMARY

In the Executive Summary, the proponent must provide:

1. A concise statement outlining the **purpose** of the DP, including a summary of the project's purpose (e.g. expected MW), key components as outlined in the "Project Description" and proposed total footprint (in hectares).
2. A concise description of **engagement/consultations** with First Nations, the public, stakeholders, and government agencies including a summary table of the issues raised, solutions suggested or actioned, issues outstanding, and of information distribution activities, including public meetings or open houses.
3. A general overview of **key impact issues** and proposed impact management measures or future studies and/or monitoring that will address mitigation and residual impacts.
4. **Maps** showing both regional context (1:20,000 scale) and site-specific setting (1:5,000 scale).
5. Estimated total **direct labour force** in person years (PY[2]) required during construction and operation, and deconstruction where applicable.
6. Estimated **capital cost** of the project.
7. Estimated **project benefits** (social, environmental, and economic).
8. The QPs' **conclusions** from the environmental and socio-economic assessments.

Table 1: Summary of Agency Issues

Agency	Authorization/ Approval requested	Status	Comments	Contact
Example: Fisheries and Oceans Canada	*Authorization for HADD/ Operational Statements*	*Submitted Oct-02-2011*	*Operational Statements will be followed, Authorization not required*	*Joe Smith, DFO Smithers. Phone/ Email*

Table 2: Summary of Issues Raised During Public/Stakeholder Engagement

Group consulted and contact names (e.g. Mr. Joe Smith, Municipality, stakeholder group	**Dates of meetings, calls, correspondence**	**Summary of issue raised and proposed solutions**	**Mitigative measures adopted/ rationale for not adopting**	**Proponent Comments**

[2] Note: one PY equals a single person employed full time for one year (40 hours per week x 52 weeks = 2080 hours)

Table 3: Summary of Issues Raised During First Nations Engagement/Consultation

First Nation consulted and contact names	Dates of meetings, calls, correspondence	Summary of issue raised and proposed solutions	Mitigative measures adopted/ rationale for not adopting	Proponent Comments
e.g. Mr. Joe Smith, ABC First Nation				

ABBREVIATIONS

Abbreviation/ Acronym	Explanation
7Q10	Seven-day, consecutive low flow with a ten-year return frequency
AIR	Application Information Requirements (EAO)
BACI	Before-After-Control-Impact
BEC	Biogeoclimatic Ecosystem Classification
BMP	Best Management Practice
CABIN	Canadian Aquatic Biomonitoring Network
CDC	Conservation Data Centre
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Agency
CEMP	Construction Environmental Management Plan
CEP	Clean Energy Project
CMS	Cubic Meters per second
COSEWIC	Committee on Status of Endangered Wildlife in Canada
CP	Cut Permit
CWS	Canadian Wildlife Service
DFO	Department of Fisheries and Oceans
DPIR	Development Plan Information Requirements
EAO	Environmental Assessment Office
ENV	Ministry of Environment
ESD	Environmental Stewardship Division
FNID	First Nation Initiatives Division
FOR	Ministry of Forests
FRPA	Forests and Range Practices Act
FSP	Forest Stewardship Plan
GAR	Government Actions Regulation
HADD	Harmful alteration, disruption and destruction of fish habitat

Abbreviation/ Acronym	Explanation
IWMS	Identified Wildlife Management Strategy
MAD	Mean annual discharge
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML/ADR	Metal Leaching/ Acid Rock Drainage
MOTI	Ministry of Transportation and Infrastructure
MW	Megawatt
MMD	Mean monthly discharge
OEMP	Operational Environmental Monitoring Plan
OGMA	Old Growth Management Areas
PCL	Permit to Occupy Crown Land
PEM	Predictive Ecosystem Mapping
QP	Qualified Professional
RoW	Right of Way
RISC	Resource Information Standards Committee
RSA	Regional Study Area
RSF	Resource Selection Functions
SAR	Species at Risk
SARA	Species at Risk Act
TDS	Total dissolved solids
TFL	Tree Farm License
UWRs	Ungulate Winter Ranges
VC	Valued Component
VEC	Valued Ecosystem Component
WHA	Wildlife Habitat Area
WIDM	Water Inventory Data Management System
WLRS	Ministry of Water, Land and Resource Stewardship
WSC	Water Survey Canada
WTRA	Wildlife Tree Retention Area

LIST OF TABLES

Proponents will provide a List of Tables in the order that they appear in the DP. All tables will be numbered and titled throughout the DP.

LIST OF FIGURES / DIAGRAMS

Proponents will provide a List of Figures/Diagrams as they appear in the DP. All figures and diagrams be numbered and titled throughout the DP.

LIST OF STUDIES AND CONSULTANT REPORTS

Proponents will provide a list of all studies and consultant reports prepared for the DP and include contacts for the QP responsible for the studies and reports. Please note: where the complete report is not included as part of the DP, the proponent may be asked to provide complete reports during the review of the proposal. Information submitted in support of an application will become part of the public record. See also the requirement for QPs to complete and sign the Professional Certification table.

LIST OF MAPS

Proponents will provide a list of all maps in the order that they appear in the DP with reference to the title, page number and section where the maps are located. Each map must have a title that indicates the theme and measurements in metric (e.g. meters, hectares, and kilometers). Maps must contain a north arrow and longitude and latitude references. Where available, please provide shape files.

At a minimum, the following maps must be included as part of the DP and attached as an Appendix. If the suggested scale of map listed is not appropriate, discuss site specific requirements with your project Lead.

1. **Overview** Maps (showing both regional context (recommend 1:20,000 scale) and site-specific setting – (1:5,000 scale).
    a) stream name (gazetted and/or local) and FISS watershed code (1:20k)
    b) drainage area & stream order (1:20,000) at intake and powerhouse
    c) general description of surface materials and topography
    d) hypsometry and elevation(s) at proposed point(s) of diversion
    e) glacial and lake coverage
    f) TRIM and NTS map number(s) for project location
    g) forest cover type(s)
    h) proposed project footprint at appropriate scale for relevant detail

2. **Infrastructure/ Built Environment** map(s) at a scale of 1:20,000 on a TRIM base that shows the project location within a regional context, including closest communities, existing infrastructure such as roads, rail, bridges, transmission lines, etc.
3. **Environmental Features** map(s) at a scale of 1:20,000 on a TRIM base that shows designated parks, conservancies, heritage conservation sites, areas designated pursuant to the Forest and Range Practices Act /Government Action Regulations (e.g. Ungulate Winter Range (UWR), Wildlife Habitat Areas (WHA), OGMAs, etc.); watercourses (rivers, coastline, lakes, etc.) and topographical features.
4. **Geomorphology** map at a scale of 1:20,000 detailing the soils, geotechnical elements (stability, erosion, etc.) and natural hazards (seismology, flood, avalanche, land slide, etc.).
5. **Municipal/Regional Government** map at a scale of 1:20,000 showing the Official Community Plan Designations, Development Permit Area Designations, Recreational Features, zoning bylaw designations, building inspection, water and sewer services, floodplain, fire protection areas, socio-cultural features (most local governments have copies of their Official Community Plans on their website).
6. **Wildlife/Ecosystems** map(s) (at appropriate scales) of known information (known occurrences, current and future range, habitat suitability) within the project area for:
    a) Provincial red and blue listed animals
    b) Provincial red and blue listed plants, plant communities and ecosystems
    c) Species listed by the Committee on Status of Endangered Wildlife in Canada (COSEWIC) and federal Species at Risk Act (SARA)
    d) Regionally significant/other VC species (i.e. mammals, amphibians, reptiles, birds, bats, insects, migratory birds)
    e) Known information of locations and habitat distribution (e.g. from CDC)
    f) Fish, wildlife and plant species identified as being of cultural importance to First Nations
7. **Transportation** map (at an appropriate scale) illustrating the known transportation and travel axis in the study area (e.g. commercial shipping routes, winter roads, recreational boating/ kayak routes).
8. **Regional Watershed** map (1: 250,000) showing:
    g) Location of project watershed and distance from nearest community
    h) All streams and tributaries (specify any fisheries-sensitive watersheds or temperature-sensitive streams
    i) Watershed boundaries to 3rd order
9. Any additional maps as necessary to evaluate the project.

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1. PROJECT SUMMARY

The summary provides contextual background information on the project and the proponent.

1.1 Project Proponent

The proponent must identify the proponent's background, including history, description and contact information (i.e. name, address, phone, fax, email). Also provide the name and contact information for the firm(s)/individual(s) managing the project, including the registered B.C. Company name(s) and number(s).

1.2 Overview of Proposed Project

Include the following in the Project Overview using maps, diagrams, schematics, and figures as applicable (in metric measurements):

1. The formal project name (to be used by all agencies).
2. The legal description of the area under application, including a legal description and status of land appurtenant to the powerhouse, and any private or federal land affected by the works.[3]
3. A concise statement outlining the purpose of the DP, including a summary of the project's purpose and rationale, key components and proposed total footprint (in hectares) including the proposed length of transmission lines.
4. For waterpower projects, provide the maximum proposed quantity of water to be diverted, in cubic meters per second (cms) and amount of energy production in megawatts (MW) required for the project.
5. For wind energy projects, please indicate the anticipated energy production in MW.
6. A statement as to whether the project will be submitted to the Provincial Environmental Assessment Office (EAO) or Impact Assessment Agency of Canada for review.
7. Overview Maps, Infrastructure/ Built Environment, Environmental Features, Geomorphology maps (see List of Maps for more detail).
8. A summary of the prevailing climate conditions.
9. A general description of the activities associated with the development including construction, clearing, alteration of land, upgrading of existing infrastructure. Include the BEC zone and associated habitat information for the area impacted.
10. An estimate of capital construction costs.
11. An estimated time frame for each phase of development.
12. Engineered drawings as appropriate.
13. An assessment of the direct employment in person years (PY) that the project will create during

[3] For instructions on legal descriptions for unsurveyed Crown land, see Attachment 1.

construction, operation, and decommissioning, where applicable. Include key job categories and salary ranges for each phase.

14. A list of other developments in the regional study area (RSA) (e.g. existing transmission lines).

1.3 Summary of Non-Provincial Agency Authorizations/Approvals

Discuss and summarize applicable approvals, authorizations, or best management practices from other jurisdictions (e.g. local and federal governments) that are associated with the construction and/or operation of the project.

Table 4: Summary of Non-Provincial Agency Authorizations/ Approvals

Agency	Authorization/ Approval	Status	Comments	Contact
Example 1: Fisheries and Oceans Canada	*Authorization for HADD/ Operational Statements*	*Submitted Oct-02-2011*	*Operational Statements will be followed, Authorization not required*	*Joe Smith, DFO Smithers* *Phone/ Email*
Example 2: Regional District of Skeena Queen Charlotte	*Zoning Bylaw Amendment*	*Submitted Oct – 4-2011*	*Zoning bylaw has received 3rd Reading; adoption pending*	*Jean Smith, Planner, RDSQC* *Phone/ Email*

1.4 Summary of Provincial Authorizations

For assistance determining what provincial permits are required and additional guidance on completing the application package(s) for these, please see Appendix 1 and consult the project Lead.

Discuss provincial authorizations that will need to be considered for the project.

Table 5: Summary of Provincial Authorizations

Authorization Required	Statute/ Regulation	Status	Prerequisites	Development Plan reference (section and page)

2. PROJECT DESCRIPTION

This section describes the project facilities and associated activities for all stages of project development, including construction, operation/maintenance, and decommissioning/reclamation. The description must be in sufficient detail to allow a meaningful assessment of potential project effects. If an up-to-date and current Project Description has been developed previously it may be used to form the content for this section. Please refer to the Project Description i.e.: “The (NAME) Project Description dated (XX/XXXX) forms part of this Development Plan”.

All key project components and activities must be identified and clearly explained.

2.1 Project Planning and Design Approach

This section should include information on the project planning and design approach.

Include maps, photographs, site plans, and engineered drawings at appropriate scales that indicate the layout of project components and activities. Drawings should contain sufficient detail to allow for meaningful review of the project. It is recognized that comprehensive design information may not available at the DP stage, and in such cases, the feasibility of the design approaches (using established precedents, constructed projects, etc.) is important to include to provide agency reviewers and the public with an understanding of the overall project, and highlight the role of professional reliance in the detailed design, construction, and operation of the project following the approval of the DP.

2.1.1 Project Background and Rationale

Describe the background and rationale for the project, including:

1. Project history, including a summary table of all project decisions issued to date.
2. Rationale for the project and project location, and description of the project’s objectives.
3. Description of any sustainability principles which have guided project planning (e.g. LEED design principles, energy efficient technologies, relevant information, and criteria from higher level plans, etc.).

2.1.2 Location of Project and Mapping

Drawings should contain sufficient detail to allow for meaningful review of the project. The following information should be provided for the project location:

1. Longitude and latitude of the proposed project footprint. If it is a linear area, two or more sets of coordinates should be provided.
2. For waterpower projects, provide the coordinates for the point(s) of diversion (e.g. intake and powerhouse).

3. Legal description of project area.[4]
4. For wind power projects, provide locations and coordinates for all components of the proposed wind farm (which would include, but is not limited to; WTG, location of met towers, location of electrical components and substations, location of transmission lines, interconnection points and switch houses).

Maps required for this section are outlined below. Detailed requirements for each map are listed in the List of Maps.

1. A watershed overview map[5]
2. Topographic maps (on 1:20,000 TRIM base)
3. A map showing the primary project facilities in relation to existing infrastructure and features including existing transportation components (e.g. airports, ports, railways, roads, electrical power transmission lines, pipelines, national historic sites, nearby communities, fishery and fishing areas, important archaeological sites, residential areas etc.)
4. A description and map of other industrial activities in the watershed, past and present (e.g. forestry, landfills or contaminated sites, mining and other hydroelectric power generation facilities, including their relationship(s) to the proposed project facilities and shared infrastructure, roads, transmission lines etc.). Also include, as appropriate, any restoration activities that have taken place (road deactivation, riparian restoration, stream rehabilitation, reforestation, etc.).
5. Location map of any camps required for work crews. Permits from Local Health Authorities may be required depending on camp size and duration of use – see Appendix 1 for more information on camp requirements.
6. A description and map of proposed quarry sites, if applicable.
7. For wind power projects, provide a wind map and applicable geographical information such as slope/aspect.

2.1.3 Project Facilities

The objective of this section is to describe the project components and associated on-site and off-site infrastructure and other facilities required for project construction, operation, and maintenance. The proposed infrastructure should be presented on a 1:20,000 TRIM map and be properly geo-referenced.

Provide a detailed explanation (including diagrams, schematics, maps, and figures where appropriate) of all works required for the project, including (but not limited to) the following:

[4] For instructions on how to describe un-surveyed Crown land see Attachment 1
[5] See preliminary project description in Hatfield et al. (2007) for detailed watershed mapping requirements.

• Intake/weir • Penstock • Powerhouse • Switchyard • Substations • Transmission Line Routing and interconnection to the grid • Construction Staging Areas • On and Off-Site Construction zones • Construction access and transportation routes • Stream crossings • Bridges (temporary and permanent) • Barge landings • Air strips/ helipads	• Quarries, borrow areas and spoil areas • Towers (transmission, meteorological, etc.) • Turbines (water, wind, ocean) • Transformers • Roads (temporary and permanent) • Batch plants • Communication sites • Access roads • Construction Camp • Laydown areas

In addition, provide discussion on the following:

1. Any permanent and/or temporary structures (e.g. wind turbine generator foundations, generators, penstock(s), dam/intake structure (type, height, footprint), diversion weir, sediment and large woody debris structures, and fish passage structures past dam if fish present in the diversion reach).
2. A list of the type of equipment to be used at each location.
3. A discussion of permissions to connect to the electrical utility Grid (e.g. BC Hydro, Fortis BC, etc.).
4. The capacity and the size of the various components/size of site in MW.
5. Service and maintenance centre/project interpretation centre, if applicable.
6. Activities such as clearing or site grading.
7. For waterpower projects discuss:
   j) Extent of flooding associated with the project (e.g. any proposed storage or headponds), and
   k) Tailrace structure, tailrace fish exclusion structure and location relative to most upstream extent of fish migration routes.
8. For wind power projects discuss:
   l) Extent of areas inappropriate for roads or wind turbine placement, and
   m) Control points for road network (stream crossings, gully crossings, steep / impassable slopes, etc.
9. Summarize the results of evaluating alternative locations for the project or project components, identifying factors which led to selection of preferred option(s).

2.1.4 Labour Pool Requirements

1. Discuss the anticipated labour pool requirements for construction, operations and post-maintenance and maintenance phases and provide an overview of the expected housing and

services to be used in support of the labour pool during each phase. Indicate if employees will be sourced locally, regionally, nationally, etc. and describe any relevant employment strategies.

2. Where applicable, discuss the intended approach and associated logistics for the delivery of services required to support the labour force. This will include such items as water supply, waste disposal, material requirements, energy supply, operations stage transportation/traffic, and operating workforce services, work camp details (see Appendix 1 for information on additional permit requirements from Local Health Authorities or provincial agencies).

2.2 Environmental Setting

Briefly describe the environmental condition of the project area. Proponents should:

1. Describe the physical setting including any existing infrastructure,
2. Describe the site setting within the entire footprint of the proposed project and potential downstream areas, and
3. Describe any clearing or grading that may have an effect on the drainage and impacts to "downstream" users. For example, more water introduced to Ministry of Transportation and Infrastructure (MOTI) ditches means that MOTI must manage the extra water. Typically, MOTI does not allow extra drainage to enter ditches, as this requires mitigation with larger culverts in order to drain the water to a natural mean annual discharge.

2.3 Energy Production and Market for the Product

Briefly describe the anticipated energy production of the project in general terms. Include tables and figures as necessary. Commercially sensitive, proprietary information should not be provided in the DP but can be discussed with the project Lead where appropriate. Describe any existing agreements with BC Hydro, Fortis BC, or other arrangements for the sale of power.

2.4 Description of Land Requirements

Provide an explanation of Crown land requirements for the project, and any private land acquisition needs. (Sections 5.2 and 5.3 provide additional details on land requirements and potential implications).

Note: If the project is contained wholly on private or federally controlled land, please see Appendix 2 for additional details that will need to be discussed in this section.

2.5 Project Activities

2.5.1 Construction and Commissioning

Provide a description of all construction activities associated with the project. All the associated authorizations will be listed in Table 1.4. Appendix 1 provides information and links for preparing additional

provincial application packages for some of the construction activities associated with the project.

The description will include the following:

1. **Site Preparation**:
   a) Discuss the establishment of staging, borrow, and spoil areas, as well as the clearing and grubbing of the intake and powerhouse sites, penstock, and wind turbines.
   b) Discuss the survey of the transmission alignment and structure layout, the establishment of staging areas, the clearing and grubbing of new access trails, and upgrade of existing access.
   c) Discuss the survey of the permanent road alignment, the establishment of staging and borrow areas, and the clearing and grubbing of the ROW, and any clearing required to access the site.
2. **Intake Construction** (for waterpower projects).
   Discuss the construction of the intake, including the methods for temporary stream diversion, development of the weir site, dam structure[6] (type and height), throughput of sediment, fish passage upstream and downstream from the dam, dismantling of the temporary stream diversion, completion of the intake structure and proposed timing for construction and proposed blasting associated with construction.
3. **Water Conveyance System** (for waterpower projects)
   Discuss the blasting and excavation of trenches, the blasting and boring of tunnels, the installation of the conduit, the construction of thrust blocks, anchors, and access manholes, the excavation and construction of surface penstock supports and the installation of the penstock.
4. **Construction** (for wind power projects)
   Discuss the wind turbine generators (type, size, number, footprint, type of foundation), the electrical and substations, the operating service centres, the concrete batch plants, the transportation routes for equipment, the location of the quarries, and the geotechnical information for the foundations. Discuss the construction of the wind turbines, including foundations, towers, blades, nacelles and transformers.
5. **Powerhouse and Switchyard**
   Discuss the blasting and excavation required for the powerhouse and tailrace sites, the construction of the powerhouse and tailrace structures, the installation of the turbines, generators, and mechanical systems, the installation of electrical and telecommunications equipment, the construction of the switchyard, and the installation of switchyard equipment.
6. **Testing and Commissioning**
   Discuss the activities associated with testing and commissioning the project.
7. **Reclamation, Restoration and Offsetting**
   Discuss the reclamation of staging, borrow, and spoil areas and any planned restoration of species and/or ecosystems affected by the project. Discuss how residual or unavoidable environmental impacts will be offset through conservation actions on-site, adjacent to or elsewhere.
8. **Transmission Corridor - Line Construction**

[6] Dam Safety Regulations apply to the construction of dams in BC, see Appendix 1

Where applicable, discuss the installation of the pole structures, rationale for pole design, installation of steel towers, installation of the electrical conductors and fixtures, and construction of new substations. Consider the height of the pole structures and whether the design impedes access to resource lands beyond the transmission lines (e.g. heli-logging or forestry access). Provide a summary of discussions to date with the applicable electrical utility regarding connection to the grid (e.g. BC Hydro, Fortis BC, etc.) (See also section 5.3).

9. **Access Management - Site Preparation**

   Access roads must be designed by an engineer and comply with the minimum standards of appropriate jurisdiction. On Crown lands, the Ministry of Transportation and Infrastructure (MOTI) and Ministry of Forests (FOR) have jurisdiction over road design and the proponents must discuss how their access roads will comply with or exceed provincial requirements. If applicable, discuss other means of access (e.g. trams, rail, marine, etc.).

10. **Access Road Corridor - Road Construction**

    Discuss the establishment of any rock quarries and crushing plants, the excavation of new road sub-base (where required), the construction of any new road base, the repairs and construction to bridges, construction activities associated with potential upgrades to any marine access points, and the installation of drainage structures and watercourse crossings.
    *NOTE. Proponents must pro-actively develop a comprehensive **road and transmission corridor strategy** that considers / mitigates impacts on the crown land base, private land and other resource and environmental values. Proponents must provide a map indicating the possible road and transmission corridors, as well as a comparison of the alternatives. The proponent must also include a detailed evaluation of the preferred alternative, including a rationale for the preferred location(s) and an assessment of the potential environmental impacts (including, if appropriate, a geotechnical analysis of chosen areas for slope and road stability). Proponents are advised to discuss the proposed connection to the electrical grid with the appropriate utility (e.g. BC Hydro, Fortis BC) early in their planning process.*

11. **Schedule** for All Phases of Construction

    Provide the most up to date construction schedule estimates for preconstruction, construction, operations, maintenance and refurbishing or removal. When preparing the construction schedule proponents are reminded that there are fisheries windows that will apply when working in or near watercourses. Additionally, there may be timing restrictions associated with general wildlife measures under the *Wildlife Act.*

2.5.2 Operations and Maintenance

Discuss plant start up under various conditions, plant monitoring and control, and plant/facility shutdown scenarios and methods, including those that will be employed during an emergency. You may be required to provide Operating Parameters and Procedures Manuals and compliance with these may be required as part of any licence or approvals you receive.

In some cases, proponents may be permitted to submit final maintenance plans in the construction phase. Proponents are advised to speak with the project Lead to determine whether they may be permitted to provide less detailed or preliminary maintenance plans at the DP stage.

1. **Project Maintenance**

Discuss the maintenance of the project and the role that qualified professionals will play in overseeing and designing the maintenance strategy for the life of the project.

2. **Transmission Corridor and Right(s) of Way Maintenance**
   Discuss the maintenance activities associated with the transmission corridor, including under- line pruning, line inspection, and repairs.
3. **Access Road Corridor Maintenance**
   Discuss maintenance activities associated with the access road corridor, including access road grading and surfacing, vegetation pruning, ditching, inspection and maintenance of culverts and bridges, and signage.
4. **Shared Road and Right of Way Agreements**
   Where applicable, provide details of agreements to share existing Rights of Way (RoW) with other users (e.g. Ministry of Transportation and Infrastructure approval to use road RoW for transmission lines), Forest Service Roads and road use agreements with other industrial users. Where applicable, discuss how the roads will be designed to meet the setback requirements outlined in existing policy or legislation (e.g. for wind energy Projects) – see Appendix 1 for additional information on Forest Service Roads).

2.5.3 Future Project Phases

Include information on any future phases that are not addressed in section 2.6.

2.5.4 Decommissioning Activities

Provide information on the expected lifetime of the project or of temporary project components. Include conceptual decommissioning or reclamation plans, removal of structures and ancillary equipment, site remediation, estimated costs of removing infrastructure and deactivating roads, removing buried cables, transmission lines, etc.

2.6 Schedule for Development

Provide a schedule for the development of the project, including the preconstruction, construction, commissioning, operational, and decommissioning (if applicable) and monitoring phases.

3. SCOPE OF THE ASSESSMENT

The objective of this section is to clearly define the issues/factors that need to be considered in the assessment sections of the DP. The scope of assessment should outline the appropriate level of effort necessary for the assessment based on relevant issues and concerns. Defining the level of effort may include whether fieldwork is necessary or specifying whether the assessment can rely on existing information for a particular component.

3.1 Scope of Issues and Valued Components

The scope of the assessment should identify relevant issues and concerns that are of consequence, reasonably expected to occur and/or of concern from a regulatory or public perspective. Relevant issues are often referred to as valued components (VCs). VCs are elements or aspects of the environmental, cultural, or socio-economic landscape that are important and have value, and therefore are managed.

They incorporate ecological conservation, regional concerns, land use and socio-cultural values. VCs should be selected based on legislation, regulation[7] and input provided by the proponent, the public, and local, provincial, federal and First Nation governments. VCs may be a species, species guild, ecological community, critical habitat, physical parameters (such as water quality or air quality), features or indicators of social, cultural, or economic health, or a combination thereof.

In preparing the draft DP proponents will provide a list of all the identified VCs and subcomponents to be considered in the assessment and include the rationale for selecting each VC. **The preliminary list of VCs and subcomponents must be included in the draft DP submission.**

3.1.1 Spatial Boundaries

Identify the spatial boundary of the assessment. It is important to note that spatial boundaries are not limited to geography and can include broader definitions such as air-shed, watershed, and global ecological footprint. Spatial boundaries may vary between VCs. The proponent must commit to provide the following in the DP:

1. Describe the local and regional spatial extent of the assessment relative to the VCs.
2. Provide maps outlining the spatial extent of the regional study area (RSA) and local study areas (LSA) of the assessment.

For environmental VCs, LSA is the area affected by the project through direct effects (i.e. habitat loss and sensory disturbance). LSAs should be large enough to capture setbacks or buffers required by the VC of

[7] Many Regions have already determined specific ecological VCs for their region. It is expected that proponents will follow regional guidelines and talk to regional staff to ensure all appropriate VCs are included in the assessment.

interest. LSAs for species specific VCs should be informed by the species ecology and life history characteristics such as moisture regime, home range, and migration routes. RSAs for species specific VCs should examine the potential sub-population or population level effects or implications of the proposed project by investigating a larger geographic area (i.e. watershed or management area).

For socio-economic VCs there are number of spatial boundaries that should be considered: local, regional, national, and international. Smaller projects will likely only impact the local economy, whereas some larger scale projects will have international effects. Proponents should identify the appropriate spatial boundary for social, cultural, and economic VCs. A list of potential sources for socio-economic information is provided in Section 5.

3.1.2 Temporal Boundaries

Given the distinct activities associated with each phase of a proposed project, defining temporal boundaries will clearly and uniquely consider site preparation, construction, operation and maintenance and decommissioning.

The proponent must commit to provide the following in the DP:

1. Describe the temporal extent of the assessment relative to the VCs for the life of the project, specifically each of the following phases of the proposed project: planning and design, construction, operations, and decommissioning and closure.
2. Describe any annual or seasonal variation related to VCs and biophysical constraints for all phases of the proposed project (e.g., migration patterns, breeding patterns, freeze-thaw cycles etc.).

3.2.3 Baseline Environmental Conditions

The objective of this section is to describe the existing environmental conditions in the proposed project area as an understanding of the general environmental setting and characteristics of the project area is necessary for decision making.

Proponents are advised to describe baseline conditions for all environmental elements of the project area. Specifically, the baseline environmental conditions section should describe and summarize the existing environmental characteristics of the site, including the zone of potential influence of the proposed project. Baseline conditions should be based on information obtained from previous studies and databases. Supporting documents should be referenced and, where applicable, attached as appendices to the DP.[8]

The collection of baseline information may require additional field studies or programs. All data must be collected to Resource Information Standards Committee (RISC) or relevant provincial standards/regional guidelines. All methods should be described including sample locations, timing, search effort, and results from field sampling reported and mapped. Any exceptions must be presented to and approved by regulatory

[8] It is recommended that proponents refer to provincial databases. A list of existing provincial environmental databases and associated links is provided in Attachment 4.

agencies. If an alternative assessment method is used for the project, indicate the methodology used. Raw data should be included as appendices. All relevant permits, such as fish collection permits or wildlife sundry permits, must be obtained prior to sampling.

3.2 Environmental Assessment Methodology

NOTE: Baseline studies and assessment analyses must follow relevant provincial and federal standards and guidance and be conducted under the direction of an appropriately qualified professional.

3.2.1 Environmental Impact Assessment

The following five sections must be included for each identified VC: (1) existing condition, (2) impact assessment, (3) proposed environmental mitigation and offsetting, (4) significance of residual effects; and (5) summary. Each section is briefly discussed below:

1. **Existing Conditions**: The objective of this section is to describe baseline conditions for each identified VC (see Section 3.1.3).
2. **Impact Assessment:** The purpose of this section is to adequately describe the interactions of the project components and the project setting with identified VCs. The Impact Assessment section evaluates the impacts of the proposed project activities (construction, operation, maintenance, and decommissioning) on the specific environmental VCs. The assessment of impacts should be based on information obtained from previous studies and databases and/or collected in accordance to RISC or relevant provincial standards/regional guidelines. Any exceptions must be presented to and approved by regulatory agencies. If an alternative assessment method is used for the project, indicate the methodology used. Proponents should include or make available, if requested, a copy of the data on which the assessment of the impact is based. The impact assessment should explicitly detail the direct and indirect impacts of the project on each VC for all phases of the project. Occasionally, it may not be possible to fully assess all impacts from the project due to either insufficient data or the assessment of the impact requiring input from agencies. In such cases, the proponent should provide commitments for additional studies if the proponent is unable to fully assess the impact. Proponents are expected to use QPs with appropriate qualifications and demonstrated expertise in the field of study related to the VC, and direct experience in detailed assessments of clean energy projects.
3. **Proposed Environmental Mitigation and Offsetting**: The objective of this section is to describe measures the proponent will commit to undertaking to mitigate the potential adverse environmental impacts identified for each VC. Mitigation actions include the following, in order of priority: avoidance, on-site mitigative measures, off-site mitigative measures, restoration, compensation, actions to offset residual or unavoidable effects on-site, adjacent to, or elsewhere, in lieu fees to offset residual or unavoidable effects, and additional conservation actions. Proponents should describe efforts taken during project design and siting to minimize effects on the environmental VC. This must include a justification for the location of all facilities and infrastructure and where changes to the project design were undertaken to minimize or avoid

impacts. Describe mitigation measures for each impact, by identifying applicable provincially/regionally developed best management practices (BMPs), guidance documents, and/or best available science. The mitigation plan should be integrated within the Construction Environmental Management Plan (CEMP) (see section 8.1). When the level of effectiveness is clearly uncertain, it may be necessary to provide additional mitigation, higher levels of compensation/offsetting, and/or an adaptive management approach. In addition to the CEMP, proponents may be required to provide a list of environmental management plans and commitments to the Operational Environmental Monitoring Plan (OEMP) (see Section 8).

4. **Significance of Residual Effects:** This section evaluates the potential residual adverse effects of each identified VC. Proponents should assess whether any residual adverse effects would be significant, after accounting for mitigation and/or compensation/offsetting. Significance determination should be assessed by analyzing the following factors: magnitude, known threshold (if applicable), geographic extent, duration and frequency, reversibility, context, and probability. Attachment 5 describes these factors in greater detail.

Summary: The objective of this section is to summarize findings and include any further information on the VC that is relevant to the project. The proponent should summarize the assessment in Impact Assessment Tables (See Appendix 4).

4. ENVIRONMENTAL ASSESSMENT

The objective of the environmental assessment is to describe the baseline environmental conditions of the project setting and to evaluate the potential impacts of the proposed project on identified environmental VCs (see Section 3). Four general subsections have been identified: 4.1 Aquatic Environment, 4.2 Atmospheric Environment; 4.3 Geophysical Environment; and 4.4 Terrestrial Environment. All VCs identified during the scoping assessment must be addressed in one of these four sub-sections.

Both the provincial and federal EA processes require cumulative effects assessment according to policies of respective offices. For projects that do not trigger the federal or provincial EA, cumulative effects assessment is desirable, but not required by legislation.

4.1 Aquatic Environment

The objective of this section is to describe existing conditions; assess potential impacts; prescribe adequate mitigation and offsetting measures; evaluate the residual impacts, include a statement of significance; and provide a summary (see Section 3.2 Environmental Assessment Methods) for all aquatic environment VCs. [9]

For waterpower projects or other project components that will divert stream flows, provincial guidelines have been developed which outline the information requirements. In addition to the guidance provided within each section, proponents are encouraged to refer to the following documents.

- Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower Projects in British Columbia. (Hatfield et al. 2007)
- Assessment methods for aquatic habitat and instream flow characteristics in support of applications to dam, divert, or extract water from streams in British Columbia. (Lewis et al. 2004)

Proponents should be aware that stream crossings or construction activities in or about a stream must comply with the *Water Sustainability Act.* Construction activities should conform to the instream work windows and guidelines. In addition to provincial guidelines and requirements, Attachment 3 summarizes DFO's Projects Near Water website designed to help people undertaking projects in and around water understand what they need to know and do to comply with the Federal *Fisheries Act.*

4.1.1 Aquatic Habitat

This section is applicable to clean energy projects which have the potential to affect any aquatic habitat, including marine and/or freshwater. The baseline environmental conditions should address existing aquatic habitat within the project setting.

An environmental impact assessment will be conducted for all aquatic habitats identified as a VC (see Section

[9] See Section 4.1.10.1 of Lewis et. al (2004) for impact analysis assessment methods in support of water licence applications.

3.2.2).

When describing baseline conditions, proponents and their qualified professionals should:

1. Describe and map, consistent with provincial standards, all aquatic resources (ponds, streams, rivers, lakes, reservoirs, wetlands, bogs, fens, swamps, estuaries, oceans, etc.) within their project area, including infrastructure as well as access roads and utility corridors.
2. Summarize and interpret aquatic resources and related data.
3. Provide habitat information including aerial photography, the watershed atlas, and bathymetric mapping.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Describe and quantify footprint effects associated with each structure (e.g. stream crossings, transmission line and penstock crossings, buildings and facilities), including both direct effects (e.g. alienation of habitat) and indirect effects (e.g. downstream sedimentation during construction).

4.1.2 Aquatic Fauna

The baseline environmental conditions should address existing aquatic, freshwater and/or marine fauna within the project setting. An environmental impact assessment will be conducted for all aquatic fauna identified as a VC (see Section 3.2.1). Additional guidance and requirements are provided below for fish and fish habitat and other species. Submit occurrence record to B.C. Conservation Data Center, where applicable.

4.1.2.1 Fish and Fish Habitat

This section is applicable to CEPs which have the potential to affect fish and fish habitat[10]. The provincial *Water Sustainability Act* and *Riparian Areas Protection Act* allow water managers to consider impacts to fish and fish habitat. Fish and fish habitat are also protected by the federal *Fisheries Act*, which defines fish habitat as "spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly or indirectly in order to carry out their life processes". See Attachment 3 for details regarding DFO's requirements for proponents working near water.

For the baseline environmental conditions, proponents and their qualified professionals should consider the following.

1. Compile and map, according to the RISC Standards (1:20,000 TRIM), known information (with reference sources) on:
    a) Aquatic species that may be directly affected by the proposed project.
    b) Observations and potential occurrences of species at risk and of concern, defined by regional biologists, the Provincial Conservation Framework and the Species at Risk Registry. Include observations and potential occurrences of regionally important species.
    c) Fish habitats (spawning, incubation, migratory, overwintering, rearing, riparian, and food

[10] See Hatfield et al (2007) for guidelines on collection and analysis of fish and fish habitat data.

producing etc.) that may be affected by the project footprint.

2. For freshwater:
    a) Provide information on species presence; distribution, fish stocking records, with confirmed and suspected fish migration barriers/obstacles, for all fish.
    b) Confirm presence/absence of fish-bearing status of the subject waterbody through a field inventory consistent with provincial standards.
    c) If fish are absent, fulfill detailed sampling requirements, as per Hatfield et al. 2007, to classify a reach as non-fish-bearing. Describe methods (sample locations, timing, search effort, etc.) and report and map results from field sampling. Designation that the stream is not fish bearing may be required for DP submission.
    d) Describe the existing condition of riparian vegetation (such as BEC site series, vegetation composition, stand structural stage, density, coarse woody debris (size and volume) and general condition) within the project area that are predicted to be affected by project construction and operation, including adjacent to flooded areas (i.e. lakes proposed for use as water storage). Utilize TEM if available.
    e) Proponents may be required to provide baseline data and information on the aquatic macroinvertebrate community using standard methods.
3. For marine systems:
    a) Provide information on species presence, distribution, fish stocks and management records.
    b) Describe existing condition of foreshore vegetation within the project area.
4. For species VCs, define habitat preferences, life-history periodicity, critical timing of life stages, and identify critical habitat parameters.
5. Identify the performance standards for each VC[11], when applicable. For Species at Risk, ensure performance standards are consistent with provincial recovery planning, federal recovery strategies, and federal management plans, where available.

For the environmental impact assessment, proponents and their qualified professionals should consider the following:

1. Describe and quantify aquatic, freshwater and/or marine, and riparian footprint effects associated with each structure (e.g. stream crossings, transmission line and penstock crossings, buildings, and facilities), and which are predicted to be affected by project construction and operation.
2. If applicable, describe natural ice formation and frazil ice in streams and potential implications for fish and fish habitat that may occur as a result of altered and/or reduced flows.
3. Proponents may need to assess the potential change in macroinvertebrate communities to assess impacts on fish and fish habitat.
4. Describe conceptual Fish Habitat Compensation Plan, if required by DFO. Describe approved Fish Habitat Compensation Plan, if applicable.

[11] Performance standards are to be set by government and referenced here by the project's QPs.

Additional guidance is provided for proponents of waterpower projects or projects which will divert stream flows, including important guidance surrounding an instream flow study (Lewis et al. 2004, Hatfield et al. 2007).

Please note: Collecting appropriate data for the Instream Flow Analysis is of utmost importance.

4.1.2.2 Other Aquatic Species

The baseline environmental conditions should address other existing aquatic, freshwater and/or marine, species within the project setting. An environmental impact assessment will be conducted for all other aquatic species (freshwater or marine) identified as a VC. These may be a species, species guild, ecological community, or a combination thereof, defined by the Provincial Conservation Framework and the Species at Risk Registry to be sensitive to the construction and operation of the proposed project.

4.1.3 Aquatic Vegetation

The baseline environmental conditions should consider describing aquatic vegetation, freshwater and/or marine, within the project setting. An environmental impact assessment will be conducted for all aquatic vegetation (freshwater or marine) identified as a VC. These may be a species, species guild, ecological community, or a combination thereof, defined by the Provincial Conservation Framework and the Species at Risk Registry to be sensitive to the construction and operation of the proposed project.

Proponents and their qualified professionals should consider the following while describing existing conditions:

1. Compile and map (1:20,000 TRIM) the distribution and abundance of all aquatic plants listed as species at risk and of concern, defined by the Provincial Conservation Framework and the Species at Risk Registry, which may be impacted by project activities.
2. If uncertain, a specimen voucher may be required to confirm identification.

4.1.4 Water Quality

This section is applicable to projects which may adversely affect environmental water quality. Drinking water implications are discussed in section 5.5. An environmental impact assessment will be conducted if water quality was identified as a VC.

Proponents and their qualified professionals should tailor the water sampling program to describe the existing conditions specific to the project being proposed and include discussion of potential contaminants of concern.

For the baseline environmental conditions, proponents and their qualified professionals should:

1. Map (1:20,000 TRIM) water quality sampling locations and discharge points.
2. Include a study design table listing sample site locations and sample dates.
3. Provide a rationale for site selection.

4. Compile existing baseflow water chemistry data and basic seasonal water chemistry data.[12]
5. Ensure that water quality data collection follows the procedures in the methods standards for quality control and assurance.
6. Identify critical periods for measuring some water quality parameters. These critical periods need to be identified by a qualified professional in consultation with regulatory agency personnel.
7. Provide tables showing water quality by site and sampling period for each parameter, MDL, and QA/QC information.
8. Provide laboratory results and water quality field notes in appendices.
9. Map (1:20,000 TRIM) the drainage divides, areas of groundwater discharge, wetlands, and notable topographic features.
10. Identify whether provincial water quality guidelines[13] are naturally exceeded during baseline conditions and whether site-specific water quality objectives need to be established.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Include current activities in the watershed and locations of permitted and/or non-permitted discharges to water that may affect the water quality.
2. Describe the potential impacts to water quality from project activities (construction and operations).
3. Describe potential impacts associated with metal leaching and acid rock drainage (ML/ARD).

If guidelines are naturally exceeded during baseline conditions, then site specific water quality objectives may need to be established using approved methods.

Proponents are encouraged to reference the detailed procedural guidelines and sampling manuals.

4.2 Atmospheric Environment

This section is applicable to projects which may adversely affect environmental air quality. The objective of this section is to describe existing conditions, assess potential impacts, prescribe adequate mitigation and offsetting measures, evaluate the residual impacts, include a statement of significance, and provide a summary. An environmental impact assessment will be conducted if air quality was identified as a VC.

For the baseline environmental conditions, proponents and their qualified professionals should:

1. Provide information on the existing air quality conditions; if applicable include Air Quality data.
2. Identify existing air quality management plans effective in the project area.
3. Describe climatic factors that may influence air quality including the direction and velocity of

[12] See Section 1.5 Water Quality in Hatfield et al. (2007)

[13] BC Water Quality Guidelines are safe levels of substances for the protection of a given water use, including drinking water, aquatic life, wildlife, recreation, irrigation, and agriculture. They are developed in order that water quality data can be assessed and site-specific water quality objectives can be prepared.

dominant winds, and the frequency of atmospheric inversions. This may also include temperature, precipitation (rain and snow) (i.e.: mean annual precipitation, monthly precipitation distribution, wet and dry year precipitation, and snowfall depth and duration), and wind.

4. Describe current activities in the project area that may impact the airshed, including locations of permitted and non-permitted discharges to air. Identify pre-existing sources of air contaminants.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Discuss potential emissions (including timing and locations) from the project construction, operation and maintenance which are expected to produce air quality impacts (e.g. dust, other airborne particulates, greenhouse gases, chemical vapors, or odors).
2. Identify any receptors that may be affected by the air emissions (such as residential areas, schools, etc.)
3. Identify the Provincial and Federal emissions criteria used to evaluate potential effects.

Proponents are encouraged to include reference to provincial air quality best management practices.

4.3 Geophysical Environment

The objective of this section is to describe existing conditions, assess potential impacts, prescribe adequate mitigation and offsetting measures, evaluate the residual impacts, include a statement of significance, and provide a summary (see Section 3.2) for all geophysical environment VCs. In addition to the guidance described below, proponents of waterpower projects or other project components that will divert stream flows are encouraged to refer to Hatfield et al. 2007 and Lewis et al. 2004.

4.3.1 Surface Hydrology and Hydrogeology

This section is applicable for projects which are associated with water withdrawal or works in watercourses such as waterpower projects. For projects with limited instream work, evidence should be provided that hydrological studies and associated impact assessments are unnecessary.

The objective of this section is to characterize the resources sufficiently to address all the relevant issues related to surface water and groundwater, and to describe natural flow conditions, present flow conditions, and how flows may be altered by the project. It is important that hydrologic information be collected, analyzed, and presented to a high standard. Some standard practices and procedures can be found in the RISC Manual of British Columbia Hydrometric Standards. All information should be presented graphically and in tables using appropriate summary statistics. It is expected that assessment should be performed to the current standard of professional practice and sealed by an appropriate qualified professional in the field of engineering (P.Eng.) or geosciences (P.Geo.).

For the baseline environmental conditions for hydrology, proponents, and their qualified professionals

should:[14]

1. Provide a minimum of one year on-site continuous hydrometric data relating to the proposed intake location in the case of a waterpower project. In addition, provide regional snow survey data for basins that have snowmelt influence on the hydrograph.[15]
2. Conduct a regional analysis including a map of candidate long-term Water Survey of Canada hydrometric stations in the areas of interest showing stations selected for regional hydrology analysis.
3. Provide maximum quantity of water to be diverted, including timing of maximum diversions.
4. Determine mean monthly discharges (MMD) and mean annual discharge (MAD).
5. Provide 7-day average low flow (mean annual, 7Q10, 5, 20 & 50 years).
6. Provide 200-year instantaneous peak flow.
7. Provide ecosection, ecoregion and ecoprovince of diversion reach support for proposed unit runoff, seasonal flow regime and fish productivity.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Provide flow exceedance curves for each month and determine 80% exceedance flow in cms and %MAD.
2. Provide elevations and relative catchments of intake and powerhouse.
3. Provide discharge estimates, integrating onsite data and regional analysis.
4. Evaluate the potential effects of climate change on water supply; evaluate the potential effects of changes to glacial- and snow-melt water contributions on water supply, given current trends.

NOTE: If local inflow to the diversion section exceeds 10% of MAD at the intake, an additional time series of baseline and post-project flow conditions should be calculated at the powerhouse.

For waterpower projects, in addition to Hatfield et al. (2007) and Lewis et al. (2004), proponents are encouraged to refer to the Hydrological Guidelines for Waterpower Projects (Land and Water British Columbia Inc. 2005). For waterpower proposals which include lake drawdown or creating water storage (such that inflows to headpond will not equal outflows over a 24-hour period), the following information is required to assess the project:

1. Identify how aquatic and terrestrial values would be affected by the proposed operations. This should include, but is not limited to, consideration of potential changes to:
   a) stability of the littoral zone,

[14] See section 1.6 in Hatfield et al. (2007) for further guidance on collecting hydrometric data and discharge estimates, and conducting regional analysis.

[15] If the basin is glaciated, a characterization of the glacial meltwater component of the hydrograph should be made (both above and below the project, if applicable), as well as an analysis of the rate of change in the glacier (retreat, downwasting), and resultant ongoing and projected changes in the hydrograph.

b) riparian vegetation,
c) water temperature,
d) suspended sediment,
e) productivity, and
f) connectivity with inlet and outlet stream(s).

2. Assessment from the proponent's qualified professional as to whether the proposal triggers the information requirements of the B.C. Dam Safety Regulation.
3. Stage-volume curves for regulating storage.
4. Information on the types of storage being proposed: active, inactive, dead and surcharge.
5. Identify if/ where flooding of Crown land will/may occur.

NOTE: Areas upstream of the intake must also be considered in subsequent sections of the DP.

For projects which are anticipated to have impacts on groundwater, for existing conditions proponents and their qualified professionals should consider the following:

1. Provide baseline information on the extent, use, and potential of groundwater resources in and around the proposed development for subsequent water quantity and water quality impact prediction and monitoring.
2. Map hydrology stations (1:20,000 TRIM) as well as the discharge points and groundwater monitoring locations. Include an accompanying study design showing rationale for site selection and monitoring parameters.
3. Describe current activities in the project area that may impact groundwater, including locations of permitted and non-permitted discharges. Identify pre-existing sources of contaminants.
4. Provide an outline of the site boundaries for the proposed development including catchment and watershed delineation (regional-scale and site-scale).
5. Identify and describe the connection to surface water and outline surface water and groundwater dependent features (quantity and quality); estimate of relevant fluxes.
6. Provide relevant maps and sections showing groundwater elevations and inferred directions of groundwater flow.
7. Discuss the implications of seasonal conditions on groundwater flow.

For the environmental impacts assessment, proponents and their qualified professionals should:

1. Evaluate how the project will impact seasonal changes in groundwater flow patterns.

4.3.2 Geotechnical / Slope Stability

The objective of this section is to assess the likelihood of impacts to important habitats, species at risk, existing infrastructure, and public safety as a result of geotechnical hazards and the proposed works. Assess all geotechnical and slope stability components that have been recognized as a VC in the Scope of

Assessment (see Section 3.2).

For the baseline environmental conditions, proponents and their qualified professionals should:

1. Provide maps (at an appropriate scale) to present information on geotechnical elements (stability, erosion, etc.) and natural hazards (seismology, flood, avalanche, landslide etc.).
2. Identify and describe where applicable, natural hazards present in the plan area including landslides, avalanches, steep terrain, and seismology. Provide information on bedrock (depth, observations of mineralization) regarding the potential for metal leaching and acid rock drainage (ML/ARD). Describe other physical processes occurring in the plan area.

During environmental impact assessment, proponents and their qualified professionals should:

1. Identify and describe, where applicable, terrain stability as a function of proposed land use.
2. Identify if the project is likely to result in new avalanche paths.
3. Include a discussion of the potential for acid rock drainage and metal leaching if bedrock will be exposed or quarried for road, penstock, and other construction.
4. Describe modifications to road sections affected by works that will be required to prevent landslides.
5. Ensure that a probability assessment of the project being over-topped by landslide (using a probabilistic assessment, not qualitative rating) is included in the impact assessment.
6. Assess ice build-up on wind turbine blades and impacts of avalanche and snow creep for transmission line towers, transmission lines and roads, and the resulting road and transmission corridors/rights of way.

Proponents and their qualified professionals may be required to provide a terrain stability assessment relevant to the project and should contact the province for specific standards.

4.3.3 Geomorphology

The purpose of a geomorphology assessment is to determine whether project-induced changes in stream flows will alter the relationship between flow, sediment, and channel form, with associated impacts to fish habitats. An environmental impact assessment will be conducted if geomorphology was identified as a VC. For projects that are associated with water withdrawal or works in watercourses such as waterpower projects, proponents, and their qualified professionals (P. Eng. or P. Geo) should, in addition to the provincial guidelines[16] , include the following in the baseline environmental conditions:

1. Describe watershed characteristics including the channel condition, channel confinement, geology, and stream type. A review of aerial photographs may be used to determine likelihood of diversion reach containing off-channel habitats in braided sections, fish barriers (partial or complete), or narrow canyonized sections.

[16] See Hatfield et al. 2007; Lewis et al. 2004, and the Channel Assessment Procedure Field Guidebook and Channel Condition and Prescription Assessment (Interim Methods)

2. Identify the presence of features that may affect sediment transport (e.g. significant changes in channel gradient, lakes, waterfalls).
3. Identify the locations of off-channel habitats. Wetlands and areas of seasonal flooding should be identified on 1:20,000 maps.[17]

For waterpower projects, proponents are encouraged to refer to Hatfield et al. (2007) and Lewis et al. (2004).

4.3.4 Geology and Geochemistry

The objective of this section is to describe existing conditions; assess potential impacts; prescribe adequate mitigation and offsetting measures; evaluate the residual impacts, include a statement of significance; and provide a summary for all geology and geochemical VCs.

Regional studies or previous exploration and development work within or adjacent to the project may provide initial information relative to the baseline geology and geochemical conditions. Sources for this type of information would include the Geological Survey of Canada (GSC) and the British Columbia Geological Survey (BCGS).[18]

When completing the environmental impact assessment for geology and geochemistry, proponents and their qualified professionals should consider potential impacts associated with metal leaching and acid rock drainage (ML/ARD).

4.4 Terrestrial Environment

The objective of this section is to describe existing conditions, assess potential impacts, prescribe adequate mitigation and offsetting measures, evaluate the residual impacts, include a statement of significance, and provide a summary for all terrestrial environment VCs.

4.4.1 Wildlife and Wildlife Habitat

This section is applicable for projects which may impact wildlife, wildlife habitats, and invertebrates protected or managed through provincial conservation initiatives[19], resource land use and management plans, and regulation and legislation, such as the *Wildlife Act*, *Forest and Range Practices Act* (FRPA), as well as federal regulation and legislation including the *Migratory Birds Convention Act*, and the *Species at Risk Act.* An environmental impact assessment will be conducted for all wildlife and wildlife habitats identified as a VC.

When describing existing conditions, proponents and their qualified professionals should:

1. Compile and map (1:20,000 TRIM) the following information within the project area:

[17] See also: Wetlands of British Columbia: a guide to identifications
[18] Links to various studies and reports that may be useful when reviewing baseline conditions can be found in Attachment 2.
[19] See hotlinks in Attachment 2: (1) Conservation Framework and (2) Identified Wildlife Management Strategy.

a) Observations and potential occurrences of species at risk and of concern, defined by regional biologists, the Provincial Conservation Framework and the Species at Risk Registry. Include observations and potential occurrences of regionally important species.

b) Areas legally designated pursuant to the Wildlife Act, FRPA, and Government Action Regulations (GAR) (e.g. UWR, WHA, OGMAs, WHFs, etc.).

c) Locations of uncommon habitats and important wildlife habitat features (caves, hibernacula, wildlife corridors, known nest trees, etc.).

d) Special management areas such as SRMZ, which are designated through Resource Management and Land Use Plans.

e) Provincial Parks and Protected Areas, Ecological Reserves, and Conservation Lands.

2. Describe population status and habitat use in the project area for each VC by discussing distribution, habitat suitability, habitat capability, and migration. Include maps when possible. If applicable, describe the species distribution using habitat suitability and capability models[20].
3. Communicate with Provincial staff, as well as relevant local and regional governments, university researchers, First Nations governments, local naturalists, B.C. Guide Outfitters and B.C. Trappers Association to obtain baseline information, habitat models, and traditional ecological or community knowledge, where available.
4. Identify the performance standards for each VC[21], when applicable. For Species at Risk, ensure performance standards are consistent with provincial and federal recovery goals identified in recovery plans and management strategies where available.
5. Report all red and blue-listed species sightings to the B.C. Conservation Data Centre.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Provide maps (1:20,000 TRIM) showing how the project components overlap with suitable/capable habitat for each VC.
2. Provide tables that quantify habitat loss and footprint impacts, for each VC in the project area (by area and percentage). Habitat loss and impacts should reflect habitat value, especially high and moderate habitat suitability.
3. Predict direct and indirect impacts to habitat quality and connectivity (e.g. prey availability, cover, travel, and corridors) and critical life history stages (breeding, rearing, foraging, overwintering) from habitat fragmentation and/or degradation.
4. Predict direct and indirect impacts to wildlife populations (if possible), including potential auditory and visual impacts on wildlife.

Proponents and their qualified professionals are encouraged to consult the provincial management practices

[20] Habitat models should be independently validated with empirical data. If feasible use Resource Selection Functions (RSF) (Boyce et al. 2002.). If verified models are not available, develop new models. Describe methodologies, variables, equation, assumptions, and sources of uncertainty. Validate and refine with sufficient field data (i.e. ground truthing). Consult with MOE species expert where possible.

[21] Performance standards are to be set by government and referenced here by the project's QPs.

(BMPs) and existing guidelines when prescribing mitigation measures. Mitigation plans may also need to address human-wildlife conflicts and access management. The proponent must ensure that the construction and operation of the project will not contravene with Section 34(b) of the *Wildlife Act*.

In addition to the guidance above, proponents of waterpower projects or other project components which will divert stream flows are encouraged to refer to Hatfield et al. 2007.

For wind energy projects, federal guidelines have been developed which outline appropriate information to consider. Proponents and their qualified professionals are encouraged to refer to the following documents, and where appropriate, to consider results of research being done nationally or internationally to develop suitable mitigation measures.

- Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds (Environment Canada 2007a)
- Best Management Practices - Guidelines for Bats in British Columbia - Chapter 4: Wind Power Developments (February 2016)
- Wind Turbines and Birds: A Guidance Document for Environmental Assessment (Environment Canada 2007b)

4.4.2 Rare Plants, Plant Communities and Ecosystems at Risk VCs

This section is applicable for projects which may impact wildlife and wildlife habitats protected or managed through provincial conservation initiatives[22] and *the Species at Risk Act.* Assess all rare plants, plant communities and ecosystems-at-risk components that have been recognized as a VC.

When describing existing conditions, proponents and their qualified professionals should:

1. Compile and map (1:20,000 TRIM) known information within the watershed or landscape unit(s) on:
    a) Observations and potential occurrences of plants, plant communities and ecosystems or species at risk and of concern, defined by the Provincial Conservation Framework and the Species at Risk Registry, include observations and potential occurrences of regionally important species and communities, wetlands as defined by FRPA, or if appropriate the Federal Policy on wetlands;
    b) Areas legally designated pursuant to the FRPA (e.g. OGMA and WTRA); and
    c) Provincial Parks and Protected Areas, Ecological Reserves, and Conservation Lands.
2. Provide a general description of the BEC variants, plant communities and ecosystems present in the project area.
3. Describe the distribution and abundance of rare plants, plant communities, and ecosystems at risk through known records and ecosystem mapping such as Terrestrial Ecosystem Mapping (TEM), Predictive Ecosystem Mapping (PEM), and Sensitive Ecosystem Inventory, where applicable.

[22] See 2 hotlinks in Attachment 2: (1) Conservation Framework and (2) Identified Wildlife Management Strategy

4. Conduct rare plant surveys[23], if required.
5. Communicate with Provincial staff as well as relevant local and regional governments, university researchers, First Nations governments, and local naturalists, to obtain baseline information, and traditional ecological or community knowledge, where available.
6. Submit all red and blue-listed species sightings to the B.C. Conservation Data Centre.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Assess direct impacts to rare plants including effects of soil disturbance and compaction from vegetation removal and disturbance and consider potential indirect impacts such as edge effects, increased windfall and increased species and numbers of invasive species resulting from altered microclimate.
2. Provide tables that quantify habitat loss and footprint impacts, in the Project area (by area and percentage).

Proponents and their qualified professionals are encouraged to consult the provincial management practices (BMPs) and existing guidelines when prescribing mitigation measures.

4.4.3 Forest and Range Considerations

This section is applicable for projects which may impact forest and range values. The objective of this section is to provide baseline information and assess potential effects on forest and range considerations. Proponents must use appropriate qualified professionals, such as foresters, biologists, agrologists or engineers with the appropriate qualifications and licensed to practice in B.C., to investigate and address the considerations noted below and should involve appropriate provincial staff on an as needed basis. Additional forestry items are discussed in Section 5 Socio-economic Assessment.

4.4.3.1 Forest Health

Assess all forest health components that have been recognized as a VC in the Scope of Assessment. The objective for forest health is to maintain the health of the forest immediately adjacent to project infrastructure or temporary development areas. Discuss how the project plans to maintain, and if possible, enhance the health of the forest immediately adjacent to any required infrastructure or temporary development areas.

When describing baseline conditions for forest health, proponents and their qualified professionals should consider the following:

1. Identify any current localized forest health issues or concerns.

For the environmental impact assessment, proponents and their qualified professionals should:

1. Identify any increased forest health risks that may result from the project (e.g. such as an increase

[23] Follow e-Flora BC Protocols for Rare Vascular Plant Surveys.

in windthrow or tree death following construction that may result in an increase in bark beetles, slash that is retained that may increase bark beetles, etc.).

2. Prepare strategies to minimize typical local forest health pest impacts (e.g. removal of damaged trees, slash abatement, etc.).

4.4.3.2 Invasive Plants

Assess all invasive plants components that have been recognized as a VC in the Scope of Assessment.

The objective for this section is to ensure protection of ecosystem integrity by preventing the spread or introduction of invasive plants. It is important that project developments do not introduce or increase the spread of invasive plants through their activities. The Province of B.C. operates the Invasive Alien Plant Program and should be contacted for further details on issues specific to the project area.

When proposing mitigation, proponents and their QPs should consider the following strategies:

1. Using natural re-vegetation techniques in association with appropriate invasive species management / control.
2. Using appropriate Canada #1 certified seed mixtures to local specifications when hydro-seeding.
3. Minimizing soil disturbance.
4. Preventing spread by not transporting dirty equipment from infested sites to non-infested areas.
5. Identifying, monitoring, and reporting invasive plant species.
6. Identifying and undertaking control options.

4.4.3.3 Forest Resource Features

Assess all forest resource feature components[24] that have been recognized as a VC in the Scope of Assessment.

When describing existing conditions, proponents and their QPs should identify if the following features are present within the spatial boundary:

1. Karst systems. Where karst occurs in the project area, a karst assessment may be required. Cave and karst features need to be protected – see Guidance in Attachment 2 for additional information.
2. Range developments (e.g. fences, cattle guards, or water sources).
3. Research or experimental areas (such as permanent sample plots, growth and yield plots, and research installations).
4. Permanent snow course sample sites.
5. Cultural heritage resources used by First Nations.
6. Interpretive forest sites, recreation trails, sites, facilities, and features.

[24] The *Forests and Range Practices Act* (FRPA) defines resource features as specific items legally designated under the FRPA *Government Actions Regulation* (GAR).

7. Trail or other recreation facility identified in s.57 of FRPA.

If these areas have been legally identified under the Government Actions Regulation (GAR) they may have a legal effect on new project development and must be considered. Under FRPA (FPPR s.70), these features must not be damaged or rendered ineffective.

4.4.3.4 Range and Forage

Assess all range and forage components that have been recognized as a VC in the Scope of Assessment.

When proposing mitigation measures for the project, proponents and their QPs should consider impacts to the following:

1. Livestock movement.
2. Natural range barriers.
3. Available forage.
4. Introduction or spread of noxious weeds.
5. Access to water sources.
6. Direct or indirect impacts to sensitive grasslands sites.
7. Increased public access to traditionally remote or inaccessible areas (potential for livestock disturbance, injury, poaching and litter impacts).

4.5 Summary of Environmental Effects, Mitigation, and Significance

The objective of this section is to summarize assessment findings including:

1. An overview of the potential environmental impacts.
2. Mitigation strategies.
3. The significance of any residual environment effects that cannot or will not be mitigated (See Appendix 4).
4. Additional information deemed to have relevance.

See Appendix 3 for a sample interaction matrix between project activities and Environmental VCs.

5. SOCIO-ECONOMIC ASSESSMENT

Proponents must utilize appropriate qualified professionals licensed to practice in B.C. (such as foresters, biologists, agrologists or engineers) to investigate and address the considerations noted below and involve appropriate Provincial government staff on an as needed basis.

The objective of the socio-economic assessment is to assess the potential implications of the proposed project on the local and regional economy, and communities. This section summarizes findings and includes any further information on the VCs that are relevant to the project and should be prepared in the same manner as the environmental assessment in section 4.

The following five sections should be discussed for each identified socio-economic valued component (VC): (1) existing condition, (2) impact assessment, (3) proposed environmental mitigation and offsetting, (4) significance of residual effects; and (5) summary. Each section is briefly discussed below:

1. **Existing conditions**: The section describes and summarizes the existing socio-economic characteristics of the project's area and vicinity. Proponent should document the existing population distribution, demographics, and social profile within the project boundaries as well as in the nearest community and urban centres to the project areas. This description will include both Aboriginal and non-Aboriginal communities.[25] Local governments and Chambers of Commerce may be useful contacts for proponents for completing this section.
2. **Impact Assessment:** This section assesses the impacts based on the definition of the project. The assessment of impacts should be based on information collected in accordance with acceptable academic or industry standards. The proponent should include or make available, if requested, a copy of the data on which the assessment of the impact is based. In some cases, it may not be possible to fully assess all impacts from the project due to either insufficient data being available or the assessment of the impact requiring input from agencies. In such cases, the proponent should provide commitments for additional studies.
3. **Proposed Mitigation and Offsetting**: The objective of this section is to describe measures the proponent will commit to undertaking to mitigate the potential adverse socio-economic impacts identified. Mitigation actions include the following in order of priority: avoidance, on-site mitigative measures, off-site mitigative measures, restoration, compensation, offsets, and additional conservation actions. Identify proposed mitigation measures including those considered in the design of the proposed project. The mitigation plan should be supported by existing guidance and available literature. Use BMPs or best available science to inform mitigation and compensation options.
4. **Significance of Residual Effects:** This section evaluates the significance of the potential residual effects, after mitigation. If the impact will not meet the performance standards

[25] Statistics Canada has useful information for proponents on regional economic and employment statistics: Census Program

associated with the VC and will not fully mitigate the impact, characterize and evaluate the significance of the residual impacts. Explain the significance of any residual socio-economic effects of the project on identified VCs. Evaluate the significance of the potential residual effects of the proposed Project considering magnitude, geographic extent, duration and frequency, reversibility, context and probability.

5. **Summary:** This section summarizes findings and includes any further information on the VC that is relevant to the project. The proponent should summarize the assessment in Impact Assessment Tables (See Appendix 4).

5.1 Regional Economy

Assess all regional economy components that have been recognized as a VC in the Scope of Assessment.

Describe the socio-economic environment, including information on the following elements:

1. Local and regional economy, including economic drivers within the project boundaries, and at a regional scale.
2. Regional labour market, including unemployment rates, labour supply, and training opportunities.
3. Existing economic undertakings in the area that could be affected by the development of the project.

5.2 Resource Objectives, Land Use Plans or Other Designations

This section describes the management direction for natural resource objectives, plans or other designations (e.g. reserves) that have previously been legally established, established in policy (such as government approved land use plans or government to government agreements with First Nations), or are under development. These items may be for many values such as water quality, ecosystem management, fish protection, access management, habitat protection, forest management, cultural heritage, recreation, old growth, and others.

Please refer to related important links in Attachment 2.

When discussing existing conditions for section 5.2, describe the following:

1. Current land uses in the study area (include Federal, Provincial, First Nation Land Use and Official Community Plan and zoning designations).
2. Provincially designated Protected Areas, reserves, land use designations (e.g. zoning, FRPA reserves, etc.).
3. Current or proposed planning initiatives in the project area.
4. Location of camps associated with the project, regardless of the degree of permanence.
5. Location and description of past or present logging or mining activities (including leases, area- based tenures, Community Forest Licences, etc.), quarries and borrow areas, guide outfitting operations

and recreation leases, as well as any uses of land in the area.

6. Location of any shellfish and finfish aquaculture facilities in the project area.
7. Frequency of land use (e.g. hunting, trapping, fishing, logging, tourism, or commercial recreation uses, boating, vacationing), including harvesting of species for the practice of hunting, fishing, trapping and gathering.
8. Spatial relationship(s) between the proposed project and existing land encumbrances and uses.
9. Any private land acquisition that is needed for the project.
10. A map illustrating the known transportation and travel axis in the study area (e.g. commercial shipping/ fishing routes, winter roads, recreational boating, sport fishing areas, kayak routes).

5.3 Implications for Adjacent or Overlapping Crown Land and Resource Values

Assess all implications for adjacent or overlapping crown land and resource values that have been recognized as a VC in the Scope of Assessment (see Section 3.2). Demonstrate how the project will minimize the impact to:

1. Timber harvesting opportunities, forestry operations and delivered wood costs
2. Agriculture and farming opportunities, Crown land grazing and foraging
3. Aquaculture (potential implications for marine, lake, stream and land-based facilities should be considered)
4. Mining and mineral exploration activities, including aggregates and placer mining
5. Commercial tourism
6. Public outdoor recreation
7. Aesthetics and visual resources

List and describe all existing provincially issued tenures, licences, leases, rights of way, or permits that occur within the project vicinity. Consider and explain how the project may potentially affect these tenure holders and discuss mitigative, compensatory, or avoidance measures to minimize or eliminate these impacts. Where applicable, discuss arrangements with impacted tenure holders such as easements or compensation. (For potential implications for tenure holders under the Water Sustainability Act, please see section 5.5. below)

Attachment 7 includes a list of considerations for assessing the implications for other Crown land and resource values.

5.3.1 Wildfire Protection

Assess wildfire protection components that have been recognized as a VC in the Scope of Assessment (see Section 3.1). The objective for wildfire is to minimize the risk of wildfire to public safety, resource values, and investments, during the project development and operation. Discuss the following in relation to the project's wildfire management strategy:

1. Describe the project's wildfire management strategy.

2. Confirm that the strategy is in compliance with the provincial *Wildfire Act* and regulations.
3. Indicate steps that will be taken to decrease the wildfire risk and address fuel management (fire hazard assessment and abatement), as well as all of the management and industrial requirements regarding fire control during industrial activities (such as land clearing).
4. Consider and review any applicable Wildfire Management Plans, including provincial, community or First Nations fuel and/or wildfire management plans.
5. Describe measures taken to manage the potential for ignition of forest fires associated with failed turbines.

See Appendix 1 for additional information related to Wildfire Protection.

5.4 Navigation, Transportation, and Access

The Federal government has jurisdiction over many aspects associated with Navigation, Transportation and Access. For information with respect to the federal requirements please view the "Navigational Impact Assessment Requirements for Privately Operated Hydro Electric Facilities". (Contact Transport Canada's Navigation Protection Program to obtain this document.) It should also be noted that the federal government has requirements for proponents working near water (Projects Near Water, and see Attachment 3). Both direct and indirect effects to Navigation must be included in the assessment.

1. For projects that involve works in or near water identify the river dimensions at the proposed points of crossing or diversion, and the location of any existing constructed or natural obstructions within the creek or its tributaries that are deemed navigable by a Navigable Waters Protection Officer within the defined study area boundary.
2. Consider the Aboriginal and local communities' knowledge of navigation, transportation, and access in the project area and include a description of this knowledge.
3. Describe the current uses of the project area for navigation, transportation, and access, and identify those that would become dangerous or not accessible following project construction. Include detailed information and design drawings of proposed crossing and instream structures indicating:
    a) location of any proposed works
    b) name of waterway(s)
    c) mapping coordinates of the proposed crossing/ diversion points and instream structures (latitude/longitude)
    d) applicable chart and topographic map number
    e) legal descriptions[26]
    f) physical characteristics of the waterway, i.e., length, width, depth, seasonal flow, and fluctuations
    g) gradient at crossing/ diversion site

[26] See Attachment 1 for instructions on legal descriptions for unsurveyed Crown land.

h) construction methodology

i) photographs of any proposed crossing sites.

4. Description of any crossings in the pathway of a transmission corridor that may involve Navigable Waters or transportation.
5. Detailed information (as specified above) and design drawings of proposed aerial crossings or instream structures.
6. Detailed information (as specified above) and design drawings of proposed bridge crossings structures, whether temporary or permanent.
7. Description of any crossings in the pathway of the access road(s) that may involve Navigable Waters or transportation.
8. Description of any barge facilities that may impact on Navigable Waters or transportation.
9. Description of all known current, past, or likely future usage for navigation.

5.4.1 Roads Bridges, and Railroads

Assess all roads, bridges, and railroads that have been recognized as a VC in the Scope of Assessment.

Proponents will need to use a qualified professional engineer to design and oversee construction of the roads, bridges and railroads needed for the project. Engineer sign-off may be required for many of the items listed in this portion of the DP. Proponents should discuss specifically where an engineer's sign-off is needed with their project Lead.

Roads are regulated by different agencies and levels of government (e.g. municipal, provincial, and federal) depending on the use and project specific circumstances. From a provincial perspective, roads can be tenured in a variety of ways (i.e. under different Acts or regulations). Proponents must outline the long term and short-term needs for each road, or portion thereof, and under what jurisdiction the roads will be managed for the duration of the project. See Appendix 1 for information on the various provincial statutes applicable to roads.[27]

Discuss how the project will ensure project access roads (including bridges, culverts, etc.) are constructed in a structurally sound manner and maintained in a safe condition for industrial and other users. Discuss where applicable the following anticipated project impacts and mitigation measures:

1. Impacts on road user safety, stability or maintenance of the road, and the environment from modification or realignment of existing roads, installation of penstock, transmission lines or other works.
2. Impacts on timber harvesting operations in the immediate vicinity of the works or in the watershed from installation of roads to access the penstock, transmission lines, and other works.
3. Effect on future access to the forest land base by industrial users and recreational interests,

[27] Proponents are also encouraged to conduct waterway assessments using the Minor Works Order available from Transport Canada.

including off-road motorized users, which may result in additional impacts.

If the project will be using existing forest roads, it is important to note that many forest roads already have a variety of tenure granted rights and/or agreements that need to be identified and addressed early in the project application process. Discuss the following:

1. Potential impacts on holders of authorizations (including Forest Service Roads (FSRs), road permits, road use agreements, and MOF works permits)
2. Potential impacts on the forest road and other elements at risk
3. Safety of forest road users
4. Stability of the forest road and associated infrastructure
5. Possible impacts on environmental, social, and economic values
6. The costs of forestry road inspections and maintenance expenses
7. The legal rights of those authorized to use the forest road or to harvest Crown timber or conduct other industrial activities
8. Whether affected parties are in agreement with proposed mitigation and compensation measures.

Please review the following provincial document, which provides more detailed information that should be addressed in the Development Plan. Although the document was developed specifically for waterpower projects, there is information contained within it that may be useful for other types of clean energy projects. Links to this document can be found in Attachment 2.

- Clean Energy Projects - Requirements for Planning, Design and Construction to Protect Forest Roads or Timber Tenures

Describe how the project will be designed to maximize safety and minimize disruption for the public using public bridges, roads, and railroads. Provide information on the following:

1. Permissions needed/obtained to access the highway with industrial machinery or equipment.
2. Requirements to upgrade roads with turning lanes for safe access.
3. Commercial and industrial use of public roads.
4. Possible security/ bonding to ensure damage to public roadways resulting from industrial use is repaired.
5. Plans to ensure debris on public roads resulting from construction or transportation of materials to the site is removed.
6. Plans to ensure bridges are suitable and safe for industrial weight and traffic.
7. Plans to ensure safe transport of construction materials.
8. Details on licenses required/ obtained for over-height or over-length vehicles.
9. Information on the correct insurance of construction machinery, vehicles, etc.
10. Adequate signage and marshalling on roads during times of heavy industrial use (certified flags people, etc.

5.4.2 Flight Path

Assess all flight paths that have been recognized as a VC in the Scope of Assessment (see Section 3.2). Discuss how the project will be designed to minimize, mitigate, or avoid potential impacts on existing flight paths or aerial routes in the vicinity of the site (e.g. height of towers, safety beacons on turbines, height/marking of transmission lines, etc.). Discuss where the closest airfield is in relation to the project.

5.4.3 Public Access

Assess all public access components that have been recognized as a VC in the Scope of Assessment. Crown lands are often used by a variety of groups. Please provide a detailed operational plan for the management of public access to the site, such as plans for fencing, installing gates at certain locations, restricted access during construction/ maintenance, onsite security personnel, signage, etc.

Please note that a justification for restricting public access to Crown lands is required.

Proponents must contact the Ministry of Transportation and Infrastructure (MOTI) as early as possible in the project development to discuss accessing roads under MOTI's jurisdiction and/ or proposing the location of transmission lines within existing road corridors. See Attachment 2 for more information on MOTI requirements.

5.5 Water Rights

Assess all water rights that have been recognized as a VC in the Scope of Assessment. If the Project will be constructed entirely on private land, please refer to Appendix 2. Some items identified under Section 5.2 may also be applicable to this section.

Proponents will address the following items:

1. Are there other lands including private land and Crown land under separate tenure that will be, or are likely to be, directly affected by the project or its associated works? If yes, provide a legal description for each property that will be affected by the works, or flooding.
2. Provide a list of Crown land tenure holders and landowners who are potentially affected by the project or its associated works and discuss potential mitigative measures to reduce impacts.
3. If applicable, include a discussion about the requirement for a Permit over Crown Land under the Water Sustainability Act (PCL). Note that most projects which are larger in scale, such as clean energy projects, require a Land Act tenure. PCLs allow non-exclusive use of Crown land and are usually issued for less significant works.
4. If applicable, provide details of the arrangements with private landowners to use the land for the project, or components of the project (signed letters of authorization from landowners, registered easements, rights of way, etc.). Please indicate whether the authorization to use private land expires upon change of ownership.
5. Provide copies of the correspondence issued to all property owners notifying them of the proposed

Project and providing opportunities for their input. Please note that "affected property owners" include any private landowner whose property is physically impacted by the proposed water licence, Water Licensees whose rights may be impacted, as well as riparian landowners who might be affected by the project.

6. Identify whether the proposed point(s) of diversion will be located on a stream, the waters of which flow through an Indian Reserve. For any such proposals, it is necessary to notify the appropriate Band office of the proposal. If applicable, list the affected First Nations; provide copies of correspondence with the affected First Nations; and summarize discussions that have occurred with these First Nations with respect to the project. Please describe any known water users downstream with consideration to effects on their water usage, interruption, compensation, and notification. This could include unlicensed water users, water use for navigation such as kayaking, water use for bathing or spiritual purposes etc.
7. Discuss the project's potential implications with respect to riparian rights for any landowners. Examples of impacts to riparian rights include alteration of flows, erosion or accretion impacts, changes to water level regimes in lakes etc.
8. Discuss the project's potential implications with respect to existing water rights. This includes discussion about how other existing water licensees may be affected by the proposed project (e.g. assured access to water during times of shortage, altered water level regimes in lakes etc.)
9. Include current activities in the watershed and locations of permitted and/or non-permitted discharges to water that may affect drinking water quality. See Appendix 1 for links to *Drinking Water Protection Act* requirements and guidelines.
10. Discuss whether any expropriation of private land is required for the project. If expropriation is being contemplated, discuss the steps that will be taken to complete expropriation, including public consultation, landowner compensation, etc. This is a last resort option to be considered after all reasonable attempts to access land have failed. It is available only after a Water License has been issued. Refer to the *Water Sustainability Act* Regulation section on expropriation.

5.6 Human Health and Safety

Assess all human health and safety components that have been recognized as a VC in the Scope of Assessment. This section will describe the existing conditions and potential hazards to human health and safety arising from the project. Consider potential implications for safe enjoyment of nearby residential areas or tourism uses, including noise, dust, smoke, odor, vibration, or other perceivable health implications resulting from construction, terrain stability risks, landslides and sedimentation, operation, maintenance, or transmission lines. Proponents should include an assessment of the potential implications for drinking water and air quality for local communities.

Provide a detailed Emergency Response Plan that outlines the planned response, equipment needed and action plan for medical emergencies, fire or natural hazard events, environmental spills, etc. Please include an overview of the proposed training that will be provided to ensure the plan is followed and a list of the

people responsible within your company for ensuring compliance with the Emergency Response Plan and worker safety.[28]

Where a dam is associated with the project the following information must be provided:

1. An estimation of the magnitude of the dam break flood hydrographs resulting from various hypothetical dam failure scenarios occurring with the reservoir at normal storage elevation and maximum storage elevation.
2. For those structures that pose risk to human life, an inundation map delineating the maximum extent of flooding anticipated by a sudden breach. The mapping will continue downstream until the expected flooding is within the 100-year floodplain elevation.
3. The downstream hazard classification as defined by Schedule 1 of the Dam Safety Regulation which reflects the current and proposed conditions of development in downstream areas and a description of how the downstream impacts relate to the chosen rating. The most serious potential consequences of failure of those listed shall be used to establish the appropriate downstream hazard classification. Please note the Regional Dam Safety Officer is responsible for deciding the final consequence rating.

See links in Appendix 1 and Attachment 2 for the provincial Dam Safety Regulations and additional information.

5.7 Summary of Socio-Economic Effects, Mitigation, and Significance

Summarize assessment findings, including:

1. The potential socio-economic impacts of the Project at local, regional and provincial scales, where appropriate; (see Appendix 3 and Appendix 4).
2. Potential health and safety impacts.
3. Mitigation strategies.
4. The significance of any residual socio-economic effects.

[28] For a sample of the types of items to include in the Emergency Response Plan, see the Mining and Minerals ERP document referenced in the hotlinks in Attachment 2.

6. PROJECT ENGAGEMENT ACTIVITIES

This section summarizes the proponent's past and proposed engagement initiatives with the public, interested parties and various levels of government.

6.1 Record of Engagement Activities

Describe any engagement or information sharing activities that took place with federal, provincial, regional, and local government agencies, and the public. Include information on public meetings and open houses, one-on-one meetings with government staff or interested parties, publication of articles on a project in the written media, (journal articles, community newspapers, etc.) interviews on local radio and television, participation in community events/fairs, etc.

This section will include a description of the issues and solutions presented during engagement and how these are addressed in the final project plan. If the issues raised during engagement on the project are not addressed in the final project plan, you must provide a rationale.

Table 6: Summary of Issues Raised During Public/Stakeholder Engagement

Group consulted and contact names	U/ F/ C *	Dates of meetings, calls, publications, correspondence, events	Summary of issue raised and proposed solutions	Mitigative measures adopted/ rationale for not adopting	Proponent's comments
Mr. Joe Smith, Sierra Club)					

*U = Engagement underway; F = Engagement planned for Future date; C = Engagement Complete

See Section 7 for First Nation consultation requirements and reporting.

7. FIRST NATION INFORMATION REQUIREMENTS

7.1 Consultation Obligations of the Province

The Province of B.C. is legally required to consult with First Nations prior to making decisions on Crown land and resources that have the potential to affect Aboriginal Interests (claimed or proven rights or Treaty rights). Recent case law states that the Province may delegate certain operational aspects of consultation with First Nations to proponents, acknowledging that the proponents often have access to more detailed information on the planned phases and components of the project (especially in earlier stages). If any aspects of consultation are delegated it is important that all parties understand when consultation is being done on behalf of the Province and when the discussions are bi-lateral between the proponent and the First Nations. All aspects of consultation must be documented. Proponents are advised to discuss their interactions with First Nations with the project's Consultation Coordinator and obtain feedback as to the content and structure of consultation undertaken on behalf of the Province.

Whether or not aspects of consultation are delegated by the Province to a proponent, proponents are encouraged to share information about the project with First Nations and attempt to address Aboriginal concerns that may be raised. Documentation of information sharing and proponent efforts to address any Aboriginal concerns is very helpful to the Province in its efforts to fulfill the Province's legal consultation obligations.

7.2 Identification of First Nations

This section will identify the local First Nations that could potentially be affected by the project. Proponents are encouraged to use the provincial, publicly available, Contacts for First Nation Consultation Areas Database to identify the appropriate First Nations .

7.3 Project Setting – Traditional Use and Aboriginal Rights/Title Issues in the Project Area

This section will discuss the traditional use study (TUS), traditional knowledge (TK) and traditional land use (TLU) information for each of the identified First Nations. The objectives and approach taken to collect, verify and record the information for each First Nation will be considered and discussed. Results of the TLU impact assessment will also be presented. The TLU impact assessment will consider all potential environmental effects.

This section will also discuss potential impacts of the proposed project on the treaty rights and interests which arise under applicable treaties between First Nations, the Province, and Canada.

When preparing the impact assessments for sections 7.3 to 7.5, it may be useful to consider the following:

1. Potential social and/or economic effects to Aboriginal groups that may arise as a result of the project, including a discussion of any factors that may inhibit or foster the flow of economic and other benefits to Aboriginal communities.
2. Potential effects on current and proposed uses of land and resources by Aboriginal groups for traditional purposes, including effects on hunting, fishing, trapping, cultural and other traditional uses of the land (e.g. collection of medicinal plants, use of sacred sites), as well as related effects on lifestyle, culture and quality of life of Aboriginal groups and proposed measures to avoid, mitigate, compensate or accommodate effects on traditional uses.
3. Effects of alterations to access into the area on Aboriginal groups, including deactivation or reclamation of access roads.
4. Effects of the project on heritage and archaeological resources in the project area that are of importance.
5. Significance of any residual effects of the project on First Nations, archaeological, and historical resources. Reference supporting documents and, where applicable, attach them as appendices to the DP.

7.4 Project Setting - Archaeological Resources

This section will present a summary of archaeological resource baseline conditions.[29]

The section will identify potential effects on archaeological resources and consider each requirement of the *Heritage Conservation Act*. Results from the archaeological overview assessment will be used to define and describe the geographic boundaries of the archaeological impact assessment (AIA). The DP will identify proposed mitigation measures, as recommended in the AIA, for sites where impacts cannot be avoided. The significance of identified residual effects will be determined.

7.5 Consultation with First Nations

This section will discuss the consultations[30] undertaken for the project between the proponent and First Nations. It will describe the methods used to ensure that there were as many opportunities as possible for First Nations to identify interests and concerns related to the project. The DP will describe the issues raised during these consultations and the ways in which the proponent addressed these issues including description of changes to design made due to First Nations comments as appropriate. Please indicate where agreements

[29] Please see this website for additional information on archaeology in B.C.
https://www2.gov.bc.ca/gov/content?id=F92DE8F1620F41F8902392A4586E4692

[30] It should be noted that some discussions with First Nations will be considered official consultation, where this has been delegated by the Province and agreed to by all parties. In other cases, information sharing and engagement with First Nations will proceed outside of formal consultation that will be done to meet the Province's obligations. Proponents can use the same log to record consultation and engagement, but should indicate which applies (i.e. whether the communication is consultation or engagement)

have been reached between you and the First Nations and where applicable, provide details of the agreement and it implications for the project and potential mitigation of impacts for First Nations.

Communications Log with First Nations

This table tracks the process component of information sharing or consultation undertaken by the proponent as delegated by the Province and should contain the factual and chronological documentation of all types of engagement and information exchanged. It is particularly important to record both verbal and written communication exchanges. It is important to attach all correspondence sent to First Nations and notes from any meeting staff may attend with First Nations.

Under Comments, describe the nature of the communication, materials shared, and result of the communication. Record specific issues in the Concerns and Accommodations Tracking Table. Insert copies of correspondence or documents as embedded objects if appropriate or include a hard copy as an appendix in the package that goes to decision makers.

Table 7: Communications Log with First Nations

First Nation	Source (e.g. who sent First Nation a letter or attended a meeting)	Medium (i.e. Phone, In Person etc.)	Date	Comments

Aboriginal Concerns and Accommodations Tracking

This table records all the critical information that arises during any proponent-led information sharing or consultation. It is designed to capture the information needed for the provincial consultation coordinator and decision makers to determine if aboriginal concerns have been recorded and appropriately accommodated.

Under Aboriginal Concerns, describe the nature, extent, and location of the Aboriginal Concern under consideration. Create a new row for each concern.

Under Analysis, briefly summarize the potential impacts including the type, severity, permanence, size, and location and how they may affect the Aboriginal Concern under consideration.

Under Potential Accommodation, summarize the proposed accommodation measures that relate to a particular impact or concern identified. Describe any First Nation views on how to address the potential impact/concern. If there are multiple potential impacts or accommodation measures for an Aboriginal

concern create a new row for each impact/accommodation measure.

Table 8: Aboriginal Concerns and Accommodations Tracking

First Nation	Consultation Stage	Aboriginal Concerns	Analysis of Potential Impact/ Concern Identified	Potential Accommodation

7.6 Potential Project Effects on First Nation Interests

This section will include an assessment and description of identified potential effects of the project that could directly affect First Nations at any phase of project development – during construction, operations, or where relevant, decommissioning. This will include a description of identified First Nations claimed or proven aboriginal rights (including title) and treaty rights in the Project setting that will be, or could be, affected by project development. It will include a summary of impact assessment findings, indicating the potential impacts identified and document any relevant non-confidential agreements with First Nations (e.g., any benefits agreement). The Application will also include a summary of mitigation and management measures proposed to manage potential effects on First Nations.

7.7 Commitments to First Nations

This section will identify key issues, concerns, and project design interests from the various First Nations (at any phase of project development, i.e., during construction, operations, or where relevant, decommissioning), and will contain a description and summary table of agreements with, and commitments to, the various First Nations. A summary of proposed management commitments including specialized and standard management practices will be included in Section 7.

8. MONITORING PROGRAMS

8.1 Construction Environmental Monitoring

The Construction Environmental Management Plan (CEMP) details the environmental practices and procedures that will be applied to and adhered to during the construction phase of the project. The goal of the CEMP is to address, prevent or manage potential environmental and socio-economic effects. The CEMP submitted in a DP is a draft that may be revised based on Provincial review and consultation with the proponent. For waterpower projects, the need to comply with the CEMP will be referenced as a condition within the water license, and a CEMP approved by the DM under the Water Sustainability Act will be required prior to provision of the Leave to Commence Construction (LCC).

Proponents should employ independent qualified environmental monitors to ensure environmental objectives and legal obligations are being met. Monitors must be given the authority to modify or alter activities or stop work where necessary until issues of potential or actual environmental damage are resolved.[31]

CEMP may include, but is not limited to, the following information:

1. Air Quality and Dust Control Plan
2. Noise Management Plan
3. Surface Water Quality Plan
4. Erosion and Sediment/ Soil Management Control Plan
5. Contaminated Sites
6. Hazardous Materials Management Plan
7. Solid Waste Management Plan
8. Spill Prevention and Emergency Response
9. Archeological Monitoring Plan
10. Habitat Mitigation/Compensation Plan
11. Landscape Design and Restoration Plan
12. Ungulate Winter Range/ Mountain Goat Monitoring Plan
13. Access Management Plan
14. Human-Wildlife Conflict Management
15. Metal Leaching/Acid Rock Drainage (ML/ARD) Management Plan

Approval of the CEMP for waterpower projects is normally undertaken after the water license has been

[31] Scope of information and reports by the Environmental Monitor, Scope of information and reports by the Independent Engineer

granted, since many of the essential details required in these plans may be unavailable until after final construction drawings have been prepared.

8.2 Operational Environmental Monitoring

The Operational Environmental Management Plan (OEMP), or alternatively the Long-term Monitoring Plan, typically comprises three types of monitoring: (1) compliance, (2) effectiveness, and (3) response monitoring. Compliance monitoring verifies compliance with conditions set forth in the permits and licenses issued to the proponent enabling the construction and operation of the project. Effectiveness monitoring evaluates the effectiveness of mitigation measures on key environmental variables and the accuracy of the environmental assessment in predicting the efficacy of measures adopted to avoid or minimize adverse environmental impacts. Meanwhile, response monitoring refers to the long-term monitoring of parameters to determine if the project is having an effect on the environment. Thus, while effectiveness monitoring examines VCs with respect to specific mitigation measures, response monitoring seeks to establish whether operation of the project as a whole is having long-term effects on VCs. More details on these types of monitoring are provided in Attachment 6.

For compliance monitoring, proponents will likely be required to provide a concise annual monitoring report that specifically confirms compliance with regulatory/permit conditions for the life of the project. For effectiveness and response monitoring, the monitoring and reporting requirements will likely be more flexible. Typically, the OEMP will describe monitoring to be conducted on key parameters over an initial period of 5 years, with the objective being to confirm that licensed operations do not result in unacceptable impacts to specified VCs and habitat parameters. The monitoring program is then reviewed to determine which parameters require ongoing monitoring. For reliable comparisons to be made, the OEMP requires that the collection of post-construction monitoring data follows the same methodology as used for baseline data collection. The baseline data set also provides information on species VCs and habitat that acts as the foundation for the impact assessment within the DP. DMs typically require a draft plan and possibly substantial completion of the OEMP with the majority of baseline data collection completed. This is typical for components of the monitoring program which require complex and time-consuming data analysis.

For waterpower projects, Hatfield et al. (2007) provides relevant guidelines. Monitoring guidelines also exist for wind power projects: Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds. (Canadian Wildlife Service, Environment Canada, 2007).

9. FEDERAL REQUIREMENTS

When preparing a DP, proponents are often considering and addressing Government of Canada requirements. Federal employees have reviewed and provided input to the draft provincial DPIR and where federal requirements are known, a list of these is provided in Attachment 4.

Summarize the federal requirements associated with the project and include information on the status of each requirement and the appropriate federal contact person. It is recommended that you provide the information in a table for easy reference.

Table 9: Federal Requirements

Agency	Nature of Authorization/ Approval requested	Status	Comments	Contact
Example1: Fisheries and Oceans Canada	*Authorization for HADD/ Operational Statements*	*Submitted Oct-02-2011*	*Operational Statements will be followed, Authorization not required*	*Joe Smith, DFO Smithers* *Phone/ Email*

10. SUMMARY OF COMMITMENTS AND CONCLUSIONS

10.1 Summary of Project Commitments

Include a summary Table of Commitments, including timing of each action and the responsible party for addressing each of the actions for which a commitment has been made. The summary should include all the significant impact management commitments in the DP, including commitments to meet specified standards as well as special management practices and design features, organized by impact topic. This table should also include commitments that the proponent is required to meet to comply with a federal or provincial Environmental Assessment Certificate, subject to any amendments or modifications as a result of provincial decisions. This Table of Commitments will form part of the Land Act tenure agreement and will be used to monitor compliance.

Table 10: Sample Template for Table of Commitments

Details of Commitment/ Action	Target Date for completion/ milestones	Agency Requiring Action (e.g. MOE)	Proponent's Project Lead and contact information	Status/ Comments

10.2 Concluding Remarks

This section will present a clear conclusion from the project impact assessment. Based on the results of the assessment, this section will provide one of the following three conclusions:

1. For the consideration of the Responsible Authorities, it is the opinion of (*Company Name Here*) that the (*named*) project is not likely to cause significant adverse environmental, socio economic/ community, First Nations, or other effects, taking into account the implementation of appropriate impact management measures, as identified in the Development Plan's "Table of Proposed Commitments,"; or
2. For the consideration of the Responsible Authorities, it is the opinion of (*Company Name here*) that the (*named*) project is likely to cause significant adverse environmental, socioeconomic/ community, First Nations, or other effects, even taking into account the implementation of appropriate impact management measures, as identified in the Development Plan's "Table of Proposed Commitments,"; or
3. For the consideration of the Responsible Authorities, it is the opinion of (*Company Name here*) that it is uncertain at the time of the review whether or not the (*named*) project is likely to cause

significant adverse environmental, socioeconomic/community, First Nations or other effects, taking into account the implementation of appropriate impact management measures, as identified in the Development Plan's "Table of Proposed Commitments".

REFERENCES

To be completed by the proponent.

GLOSSARY OF TERMS

Term	Definition
7Q10	The lowest stream flow for seven consecutive days that would be expected to occur once in ten years (7 day low flow within a 10 year return frequency).
Anadromous	Refers to fish that spend most of their life in saltwater but migrate to freshwater to spawn. Salmon, trout and Arctic char that live in the ocean are prime examples of anadromous species.
Ecological Threshold	The value for a given performance measure that indicates the attainment of desired future condition (i.e., objective has been met). This will be informed by literature review, recovery teams, recovery strategies, etc.
Headpond	Headpond is storage of water that has a STATIC water level so as to create sufficient haed (pressure) to allow production of electricity. No water licence is issued for this purpose. Flooding of crown land associated with headponds is authorized under the Land Act.
Operational Statements	Documents developed by DFO for Proponents that provide nationally consistent advice on standard measures to apply to selected activities that are low risk to fish habitat.
Performance Measure	Measurable element related to the VC(s) that indicates the degree to which objectives are being achieved (METRIC). A good performance measure is measurable, precise, consistent, and sensitive to change.
Qualified Professional	An applied scientist or technologist specializing in a relevant applied science or technology who, through demonstrated suitable education, experience, accreditation, and knowledge relevant to the particular matter, may be reasonably relied on to provide advice within their area of expertise, and who, in British Columbia is registered with their appropriate professional organization, and acting under that association's Code of Ethics and subject to disciplinary action by that association.
Residual Effects	An environmental effect that remains, or is predicted to remain, even after mitigation measures have been applied.
Storage	Storage reservoir is storage of water which has fluctuating water levels and the stored water is used to generate electricity during low flow periods. A water licence is required for the amount of water used from storage. This storage water licence authorizes any works i.e. dam. Flooding of crown land associated with storage to generate power is authorized under a Permit over Crown Land (PCL) issued under the Water Act. So, it is important that the waterpower development plan explain clearly HOW the “stored” water is being used in a power Project.
Works:	Any activity that results in alteration of Crown land or resources. "Works" as defined in the Water Act, means 1) anything capable of or used for a) diverting, storing, measuring, conserving, conveying, retarding, confining or using water, b) producing, measuring, transmitting or using electricity,

Term	Definition
	c) collecting, conveying or disposing of sewage or garbage, or (iv)preventing or extinguishing fires, 2) booms and piles placed in a stream, 3) obstructions placed in or removed from streams or the banks or beds of streams, 4) changes in and about a stream, 5) access roads to any of the works referred to in paragraphs (a) to (d), and 6) except in Parts 2 and 3, unless made applicable by a regulation under section 1.1, a) wells, b) wellheads, c) anything that can be or is used for injecting or otherwise adding water or any other substance to a well, d) anything that can be or is used to construct a well, deactivate a well or close a well, e) anything that can be or is used for exploring for, testing, extracting or monitoring ground water, f) anything that can be or is used for disinfecting a well, g) an injection system attached to a work that is used for conveying, from a well, ground water that will be used for applying fertilizers or pesticides, h) anything that can be or is used in relation to a monitoring well or a well made for the purpose of ground water remediation, and i) access roads to wells.

APPENDIX 1: PROVINCIAL PERMITS, PROCESS, AND PURPOSE

Statute	Agency	Authorization	Purpose
Agricultural Land Commission Act	Agricultural Land Commission	Non-Farm Use/ Exclusion	Approval to use land that is designated within the Agricultural Land Reserve for a clean energy project may require an application for Non-Farm Use under the ALC. ALC Applications
Dike Maintenance Act	WLRS	DMA approval	Approval to construct new dikes or change existing dikes may require approval under the Dike Maintenance Act. Dike Maintenance Act approvals
Drinking Water Protection Act	Local Health Authority (LHA)	Construction Permit, s.6 and Operating Permit, s.7	Authority to commence construction, installation, alteration or extension of a water supply system. Required for commissioning of a new water system and also for every structural or mechanical change to an existing water system that may occur over time, but not required for routine maintenance. Construction, installation, alteration, or extension of any part of a water supply system without a valid Construction Permit is an offence under s. 45 of the Act. Search "water supply" on the home page of each Health Authority: Regional Health Authorities Example from Northern Health Authority
Environmental Assessment Act	EAO	EA Certificate	Required prior to undertaking any activity on a reviewable project. Provides an integrated process for identifying and evaluating a project's potential adverse effects (environmental, social, health, heritage, and economic) and avoiding or mitigating any such effects where practicable. Ensures issues and concerns of public, First Nations, stakeholders and government agencies are considered. Comprehensive and efficient environmental assessments result in well-informed and timely decision-making that supports sustainable development. Environmental Assessment Office
Environmental Management Act	ENV	Various, depending on activity	Authority to release waste into the environment. Includes air contaminants, effluent, fuel storage, garbage, hazardous waste, sewage. Waste Discharge Authorizations
Fisheries Act	ENV	Various	Natural Resource Online Services
Fish Protection Act	ENV	Various	Natural Resource Online Services

Statute	Agency	Authorization	Purpose
Forest Act	FOR	Occupant Licence to Cut	Authority to cut and remove trees. Examples include: CEP site, access roads and power lines, widening of access road(s) for permanent access and/or the power lines. Please note that in many cases Timber Cruising cannot be done during winter months. Occupant Licence to Cut
Forest Act	FOR	Special Use Permit	Authority to use a new or existing road to access CEP area. Special Use Permit Resource road safety Information
Forest and Range Practices Act	FOR	Various	Information on the designations under FRPA that could affect the Project, including Ungulate Winter Range Wildlife Habitat Areas, Old Growth Management Areas.
Heritage Conservation Act	FOR	Various	Archaeology assessments and studies Table comparing archaeological studies and permits
Integrated Pest Management Act	ENV	Use of pesticides	General information on pesticides and pest management
Land Act	WLRS	Investigative Licence, Licence of Occupation, etc.	Guidance on Investigating Clean Energy and obtaining land tenure (such as a Licence of Occupation). Application portal: Natural Resource Online Services Detailed information is available for Waterpower, Wind Power and Ocean Energy project applications.
Public Health Act –	MOH	Various	Permitting required for Industrial Camps.
Transportation Act	MOTI	Access Permit, Utilities Permit	Highway Use Permits Access Works Highway Permits and Approvals Manual Utility Policy Manual

Statute	Agency	Authorization	Purpose
Water Sustainability Act	WLRS	Water Licence	General information about the WSA and authorizations Water Licenses (section 7, 9) Use Approvals (section 10) Change Approvals (section 11) - changes in and about a stream Dam Safety Regulation and Dam Safety
Wildfire Act	BC Wildfire Service	Burn Registration	Registration is required for Category 3 fire.
Wildlife Act	FOR	Wildlife and Fish Permits	General Wildlife Permit Scientific Fish Collection Activities in a Wildlife Management Area (WMA)

APPENDIX 2: PRIVATE/FEDERAL LAND REQUIREMENTS

If the project is located wholly on private or federally controlled land but still requires multiple Provincial authorizations, please provide the following details:

1. For federally controlled land, provide a list of the federal authorizations that need to be considered for the Project, and a contact list of federal employees who are engaged in the project.
2. A list of Provincial approvals needed to complete the project.
3. Complete list (names, contact information, legal description) for all **private properties directly affected** by the project (i.e. properties that will contain any works, transmission lines, pipelines, crossings or development associated with the project.
4. Description of the **arrangements with private landowners** to use the land for the project, or components of the project (signed letters of authorization from landowners, registered easements, rights of way, etc.). Please indicate whether the authorization to use private land expires upon change of ownership.
5. Discuss whether any **expropriation of private land** is required for the project. If expropriation is proposed/ required, discuss the steps that will be taken to complete expropriations, including public consultation, landowner compensation, etc.
6. Copies of the correspondence issued to all property owners notifying them of the proposed project and providing opportunities for their input. Please note that “affected property owners” include any private landowner whose property is physically impacted by the proposed water licence.
7. Known **water users downstream** with consideration to effects on their water usage, interruption, compensation, and notification.
8. Discussion of the project’s potential implications with respect to **riparian rights** for any landowners. Examples of impacts to riparian rights include alteration of flows, erosion, or accretion impacts.
9. Discussion of the project’s potential implications with respect to **existing water rights**. This includes discussion about how other existing water licensees may be affected by the proposed project. For example, access to water during time of shortage.
10. Confirmation the project meets the Official Community Plan land use designation and zoning bylaw regulations of the applicable local government. Discuss the zoning requirements with respect to minimum setbacks to property lines; maximum structure height; maximum parcel coverage; riparian area regulations and setbacks to watercourses.
11. Discuss whether the project requires approvals from the local government and list the status of any applications associated with the project (e.g. building permits, zoning amendments, development permits, etc.

APPENDIX 3: SAMPLE MATRIX OF PROJECT ACTIVITIES AND VCS

PROJECT PHASE	Valued Component																		
	Atmospheric Environment	Socio-Economic			Forest and Range				Terrestrial Environment		Geophysical Environment				Aquatic Environment				
	Air quality	Sites of archaeological significance	Navigation, Transport, and Access	Human health and Safety	Forest Health	Invasive Plants	Forest Resource Features	Range and Forage	Wildlife and Wildlife Habitat	Rare Plants, Plant communities Ecosystems at Risk	Physical Geography and Topography	Surface Hydrology and Hydrogeology	Geotechnical / slope stability	Geomorphology	Aquatic Habitat	Aquatic Vegetation	Water Quality	Aquatic Fauna – Fish and Fish Habitat	Aquatic Fauna – Other Aquatic Species
CONSTRUCTION																			
Activity 1 (e.g.: Excavation)				■			■	■	■	■	■	■	■	■	■	■	■	■	■
Activity 2 (e.g.: Blasting)	■																		
OPERATION																			
Activity 1 (e.g.: Flow Diversion)			■	■											■	■	■	■	■
Activity 2 (e.g.: Ramping)			■	■					■						■			■	■
DECOMMISSIONING																			
Activity 1 (e.g.: road decommissions)			■	■					■	■	■	■	■				■		
Activity 2 (e.g.: Excavation)			■	■					■	■	■	■	■	■	■	■	■	■	■
	■	Shade boxes where potential interaction exists with a magnitude that warrants inclusion in the EA / SEA																	

APPENDIX 4: RESIDUAL IMPACT ASSESSMENT TABLE TEMPLATE

Valued Component	Project Activity/ Interaction	What mitigation measures are required?	Would the effect be significant with the application of identified mitigation?						Significance of Residual Effects	Level of Confidence
			Geographic extent	Duration & Frequency	Magnitude	Probability	Reversibility	Context		

APPENDIX 5: REGION-SPECIFIC REQUIREMENTS

Specific requirements for special studies in the Regions.

Placeholder for maps/tables that indicate special requirements for certain parts of the province. For example, a map can indicate areas where specific Mountain Caribou studies are required and direct proponents to focus on certain regionally significant wildlife.

As results of specific pilots or studies become available this attachment can be populated or updated.

ATTACHMENT 1: INSTRUCTIONS TO DESCRIBE UNSURVEYED CROWN LAND

1. The point of commencement, for unsurveyed parcels, should be described in terms of an existing survey post. e.g. 18 metres west of the S.E. corner of the parcel) or a readily identifiable geographic feature (e.g., a prominent point of land or intersection of two roads) to enable accurate location of the parcel.
2. Boundary lines of the area must be, as much as possible, astronomically true north, south, east and west so that a rectangular lot is formed.
3. Where the topographic features of the area do not allow for rectangular boundary lines running true north, south, east and west, then boundaries will be permitted in other directions as long as they do not interfere with the orderly survey of other surrounding land.
4. The side lines of small parcels fronting on lakes, rivers, tidal waters and on certain surveyed highways shall, where possible, be parallel to each other and perpendicular to the general trend of the features on which the small parcel fronts.
5. The sidelines for unsurveyed foreshore shall, as a general rule, be laid out at right angles to the general trend of the shore. This may be varied to suit special conditions, but encroachment on the foreshore fronting adjoining lands shall be avoided. The outside or waterward boundary shall be a straight line or series of straight lines joining the outer ends of the side boundaries. On narrow bodies of water the outside boundary shall not normally extend beyond the near edge of the navigable channel.

1 hectare = 2.471 acres

1 metre = 3.281 feet

100 metres x 100 metres = 10,000 square metres or 1 hectare

ATTACHMENT 2: LINKS TO IMPORTANT DOCUMENTS

Below are hotlinks for websites, guidelines, and studies referenced in the DPIR.

Please note: some statutes are listed here for reference when preparing specific sections of the Development Plan. Proponents are advised to review the statute listing in Appendix 1 for more details on application processes.

PROPONENT GUIDANCE
Clean Energy Production in BC Inter-Agency Guidebook for Project Development
Land Use - Clean Energy
1 PROJECT SUMMARY
B.C Environmental Assessment Office
B.C. Environmental Assessment Office – Reviewable Projects Regulation
B.C. Environmental Assessment office – User Guide
Canadian Environmental Assessment Agency
2 PROJECT DESCRIPTION
Hatfield, A. A. Lewis & S. Babakaiff (2007). Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower projects in British Columbia.
3 SCOPE OF ASSESSMENT
Natural Resource Best Management Practices
4 ENVIRONMENTAL ASSESSMENT
Environmental Mitigation and Offsetting Policy for British Columbia
Guidelines and Best Management Practices (BMPs)
Scientific Fish Collection Permit
Wildlife Permit
Resources Information Standards Committee (RISC)
Water Licences and Approvals
4.1 Aquatic Environment
Requirements and Best Management Practices for Making Changes in and About a Stream in B.C.
DFO Projects Near Water
Hatfield, A. A. Lewis & S. Babakaiff (2007). Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower projects in British Columbia.

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Field Supplement to Evaluating the Condition of Streams and Riparian Management Areas (Field Guide) - 2009
Water Sustainability Act
Riparian Areas Protection Act
Resource Information Standards Committee (RISC) - Aquatic Ecosystems
Provincial Conservation Framework
Species At Risk Registry
Provincial Conservation Framework
Fish and Fish Habitat Data and Information
Species At Risk Registry
Species and Ecosystems at Risk
Species at Risk - BC Recovery Planning
Species at Risk - Federal Recovery Strategies
Species at Risk - Federal Management Plans
Water Quality
BC Field Sampling Manual
Environmental Monitoring System (EMS)
Water Quality Reference Documents
Water Quality Guidelines
Water Quality Objectives
Water Data and Tools
RISC 2003. Ambient Freshwater and Effluent Sampling
RISC 1998. Guidelines for Designing and Implementing a Water Quality Monitoring Program in British Columbia
4.2 Atmospheric Environment
BC Field Sampling Manual
B.C. Meteorological Monitoring
Air Quality Managements B.C.
Air Pollution Emissions
Air Pollution - Federal
Air Quality Objectives and Standards
RISC Atmosphere and Air Quality Ecosystems Standards.

4.3 Geophysical Environment
Hatfield, A. A. Lewis & S. Babakaiff (2007). Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower projects in British Columbia.
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RISC. 2018. Manual of British Columbia Hydrometric Standards
Snow Survey Data
Water Survey of Canada hydrometric stations
Hydrological Guidelines for Waterpower Projects
B.C. Dam Safety
Pacific Climate Impacts Consortium: Regional Analysis Tool
Wetlands in BC
Wetlands of British Columbia: a guide to identifications
Channel Assessment Procedure Field Guidebook
Channel Condition and Prescription Assessment (Interim Methods)
Geological Survey of Canada (GSC)
BC Geological Survey (BCGS)
Soil
Terrain Mapping
Metal leaching and acid rock drainage (ML/ARD)
BCGS MapPlace
BCGS Assessment Reports (ARIS)
Ministry of Energy and Mines - MINFILE Mineral Inventory
BCGS Geology
4.4 Terrestrial Environment
Draft B.C. Biodiversity and Ecosystem Health Framework (2023)
Boyce, M.S., P.R. Vernier, S.E. Nielsen, and FKA Schmiegelow. 2002. Evaluating resource selection functions. Ecological Modelling 157: 281-300.
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Species at Risk: Recovery Strategies
Forest and Range Practices Act
Guidelines and Best Management Practices (BMPs)
Identified Wildlife Management Strategy (IWMS)
Land Use and Management Plans
Migratory Birds Convention Act
Provincial Conservation Framework
Provincial Species at Risk Recovery Planning
Species at Risk Act (SARA)
Species At Risk Registry
Wildlife Data and Information
Vennesland, R. and K. Welstead (2009). Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia
Wildlife Act
Wildlife Habitat Features
Recommended Protocols for Monitoring Impacts of Wind Turbines on Birds
Best Management Practices - Guidelines for Bats in British Columbia - Chapter 4: Wind Power Developments (February 2016)
B.C. Conservation Data Centre
Protocols for Rare Vascular Plant Surveys
Federal Policy on Wetland Conservation
GeoBC
Mackenzie and Moran (2004). Wetlands of British Columbia: A guide to identification.
Ecosystem Mapping
Sensitive Ecosystems Inventory (SEI)
Species at Risk Act (SARA)
Wildlife Data and Information
Vennesland, R. and K. Welstead (2009). Guidelines for Dealing with Development Effects on Species and Ecosystems at Risk on the South Coast of British Columbia
FRPA General Bulletin #16 Application of FRPA to Independent Power Producers, Mineral Interests and Other Occupiers of Land

Karst Inventory Standards and Vulnerability Assessment Procedures for British Columbia (RISC 2003)
Karst Management Handbook for British Columbia (B.C. Ministry of Forests, 2003)
5 Socio-economic
Municipalities in BC
Regional Districts in BC
Land Use Planning BC
Integrated Land and Resource Registry (ILRR)
Ecosystems (BC Govt)
Integrated Land and Resource Registry (ILRR)
Resource Information Standards Committee (RISC)
Statistics Canada
WLRS Land Use - Water Power
Transport Canada - Navigational Protection Program
Clean Energy Projects - Requirements for Planning, Design and Construction to Protect Forest Roads and Timber Tenures (Rev 2)
Resource Roads in BC
Transport Canada. Works on Navigable Waters
7 FIRST NATION INFORMATION REQUIREMENTS
Contacts for First Nations Consultation Areas Database
Indigenous Services Canada: The Community Well-Being (CWB) Index
Ministry of Indigenous Relations and Reconciliation
Engaging First Nations: Proponent Resources
Nisga'a Final Agreement and Background Information
Treaty 8 First Nations
8 MONITORING
Develop with Care 2014: Environment Guidelines for Urban and Rural Land Development in British Columbia
Guidelines for metal leaching and acid rock drainage at mine sites in British Columbia
Hatfield, A. A. Lewis & S. Babakaiff (2007). Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small hydropower projects in British Columbia.
Recommended Protocols for Monitoring Impacts to Wind Turbines on Birds.

ATTACHMENT 3: DFO REQUIREMENTS

The following information is included here for information only and may not be current. Proponents are advised to contact the federal Department of Fisheries and Oceans (DFO) directly to discuss federal requirements for the project.

Fisheries and Oceans Canada in the Pacific Region

Fisheries and Oceans - Habitat Management Program Pacific Region has a website designed to help people undertaking projects in and around water understand what they need to know and do to comply with the federal Fisheries Act.

The website is one component of a broader referral improvement initiative DFO has undertaken to: increase client access to regulatory process information; improve efficiencies and facilitate more effective interagency referral management processes and better support existing streamlined joint project review partnerships.

The website outlines the DFO regulatory review process for works in and around water and provides step wise instructions for the public on navigating the DFO review, approval, and authorization process. It also directs clients to Project planning and design resources to assist them in developing their Projects in a manner that will conserve or protect fish habitat.

Also included on the site is information and links for requesting a project review which is required for any project DFO is being requested to review or authorize. While submissions in this format can still be mailed or delivered, clients are also able to submit applications electronically. Referrals should be directed to the appropriate DFO referral centre and electronic submissions should be sent to the appropriate e-mailboxes. The boundaries for DFO referral centres can be found on their website.

DFO is coordinating with FrontCounter BC to ensure that proponents proposing projects near water are informed of the website.

Furthermore, proponents should be aware that DFO may require sampling beyond RISC standards in order to identify fish presence, in addition to fish abundance and habitat utilization. Sampling in steeper gradient habitats can be very difficult and possibly costly and may require different sampling techniques (e.g. float assessments, possibly even fish counting weirs). For instance, to obtain information on spawning and incubation locations and timing may take additional efforts. This information may be required in order to properly identify and assess impacts and for future monitoring of effects.

Proponents should be aware of the possible costs to obtain this information.

ATTACHMENT 4: LINKS OF INTEREST

Provincial and Federal Databases
Biodiversity/Environmental Information Resources System for Biodiversity
Species and Ecosystems at Risk
BC Conservation Data Centre
BC Species and Ecosystems Explorer
CLIR (Cross-linked Information Resources)
Conservation Framework
Fisheries Inventory Summary System (FISS)
Forest Range Practices Act (FRPA) information
EcoCat: The Ecological Report Catalogues
Fisheries Inventory Data Queries (FIDQ)
Forest Inventory
GeoBC
Habitat Wizard
iMap BC
Sensitive Ecosystem Inventory
Soils
Species Inventory Database (SPI)
Terrain Mapping
Water Survey Canada (WSC)
Federal Websites of Interest
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)
Environment and Climate Change Canada (Air, Water, Climate, Environmental Indicators, Pollution)
Fisheries and Oceans Canada Pacific Region, General Information
Impact Assessment Agency of Canada
Navigable Waters Protection Act
Navigable Waters information, Transport Canada
Species at Risk Act
Species at Risk Registry

ATTACHMENT 5: RECOMMENDED FACTORS TO ASSESS SIGNIFICANCE

Definitions **have been** taken from EAO Application Information Requirements and consistent with the analysis used in federal environmental assessments under the *CEAA.*

1. **Magnitude**: This refers to the magnitude or severity of the effect. Low magnitude effects may have no impact, while high magnitude effects may have an impact.
2. **Geographic Extent**: This refers to the extent of change over the geographic areas of the proposed project. The geographic extent of effects can be local or regional. Local effects may have a lower impact than regional effects.
3. **Duration and Frequency**: This refers to the length of time the effect lasts and how often the effect occurs. The duration of an effect can be short term or long term. The frequency of an effect can be frequent or infrequent. Short term and/or infrequent effects may have a lower impact than long term and/or frequent effects.
4. **Reversibility**: This refers to the degree to which the effect is reversible. Effects can be reversible or permanent. Reversible effects may have lower impact than irreversible or permanent effects.
5. **Context**: This refers to the ability of the environment to accept change. For example, the effects of a Project may have an impact if they occur in areas that are ecologically sensitive, with little resilience to imposed stresses.
6. **Probability**: The likelihood that an adverse effect will occur in circumstances where it is not certain that the effect will materialize.

ATTACHMENT 6: DEFINITIONS OF ENVIRONMENTAL MONITORING

Compliance monitoring verifies compliance with conditions set forth in the permits and licenses issued to the proponent enabling the construction and operation of the project. This could include, for example, monitoring compliance of instream flows and ramping rates for a waterpower project. In this instance, data are to be submitted to the province annually, and monitored continuously by the proponent such that any non-compliance with the permitted instream flow is identified, acknowledged, and resolved. Non-compliance reports will likely also be required as a condition of the water license, so that any issues are brought to the attention of the relevant regulatory agencies in a timely manner. Details of the monitoring required to enable accurate reporting on compliance with permit and license conditions will be included either in the Construction Environmental Management Plan (CEMP) or Operation Environmental Monitoring Plan (OEMP), depending on the project phase.

Effectiveness monitoring evaluates the effectiveness of mitigation measures on key environmental variables and the accuracy of the environmental assessment in predicting the efficacy of measures adopted to avoid or minimize adverse environmental impacts. Effectiveness monitoring is integral to successful environmental impact assessment under a "results-based" management framework, as it enables regulatory agencies to assess the effectiveness of different mitigation measures. Effectiveness monitoring results can then be carried forward to future impact assessments to improve predictions on the magnitude and extent of impacts. The mitigation measures employed during construction and operation of clean energy projects will vary based on the project, location, VCs etc. However, for example, effectiveness monitoring for a wind power project will evaluate how effective mitigation measures are in reducing bird and bat mortality from turbine strikes. Details on effectiveness monitoring will be described in the OEMP.

Response monitoring refers to the long-term monitoring of parameters to determine if the project is having an effect on the environment. Thus, while effectiveness monitoring examines VCs with respect to specific mitigation measures, response monitoring seeks to establish whether operation of the project as a whole is having long-term effects on VCs. Response monitoring requires repetitive and systematic sampling to establish empirical links between project development and operation and any impacts on the environment. Response monitoring therefore benefits from a rigorous understanding of pre-project baseline conditions and natural variations. A year or two of pre-construction data collection is recommended to allow for a before-after-control-impact (BACI) design.

It is recommended that proponents include a number of different VCs in the monitoring program, including the priority VCs identified by the province in section 4. If additional species are proposed: a) select candidates based on ability to represent other species (ecological indicators); b) select candidates based on sensitivity to disturbance caused by the proposed development. All details on response monitoring are to be included in the OEMP.

Examples of response monitoring would include monitoring of impacts on bird or bat populations in the

area surrounding a wind power project, and monitoring of fish populations to ensure there are no long-term effects of reduced flow or entrainment associated with a waterpower project.

ATTACHMENT 7: ADDITIONAL CONSIDERATIONS FOR CROWN LAND RESOURCES

(Supplemental to **section 5.2** and **5.3**)

Crown Timber Resources

If the project has the potential to impact Crown Timber resources, please consider addressing the following:

1. Has there been communication with all affected forest tenure holders, including BCTS and First Nations who have Forest and Range opportunity agreements?
2. Have specific consideration of power line clearances along logging roads been included? Proponents may wish to keep pole heights as low as possible, but this transfers costs to forest licensees.
3. Have any potential tenure impacts and/or impacts to forest obligations (e.g. Cutting Permits (CPs), Forest Stewardship Plans (FSPs), silviculture investments, etc.) been identified and quantified?
4. Have the following timber supply impacts been quantified:
    - Any isolation of timber
    - Removal of forest land (including species, productivity, value, merchantability)
    - Displacement effects (e.g. if a "special management area" is impacted and is subsequently required to be moved onto the productive forest land base), and
    - Impacts to forestry tenures.
5. Are there any significant changes to delivered wood costs, including but not limited to:
    - Increasing haul times
    - Loss of helicopter harvesting opportunities (due to transmission lines)
    - Water access concerns (note: delivered wood costs include the costs of accessing and harvesting timber and delivering it to a mill and can be increased due to timber isolation or insufficient pole heights at road crossings, or decreased if roads are upgraded)
6. Discuss how the Project will minimize the permanent "footprint" of the unproductive lands created by land clearing for the CEP Project and identify and describe revegetation opportunities that include reforestation.

Also, please review FRPA General Bulletin #16: Application of FRPA to Independent Power Producers, Mineral Interests and Other Occupiers of the Land. This bulletin identifies a number of considerations, including some legally required forest practices that must be considered by proponents and addressed in the DP.

Commercial Tourism / Outdoor Recreation Resources

If the project has the potential to impact commercial tourism or outdoor recreation resources, please consider addressing the following:

1. Describe the commercial tourism and outdoor recreation activities practiced in the study area including ecotourism, adventure tourism, backcountry tourism, sport and recreational hunting and fishing activities, guiding, trapping, outdoor activities (e.g. canoeing, kayaking, sailing, hiking, camping, mountain climbing, wildlife viewing, scuba diving), viewing sites of historical interest and resorts.
2. Identify the areas within the study boundaries that are of special recreational interest. Outline the number of persons practicing these activities, the sites used, the frequency and duration of the activities, the period of the year, the practices and expectations of users, as well as the economic contributions to Aboriginal and local communities. For sport hunting and fishing activities, the description will also include the species sought and, where possible, the hunting and fishing success.
3. Describe the existing infrastructure in place which makes it possible to practice these activities and identify the stakeholders operating recreational-tourism enterprises in the study area. The various organizations involved in tourism and commercial recreation development of the region will be identified including, if possible, the location and description of their development.

End of Document.