Chapter 4

Completing Activity Details

4. Completing Activity Details

This chapter provides a comprehensive walk through of the Regulator's requirements for completing the activity details in the Application Management System. Each section of this chapter provides an overview of activity, definitions and technical requirements for the activities listed below. Each section corresponds to the activity tab in AMS. Activity-specific requirements (and corresponding section number) includes:

- 4.1 Well
- 4.2 Pipeline
- 4.3 Facility
- 4.4 Geophysical
- 4.5 Road
- 4.6 Associated activity
- 4.7 Short-term water use
- 4.8 Changes in and about a stream

Activity-specific tabs are only activated once a new (or amendment) application is created and is based on the activity (or activities) chosen when creating a new application. In addition, the Application Management System is designed to pull geographic location and coordinates from the spatial data uploaded during the application creation stage which triggers activity and land information. A globe symbol references spatially derived information from the spatial files uploaded.

Additional supplementary information to support the activity may be required depending on the type of activity, location and engineering and technical details provided in the activity tab. The application information tabs are visible and the validation tool will assist in ensuring all components of the application are completed. The requirements for the application information tabs are detailed in Chapter 5 of this manual.

Chapter 4.1 Completing Well Activity Details

4.1 Well Activity Tab

Applicants applying for a well permit or a geothermal well permit must complete the well activity tab in the Application Management System. The well tab is made up of three components: well area overview, well details (further broken down to include well specifications, well hazard, flaring and exemption sections) and well land details.

This chapter is separated into two sections: ERAA Wells and Geothermal Wells including an overview of well permitting, guidance regarding well planning and design, details related to well-specific application requirements and detailed instructions for completing the data fields of the wells tab of the Application Management System.

Please Note:
This manual is written as a whole and provided to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

ERAA Wells

4.1.1 Wells Defined

Wells are an energy resource activity as defined in ERAA, and are specifically defined in the Petroleum and Natural Gas Act as:

A hole in the ground:

a) Made or being made by drilling, boring or any other method to obtain petroleum or natural gas.

b) Made or being made by drilling, boring or any other method to explore for, develop or use a storage reservoir for the storage or disposal of

petroleum, natural gas, water produced in relation to the production of petroleum or natural gas, waste or any other prescribed substance.

c) Used, drilled or being drilled to inject natural gas, water produced in relation to the production of petroleum or natural gas or other substances into an underground formation in connection with the production of petroleum or natural gas.

d) Used to dispose of petroleum, natural gas, water produced in relation to the production of petroleum or natural gas, waste or any other prescribed substance into a storage reservoir, or

e) Used, drilled or being drilled to obtain geological or geophysical information respecting petroleum or natural gas.

And includes a water source well.

Approved energy resource applications receive a permit under Section 25 of ERAA to carry out construction and operations pertinent to the activity. The permit expires where construction activities have not started within two (2) years of permit issuance. Unless expired, the permit remains active until cancelled, suspended or declared spent, according to the provisions of ERAA.

Well Names

Well names are generated by, and populated into, AMS automatically when spatial data is uploaded. Well names are based on information gathered at the application stage and formatted as follows:

- Company abbreviation – working interest partner(s) abbreviation – well profile – oil and gas field name – legal location or NTS/DLS legal location, including exception codes.

Each well must have a unique legal location. All wells must use the defined NTS or DLS legal location as per the Petroleum and Natural Gas Grid Regulation. After the first well within a quarter unit in the PNG grid system or within a legal subdivision in the DLS system, additional wells must be distinguished from each other with an exception code. Exception codes must be entered into AMS manually to differentiate between multiple wells at a single legal location.

- The 2nd well is identified with exception code “A”, the third well is identified with exception “B” and continues through to exception code “Z”. Sequencing then continues with exception code “AA, then AB and AC through to AZ, followed with BA, BB, BC, etc.

- Once an exception code and legal location has been recorded against a permitted well, that same exception code and legal location cannot be used on another proposed well.

Depending on the number of wells in a quarter unit or legal subdivision; and depending on the order in which wells were applied for, exception codes may not be sequential on a single wellpad. Scenarios may include:

- One wellpad that spans into different NTS or DLS legal locations where wells already exist.
- Multiple wellpads in the same quarter unit or the same legal subdivision where wells already exist.

Exception codes do not have to be in sequence based on the order in which the permit holder plans to drill them.

Oil and Gas Field Name: AMS will spatially derive the oil and gas field name or display "not found" if the well location is not located within a defined field. When "not found" displays, applicants may select the nearest appropriate field from the oil and gas field name drop-down list or enter the nearest geographical location. To enter a field name that is not available in the drop-down list, select "Other Areas" from the list and type the name in the 'specify area' text field.

Well names are issued by the Regulator at the time of permit issuance. Once permitted, the Regulator will not re-name wells or re-organize exception codes to accommodate drilling activities.

Final locations in well head surface coordinates must be reported in the eSubmission portal using the As-Drilled Survey Plan process. If the final UTM coordinates result in the well head being drilled in a different NTS or DLS grid, the permitted legal location and well name will be updated to reflect the drilled NTS or DLS legal location using the next available exception code. Refer to the Oil and Gas Activity Operations Manual for further information on the As-Drilled Survey Plan requirements.

Well names can not be renamed to be in sequential order and exception codes will not be re-assigned according to drilling sequence.

4.1.2 Creating a New Well Activity Application

New Well Applications

A new well permit is required for any new well to be constructed and operated, including re-entering wells which have been previously issued a certificate of reclamation.

An application may include a single or multi-well application and may be submitted with other energy resource activities. The system generates data input requirements for additional wells based on the well-points specified within the spatial data upload. Where multi-well pads are planned, the Regulator encourages applicants to submit the all the wells together in one application.

In situations where a new well application is being applied for on an existing wellpad, but additional land is required, an applicant has two options:

Option 1 - Submit a new well application that includes the “additional” land area. The “additional” area must be adjacent to the existing “permissioned” area. The “additional” area will be assigned its own new land id resulting in two land id’s for one wellpad. The Regulator will not merge the new land id for the “additional” area with the existing permissioned land id.

Option 2 - Submit an amendment to the original permit to modify the wellpad area. A replacement polygon may be submitted for the entire wellpad area to be captured under one land id. After the amendment application has been approved, the applicant can then submit a new application for the well on permissioned land.

Well Permit Amendments

A well permit amendment is required for changes to approved well permits as outlined in the following scenarios. Approval of a permit amendment is required before the associated changes are carried out. Amendment scenarios include:

- Surface footprint (surface disturbance) is changed.
- Change in well type (for example from Production to Disposal)
- Change in BHL with attendant changes in well profile such that the well name adds or deletes "HZ".
- Adding (drilling) a new bottom hole location to a well that has previously been drilled and rig released. This can include lengthening the depth, window cutting, or O/H sidetracking from an existing wellbore.
  Note: an Engineering Data Sheet must be submitted with the amendment application as an "Other Attachment".

The following minor well changes do not require an amendment, and can be submitted as a notification providing the well permit includes the notification permission and:

a) prior notice of the change is provided, in the form and manner the BC Energy Regulator requires;
b) notice of the change, other than for changes to the maximum volume and H2S content of gas to be flared, is provided to the Regulator not less than 7 days in advance of the change taking effect;
c) there is no substantive impact to any aspect of the activities that was included in the consultation;
d) The well activities continue to meet all regulatory requirements and applicable standards.

Well Hazard Planning

- Sour Formations, and Maximum H2S Concentration (%) therein
- H2S Release Rate (Maximum Cumulative Drilling, Maximum Completion, Maximum Applicable)
- EPZ Distances (Calculated Drilling, Calculated Completion, Effective)
- Critical Features, and # within Effective EPZ

Bottom Hole Details

- Formation at Total Depth
- Expected Total Depth (TVD, MD) (m)
- BOP Class
- Objective Formation
- Objective Depth (TVD, MD) (m)

Well Flaring

- Flaring Objective Formation
- Maximum H2S Concentration (%)
- Requested Volume (10^3m^3)

More information on the minor well change notification process, including how to submit a notification, can be found in the Oil and Gas Activity Operations Manual.

A permit amendment is not required for the following but must be reported using the "As Drilled Survey Plan" process in eSubmission:

- Minor changes if the proposed final total depth (FTD) resulting from geological prognosis change, or minor changes in well centre coordinates.
- When relocating the well head location within the permitted wellpad.
- After drilling, final well head UTM coordinates must be reported in the eSubmission portal using the As-Drill Survey Plan process. Note: if the final UTM coordinates result in the well head being drilled in a different NTS or DLS legal location, the permitted legal location and well name will be updated to reflect the drilled NTS or DLS legal location using the next available exception code. Well names will not automatically be renamed to be in sequential order and exception codes will not be re-assigned according to drilling sequence. Refer to the Oil and Gas Activity Operations Manual for further information on the As-Drilled Survey Plan requirements.

Please Note:

Neither the working interest partner nor the oil and gas field name can be modified through an amendment application. To change the working interest partner a permit holder is required to submit a Well Name Change Notification Form to assetmanagement@bc-er.ca. Oil and gas field names are typically not changed once permitted. To request a change to an oil and gas field name, send a request to servicedesk@bc-er.ca.

Well Identification

The well must be identified by type, sequence and drilling direction.

1. Well type:
   - Gas is a well drilled for the primary purpose of extracting natural gas.
   - Oil is a well drilled for the primary purpose of extracting oil.
   - Water source is a well drilled to obtain water for the purposes of injecting water into an underground formation in connection with the production of petroleum or natural gas.
   - Injection is a well drilled or operated for the primary purpose of injection into a subsurface formation to increase oil recovery or the storage of natural gas. It can be either water or gas injection.

- Disposal is a well drilled or operated for the primary purpose of disposal of fluids that are a by-product of production.
- Observation is a well drilled to observe production parameters.

2. Well sequencing and exception code:
   - Each well must have a unique legal location. All wells must use the defined NTS or DLS legal location as per the Petroleum and Natural Gas Grid Regulation .See the Well Name section above for more information on well sequencing and exception code requirements.
3. Well drilling direction
   - Directionally drilled wells are greater than a five degree inclination for a minimum of 150 metres of measured depth.
   - Horizontally drilled wells have a greater than an 80 degree inclination for a minimum of 100 metres of measured depth.

Both injection and disposal wells require a permit to construct and complete a well. In conjunction, an additional order or permission is required under s. 75 of ERAA before a permit holder can use a particular sub-surface formation for the purpose of disposal or injection. This can be obtained via an amendment to the original permit or independently, depending on the specifics of the case. Contact the Regulator's Reservoir Engineering department for more information regarding orders allowing for injection or disposal.

Well Classification

Wells are classified as development, exploratory wildcat, exploratory outpost, discovery, special data or observation well as defined in Section 2 of the Drilling and Production Regulation. To determine the classification of a well, refer to the high resolution Schedule 2 Unconventional Zones Map available on the Regulator's website.

The Regulator may reclassify a permitted well, post approval, if a well, or a portion of a well (in the opinion of the Regulator) resulted in a discovery of prior unknown factors.

The Regulator may reclassify re-entries if a well is re-entered and a new pool is not identified. Well information obtained during the re-entry is released in accordance with the classification assigned to the re-entry event.

The classification assigned to the well is reflected on the well permit letter. It is the permit holder's responsibility to review the classification assigned and follow-up with the Regulator if there are any questions.

4.1.3 Well Planning and Design

This section provides typical planning and design requirements, guidelines and considerations when planning and designing a well for an energy resource activity application. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the well application relative to the engineering and technical information provided in AMS; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the components.

Regulatory Requirements

Well activities must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), Drilling and Production Regulation (DPR), the Environmental Protection and Management Regulation (EPMR).

If an exemption is requested from regulatory requirements, an exemption request may be submitted prior to an application, with an application, or after a permit has been issued. It must include:

- Specific regulatory provision requiring an exemption.
- Rationale for exemption (explanation of why an exemption is required).
- Proposed plan showing mitigation strategies to reduce impacts.

If exemptions are approved prior to the application, this approval must be attached to the application.

Specific well exemption considerations include:

- Inline testing is required for all new wells within 1.25 kilometres of a residence and 3.0 kilometres or less of a suitable pipeline. If an exemption is desired for a specific well, a justification for the exemption must be included with the permit application. Exemption considerations are outlined in Regulator Directive 2010-03.

Guidance Requirements

In addition to the requirements articulated in the Energy Resource Activity Application Manual, well activities should meet guidance recommendations in the following Regulator documents:

- Oil and Gas Activity Operations Manual.
- Inline Testing Directive.
- Supplementary Information for Water Source Wells.

If energy resource activities cannot adhere to the guidance recommendation then justification for a variance must be included in the permit application. Include specifics of the guidelines not followed, an explanation of why they cannot be followed, proposed plan and mitigation strategies.

Advisory Guidance

The Regional Health Authority must be contacted prior to construction of the camp sump and disposal of sump fluids before reclamation. Locations of the various Health authorities are:

- 1001-110th Avenue, Dawson Creek, B.C., (250) 719-6500.
- 5217 Airport Drive Bag 1000, Fort Nelson, B.C., (250) 263-6000.
- 10115-110th Avenue, Fort St. John, B.C., (250) 263-6000.

Other than Normal Well Spacing

Normal spacing requirements for oil and gas wells are defined within Sections 5 through 7 of DPR.

Other than normal spacing areas occur along the entire provincial boundary and along the boundary of the Peace River Block, (Township-Range survey system), where it adjoins the Petroleum and Natural Gas Grid system. Other than normal spacing areas can also occur where active tenure was surrendered up to the boundary of a newly established park or protected area. They may also be established to manage resource production more equitably.

Horizontal wells with the productive interval open in two or more normal spacing areas, and not within an approved reservoir project (good engineering practice, pressure maintenance or unitized operation), must have an approved enlarged "other than normal" spacing area prior to production.

To space wells outside of the requirements, review the Other Than Normal Spacing Application Guideline and Information Letter EMD 00-09 Other Than Normal Spacing and Target Areas for Petroleum and Natural Gas Wells.

Wells with Surface Casing Set Depth Less Than 600m

Wells with a surface casing set depth less than 600 metres require a justification indicating how the base of useful ground water was determined and how the ground water will be protected. Justifications for the planned surface casing set depth can be submitted to the Regulator via the Application Management System. For more information, refer to INDB 2016-09 Technical Guidance for Determining "Base of Usable Groundwater" on the Regulator's website.

An intermediate casing program can be used as a justification for a shallow set surface casing if the intermediate hole will be drilled with non-toxic drilling fluid and the intermediate casing is to be set deeper than 600 metres and cemented in full length.

4.1.4 Well Specific Activity Requirements

This section outlines requirements for well applications. Requirements are dependent on the characteristics of each well and are outlined in full details below including a description, details of additional information and requirements. In most cases, the details are input into the well application tab within AMS, but may require the upload of an attachment to support the details

Attachments must meet specific size and file formatting restrictions in order to be uploaded correctly as defined in Section 5.8 of this manual.

Technical and engineering well details are required for each well and include surface hole details, bottom hole details, well classification, well type and well characteristics.

For well re-entry of an active or abandoned well the Engineering Data Sheet for Re-entry must be completed and submitted with application as an "Other Attachment".

Water Source Wells Requirements

A water source well is defined in Petroleum and Natural Gas Act as:

- A hole in the ground drilled to obtain water for the purposes of injecting water into an underground formation in connection with the production of petroleum or natural gas.

A water source well permit is required before drilling or operating a water source well. Petroleum and natural gas titles are required for water source wells if petroleum or natural gas is produced. A water well drilled for the purpose of supplying water for drilling, camps, hydrostatic testing of pipelines, etc., does not classify as a "water source well" therefore does not require a well permit, but is regulated under the Water Sustainability Act.

All water source wells require well permits, however, companies wishing to explore for groundwater sources through test well drilling to depths of up to 300m on Crown land, may do so under an Investigative Use through an Associated Activity application. Following test well drilling under an Investigative Use , a water source well permit under ERAA and authorization under the Water Sustainability Act are required before any test well can be used as a water source.

Groundwater test wells drilled to depths greater than 300m on Crown land, or to any depth on private land cannot be authorized under an Investigative Use Permit, and require direct application for a well permit. Investigative Use applications are discussed in more detail in Section 4.6 of this manual.

Applicants are encouraged to consult the Supplementary Information for Water Source Wells document available on the Regulator's website for additional information regarding drilling of test groundwater wells under an Investigative Use and description of operational requirements for water source wells.

Groundwater Usage

The use of groundwater is regulated under the Water Sustainability Act and requires a water authorization (licence or approval) from the Ministry of Forests (MOF). Water licences are required to operate water source wells, unless they access "deep groundwater" as defined in the Water Sustainability Regulation. Consult the Regulator's Water Licence Application Manual.

Operators must comply with the Ministry of Environment's Ground Water Protection Regulation and the Ministry of Health's Protection Drinking Water Protection Act when using groundwater for camp water supply.

Requirements for Fracturing Operations Less than 600m Below Ground

The Drilling and Production Regulation states fracturing operations must not be conducted at a depth less than 600 metres below ground level unless the operations are permitted by the well permit. Fracture model simulation is required as part of the application if fracturing at depths shallower than 600 metres and must include a risk assessment for all potential impacts to usable groundwater resulting from the fracturing operations (where the "base of usable groundwater" is defined as per IB 2016-09). As a minimum, the fracture model simulation report must include:

- Fracture program design including proposed pumping rates, volumes, pressures, and fluids.
- Estimation of the maximum height and length of fracture propagation.
- Determination of the "base of usable groundwater" as per Information Bulletin 2016-09.
- Identification of water supply wells within 200 m of the proposed surface hole location and within 200 lateral metres of the surface trajectory of a horizontal or directional well. Include notification documentation of the water well owners of the proposed activity.
- Development of a groundwater monitoring program for the identified water supply wells that includes pre-drilling and post-fracture sampling of water wells where agreed to by the water well owners.
- Verification of cement integrity through available public data of all wells under the Regulator's jurisdiction within a 200 metre radius of the well to be fractured.

- Determination of bedrock depth.
- Assessment of the suitability and geological integrity of the candidate well for the proposed fracturing operations including casing and cement integrity.

Sour Well Formation Details

Applicants submitting a permit application for a well with an expected H_2S release rate greater than 0.01 m^3/s, must provide additional information, including H_2S release rate rationale spreadsheet and emergency planning zone (EPZ) map. Sour well formation details include:

- All expected sour zones and the corresponding maximum H_2S content.
- Estimated H_2S release rates for drilling and completions in accordance with the CAPP H_2S Release Rate Assessment Guidelines.
- Distance to nearest occupied dwelling. In remote areas, it is acceptable to indicate the distance to the nearest occupied dwelling with a greater than symbol. For example, distance to nearest occupied dwelling: greater than 4.2 kilometres. The Regulator does not require applicants to search a large radius to identify the nearest occupied residence. It is sufficient to ground truth the area out to the edge of the Emergency Awareness Zone (EAZ).

If the well is classified as a special sour well, the applicant must also submit a drilling plan. Drilling plan details include (but not limited to):

- Drilling fluid type.
- Underbalanced drilling (pressure in the well bore is lower than the fluid pressure in the formation).
- Managed pressure drilling information (an additive drilling process used to precisely control the annular pressure profile throughout the well bore).
- Sump information. A remote sump must be shown on construction plans.
- Geological information, including the extent and quality of offset data, a summary of offset hole problems and adverse drilling occurrences, an assessment of the possibility of encountering similar problems and occurrences at the proposed well, and how the problems and occurrences is dealt with.

- Description of the equipment used to drill the well including:
    1. Blowout preventer system, including a discussion as to whether blind shear rams is used and if not, an assessment or evaluation of the possible use.
    2. Drill pipe.
    3. Mud-gas separators.
    4. Drilling fluid system and equipment (type, density, quantity, hole volume, surface volume, stockpile supplies and availability, H_2S scavenger, mixing and pumping equipment).
    5. Wellhead (casing bowl, intermediate spool, valves) and casing (surface, intermediate, production).
- Description of the procedures to be followed in drilling the well including:
    1. Inspection and testing procedures ensuring all equipment is fully operational prior to the well reaching the critical depth and procedures to ensure a state of readiness is maintained.
    2. Procedures to ensure wellsite personnel are familiar with the drilling and emergency response plan, trained in the use of the drilling and safety equipment, and are proficient in blowout preventer and well control procedures.
    3. Procedures to ensure wellbore and casing integrity (directional survey, formation leak-off tests, casing pressure test, caliper logs).
- Description of the monitoring of drilling and drilling fluid parameters to be installed ensuring drilling occurrences (kicks, lost circulation) or warning signs (drilling rate, torque, pump pressure, gas-cut mud) are promptly detected.
- Information to confirm, prior to licensing sufficient well-site personnel are available and adequately trained and experienced for the drilling operation.

Special sour wells are classified by a combination of potential H_2S release rate and distance from an urban centre as outlined below. In addition, the Regulator may classify a well as a special sour well based on the maximum potential H_2S release rate, population density, environment, sensitivity of the area and any expected complexities during the drilling phase.

Potential H_2S Release Rate (m^3/s)	Distance to Boundary of Urban Centre
$0.01 \leq H_2S < 0.10$	≤ 500 metres
$0.10 \leq H_2S < 0.30$	≤ 1,500 metres
$0.30 \leq H_2S < 2.00$	≤ 5,000 metres
$H_2S \geq 2.00$	N/A

Flaring

Where flare volumes are requested as part of a new permit application or well permit amendment application, a technical justification in support of those volumes may be required, and will always be required if the total of all requested volumes across all zones exceed the following thresholds:

- 400 10^3 m^3 for a well classified as a development well.
- 600 110^3 m^3 for a well classified as either an exploratory outpost or exploratory wildcat well.

Requirements where applicant is not PNG rights tenure holder

According to Section 24.4 of ERAA, if the applicant is not the registered petroleum and natural gas rights holder for the target formation, an agreement between the applicant and the registered holder of the subsurface rights must be in place.

Applicants must adhere to the conditions of the PNG tenure and ensure any proposed applications are compliant with the tenure conditions set out under Section 72 of the PNG Act, if there are any.

If the PNG tenure includes any special conditions, known as caveats, the applicant must provide an explanation of the caveats in AMS. These caveats disclose information related to potential access restrictions that an applicant may adhere to and that the Regulator may need to consider as part of the decision making process. Caveats may have been identified as part of the pre-tenure engagement referral process with another Ministry, local government and or First Nation.

For more information, refer to the Ministry of Natural Gas Development website.

Emergency Response Planning

An Emergency Response Plan (ERP), or an update to an existing plan, must be submitted to the Regulator prior to commissioning a well, in accordance with Section 7 of the Emergency Management Regulation. Emergency planning zones are determined using H_2S content of product in a well or pipeline. Review Schedule A of the Emergency Management Regulation for more information.

4.1.5 Geothermal Wells

On March 31, 2017, the Geothermal Operations Regulation of the Geothermal Resources Act (GRA) was amended. With the amendment to this legislation, the BC Energy Regulator was granted jurisdiction over geothermal wells.

The Geothermal Resources Act regulates wells encountering water equal to and greater than 80 degrees Celsius.

Please Note:

If the proposed application is being designed to extract ground water at a rate that is equal to or greater than 75 litres per second, periodically or continuously for one year or more, an Environmental Assessment review may be required. Please contact the Regulator prior to submission of the application.

4.1.6 Geothermal Wells Defined

The Geothermal Resources Act (GRA) defines a geothermal well and resource as follows:

"**well**" means a hole in the ground:

a) made or being made by drilling, boring or any other method for the purpose of producing a geothermal resource or through which a geothermal resource is or can be produced,

b) used, drilled or being drilled for the purpose of injecting any substance into subsurface strata to assist the production of a geothermal resource, or to dispose of water produced in connection with the production of a geothermal resource, or

c) used, drilled or being drilled for the purpose of obtaining information about a geothermal resource.

"**geothermal well**" means a well in which casing is run and that the minister considers is producing or capable of producing a geothermal resource from a geothermal resource bearing zone.

"**geothermal resource**" means the natural heat of the earth and all substances that derive an added value from it, including steam, water and water vapour heated by the natural heat of the earth and all substances dissolved in the steam, water or water vapour obtained from a well, but does not include:

a) water that has a temperative less than 80 degrees Celsius at the point where it reaches the surface, or
b) hydrocarbons;

"**facility**" means any surface equipment required to produce geothermal resources or to inject water or other fluids produced in connection with a geothermal resource into subsurface strata, but does not include:

a) a pipeline as defined in the Energy Resource Activities Act, or
b) equipment used in connection with the conversion of the geothermal resource into a commercial commodity.

"**development plan**" means a plan for the drilling of the number of wells that are, in the opinion of the minister, sufficient to enable production of a geothermal resource underlying a lease to begin, including providing piping, equipment, reinjection wells and controls required to produce the geothermal resource, but does not include plans for the commercial utilization of the geothermal resource or for converting it into any other form of energy.

The Geothermal Operations Regulation defines a thermal gradient well as follows:

"thermal gradient well" means a well drilled to obtain geotechnical information about a geothermal source.

Approved geothermal applications receive a permit under Section 12 of the GRA to carry out construction and operations pertinent to the activity. The permit expires where construction activities have not started within two (2) years of permit issuance. Unless expired, the permit remains active until cancelled, suspended or declared spent, according to the provisions of GRA.

Geothermal Well Names

Well names are generated by, and populated into, AMS automatically when spatial data is uploaded. Well names are based on information gathered at the application stage and formatted following the same standards as identified for an ERAA well name in Chapter 4.1.1 of this manual.

4.1.7 Creating a New Geothermal Well Activity Application

New Geothermal Well Applications

A new geothermal well permit is required for any new geothermal wells to be constructed and operated, including re-entering wells which have been previously issued a certificate of reclamation.

Currently, the Regulator utilizes an ERAA well application in AMS for the submission of a geothermal well. To create a geothermal well application:

1. Select New ERAA application
2. Select the activity as an ERAA well

Application Information Tabs

Applicants are required to follow the guidance for Application Information tabs which include: Spatial Data, Administrative, Land, Stewardship, Agriculture, Archaeology, First Nations engagement, Rights Holder Engagement, Maps and Plans and Attachment requirements as outlined for an ERAA application found throughout this manual. Exceptions to this guidance, specific to a geothermal well, are identified below.

Additional information on how to create an application can be found in the AMS User Manual.

Agriculture

The ALC-OGC Delegation Agreement does not apply to geothermal activity; however, based on spatial data uploaded, AMS will identify if the application falls within the Agriculture Land Reserve (ALR) and trigger additional questions.

If the application impacts ground disturbance within the ALR an application to the Provincial Agricultural Land Commission will be required to be submitted to them or to the local authority with an ALC delegation agreement.

More information can be found in Chapter 5.3 – Agriculture Land Reserve Information Tab.

Rights Holder Engagement

A geothermal well application will require Rights Holder Engagement (RHE); however, for this application type, AMS will populate the Consultation and Notification tab.

Rights holder engagement information can be found in Chapter 6.2 of this manual.

Please Note:

AMS will populate the C&N tab, rather than RHE tab, therefore the following items will need to be completed:

- The activity radius data fields are required input. The system is designed to only accept the radius for ERAA oil and gas wells as per the Requirements for Consultation and Notification Regulation (RCNR). Enter the minimum radius as outlined in the Section 17 of the RCNR for an ERAA well.
- For a new geothermal well, AMS will require an RCNR Line List to be uploaded, rather than the Rights Holder Engagement Line List. The template can be found here: RCNR Line List.
- Populate the line list with Rights Holder Engagement information. For "Recipient Type", select the "Rights Holder", notify, as per Section 10 of the RCNR.
- AMS will also validate the application submission timelines using the consultation and notification timelines shown in Figure 6-I, rather than rights holder engagement timelines shown in Figure 6-F; within Chapter 6 of this manual.
    - Select "YES" to the question. Exemption from Requirements from Consultation and Notification Regulation requested.
    - When prompted for the Exemption Approval attachment, upload a rationale explaining that the application is for a geothermal well, therefore rights holder engagement timelines apply.

After submission, the application will proceed to a decision once all obligations for rights holder engagement timelines have been met.

First Nations

First Nations consultation for geothermal projects will be assessed on a case by case basis. The Project Description Form is a required attachment and can be found here.

Maps and Plans

Maps and plans for the application should be designed and submitted as per Chapter 5.7 of this manual.

When preparing a construction plan for a geothermal well, ensure position of the well, within the wellpad, references location of the proposed well head in relation to criteria covered under Section 5 of the Geothermal Operations Regulation.

Attachments

Attachments that are mandatory to upload on a specific page will display under the applicable category under the Attachments Tab.

Applicants may wish to upload additional documents directly under the Attachments Tab, such as Emergency Response Plans, Engineering information and any other documentation that may assist in the review of the application.

For more information on Emergency response Plans, refer to the Emergency Response and Safety page on the Regulator's website.

Applicants are required to provide a project summary document including the anticipated temperature and anticipated fluid production.

Well Activity tabs

Further to the application information tabs, the well activity tabs are required to be populated as guidance for an ERAA application found in Chapter 4.1.1 of this manual. Exceptions to this guidance, specific to a geothermal well, are identified below.

Under the Well Overview tab

Oil and Gas Field Name: AMS will spatially derive the oil and gas field name or display "not found" if the well location is not located within a defined field. When "not found" displays, applicants may select the nearest appropriate field from the oil and gas field name drop-down list or enter the nearest geographical location. To enter a field name that is not available in the drop-down list, select "Other Areas" from the list and type the name in the 'specify area' text field.

PNG Tenure Rights ID: Enter the Geothermal subsurface tenure permit number.

Under the Well Details tab

Well Type: Select the appropriate drop down option for the intended use of the geothermal well: "Geothermal Disposal", "Geothermal Injection", or "Geothermal Production". For a thermal gradient well select "Geothermal Exploration". Provide an attachment explaining the intended use of the well.

Well Classification: If the Well Type selected is "Geothermal Disposal", "Geothermal Injection", or "Geothermal Production", then select the Well Classification as: "Geothermal Operation". Otherwise, select the classification option: "Thermal Gradient".

- Applicants must agree to the well classification confidentiality clause by selecting the check box

Bottom Hole Details:

- **Well Profile:** select the profile based on the drill path
- **Formation at depth:** select "Pre-Tertiary"
- **BOP:** select "Other" and provide a description
- **Objective Field:**
  - **Formation:** Pre-Teriary
  - **Fluid:** Water
  - **Depth:** Same as above

Well Hazard Planning: Select "No" as this section does not apply to geothermal wells.

Flaring details: Depending on the geology of the area for the well that is being drilled, flaring may be required. Please refer to Section 4.1.4 of Chapter 4.1 – Completing Activity Details: Well Activity.

Exemption details: Select "Yes", "Yes" then "No" as this section does not apply to geothermal wells.

Application Validation and Submission

The application can be submitted once all mandatory application requirements have been met. For more information on validating and submitting an application, please refer to the AMS User Manual.

AMS Payment

Upon submission of the application, AMS will calculate the application fees for an ERAA well. Applicants are requested to select the e-Pay option to "pay later". Once the application has been submitted, please contact the Authorization Director for the applicable zone to request an adjustment on the application fees from an ERAA well to a geothermal well.

Chapter 4.2 Completing Pipeline Activity Details

4.2 Pipeline Activity Tab

Applicants applying for a pipeline permit must complete the pipeline activity tab in the Application Management System. The pipeline tab is made up of three components: pipeline overview; pipeline details including segment details, segment linkages; installation details and exemptions; and land details.

This section includes an overview of pipeline permitting, guidance regarding pipeline planning and design, details related to pipeline-specific application requirements and detailed instructions for completing the data fields within the pipeline tab.

Please Note:

This manual is written as a whole and available to industry in sections to allow permit holders to access activity chapters. It is prudent of the applicant to review the manual in its entirety and be aware of the content in other sections of the manual.

4.2.1 Pipelines Defined

Pipelines are an energy resource activity as defined in ERAA as:

Piping through which any of the following is conveyed:

a) an energy resource,

a) Carbon dioxide,

b) Water used for, or produced in the course of, an energy resource activity,

c) Solids,

d) Substances prescribed in Section 133(2)(v) of the Petroleum and Natural Gas Act,

e) Other prescribed substances.

And includes installations and facilities associated with the piping, but does not include:

f) Piping used to transmit natural gas at less than 700 kilopascals (kPa) to consumers by a gas utility as defined in the Gas Utility Act.

g) A well head, or

h) Anything else that is prescribed.

Additionally, the following substances are prescribed in the ERAA General Regulation for the purposes of paragraph (e) above:

- Water and steam used for geothermal activities

And the following is prescribed for the purposes of paragraph (h) above

Pipelines used in a gas distribution main, as defined in regulations under the Safety Standards Act.

Energy Resource is defined in ERAA as:

a) petroleum,

b) natural gas,

c) hydrogen,

d) methanol, or

e) ammonia

In the field, pipelines encompass all piping from pig sending barrel to pig receiving barrel including all segments, risers, and appurtenances in between. For pipelines without pig barrels, the pipeline includes the last valve on the riser (or below ground valve), pump stations, line heaters, regulator stations, etc. prior to the facility tie-in. This transition may occur inside or outside the lease boundary.

Approved pipeline applications receive a permit under Section 25 of ERAA to construct and operate a pipeline. Pipeline permits expire where construction activities have not started within two (2) years of permit issuance. Unless expired,

the pipeline permit remains active until cancelled, suspended or declared spent, according to the provisions of ERAA.

Temporary Above-ground Freshwater Lines

Temporary above-ground lines designed to transport fresh water are not within the definition of a pipeline; therefore a pipeline permit is not required. Temporary above-ground water lines are authorized by the Regulator as associated activity and require an applicable authorization. Associated activities are detailed in Section 4.6 of this manual.

Canadian Energy Regulator (CER) Pipelines

In accordance with Sections 8 and 9 of ERAA, the Regulator has limited authorities with respect to federally regulated pipelines. These authorities do not include the power to issue an approval for these pipelines; however, applications for the pipeline right-of-way, road right-of-way; as well as ancillaries including facilities are submitted through AMS. Refer to Chapter 7 of this manual for more information regarding CER applications.

Preliminary Plans and Fixing the Site of a Proposed Pipeline Route

Under Section 23 of ERAA:

- Submitting a pipeline preliminary plan when preparing an application for a pipeline permit is optional. However, it is mandatory when entering land to conduct preliminary surveys or examinations, to fix the site of a proposed pipeline route.

Submission of a pipeline preliminary plan must include:

- Detail the proposed route, including a map of the proposed pipeline route at an appropriate scale:
    1. Base data.
    2. Tenure holders.
    3. Land parcels (legal land title).
    4. Portions of private land under agreement.
    5. Portions of private land without an agreement.
    6. Portion of land on which activities are completed.

- Outline proposed portions on private land where the applicant has not been granted access and submit the prescribed security to the Regulator to compensate the land owner or the Crown for any damage or disturbance possibly caused by fixing the site.
- Complete the required notifications.

Applicants should follow best management practices in addition to the regulatory requirements when following the preliminary plan process including:

- Immediately advise land owner when a situation requires the land owner's attention.
- Immediately notify land owner of changes made in respect of the obligations in Section 23 of the Requirements for Consultation and Notification Regulation.
- Consult land owner on preferred method of land access and only use motorized vehicles with the permission of the land owner.
- Ensure surveyors minimize the number of survey stakes used.
- Ensure surveyors only cut trees or branches in areas where growth is too dense for site lines.
- Ensure any trees or branches cut down are disposed of in a manner acceptable to the land owner.
- Ensure assessments are coordinated (for example, soil assessment with archaeology assessment) to avoid secondary intrusions.
- Provide the land owner with any soil assessment reports.

Additional Consultation and Notification Requirements: Notification Before Fixing the Site of a Pipeline

Notification requirements specific to fixing the site of a pipeline are indicated in Section 15 (3) of ERAA and Section 15 of the Requirements for Consultation and Notification Regulation. This notification precedes the consultation and notification associated with the pipeline permit application.

A person is required to notify the land owner of the intent to enter onto the land owner's property. The notice must include:

- Applicant name and contact name (person entering the land).

- Applicant contact information (or land agent representing the applicant) including contact name and phone number and email address.
- Preliminary plans under Section 23 (1) of ERAA.
- Description of the specific portion of the land to be surveyed or examined, and the activities to be undertaken for the purpose of fixing the site of the pipeline.
- Timelines and order in which proposed activities are carried out. For multi-well pads, include the entire schedule of activities over various years, where applicable.
- Statements advising the land owner of notification and consultation obligations if the company intends to submit an application for a pipeline permit on the land.

Applicants intending to enter on land in accordance with Section 23 (2) of ERAA must, provide notice to the land owner at least two (2) working days before entering the land.

4.2.2 Creating a New Pipeline Activity Application

New Pipeline Applications

A new pipeline permit is required for any new pipeline construction or operation, including pipelines constructed in existing right-of-way or over new Crown or private land. New pipeline segments can be added to an existing pipeline permit via an amendment application.

Pipelines can be applied for individually or with other energy resource activities as part of a multi-activity project application. The system generates data input requirements for additional activities specified within the spatial data upload.

Pipeline Permit Amendments

Approval of a permit amendment application is required before the associated changes are carried out. Applications for amendments to pipeline permits may be required if the permit holder plans to change the surface disturbance associated with the pipeline permit or certain operating parameters of the pipeline. With respect to operating parameters, changes requiring an amendment to a pipeline permit include:

- Increase in maximum operating pressure.
- A new pipeline segment to an existing pipeline permit.
- Modify pipeline, including installation of a liner within an existing pipe.
- Adding the following installations, these should be added under the pipeline installation section in the application and require spatial data:
    1. Flare stack
    2. Generator
    3. Line heater
    4. Pump
    5. Regulator
    6. Riser
    7. Tank
    8. Valve (pressure control and / or isolation. Isolation valves and Emergency shut down valves should be entered as two separate installations.)
- A permit amendment is required, prior to a change of service, when planned or actual fluid composition of a pipeline is outside of the permitted parameters or does not meet the criteria of a notification. Common examples of change of service fluid that require an amendment include increase of H_2S and changes to some fluid types.
- The following changes do **not** require an amendment, and can be submitted as a notification providing the pipeline permit includes the notification permission and:
    a) prior notice of the change is provided, in the form and manner the BC Energy Regulator requires;
    b) the change is not made before the 7th day after the notice identified in (a) is submitted or the day the permit holder receives notification from the BC Energy Regulator, whichever occurs first;
    c) the change does not affect direct connections to pipelines and facilities;
    d) there are no changes to approved pressure protection, H2S protection or isolation;
    e) there is no substantive impact to any aspect of the project that was included in the consultation;
    f) the design and operation of the pipeline continues to meet all regulatory requirements and the requirement of CSA Z662

- changes to outside diameter
- adjusting the wall thickness
- changes to the pipe grade as identified in the product change table (see, Oil and Gas Activity Operations Manual)
- allowable pipeline product changes
- reducing H2S
- reducing the maximum operating pressure
- changing the flow direction;
- pipeline segment split
- minor modification for installations

More information on the notification process, including how to submit a notification, can be found in the Oil and Gas Activity Operations Manual.

- If the service fluid is seen to go out of specifications, the permit holders should ensure the fluid composition is within the parameters of any connected facility or pipeline until the permit amendment, for the change of service, is approved.
- Amendments to adjoined facilities or facilities linkage changes may be required. See section 4.3 of this manual and the Oil and Gas Activity Operations Manual for more information.

Pipeline Integrity Works Applications

Where in-stream works, temporary workspace or other authorizations are required to facilitate regular maintenance and integrity work for pipelines, permit holders are required to do the following:

1. Contact the appropriate Authorizations Director at the Regulator and notify them of the timing of submission and the risk ranking (based on risk rating criteria below) of the integrity works application.
2. Ensure that the application summary clearly identifies the application as integrity work.
3. The application summary must include the level of urgency of proposed integrity works, ranked from 1 to 3 for risk to public safety and environment.

Risk Rating Levels:

- Level 1 - Investigative digs and planned maintenance: Where smart tool analysis or visual inspection has indicated an anomaly of some form and further investigation is required, or planned maintenance works (digs, pipeline replacements, depth of cover maintenance, etc.), that are part of planned infrastructure maintenance where no immediate threat to the environment or public safety is present.

- Level 2 - Known Risk: Where there is exposed pipeline or potential for pipeline integrity to be compromised.
- Level 3 – Emergency Works: Where pipeline integrity is compromised and the threat to the public or the environment is existing or imminent.

Historical Submission: Pipeline

A historical pipeline submission is intended to collect missing data including dates for NCS, NPT, LTO and as built information. The historical pipeline submission is also used for notification of pipeline changes. Specific details for historical pipeline submissions can be found in the AMS User Manual. Any changes, which require an amendment application, cannot be applied through a historical submission.

The historical pipeline submission is selected from the create "application type" menu as "historical submission".

Historical pipeline applications pass fewer data validation checks upon submission. No fees are collected for an historical pipeline submission.

In order to complete a historical pipeline submission, AMS searches pipelines based on the applicant's information including:

- Approval determination number.
- Legacy BCER File number.
- Authorized activity number (Pipeline project number).

Once the permit holder enters the historical activity description, AMS pre-populates the information fields based on the current information, where information exists. Complete and/or edit the activity details within the AMS tabs. Spatial data may be uploaded where it does not exist providing it meets the spatial data standards and the spatial data provides the physical location of the facility. Spatial data for historical submissions is optional, except where a notification for segment splits or changes to installations occurs..

4.2.3 Pipeline Planning and Design

This section provides typical planning and design requirements, guidelines and considerations when planning and designing a pipeline for an energy resource activity application. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the pipeline application relative to the engineering and technical information provided

in AMS; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Pipelines must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), the Pipeline Regulation and the Environmental Protection and Management Regulation (EPMR).

Of particular note, as required under Section 3 of the Pipeline Regulation:

- Every permit holder designing, constructing, operating, maintaining or abandoning pipeline infrastructure in British Columbia must follow the most current version of CSA Z662, including Annex N.

CSA Z662 is the standard developed and maintained by the Canadian Standards Association covering the design, construction, operation and maintenance of energy resource industry pipeline systems conveying liquid hydrocarbons, oilfield water and/or steam, carbon dioxide, or gas. It is a legal requirement for operators to meet this standard for pipelines operating under ERAA in B.C.

If an exemption is requested from regulatory requirements, an exemption request must be prepared at the time of application and include:

- Specific regulatory provision requiring an exemption.
- Rationale for exemption (explanation of why an exemption is required).
- Proposed plan showing mitigation strategies to reduce impacts.

If exemptions are approved prior to the application, this approval must be attached to the application.

Guidance Requirements

In addition to this Energy Resource Activity Application Manual and the CSA Z662 standard, pipeline activities should meet guidance recommendations in the following Regulator documents:

- Oil and Gas Activity Operations Manual.
- Environmental Protection and Management Guideline.

If energy resource activities cannot adhere to the guidance recommendation then justification must be included in the permit application. Include specifics of the guidelines not followed, an explanation of why they cannot be followed, proposed alternative and mitigation strategies.

Pipeline Integrity Management Programs (IMP)

In accordance with Section 7(1) of the Pipeline Regulation:

- A pipeline integrity management program must be prepared in compliance with CSA Z662 including Annex N.

Applicants must be aware of the legal requirements to meet this standard for pipelines operating under ERAA in B.C. and answer IMP-related questions in the pipeline permit application.

Damage Prevention Plans (DPP)

In accordance with Section 7(1) of the Pipeline Regulation:

- All pipeline permit holders must develop and implement a damage prevention plan and submit the program for review upon the Regulator's request. For a successful damage prevention plan, permit holders should review the British Columbia Common Ground Alliance's Recommended Practice for Damage Prevention Programs.

Damage Prevention Programs are intended to reduce the frequency of preventable damage by addressing external/third-party threats to the integrity of pipeline infrastructure.

Surface and/or Subsurface Planning

Pipelines often require surface or subsurface corridors. Environmental considerations must go into planning a pipeline route including:

- Projects may require approval from the Environmental Assessment Office and timelines for approvals should factor into the application planning stages.
- Crossing plan drawings/diagrams should be prepared when crossing water, roads, rails and other utilities. Include a table of crossing type, typicals for all types of crossings and specific design drawings for any aerial crossings.

- Plot plans should be prepared showing the riser/pipeline starts and ends on a site and how it leaves the site going into the right-of-way. Risers associated with the pipeline require National Topographic Series (NTS) or Dominion Land Survey (DLS) co-ordinates for location confirmation. The locations must be filled out and indicated on the design schematics along with segment specification information. Include as part of the pipeline or amendment to the pipeline, even if it exceeds the width of the existing right-of-way.
- Geotechnical summary identifying geohazards along the pipeline route and mitigating strategies. This is a required document for all trenchless crossings.

4.2.4 Pipeline Specific Activity Requirements

This section outlines application requirements for pipeline applications. Requirements are dependent on the characteristics of the pipeline and are outlined in full details below including a description, details of additional information and requirements.

In addition to the pipeline project description, pipeline specific details are input into the pipeline application tab within the Application Management System and may require the upload of an attachment. Additional attachments may include (further described in this section):

- Engineering assessment.
- Piping and instrumentation diagram.
- Appurtenance design.
- Above ground pipeline protection and support drawings.
- Pressure control/overpressure protection.
- Proposed pressure test design.
- Leak detection design.
- Gas analysis for new sour pipelines.

Attachments must meet specific size and file formatting restrictions in order to be uploaded correctly as defined in Section 5.8 of this manual.

Technical and engineering pipeline details are required for all known design specifications for the pipeline, and the start and end points of the pipeline. The start and end points are not just from lease to lease, but the exact start and end point of the pipeline is required for all pipeline applications; this information is collected within the line data of the spatial data submission.

If Annex C of CSA Z662 has been used in the design of the pipeline, please attach documentation in the application detailing which segments followed the design along with how Annex C was incorporated into the design.

1. Engineering Assessment

An engineering assessment is required for the activities that fall under the CSA Z662 clauses listed in Appendix A of this manual. Engineering assessments must be performed and documented to the standards outlined in the CSA Z662. The standards are considered engineering documents. Section 20(9) of the Engineers and Geoscientists Act states the assessments must be sealed, signed and dated by a professional engineer licenced in the province of British Columbia.

2. Piping and Instrumentation Diagram (P&ID)

A full P&ID is required for all new pipeline applications and the amendments which affect the whole pipeline. P&ID of the point location can be submitted, if the change is only applied for that point location.

The minimum requirements for P&IDs are:

- All pipelines which are part of the permit are shown, including their connections (input and output).
- All segment breaks indicated and segments labelled (by project/segment).
- Facility and pipeline breaks, if applicable, clearly indicated.
- Spec breaks and class location changes indicated.
- Valves, fittings, flanges, etc. shown.
- Risers indicated with locations.
- Flow direction indications/arrows.
- Any equipment or pressure control directly on the pipeline, including setpoints. (Note pressure control can be on the facility drawings, in which case a separate pressure control attachment can be provided).

- Pipeline fluid or fluids, maximum permitted H_2S and maximum operating pressure.
- Pipeline outside diameter (OD) and wall thickness (WT).
- Drawing cross-references. Indicate on the drawing the line continued on so it is traceable.
- Drawing number, revision number and date.

Risers or installations directly supporting the pipeline are considered part of the pipeline and should be included in the piping and instrumentation diagram. Installation types included on a pipeline application include:

- Pump
- Storage vessel/tank
- Regulator
- Riser
- Pressure control/pressure protection valves/devices
- Isolation valves showing the physical location.
  (If applicable, the distance between valves and relation to major water crossings is to be determined)
- Farm taps
- Line heater
- Flaring
- Generator

Installations not included in the list should be shown on the P&ID and may be included as part of the facility application.

3. Appurtenance Design

An appurtenance is an item that belongs to the pipeline, such as a riser, pig sender, pig receiver or pump stations. The appurtenance design may be shown as a table or schematic that includes all specifications, codes and or standards and appurtenance locations.

4. **Above Ground Pipeline Protection and Support Drawings**

   If the pipeline is installed above ground, provide documentation showing the additional measures taken to protect it from external interference, UV degradation and other possible failure modes. This is not applicable for typical surface piping on a riser site. For aerial crossings, provide documentation for the pipeline support structure.

5. **Pressure Control/Overpressure Protection**

   Pressure control/overpressure protection must include the locations and set points of any devices protecting the line from possibly exceeding maximum operating pressure (MOP).

6. **Proposed Pressure Test Design**

   Pressure test plans should meet the requirements of CSA Z662. Hydraulic test plans must include the test medium, the minimum and maximum anticipated test pressure considering elevation differences, and the hold times. Pneumatic test, plans must include the procedures which are used at the site including all safety protocols. Pneumatic plans must also include a rationale for pneumatic testing.

7. **Leak Detection Design**

   A description and/or drawings of the leak detection methodology is required for liquid hydrocarbon and optional otherwise.

8. **Gas Analysis**

   Representative gas analysis and expected release volume, expressed at standard conditions of 15 degrees Celsius and 101.3 kPa, of hydrogen sulphide from the pipeline. This is required by Section 2 of the Pipeline Regulation.

4.2.5 Additional Considerations for Pipeline Activity

Emergency Response Planning

An Emergency Response Plan (ERP), or an update to an existing plan, must be submitted to the Regulator prior to commissioning the pipeline (Leave To Open), in accordance with Section 7 of the Emergency Management Regulation. Emergency planning zones are determined using H_2S content of product in a pipeline. Review Schedule A of the Emergency Management Regulation for more

information.

Please Note:

Applicants submitting an update to an existing Emergency Response Plan should include a statement identifying the existing plan.

Approval from Other Jurisdictions for Pipelines

The Regulator may authorize a permit holder to construct a pipeline across, along, over or under any highway, road, public place, railway, underground communication or powerline, or another pipeline. Despite this permission, the permit holder may still require authorization for the use or occupation of land from the affected jurisdiction. Applicable legislation should be consulted.

BC One Call

Section 7 of the Pipeline Regulation states:

- A permit holder must not operate a pipeline approved by a permit unless the permit holder is a member of BC One Call. For more information on BC One Call, visit the BC One Call website.

Chapter 4.3 Completing Facility Activity Details

4.3 Facility Activity Tab

Applicants applying for a facility permit must complete the facility application tab in the Application Management System. The facility tab is made up of three components: facility overview; facility details including equipment details, technical specifications and exemptions; and land details.

This section includes an overview of facility permitting, guidance regarding facility planning and design, details related to facility-specific application requirements and detailed instructions for completing the data fields within the facility tab.

Please Note:

This manual is written as a whole and provided to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.3.1 Facility Permitting Defined

Facilities are an energy resource activity, and are defined in ERAA as:

- A system of vessels, piping, valves, tanks and other equipment used to gather, process, measure, store or dispose of petroleum, natural gas, water or a substance referred to in paragraph (d) or (e) of the definition of pipeline.

Approved energy resource applications receive a permit under Section 25 of ERAA to carry out construction and operations pertinent to the activity. The permit expires where construction activities have not started within two (2) years

of permit issuance. Unless expired, the permit remains active until cancelled, suspended or declared spent, according to the provisions of ERAA.

Facility Types

Applicants must apply for a specific type of facility. The appropriate facility type must be selected in the facility details component of the facility tab in the Application Management System. Facility types include (and are further defined in the Regulator's glossary):

- Battery site
- Compressor Dehydrator
- Compressor station
- Disposal station
- Gas dehydrator
- Gas processing plant
- Gas sales meter
- Injection station
- LNG facility
- Oil sales meter
- Processing battery
- Satellite battery
- Tank terminal
- Water hub
- Well facility
- Pump station
- NGL fractionation facility
- Hydrogen Manufacturing Facility
- Ammonia Manufacturing Facility
- Methanol Manufacturing Facility
- Carbon Dioxide Storage Facility
- Gas Conversion Facility
- Petroleum Refinery

Facilities and operational equipment required in energy resource activities, whether temporary or permanent require a facility permit. The facility application tab in AMS is used for all facility applications, whether within an existing right-of-way, wellsite or over new Crown land or private land.

Facility Names

Facility names are generated by, and populated into AMS automatically when spatial data is uploaded. Facility names are based on information gathered at the application stage and formatted as follows:

- Operator Abbreviation – Oil & Gas Field Name – NTS/DLS Location – Name Qualifier

AMS will spatially derive the oil and gas field name or display "not found" when a facility location is not located within a defined field. When "not found" displays, applicants may select the nearest appropriate field from the oil and gas field name drop-down list, or enter the nearest geographical location. To enter a field name that is not available in the drop-down list, select "Other Areas" from the list and type the name in the 'specify area' text field.

Liquefied Natural Gas and Gas Processing Plants

Liquefied Natural Gas (LNG) facilities, oil refineries and gas processing plants are considered facilities under ERAA. New plant or refinery applications are submitted under facilities; amendments are submitted when certain equipment is added to an existing plant, such as a new compressor or processing train.

Facility Numbering

Upon issuance of a facility permit, the Regulator's information systems will assign a facility identification number (FACID) to the facility. The codes are used to track facilities and associated operational submissions in the Regulator's KERMIT information system.

4.3.2 Creating a New Facility Activity Application

New Facility Application

A new facility application is submitted to obtain a facility permit on either a new well/facility area or on a previously permissioned well/facility area. A permit is required prior to any construction or installation of equipment and flow of product.

Facilities can be applied for individually or with other energy resource activities as part of a multi-activity project application. The AMS generates data input requirements for additional activities specified within the spatial data upload.

Facility Permit Amendments

An amendment must be used for modifications beyond what is authorized in the permit and is required for facility expansions and activities where work initiates or impacts noise and/or air emissions. Examples where a permit amendment is required include:

- The addition of equipment for a new well tie-in and for newly completed wells at a permitted facility,
- The addition of any equipment listed in AMS under the Facilities Details tab, for example: flare stack, main gas compressor, glycol dehydration unit. (please refer to Appendix C of this Manual for a more specific list),
- Addition of production storage tanks (oil, water, emulsion or condensate)
- Replacing equipment where additional regulatory considerations may be required (e.g. replacing with a larger unit that may consequentially increase processing capacity, noise emissions or waste discharge),
- Increasing the permitted H2S concentration,
- Increasing the inlet capacity of a gas plant,
- Modifying an aspect of the facility outside the limits of the permissions and authorizations of the permit (such as increases in flare limits).

Appendix C provides a comprehensive list of facility changes requiring a facility permit amendment. Appendix D includes examples of changes that can be made under the existing permit without submission of amendment applications, NOI or updated as-built record drawings.

Please Note:

Drawings included with amendment applications must include clouded areas to indicate amended areas.

Notice of Intent to Remove All Equipment from a Site

When a permit holder has removed all the equipment and pilings (or cut 1 metre below grade and buried) from a facility site, they must submit a Notice of Intent (NOI). A project description and documentation of proof must be submitted to the Regulator which should clearly identify all facility equipment and piping that was removed. The documentation of proof could include pictures of the location showing the equipment has been removed or a signed confirmation from the

contractor that completed the removal. The Regulator's Oil and Gas Activity Operations Manual provides more information on Notice of Intent submissions.

Notice of Intent to Suspend a Gas Plant or Other Facility

Suspension of a facility must be carried out in accordance with Section 79 of the Drilling and Production Regulation and notice submitted via a Notice of Intent (NOI). The Regulator's Oil and Gas Activity Operations Manual provides more information on Notice of Intent submissions.

Facility Permit Amendment for Change of Service

A change of service typically applies to both a facility and a pipeline and requires that each be amended under the permit in which they were originally issued. If the change of service includes a pipeline that was not originally approved in the same permit as the facility, the permit number for the pipeline must be entered in the description box in the facility amendment.

If a product is introduced into a facility or pipeline that was not originally designed for sour service, an Engineering Assessment, in accordance with the latest edition of CSA Z662, must be completed and attached to the amendment application. A facility permit amendment is also required to increase the permitted H2S concentration of a facility.

For changes in service at a facility to decrease H_2S concentration, a Notice of Intent (modify equipment or facility) may be appropriate depending on the limitations of the permit permissions. The Regulator's Oil and Gas Activity Operations Manual provides more information on Notice of Intent submissions.

Historical Submission: Facility

The historical facility submission is intended to collect missing data into KERMIT. This includes equipment and compressor details that were not required at the time the facility was originally permitted.

The historical facility entry submission is selected from the create "application type" menu as "historical submission". It is often required when the facility has incomplete, absent or incorrect data.

Historical facility submissions pass fewer data validation checks upon submission. No fees are collected for an historical facility submission.

In order to complete a historical facility submission AMS searches facilities approved prior to October 4, 2010 based on the permit holder's information including:

- Approval determination number.
- Legacy BCER File number.
- Authorized activity number (Facility ID#).

Once the permit holder enters the historical activity description, AMS pre-populates the information fields based on the current information; where available. Complete and/or edit the activity details within the AMS tabs. Spatial data may be uploaded where it does not exist providing it meets the spatial data standards and the spatial data provides the physical location of the facility. Spatial data for historical submission is optional.

4.3.3 Facility Planning and Design

This section provides typical planning and design requirements, guidelines and considerations when planning and designing a facility for an energy resource activity application. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the facility application relative to the engineering and technical information provided in the Application Management System; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Facilities must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), Oil and Gas Waste Regulation (OGWR), Drilling and Production Regulation (DPR), or the Liquefied Natural Gas Facility

Regulation (LNGFR), as applicable, and the Environmental Protection and Management Regulation (EPMR).

If an exemption is requested from regulatory requirements, an exemption request may be submitted prior to application submission, at the time of application, or following application determination, depending on the specifics of the circumstance, and the regulatory requirements from which exemption is being requested. Exemption requests must include:

- Specific regulatory provision requiring an exemption.
- Rationale for exemption (explanation of why an exemption may be required).
- Proposed plan showing mitigation strategies to reduce associated impacts relative to the feature that the regulatory provision addresses.

If exemptions are approved prior to the application, this approval must be attached to the application.

Guidance Requirements

In addition to this Energy Resource Activity Application Manual and CSA Z276, CSA Z662 and ASME B31.3 standards, facility activities should be designed to meet guidance recommendations in the following Regulator documents:

- BC Measurement Guideline.
- Flaring and Venting Reduction Guideline.
- BC Noise Control Best Practices Guideline.

If energy resource activities cannot adhere to the guidance recommendation then justification must be included in the permit application. Include specifics of the guidelines not followed or met, an explanation of why they cannot be followed or met, the alternative proposed plan and any relevant mitigation strategies.

Safety Standards Amendment Act: Regulatory Authority and Process Changes

The Safety Standards Amendment Act came into force on November 7, 2016, and has resulted in changes to the administration of regulatory authority and processes by the Regulator and Technical Safety BC.

The Regulator and Technical Safety BC have a revised MOU in place. Please refer to Technical Safety BC for guidance.

All permit holders of Regulator regulated facilities must prepare, regularly update as required, and keep on file the following documentation. These management systems and processes are to be followed in the design, construction, operation, maintenance, and decommissioning of facilities in the province of British Columbia for the particular permit holder. The submission of this information is NOT required in a permit application package, but must be available upon request, or for audit purposes.

1. Permit holders must have the following in place prior to the start-up of new or modified facilities:
    a. a report from a Qualified Professional confirming that all of the elements of a quality assurance/quality control process necessary for construction are documented and applicable to the scope of work. The scope of validation should include at a minimum:
        i. quality planning, control, assurance and continuous improvement processes;
        ii. a full explanation of how the quality objectives will be managed for the duration of the construction including those for the subcontractors and/or the suppliers;
        iii. details regarding how the plan addresses the project quality policy and objectives, quality organization, resource management, information management, codes, standards and specifications, management of change, control of deviations and concessions, and regulatory legislation compliance; and,
        iv. a plan to verify of the effectiveness of the quality assurance program during design, construction and testing.
    b. a written description of the management of change process that will be used by the permit holder in the design, construction, and operation of the facility. The management of change system should:
        i. include written procedures for managing change;
        ii. address the basis for each change;

iii. evaluate potential safety, health and environmental impacts for each change;

iv. define requirements for authorizing changes to be made; and,

v. include methods by which the permit holder will appropriately inform and train affected workers before changes occur.

The Center for Chemical Process Safety Guidelines for Management of Change for Process Safety identifies key components of what would be an acceptable change management system to the Regulator.

c. a Facility Integrity Management Program in accordance with s. 78.1 of the Drilling and Production Regulation.

2. In lieu of Pressure Piping Registration for ASME B31.3 facility piping that was previously under Technical Safety BC jurisdiction, permit holders must have the following in place prior to the start-up of new or modified facilities:

a. P&IDs that include the following information:

i. Number and revision

ii. Design code of construction information

iii. Line identification list showing maximum design pressures, maximum and minimum design temperatures, and pipe specifications including:

- Fluid service
- Dimensions
- ASME material specifications
- Flange, valve and fitting standards
- Heat treatment
- Non-destructive examination requirements
- Corrosion allowance
- Impact testing
- Pressure test conditions and fluid
- Formulas used or reference to code section

b. Stress analysis calculations demonstrating the piping system can withstand or is isolated from all ambient influences, dynamic effects, weight effects, and interface loads, as defined in ASME B31-series code. If these conditions are unknown, clearly stated worst-case loading restrictions shall be included

Liquefied Natural Gas (LNG)

Applicants planning to construct and operate a Liquefied Natural Gas facility (LNG facility) in British Columbia should review the Liquefied Natural Gas Facility Application and Operations Manual. Operators must be familiar with the requirements and procedures for applying and obtaining a permit to construct and operate an LNG facility. Permit holders must follow key regulatory milestones and requirements during the facility's construction, operations and site restoration phases.

Gas Processing Plants

Before submitting an application for a gas processing plant(s), applicants are encouraged to meet with the Regulator and allow sufficient time for application processing based on the specifics of the proposal. The Regulator has defined a process where one or more meetings may be necessary as part of application review and determination. This process includes:

- Submission of a brief written description of the project scope, including sketches of the proposed tentative gathering/processing system and sales tie-in points. Timing for this should be a week prior to the pre-application meeting to allow more meaningful feedback to assist in the preparation of the application. The submission should be directed to pipelines.facilities@bc-er.ca,
- Pre-application meeting with key Regulator staff, and,
- Mid-process meeting to discuss Regulator application reviewed feedback. This meeting is arranged on a case by case basis only when written communication isn't sufficient to answer regulatory questions.

Gas Plant Proliferation Analysis

A gas processing plant proliferation review must be included with the application and must contain the rationale for constructing the newly proposed plant after consideration of existing active plants and pipeline infrastructure feeding into active plants within a 50 km radius. This is required as an attachment with the application for new plants and amendments that increase the throughput of the plant. Other plant amendments do not require a proliferation review.

Flare and Incinerator Systems

Flare and incinerator systems must be designed and operated within the limits specified by a Qualified Professional. Applicants should seek guidance on flare system design from the following regulations and guides:

- API Standard 521.
- Flaring and Venting Reduction Guideline.
- Drilling and Production Regulation (DPR):
    1. Section 47 (c) and (h)
    2. Section 44 (a), (b), (c), (d) and (e)
    3. Section 42 (1) and (5)
    4. Section 43 (1), (2) and (3)
- Oil and Gas Activity Operations Manual
    1. Section 9.6.15

The Regulator considers uninterrupted flared volumes with a constant and visible flame under routine operations to be “continuous”. This includes fuel gas being burned to maintain a pilot and / or continuous purge in the flare header.

Flare Blackened Areas

Flare blackened areas must be maintained within permissioned well and/or facility application area. If new area is required to accommodate the blackened area, a land amendment to the well and/or facility area is required. Note: Flare blackened area determination must take into consideration the current elevated risks of wildfires due to recent drought conditions. This may increase the flare blackened area requirements.

If a post construction plan (PCP) has not been submitted or a Statutory Right of Way (SRW) has not been issued for the existing permissioned well and/or facility area, the spatial data file for the land amendment may include a replacement polygon. The replacement polygon must represent the existing permissioned well and/or facility area plus the additional area required for the blackened area.

If a PCP has already been submitted or the well and/or facility area is tenured under a SRW, the spatial data for the land amendment should only include the new area required for the blackened area. The additional area should be referenced as “new” (AREA_TYPE = N) in the spatial data file. Upon submission of the amendment application, the new land area will be assigned a LAND_ID and upon approval, the appropriate tenure will be assigned.

Natural Gas Venting Requirements

Effective January 1, 2025, applicants for new facilities or amendments for existing facilities that include the installation of major equipment such as a compressors, dehydrators or production tanks must demonstrate near elimination of natural gas venting.

It is expected that venting during normal operations will not occur from the following sources:

- Production tanks.
- Compressor seals.
- Glycol dehydrators.
- Pneumatic devices and pumps that are powered by natural gas.

Emergency shutdown devices and pneumatic compressor starters are not included in the definition of pneumatic devices.

For new well facility applications, venting of natural gas is prohibited. For existing well facilities, consideration should be given to eliminating venting.

Venting from the above sources, except for pneumatic devices at new facilities, may be permitted if an applicant demonstrates that it is impractical to eliminate the venting for one or more of the following reasons:

- Impairment of the safe operation of the facility;
- Impairment of the reliable operation of the facility;
- Economic feasibility based on a net present value that considers the following:
    - Capital costs
    - Operating costs
    - Total emission reduction achieved
    - Provincial price of carbon emissions

Economic feasibility calculations should be completed in a manner that is consistent with section 1.8.1 of the Flaring and Venting Reduction Guideline.

Calculations should be based on a CO_2 equivalent basis using a global warming potential of 28 for methane.

Leak Detection

Leak detection system with adequate controls must be in place according to Section 39 of the Drilling and Production Regulation. The Regulator may require additional levels of detection and control based on the location and specifics of a facility installation. Examples of common leak detection and control include high/low pressure alarms/shutdown, H_2S/LEL/fire detection, ESDV, etc.

Overpressure Protection

Overpressure protection must be designed and operated according to CSA Z662 and/or ASME B31.3. The Regulator may require additional levels of detection and control based on the location and specifics of a facility installation.

Secondary Containment

All produced oil, water and condensate storage (production) tanks as outlined in Section 50 of the DPR have secondary containment requirements.

On a case-by-case basis, there is an option for produced water tanks to utilize a double wall design in place of a dyke or berm for secondary containment.

- The double wall design option must include a secondary tank system capable of holding 110 per cent of the primary tank's volume where the space between the tanks has a level indicator and high-level shutdown.
- The main tank must have a high-level shutdown.

The Regulator has established standards for secondary containment for above-ground tanks storing fluids not produced from an oil, gas or water well. Installations adhering to the standards detailed below will meet regulatory requirements for secondary containment, as per the Drilling and Production Regulation, Section 50 (1) and (2), the most recent version of CSA Z662 and the most recent version of the National Fire Protection Association (NFPA) Code Section 30, (specifically, but not limited to NFPA 30, Chapter 1, section 1.4.2).

The minimum requirements for secondary containment of non-production tanks include:

- Tanks greater than 45 gallons (one barrel) and less than 12,000 gallons (U.S. gallon), 45,400 litres or 45.4 m^3, storing chemicals, fuel or other products, for example, methanol and corrosion inhibitor, on a wellsite or facility site, will meet the standard for secondary containment with a double-walled tank design.

- The installation of a single-walled tank design with a catch-bin for containment or a dyke, as long as the capacity provides for 110 per cent of the tank volume.
- Tanks less than 45 gallons do not require secondary containment and tanks greater than 12,000 gallons (U.S. gallon), 45,400 litres or 45.4m^3, require dyking or berming to contain an unexpected release of fluid.

Barrels containing non-production fluids such as chemicals (glycol, amine, corrosion inhibitor, etc.); fuel for gensets or helicopters; oil (lube, engine crankcase) for compressors, one or more barrels can be stored at a location without secondary containment as long as the barrels are located in a manner where a spill would be contained within the facility area, and the spilled fluid would be contained in an area free of hazards such as away from a source of ignition. For production tanks in a tank farm, NFPA 30 requires the dyke / berm secondary containment to be sized for the containment of the full volume of the largest tank only. The requirement for barrel docks are described in NFPA 30.

Typical pop tank installations do not require secondary containment, as long as the facility site is constructed to contain all on-site fluid storage volumes and surface run-off. Where a pop tank is being used as both a drain tank and for emergency PSV fluid carry-over capture, secondary containment is required.

Truck Out Boxes

Truck out boxes are considered spill or leak prevention devices, not secondary containment. As a best practice, the Regulator recommends the boxes are installed inside the tank's secondary containment boundary. Any deviation from this design must achieve the same results, and is considered on a case by case basis. The design should be configured to enable the truck operator to remain outside the secondary containment area while loading and unloading the fluid.

Truck out boxes should be reflected on the drawings relative to the tank's secondary containment boundary as follows:

- By showing the location of the truck out boxes on the Plot Plan, PFD or P&ID, and/or
- By inserting a note on the drawings stating the location of the truck out boxes.

Petroleum Storage Tank Design

The general standards for atmospheric and low-pressure petroleum storage tanks in B.C. are included in the following American Petroleum Institute (API) documents:

API-650	Welded Steel Tanks for Oil Storage: governs the construction of tanks storing products with internal pressures of up to 2.5 psig.
API-651	Cathodic Protection for Above-Ground Petroleum Storage Tanks.
API-652	Lining of Above-Ground Petroleum Storage Tanks.
API-653	Tank Inspection, Repair, Alteration, and Reconstruction.
API-620	Design and Construction of Large Welded Low-Pressure Storage Tanks: construction of tanks with internal pressures of up to 15 psig.
API-2000	Venting Atmospheric and Low-Pressure Storage Tanks.
API-2350	Overfill Protection for Petroleum Storage Tanks.
API-2015	Cleaning Petroleum Storage Tanks.
API-2550	Measurements and Calibration of Petroleum Storage Tanks.

For general requirements on underground tank inspections and abandonment, refer to CSA Z662, API-1604 and NFPA 30.

Water Storage at Facility Sites

Long-term produced water storage sites where containment ponds and/or other produced water storage and treatment equipment is constructed for reclaimed, blended, or produced water, including frac flow back water, are part of the facility application process. This type of stand-alone produced water storage facility must be applied for as a water hub facility. If a produced water storage containment pond is to be constructed at an existing facility site, such as a compressor facility, a new application must be submitted for a water hub facility. Existing facilities other than a water hub, cannot be amended to add a water hub via permit amendment to add storage capacity or related equipment.

If a facility is proposed to store only fresh water (fresh water storage site), an application for an associated activity can be submitted, as described in Section 4.6 of this manual. Fresh water storage sites may also be subject to authorizations under the Water Sustainability Act and Dam Safety Regulation.

Light Control

The Regulator requires that operations at a well or facility do not cause excessive emanation of light. It is expected that permit holders have done all that is reasonable to mitigate light emissions to surrounding areas, without compromising the safety of workers or the facility's safe operation.

Mitigation measures that might be considered include:

- Minimizing the amount of lighting required while ensuring safe operation of the facility,
- Minimizing brightness of lights to the extent practicable,
- Use of automated sensors that shut down lighting in areas of no activity where it is safe to do so, and,
- Re-angling, shading or screening of lighting.

As required in Appendix B of this manual, a summary of how light pollution has been identified, considered and mitigated must be included as a mandatory application deliverable for gas processing plants.

4.3.4 Facility Specific Activity Requirements

This section outlines application requirements for facility applications. Requirements are dependent on the characteristics of each facility activity and are outlined in full details below including a description, details of additional information and requirements. In most cases, the details are input into the facility application tab within AMS, but may require the upload of an attachment to support the details including:

- Project description (as described below).
- Piping and instrumentation diagram.
- Process flow diagram.
- Gathering system schematic.
- Plot plan.
- Air dispersion model (as described below).
- Dehydration engineering and operations sheet (as described below).

- Discharge of waste reporting (as described below).
- Sand Management Plan (as described below).
- A table of all design codes to be used in the facility design, construction and operation including a summary of the scope of application of each code within the facility.
- a table of all natural gas fired appliances proposed at the facility with the corresponding ASME Boiler and Pressure Vessel Code section, burner control system standard, appliance rating, and pressure piping standard, for which the appliance was designed.

Attachments must meet specific size and file formatting restrictions in order to be uploaded correctly as defined in Section 5.8 of this manual.

1. Project description

Provide a brief description of the project and any comments relevant to the facility and/or application. Specific information is required in project descriptions accompanying new facility applications and facility amendment applications and should include:

- New facility application – include oil condensate capacities in project description,
- New facility application – include the means and plans for security and access control in accordance with Section 39(3) of the Drilling and Production Regulation and/or Section 8(1)(e) of the Liquefied Natural Gas Facility Regulation in project description,
- Notice of Intent to suspend a gas plant or other facility: include a list of wells from the schematic, a rationale for shut-in and plan and duration of shut in in project description. Must also show provisions have been made to:
    i. Store, handle and dispose of toxic material,
    ii. De-pressure the facility,
    iii. Dispose of corrosive, combustible or explosive fluids,
    iv. Minimize or prevent degradation of the plant or facility equipment, vessels and piping,
    v. Secure the plant or facility against unauthorized entry and vandalism,

vi. Periodically have the plant or facility and site inspected by qualified persons, and,

vii. Address any other concerns the Regulator has identified.

2. Air Dispersion Modelling

Applicants shall consider the impacts to ambient air quality as a result of routine combustion of sour gas and / or combustion of gas containing >=1 mole per cent H_2S for a duration of >=15 minutes or that results in 1 tonne/rolling 24 hours of sulphur emissions. Results and records of air dispersion modelling must be attached to facility permit applications where this applies. Further information can be found in the Flaring & Venting Reductions Guideline, Section 6.10.

3. Dehydrator Engineering and Operations Sheet

A Dehydrator Engineering and Operations Sheet (DEOS) must be attached to facility applications or amendment applications where new or used glycol dehydration equipment is to be installed, where existing glycol dehydration equipment is to be modified, or requested changes to the facility affect the dehydration process. The DEOS must show that the dehydration process will follow the Regulator's policy on benzene emissions outlined in the Flaring and Venting Reduction Guideline.

4. Discharge of Waste

Some facilities require a waste discharge authorization under Section 6 of the Oil and Gas Waste Regulation. This approval is required when:

- The cumulative rated power of all compressor drivers is greater than 600 but less than 3,000 kilowatts of total power,
- The cumulative rated power of all oil pump drivers is greater than 600 but less than 3,000 kilowatts of total power,
- The cumulative rated power of all electricity generator drivers is greater than 600 but less than 3,000 kilowatts of total power,
- The facility includes dehydrators, line heaters or treaters that combust high sulphur gas (> 1 per cent) and are each rated at 150 kilowatts or more, or,
- The facility is a processing plant.

The first three items in the bulleted list above are individual entities and must not be combined to determine total driver power. The Application Management

System prompts for the upload of a completed Schedule 3 form if an approval under Section 6 OGWR is required. The Regulator's Environmental Management and Reclamation department conducts the appropriate review and determination process for waste discharge approvals based on the information entered at time of facility application. No separate application is needed.

Some facilities are not subject to the OGWR, thus requiring a Waste Discharge permit under the Environmental Management Act and are described in Section 2(1) of the OGWR. Contact the Regulator's Director, Environmental Management and Reclamation for more information.

Additional Facility Requirements

1. Engineering Assessment

   The Regulator may request an engineering assessment, as deemed necessary. Engineering assessments must be completed in accordance with the latest version of CSA Z662, including:

   - Design capacity of the facility and design standard used.
   - Gas rate for a gas facility and solution gas rate for an oil facility.
   - Total sulphur emissions of the facility.

2. Sand Management Plan

   All operators of wells within British Columbia utilizing sand fracturing are required to develop and implement an appropriate Sand Management Plan. The Sand Management Plan is a comprehensive plan outlining the preventative steps to reduce, monitor, and capture sand returns, incorporate leak detection, monitor and maintain piping integrity, and ultimately minimize the risk of loss of containment due to sand erosion. The Sand Management Plan, and all records relating to sand monitoring and testing programs, must be reviewed and updated at regular intervals or as required and made available to the Regulator upon request. The Sand Management Plan must take into consideration and document:

   - procedures for monitoring sand returns during cleanup and define the cleanup target criteria for sand returns,
   - procedures for monitoring sand returns upon initial production, during the life of a well, and after periods of extended pressure buildup,

- proposed de-sanding equipment upon initial production and throughout the life of a well,
- when a well workover, recompletion, or well-bore alteration takes place there must be an adequate plan to either complete additional flowback through well testing equipment, or another means to control sand returns and potential erosion in surface and equipment,
- piping configurations to minimize erosion,
- well facility design to detect and control leaks as quickly as practicable,
- maximum velocity determination and methods to keep velocities within appropriate and defined parameters as stated by API RP 14E or the NORSOK standard P-001. Either standard may be used, but must then be followed in its entirety for erosion calculations,
- baseline and ongoing ultrasonic testing, and interpretation of results,
- justification for location of erosion sensing devices and demonstration of effectiveness, if applicable,
- the application and as-built P&IDs must include the maximum well design flow rates that incorporate the calculated maximum design erosion flow velocities in the facility piping,
- management of design changes, and
- communication and documentation procedures of operating limits with field personnel.

3. Water Management Plan

   All water hub facilities and facilities with excavated ponds and pits or permanent C-rings must include a water management plan (WMP) with the application. The water management plan is a comprehensive plan outlining the process and inventory of produced and fresh water, as well as preventative designs and procedures. All records relating to water monitoring and testing programs must be maintained and made available to the Regulator upon request. The Water Management Plan must include at a minimum:

   - Description of the water process flow.
   - Water inventory management and monitoring.
   - Regulatory submissions.

- Leak detection description.
- Counter measures, responses and training in the event of a spill.
- Spill kits and equipment on site.

Other details in the plan may include:

- Design and geotechnical details.
- Wildlife mitigation.
- Likely spill / leak scenarios.

4. Comingled Production

   Comingled production approvals are required attachments for some facility applications. The Regulator's Production Allowables web page provides more information on comingled production approvals.

Gas Processing Plant: Additional Requirements

The review must include the rationale for constructing the newly proposed plant after consideration of existing active plants and pipeline infrastructure feeding into active plants within a 50 kilometre radius.

Appendix B of this manual provides a detailed listing of technical documentation to be included in an application for a gas processing plant in addition to specific details on requirements for plans, diagrams and maps.

4.3.5 Additional Considerations for Facilities Activity

Emergency Response Planning

An Emergency Response Plan (ERP), or an update to an existing plan, must be submitted to the Regulator in accordance with Section 7 of the Emergency Management Regulation. Emergency planning zones are determined using H_2S content of product in a pipeline, well or at a facility. Review Schedule A of the Emergency Management Regulation for more information.

Chapter 4.4 Completing Geophysical Activity Details

4.4 Geophysical Activity Tab

Applicants applying for a geophysical permit must complete the geophysical application tab in the Application Management System. The geophysical tab is made up of two components: geophysical details and geophysical land details.

This section includes an overview of geophysical permitting, guidance regarding geophysical planning and design, details related to geophysical specific application requirements and detailed instructions for completing the data fields within the geophysical tab.

Please Note:

This manual is written as a whole and provided to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.4.1 Geophysical Exploration Defined

Geophysical exploration is an energy resource activity under the Energy Resource Activities Act (ERAA) and is specifically defined in the Petroleum and Natural Gas Act (PNG) Act as:

- Investigation of the subsurface by seismic, gravimetric, magnetic, electric and geochemical operations and by any other method approved by the Regulator, but does not include the use of geophysical well logs, vertical seismic profile surveys or other surveys obtained from a well.

Approved energy resource applications receive a permit under Section 25 of ERAA to carry out construction and operations pertinent to the activity. The permit expires where construction activities have not started within two (2) years of permit issuance. Unless expired, the permit remains active until cancelled, suspended or declared spent, according to the provisions of ERAA.

A geophysical exploration permit is spent when the Regulator receives a final plan from the permit holder. The Geophysical Regulation states final plans must be submitted within 60 days after the date of project completion.

4.4.2 Creating a New Geophysical Application

New Geophysical Applications

A new geophysical permit is required for all new geophysical exploration programs to be carried out including programs or portions of programs carried out within existing disturbance.

Since geophysical exploration includes surface, subsurface and aerial, applicants must indicate the program type, energy source and construction method for the activity within the geophysical details component of the geophysical tab.

Geophysical Permit Amendments

A permit amendment is required before the associated changes are carried out. A geophysical exploration permit amendment is required for the following scenarios:

- Adding lines.
- Changing line locations or details, where the permit does not explicitly provide for this via authorization of 'Line Shift Variance'.
- Corrections to inadvertent data errors where the error is in the permit or impacted on the decision.

4.4.3 Geophysical Exploration Planning & Design

This section provides typical planning and design requirements, guidelines and considerations when planning and designing geophysical exploration. The standards and guidelines presented here form a substantial basis for assembling

an application. The Regulator reviews the geophysical application relative to the engineering and technical information provided in the Application Management System; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Geophysical exploration activities must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), Geophysical Exploration Regulation (GER) and the Environmental Protection and Management Regulation (EPMR).

If an exemption is requested from regulatory requirements, an exemption request must be prepared at the time of application and include:

- Specific regulatory provision requiring an exemption.
- Rationale for exemption (explanation of why an exemption is required).
- Proposed plan showing mitigation strategies to reduce impacts.

If exemptions are approved prior to the application, this approval must be attached to the application.

Specific to geophysical exploration, an applicant may request an exemption from part or all of the geophysical project report and the final plan in accordance with Sections 2 and 3 of the Geophysical Exploration Regulation.

Guidance Requirements

In addition to this Energy Resource Activity Application Manual, geophysical exploration activities should meet guidance recommendations in the following Regulator documents:

- Oil and Gas Activity Operations Manual.
- Environmental Protection & Management Guideline.
- Horn River Basin and Muskwa-Kechika Management Area Guidance document.

If energy resource activities cannot be carried out in accordance with the guidance recommendation then justification must be included in the application. Include specifics of the guidelines not followed, an explanation of why they cannot be followed, proposed plan and applicable mitigation strategies.

Notification in Advance of Camp Applications

Applicants must notify Peace River Regional District (PRRD) and the Northern Rockies Regional Municipality (NRRM) as a rights holder in advance of submitting any camp applications.

Geophysical Exploration Buffers & Prior Consent for Reduced Buffer Distances

Section 4 and Schedule 1 and 2 of the Geophysical Exploration Regulation (GER) states buffer distances for geophysical exploration near pipeline, utility, residence, etc. and establishes buffer distances in relation to prescribed structures for the use of energy sources in carrying out geophysical exploration.

Where reduced buffer distances are planned, as provided in Schedule 2 of GER, written consent must be obtained from the owner of the structure prior to carrying out the activityIn order to avoid amendments, the Regulator encourages applicants to obtain consent from structure owners for any planned reduced buffer distances prior to application submission.

When planning projects and buffer distances, applicants should take into consideration that some residences, as defined within the GER, may not be registered or identified in provincial land registries. All residences, including permanent and temporary dwellings, and cabins, must be factored into application planning and buffers complied with during geophysical operations.

Overlapping Projects

Applicants should use the analysis tool within the Application Management System to investigate for overlapping geophysical projects in an effort to minimize environmental impacts on the land base. Overlaps exist where two or more geophysical projects cover portions of the same area of land.

The coordination of overlapping projects should occur wherever practicable and arrangements made to use the same seismic lines (source or receiver) and/or access other geophysical projects for overlap. As a general permit condition, the Regulator requires that any opportunity to coordinate or use existing lines or access identified in the field (not previously identified by an applicant or the Regulator) must be taken wherever practicable. Justification and mitigation

measures must be explained for geophysical programs overlapping and not coordinated or using existing seismic lines within 400 metres of the proposed line.

Geophysical Line Shift Variance

Line shift variance provides flexibility in the field to move geophysical lines one way or another within the variance permitted. The line shift variance must comply with buffer distances and appropriate archaeology and consultation and notification requirements must be conducted. Geophysical projects without a line shift variance and needing to move locations require an amendment.

Completing Reconnaissance as Part of Geophysical Application Planning

Observing field conditions is critical, and reconnaissance evaluations are essential to planning for and completing a geophysical exploration application. Ideally, site evaluations are assessed through a combination of aerial and ground reconnaissance.

Pictures taken during the area reconnaissance may accompany the application in order to assist in the Regulator decision making process. Digital pictures must be .jpg format uploaded in the attachments tab of AMS. Suggested pictures include:

- Wildlife/wildlife features encountered.
- Stream crossing locations.
- Re-growth on existing lines that are planned for use.
- Overall picture of area.

In addition, applicants may be able access the following tools and methods through Data BC and other external sources to assist in evaluating site conditions and operational planning:

- Crown land status maps.
- Forest development plans/ forest stewardship plans.
- Aerial photography.
- Forest cover maps.
- Fish and wildlife mapping.
- Light Detection and Ranging (LiDAR).

4.4.4 Geophysical Program Activity Requirements

This section outlines application requirements for geophysical applications. Requirements are dependent on the characteristics of each geophysical program. In most cases, the details are input into the geophysical application tab.

Applicants must provide general statements regarding primary and secondary watercourse crossing methods and how they will be constructed. Applicants are then required to submit a list of all watercourse crossings constructed with method of crossing utilized within the post construction submission (final plan).

Mapping Requirements Specific to Geophysical Programs

In addition to the mapping requirements for all projects, proposed geophysical projects require the following mapping:

1) 1:20,000 Maps:
    - 2D project maps require UTM (NAD 83 CSRS) or latitude and longitude coordinates at the start and end of each line.
    - 3D project maps require UTM (NAD 83 CSRS) or latitude and longitude coordinates at the corners of the project area.
    - Forestry cutblocks (colour coded to status) and any other overlapping tenures.
    - Mechanical stream crossings.
    - Approximate number of push outs to be constructed; total to be confirmed on the final plan.
    - If heli-assisted operations are proposed, amount and size of helipads must be indicated on the legend; total to be confirmed on final plan.
    - Include staging areas and campsites (if required for less than 100 days).
2) 1:250,000 Access Map (this can be inset into the above map or on a separate map):
    - Access to the project highlighted in yellow.
    - Project outline.
    - Trapper boundaries and numbers.

Chapter 4.5 Completing Road Activity Details

4.5 Road Activity Tab

Applicants applying for an energy resource road permit must complete the road application tab in the Application Management System. The road tab is made up of three components: road overview, road details, and road land details.

This section includes an overview of road permitting, guidance regarding road planning and design, details related to road-specific application requirements and detailed instructions for completing the data fields within the road tab.

Please Note:

This manual is written as a whole and available to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.5.1 Roads Defined

As of September 01, 2023 the Oil and Gas Road Regulation was replaced with the Energy Resource Road Regulation.

Energy resource roads are prescribed as an energy resource activity in ERAA and are defined within the Energy Resource Road Regulation (ERRR) as: .

(1) (a) A road or portion of a road that is constructed or maintained to facilitate the carrying out of a primary activity;

(b) A road or portion of a road that was constructed before June 3, 2013 [the coming into force of the Energy Resource Road Regulation] under the Land Act, the Petroleum and Natural Gas Act, or the Pipeline Act.

(2) Subsection (1) does not apply to a road that

(a) has been deactivated, or

(b) is required to be maintained under an enactment other than

(i) this regulation, and

(ii) an Act referred to in subsection (1) (b).

Approved energy resource applications receive a permit under Section 25 of ERAA to carry out construction and operations pertinent to the activity. The permit expires where construction activities have not started within two (2) years of permit issuance, unless a permit extension has been granted. Unless expired, the permit remains active until cancelled, suspended or declared spent, according to the provisions of ERAA.

The ERRR prescribes the rights and obligations of permit holders related to design, construction, maintenance, use and deactivation of energy resource roads.

Road Types

Applicants must apply for a specific type of energy resource road. The appropriate road type must be selected in the road details component of the road tab in the Application Management System. Road types are defined further in the Regulator glossary and include:

- Long-term, all-weather road is a roadbed surfaced with gravel.
- Short-term, low-grade road is constructed during non-frozen ground conditions with a minimal grade and adequate drainage control. Low-grade access may be constructed during frozen ground conditions.
- Snow and/or ice road is construction and suspension activities carried out during frozen ground conditions with minimal soil disturbance.
- Existing traditional winter access is construction and suspension activities carried out during frozen ground conditions with minimal soil disturbance.

4.5.2 Creating a New Road Application

New Road Application

A new energy resource road permit is required for any new road to be constructed and operated, for a non-status road to be maintained or modified by an energy resource operator, or to acquire an energy resource road permit for a road currently regulated under another statutory authority (Transfer of Jurisdiction).

Roads can be applied for individually or with other energy resource activities as part of a multi-activity project application. The system generates data input requirements for additional activities specified within the spatial data upload.

Road Amendment

A road permit amendment is required to:

- Carry out activities not authorized by, or which are alterations to the original permit.
- Modify an ERAA permitted road, except modifications allowed under the terms of the permit or the Energy Resource Road Regulation.

Please Note:

An ERAA road permit is required prior to carrying out maintenance activities on non-status roads. Several non-status roads can be included in one road permit application by identifying each road as a separate segment in the application. Permit holders will be required to submit a Historical submission for existing permitted roads that have not been transitioned to an ERAA road permit or have not been reconciled prior to submitting an amendment.

Transfer of Jurisdiction (MOF/Regulator)

To apply for an ERAA road permit on an existing road authorized by MOF applicants should include the following additional attachments:

- Documentation indicating the current road tenure holders' willingness to relinquish the road in favor of an energy resource operator.
- Confirmation from MOF of willingness to close the road permit upon the Regulator's approval of an energy resource road permit.

It is the responsibility of the current road tenure holder to provide a disclosure of new information relevant to the road to the proposed energy resource operator.

The Regulator will not transfer a road permit issued by MOF to an energy resource operator; but will work with MOF to enable the issuance of an ERAA road permit.

Roads that may be the subject of a transfer of jurisdiction can be applied for as a standalone ERAA Road permit, or included as part of a multi activity ERAA application if applicable.

The Regulator will forward a copy of the ERAA road permit to MOF in order to terminate the MOF road permit. During this interim period, there may be spatial overlap of the MOF permit and ERAA permit while the digital inventory gets updated.

Historical Submission: Road

The historical road submission is intended to define the process to transition existing permitted energy resource roads to an ERAA road permit and to collect or update missing information required for road reconciliation.

The historical road submission is selected from the create "application type" menu as "historical submission". Scenarios where a historical road submission is appropriate are:

- When an existing permitted road has not been transitioned to an ERAA road permit.
- The road information has not been reconciled.
- The road information is inaccurate or missing segment data and/or stream crossing information.

An existing permitted road must be reconciled and hold a valid ERAA road permit before the permit holder may apply to amend or modify the road.

Please Note:

If a permit holder wishes to submit a historical submission for a road that has been reconciled and holds a valid ERAA road permit, the applicant must provide a rationale explaining why the submission is required.

4.5.3 Road Planning & Design

This section provides typical planning and design requirements, guidelines and considerations when planning and designing a road for an energy resource activity application. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the road application relative to the engineering and technical information provided in the Application Management System; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Roads must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), the Energy Resource Road Regulation (ERRR), the Pipeline Crossings Regulation (PCR), and the Environmental Protection and Management Regulation (EPMR).

Part 3 of ERRR outlines requirements related to road construction, including:

- Supervision of design, construction and maintenance by a qualified person, clearing widths, bridges and culverts, record keeping requirements, hazard warnings and post-construction reporting.

The Water Sustainability Act regulates authorization to make changes in or about a stream. A federal Fisheries Act review may also be required by DFO. ERRR regulates construction of bridges and/or culverts as part of a road to facilitate a crossing. Permit holders must be aware of and abide by Canadian Standard Association and Canadian Highway Bridge design codes for bridges or culverts.

If an exemption is requested from regulatory requirements, an exemption request must be prepared at the time of application and include:

- Specific regulatory provision requiring an exemption.

- Rationale for exemption (explanation of why an exemption is required).
- Proposed plan showing mitigation strategies to avoid, reduce, or mitigate potential impacts.

If exemptions are approved prior to the application, this approval must be attached to the application.

A permit (either an ERAA road permit or an AOGA access permit) is **NOT** required if utilizing an existing road for a limited duration or one time use. This also includes well permit holders who need to access a wellsite for the purpose of abandoning the well.

In addition:

- An ERAA road permit is NOT required when:
  - An energy resource operator is not actively maintaining, or causing maintenance to be required by the use of the existing road, nor causing harm or damage to the environment with the use of the road. Exceptions to requiring a permit may also apply where roads are temporarily being maintained during winter seasons. (i.e.. in the case of snow plowing, a road permit may not be required, however, a Section 11 WSA authorization may be required if stream crossing are identified).
  - An energy resource operator is maintaining a road on private land that existed prior to January 27, 2011, as per Section 118.1 ERAA.
- An ERAA road permit is required for:
  - **New roads** (new construction on Crown or private land)
  - An existing non-status road on Crown land that is being maintained and is being used to carry out a primary energy resource activity such as:
    - Maintenance to road grade beyond snow plowing.
    - Road being maintained and there is a permanent bridge installation or major culvert required.
    - Road being maintained for active production.
    - Road being maintained and is a 'mainline' high traffic or higher speed road that needs signage / road frequency – will need to determine/investigate responsible party prior taking action seeking to assign.
  - A road on private land that is being maintained and existed after January 27, 2011.

- An existing road that requires a modification that includes the addition of a (permanent structure) bridge and/or a major culvert.
  - A temporary clearspan bridge is not considered a permanent structure; but an amendment to the Regulator would still be required as this would be considered a change to their permit.

A formal exemption can be granted under Section 28 of the ERRR by the Executive Director, Permit Adjudication or the Vice-President, Applications.

AOGA – Temporary Access

Temporary access means a trail, shoe-fly or a means of accessing a related activity that is required during the construction of that related ERAA activity. Temporary access cannot be constructed to the standards identified within Part 3 of ERRR, otherwise the applicant should be advised to apply for an ERAA road permit.

CER Related Road Right of Way

A 'Road' applied for as an CER Related Road Right of Way, must be related to an CER project as per Section 9 of the ERAA under a specified enactment.

Guidance

- Issuance of a permit is authorized under a specified enactment as defined in ERAA.
- Section 8 of ERAA defines the Regulator's responsibilities under specified enactments.
- The ERRR applies by policy.

CER Ancillary – Access

Access means a trail, shoe-fly or a means of accessing a related activity that is required during the construction of the related CER activity.

Guidance

- Ancillary access is temporary.
- Issuance of a permit is authorized under a specified enactment as defined in ERAA.
- Section 8 of ERAA defines the Regulator's responsibilities under specified enactments.

Guidance Requirements

In addition to this Energy Resource Activity Application Manual, roads should meet guidance recommendations in the following Regulator documents:

- Oil and Gas Activity Operations Manual.
- Environmental Protection and Management Guideline.

Planning Road Rights-of-Way

Provide a rationale for the proposed right-of-way location chosen and overall details for the road including to and from locations, right-of-way length and maximum width. Proposed road rights-of-way must also be identified on the project construction plan. If there is a road nearby that can provide access, provide a rationale for why new construction is needed.

Planning Construction Corridors

Provide an additional mapped area around the proposed road right-of-way providing for construction corridor. Construction corridors allow the flexibility to construct the road and accommodate any related activities.

Planning for Stream Crossings

Stream crossings required for road construction can be applied for as part of a road permit application and approved under ERAA, and / or the WSA. A review under the federal Fisheries Act may also be required by DFO for any changes in or about a stream.

Stream crossing authorizations issued with a road permit are valid for the life of the road, except as otherwise limited in the permit or the Energy Resource Road Regulation.

Road modifications requiring the installation or replacement of a bridge or major culvert associated with the road require an amendment to the road permit and an application for Changes In and About a Stream under Section 11 of the WSA and detailed in Section 4.8 of this manual.

Planning for Borrow Pits

Borrow pits are applied for as part of an Associated Activity application as detailed in Section 4.6 of this manual.

4.5.4 Road Specific Considerations for a Road Activity

Forest Service Roads

If the proposed road enters or affects a Forest Service Road right-of-way, or Ministry of Transportation and Infrastructure (MOTI) right-of-way, consent to carry out the approved activities must be obtained from the applicable agency before the project begins.

A road use permit (RUP) is required to use Forest Service Roads to carry out energy resource activities. Where a RUP is not already held, one can be obtained by submitting a RUP application via the Natural Resource Online Services (NROS) portal. For additional information on forest road administration, please refer to the Guidance documents for oil and gas activities.

Road Use Requirements Applicable to all Energy Resource Permit Holders

Permit holders must review and comply with ERRR:

- Part 3: outlines requirements related to road maintenance including: general and technical road maintenance, bridge maintenance, and limited maintenance related to temporary stoppage in road use.
- Part 4: outlines requirements related to streams and stream crossings.
- Part 5: sets out road use and operation provisions and requirements including: right of access, limited application of the Motor Vehicle Act to energy resource roads, speed restrictions, use and requirements related to traffic control devices, storage and disposal, temporary closures, temporary restriction of access, removal of objects, and the use of energy resource roads maintained by a road permit holder.
- Part 6: prescribes requirements for road permit holders in relation to road deactivation.

Use of Energy Resource Roads Maintained by a Road Permit Holder

Section 21 of the ERRR establishes requirements related to use, notification and contribution to maintenance costs associated with using an energy resource road maintained by a road permit holder:

- Providing Notice of Use to the road permit holder at least 14 days before the intended use will begin.

Upon receiving a notice of intended road use the road permit holder must provide to the permit holder providing the notice, an estimate of costs along with supporting data and records in relation to maintenance or any modifications necessary to accommodate the intended use of the permit holder, or to repair any damage caused by the user.

Chapter 4.6 Completing Associated Oil and Gas Activity Details

4.6 Associated Activity Tab

Applicants applying for an associated activity (AACT) permit must complete the associated activity application tab in the AMS. The AACT tab is made up of two components: AACT details and AACT land details.

This section includes an overview of AACT permitting, guidance regarding associated activity planning and design, details related to AACT specific application requirements and detailed instructions for completing the data fields within the AACT tab.

For stand-alone Water Sustainability Act authorizations, rights holder engagement is required and the line list must be uploaded under the Rights Holder Engagement tab in AMS. For further information regarding rights holder engagement requirements, refer to Chapter 6.2 of this manual.

Please Note:

This manual is written as a whole and available to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.6.1 Associated Activity Defined

Section 1 of Energy Resource Activities Act (ERAA) defines energy resource related activity as an activity:

- That, under a specified enactment, must not be carried out except as authorized under the specified enactment or that must be carried out in accordance with the specified enactment.
- The carrying out of which is required for or facilitates the carrying out of an energy resource activity.

Please Note:

The Energy Resource Activities Act defines both energy resource activity and related activities and the Regulator adheres to the definitions. The Regulator's glossary and acronym listing is an extension of this manual and defines terms used throughout the energy resource activity. Applicants and permit holders should refer to the glossary to understand the exact definition of terminology as it may differ from other regulatory bodies. Due diligence is required to ensure proper understanding of terms, acronyms and legislation.

AACT's are related activities that require an authorization under either the Land Act or under s.138 of the Petroleum and Natural Gas Act where applicants cannot adhere to s.8.3 of the Crown Land Permission Policy. The Regulator does not issue authorizations for associated activities on private land.

In accordance with Section 24(3) of ERAA:

- The Regulator may not grant an authorization to a person for a related activity unless the person holds, or has applied for, a permit for the energy resource activity related to that activity.

For some AACT, such as Investigative Use or Restoration activity, the Regulator may grant authorizations without the existence of a primary energy resource activity permit or application where it has delegated authorities to do so. Contact the appropriate Authorizations Director for more information.

The AMS Restoration Release Guide provides additional information on restoration activity.

Approved AOGA applications receive an authorization which generally expires two (2) years after the date of issuance if the activity has not begun. If the activity

is carried out prior to two years from the date of issuance, the authorization remains active for so long as required. Any subsequent tenure renewals will be issued by the Regulator, as required.

Associated Activity Intended Land Use Types

Associated activity applications can be submitted for several intended land use types, including:

- Access
- Above ground fresh water line
- Aggregate / Borrow Pit
- Airstrip
- Campsite
- Cathodic Protection Anode Bed
- Communication site
- Deck site
- Fresh water storage site
- Gate monitoring site
- Helipad
- Investigative use – General
- Investigative use – Water source well testing
- Monitoring site
- Offset
- Powerline
- Restoration
- Site remediation
- Staging area
- Storage area
- Sump
- Water source dugout
- Workspace

The AOGA type is auto-populated into the AMS based on attribute data included within the spatial data upload.

4.6.2 Creating an Associated Activity Application

Associated activities can be applied for independently, but also can be combined in a multi-activity application along with the primary activity. The Regulator encourages multi-activity applications wherever practicable, especially when additional authorizations are required in relation to the associated activity.

Amendments

An amendment may be used for the addition of associated activities and / or for the modification of existing associated authorizations. The application must include a clear description of the changes in the amendment application description box. Any changes must also be highlighted on the associated construction plan.

4.6.3 Associated Activities Planning & Design

This section provides guidelines and considerations when planning and designing associated activities. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the associated activities application relative to the technical information provided in the Application Management System; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Associated activities must meet the design and operational requirements outlined in the Energy Resource Activities Act (ERAA), the Land Act and the Petroleum and Natural Gas Act.

If an exemption is requested from regulatory requirements, an exemption must be applied for at the time of application, and must include:

- Specific regulatory provision requiring an exemption.

- Rationale for exemption (explanation of why an exemption is required).
- Proposed plan showing mitigation strategies to reduce impacts.

The exemption request must demonstrate that it is not reasonably practicable for the activity to comply with the regulatory requirements, and must be reviewed and approved by the Regulator.

Guidance Requirements

By policy, the Regulator applies the tests and principles of the Environmental Protection and Management Regulation (EPMR) to AOGA applications. Refer to the Environmental Protection and Management Guide (EPMG) for more information regarding how the Regulator considers the identified values.

If energy resource activities cannot be carried out in accordance with the guidance recommendations in this chapter and in the EPMG, then a rationale must be included in the permit application. The rationale must include specifics of the guidelines not followed, an explanation of why they cannot be followed, as well at outline any planning strategies or operational measures that have been or will be implemented to mitigate impacts on the associated value.

4.6.4 Associated Activity Specific Activity Requirements

This section outlines application requirements for AOGA applications. Requirements are dependent on the characteristics of the associated activity and are outlined in more detail below including a description, details of additional information and requirements. In most cases, the details are input into the associated activity application tab, but may require the upload of an attachment to support the details. A rationale text box may be indicated as optional in AMS, this is not because the submission of the rationale itself is optional. However, the option to include the rational in the associated text box is optional rather than uploading a more comprehensive rationale as an attachment. Attachments must meet specific size and file formatting restrictions in order to be uploaded correctly as defined in Section 5.8 of this manual.

Please Note:

Applications submitted without appropriate rationales will be subject to processing delays while the Regulator waits for the required application deliverables.

Aggregate / Borrow Pits

The Ministry of Energy and Mines has delegated limited authorities to the Regulator to authorize aggregate operations under the Mines Act. Applicants should indicate whether, in their assessment, if a Mines Act Permit is required. The aggregate operation /worksite borrow pit categorization key provided in Appendix E illustrates the difference between an aggregate operation, and an energy resource aggregate operation and a worksite borrow pit.

Worksite borrow pits are defined as an excavation of clay, gravel, rock, shale, sand or soil used solely for the construction of the related energy resource infrastructure. Worksite borrow pits are temporary in nature and permission to further excavate material is considered spent on the completion of construction of the associated energy resource infrastructure. Work in and around a worksite borrow pit is subject to WorkSafeBC regulations.

Energy Resource Aggregate Operations

Energy Resource Aggregate Operations are an excavation of shale, gravel, rock, or sand used for the construction or maintenance of energy resource infrastructure that does not meet the criteria for a worksite borrow pit.

Criteria considered in determining energy resource aggregate operations for the proposed pit include:

- Size of proposed pit (is it greater or less than 3 ha).
- Life of proposed pit (is it needed for more than 2 years).
- Development of a bench.
- Volume extraction is greater than 25,000 tonnes per year.
- Blasting that involves processing of aggregate.

These criteria are a general guideline for determining when an applicant must apply for an Energy Resource Aggregate operation; if there are questions about the

categorization of the worksite borrow pit / aggregate operation please contact the appropriate Regulator Authorizations Director.

Please Note:

Energy Resource Aggregate Operations considered by the Regulator include only the excavation or quarrying of aggregate that:

- produce material solely for the construction and maintenance of energy resource infrastructure;
- is not located within a construction corridor;
- does not produce materials for sale to or use by any party other than for the permit holder, or the holder of an approval referred to in Section 9 of ERAA, with authorization for its use;
- does not produce sand for use in hydraulic fracturing; and
- is subject to the requirements of the Health, Safety, and Reclamation Code for Mines in British Columbia.

Applications for aggregate operations, whether for energy resource purposes or not, that do not meet the above criteria, must be submitted directly to the Ministry of Energy and Mines. If there are associated Land Act authorizations required, the Regulator remains responsible for adjudication of those.

All energy resource aggregate operations are considered a mining activity under the Mines Act and are subject to the requirements of the Health, Safety and Reclamation Code for Mines in British Columbia. WorkSafeBC regulations do not apply.

An energy resource aggregate operation requires a Mines Act Permit in addition to a License of Occupation under Section 39 of the Land Act to occupy and use Crown land. As per the Health, Safety and Reclamation Code for Mines in British Columbia, all Mines plans, including programs for reclamation and closure, must be updated at a minimum of 5 years upon commencement of activity.
Applications for an energy resource aggregate operation must include a mine plan and mine emergency response plan as follows:

Mine Plan must include:

- Project description.
  a) Kind of aggregate material (clay, shale, gravel, rock, sand).
  b) Purpose – proposed use of material.
  c) Proposed start/end dates.

d) Identification of the Mine Manager appointed under Section 21 of the Mines Act (name and contact information).

e) Timing of activities (continuous, seasonal, intermittent).

f) Description of proposed work.

g) Activities and estimated disturbance:

- List any access roads / Trails / Heli Pads / Air Strips, including area of disturbance.
- Description of Sand, Gravel and Quarry Operations, including area for each activity:
    - Excavation of Pit Run.
    - Crushing.
    - Mechanical Screening.
    - Washing.

h) Settling Pond- provide the number of settling ponds, area of disturbance, and how the water will be disposed of i.e.. Recycled / Exfiltrate to ground / discharge to environment.

i) The estimated total mineable reserves over the life of the mine (tonnes).

j) The estimated annual extraction of material from site (tonnes/yr).

k) The estimated volume of timber to be cleared (m3).

l) Equipment list.

m) Blasting/rock crushing requirements (if any).

- Site condition:

a) Application area description (Forest composition, hydrology, geology, etc.).

b) Description of surrounding development.

- Engineering design & construction:

a) Mine location and size.

b) Site Preparation:

- Description of stripping overburden.
- Overburden management: storage location, height and slope, etc.

c) Pit slopes.

d) Perimeter berms.

e) Depth of groundwater table.

f) Proposed access and exit point.

g) Drainage exit locations.

h) Mine development maps and cross sections indicating:

- Depth.
- Length/width of open pit area.
- Length/width of total project area.
- Slope ratios.
- Setback areas with measurements.
- Overburden storage area with dimensions.

i) Erosion and sediment control.

j) Vegetation management strategy.

k) Reclamation plan.

Blasting Plan

A blasting plan should be included with the application if blasting is to be carried out to extract materials from the proposed pit. The blasting plan should include a map showing the existing infrastructures adjacent to the proposed site. The proponent should submit justification that the integrity of these infrastructures will not be impacted from blasting. The plan must be submitted by a Qualified Professional.

Mine Emergency Response Plan

Guidance on the development of a Mine Emergency Response Plan is available online from the Ministry of Energy and Mines.

Royalties Payable on Aggregate Material Mines

Aggregate volumes removed from a worksite borrow pit and from an energy resource aggregate operation may be subject to the payment of royalties to the Ministry of Forests as defined in the Crown Land Operational Policy: Aggregate and Quarry Materials.

Development and Reclamation Plan Requirements

Borrow pit and aggregate operations activities must be reclaimed in accordance with the reclamation plan. The following development and reclamation plan requirements must be prepared by a Qualified Professional.

- Plan view (map) of proposed development featuring:
    1. Topographic features.
    2. Property boundaries.
    3. Watercourses and drainages on the property and within 150 metres of the boundaries.
    4. Final boundaries and proposed excavation.
    5. Access roads
    6. Access to public roads.
    7. Proposed stockpiles (e.g., topsoil, overburden, product, etc.)
    8. Buildings and other facilities.
    9. Sediment control structures.
    10. Fencing and berms.
- Cross sections of proposed development illustrating:
    1. Original land surface.
    2. Typical configuration during mining, indicating the angle of slope and bench locations, if applicable.
    3. Proposed configuration upon completion of reclamation.
- Plan on the progressive development and reclamation of the aggregate operation/borrow pit:
    1. Describe the progressive development of the aggregate operation/borrow pit and reclamation plan.
    2. Describe the backfilling materials and placement procedures.
    3. Excluding lands not reclaimed. The average land capability to be achieved on the remaining lands must not be less than the average existing prior to the activity.
    4. Land, watercourses and access roads must be left in a manner ensuring long-term stability.
    5. Re-vegetated lands to a self-sustaining state using appropriate plant species.

6. Re-vegetated lands so the growth medium must satisfy land use, capability, and water quality objectives. All surficial soil materials removed must be saved for use in reclamation programs, unless the objectives are otherwise achieved.
7. Land and watercourses must be reclaimed in a manner consistent with the adjacent landforms where practicable.

- Prior to abandonment:
  1. All machinery, equipment and building superstructures must be removed.
  2. Concrete foundations must be covered and re-vegetated.
  3. All scrap material must be disposed of in a manner acceptable to an inspector.

Fresh Water Storage Sites

Under the Water Sustainability Act (WSA), the storage of water from a groundwater source or a stream (which includes a lake, pond, river, creek, spring, ravine, gulch, wetland or glacier) requires an authorization. In addition, structures constructed for water storage above natural grade elevation behind a berm or a barrier (i.e., "live storage") are dams under the Dam Safety Regulation (DSR) and require compliance with the construction and operational standards specified by the Ministry of Forests (MOF). Water storage behind a dam may also require a water licence.

Applicants for the use of Crown land for the construction and operation of a Freshwater Storage Site are required to provide the following information to the Regulator, in addition to what is specified for a standard Crown land application:

- Type of proposed water storage infrastructure planned for the site (e.g. c-rings, tanks, earthen excavation, etc.).
- Should the water storage involve a berm or barrier, provide the:
- Proposed maximum height of any berm or barrier above native grade elevation that enables the storage of water.
  - Total proposed water storage volume (cubic metres, m^3).
  - Total proposed "live storage" volume (m^3). Live storage is calculated as the volume of water stored above native grade elevation behind a berm or a barrier that would be released by a failure of the berm or barrier.
- If the structure is a dam other than a minor dam, provide the anticipated classification of the dam, following the approach detailed

in Schedule 1, Section 2, of the DSR.

Applicants are required to provide the above noted information in the Activity Description box, or attach a document providing the above-noted information to any associated activity application for a freshwater storage site submitted through the Regulator's AMS.

Dam Safety Regulation

Under the Dam Safety Regulation (DSR), a "dam" means a barrier constructed for the purpose of enabling the storage or diversion of water from a stream or aquifer.

The DSR creates three categories of dams (refer to Figures 4.B and 4.C below):

1. Minor dams: Section 2 of the DSR specifies minor dams as:
    - Less than 7.5 m in height; and
    - Capable of impounding at full supply level a maximum total live storage volume of 10,000 m^3 or less.

    Minor dams are exempted from the DSR, except in situations where the Comptroller or Water Manager believes the dam is potentially hazardous to public safety, the environment, or land or other property.

2. All dams: except minor dams, must comply with all parts of the DSR except Part 3, which only applies to certain large dams.

3. Large dams**:** All parts of the DSR including Part 3 apply to certain "large" dams or dams with a significant or higher consequence classification. The regulatory requirements for dams to which Part 3 of the DSR applies are more substantial. These dams meet one or more of the following criteria:
    - 1 m or more in height, and live storage of >1,000,000 m^3.
    - 2.5 m or more in height, and live storage of >30,000 m^3.
    - 7.5 m or more in height (regardless of volume).
    - The dam has a consequence of failure classification of significant, high, very high or extreme.

The construction, operation, maintenance, surveillance and decommissioning of any Freshwater Storage Site that is a dam under the DSR must be consistent with the DSR and the Ministry of Forests (MOF) dam safety guidelines. Applicants should refer to the MOF Dam Safety Program for detailed information.

Where the proposed Freshwater Storage Site is a dam, except for minor dams, applicants are required to:

- Follow MOF's requirements specified in the Plan Submission Requirements for the Construction and Rehabilitation of Dams;
- Complete and submit required plans and other information for the proposed dam to:
  - Dams <9 metres in height – MOF Regional Operations (Prince George).
  - Dams ≥9 metres in height – MOF Dam Safety Section (Victoria).
- Obtain "leave to commence construction" from MOF prior to the construction of any live storage potential for the dam.
- Comply with the DSR for the construction, operation, monitoring, maintenance, and removal etc., of the dam.
- Contact the appropriate Dam Safety Officer if assistance is required.

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Figure 4.B: Application of the Dam Safety Regulation to Dams in British Columbia

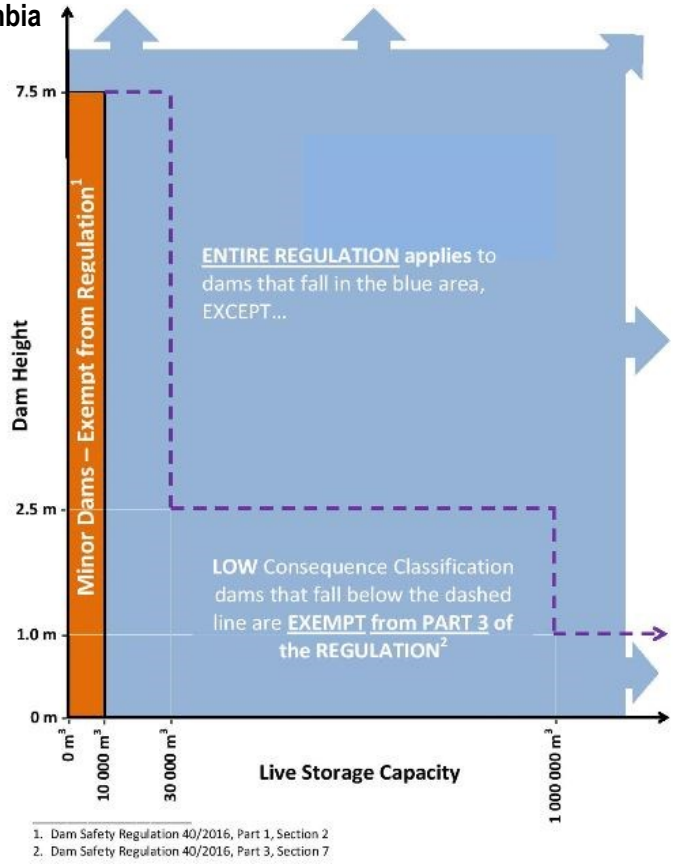
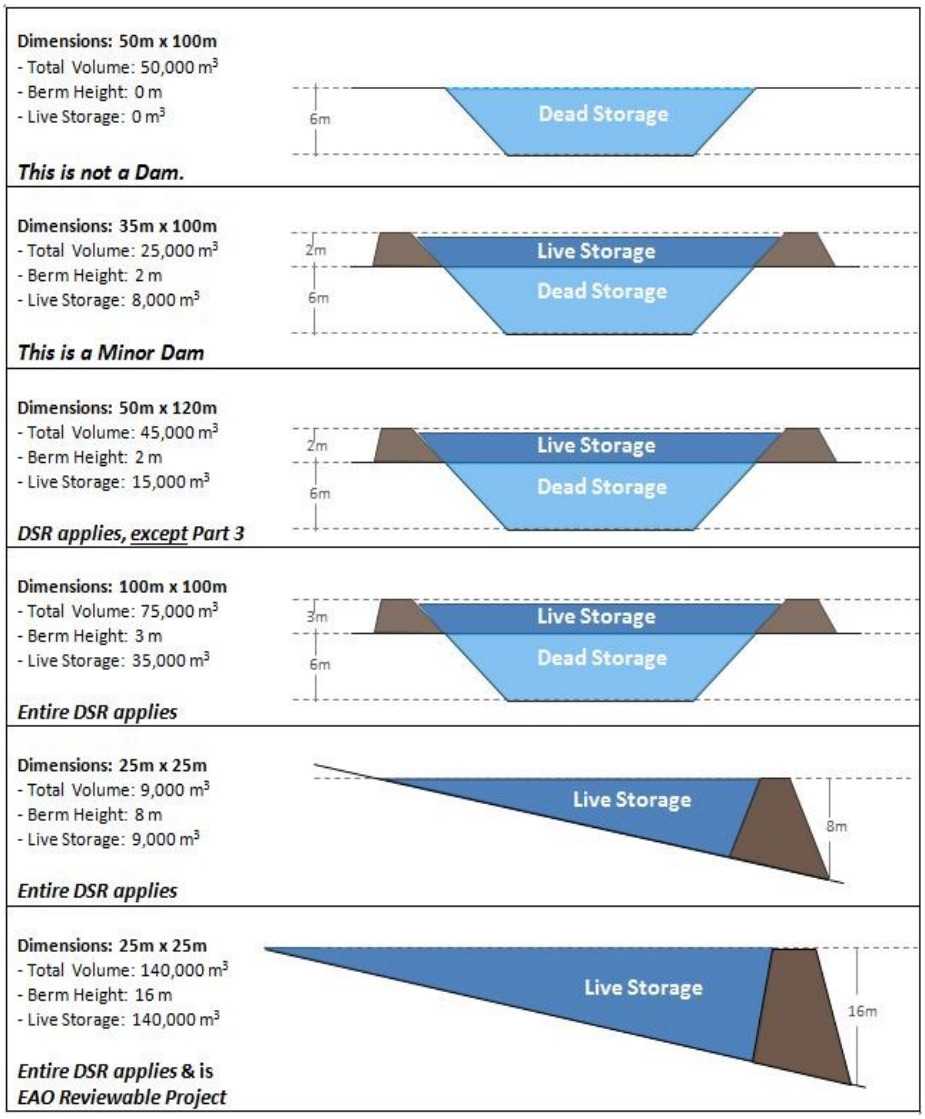


Figure 4.C: Examples of Water Storage Sites that are Dams or not Dams



Authorization to Store Water

All Freshwater Storage Sites storing water from a stream or a groundwater source require authorization under the WSA for the storage. Section 3(2) of the Water Sustainability Regulation stipulates that a short term use approval cannot be used to authorize water storage by a dam to which Part 2 of the DSR applies, unless the dam is authorized by a water licence. Energy resource operators who are proposing to store water from a stream or from a groundwater source in a Freshwater Storage Site can obtain the storage authorization in either of two ways:

1. Where the Freshwater Storage Site is a dam, except for a minor dam, the water storage must be associated with a water licence. Should an operator already have a water licence, it may be possible to amend the licence to add additional works to the licence, including a dam used to create the storage. Should an operator not have an existing water licence, the operator is required to apply for and obtain a water licence before a dam enabling live storage of water is constructed. Water licence applications are made to the Regulator using the online application portal.
2. Where the Freshwater Storage Site is a minor dam, or is an earthen excavation that is not a dam (i.e., with no live storage), authorization for water storage can be provided either with a short term use approval (Section 10 of the WSA), or with a water licence.

Environmental Assessment Act Requirement

Under Part 5 of the Reviewable Projects Regulation, a Freshwater Storage Site that is a dam with a berm height that equals or exceeds 15 metres is a reviewable project under the Environmental Assessment Act. The operator must contact the Environmental Assessment Office to determine whether an Environmental Assessment Certificate is required.

Equipment Storage Sites

The Regulator may authorize energy resource operators to use land for the purposes of temporarily storing equipment that is not currently in use on operating areas. This will generally be for centralizing equipment that is in transition in preparation for sale, alternate use or recycling. The Regulator will consider applications for this type of storage site under the following conditions:

- The proposed storage area must be located on an existing disturbance. The Regulator will not authorize new cut for the storage of aged equipment.
- Authorization terms will be limited to a maximum of five years.
- The application must include an explanation of what measures will be taken to ensure the site is restored to the standard of Section 19(1) of the EPMR prior to permit expiry.

Microseismic Monitoring Site

Applications for microseismic monitoring activity are submitted as an associated activity (AACT) through the Application Management System (AMS). When applying for a microseismic monitoring site in AMS, the correct associated activity

type (AS_TYPE) to use in the spatial file is “MONS” (monitoring site), no other type will be accepted.

Microseismic monitoring applications are accepted on Crown land only, where monitoring sites are required outside the permitted wellsite area. The Regulator does not issue authorizations for associated activities on private land. Additionally, microseismic activity on private land is an exempted activity under the ALC/OGC Delegation Agreement, therefore, an application to the Regulator for microseismic activity on private land is not required; but landowner agreements may be required.

Applicants are also required to provide the following information in the application description section, or as an attached rationale, when completing the application:

a) The purpose of the program (seismicity, fracturing or completions, etc.)
b) The type of equipment and installation method.
    i. If the installation method is buried, the depth of equipment
    ii. If the equipment permanent or non-permanent.
c) If the monitoring program will be run continuously or intermittently.

Since a relatively small area of land may contain many geo stations, and there may be uncertainty regarding the exact locations, it is recommended that the application include a construction corridor.

Where microseismic monitoring equipment is installed in a wellbore, the permit holder must submit a Notice of Operations for the installation and removal of the equipment. No well permit amendment is required to install monitoring equipment in a wellbore.

Offsite Environmental Mitigation

Applicants who are required to apply for Offsite Environmental Mitigation (also known as offsets) under regulation, must include offset areas as an associated activity type within their application. The spatial data must include and reference the associated activity type (AS_TYPE) for Offset (OSET).

Where required, an impact offsetting plan must be included as part of the application for the energy resource activity. The Environmental Offsite Mitigations Guidance document and accompanying frequently asked questions have been developed to assist energy resource companies to understand the requirements for offsite environmental mitigation.

4.6.5 Additional Considerations for Associated Activities

Approvals from Other Jurisdictions for Camps

The Regulator may authorize energy resource operators to use land for the purposes of a camp; however, additional authorizations and permits are required from other jurisdictions to construct and operate a camp. For more information refer to the Approvals from Other Jurisdictions for Camps Guidance Document.

The Peace River Regional District (PRRD) plans for potential impacts on services and infrastructure resulting from the operation of worker camps within the PRRD boundaries. Those camps that will house more than 30 workers are of particular interest, and permit holders with camps that meet that threshold will be required to provide such information annually to the regional district. For more information refer to PRRD website: https://prrd.bc.ca/temporary-use-permits/.

The Northern Rockies Regional Municipality is cognizant of potential impacts on municipal services, infrastructure, and socioeconomics, resulting from the operation of worker camps within the NRRM Boundaries. The NRRM requires all camps to secure the appropriate zoning, or a Temporary Use Permit prior to camp construction or siting. For more information please contact the NRRM Regional Development and Planning Department: https://www.northernrockies.ca/.

Chapter 4.7 Completing Short Term Water Use Activity Details

4.7 Short-Term Water Use

Authorization to divert or use surface water or groundwater for energy resource activities is obtained through either a licence or use approval, issued under Section 9 or 10, respectively, of the Water Sustainability Act (WSA).

Applicants applying for a use approval must complete a Short-Term Water Use application in the Application Management System (AMS). A Short-Term Water Use application is made up of two tabs: Short-Term Water Use (POD) Overview and Point of Diversion Details.

Applications for water licenses cannot be submitted through AMS. Information and guidance related to the water licence application process is available from the Regulator's Water Information website.

Water resources in the province of British Columbia are co-managed by the Regulator and the Ministry of Forests.

The Regulator is responsible for any authorizations issued to energy resource operators that are required to facilitate the carrying out of energy resource activities. This includes applicants that are not energy resource operators but whose primary business is to supply water or water logistic services to energy resource operations.

This section includes an overview of short-term water use permitting and provides guidance regarding planning and design, details related to application requirements, and instructions for completing the data fields within an application.

Where short-term water use questions arise that are not addressed in this section, the Regulator's Regional Water Manager or Assistant Water Manager should be contacted.

Please Note:

This manual is written as a whole and is available to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.7.1 Short-Term Water Use Defined

Short-Term water use for energy resource development is a type of related activity, as defined in ERAA. Through ERAA, the Regulator is empowered to grant authorizations under specified provisions of the Water Sustainability Act.

In accordance with Section 24(3) of ERAA:

- The Regulator may not grant an authorization to a person for a related activity unless the person meets the prescribed requirements.
- For short-term water use related to major projects, prior to application for an energy resource activity related to the project, the Regulator may grant authorizations without the existence of a primary energy resource activity permit or application where it has delegated authorities to do so. Contact the Regulator's Major Projects team for more information.

Applications for use approvals are submitted as either stand-alone, or in combination with primary activity applications. If applying for a stand-alone authorization, a cross-reference number for a related primary activity is required at the time of application in order to verify the applicant criterion is met.

Term

By regulation, a short-term water use approval may be issued for a term not exceeding 24 months. The expiration date is noted on the approval.

A use approval cannot be amended to extend the term beyond 24 months from the date of issuance of the original authorization.

Where short-term water use is required beyond 24 months, applicants must submit a new application to the Regulator and are required to reference the

previous Application Determination (AD) number, short-term water use activity identifier, and/or Legacy BCER Number in the Activity Description section of the Short-Term Water Use (POD) Overview tab.

If activities have not started by the end of the permit term, the applicant must re-apply to the Regulator for a new use approval in order to use water.

4.7.2 Creating a Short-term Water Use Application

Applicants select their applied for activity type in the "create application" screen of AMS. For short-term water use there is only one activity: Short Term Water Use (POD).

Point of Diversion Application

A short-term water use approval is required for water withdrawals from pre-defined points of diversion (POD). Applications can be made for single or multiple points of diversion. Points of diversion include rivers/streams, lakes/ponds, and water source dugouts.

Short-Term Water Use Applications

A short-term water use approval is required for any water to be diverted or used, for the purpose of an energy resource activity. New short-term water use authorizations are also required to:

- Continue water use where a pre-existing use approval has expired; and/or
- Divert or use water from a new diversion point.
- The applicant must provide details on their water demand and a rationale to support the volume of water requested.
- The applicant must provide information on associated works or activities, such as water storage, water transportation methodology (pipeline, truck, etc.), and intake and pumping systems if applicable.

Short-Term Water Use Authorization Amendments

Approval of an authorization amendment is required before the associated use can be carried out. Amendments for short-term water use authorizations are required for:

- Adding or changing diversion points;
- Changing the length of the approval (up to 24 months from the approval's effective date); or
- Any other changes to permit provisions.

By regulation, increases to the authorized total withdrawal volume for any POD cannot be submitted as an amendment unless they were erroneously estimated. Changes in the total withdrawal volume require the current use approval to be cancelled and a new short-term water use application submitted to the Regulator.

When submitting amendments to a short-term water use approval, a letter explaining the amendment and why it is required needs to be submitted.

Short-Term Water Use Policy

The Regulator's authorization of short-term water use approvals is consistent with the provisions of the Water Sustainability Act. The duration of a use approval cannot exceed 24 months. Upon the expiration of a use approval, subsequent applications for authorizations are reviewed and adjudicated as new applications.

In some instances, energy resource operators may require water licences issued by the Regulator including:

- Where a company proposes to construct permanent water infrastructure (e.g., a pipeline) as part of its water supply strategy.
- Where a company requires assurance of long-term water access through the "first in time, first in right" principle of the Water Sustainability Act.
- When a company proposes to divert surface or groundwater into a structure that is a dam under Part 2 the Dam Safety Regulation.

Water Source Details

Water source types must be identified when submitting a short-term water use application. Applicants must determine and select the purpose, quantity, source of water, and the works required.

The Water Sustainability Act vests "the water at any time in a stream" and the "percolation and flow of groundwater" to the Crown. The WSA defines groundwater as "water naturally occurring below the surface of the ground" and considers all groundwater to be from an aquifer.

An aquifer is defined in the WSA as:

> "(a) a geological formation,
>
> (b) a group of geological formations, or
>
> (c) a part of one or more geological formations that is groundwater bearing and capable of storing, transmitting and yielding groundwater."

Definitions for surface water source types include:

- Lake/pond: a body of relatively still fresh water, localized in a basin. Lakes and ponds are contrasted with rivers or streams, which normally flow. There are no universally accepted criteria to distinguish ponds from lakes, however, as general guidance; ponds can range in size from a few square metres to approximately two hectares, while lakes are generally larger than two hectares. Most lakes are filled and drained by rivers and streams. Lakes and ponds are both "streams" as defined in the Water Sustainability Act.
- Stream: a natural watercourse of fresh water flowing towards an ocean/sea, lake or other river, sometimes drying up prior to reaching another water body. Small channels may also be called by several other names, including stream, creek, brook, rivulet, tributary, rill, ravine and gully. A stream in this manual specifically refers to a stream as defined in the Water Sustainability Act, which includes: a lake, pond, river, creek, spring, ravine, gulch, wetland (swamp, marsh or fen) or glacier, whether or not usually containing water, including ice.
- Water source dugout: created when a pit or other earthen excavation is used as a source of water that has naturally accumulated water via surface water diversion, runoff, snowmelt, rainfall, or groundwater inflow. Refer to the "Water Policy Bulletin: Authorization requirements for storage and use of water in dugouts August 2017" for more information

under the Water Sustainability Act. For dams refer to Part 2 of the Dam Safety Regulation.

Water Storage

Authorization is required for the storage of water diverted under a short-term water use approval. Storage should be selected where the applicant is applying for a section 10 use approval and is intending to store the water before and during use, the applicant is required to provide the following information pertaining to the primary storage locations to be authorized:

- A table listing the location(s) of primary water storage sites, with UTM coordinates and/or other location identifiers;
- Type of water storage (e.g. tank, c-ring, earthen excavation, dugout, dam);
- The total volume of water to be stored at each storage location;
- If water storage is on Crown land, the associated Crown land authorization;
- If water storage is on private land, the name of the landowner and the PID of the private land;
- For all proposed water storage involving earthen excavations provide:
    - Total water storage volume (m^3);
    - Maximum height of any berm or barrier above native ground elevation, if the excavation has a berm;
    - Maximum "live water storage" volume (m^3), if the excavation has a berm or barrier (Live storage is calculated as the volume of water stored above native ground elevation behind a berm or barrier);

If the water storage is associated with a water licence, the water licence number.

Please be aware that a short-term water use authorization (or a water licence) is required for any water storage structure intercepting groundwater or water from a "stream" as defined in the WSA, regardless of whether the source of water is located on Crown land or private land. Under the Water Sustainability Act, the Regulator cannot authorize in a short-term use approval the storage of water in a Dam to which Part 2 of the Dam Safety Regulation applies unless the dam has been authorized under a water licence. All storage of water in a Dam to which Part 2 of the Dam Safety Regulation applies must be authorized under a water licence.

Environmental Flow Needs Assessment

The Regulator evaluates Environmental Flow Needs (EFN) as required under Section 15 of the Water Sustainability Act. The EFN of a waterbody is defined as "the volume and timing of water flow required for the proper functioning of the aquatic ecosystem."

The BC Environmental Flow Needs Policy is a coarse screen to assess the risk to EFNs (**Figure 1**) where the origin of the water is a stream, lake, or wetland, or a dugout or aquifer that is reasonably likely to be hydraulically connected to a stream, lake, or wetland. An EFN assessment is required for all proposed water withdrawals from a stream, river, lake or wetland.

For proposed water withdrawals from water source dugouts or dams that are potentially hydraulically connected to any streams, lakes or wetlands (e.g., within 50-100 metres) the applicant must assess the hydraulic connectivity. Unless the applicant can demonstrate otherwise, the Regulator will assume hydraulic connection to any waterbody within a reasonable (generally 50-100 metres) distance of the source. If hydraulically connected, the application must also include an assessment of the EFN of the proximal stream, lake or wetland, performed by a Qualified Professional.

In situations where information is available from the Northeast Water Tool, the Northwest Water Tool, or the Omineca Water Tool, these tools can be utilized to assist in assessing the EFN of the primary source.

Applications for water diversion and use in the Blueberry River, Upper Beatton River, and Lower Sikanni Chief River Watersheds shall refer to the New Environmental Flow Needs Framework for Water Management interim guidance documentation and tool.. For more information refer to IU 2023-05 Implementing the Northeast British Columbia Treaty Agreements: New Framework for Water Management.

If no information is available from these tools, the EFN of the primary source as well as the EFN of any hydraulically connected stream, lake or wetland must be assessed by a Qualified Professional and a report submitted to the Regulator with the short-term water use application.

If the application relates to water in an aquifer the applicant is required to provide the official names of each stream or other aquifers known to the applicant to be reasonably likely to be hydraulically connected to the source aquifer, or if there is no official name, a locational description of each stream or aquifer.

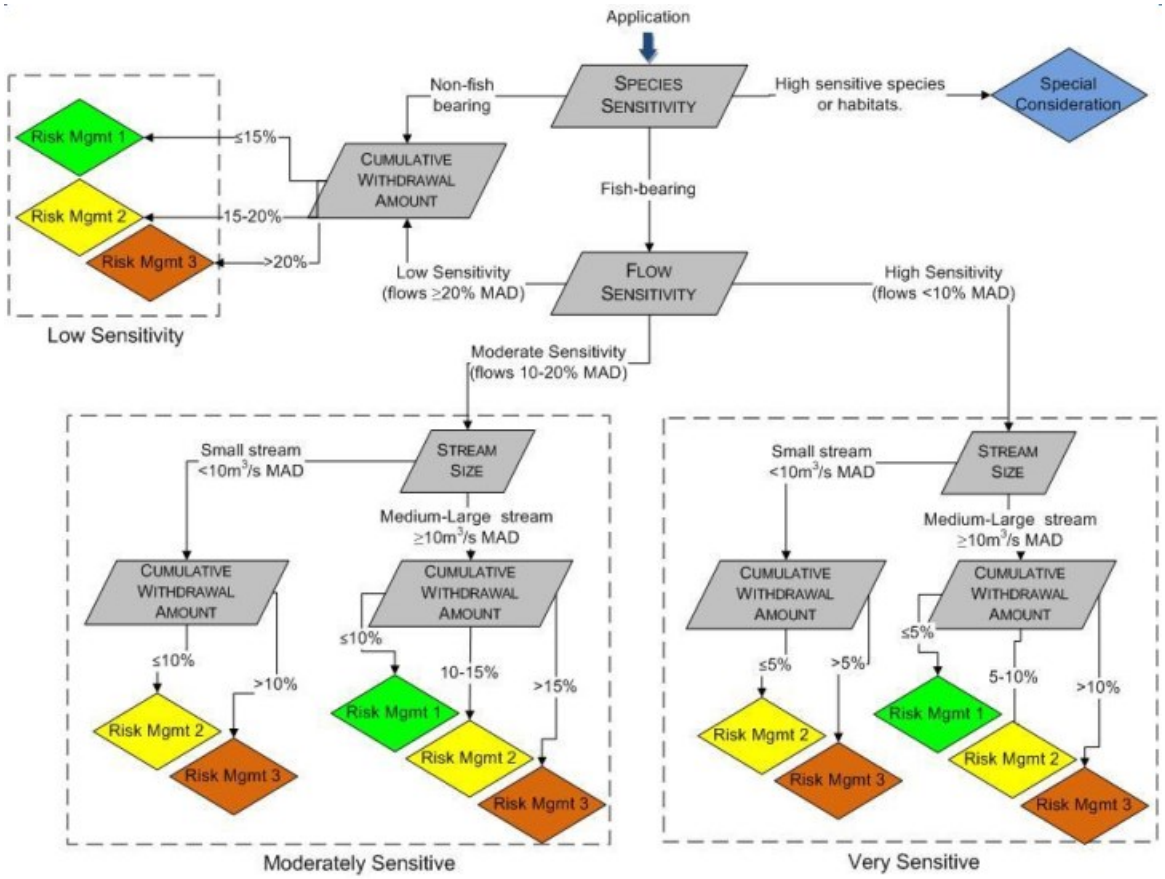


Figure 1. BC EFN Environmental Risk Management Framework

Withdrawal Volumes and the Regulator Decision Framework

The Regulator manages use approvals to protect fisheries or aquatic resources, and the drinking water supply.

There is considerable variability in the hydrology of water bodies across B.C., varying from east (drier) to west (wetter). There is also a very strong seasonality of water supply, varying from high runoff rates during the spring snowmelt period

(typically mid-April until late June), to low runoff rates during winter (typically early-December until late March).

The volume of water requested through a use approval should be reasonable with respect to the associated activities. The short-term water use application should be consistent with the guidance detailed below and consistent with Section 15 of the Water Sustainability Act and the BC Environmental Flow Needs Policy.

If energy resource activities cannot adhere to these water withdrawal guidance recommendations, a rationale and justification must be included in the permit application, along with the additional operational practices or mitigations that will be employed to prevent any adverse effect on the water supply in that watershed. Field-based monitoring evidence must clearly show sufficient inflow to a lake or discharge in a stream to support the requested water withdrawals for the specified time. Applicants are required to use a Qualified Professional to collect, interpret and provide support with field data.

Guidance on water withdrawals are as follows:

1) Winter Season Withdrawals in Northeast B.C. (December 1 – March 31)

   Watersheds with drainage areas less than 500 square kilometres are likely to have zero or near zero discharge during most winters, and will likely not support water withdrawals.

2) Watersheds with drainage areas of 500 square kilometres or greater, the following framework is used to guide winter water withdrawals:

   - Quantitative values on Mean Annual Discharge (MAD) and Dec – Mar winter discharge is estimated for all watersheds in northern B.C. from NEWT, NWWT or OWT.
   - Small rivers and streams in northeast B.C. are subject to deep ice formation and very low flows during the winter period. In some cases, field evidence indicates there can be zero flow. The small quantities of liquid water remaining in small streams during winter can be critical for over-winter survival of fish.

3) Water source dugouts: the water in water source dugouts is acquired through the diversion of surface water or shallow aquifers, and/or through the percolation and flow of groundwater, unless proven otherwise. Streams

proximal to water source dugouts (e.g. within 50 to 100 metres of any edge of a water source dugout) have the potential to be hydraulically connected to the dugout. As such, there is a requirement that short-term use approvals for water source dugouts consider the environmental flow needs of streams, lakes or wetlands reasonably likely to be connected to the water source dugout.

Where there are no environmental flow needs concerns relating to proximal streams with a water source dugout, there is no restriction on water withdrawals.

4) Winter Season Lake Withdrawals: Inflow to most lakes in northeast B.C. during the winter period is usually zero or near-zero due to prolonged and sustained temperatures below freezing, frozen ground conditions, and the accumulation of precipitation as snow. The maximum cumulative volume of water (for all use approvals and water licences) approved for withdrawal from lakes during the winter flow period is restricted to a 10 centimetre drawdown from the high water level (HWL) mark, as a function of the lake area, regardless of the watershed area for the lake. An estimate must be provided of the available water for authorization in the lake based on a 10 centimetre drawdown and current authorizations. Examples are shown in **Table 4.I**.

5) If energy resource activities cannot adhere to the above, the application must include field-based monitoring evidence collected and interpreted by a Qualified Professional which provides clear support showing sufficient inflow to a lake or discharge in a stream during the winter period to support the requested water withdrawals.

6) The Regulator will evaluate applications for winter withdrawals outside of northeast B.C. on a case by case basis, taking into account the characteristics of the watershed and the volume of water requested.

Table 4.I. Winter Lake Maximum Water Allocation

Lake	Lake Area (hectares)	Lake Area (m^2)	Maximum Drawdown (m)	Maximum Cumulative Volume for Approval (m^3)
Lake 1	4.3	43,000	0.10	4,300
Lake 2	27.5	275,000	0.10	27,500
Lake 3	11.6	116,000	0.10	11,600

Lake 4	125.0	1,250,000	0.10	125,000

7) Open-Water Season Withdrawals (April 1 – November 30)

- Rivers and streams: The maximum volume of water approved for withdrawal from rivers and streams during the open-water season is **guided** by the water availability as calculated by NEWT, NWWT or OWT, and the Environmental Flow Needs Policy, as shown in **Figure 1.**
- Lakes: the maximum volume of water approved for withdrawal from lakes during the open-water season is **guided** by the water availability as calculated by NEWT, NWWT or OWT, and limited to the 10 centimetre maximum drawdown limit from the HWL mark. An estimate of the available water must be provided for the lake based on a 10 centimetre drawdown, and other authorizations.
- Water source dugouts: there is no restriction on the water withdrawal from water source dugouts unless additional restrictions are required as a result of the Environmental Flow Needs of hydraulically connected streams.

Please Note:

Please be aware that the WSA gives the decision maker the discretion to request any additional information he or she may deem necessary for a determination to be made on the application.

Cancellation and Expiration of Short-Term Water Use Approvals

If a permit holder decides not to use water from an active use approval, the permit holder may submit a letter requesting cancellation of the authorization prior to expiry of the authorization to the Authorizations Director of the Regulator administrative zone in which the POD is located. The cancellation request letter must clearly identify:

- Application Determination and Short-Term Water Use numbers assigned within AMS;
- Point(s) of diversion; and
- Whether or not any water withdrawal has occurred to date.

If water withdrawal occurred prior to the date of cancellation, the permit holder is required to report water withdrawal up to the date of cancellation.

4.7.3 Short-Term Water Use Planning & Design

This section provides typical planning and design requirements, guidelines, and considerations when planning and designing for short-term water use for an energy resource activity application. The standards and guidelines presented here form a substantial basis for assembling an application. The Regulator reviews the short-term water use application relative to the engineering and technical information provided in the Application Management System; therefore, applicants should review this section for an indication of any application requirements or attachments required in relation to the required components.

Regulatory Requirements

Short-term water use activities must comply with the requirements outlined in the Water Sustainability Act and its regulations, including the Water Sustainability Regulation, the Groundwater Protection Regulation and the Dam Safety Regulation.

The Regulator does not grant exemptions under the Water Sustainability Act. However, some relevant activities are exempted by regulation from requiring authorization under the Act to divert and use water. Specifically, the exemption for well drilling as it pertains to geotechnical investigations specified in Part 4 of the Water Sustainability Regulation. Under this Part, use approvals are not required for geotechnical or geophysical drillings as long as (among other restrictions as specified in this Part):

- The water diversion is done by or supervised by a Professional Engineer or Professional Geoscientist licensed or registered under the Engineers and Geoscientists Act, or a qualified well driller as per Section 7 (a) (1) of the Groundwater Protection Regulation, for geotechnical or geophysical exploration wells;
- The proponent does not divert water from any one location on a stream or aquifer for more than 5 consecutive days;
- The proponent does not divert water from a stream or aquifer for more than 10 days in any calendar month;
- The proponent does not divert more than 10 m^3 of water per day from a stream or aquifer;

- The proponent does not divert or use water from a wetland;
- The proponent does not divert or use water from a stream that is within the boundaries of a protected area;
- The proponent does not divert or use water from a stream, other than a lake, unless the width of the flowing water in the steam channel is at least 5 metres at surface level; and/or
- The proponent does not divert or use water from a lake unless the surface area of the lake is at least one hectare.

Guidance Requirements

In addition to this Energy Resource Activity Application Manual, short-term water use applicants should review the following:

- Environmental Protection Management Regulation and Guideline;
- Wildlife Act requirements to leave muskrat and beaver houses and dens undisturbed;

Additionally, the following operational requirements must be planned for and met:

- End-of-pipe intakes must be screened with maximum mesh sizes in accordance with the Fisheries and Oceans Canada 'Interim Code of Practice: End-of-pipe fish protection screens for small water intakes in freshwater'.

Water Supply Verification (Northeast, Northwest, and Omineca Water Tools)

When making an application for short-term use of water from specific points of diversion, applicants are required to indicate that sufficient water supply has been verified.

Before submitting an application to the Regulator, applicants are required to utilize the Northeast Water Tool (NEWT), the Northwest Water Tool (NWWT) or the Omineca Water Tool (OWT), as applicable, to assist in estimating the water supply within the watershed of the proposed water source and in determining whether water is likely to be available for permitting at the POD within the watershed of the proposed water source.

Reports generated from NEWT, NWWT, or OWT provide information on estimated mean monthly discharge, existing licenced or approved uses, and potentially available water based on the B.C. Environmental Flow Needs Policy Risk Management Levels. Applicants are required to use the generated reports and submit these reports with all short-term water use applications for watercourses, where data from these tools is available. If no report is available from these tools, the required information must be submitted by a Qualified Professional.

The Regulator's water information webpage provides detailed information on the use and limitations of the Water Tools. Please be aware that **these tools are not useful for estimating the annual or seasonal runoff into water source dugouts, and there is a higher degree of uncertainty for watersheds smaller than 500 km^2**.

Where streamflow measurements exist, such as from the Water Survey of Canada or industry-specific measurement sites, applicants are encouraged to supplement the Water Tool analysis with data from these sources. In addition to the online Water Tools, the Regulator makes available the Water Portal, which provides access to available hydrometric and climate data.

Additional information is required for sensitive and highly variable streams, and large water volume requests. Because of the natural variability and associated low flows, it is recommended that a low flow analysis be conducted and the seasonal withdrawal period be considered. Open-water season is defined as April 1 – November 30 and the winter water season is defined as December 1 – March 31.

Water Sources with Water Allocation Restrictions

Some water sources (rivers, lakes, springs, etc.) in Northeast B.C. are noted by the Ministry of Environment (MOE) and MOF as having Water Allocation Restrictions.

A Water Allocation Restrictions map layer is contained in the Regulator's GIS coverage titled Areas Established by BCER. Industry is advised when a Point of Diversion (POD) application is located within a source specified as having a Water Allocation Restriction via the Application Analysis Tool Report, or the SOE (Spatial Overlay Engine) Report. An applicant for sources specified as having a

Water Allocation Restriction is required to submit additional information to support the application.

A Water Allocation Restriction alerts water users and Regulator staff of current or potential water allocation concerns. This information is considered by the Regulator, along with all other relevant information, when making short-term water use decisions.

Three types of Water Allocation Restrictions are noted in the Regulator's map coverage:

- **Fully Recorded** indicates that the source has water shortages and that water for further allocations may be limited, seasonally limited, or not available.
- **Possible Water Shortages** indicates that the stream is nearing the Fully Recorded stage and there is potential for periods of insufficient water availability.
- **Office Reserve** indicates that a specialized comment has been placed by MOE/MOF on the source that must be taken into consideration for further water allocation decisions.

As per Section 12.1.b.iii (Application and Decision Maker Initiatives) and Section 15.1 and 15.2 (Environmental Flow Needs) of the Water Sustainability Act, the Regulator requires that an application for water diversion from a source specified as having a Fully Recorded or Possible Water Shortage status include a hydrological report to support the application. The hydrological report will:

- Be produced by a Qualified Professional;
- Provide detailed information on weekly, monthly, seasonal, and annual means and variable discharge for the source, derived from analysis of long-term streamflow data associated with the source or from simulations based on long-term hydrology data;
- Document existing authorized water diversions on the source, and quantify the extent by which existing diversions affect weekly, monthly, seasonal, and annual discharge at the POD;
- Document fisheries utilization of the water source at and downstream of the POD, and the Environmental Flow Needs of the source to maintain fish resources, where the Water Allocation Restriction is associated with fisheries or environmental flows;

- Document community or domestic drinking water use and other licensed water diversions at and downstream of the POD, where the Water Allocation Restriction is associated with maintaining community or domestic drinking water supply or another existing licenced water use.
- Include both the maximum and minimum pumping rates, and the minimum depth (e.g. minimum 0.30 m) above the bottom of the watercourse to install the pump to prevent entrainment of sediment and aquatic organisms; and,
- Make recommendations for rates and thresholds of daily, weekly, monthly and seasonal water diversions to address Environmental Flow Needs such that the factors triggering the Water Allocation Restriction specification are addressed.

Approvals for water diversion from sources specified as Fully Recorded or Possible Water Shortage will generally include special permit conditions, including:

- Discharge monitoring before and during diversion (which can include Water Survey of Canada stations, if available);
- Specified Environmental Flow Needs thresholds linked to discharge monitoring, below which water diversion will not occur.

Please be aware that in all cases where EFN threshold conditions have been applied, the Regulator's Compliance and Enforcement Department is tasked with conducting site investigations to ensure compliance.

Authorizations for Crown Land Access and Associated Developments

A short-term water use approval alone does not grant any land tenure or access, only the use of water from the approved diversion point. Additional authorization under either the Land Act, Petroleum and Natural Gas Act, or Section 24 of the Water Sustainability Act may be required.

Applicants must determine if additional authorizations are required to support operations under the use approval. (For example, access to the water withdrawal point(s)). If the proposed activity, as described in the short-term water use application, requires primary or associated activities (roads, water storage sites, pipelines and facilities) and/or the use of Crown land, applicants must apply to the

Regulator for permits related to these requirements. Applicants are encouraged to submit applications for all activities associated with a short-term water use application as a single multi-activity application in AMS.

Additional Requirements for Engaging Rights Holders

For the purposes of short-term water use applications, rights holders as defined in the Water Sustainability Act include: water licensees, applicants for water licences, use approval holders, short-term water use applicants, riparian owners, and landowners whose property is likely to be detrimentally affected by the applicants' operations.

Applicants must notify and engage with rights holders as defined in the Water Sustainability Act and provide a summary of that engagement with their application, using the Rights Holder Engagement Line List as detailed in this manual.

Surface Agreement for Activities on Private Land

Access to private land is not granted along with use approvals. Activities associated with a use approval, that are to be carried out on private land, such as space for pumps or access roads, require a surface agreement with the land owner. Surface agreements must be in place before applying to the Regulator; however, the agreement is not required to be submitted with the application.

Authorizations for Temporary Water Lines or other Works under Section 24 of the Water Sustainability Act

Section 24 of the Water Sustainability Act discusses the requirements for permits needed over Crown land(s). In the application, the applicant must identify, if any, works, as defined in the WSA, that are required for the water withdrawal.

A Section 24 authorization may be issued for the installation of a temporary above ground fresh water line over Crown lands if no new cut is required and the line is not to be run within existing ROWs.

Other Considerations for Temporary Water Lines:

- If a water line is located on Crown land where new cut is required, an associated activity application is required; this process is done through the Application Management System (AMS). The Regulator does not encourage or support additional cut for temporary water lines associated with short-term water use.
- If a temporary water line is required, a map clearly indicating the proposed water line route must be submitted.

Please Note:

Impacts to recreation features, trails, recreation facilities, interpretative forest sites or recreation sites identified, authorized or established under the Forest and Range Practices Act are subject to additional authorizations by the Ministry of Forests. Applicant Information Guide: Authorization to Use a Recreation Site or Trail (gov.bc.ca)

4.7.4 Short-Term Water Use Specific Activity Requirements

This section outlines application requirements for short-term water use applications. Requirements are dependent on the characteristics of each short-term water use activity (i.e. each POD in the application) and are outlined in detail below.

In most cases, the details are input into the short-term water use application tab, but may require the upload of additional attachments to support the details including:

- Water Tool Report (NEWT, OWT, NWWT)
- Environmental Flow Needs (EFN) assessment and mitigation, if required; and/or
- Mapping of hydraulically connected streams, lakes, or wetlands.

If the EFN assessment includes more than one POD, the POD's must be properly labelled to align with the Diversion Map.

Attachments must meet specific size and file formatting restrictions in order to be uploaded correctly, as defined in this manual.

Diversion Map

A diversion map illustrating in detail the location and extent of planned activities at an appropriate scale is required. The diversion map must be uploaded in the Maps and Plans tab of the Application Management System and clearly indicate:

1) Map date;
2) POD locations and labels;
3) Primary Storage site locations;
4) Direction of streamflow if withdrawals are proposed from a stream;
5) NTS and BCGS map sheet numbers indicated on a legend and on the maps;
6) North arrow;
7) Version number (for example, “Revision #1, Amendment #1”);
8) Any planned works associated with the proposed short-term use of water.

4.7.5 Additional Considerations for Short-Term Water Use Activity

Use Approvals Preceding Water Licence Applications

If applying for a short-term use approval with the intent to subsequently apply for a water licence under section 9 of the WSA, a full Water Management Plan (WMP) prepared by a Qualified Professional is required to be submitted. This requirement ensures that all considerations be taken to confirm future water availability and thus the Regulator will treat the short-term use approval application as a water licence application. A WMP template is provided in Appendix B within the Water Licence Application Manual.

Post Approval Reporting

Companies holding short-term use approvals are required to submit monthly water withdrawal data to the Regulator on a quarterly basis. Water withdrawal data must be reported for each approved withdrawal location and is submitted

through eSubmission. For information on eSubmission, please refer to the eSubmission Portal User Guide on BCER website.

Data submitted quarterly is comprised of the total volume withdrawn each month (cubic metres). If no volume was withdrawn for a reporting period, or a part of a reporting period, a volume submission is still required. In this case, the volume withdrawn is "0.00 m^3". Reporting periods are listed in Table 4.J.

Table 4.J Submission Reporting Periods

Reporting Period		Report by Date
January – March	----------	April 25th
April – June	----------	July 25th
July – September	----------	October 25th
October – December	----------	January 25th

The Regulator deems a failure to report as non-compliance and may take action depending on the severity of the infraction.

If a use approval has been cancelled, the permit holder is only responsible for reporting on water withdrawals occurring up to the cancellation date.

Compliance and Enforcement Related to Water Authorizations

Special conservation officer status allows the Regulator to enforce specific sections of the Water Sustainability Act. Enforcement can include:

- Warnings.
- Prosecution (violation tickets or court appearance).
- Restriction of issuance of renewals and cancellation of existing permits.

Section 94 of the Water Sustainability Act states when and why an approval may be cancelled or suspended by the regulator. Cancellation or suspension by the Regulator can occur when an operator fails to:

- Make beneficial use of the water.
- Construct within the timeframe.

- Pay rental/fees.
- Comply with an approval condition.
- Comply with the Water Sustainability Act.
- And/or other reasons as defined in Section 94 of the Water Sustainability Act.

Chapter 4.8 Completing Changes in and About a Stream Activity Details

4.8 Changes in and About a Stream

Applicants applying for an energy resource activity causing changes in and about a stream as defined in the Water Sustainability Act must complete the changes in and about a stream application tab in the Application Management System (AMS). The changes in and about a stream tab is made up of two components: stream details and exemptions. This section includes an overview of changes in and about a stream activity permitting, guidance regarding changes in and about a stream planning and design, details related to changes in and about a stream specific application requirements and detailed instructions for completing the data fields within the changes in and about a stream activity tab.

Please Note:

This manual is written as a whole and available to industry in sections to allow permit holders to access activity chapters. It is prudent of the permit holder to review the manual in its entirety and be aware of the content in other sections of the manual.

4.8.1 Changes in and About a Stream Defined

Common changes in and about a stream activities include the construction, maintenance and removal of watercourse crossings and crossing structures. Other types of works that comprise changes in and about a stream include stream diversion, stream bank erosion protection and/or stabilization, debris removal and beaver dam management.

Changes in and about a stream (instream works) are defined in the Water Sustainability Act (WSA) as:

a) Any modification to the nature of a stream including the land, vegetation, natural environment or flow of water within a stream.

b) Any activity or construction within the stream channel that has or may have an impact on a stream.

The Regulator considers any works within the high water mark of any stream as "changes in and about a stream."

Doing any instream works without a written authorization is a violation of the WSA. This includes the construction of dugouts across streams, or the diversion of streams into dugouts, to enhance water capture and storage.

Instream works are authorized in one of two ways. For energy resource activities (wells, pipelines, geophysical, facilities or roads) permitted under ERAA, instream works can be authorized by the energy resource activity permit, and the provisions of ERAA and the EPMR apply. For instream works associated with related activities, including CER related approvals, instream works must be authorized in accordance with Section 11 of the WSA or Section 39 of the WSR. There are some distinct differences between these application streams with respect to instream works.

Despite the differences in the definition of a "stream" between the WSA and EMPR, operational assessments and field surveys usually integrate the two criteria. As noted further in this document, all applications for changes in and about a stream must indicate the riparian classification of the stream per Section 22-24 of the EPMR, as this detail is required for the Regulator's review. This is further detailed in the Environmental Protection and Management Guideline (EPMG).

Instream Works for Energy Resource Activities

The legal mechanism by which instream works associated with energy resource activities is authorized is ERAA. A review under the federal Fisheries Act may also be required by DFO for any changes in and about a stream.

defines instream works authorized by a permit issued under the ERAA and in accordance with the EPMR and any applicable permit conditions as authorized changes; additional authorization under Section 11 of the WSA is not required for ERAA activities. Thus, for instream works associated with energy resource activity applications, the definition and classification of streams as defined in the EPMR will be used to evaluate and authorize works.

The EPMR defines a stream as a watercourse scoured by water or containing observable deposits of mineral alluvium, a continuous channel bed greater than 100 metres in length, connected to a fish-bearing stream or lake or waterworks (all as defined in the regulation).

Small ephemeral or intermittent streams that do not meet the EPMR definition and classifications of a stream (S1-S6) are classified as "Non-Classified Drainages (NCD)". An NCD is an ephemeral or intermittent watercourse having a continuous defined channel that is less than 100 metres in length and at some points may spread over a level area without defined banks, before flowing again as a defined channel.

Please Note:

A NCD is not a stream under the EPMR. Therefore, it is not required to be identified or evaluated in new ERAA applications where changes in and about a stream are applied for with an ERAA activity, or for amendment applications where the original permit included an ERAA activity. However, if the existence of a NCD is suggested in the TRIM data, the construction plan should show it as a NCD.

Instream Works for Related Energy Resource Activities

The legal mechanism by which instream works associated with a related activity are authorized is Section 11 of the WSA. A review under the federal Fisheries Act may also be required by DFO for any changes in and about a stream.

The requirement for authorizations for instream works under Section 11 of the WSA pertains to streams as defined in that Act, which has a broader meaning than in the EPMR. A "stream," as defined in the WSA, includes any natural watercourse or source of water supply, whether usually containing water or not, and a lake, river, creek, spring, ravine, wetland, swamp or gulch". Streams do not have to contain water in all times of the year, and can be ephemeral or intermittent.

The term "natural watercourse" is not defined in the WSA; however, common usage indicates that a natural watercourse is a natural channel where water flows over a bed between defined banks. The flow of water does not need to be constant, but the channel must be a permanent and distinct feature on the landscape. The watercourse may also, at some point, spread over a level area without defined banks, before flowing again as a defined channel.

Please Note:

A NCD is a stream under the WSA, therefore, it must be identified or evaluated in CER applications and/or related activity applications where changes in and about a stream have been included. Appropriate provincial authorizations and/or approvals must be acquired before commencing any works in and about a NCD.

Authorized Changes

As per INDB 2021-06, Regulator staff have received designations as Habitat Officers. As a result, applicants proposing activities constituting an "authorized change", per Section 39 of the WSR, can submit their notification(s) directly to the Regulator.

The new designation does not modify the regulatory requirements for submitting a notification of an authorized change under of the WSR.

A statement of the terms and conditions for the authorized changes may be provided by the Habitat Officer, or if an applicant has not received a response from the Habitat Officer within 45 days, they may proceed with the authorized changes subject to the requirements set out in Part 3 of the WSR.

In order to submit a notification of change in and about a stream to the Regulator, applicants must submit a Changes In and About a Stream application through the Regulator's Application Management System (AMS). Applicants must indicate in the Application Description section of AMS that the application meets the requirements for notification under Section 39 of the WSR. In addition, applicants will need to upload a project description that states how their activities are consistent with an authorized change set out in Section 39 of the WSR, including relevant conditions.

Applying for Authorization to Carry Out Instream Works

Activities comprising of or including instream works, as defined above, require authorization in writing, other than Authorized Changes under the WSR . Regulator staff may need to make a determination during application or project review as to whether the works will be authorized under ERAA or the WSA. Guidance on operational assessment is as follows:

- Streams, as mapped in the provincial Freshwater Atlas coverage (TRIM maps, at 1:20,000 scale), are assumed to be streams under the WSA and ERAA, unless demonstrated otherwise.
- Activities crossing or intersecting a "mapped" stream, but where there is believed to be no stream, require the submission of field-based evidence collected by a qualified individual to demonstrate that there is no stream.
- Small streams, which can have subtle field expression, are difficult for field surveys done in the winter season, when snow covers the ground. It should not be assumed that because a stream cannot be seen under snow cover that a stream does not exist.
- Any streams meeting the S1-S6 classification of streams as defined in the EPMR are required to further identify the riparian management areas associated with the streams as part of the application deliverables.

There are instances where a stream exists in the field but is not depicted on the provincial map base. Authorization for any works in or about the stream is still required.

If a feature depicted as a stream on the Freshwater Atlas coverage is not evident during the field survey, the construction plan submitted in conjunction with the application should note "No Watercourse Evident" or "No Watercourse Visible" (or something similar) and instream works for that watercourse do not need to be included in the application itself (i.e. in the spatial data submitted with the application). The features must not be listed as NCD in the application.

Man-made ditches and ditch lines are generally not streams under the WSA, and applicable authorization may not be required for a person to do "works" associated with ditches. That said, where manmade structures have sufficiently naturalized, they may become streams to which the provisions of WSA or ERAA apply. Where there is a question of whether or not a watercourse or waterbody is a stream, please contact the appropriate Regulator's Authorizations Director to discuss the specific situation and how works in or in proximity to that feature may be considered in an application.

In addition, in some cases, where ditches are being used as fish habitat (this can occur commonly on floodplain areas) the requirements of the federal *Fisheries Act* may apply.

4.8.2 Creating a Changes in and About a Stream Activity

It is recommended that instream works be applied together with the related ERAA or CER activity(s) application or as an amendment to the related ERAA or CER activity permit. If it is necessary to apply for instream works as a stand-alone (single) activity, applicants must provide rationale explaining why the related application determination(AD) number cannot be amended to include the changes in and about a stream activity. Single activity applications for instream works must provide a cross reference number to a primary energy resource activity to which the application relates in accordance with Section 24(3) of ERAA.

Regardless of what regulatory provision the instream works will be authorized under, the location of any proposed works must be included in the spatial data and "Changes in and About a Stream" must be selected as an activity type in the application. For information on completing this tab in the AMS, refer to section 4.8.4, below.

Applications can include multiple stream impacts (e.g. multiple stream crossings for a road, pipeline or geophysical program).

Changes in and About a Stream Authorization Amendments

Permit holders must submit an amendment application to add, or modify any portion of an authorization for instream works. For any instream works authorized through an ERAA permit, any modifications to the authorization will require an amendment to the ERAA permit. An amendment can include requests for multiple changes to a single permit but multiple amendment applications cannot be submitted for the same permit at once.

Term of Approval

Changes in and About a Stream authorizations are only valid for the initial construction of the works, unless otherwise indicated in the permit or authorization. Specific permit provisions authorizing instream works for general maintenance and operations activities associated with ERAA road and pipeline permits authorize instream works for the life of the activity. Refer to the terms of

the specific permit when considering whether additional authorization is required for instream works for maintenance or operations purposes.

4.8.3 Changes in and About a Stream Planning & Design

This section provides planning requirements, guidelines and considerations when planning an application for instream works. The Regulator reviews the application relative to technical information provided in AMS; therefore, applicants should review this section for an indication of any application requirements or attachments required.

Regulatory Requirements

Changes in and about a stream must meet the applicable design and operational requirements outlined in the Energy Resource Activities Act (ERAA), the Water Sustainability Act (WSA), the Water Sustainability Regulation (WSR), the Ground Water Protection Regulation (GWPR), the Dam Safety Regulation (DSR), and the Water District Regulation (WDR). The Regulator does not grant exemptions under the WSA.

Guidance Requirements

In addition to this Manual, applications for instream works should follow guidance provided in the EPMG for minimizing and/or avoiding impacts on the surrounding landscape. Additional guidance is available from the following:

- Fish-stream Crossing Guidebook (published by the Ministry of Forests, the Ministry of Environment, Fisheries and Oceans Canada) for more information on planning stream crossings on fish bearing streams.
- For many types of proposed works, relevant standards and best practices are found at the following Ministry of Environment link: Standards and Best Practices for Instream Works.
- The Canadian Association of Petroleum Producers provides guidance on pipeline-associated watercourse crossings: Pipeline-Associated Watercourse Crossings.

If the energy resource activities cannot adhere to these guidance recommendations, a rationale must be included in the permit application. This

rationale must be prepared by a Qualified Professional and include site specific information regarding the guidelines not followed, an explanation of why they cannot be followed, and the proposed plan and mitigation strategies the company will implement in lieu of the guidance recommendations not followed.

Riparian Classification

All watercourses impacted by the application must be assigned a riparian classification as defined in Section 22, 23 and 24 of the EPMR. Guidelines and requirements for riparian classification of streams, wetlands, and lakes are provided in Chapter 5 of the Regulator's EPMG. The riparian classification must be entered in the Application Management System. Please see note above regarding non-classifiable streams (NCDs).

Crossing-type Selection

For watercourse crossings, the crossing method must be indicated in the application. Crossing methods include: aerial, bank erosion protection, bridge, ice bridge, clear span bridge, snow fill, culvert, major culvert, debris removal, gravel removal, punch and bore, (HDD) directional drill, micro tunneling, matting, stream diversion, temporary ford, flow isolation and open cut. Applications may include multiple stream impacts and/or crossings.

If an activity requires multiple crossing methods for a stream crossing location, applicants are required to identify one primary crossing method. Applicants must then select all other crossing method(s) that may be required from the secondary crossing method drop down list. Primary and secondary crossing methods are not applicable to mechanical crossings.

If a mechanical stream crossing is required, the applicant must respond 'Yes' to the question, "Is a mechanical crossing required at this location?". When 'Yes' is selected, applicants may select the applicable mechanical crossing method from the drop down list.

4.8.4 Changes in and About a Stream Activity Requirements

This section outlines application requirements for changes in and about a stream application. Requirements are dependent on the characteristics of instream works

and are outlined in full details below. In most cases, the details are input into the changes in and about a stream application tab in AMS, but may require the upload of supporting attachments, including:

- Sketch plan (if applicable).
- Fisheries habitat assessment.
- Mitigation Plan.

Attachments must meet specific size and file formatting restrictions as defined in Chapter 7 of this manual.

Fish Habitat Assessment

Where a Qualified Professional has determined the proposed activities may adversely affect fish habitat or water values through direct or indirect means, a Fish Habitat Assessment (FHA) must be completed in the potentially affected area.

Applicants are responsible for determining fish presence or absence and assessing fish streams for fish habitat values prior to application for instream works.

A Fisheries Habitat Assessment must include at a minimum the following information:

a) Stream classification as per the Environmental Protection and Management Act.

b) Description of fisheries habitat at the stream reach to be impacted.

c) List of fish species that may be present within the stream reach to be impacted.

d) Applicable Least-Risk Fisheries Timing Window.

e) Confirmation if works are to occur within or without the applicable Least-Risk Fisheries Timing Window.

f) Mitigation to be implemented if works are to occur outside the applicable Least-Risk Fisheries Timing Window.

Plans, Designs and Drawings Signed by a Qualified Professional

Some changes in and about a stream applications require the submission of designs, plans and drawings signed and sealed by a Professional Engineer

(P.Eng) licensed or registered under the Engineers and Geoscientists Act, and/or a Qualified Professional (QP). Applications that require these deliverables include:

- Bank erosion protection – P.Eng.
- Bridge construction, maintenance or removal (other than clear span) – P.Eng.
- Major culvert construction, maintenance or removal – P.Eng (a Major Culvert is a pipe that has a diameter of 2,000 mm or greater, a pipe arch having a span of 2,130 mm or greater, an open bottom arch having a span of 2,130 mm or greater; or any stream culvert with a maximum design discharge of 6 cubic metres per second or greater.
- Stream diversion – QP.
- Large debris removal – QP.
- Gravel removal – QP.

Works plan

For applications involving works other than watercourse crossings, a Works Plan must accompany the application. The Works Plan for projects involving gravel or debris removal, bank erosion protection, or stream diversion, must be completed by a Qualified Professional. Works Plans should include the following:

- A detailed description of the works proposed including a rationale for why the works are required.
- Site-specific stream and aquatic habitat information.
- A description of the operational activities that the company will utilize to avoid or mitigate impacts to the stream values.
- A project monitoring plan.
- Any other relevant information that may assist the decision maker in rendering a decision on the application. Photos are recommended.