Class I Fluids Dispose Application Checklist

**Mineral Rights Ownership, Consent to Dispose & Indemnification Letter**

* Evidence of your right to dispose into the proposed zone (if applicable):
* a letter of consent from the Crown for unleased Crown land,
* a letter of consent from the Freehold mineral holder for Freehold land, and
* a letter of consent from the lease holder of Crown or Freehold lands if leased by other than the applicant.
* Send an indemnification letter (link to template provided) to Alberta Crown for the disposal of fluids into the pore space within Freehold lands. This does not apply for proposed disposal operations into Crown lands.

**Notification**

* A map illustrating notifications, including unit operator, approval holder of schemes, all well licensees including abandoned wells, all mineral lessees and lessors, within a radius of 1.6 km from the proposed disposal well where the disposal zone is known to be present.
* A map illustrating notifications of landowners and occupants within a radius of 0.5 km from the proposed disposal well.
* A statement as to whether the parties shown on the map referred to above have been notified about the application and, if so, include any statements of concern received.
* If the proposed disposal fluids contain any H2S, a statement indicating that notification of the scheme for emergency response plan (ERP) purposes has been made. See *Directive 071*: *Emergency Preparedness and Response Requirements for the Petroleum Industry*.
* Confirmation that all wells within the maximum expected area of influence surrounding the proposed well or a 1.6 km radius, whichever is greater, have been completed or abandoned as per *Directive 020* and grandfathering provisions, and in a manner that ensures hydraulic isolation of the proposed disposal zone. If a hydraulic isolation risk to a completed or abandoned well is identified by a licensee then the applicant and the licensee have to come to an agreement on what needs to be done to mitigate this risk.

**Description of Proposed Disposal Well**

Unique well identifier (surface and bottom, if different) of the proposed disposal well, and general drilling, completion and activity history.

* Disposal zone with zone top and base, perforations, depth of the production packer. Note that the packer is expected to be within 15 meters above of the top of disposal perforations, unless technically justified;
* The base of the usable groundwater – It is available for locations across Alberta by using the Base of Groundwater Protection Query Tool on the AER’s Systems & Tools on the AER website, [www.aer.ca](http://www.aer.ca).
* Provide a statement on the H2S content of the proposed disposal fluid and the details of an AER approved up-to-date ERP that the applicant maintains in the area of the proposed operation. Clearly state the H2S concentration and whether greater than or less than100 parts per million (ppm);
* Anticipated daily volumes to be disposed, and its effect, if any, on the recovery of hydrocarbon from the pool.
* The cumulative disposal volume for the scheme in million standard cubic metres.
* Proposed maximum wellhead injection pressure (MWHIP) – a detailed report of a step-rate injectivity test (SRT) or other acceptable test performed to determine fracture pressure of the formation including the followings (if available):
* the wellbore schematics of the proposed disposal well or analogue well,
* the directional survey for the proposed well or analogue well,
* evidence that shows the time steps were of equal duration, and/or evidence to show that each stage achieved stabilized pressure;
* the SRT data is presented in graphical and tabular form, and
* calculation of a MWHIP and a discussion on the appropriate safety factor to ensure fluid containment.
* An indication of whether you have applied for or obtained approvals for related licenses of the proposed disposal well and surface facilities – the surface facility application must be made in accordance with *Directive 058*, and the well license application must be made in accordance with *Directive 056*.

**Discussion & Justification to Support Proposed Disposal Operations**

* Geology Reservoir History & Containment
* A geological discussion should include geological setting, continuity, areal extent, thickness, and lithology of the proposed disposal zone, including average porosity, water saturation and permeability and any gas-oil, gas-water, oil-water contacts, cross-sections, structural contour and isopach maps with details of top and base of porosity, if applicable, and
* A discussion of the geological setting of the bounding formations, base and caprock, including; rock properties, continuity, areal extent and thickness, evidence of fracturing or faulting and effective formation boundaries.
* A discussion on the maximum expected area of influence surrounding the proposed well over the life of the proposed operation, including any pressure gradients that exist as a result of past or current production or injection operations.
* Offsetting wells including abandoned wells must be investigated for hydraulic isolation of the disposal zone. Confirmation that all wells within the area of influence or a 1.6 km radius, whichever is greater, have been completed or abandoned in a manner that ensures hydraulic isolation of the proposed disposal zone.

**Conservation**

* If disposal is to occur in hydrocarbon pools or their associated aquifers, the applicant must provide evident that the proposed operations will not have a detrimental effect on the ultimate hydrocarbon recovery from the pools, including the followings: (If the proposed disposal well is more than 1.6 km from any potentially affected hydrocarbon pool or accumulation, the applicant may omit requirements relating to conservation.)
* A discussion on histories of productions/injection (including all AER-approved disposal wells) and reservoir pressures of hydrocarbon pools or accumulations within 1.6 km of the disposal well, including identification of the hydrocarbon zone to be injected, anticipation of a result of the proposed injection whether it could increase hydrocarbon recovery. A discussion on whether the proposed injection would have an impact on any producing wells within the hydrocarbon zone.
* Discussions on the stage of depletion of the recipient hydrocarbon zone, and on whether the hydrocarbon zone contains an oil-water or gas-water contact.
* An explanation of why the proposed disposal would not be detrimental to ultimate hydrocarbon recovery.
* A discussion on how the proposed disposal is compatible with the current disposal locations.
* A discussion on whether there is an enhanced recovery scheme in the subject zone. If there is, explain why the proposed disposal cannot be incorporated into the scheme and why or how the proposed disposal is compatible with the current injection.
* A tabulation of the applicant interpreted net pay, porosity, and water saturations for each well in the zone, along with the cutoffs, methodology, formulas, and constants used.
* A discussion on the proposed maximum operating pressure (Maximum average reservoir pressure) for disposal into the receiving hydrocarbon zone or the associated aquifer.

Amendment to disposal Class I fluids applications are submitted to request the following changes:

* Revise assessed MWHIP,
* Change the perforation interval within the same formation,
* Change the injection packer setting depth,
* Amend or rescind scheme-specific operating conditions,
* Rescind a disposal well, or
* Terminate the scheme.

Amendment type applications only require a clear statement of the request being made and the reason for it. MWHIP revision requirements are as laid out above.

*Directive 051* application for disposal Class I fluids should contain the followings:

A Class I disposal well must meet the *Directive 051* requirements prior to the well going on injection. It is necessary to ensure that the integrity of the wellbore will prevent contamination of other zones and protect all groundwaters.

The applicant should specify in the application whether the proposed disposal wells are in compliance with *Directive 051* requirements. If they are not, provide a discussion of the plans to bring the wells into compliance with *Directive 051* or indicate that a waiver is requested or has been approved.

**Hydraulic Isolation**

* The *Directive 051* application should include the recent completion logging, testing requirements, and associated discussion for the proposed disposal well, and
* An area of review is required for all waste disposal wells to ensure the waste fluids will not migrate, through an existing wellbore, from the disposal zone to another strata.