

# Draft Directive 020: Well Abandonment (released July 2024)

## What We Heard – And Our Response



We would like to thank all those who provided comments. We reviewed each one and consolidated comments covering similar issues. What follows is a summary of the issues raised and our responses.

Comments on grammar, punctuation, and cross-referencing have not been summarized, but changes were made where needed.

A list of the respondents is provided at the end of this document.

Stakeholder Feedback – Issue	AER Response
<b>1. General – Administrative Changes</b>	
Could the AER please summarize the “administrative changes” that will be taking place in the updated version of the directive; no descriptions were provided in the draft.	Administrative changes are minor and have not changed any regulatory requirements in the directive.
<b>2. Section 1.3, What’s New in This Edition</b>	
Recommend the updated web copy with information (qualified pools for commingled abandonment in central Alberta and a map of a new routine commingled abandonment region) be included as an appendix to the directive for ease of reference.	We have included the web copy information in section 5 of the directive and removed it from our website.
<b>3. Section 1.4, Overview of Routine and Nonroutine Abandonment</b>	
The overview is missing examples of nonroutine abandonment. Suggestions: <ul style="list-style-type: none"><li>• Add nonroutine for entering the surface cut and cap when you are missing the reports. (You have a process in place that is not listed anywhere.)</li><li>• Add permanent bridge plug (PBP) at base of groundwater protection (BGWP) depth example to displace the upper part only to fresh water.</li></ul>	The list in section 1.4 is a list of examples only and not a comprehensive list of all nonroutine abandonments or possible situations that could be encountered. However, after considering the two suggestions, we added clarity under requirement 261 in section 8 regarding scenarios where surface cut and cap information is unavailable. The note informs licensees to email the AER for direction on how to report the surface abandonment. We did not implement the PBP at the BGWP suggestion.

Stakeholder Feedback – Issue	AER Response
4. Section 2, Requirements for Nonroutine Abandonment Requests and Notification/Reporting	
Requirement 2 says the licensee must submit a nonroutine abandonment request using the designated information submission system. You only have Digital Data Submission (DDS) for this; just say DDS.	The reporting system can change, so references to specific AER systems in directives (e.g., DDS and OneStop) were replaced with “a designated information submission system.”  See the <i>Directive 020</i> webpage for a table listing the AER systems used for the various reporting requirements outlined in the directive.
4. Section 4.1, Open-Hole Abandonment of Non-Oil Sands Wells	
Please explain the logic for cementing all zones (porous or not) above the Mannville group. This requirement makes no sense and adds cost to abandonment operations.	Requirement 22 addresses groundwater protection and zonal isolation to prevent hydraulic communication between the zones above the top of the Mannville Group or equivalent. We may evaluate this requirement in a future <i>Directive 020</i> regulatory change project and determine if changes are needed.
5. Section 5, Commingled Abandonment	
<p>a) Requirement 51: The draft directive does not address the long-standing issue of certain wells permitted to exist in a commingled state (producing and standing for decades). There is a need to make an informed, risk-based decision to expand the use of routine commingled abandonment.</p> <p>b) Requirement 52: The wording references CO<sub>2</sub> EOR and critical sour recovery/storage but does not explicitly exclude SAGD recovery. Clarify that enhanced recovery excludes SAGD operations.</p> <p>c) Requirement 52 does not specify whether the 1.6 km criteria applies only to the open/completed zones but also to the upper zones with nearby operations and is considered nonroutine. The upper zones should be excluded from being nonroutine because of the additional review time and administration effort.</p> <p>d) Do requirements 52 and 53 pertain to commingled well abandonments or all abandonments? What is the definition of water sourcing? What is the definition or reference to a map for routinely approved geological strata?</p>	<p>a) We continue to work on the issue of commingled well abandonment. We conducted two scientific investigations to review additional geological strata and hydrocarbon pools for routine commingled abandonment. Both studies used a risk-based approach to determine whether commingled abandonment can occur for select geological strata in specific regions of Alberta. We have engaged with industry and provided updates on our progress and the study results. The results of the second study formed the basis of the eligible commingled abandonment regions in the draft directive posted for public comment.</p> <p>b) Requirement 52 (now 204) applies to any offset well activity within the geological strata that are approved for routine commingled abandonment. This requirement would include thermal operations like SAGD at an offset well within the strata approved for routine commingled abandonment.</p> <p>c) Requirement 52 (now 204) applies to any offset well activity within the geological strata approved for routine commingled abandonment within 1.6 km of the well to be commingled abandoned. The requirement does not refer to offset well activities in other geological strata.</p> <p>d) Requirements 52 (now 204) and 53 (now 205) are specific to the approved geological strata for wells within the routine commingled abandonment regions. Water sourcing, as used in the directive, is when water is obtained from a</p>

Stakeholder Feedback – Issue	AER Response
<p>e) Requirement 52 and 53: Recommend a mandatory requirement that offset producers share information upon notice without potentially delaying another producer’s operational activities. Is this a precursor to routine abandonments based on the AGS heat map green boxes? Much of this information is not public and will require asking an offset producer for their operational activities, which can potentially delay abandonment operations.</p> <p>f) Need to differentiate requirement 51 from 52 and 53 that pertain only to commingled well abandonment.</p> <p>g) Are formations outlined in the AER/AGS heat ranking chart within a green box eligible for routine commingled abandonment? For example, the Ellerslie and Glauco pools?</p>	<p>geological stratum through a well completed in this stratum (<i>Directive 056</i> classifies such wells as OTH – wells that are drilled for water production). The routinely approved geological strata are the geological zones (e.g., Dino Park Formation, Oldman Formation) approved for commingled abandonment in the approved commingled abandonment regions.</p> <p>e) We revised requirement 52 (now 204) to include only publicly available offset wells for evaluation. We also revised the wording of requirement 53 (now 205).</p> <p>f) We moved the requirements specific to commingled abandonment to a new section (5.6). Licensees must meet all the other requirements in the directive as applicable.</p> <p>g) No, formations outlined in the AER/AGS heat ranking chart within a green box are not eligible for routine commingled abandonment. Licensees may use the AER/AGS heat ranking chart as a planning tool and submit a nonroutine request to the AER for review and approval.</p>
<p>6. Section 5.1.3 (now 5.2.3), Layered Cement Plug Variance Submission Template</p>	
<p>a) The instructions for submitting a “Layered Cement Plug Variance Submission” form are unclear. Provide clear instructions for pre-event and post-event submissions. How long after operations occur is the post-event form to be submitted? Is it a 30-day window to coincide with DDS/OneStop submission timelines?</p> <p>b) Clarify which scenarios will have additional requirements.</p> <p>c) Why is the date of feed rate relevant?</p> <p>d) Accept the calculated cement top value on the pre-event submission form. Presently, <i>Directive 020</i> allows for calculated cement tops to be used to determine if remedial cementing is required or not.</p> <p>e) What is the difference between coil tubing and jointed pipe for cementing?</p> <p>f) The layered cement plug variance process is too burdensome. Suggest that the orphan well association (OWA) take on some</p>	<p>a) Requirement 59 (now 57) informed the licensee to follow the nonroutine submission process outlined in section 2 of the directive. Requirement 3 outlines what to submit and where to submit the request. The 30-day surface abandonment reporting deadline is not applicable in this nonroutine scenario. The licence approval conditions will specify the post-event submission timelines.</p> <p>b) Post-event submission requirements will be covered under the conditions of approval and will be site specific and predicated on what the licensee is approved for.</p> <p>c) The feed rate may change between well perforation and cementing because of formation damage.</p> <p>d) Cement must be logged so we can see the difference before and after for accurate isolation. The calculated cement top is not acceptable for this field test’s purpose.</p> <p>e) Coil tubing is continuous on a reel with no connection, whereas jointed pipe comes in lengths and has connections. Operational timelines vary depending on how the cement is placed.</p>

Stakeholder Feedback – Issue	AER Response
<p>of the responsibility of applying for and conducting the work required for the “Layered Cement Plug Variance Submission” template. This way the industry as a whole can share in the costs of getting the information deemed necessary by the AER. It would not be a surprise if no work gets done by industry under these provisions, specifically if the AER deems milling out and conducting cement evaluation operations necessary.</p>	<p>f) We provided licensees with the opportunity to pursue this approach to well abandonment. We intended the regulatory change to enable field testing and validation of this methodology. How it is executed may be determined by industry in collaboration with the OWA.</p> <p>We have updated the units on the “Layered Cement Plug Variance Submission” template.</p>
<p>7. Section 5.2 (now 5.3), Use of Inhibitor</p>	
<p>Requirement 60 (now 58) calls for the casing to be filled with nonsaline water from the uppermost abandoned zone (below the base of groundwater protection [BGWP]) to surface. The AER should offer the permanent bridge plug (PBP) option at BGWP depth, even if it is nonroutine, and eliminate the cement cap.</p>	<p>We did not implement the PBP at the BGWP suggestion. Any deviation from the requirement is nonroutine.</p>
<p>8. Section 5.3 (now 5.4), Wells Not Penetrating Oil Sands Zones</p>	
<p>The wording of requirement 66 is confusing. Recommend changing “provided no other effective porous zones” to “within the same formation or next one.”</p>	<p>We reviewed the feedback but did not change requirement 66 (now 64). There may be multiple porous zones within a formation. The intended regulatory outcome and expectation for cased hole abandonments using the PBP option for non-level-A abandonments is to help ensure these mechanical plugs are set as close as reasonably practicable to the completed zone (perforated zone).</p>
<p>9. Section 5.3.1 (now 5.4.1), Noncompleted Wells</p>	
<p>Provide additional clarity regarding pressure testing of noncompleted wells before abandonment. Would the pressure test conducted during the production casing cement job suffice if the well is abandoned within a year of this test.</p>	<p>Pressure testing during the production casing cement job is inconclusive; therefore, a pressure test before abandonment is required.</p>
<p>10. Section 5.3.4 (now 5.4.4), Wells With Casing Patching, Casing Failures, and Previously Cement Squeezed Intervals</p>	
<p>Recommend adding another scenario or example in this section when a casing failure in the production casing string is detected above the surface casing shoe depth and the production casing</p>	<p>The section does not provide a comprehensive list of all nonroutine abandonments or possible situations that could be encountered. We reviewed the feedback but did not</p>

Stakeholder Feedback – Issue	AER Response
<p>primary cement top is above surface casing shoe. Specify that repair exemptions will be allowed for this scenario through the nonroutine process.</p>	<p>change the requirements. Any deviations for casing failure repair will continue as nonroutine as outlined in <i>Directive 087</i>.</p>
<p>11. Section 5.3.5 (now 5.4.5), Zonal Abandonment Within a Completed Well</p>	
<p>The 7000 kPa over reservoir pressure will exceed the fracture gradient for anything above 700 m depth due to hydrostatic pressure from the cement column for any remedial job.</p>	<p>We reviewed the feedback but did not change the requirements. The final squeeze pressure is conducted with the cement partially or fully set.</p>
<p>12. Section 5.3.5.1 (now 5.4.5.1), Level-A Intervals, Option 3 – Setting a Permanent Bridge Plug</p>	
<p>Recommend adding the following verbiage from 5.3.5.2 (now 5.4.5.2), Non-Level-A Intervals, to option 3 under section 5.3.5.1 (now 5.4.5.1), Level-A-Abandonments: “A retrievable plug or packer may remain in place if the licensee’s chosen option (see below) meets all zonal abandonment requirements.”</p>	<p>Abandonment of a level-A interval using option 3 in section 5.3.5.1 (now 5.4.5.1) requires AER approval. We reviewed the feedback but did not change the requirements. Using option 3 and any deviations to the requirements outlined in this option, including leaving a retrievable plug or packer in the well at abandonment, will continue to be treated as nonroutine.</p>
<p>13. Section 5.3.5.2 (now 5.4.5.2), Non-Level-A Intervals</p>	
<p>a) The wording in this section is ambiguous (the example is open to interpretation). Clearer language should be used to define expectations. Specify what happens for commingled zones behind casing in the case of a low cement top. Is the commingled approval applicable only to perforations or also to isolation behind casing?</p> <p>b) The example and questions provided below apply to all instances related to setting a permanent bridge plug for zonal abandonment purposes.</p> <p>Example: For the following example see the attached log. Assume that conditions ii) and iii) are met. (even though they may not be on the example log). In this case setting the permanent bridge plug 15 m above the perforations results in the PBP being set in the</p>	<p>a) Section 5.3.5.2 (now 5.4.5.2) does not include examples; it outlines the options for non-level-A interval abandonments. Requirement 51(b) in the draft directive states, “abandon each completed pool separately unless the AER has identified the pool as one that may be abandoned with one or more other pools.” So, the commingling of pools is specific to pools completed for production in the wellbore only and does not include porous zones or protected intervals behind the uncemented casing. Section 5.1.3 of the draft directive (now 5.2.3) outlines regulatory requirements for isolating porous zones and protected intervals. Any deviation to requirement 58, including possibly commingling some zones during the remedial cementing operation, will be treated as nonroutine and require AER review and approval. For clarity, we have added a note under requirement 58 (now 56) in section 5.2.3 that explains such scenarios are considered nonroutine.</p>

Stakeholder Feedback – Issue	AER Response
<p>Ellerslie formation. This is not the completed formation nor is it the “next” formation.</p> <p>Question: Is it permissible to set the PBP at the top of the Ellerslie assuming no porosity within the interval from 15 m above the perforations to the top of the Ellerslie? The current wording would seem to prohibit this because the BP is being set within the “2nd formation” above the completed interval.</p> <p>Question: Requirement 104(c)(i) states there can be NO porosity between the PBP and the perforations. Why would that be allowed in 104(a) (15 m above the perforations with no restrictions), but in 104(c), there can be no porosity for the entire 15+ m interval?</p> <p>c) Option 4 – Setting a Cement Plug/Squeezing Cement. Does a variance form need to be submitted in this case? Is this a routine operation?</p>	<p>b) The intended regulatory outcome and expectation for cased hole abandonments where the PBP option is used for non-level-A abandonments is to ensure mechanical plugs are set as close as reasonably practicable to the completed zone (perforated zone). So, requirement 102(a) and (b) now specifies that the plug must be placed within 15 vertical metres as this would place it within the next casing string. If the mechanical plug can be placed closer, regulated parties are encouraged to do so. If this is not possible, 102(c) may be followed; however, the intent is to set the plug as close to the completed zone as reasonably practicable.</p> <p>c) Option 4 is a routine operation. A variance form would be required if the operator wishes to deviate from the requirement.</p>
<hr/> <p>14. Section 8, Surface Abandonment Procedures</p> <hr/>	
<p><i>Directive 020</i> should indicate that once the wellbore is downhole abandoned, the wellhead master valve should be shut-in for a minimum of seven days to observe any pressure buildup. This recommendation is based on observed casing failures identified seven or more days after the wellbore was downhole abandoned and pressure tested. It is not uncommon for the follow-up cut and cap crew to find pressure at the wellhead after running casing integrity logs and casing issues identified resulting in a cement plug abandonment.</p>	<p>We reviewed the feedback but did not change the requirements.</p> <p>Licensees should be using best practices, including specific area expertise, to help ensure they meet the abandonment outcomes of the directive.</p>

## **Stakeholders Who Submitted Feedback**

360 Engineering & Environmental Consulting

Canadian Association of Petroleum Producers

City of Medicine Hat

Ember Resources

PetroChina Canada Ltd.

Peyto Exploration & Development Corp.

Pine Cliff Energy Ltd.

Terminis Downhole Services