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To the EUB Commingled Production Review Team

Thank you for the opportunity to comment on *Bulletin 2006-16: Commingling of Production from Two or More Pools in the Wellbore*. The Pembina Institute has consulted with several people who have experience with the protection of groundwater.

The EUB proposal is clearly written from the perspective of facilitating access to oil and gas production, not from the perspective of groundwater protection. The Pembina Institute objects to the proposal for the following reasons.

1. **Non-saline groundwater must be protected from any risk of contamination.** Alberta Environment has the mandate to protect groundwater. The Water (Ministerial) Regulation (section 47(g)(i)) does not allow any commingling of production from licensed water wells, to ensure that there is no risk of cross contamination between non-saline (fresh water) aquifers. The same standard should apply to all wells that are completed above the Base of Groundwater Protection (i.e., where the water is non-saline), irrespective of the type of well.
2. **The proposal increases the risk to non-saline groundwater, especially in the Ardley formation.** The proposal identifies two Development Entities (DEs) where a company would be allowed to commingle production providing the well was expected to meet conditions set out in a decision tree. One of those conditions is that the well would be expected to produce less than 5 m³/month of water. This allows for the water of condensate but suggests that the formation would otherwise be dry. There is at present almost no information about the local characteristics of coal seams in the Ardley formation that partly lies within DE #1. The seams may contain non-saline or saline water or they may be dry. The Alberta Geological

Survey is undertaking a two-year program to better understand the Ardley formation. Alberta Environment has not approved the production of any water from coalbed methane (CBM) wells in the Ardley formation. Thus a company cannot know in advance whether a CBM well is likely to produce more or less than 5 m³/month of water. Even if a company reported the production of water to the EUB, there could be a time lag before Alberta Environment is alerted. By that time cross-contamination of aquifers could already have occurred. Once damage is done, it is not known if it could be rectified or how long it would take. The inclusion of part of the Ardley formation within a DE shows that the EUB has developed this proposal on the basis of incomplete information and is not considering the protection of non-saline aquifers.

3. **There is potential for mixing of non-saline and saline water due to vertical or lateral mixing over time.** Another concern relates to changes that may occur over time, where a single wellbore penetrates or crosses zones above and below the Base of Groundwater Protection. The initial volume of water production may be less than 5m³/month. However, with time more water may be drawn toward and into the wellbore. A CBM well or a cluster of wells, for example in the Ardley formation, may initially be dry or produce saline groundwater. However, with time non-saline water in laterally or vertically adjacent areas might be drawn into the wellbore/casing, leading to inter-mixing of groundwater of different qualities. This type of occurrence within the Ardley will probably present the most serious problem, as it could damage a very good non-saline aquifer that will be needed for future generations of Albertans. Thus regulators in both the EUB and Alberta Environment must make every effort to ensure that this commingling is not allowed to impact non-saline aquifers in the Ardley or any other formation containing non-saline water. This contamination would be very costly to mitigate, if mitigation were possible at all.
4. **Non-saline water might drain to a deeper formation.** If the well casing is not properly cemented, there is a risk that water from shallow formations could drain to the lower commingled area. This point was drawn to our attention by someone who has direct experience of a non-saline aquifer being drained by a faulty well casing.
5. **There is a risk of gas migration.** Once there are perforations in an oil or gas well casing at shallow depths, there is a potential route for gas migration, even if little or no water is produced. Furthermore, in some areas there are numerous old oil/gas wells with questionable wellbore integrity. These old and deteriorated well casings could be perfect conduits for gas migration into shallow zones including aquifers and domestic water wells.
6. **The precautionary principle should be adopted and no measures should be taken that could increase the risk of water well contamination.** There have been a considerable number of water well complaints in an area where the EUB is proposing to make commingling routine, in particular areas where there is CBM production from the Horseshoe

Canyon formation. Due to lack of mandatory baseline data it has often not been possible to verify the condition of the water wells before the gas development started. However, given the number of problems already identified and the fact that commingling creates pathways that can result in the contamination of shallow aquifers, it is not the time to make it easier to commingle. Bulletin 2006-16 says that there is minimal risk that the proposed commingling will have a negative effect on the environment. However, the EUB clearly anticipates that there could be a risk to non-saline aquifers, as the Bulletin states that the EUB will work with Alberta Environment where impacts to or production of non-saline groundwater may be an issue. The best way to prevent this being an issue is not to allow any commingling of production that occurs above the Base of Groundwater Protection.

7. **Commingling of gas could make it more difficult to find the source of water well problems.** If there is gas migration into a water well, isotopic analysis can indicate the source of the gas. If gas production is commingled, it will be impossible to identify the isotopic composition of the individual gases and thus it will not be possible to meaningfully compare the produced gas with the gas in the water well.
8. **The proposal allows commingling from coals or shales within a DE, even though there is very limited knowledge on production from shales.** The EUB will **not** allow self-declared commingling outside a DE as “production from coals and shales is not well understood”. While production of gas from coals may be quite well understood within the DEs, we query how well the production from shales is understood as shale gas development is only just beginning in Alberta. It is known that shales have different characteristics in different formations and areas but until production from shales is more widespread the local characteristics will not be well understood.
9. **The proposal relies upon self-regulation by the industry.** Ideally there would not be any commingling of production from wells where some of the production comes from above the Base of Groundwater Protection. The EUB has routinely approved commingling applications, but in the past the EUB has required a company to obtain approval for commingling through a *Directive 065 Application* if one of the formations was above the Base of Groundwater Protection. This required the company to “provide justification as to why the proposed commingling will not jeopardize any usable water zone.” (*Bulletin 2004 – 26 Commingling of Production from Two or More Pools in the Wellbore Using the Notification Process*, Attachment 2, item 3). While it would have been preferable to allow no commingling of production where one of the pools was above the Base of Groundwater Protection, the onus of proof was on the company and it meant that each situation had to be examined and justified and specifically approved by the EUB. The new proposals allow the EUB to rely on industry’s assurance that conditions are being met. How often will the EUB check on the self-reporting?

10. **Provisions for compliance and enforcement are inadequate.** The compliance assurance process is insufficient to ensure the protection of non-saline aquifers. There are no detailed safeguards, such as requiring that a well is shut in if a company discovers that it is producing more than 5 m³ per month. The company is required to determine the zone of origin and composition of the water production and determine future action in consultation with the EUB, but it is possible that an aquifer may already be contaminated. Prevention is far better than trying to find a cure. Other proposed enforcement actions outlined in Appendix 8 require a company to “immediately correct/address noncompliant event...” but again rely on self-reporting.

The EUB points out that commingling reduces the number of wells required and thus the surface impacts. However, it is not appropriate to permit commingling where this could pose a threat to non-saline aquifers, which are essential to the well being of those in rural Alberta, both now and in the future. Thus we object to the proposals set out in Bulletin 2006-16 that involve commingling of production above and below the Base of Groundwater Protection. We look forward to hearing how the EUB will address the issues we have raised. If, despite our objections, the Board intends to proceed, we would appreciate a discussion on alternative and preventive measures to address our concerns.

Yours truly,

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cc Bev Yee, ADM Alberta Environment