July 8, 2024

The Honourable Rebecca Schulz
Minister of Environment and Protected Areas
Government of Alberta
204 Legislature Building
10800 – 97 Avenue
Edmonton, AB T5K 2B6
aep.minister@gov.ab.ca

Dear Minister Schulz,

Thank you for your May 23 letter regarding the issue of freshwater use by industry in the Blindman River basin[1,2]. However, our concerns around the determination of 'sufficient water' availability by the Alberta Energy Regulator (AER) remain. The issue is not isolated to our area of Lloyd Creek, but to the entire Blindman River and Medicine River sub-basins, and potentially elsewhere in the province. It is a larger issue, one that needs wider public discussion. Alberta's *Water for Life Strategy* was meant to be a continuous conversation with Albertans and that is what this letter hopes to be, part of a renewed public discussion on our relationship and priorities with our freshwater.

The *Water for Life Strategy,* released in 2001, has been vital in managing our water resources through the province's population growth and industrial development over the past 20 years. One of the most important parts of the *Water for Life Strategy* and its *Renewal* in 2008 was the emphasis put on public consultation with Albertans. This acknowledged water as a valuable resource with many competing demands. Furthermore, it recognized that we all have a stake and responsibility in helping to meet the strategy's three specific goals:

1. Safe, secure drinking water supply;
2. Healthy aquatic ecosystems; and
3. Reliable, quality water supplies for a sustainable economy.

The need to find a balance of these three goals is the cause of concern and debate in the Blindman River watershed. In 2023 and 2024, the Blindman River and its tributaries have not broken their banks or flooded, even during spring runoff. This is due to a lack of soil moisture, low snowpacks and below average precipitation. Despite the low flow rates, Temporary Diversion Licences (TDLs) for freshwater use in hydraulic fracturing are still being issued. This has our community very concerned for the impact on water availability for traditional agricultural rights holders and other downstream users, as well as on the actual viability of our river ecosystems and aquifers.

In the summer of 2023 Lloyd Creek, a tributary of the Blindman River, ran dry[3] south of the bridge on Township Road 441. This would be alarming at any time, but particularly so when freshwater diversion was being permitted upstream at an adjacent gravel pit (SW 7-44-1-W5) around the same time. For such an acute water shortage to occur and still allow freshwater diversions in the area, shows either a failure of monitoring and enforcement of the licensing system, or a failure of the licensing system itself, which would suggest a policy revision is required.

The Blindman River sub-basin is dominated by agriculture and energy, both industries which utilise our limited freshwater resources, as do the households and communities throughout the

watershed; for drinking water, recreation, waste management, and quality of life.

The Blindman River sub-basin, as well as the Medicine River sub-basin, were both designated as *Potentially Water-Short Basins* by Alberta Environment in 2006[4]. These two sub-basins also have the highest intensity of hydraulic fracturing operations[5] within the Red Deer River watershed. This is why AER's water allocation and usage numbers – which seem to be based on aggregated, province wide data – do not accurately represent what is happening in the Blindman River watershed.

Water scarcity is often a local occurrence, particularly in the central and southern portions of Alberta which have only about 20 percent of the province's freshwater and 80 percent of the demand. Our watershed is in a multi-year dry spell, as can be seen by two years of Agri-Recovery, Lack of Moisture and Moisture Deficiency Insurance payouts in our area, as well as on the Alberta Soil Moisture Reserves Maps (May 2022, 2023, 2024)[6a,6b.6c]. The issuance of new freshwater licences does not acknowledge this fact.

The *Water for Life Strategy* is about how to balance competing needs for freshwater during times of scarcity, as these conversations do not typically arise during times of surplus water. The concern in our community is that water needs of industry have superseded others who also rely on the water as a necessary resource, including households, agriculture, small businesses, recreation, and the aquatic ecosystem. Our concern is growing due to the rapid increase in oil exploration activity in the Duvernay Formation, and the resulting rapid increase in TDLs being issued. Additionally, the sudden construction of a large off-stream reservoir next to the Blindman River (SE21 and NE 16-043-02W5M)[7] for freshwater storage for hydraulic fracturing has the community asking where the energy company plans to source the freshwater to fill it during this period of below-average precipitation in our area. The result is a loss of confidence and trust in the AER and the current Alberta Environment and Protected Areas policies that are supposed to represent the best interests of our community.

Our community is not against the judicious use of freshwater for hydraulic fracturing, or other industries. We simply believe that water diversion licences, particularly in the form TDLs, should only be used in resource extraction when sufficient water is available. Our water supply is controlled by nature and unfortunately, the timetable may not be as predictable, or stable, as industry may like. We agree with government and industry's long-term planning to use water storage as part of the solution[8], but increased use of freshwater, including the filling of freshwater storage reservoirs for hydraulic fracturing, should not occur during dry periods. The ecological integrity of our rivers needs to be protected. This is the core concern of our community.

It is essential that Albertans and the government discuss how to ensure balance between the priorities in the *Water for Life Strategy.* We have two main, longer-term suggestions, both of which have been published in Alberta Government documents in the past 10 years.

1. Protect the aquatic ecosystem by ensuring rivers have the right to water themselves.

    a. The first and most important suggestion is better protection of the aquatic ecosystem. The current, Instream Objectives set by the AER on licences are insufficient, ad-hoc, and too informal to ensure the long-term viability of our creeks and rivers. Water Conservation Objectives (WCO) need to be applied to smaller, tributary rivers in the province, especially in water-short or potentially water-short areas, such as the Blindman and Medicine River sub-basins. This was suggested in *Our Water Our Future Action Plan* (2014)[9]. Additionally, in the Approved Water Management Plan for the South Saskatchewan River Basin it was recognized that mainstem WCOs should also

apply to the headwaters and tributaries of the Oldman, Bow, and South Saskatchewan[10]. Although a different stream order to the Blindman River, the Battle River, along with all its named and unnamed tributaries and groundwater (hydrologically connected to surface water) are covered by a WCO[11] of 85% of natural flow. There is no reason equivalent WCOs could not be set for other similar watersheds.

b. Typically, WCOs only apply to new water licenses, so if they are established after a river has become degraded, they may not be effective. As suggested in the 2018 South Saskatchewan Water Management Plan review, an expert panel should be formed to review current WCOs 'in terms of water quantity, water quality, groundwater, groundwater-surface water interaction, and aquatic and riparian ecosystems'[12]. While the plan review does say WCOs should be considered for the basin's tributaries, it also acknowledges that WCOs may be inadequate and other methods of ensuring ecological integrity of rivers should be considered. Other methods could include protected water or WCO licences held by water trusts[12].

c. Finally, to set WCOs we recognize the need for better data and knowledge of both the natural water supply and flows in the sub-basin, as well as more detailed and comprehensive knowledge of water use by current rights holders. Both these items were discussed in the Red Deer River Watershed Alliance's State of the Watershed Report (2009)[13]. Updating the State-of-the Watershed reports is crucial in providing insights and tracking changes to water resources within our watershed. We fully support regular updates to these reports to help inform future policy decisions.

2. Incentivize reductions in freshwater use and the development and use of alternative technologies by hydraulic fracturing operations.

a. As you point out in your letter, water reuse in the energy industry has greatly improved since 2006, thanks in part to the water conservation policies implemented by the Alberta Government[14]. However, the water use efficiency gains are almost entirely centred on the oil-sands and in-situ operations[15]. Water use for hydraulic fracturing was exempt from the 2006 Water Conservation Policy for Oilfield Injection. Perhaps due to the early developmental state of the technology at the time, it was not seen as a large user of water, but that has changed significantly in the intervening years. Alberta government's *Our Water Our Future Action Plan* states 'perhaps the strongest message received from participants was the need to reduce the use of fresh water by hydraulic fracturing operations and consider alternative water sources.'[16] The plan recommended that the 2006 Water Conservation and Allocation Policy for Oilfield Injection be updated to include hydraulic fracturing operations, and indeed, when that policy was replaced by the Water Conservation Policy for Upstream Oil and Gas Operations, it did include multi-stage hydraulic fracturing operations in horizontal wells. However, it remains unclear how the policy will improve efficiency and productivity of water use in the sector, as only operations in water-short areas need to submit 'a plan for water conservation and efficiency improvement.' [17] In potentially water short areas, such as the Blindman and Medicine River sub-basins, this is not required[17].

Most importantly, TDLs need to fall within the policy, both to meet the spirit of the policy and to ensure fairness between companies. Currently, companies that apply for term water licences have much more restrictive licensing requirements and responsibilities than companies that apply for TDLs. This loophole needs to be closed.

b. Water conservation policies are particularly important for consumptive uses of

freshwater, such as hydraulic fracturing, in which the freshwater is lost to the hydrologic cycle. We believe this is a fundamentally different use of fresh water and as such requires special attention.

While the previous two points are the most important and impactful long-term changes, in the immediate term other actions should be taken:

3. Instream Objectives on the Blindman and Medicine rivers need to be reviewed. The methodology behind Instream Objectives on many tributary rivers is outdated and needs to be revised using modern, rigorous methods. This is easier, and faster, than establishing WCOs or pursuing other methods of protecting river flows.

4. Alberta Environment and Protected Areas needs to update the provincial Water-Short Areas Assessment[17], last updated in 2006. The designations are important as they provide higher levels of review and protections when issuing water licences[18].

5. TDL holders should not have the option to use a downstream flow station to set their diversion rate, which can be greater than 60 km difference in the case of some TDLs on Lloyd Creek or the Blindman River[19]. The flow rate used to set diversion rates, must be taken at the point of diversion to ensure the intervening stretch of water is not overdrawn. This needs to be a rule, not an optional condition[20].

6. Monitoring of shallow groundwater in areas with large diversion projects, or cumulative diversion amounts is needed. This would help alleviate local residents' concerns surrounding the impacts large diversions may have on their wells, dugouts, and springs, through hydrologically connected shallow groundwater and surface water.

7. The public notice for applications for TDLs needs to be more accessible and better communicated. This could be done by posting application notices in a local newspaper or municipal newsletter, and/or having an interactive map on the AER public notice of applications website so it is easier to see if there are TDL applications being made in a given area. This would allow for greater public participation in the decision-making process. It would also help build public trust with the AER.

As Albertans, we all have a strong connection with our freshwater lakes, rivers, and streams, and value their protection and long-term sustainability. They are integral to our quality of life.

We ask you to hear our concerns and take appropriate action to address them, starting by having this conversation with all Albertans. We are planning a community meeting to discuss the issues brought forward in this letter on Thursday, August 8 at Liberty Hall in Ponoka County (see attached agenda)[21]. We would appreciate and encourage representation from your ministry at the event.

We look forward to your prompt response and actions to address these pressing issues. Thank you for your attention to this matter.

Sincerely,

Ponoka County Residents

CC:

Premier Danielle Smith, Government of Alberta; Minister Brian Jean, Energy and Minerals, Government of Alberta; Jason Nixon - MLA - Rimbey, Rocky Mountain House and Sundre, Government of Alberta; Rick Wilson - MLA - Wetaskiwin, Government of Alberta; Jennifer Johnson – MLA – Lacombe-Ponoka, Government of Alberta; Blaine Calkins - MP - Red Deer-Lacombe, Government of Canada; Paul McLauchlin - Reeve - Ponoka County and President, Rural Municipalities of Alberta; Josh Bishop – Reeve- Wetaskiwin County; Barb Shepard - Reeve - Lacombe County; Jim Wood- Mayor - Red Deer County

Appendix 1

April 26, 2024

The Honourable Rebecca Schultz
Minister of Environment and Protected Areas
Government of Alberta
204 Legislature Building
10800 – 97 Avenue
Edmonton, AB T5K 2B6
aep.minister@gov.ab.ca

Dear Minister Schultz,

As residents and landowners in Ponoka County, we are writing to bring to your attention the Alberta Environment's authorization of Baytex Energy, Clearview Resources Ltd., Spartan Delta Corporation water licences, as well as Jones Trucking and Backhoe water management practices at Lloyd Creek, particularly in light of the current drought conditions in our province.

Lloyd Creek serves as an indispensable resource for our community, supporting households, farming, wildlife, small businesses, and various other needs.

What has become apparent, is that the actions of all these companies, while profitable for them, have significant detrimental effects and if their operations continue **there will be little to no water left** for the larger community which heavily relies on this resource.

To provide you with background on this matter, Jones Trucking and Backhoe Services, situated at SW 7-44-1-W5 in Ponoka County, has excavated a substantial pit on their premises. Water from Lloyd Creek is infiltrating through the gravel and streaming into the pit. Jones Trucking and Backhoe Service has granted Baytex Energy, Clearview Resources Ltd., and Spartan Delta Corporation access to their property and the water-filled pit, which they claim is surface runoff.

All of these companies are extracting water from the pit for the purpose of oil and gas drilling (fracking). According to water licences authorized by the Alberta Government for 2024, the surface runoff water from the gravel pit can be utilized for oil and gas purposes. What this excavation has caused is not related to surface runoff, but in fact has caused the diversion of water away from Lloyd Creek, which has resulted in significantly low water levels. See the attached photos from the fall of 2023 (appendix #1).

For 2024, the Alberta Government authorized a total of 415,000 m3 of surface runoff water to be pumped out for oil and gas. This is an additional 14,100 m3 of surface runoff water from the previous year. See the attached chart (appendix #2).

Baytex Energy has also been authorized by Alberta Environment to divert 400,000 m3 of water from the Blindman River at SW 21-43-2-W5 and Lloyd Creek is a tributary of the Blindman River.

These actions have been taken despite Lloyd Creek water levels being extremely low and recent correspondence to water licence holders from Alberta Environment indicating that Alberta is in a Stage 4 drought and is urging water conservation measures. See the attached letter (appendix #3).

Furthermore, the timing of these pumping operations, which began earlier this month during spring drought conditions when water levels are already dangerously low, is deeply concerning and necessitates immediate action.

Despite the community's opposition and the recent visit from the Alberta Energy Regulator on Monday, April 15 to assess the situation, no decisive action has been taken to halt Baytex Energy, Clearview Resources Ltd., Spartan Delta Corporation, as well as Jones Trucking and Backhoe operations. This lack of intervention is deeply troubling and underscores the urgency of the situation.

Minister Schultz, the protection of our natural resources and the well-being of our communities are paramount responsibilities that demand urgent attention and decisive action.

We trust in your commitment to upholding these principles and look forward to your prompt response and actions to address this pressing issue.

Thank you for your attention to this matter.

Sincerely,

Ponoka County residents

Appendix 2

123516

ALBERTA

ENVIRONMENT AND PROTECTED AREAS

Office of the Minister

May 23, 2024

Ms. Haleigh Sanderson
Ponoka County
haleigh.packer@gmail.com

Dear Ms. Sanderson:

Thank you for your letter on behalf of Ponoka County residents and landowners about water management efforts in Lloyd Creek, and the oil and gas industry's water use during provincewide water shortages and restrictions.

The Government of Alberta is working closely with communities, water users, and all our partners to take strong action for drought preparation. We continue to carefully monitor snowpack, rainfall, river levels, and water use to ensure drought conditions are well understood and that Albertans have the information they need to be prepared. Major water users in the South Saskatchewan River Basin have signed water sharing agreements to help mitigate the risk of severe drought. These agreements are the largest water sharing initiative in Alberta's history and the most effective tool for conserving water and managing drought. As of May 2, 2024, the Government of Alberta's new Drought Response Plan is also in place and guiding the province through drought. Finally, by providing $125 million over five years for the Drought and Flood Protection Program, Alberta is helping municipalities and Indigenous communities improve their long-term resilience to drought and floods events.

Environment and Protected Areas (EPA) collaborates with the Alberta Energy Regulator (AER) in the administration and regulation of legislation, including the *Water Act*. The current drought situation emphasizes the importance of a collaborative relationship to closely monitor the situation to ensure water is available for all users. The AER approves a licence application if sufficient water is available from the desired source. The licence specifies the withdrawal rate, the timing, the total allowable volume, and the water level where pumping must stop, plus any other conditions the AER specifies. This is to ensure there is enough water to support existing users and the environment.

The AER is working with the upstream oil and gas industry and has requested stakeholders to prepare contingency plans for water shortages this year. When making decisions, the AER follows a comprehensive process, which includes following mandatory regulatory water management plans such as the Red Deer River Water Conservation Objective and the Approved Water Management Plan for the South Saskatchewan River Basin. These water management plans regulate water diversion restrictions and are conditioned into both AER and EPA water licences. When applying for a licence, applicants must demonstrate that they have considered alternatives to freshwater, and any licence issued contains various enforceable conditions, including the maximum rate of water diversion and the water course flow rate at which diversion must cease.

204 Legislature Building, 10800 - 97 Avenue NW, Edmonton, Alberta T5K 2B6 Canada Telephone 780-427-2391

License holders are required to monitor flows and adhere to licence conditions, which are monitored. In April 2024, both the AER and EPA conducted separate site visits and verified that licence holders were in compliance with the conditions of their licences, as referenced in your letter. Both regulatory bodies will continue to monitor licence holders to ensure compliance with the conditions of their licences and that regulated water diversion restrictions in Lloyd Creek and the Blindman River are met. The Blindman River is currently under a water shortage advisory where new surface water temporary diversion licence (TDL) applications are considered on a case-by-case basis, based on current flow conditions.

I share your concerns about future water availability; however, we also need to consider stakeholders' water needs, which includes the energy development sector. Only 13% of nonsaline water allocated to all industries in Alberta is allocated to oil and gas extraction, and the energy industry typically only uses about 21% of this allocation. Furthermore, over 80% of the water used by the oil and gas industry is recycled. When water availability is constrained due to dry conditions, the AER or EPA may place greater restrictions on water withdrawals, depending on the specific circumstances. Although surface water withdrawals are most affected in the short term by drought, groundwater sources may also be affected in the longer term. If water flow remains low, advisories issued by EPA could go as far as restricting the issuance of new TDLs, mainly from flowing water bodies. The department could issue direction or guidance not to issue any further TDLs in restricted water basins, and the AER would apply that direction to the energy industry.

The AER is working directly with industry and asking them to prepare contingency plans for water shortages this year. In December 2023, the AER released Bulletin 2023-43: "Water Shortage Advisories in Alberta – Important Information for Water Licence Holders," to remind water licence holders of their responsibility to understand and follow the conditions of their water licences, particularly those conditions involving low-flow restrictions. For more information, visit aer.ca and search for "water use performance."

You can find more information at open.alberta.ca/publications by searching for "*Water Act*," "Red Deer River Water Conservation Objective," and "Approved Water Management Plan for the South Saskatchewan River Basin." For the most up-to-date information on current drought conditions and the Government of Alberta's most recent drought management activities, please continue visiting alberta.ca/drought.

Thank you again for writing. I appreciate your perspective on this matter.

Sincerely,

Rebecca Schulz
Minister of Environment and Protected Areas

cc: Honourable Danielle Smith, Premier of Alberta
Honourable Brian Jean, KC, Minister of Energy and Minerals
Honourable Rick Wilson, MLA, Maskwacis-Wetaskiwin
Honourable Jason Nixon, MLA, Rimbey-Rocky Mountain House-Sundre

Appendix 3

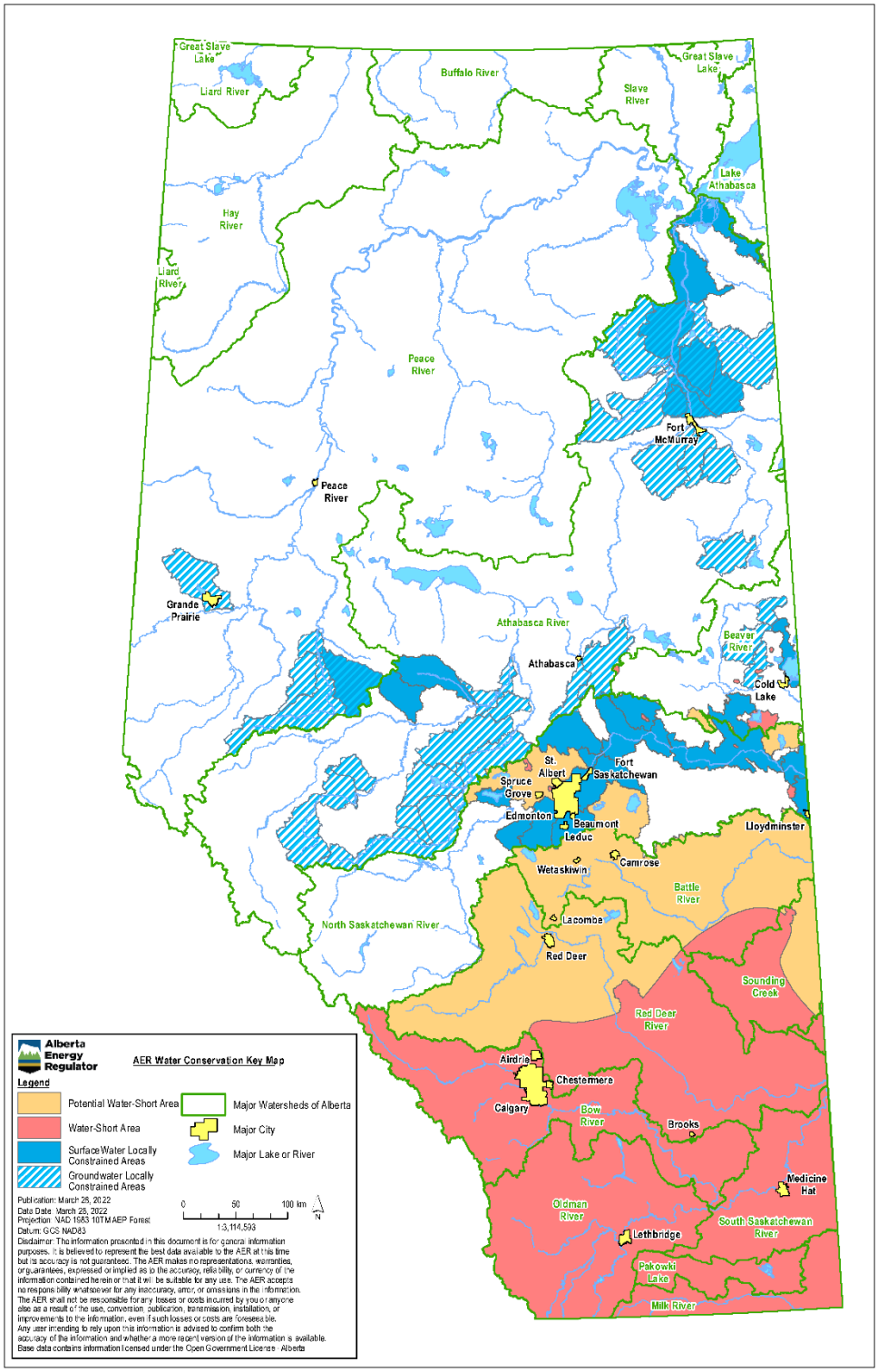


Figure 2. Map showing water-short, potentially water-short, and locally constrained areas. Locally constrained areas are updated annually. A high-resolution, interactive version of this map is available on the AER website at https://extmapviewer.aer.ca/wcp/index.html.

Appendix 5

APRIL
2020

GET THE FACTS

HYDRAULIC FRACTURING IN THE RED DEER RIVER WATERSHED

Prepared by: the Red Deer River Watershed Alliance

Photo Credit: Len Langevin

ABOUT THE RED DEER RIVER WATERSHED

The Red Deer River watershed is the largest headwater sub-basin of the South Saskatchewan River Basin in Alberta (49,650 km^2). Home to approximately 300,000 people, the watershed originates in the Rocky Mountains and includes 55 urban centres and 18 rural municipalities across central Alberta.

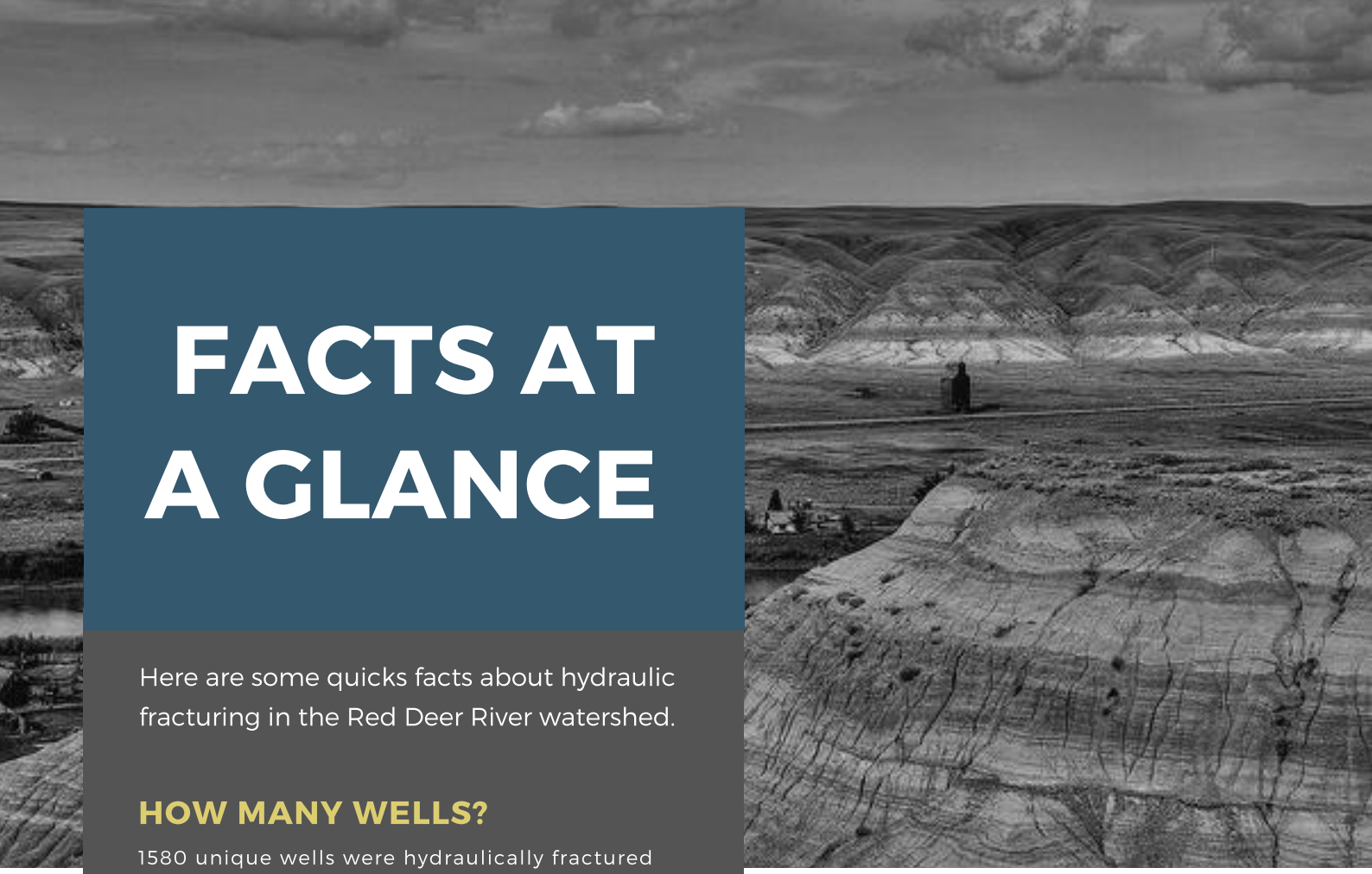
The Red Deer River watershed is made up of 15 smaller sub-watersheds that nest within the larger watershed. These sub-watersheds span five different natural regions and include a rich diversity of lakes, wetlands, creeks, tributaries and upland areas.

WHAT IS HYDRAULIC FRACTURING?

- Hydraulic fracturing is a technique used to recover oil and natural gas trapped in tight geological formations underground. A mixture of water, sand (or similar material), and chemical additives is injected at high pressure to fracture rocks in the subsurface and help get the oil and natural gas flowing. Most of the natural gas in Alberta is currently extracted using hydraulic fracturing.

- Target formations for hydraulic fracturing are typically 1 – 3 kilometres below ground. To drill a well, companies start by drilling vertically (straight down) and can then start to drill horizontally - making the well resemble the letter “L”. The horizontal path of a well can extend up to 4 kilometres.

- Hydraulic fracturing of a well can occur in one stage or in multiple stages along the horizontal portion of the well. This is called multi-stage horizontal hydraulic fracturing.



FACTS AT A GLANCE

Here are some quicks facts about hydraulic fracturing in the Red Deer River watershed.

HOW MANY WELLS?

1580 unique wells were hydraulically fractured between 2013 and 2018 in the watershed to recover gas, oil, or coalbed methane.

WHAT ARE THE MAJOR FORMATIONS?

Major target formations in the watershed include the Duvernay, Montney, and Cardium formations.

HOW MANY STAGES ARE INVOLVED?

The average number of stages per hydraulic fracturing operation increased from 11 in 2013 to 36 in 2018.

WHAT REPORTING IS REQUIRED?

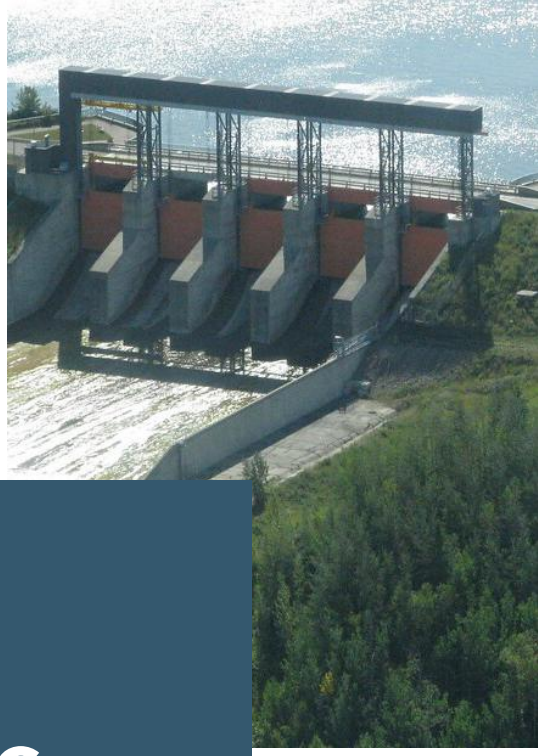
The Alberta Energy Regulator requires all companies to report the water and chemicals used in every hydraulic fracturing operation. This information is publicly available on fracfocus.ca.

REPORT METHODOLOGY

With hydraulic fracturing activity on the rise in parts of the watershed, this fact sheet provides basic information about hydraulic fracturing, the sources and volumes of water used for hydraulic fracturing in the basin, and where to go for more information.

The Alberta Energy Regulator provides data on the sources and volumes of water used for hydraulic fracturing in Alberta. The Red Deer River Watershed Alliance analyzed this data to understand trends in the watershed over the period 2013 - 2018.

The information presented in this fact sheet focuses on water quantity, and does not represent a comprehensive review of the lifecycle of hydraulic fracturing as it relates to key watershed management considerations and potential environmental impacts.



WHERE IS HYDRAULIC FRACTURING HAPPENING IN THE WATERSHED?

Top 5 sub-watersheds	Overall Condition*
Blindman	C-
Medicine	C-
Threehills	B-
Little Red Deer	B-
Waskasoo	B

* The 2009 State of the Watershed report assessed 20 indicators of watershed health for each of the 15 sub-watersheds.

Of the 15 sub-watersheds within the Red Deer River basin, these are the top five sub-watersheds with the highest water use for hydraulic fracturing, for the period between 2013-2018.

DID YOU KNOW?

The Duvernay Formation is a source rock for historical conventional hydrocarbon production, and is now emerging as Alberta's foremost unconventional shale resource.

Source: Alberta Energy Regulator

Based on the total volume of water used for hydraulic fracturing in each sub-watershed (2013-2018), major areas of activity include:

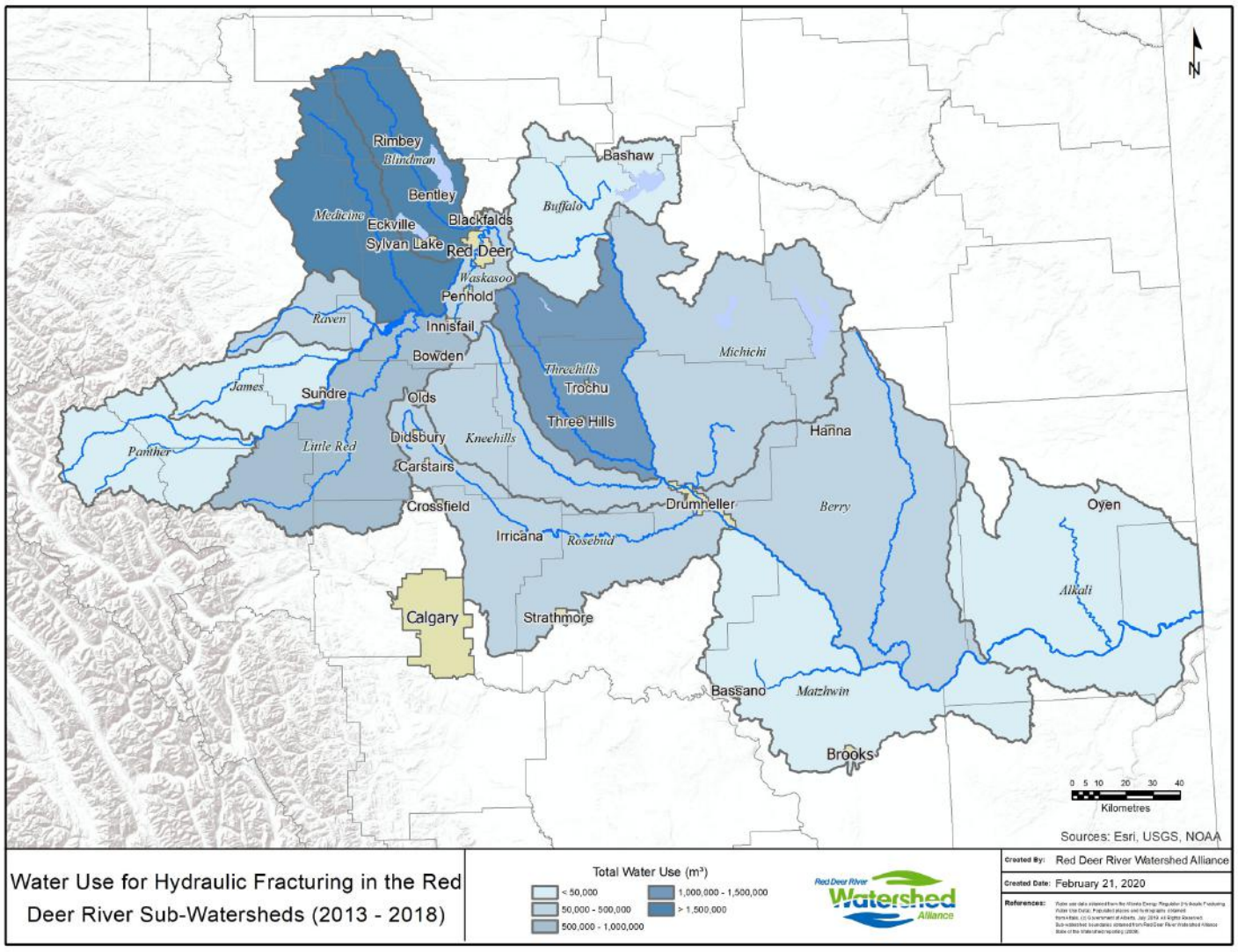
- **Blindman sub-watershed:** The area with highest activity (by water volume), the Blindman sub-watershed has multiple large volume operations (> 50,000 m^3) clustered between the city of Red Deer, Sylvan Lake, Bentley, and Blackfalds.

- **Medicine sub-watershed:** Located upstream of the city of Red Deer, this area is part of the Lower Headwaters zone and is important for downstream water provision and groundwater recharge.

- **Threehills sub-watershed:** Located downstream of the city of Red Deer, communities include Three Hills, Trochu and the Village of Elnora. This is a largely agricultural area.

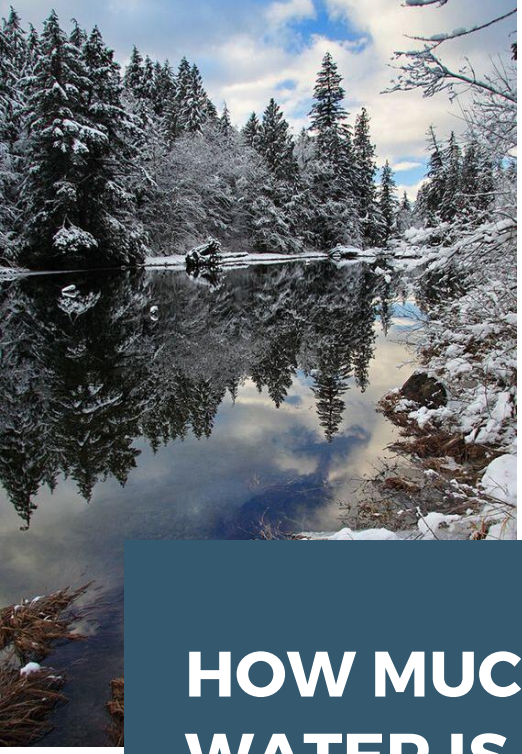
MAP OF WATER USE BY SUBWATERSHED

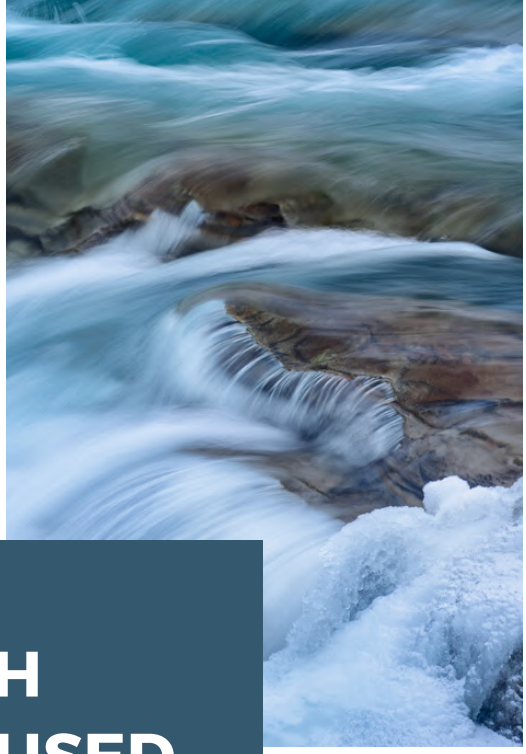
The map below shows total reported water use for hydraulic fracturing by sub-watershed for the period 2013-2018. Data is from the Alberta Energy Regulator.



DID YOU KNOW?

The Alberta Water Use Performance Report shows how water is allocated and used for oil and gas operations. The Alberta Energy Regulator publishes the detailed report online annually at www.aer.ca.





HOW MUCH WATER IS USED FOR HYDRAULIC FRACTURING?

- The reported total volume of water used in the Red Deer River watershed for hydraulic fracturing from 2013 to 2018 was 7,521,288 m^3. For comparison, this is around 3,009 Olympic-sized swimming pools of water.

- The volume of water used per operation varies based on factors including the geology of the play, technology used, and number of stages. The average volume of water used per hydraulically fractured well in the watershed was 19,550 m^3 in 2018. There is a trend toward larger operations (> 50,000 m^3 per well).

- Water use by hydraulic fracturing is typically consumptive (i.e., water is not returned to its source in the ecosystem).

- Water that is recovered from an operation (as flowback or produced water) is typically considered waste and is usually disposed of through deep well injection. Opportunities to recycle produced water and minimize freshwater use are being explored.

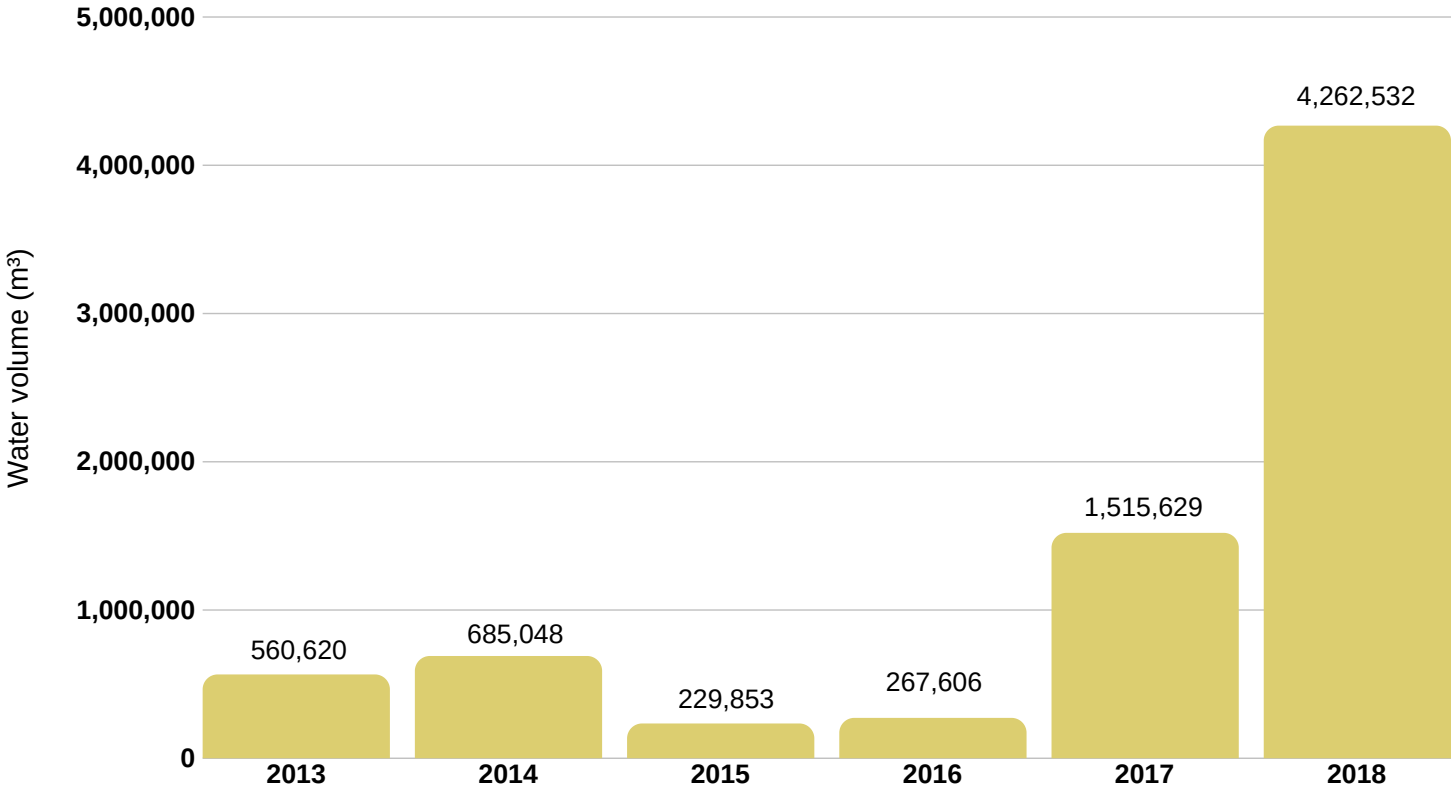
DID YOU KNOW?

People often think of groundwater and surface water as separate types of water, but in reality they can be connected in complex ways. Groundwater contributes to surface water, and vice versa, although the degree of connectivity can vary based on geology and groundwater depth.

For more information about groundwater and groundwater vulnerability in the basin, the RDRWA encourages readers to review Blueprint: An Integrated Watershed Management Plan for the Red Deer River Watershed (Phase One: Water Quality) (2016), available at www.rdrwa.ca.

WATER USE TRENDS

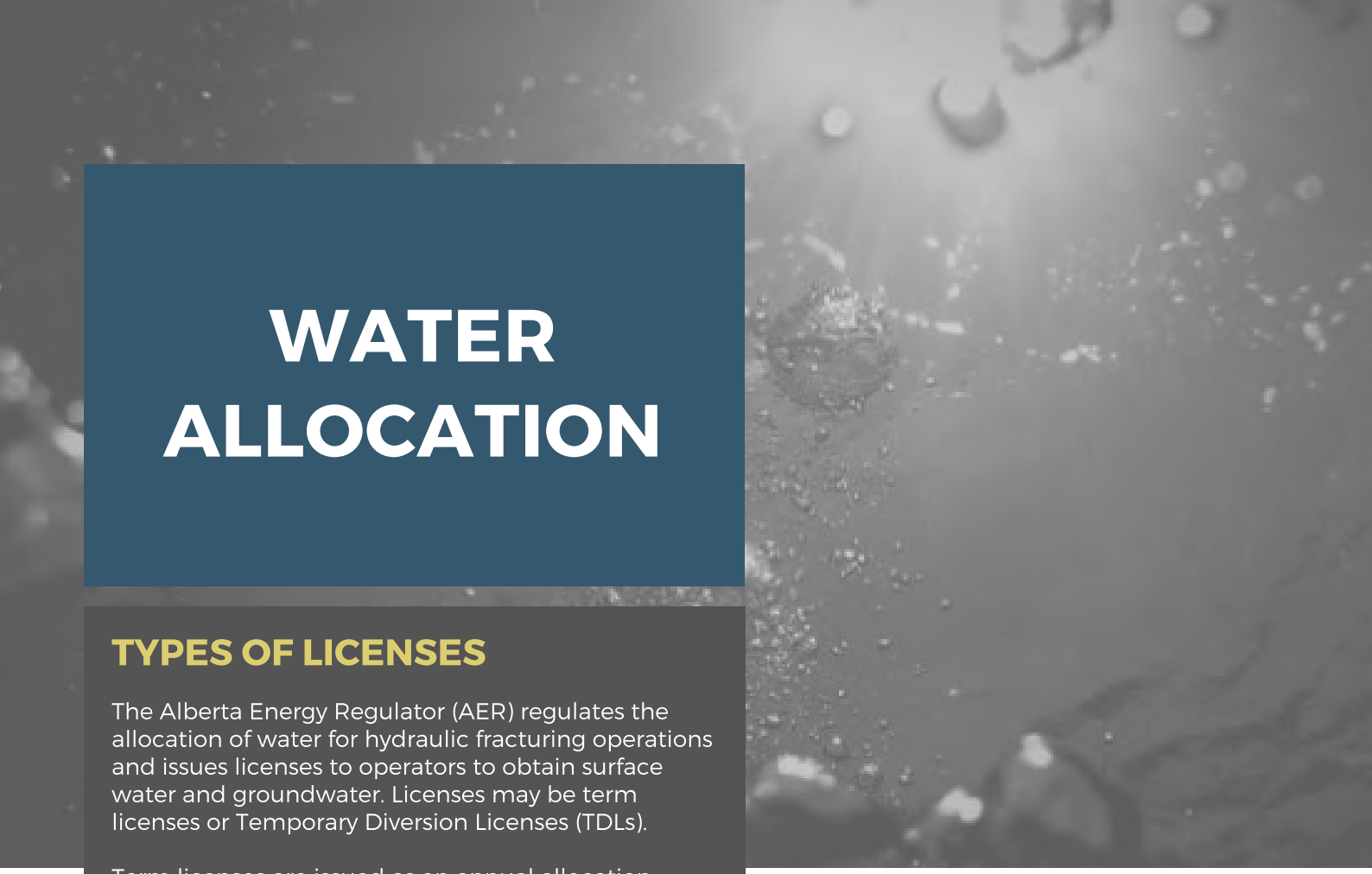
HOW MUCH WATER DOES HYDRAULIC FRACTURING USE IN THE BASIN?



2018 saw a significant increase in the reported volume of water used for hydraulic fracturing in the basin, particularly in the Medicine, Blindman, Waskasoo, and Threehills sub-watersheds. This increase was driven by an increase in development and a trend toward operations requiring higher water volumes. Reported water use (2013-2018) was calculated using data from the AER.

ALBERTA SURFACE WATER ALLOCATION DIRECTIVE

In 2019, Alberta Environment and Parks released a Surface Water Allocation Directive (SWAD) to guide water allocation decisions. SWAD attempts to balance ecological needs and economic considerations in allocation decision-making, and it applies to areas where specific water management objectives are not already established. The Directive takes a cumulative water allocation approach to minimize changes to aquatic habitats. Moving forward, there is a need to clarify how SWAD applies at a sub-watershed scale in the basin.



WATER ALLOCATION

TYPES OF LICENSES

The Alberta Energy Regulator (AER) regulates the allocation of water for hydraulic fracturing operations and issues licenses to operators to obtain surface water and groundwater. Licenses may be term licenses or Temporary Diversion Licenses (TDLs).

Term licenses are issued as an annual allocation volume, and can be multi-year. TDLs are short-term licenses issued for a few weeks up to several months.

TERM VS. TDL ALLOCATIONS

Using data from February 2020, term surface water allocations in the basin are:

- Agriculture - 31%
- Industrial - 23%
- Commercial - 4%
- Municipal - 27 %
- Water Management - 12%
- Other - 3%

0.76 % of all term allocations are for hydraulic fracturing (considered part of the Industrial category).

If both term and TDL licenses are considered, hydraulic fracturing (horizontal and vertical) accounts for 2.73% of all surface water allocations in the basin. As of February 2020, approximately 8.4 million cubic metres of water were allocated toward hydraulic fracturing in the basin (vertical and horizontal). 73% of this water was allocated using TDLs. Not all water that is allocated is used.

Allocation data are not cumulative across years and are not directly comparable with the water use and source data presented (different time periods) .

BASIN-SCALE TRENDS

Under the Approved Water Management Plan for the South Saskatchewan River Basin (2006), there is a total surface water allocation target for the Red Deer River watershed of 600,000 cubic decametres (1 dam^3 = 1,000,000 L). This target is for surface water allocations in a given year.

In February 2020, total surface water allocations in the basin (including all sectors) were 307,045 dam^3, including term (300,904 dam^3) and TDL (6,141 dam^3) licenses. This equates to 51% of the allocation target. Basin-scale allocation trends may mask local patterns of water availability and allocation.

WATER SOURCE TRENDS IN THE BASIN

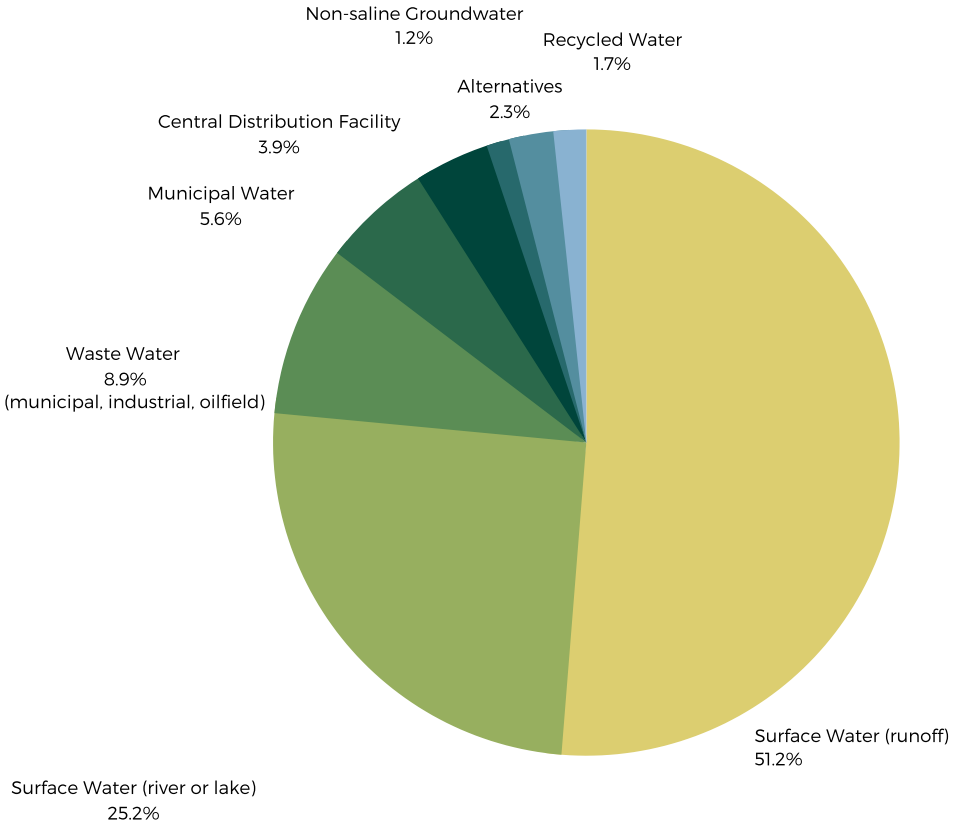
WHERE DOES THE WATER COME FROM?

DID YOU KNOW?

76% of the total water sourced for hydraulic fracturing in the basin from 2013-2018 was surface water. This includes 51% from "surface runoff", 14% from lakes, and 11% from rivers.

The AER defines runoff as water that is collected from a surface depression (e.g., borrow pit, gravel pit, dugout, stormwater collection pit, ditches). Some surface runoff sources like gravel pits may also be connected to groundwater and local aquifers.

Groundwater, both non-saline and saline, makes up a small fraction of the water used for hydraulic fracturing in the basin.



SOURCES OF WATER
By Major Category (AER)

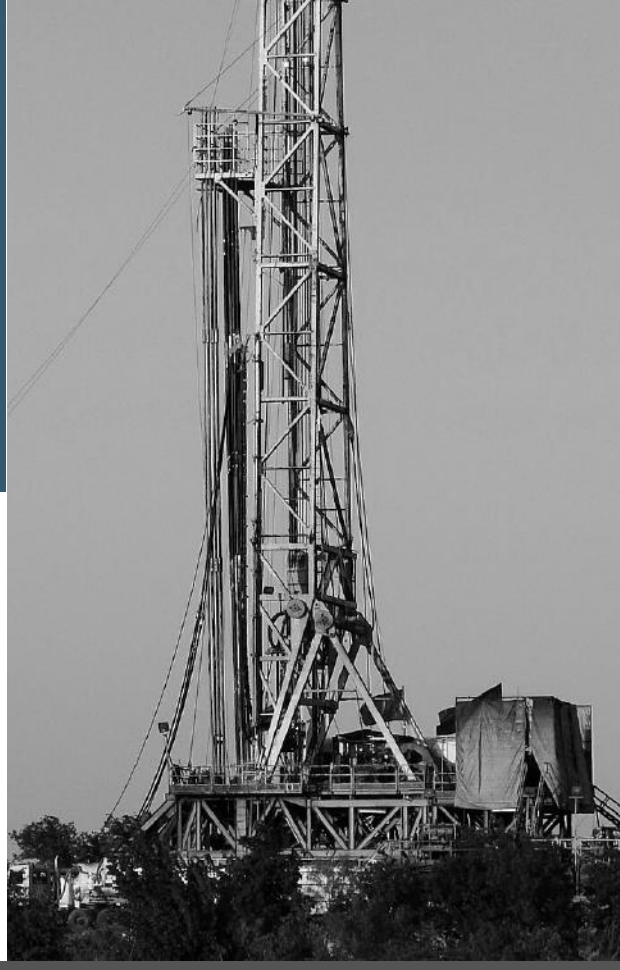
96% NON-SALINE

2.3% ALTERNATIVE
(SALINE GROUNDWATER, PRODUCED WATER, RECYCLED AT STANDALONE FACILITY)

1.7% RECYCLED
(AT WELL SITE)

- The total reported volume of water sourced in the Red Deer River watershed for hydraulic fracturing from 2013 to 2018 was 8,931,969 m^3. For comparison, this is around 3573 Olympic-sized swimming pools of water.
- 84.2% of the water or waste water sourced for hydraulic fracturing over the period 2013 to 2018 was actually used.
- Data for water use and sourcing reflects *reported* water volumes, based on *Directive 059* reporting to the AER.

CAN HYDRAULIC FRACTURING CAUSE EARTHQUAKES?



- Hydraulic fracturing has been linked to induced seismic events in the Red Deer region. The Alberta Energy Regulator / Alberta Geological Survey indicates that recent earthquakes (19 March 2018 – Local Magnitude (M_L) 3.13; 4 March 2019 – M_L 4.18) in the region were induced by hydraulic fracturing, and other smaller clusters of events in the Duvernay East Shale Basin were also induced (Schultz et al., 2019).

EARTHQUAKES ASSOCIATED WITH HUMAN ACTIVITIES ARE REFERRED TO AS INDUCED SEISMICITY (AS OPPOSED TO NATURAL SEISMICITY). THEY INCLUDE BOTH SMALL EVENTS THAT CANNOT BE FELT, BUT ARE MEASURABLE BY SENSITIVE INSTRUMENTS, AND LARGER EVENTS THAT CAN BE FELT AND THAT MAY CAUSE DAMAGE.

- In Western Canada, 3 out of every 1000 hydraulically fractured wells are associated with seismicity that can be felt at the ground surface (MW>3) (Atkinson et al., 2016). Regions with higher hydraulic fracturing activity have also been shown to be more prone to earthquakes (Bao and Eaton, 2016).

- The AER has created seismic protocols to limit the impact and potential of induced earthquakes from hydraulic fracturing in the Red Deer Region (*Subsurface Order No. 7*). Hydraulic fracturing is prohibited within five kilometres of the Dickson Dam if operations are targeting the Duvernay formation or below, and all operators in the region are required to follow a "traffic light protocol" to reduce the hazard of induced seismicity.

ABOUT THE RDRWA

The Red Deer River Watershed Alliance (RDRWA) was established in 2005 as the official Watershed Planning and Advisory Council (WPAC) for the Red Deer River Watershed, as designated under the Government of Alberta's *Water for Life* Strategy. The RDRWA is a multi-sector, collaborative, not-for-profit organization that assesses watershed conditions, leads in watershed planning, and promotes the good stewardship and proper management of water resources.

DATA DISCLAIMER

This fact sheet presents a high-level overview of hydraulic fracturing trends within the Red Deer River Basin, for general informational purposes only. Subject matter experts from multiple sectors provided data and expertise to support the process, however this document is not a comprehensive scientific report. The analyses should be regarded as preliminary and used with discretion.

The data used to calculate the volumes of water sourced and used for hydraulic fracturing come from the Alberta Energy Regulator. Water allocation data was obtained from Alberta Environment and Parks.

REFERENCES

Alberta Energy Regulator. 2019. Subsurface Order No. 7

Atkinson, G.M., D.W. Eaton, H. Ghofrani, D. Walker, B. Cheadle, R. Schultz, R. Shcherbakov, K. Tiampo, J. Gu, R.M. Harrington, Y. Liu, M. van der Baan, and H. Kao. 2016. Hydraulic Fracturing and Seismicity in the Western Canada Sedimentary Basin. Seismological Research Letters, Volume 87(3).

Bao, X., and D.W. Eaton. 2016. Fault activation by hydraulic fracturing in western Canada. Science 354: 1406-1409.

RDRWA. State of the Watershed Report. Aquality, 2009.

RDRWA. Blueprint: An Integrated Watershed Management Plan for the Red Deer River Watershed (Phase One: Water Quality). 2016.

Schultz, R., Pawley, S.M. and Hauck, T.E. 2019. Preliminary overview of the 2018 and 2019 earthquakes near Red Deer, Alberta; Alberta Energy Regulator/Alberta Geological Survey, AER/AGS Open File Report 2019-12. 10p.

FOR MORE INFORMATION

If you have questions or concerns about a proposed or active energy project in your area, the RDRWA has compiled a list of contacts below.

Alberta Energy Regulator Customer Contact Centre

Telephone: 1-855-297-8311
E-mail: Inquiries@aer.ca

Alberta Environment Non-Emergency Inquiries

Toll Free: 1 877 944-0313
Email: AEP.Info-Centre@gov.ab.ca

To Report an Incident or Emergency

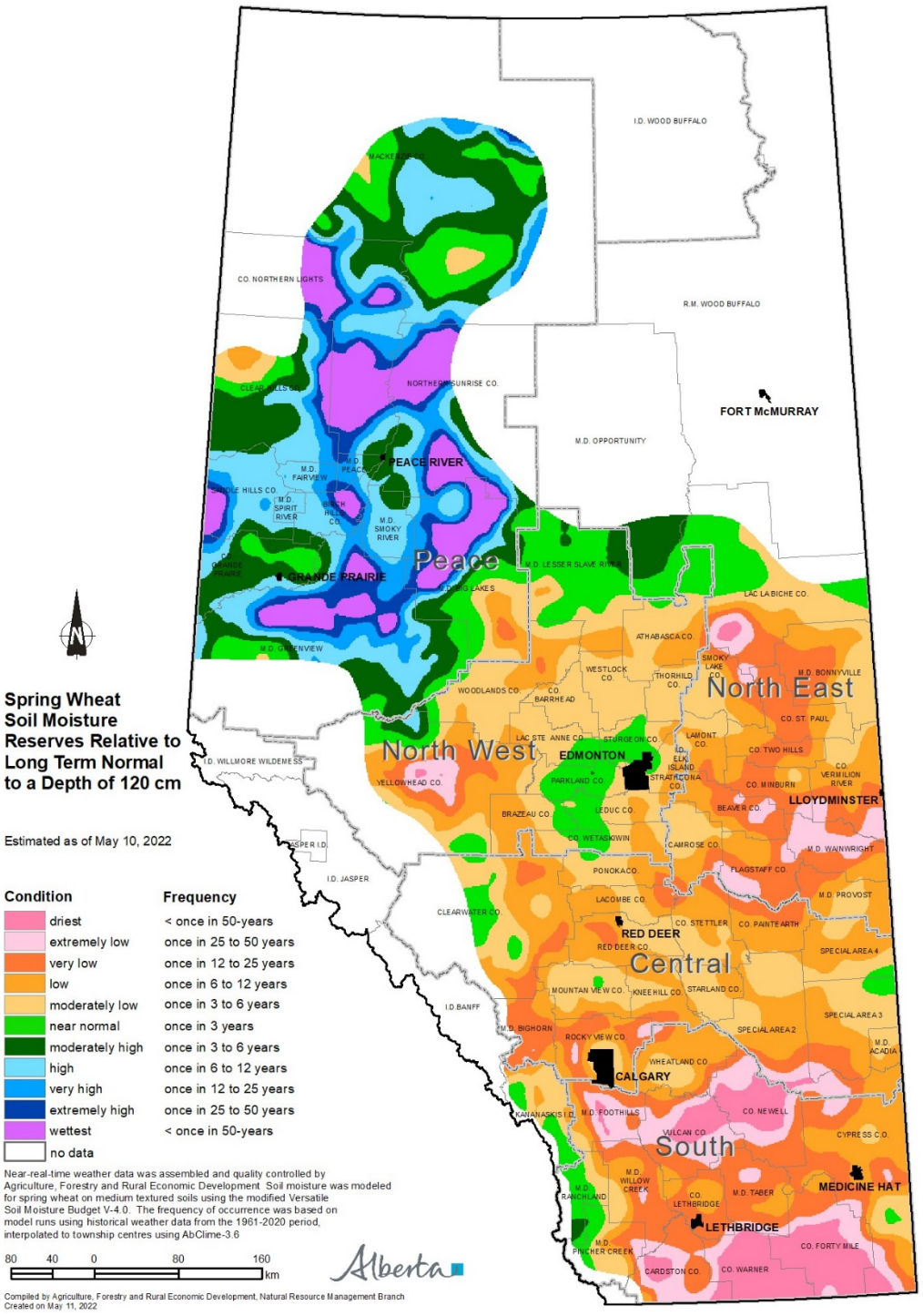
Call 1-800-222-6514 (Energy and Environmental Emergency 24-Hour Response Line) immediately if you witness, or are aware of, unreported problems regarding energy development.

Red Deer River Watershed Alliance
For more information visit: www.rdrwa.ca
Email: info@rdrwa.ca Tel : 403-340-7379

Red Deer River Watershed Alliance

Appendix 6a

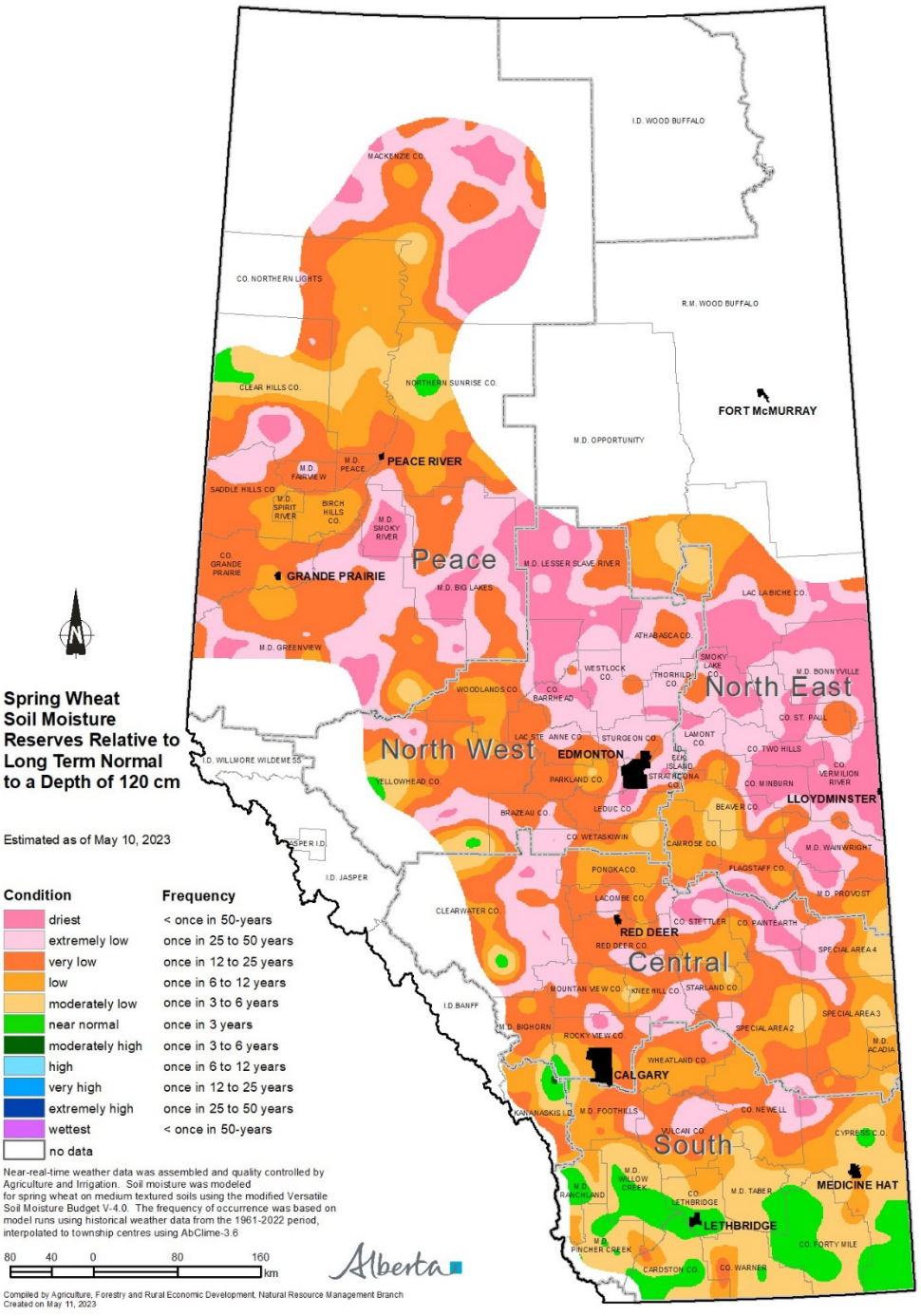
Map 5



Visit weatherdata.ca for additional maps and meteorological data

Appendix 6b

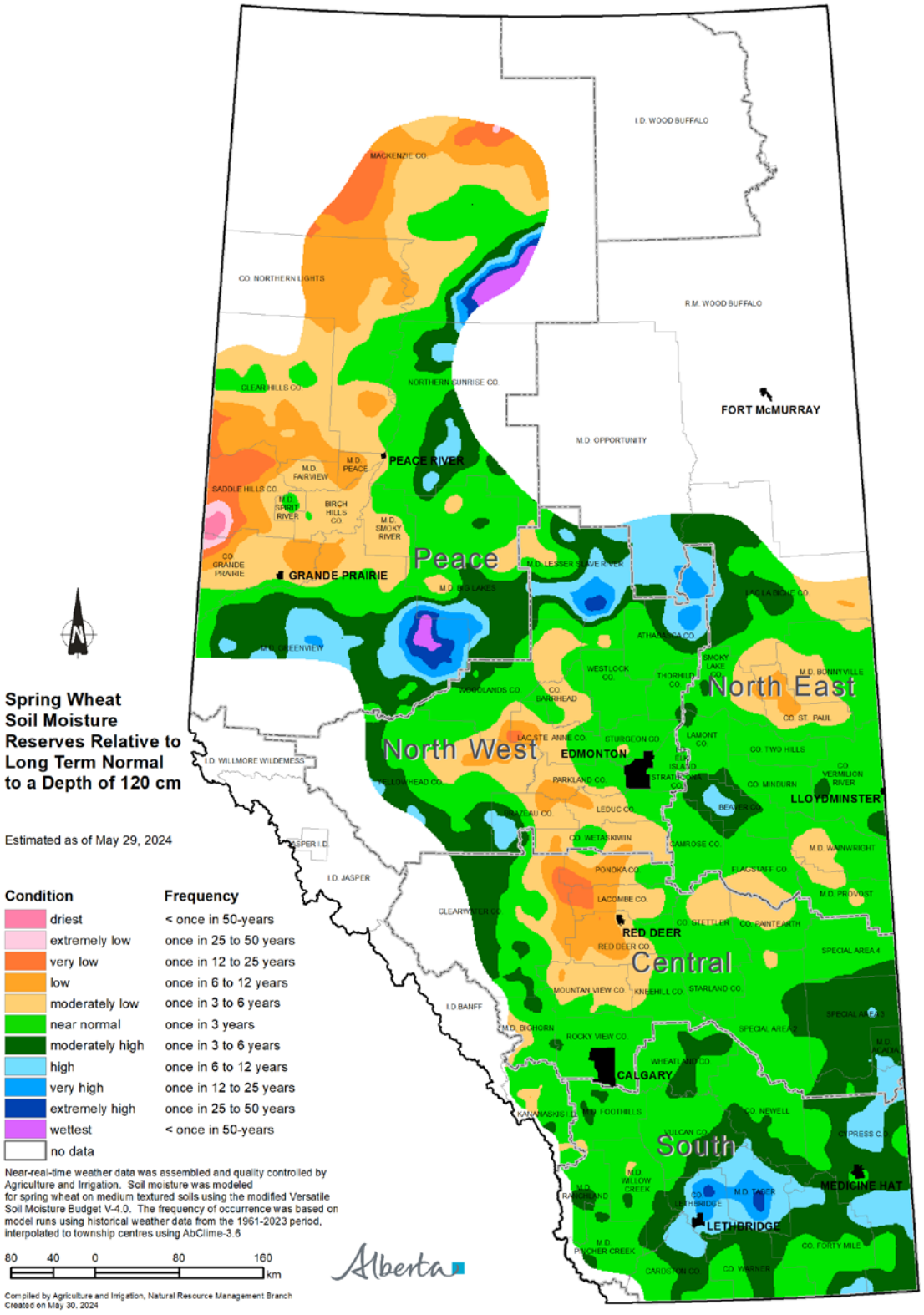
Map 4



Visit weatherdata.ca for additional maps and meteorological data

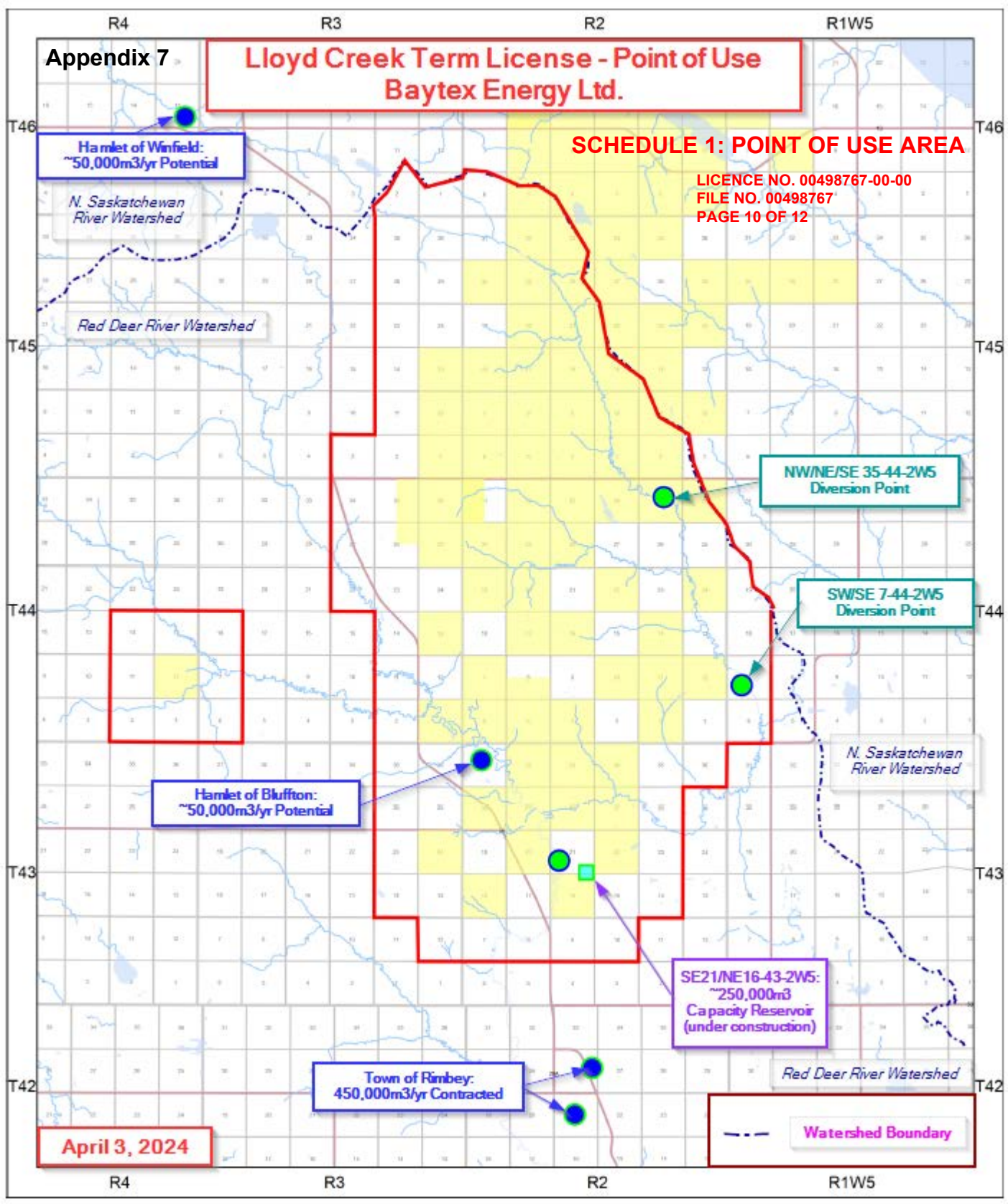
Appendix 6c

Map 4



Visit weatherdata.ca for additional maps and meteorological data

https://open.alberta.ca/publications/moisture-situation-update


Appendix 7
Lloyd Creek Term License - Point of Use
Baytex Energy Ltd.
SCHEDULE 1: POINT OF USE AREA
LICENCE NO. 00498767-00-00
FILE NO. 00498767
PAGE 10 OF 12
R4
R3
R2
R1W5
T46
T45
T44
T43
T42
Hamlet of Winfield:
~50,000m3/yr Potential
N. Saskatchewan
River Watershed
Red Deer River Watershed
NW/NE/SE 35-44-2W5
Diversion Point
SW/SE 7-44-2W5
Diversion Point
N. Saskatchewan
River Watershed
Hamlet of Bluffton:
~50,000m3/yr Potential
SE21/NE16-43-2W5:
~250,000m3
Capacity Reservoir
(under construction)
Town of Rimbey:
450,000m3/yr Contracted
Red Deer River Watershed
Watershed Boundary
April 3, 2024

Renewed licences should be encouraged to develop off-stream storage. If off-stream storage is constructed, the WCO shall replace the existing instream objective. If off-stream storage is not constructed, conditions regarding instream objectives shall remain.

New (Junior) licences stemming from applications received before January 1, 2013 should be given conditions for instream objectives that existed prior to January 1, 2013.

New (Junior) licences stemming from applications received on, or after, January 1, 2013 shall be given conditions for the water conservation objective.

Transfers should carry the instream objectives condition of the original licence. However, if the transfer includes the construction of off-stream storage, the Water Conservation Objective should replace the instream objective.

The recommended WCO should not apply to current operating conditions of existing dams and weirs.

Rationale:

It is recognized that the probability of meeting the proposed WCO is low, but that it provides a flow management objective for improving the health of the aquatic ecosystem over time. Under the *Water Act* (Section 31(1)) water diverted and stored under the proper conditions of the licence for which the works are capable of carrying are not subject to release during periods of water shortage. Through the use of off-stream storage, it is possible to improve water security for junior licence holders during water deficit periods. In cases where off stream storage is utilized, a diversion window coinciding with peak flow events is preferred.

The achievement of the recommended WCO will require that future licences, particularly those requiring year round diversion, have off stream storage to minimize the licence holder's risks of not being able to divert the full allocation of water.

5.2 Recommended Watershed Management Planning Priorities

The provisions described in this section of the plan are actions outside of the *Water Act*. These provisions may be lead by the Government of Alberta, the designated watershed planning and advisory council for

4 Overview of Opportunities for CEP

4.1 Identification of CEP Opportunities

Many opportunities for water CEP exist within the upstream oil and gas sector. A number of these are already considered on a project-specific basis, and improvements are ongoing (see Section 2.4).

Based on the definitions for CEP, opportunities were categorized as follows:

- Conservation – Opportunities that may continue to use water, but would preserve valued water sources by using alternatives such as saline water, or by reusing poor quality water such as wastewater or produced water from other industrial or municipal activities.
- Efficiency – Opportunities that would decrease the overall water use, such as additional recycle water to reduce the requirements for makeup water.
- Productivity – Opportunities that would increase production of goods and services per unit of water used.

The CEP opportunities identified by the industry are listed in Table 4-1 and described in more detail in Appendix B. All three categories noted above are included in the list, from targeting less valuable water sources to applying technology to reduce water use or increase production without using additional water. The opportunities also include infrastructure or technology solutions to provide treatment or water storage to offset water withdrawals in times of lower supply (e.g., winter months).

Many of these potential opportunities are already being implemented by some producers, or are required by regulations. Others would require changes to the current regulatory management system before they can be considered or implemented. For example, because this industry is generally less sensitive than most other sectors to the quality of water it requires, upstream oil and gas has more flexibility in the water sources it can use. Thus, the sector could further target water sources that are relatively poorly-suited for providing drinking water or ecosystem functions. Prioritizing water sources in this way would expand on the current use of saline water to define additional source categories depending on water chemistry and concurrent uses.

A decision to implement any of the CEP opportunities should be informed by a project-specific assessment of net environmental benefit.

WATER MANAGEMENT

ACTION:
Support the study of water storage potential in the South Saskatchewan River Basin (SSRB).

Participants overwhelmingly sent the message that enhancing water storage should be a key part of efforts to optimize water in Alberta. These efforts should reflect an “all of the above” approach to water management, including conservation. Developing additional water storage capacity would enable our province to capture water during times of high volume and manage its use strategically throughout the year.

Southern Alberta has some of the tightest limits of water supplies and yet faces rising water demands. As such, it makes sense to place an initial focus on the benefits of water storage in this part of the province.

Alberta Agriculture and Rural Development worked with the Irrigation Council to oversee a study of long-term water management options in the SSRB, to support the needs of the irrigation sector, municipalities, industry and the environment. The study included a technical evaluation of potential storage opportunities and an impact assessment of new storage in the watershed.

A final report was received in summer 2014.

Appendix 9

ACTION:
Explore approaches for establishing protected water through government-led initiatives and support research led by universities.

The concept of protected water found support among participants. People liked the idea of setting water aside in each river basin to meet ecosystem needs. The main questions were how much water should be protected and how best the scheme should be implemented.

To answer these questions, ESRD will identify approaches that our province can use for establishing protected water, or unallocated water, in each river basin to meet ecosystem needs. Existing planning efforts will inform much of this work. Specifically, ESRD is developing a water quantity management framework for the Lower Athabasca River, which is expected to be implemented in 2015. The framework will manage cumulative water withdrawals in support of both human and ecosystem needs, while balancing social, environmental and economic interests. Through this process, ESRD will explore possible approaches for establishing protected water.

Alberta Innovates – Energy and Environment Solutions is funding several initiatives which will support our understanding of protected water. These projects include work by the University of Lethbridge, which will examine water requirements for healthy instream and riparian ecosystems, and research by the University of Alberta, which will address knowledge gaps on impacts to fish from changes in stream hydrology.

ACTION:
Address potential impacts of climate change on the South Saskatchewan River Basin (SSRB) by studying how Alberta can manage for a range of potential impacts of climate variability throughout the SSRB.

Many participants observed that climate change stands to affect the quantity of Alberta's water resources over time. This could have significant impacts, especially in areas of the province with limited water resources, such as the SSRB. People said it makes sense to examine, prepare for and guard against potential impacts before they occur.

Healthy aquatic ecosystems

Goal: Albertans are assured that Alberta's aquatic ecosystems are maintained and protected.

Given the effects of growth pressures on Alberta's aquatic environment, an increased focus will be placed on maintaining the value and function of Alberta's aquatic ecosystems. Aquatic ecosystems are Alberta's water source. These aquatic ecosystem functions are required to maintain our ability to support drinking water and economic needs.

Specific outcomes include:

- Protection of aquatic ecosystems in critical areas;
- Establishment of priorities for sustaining aquatic ecosystems to be implemented through watershed plans; and
- Management and allocation of water to sustain aquatic ecosystems and ensure their contribution to Alberta's natural capital and quality of life is maintained.

Key actions include:

- Develop a provincial action plan to improve the health of significantly impacted aquatic ecosystems;
- Set water conservation objectives on all major basins; and
- Finalize and implement a new wetland policy for Alberta.

Rationale

It has been determined during preparation of this plan that the limits for water allocations have been reached or exceeded in the Bow, Oldman, and South Saskatchewan River Sub-basins and flow regimes have been altered by water diversions. This has created risks for both water users and the aquatic environment. In drier years, low priority licences are not able to receive their total allocations. Existing diversions have also adversely affected the aquatic environment, including the riparian vegetation, in the Bow, Oldman, and South Saskatchewan River Sub-basins. Increased withdrawals of water within existing licences further degrade aquatic ecosystem health. Issuing more licences compounds these adverse aquatic effects and increases risk to existing licences.

The need to curtail further allocations and make existing allocations more efficient and effective has been made more urgent by the economic development that is taking place in the SSRB.

2.2 Future Water Allocation Limit in the Red Deer River Sub-basin

Recommendation

A limit is not proposed for allocations from the Red Deer River Sub-basin at this time, however there is sufficient information to cause concern about the potential risk to both licences and the aquatic environment as increased volumes of water are withdrawn.

It is recommended that an allocation volume of approximately 600,000 dam^3 (cubic decameters) be considered the initial total allocation target. When allocations reach 550,000 dam^3, a temporary closure to applications to permit a review of the aquatic environment and allocations should be undertaken. Once the review is complete, a Crown Reservation should be created for the Red Deer River Sub-basin to reserve water for the aquatic environment and other identified purposes. The identified purposes will determine the allocation limit. The review should consider:

- Present and projected state of the aquatic environment.
- Present and projected reliability of licences (factoring in existing and potential water storage).
- Where there is a condition in the licences, the degree to which return flow from water users is benefiting the aquatic environment and licence reliability.
- Future water demands.
- The purposes allowed for future allocations in the Crown Reservation.

Rationale

The Red Deer River has fewer allocations than other rivers in the SSRB and, hydrologically, has the healthiest aquatic environment. The recommended total allocation target of 600,000 dam^3 is predicted to support future growth for the next 40 years. The setting of a total allocation in the future will:

- Prevent the issuance of licences where there is an unacceptably high risk of full allocations not being available in drier years;
- Limit or reduce possible future risks to existing licences; and
- Avoid the degree of environmental degradation that has occurred in other rivers in the SSRB.

2.3 Recommended Water Conservation Objectives (WCOs)

The WCOs recommended in this plan provide direction on opportunities to increase flows in the highly allocated rivers in the Bow, Oldman and South Saskatchewan River Sub-basins and permit allocations in the Red Deer River Sub-basin. They are subject to future review and refinement in light of improved knowledge and information about the aquatic environment and water quality.

It was determined that an implementation date for new WCOs needed to be incorporated into the plan as effects on the aquatic environment became clear and as the plan became common knowledge. There was a need to protect the aquatic environment and to prevent speculation on water allocations. This date was determined to be May 1, 2005, based on imminent plans at the time for the draft SSRB plan going out to public consultation.

2.3.1 Upstream WCOs

This plan was developed on the basis of recommending WCOs for the mainstem rivers, downstream of major dams or diversions. However, it became apparent during the planning process that mainstem WCOs should also apply to headwater reaches and tributaries. It is recommended that when a WCO is to be established for headwater reaches and tributaries to the mainstem that it not be less than existing instream objectives or the WCO downstream on the mainstem, whichever is greater. Given the recommendations in this plan, it is unlikely that further water management planning is needed to establish WCOs in any parts of the Bow, Oldman and South Saskatchewan sub-basins.

2.3.2 Bow, Oldman and South Saskatchewan River Sub-basins WCOs:

The recommended WCOs will serve as an administrative tool that will foster opportunities to increase flows. These opportunities could include holdbacks from transfers, voluntary actions by licence holders, cancellations, and purchases of transfers. These WCOs will serve on an interim basis until monitoring, research and public consultation identify a long-term WCO.

The recommended WCOs are either 45% of the natural rate of flow, or the existing instream objective increased by 10%, whichever is the greater at any point in time.

Recommended application of the WCO

- WCO for all storage licences under the Crown Reservation should be the existing instream objective plus 10% at any point in time.
- The existing instream objective or WCO should continue to be a condition on existing licences for which off-stream storage is constructed, to increase use of existing allocations.
- All existing licences should retain their original conditions for instream objectives.
- Renewed licences should retain conditions regarding previous instream objectives.
- New licences stemming from applications received before May 1, 2005 should be given conditions for instream objectives that existed on May 1, 2005.
- Transfers should carry the condition for instream objectives of the original licence.
- The recommended WCOs should not apply to the current operating conditions for existing dams and weirs.

Rationale

The lower reaches of these rivers have aquatic environments that have been impacted by water diversions. These WCOs, combined with the set limits on water allocations, are the first steps toward restoration of the aquatic environments.

The figure of 45% of the natural rate of flow (combined with the existing instream objectives) will provide an adequate target to increase flows for many years.

The recommended WCO of the existing instream objective, plus 10% during very high flows, (i.e. spring freshet) will enable the diversion of at least some runoff into storage for the purposes identified in this plan. The physical ability to capture and store water during the high flow events will always be limited. Storage would be more effective if there is a severe decline in peak runoff in the future and total runoff is spread over a longer period. Capturing even a relatively small proportion of a high flow could amount to a substantial volume of water. However, commitments to apportionment and existing licences will constrain the volume of water available for storage in most years.

2.3.3 Red Deer River Sub-basin WCOs:

From the Dickson Dam to the confluence with the Blindman River, it is recommended that the WCO for any applications received or licences issued after May 1, 2005 and for existing licences with a retrofit provision be:

- A rate of flow that is 45% of the natural rate of flow, or 16 cms (cubic metres per second), whichever is greater at any point in time.

From the confluence with the Blindman River to the Saskatchewan border, it is recommended that the WCO:

- For future licences for withdrawals from November to March, inclusive, be:
  - A rate of flow that is 45% of the natural rate of flow, or 16 cms, whichever is greater at any point in time.
  - That this WCO apply to any applications received or licences issued after May 1, 2005.

- For future licences for withdrawals from April to October, inclusive, be:
  - A rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.
  - That this WCO apply to any applications received or licences issued after May 1, 2005.

- For existing licences with a retrofit provision, be:
  - A rate of flow that is 45% of the natural rate of flow, or 10 cms, whichever is greater at any point in time.

It is recommended that renewed licences retain their previous conditions for instream objectives.

Alberta Environment and Sustainable Resource Development

PURSUANT TO THE PROVISIONS OF THE *WATER ACT*

Appendix 11

Establishment of Battle River Basin Water Conservation Objective

The Lieutenant Governor in Council approved the Water Management Plan for the Battle River Basin in Alberta on June 23, 2014 through Order In Council (O.C. 299/2014).

The Water Management Plan for the Battle River Basin recommends the establishment of a water conservation objective (WCO) for the Battle River basin.

The Water Management Plan for the Battle River Basin considered both the technical information on the state of the basin as well as the public's comments.

Technical and public consultation for the Water Management Plan for the Battle River Basin included deliberations by the Battle River Basin Stakeholder Advisory Group since 2004 and the general public in 2014. The established Instream Objectives (IOs) and minimum flows within the Battle River Basin were widely discussed considering the definition of a WCO under the Water Act.

The technical studies undertaken demonstrate that the diversion of water from the Battle River has negative effects on the aquatic environment to varying degrees. Technical instream needs assessments have shown that flows in excess of the current IOs are necessary to improve the health of the aquatic environment.

Therefore, as recommended in the Water Management Plan for the Battle River Basin and as provided for under Section 15(1) of the *Water Act*, I hereby establish the Battle River Basin WCO as follows:

- *A WCO shall be applied to all named and unnamed tributaries, and groundwater with hydrologic connection to surface water.*
- *The WCO is defined as a rate of flow that is 85% of the natural flow that is to be left in the watercourse; and during those times when the natural flow approaches the lowest quintile (20%) flow, reductions shall be applied based on the greater of either:*
    - *a) 15% instantaneous reduction from natural flow or;*
    - *b) The lesser of either the natural flow or the 80% exceedance natural flow based on available time step data.*

That this WCO applies to any licences issued for applications received on, or after, January 1, 2013.

I find that the public consultation undertaken as part of the Water Management Plan for the Battle River Basin planning process satisfies the public consultation requirement for establishing this WCO.

Information on this WCO will be provided to the Battle River Basin Watershed Planning and Advisory Council, First Nations, and it will be posted on the Alberta Environment and Sustainable Resource Development website.

Original signed by:

Designated Director under the Act
Neil Hollands

February 9, 2015
Dated

  - Provide clarity on the criteria used around the concept of "no significant adverse effect" (as it pertains to environmental considerations as well as any other relevant considerations outlined in the Matters and Factors).
  - Improve clarity on the information requirements to support a determination of whether a water source is groundwater or groundwater directly connected to surface water.
  - Utilize WPACs as an informed and effective resource to prioritize, identify and trial communication pieces that provide clarity, transparency and information.
- Clarification of how the Matters and Factors in the Plan that must be considered in making decisions on applications for approvals, licences, preliminary certificates and transfers of allocations are applied in decision making:
  - Generate insights through a case study on a transfer application in the Sheep River sub-basin. Preliminary scoping of this possibility was undertaken as part of this review project.
- Clearer language around certain items in the Plan:
  - Clarify the Plan's language and intent with respect to which allocations and considerations are referred to in Recommendation 2.1 (establishing a limit on water allocation). This clarity would include surface and groundwater resources, licence types (term or temporary) and quantity and quality considerations. Some of this is presented in the 2007 BOSS Order, but BOSS does not speak to temporary diversion licences and speaks only indirectly to groundwater.

The take-away ...

Effective and inclusive stakeholder engagement in watershed management requires a shared understanding of water administration. Specifically, a shared understanding of key decision-making processes, and the criteria and terminology used within those processes.

Opportunity 3: Implement programs and actions beyond the Plan that will not only prevent further degradation, but improve the long-term health of the aquatic environment

In setting a limit for water allocation in the Bow, Oldman and South Saskatchewan River sub-basins (and a future water allocation limit in the Red Deer sub-basin), along with recommending WCOs and holdbacks, the Plan intended to reduce the risk of further degradation of the aquatic environment. In considering what more needs to be done to restore and protect the long-term health of the aquatic environment, the BACs made the following observations and suggestions:

- Review WCOs for headwater tributaries as there is an opportunity to protect these streams now. An assessment of whether new WCOs could more effectively be used within the transfer approval system would be required. (There is a designated WCO for tributaries of the Red Deer River.)
- Review WCOs in terms of water quantity, water quality, groundwater, groundwater-surface water interaction, and aquatic and riparian ecosystems. While it is understood that including these criteria would likely mean that it would be harder to meet the WCOs, the criteria should still be considered. This is particularly important regarding future WCOs that may be established, as these represent an additional opportunity to do more for the aquatic environment.

- While a rationale for focusing on water quantity is provided in the Plan, moving forward, water quality and quantity should not be separated when discussing the aquatic environment. It was noted that the South Saskatchewan Regional Plan 2014 – 2024 affirms the province's commitment to integrated management considering water supply, water quality and aquatic ecosystems and the need for ongoing work to ensure innovation and development of tools and approaches.[10]
- Continue supporting important initiatives that protect the long-term health of the aquatic environment (e.g., AEP's Watershed Resiliency and Restoration Program).
- The work of the Alberta Water Council (AWC) provides an excellent foundation for protecting the long-term health of the aquatic environment and should be used to inform future discussions:
  - The *Water Allocation Transfer Update Project* (WATSUP) report (2009) had six key areas of focus, including establishing "protected water" and incenting water conservation.
  - The *Looking Back: Evaluating Sector Improvements in Water Conservation, Efficiency and Productivity* report (2017) included four key recommendations on reporting and resolving existing challenges.
  - *Provincial Ecological Criteria for Healthy Aquatic Ecosystems* (2009)
  - Protecting Sources of Drinking Water in Alberta (current project)
  - Building Resiliency to Multi-year Drought (current project)
- WCOs are a regulatory mechanism to ensure new diversions have minimal harmful impacts and it is prudent to periodically review and improve them. There is an opportunity for an appropriate group (e.g., WCO experts, scientists, WPACs, IWCC, etc.) to review whether WCOs could be more effective by being added to, improved upon or, possibly, replaced.
- Alternative mechanisms to WCOS should be explored, including (but not limited to): protected water, allowing private entities to hold WCO licences (e.g., water trusts), and a fee system whereby a fee is collected on transfer applications and is directed to initiatives that enhance the aquatic environment.
- Use the information that is provided in existing reports. AEP's 2007 Aquatic and Riparian Condition Assessment (ARCA) report identifies knowledge gaps concerning how the aquatic environment (including riparian vegetation) responds to changes in river flow regimes. It also provides information about hydrological variability/alteration that can be used to determine where research efforts should be focused. At the time of the Plan's approval, WCOs were established without the benefit of the science needed to predict a given flow regime's impacts on the aquatic environment. The ARCA report and other studies have since been made available and support a renewed effort to develop the science needed for effective protection of the aquatic environment.

The take-away ...

The Plan set the stage for future changes to how watershed management is conducted. Since its approval, significant work has been undertaken, including many reports and plans. It is now time to more fully utilize the insights and directions of these reports and plans to improve the long-term health of the aquatic environment.

waterbodies used for drinking water will be cause for concern for water treatment plants, which may subsequently require upgraded treatment for protection of public health.

Pesticides are also commonly detected in most surface water in Alberta. There are a number of compounds and their metabolites that may be detected but the testing is very expensive and so often is not completed in water quality analyses. Also of concern is the lack of Canadian and/or Alberta water quality guidelines for the majority of these compounds. It is hoped that more research will be done on these compounds to assist with the development of guidelines. In the meantime, annual monitoring of pesticides should be completed in all monitored waterbodies in the summer after a rainfall event; this will provide the best conditions for capturing pesticide runoff. Concentrations and number of detections can therefore be monitored closely and best management practices can be developed according to the types of compounds detected.

Water Quantity

This category is largely a data gap at this time. Some flow data is available for the mainstem but is largely missing for tributaries of the Red Deer River. Lake volume is also lacking across the watershed. A benchmark for flow rates and volumes must be determined in order to properly manage waterbodies and ensure that allocations do not exceed the minimum amounts required to preserve ecological integrity. This is highly specialized work that must be carried out be trained hydrologists or biologists. Assistance may be possible from Alberta Environment in this endeavor.

Wildlife Diversity

Wildlife populations are monitored to some extent, but indices of diversity have not been calculated on a subwatershed basis. Changes in land use over time can result in loss of wildlife biodiversity, which has many repercussions. Loss of biodiversity results in a loss of genetic diversity within populations and can mean that an ecosystem is less resilient to change. More biodiverse habitats generally indicate healthy and properly-functioning ecosystems. Given the lack of data in this area, more surveys and monitoring should be completed by federal and provincial governments, watershed groups or ENGOs, such as the ACA.

Land Cover

Native vegetation cover is important in preserving ecosystem health as well. In order to monitor the loss of natural vegetative cover, the AVI/NVI should be completed on a more regular basis (e.g., every 5 years) and watershed groups should lobby for the ABMI to return to the watershed on an annual basis. Sensitive areas with rare plants, SARA species or sensitive ecosystem conditions should be protected using Protective Notations or Parks status. Subwatersheds with good levels of natural cover should strive to preserve the remaining areas and those with highly impacted vegetation can look towards restoring some of the native plant populations through replanting efforts and removal of invasive species. Cleared land should be avoided due to the high risk of erosion from wind and water. Moreover, it has been shown that native/perennial plant cover provides buffer zones for aquatic

as 0.2-0.3 m^3/sec (Figure 189). Overall, discharge rates are higher at Blackfalds than further upstream near Bluffton (Government of Alberta, 2008c).

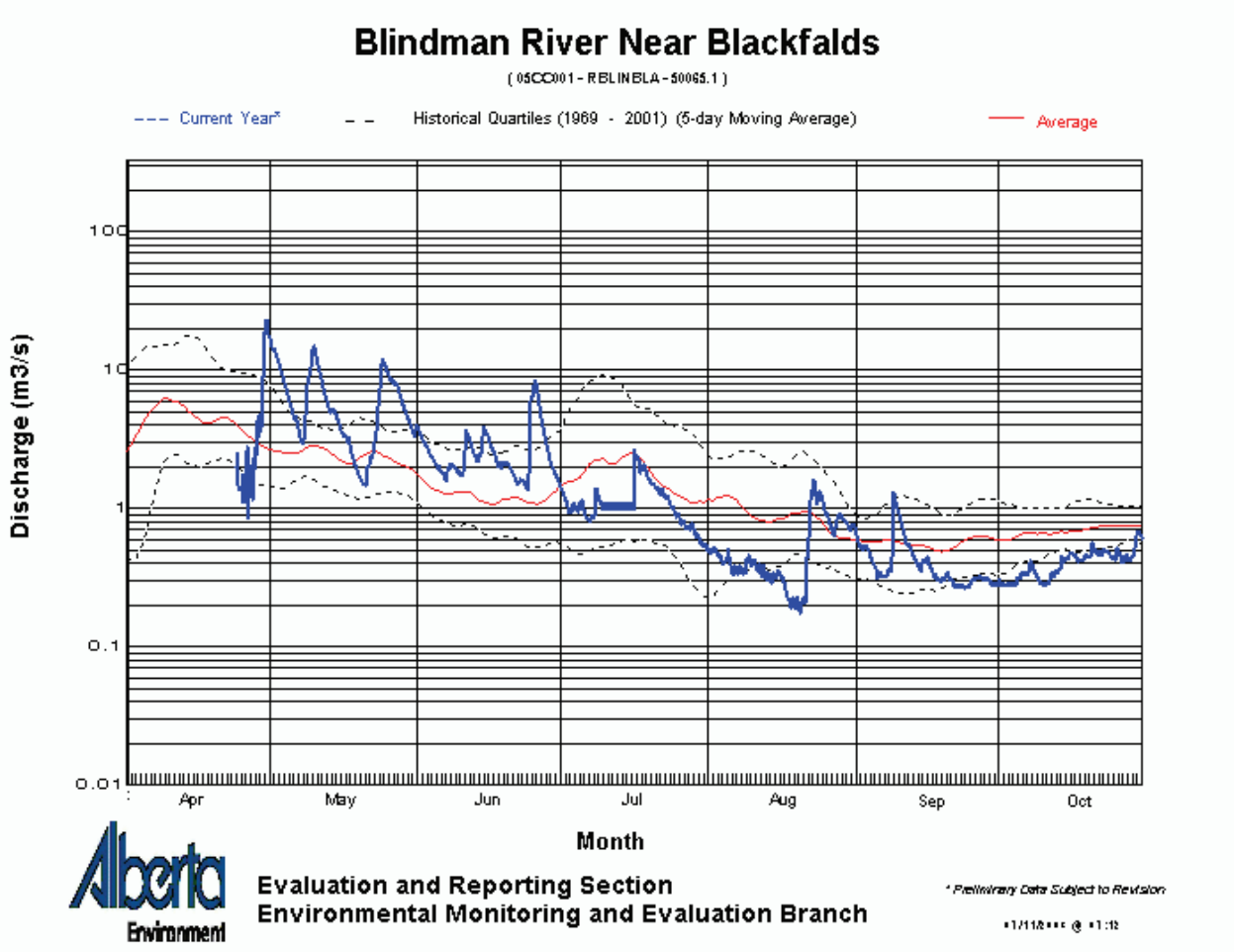


Figure 189. Discharge rates of the Blindman River near Blackfalds (Government of Alberta, 2008c). "Current year" indicates water discharge rates in 2008.

Water discharge rates at both Blindman River station were well above average levels in the spring and early summer 2008, when they exceeded 10 m^3/sec for short periods. Thereafter, discharge rates were similar to or substantially lower than average levels, e.g., near Bluffton (Figures 188, 189) (Government of Alberta, 2008c).

There are no major dams located in the Blindman River subwatershed; however, there are numerous smaller water infrastructures in the subwatershed, e.g., small dams, sluices, weirs and dykes, which control water flow.

4.6.4.2 Minimum Flows to Maintain Ecological Integrity

Minimum flows to maintain ecological integrity are the lowest flows or volumes (lakes) required to sustain native aquatic species and natural ecosystem functions. Minimum flows must be determined

before allocation of water can safely take place to preserve the ecological functionality of aquatic ecosystems.

Minimum flow requirements for the maintenance of ecological integrity have not been determined in the Blindman River subwatershed.

4.6.4.3 Contributing Areas to the Watershed

Contributing areas to the watershed are areas from which runoff flows into the lakes, creeks and rivers of the watershed. These data are used to determine an estimated volume of water contributed to the river on an annual basis.

In the Blindman River subwatershed, 10,404 ha (or 4.9% of the total area of the subwatershed) of land does not contribute to the drainage of the subwatershed (Figure 190). These areas are located primarily in the southeastern area of the subwatershed, e.g., south and east of Gull Lake, south of Sylvan Lake and west of Red Deer and are areas of low relief and a flatter topography compared to the remainder of the subwatershed (Figure 191) (AAFC-PFRA, 2008).

The Blindman River has had two high streamflow advisories in response to high precipitation events. The first was issued on June 17, 2005, and the second was issued on June 23, 2005 (Alberta Environment, 2008c).

Act, the *Oil and Gas Conservation Act*, various ERCB Directives, the *Public Lands Act*, the *Canadian Environmental Protection Act, Canadian Environmental Assessment Act*, the *Fisheries Act*, the *Navigable Waters Protection Act*, and others.

2.4 Sector History of CEP

The upstream oil and gas sector has been actively pursuing CEP opportunities on a number of fronts for several years. In addition to environmental benefits, water CEP tends to reduce net costs to industry due to the direct relationship between water and energy use. Large amounts of energy are used to process and move water through oil and gas operations. Water is often seen as a low-cost resource for the oil and gas sector; however, as the regulation and costs of water-related infrastructure, treatment and transportation have increased, the sector has become more aware of the costs associated with using water. Consequently, the sector normally tries to use water only as required and as determined by the available economic alternatives. As a result of these efforts, the sector has already realized significant, measurable water productivity improvements. Although the most obvious CEP opportunities with the largest gains have already been implemented, the recent trend toward improved non-saline water use productivity is expected to continue through 2015.

One challenge for the sector is that the viability of CEP opportunities depends on the details of each project, including reservoir/process compatibility, transportation costs and associated impacts, energy inputs required for treatment, and disposal of residual water. In other words, different environmental aspects, such as the energy required for water treatment, may have a more significant overriding impact than the quantity of water used. A life cycle analysis can help to assess all the benefits and costs.

Highlights of the sector's contributions to water CEP are discussed below.

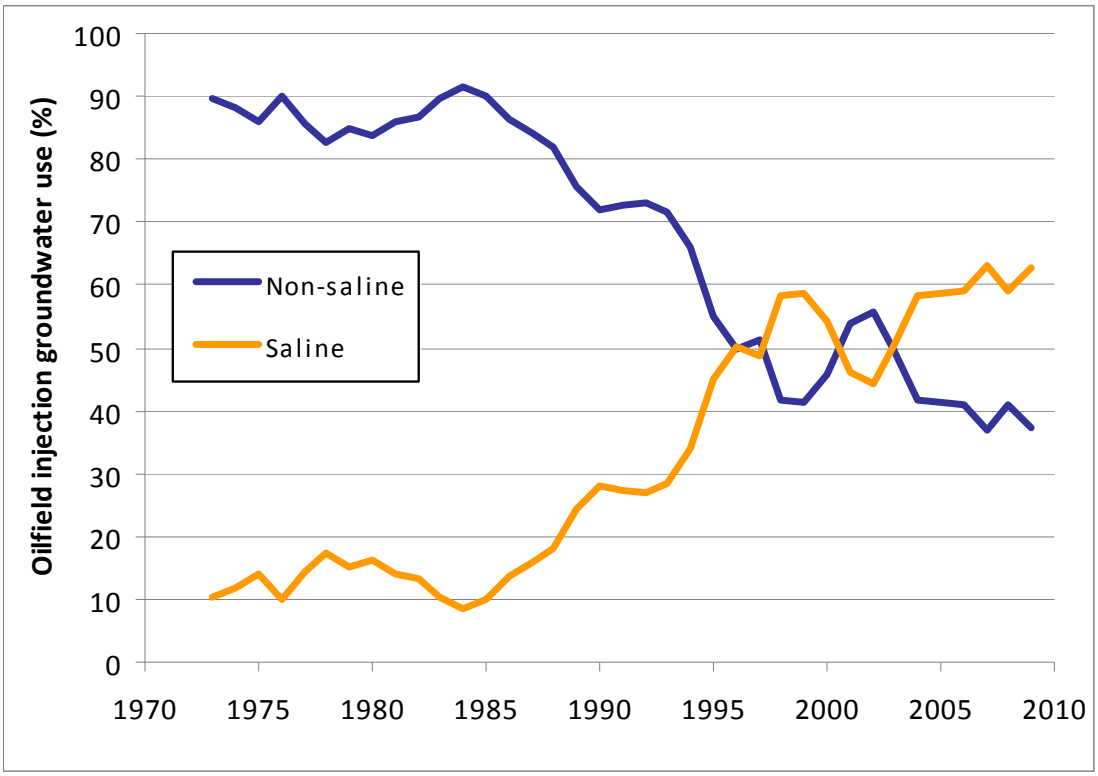
2.4.1 Technological Innovation

The design phase of every project includes a research and development (R&D) component for identifying opportunities to reduce non-saline water use. Many operators have initiated water conservation audits and other measures to improve water use efficiency. As a result, non-saline water use has been reduced on a unit production basis using new or alternative techniques and water sources, such as those noted below:

- Use of saline water instead of non-saline water;
- Maximizing recycling of produced water;
- Maximizing the use of produced water for pressure maintenance and waterfloods where possible; and
- Exploration of alternative techniques that minimize or avoid water use, or improve the efficiency and productivity of water use; e.g., mixable floods (CO_2), polymer floods, and fire floods.

In water-short areas in southern Alberta, the relatively mature upstream oil and gas developments now tend to restrict non-saline water use to drilling and completions activities, and overall use of non-saline water for EOR is decreasing throughout the province.

The sector is also actively pursuing water conservation in areas that are not water-short. One of the key water conservation trends is the use of saline groundwater to avoid the use of more valuable non-saline water (see Figure 2-11).



Source: ERCB

Figure 2-11: Saline versus Non-saline Groundwater Use for EOR and Thermal In Situ Production (1972 to 2009)

Some specific examples of CEP improvements made by companies are provided below:

- Devon Energy designed a steam-assisted gravity drainage (SAGD) facility that would use zero non-saline water in its steam generation process. The resulting Jackfish project, Devon's 35,000 barrel per day thermal heavy oil facility near Conklin in northeastern Alberta, became the first commercial SAGD operation to rely solely on saline water for production. Devon is pursuing similar principles in its Jackfish 2 Project, expected to be on-stream in 2011.
- Cenovus Energy is recycling blowdown water from cooling equipment back into its produced water stream and employing reboiler technology to recapture brackish water in its process, ultimately turning 90% of the water it uses into steam at its SAGD project at Christina Lake in northeastern Alberta.
- CNRL has developed a technique of injecting waste carbon dioxide (CO_2) into the tailings slurry at Horizon, its oil sands mining project located north of Fort McMurray, causing fine silt and clay particles to settle to the bottom of the tailings pond more quickly. This makes more water available at the top of the pond for recycling and reuse in

Appendix 15

Calgary Head Office
Suite 1000, 250 – 5 Street SW
Calgary, Alberta T2P 0R4
Canada

Alberta Energy Regulator

Water Use Performance

Updated December 2023

Energy companies use water throughout the life cycles of their projects and activities. It's our job to ensure that Alberta's energy industry uses water resources responsibly and identify where there is room for improvement.

Our *Alberta Water Use Performance Report* shows how water is allocated and used to recover oil, gas, and oil sands resources. This annual report is part of our larger industry performance (/protecting-what-matters/holding-industry-accountable/industry-performance) program, which measures, evaluates, and reports on the energy development activities that we regulate.

Our report provides information about water allocation (/node/2729#a) and use for four oil and gas extraction technologies:

- oil sands mining
- in situ operations
- enhanced oil recovery
- hydraulic fracturing

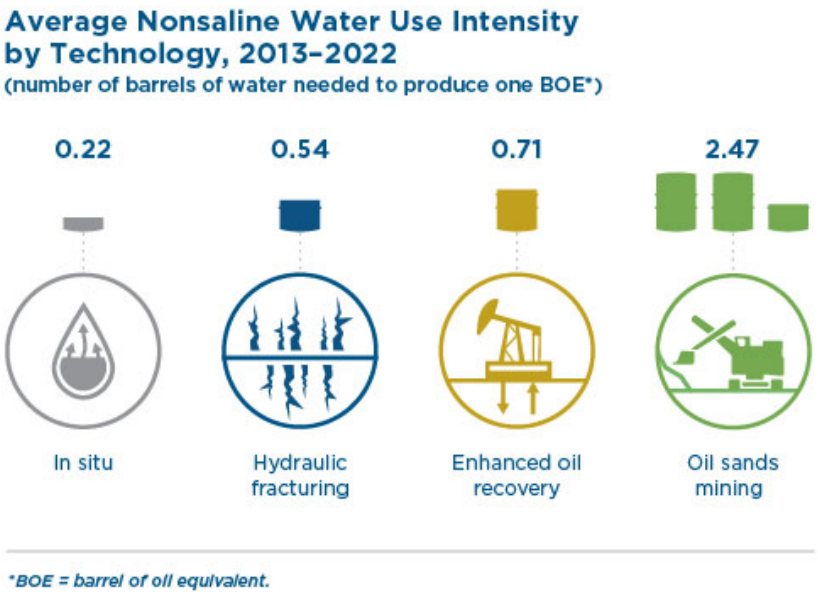
Because the volume of water used for conventional oil and gas drilling and operations is typically quite small, it is not discussed in the report. Water used for refining and processing activities is also not included in the report.

Report Highlights

- Only 13% of nonsaline water allocated to all industries in the province was allocated for oil and gas extraction.
- The Alberta energy industry uses much less nonsaline water than its allocation; the industry used only 21% of their allocation.
- Every technology used to recover Alberta's energy resources requires a combination of nonsaline and alternative water.
- In 2022, 17% of the water used by the oil and gas industry was nonsaline, 1% was alternative make-up water, and 82% was recycled water.
- Nonsaline water use intensity across the energy industry has decreased by 21.6% since 2013. The oil sand mining sector drives water use intensity and accounts for 81% of the nonsaline water used in 2022 by the energy industry.

- In 2022, oil sands mining used 17% more nonsaline water while producing 66% more hydrocarbons than in 2013. Consequently, from 2013 to 2022, nonsaline water use intensity decreased by 30% in the oil sands mining sector.
- The ten-year average (2013 to 2022) for nonsaline water use intensity in the oil sands mining sector was 2.47 barrels (/node/2729#b) of nonsaline water per barrel of oil equivalent (/node/2729#b) (BOE). In 2022, 80% of the total water used for oil sands mining was recycled water, and 43% of the make-up water came from surface runoff and groundwater from within the mining footprint. Recycling water and using surface runoff and groundwater reduces the volume of water withdrawn from the Athabasca River.
- The ten-year average for nonsaline water use intensity for hydraulic fracturing was 0.54 barrels of nonsaline water per BOE. Since 2013, the nonsaline water use intensity increased by 260%. Hydraulically fractured wells use water for the initial fracturing, but usually none after the well starts producing hydrocarbons. Consequently, water intensity for hydraulic fracturing wells is high during the first 12 months of production, falling to 0.12 bbl/BOE after five years of production for the average hydraulically fractured well.
- The ten-year average for nonsaline water use intensity for enhanced oil recovery was 0.71 barrels of nonsaline water per BOE. Over the past ten years, enhanced oil recovery producers have shown a 46% decrease in the technology's nonsaline water use intensity.
- The ten-year average for nonsaline water use intensity for in situ operations was 0.22 barrels of nonsaline water per BOE, a 48% decrease from 2013. This reduction is due to high rates of water recycling and the use of other alternatives to nonsaline water.

The figure below shows the ten-year average for nonsaline water use intensity for the extraction technologies discussed.



Appendix 16

HYDRAULIC FRACTURING AND WATER

ACTION:
Expand the 2006 Water Conservation and Allocation Policy for Oilfield Injection to include water conservation measures for hydraulic fracturing.

Develop a policy guideline setting out water conservation practices for hydraulic fracturing.

Perhaps the strongest message received from participants was the need to reduce the use of fresh water by hydraulic fracturing operations and consider alternative water sources.

Alberta has already made progress in this area with other upstream oil and gas activity. Since 2006, Alberta has required oil and gas operators to minimize the use of freshwater in the processes used to enhance oil and bitumen recovery. The Water Conservation and Allocation Policy for Oilfield Injection requires industry to seek deep saline groundwater sources and use technological alternatives to minimize the use of fresh water. Since the policy was implemented, freshwater use per unit of oil produced has been reduced by almost 30 per cent as of 2010.

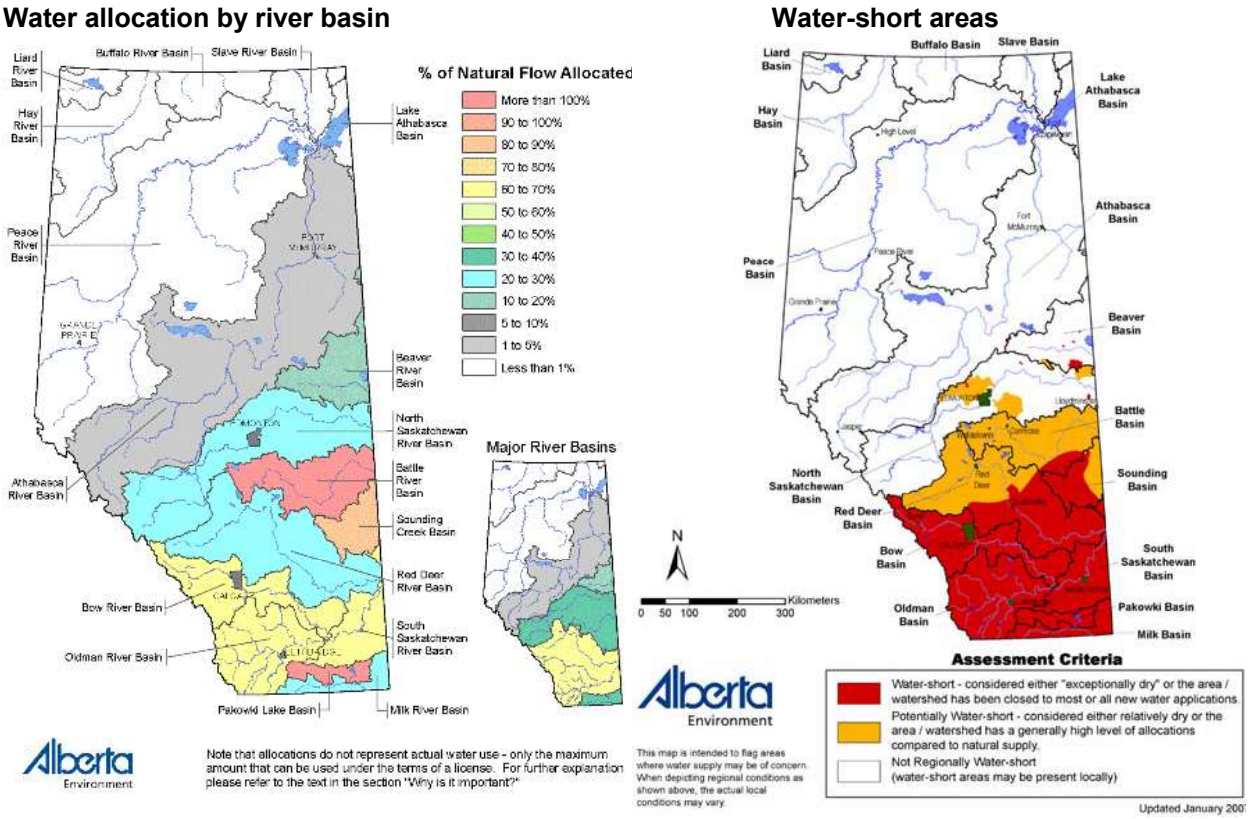
In collaboration with Alberta Energy and the new Alberta Energy Regulator, ESRD is updating the existing Water Conservation and Allocation Policy for Oilfield Injection and is developing a policy guideline regarding water conservation practices in hydraulic fracturing operations. A goal of the policy guideline will be to minimize industry's use of fresh water.

From April to June 2014, a range of groups, including First Nations, Métis, environmental groups, industry, the public and municipal associations, were engaged to inform the development of the draft policy and the guideline.

The policy and guideline will be finalized in early 2015, for implementation by the Alberta Energy Regulator.

Appendix 17

The relative availability of water throughout the province depends on both the amount of water yield available and the amount of water that is allocated for use. Overall, the northern portions of Alberta have high supply and low demand, while higher percentages of the natural flow are allocated in southern regions. This is illustrated in Figure 2-3.



Source: Alberta Environment, 2006a

Figure 2-3: Distribution of Water Allocation (2006)

Water availability is described in *Water Supply Assessment for Alberta* (Golder Associates, 2008) and in the Alberta Environment report *Water-short Areas Assessment* (Alberta Environment, 2006a). To identify water-short areas in Alberta, Alberta Environment (2006a) defined three categories of areas:

- Water-short: considered either exceptionally dry, or the area/watershed has been closed to most or all new water applications;
- Potentially water-short: considered either relatively dry, or the area/watershed has a generally high level of allocations compared to natural supply; and
- Not regionally water-short: areas that are not observed as regionally water-short, but some water-short areas may be present locally.

The water-short areas are situated primarily in the South Saskatchewan River Basin (SSRB), which includes the Bow River, Oldman River, Red Deer River, and South Saskatchewan River sub-basins. With the exception of the Red Deer River sub-basin, the SSRB was closed to new surface water licences in 2006 (Alberta Environment, 2006b).

Appendix 18

Table 1 outlines how each tier is defined, any application content recommendations, and conditions specific to water conservation that would be included should a licence be granted. Detailed descriptions of the recommended application content are given in section 3.

Table 1. Risk assessment tiers with associated application content recommendations and typical conditions related to water conservation

Tier	Criteria	Application content recommendations	Typical licence conditions
1	• Alternative nonsaline water use requested	• Confirmation-level environmental net effects assessment on the preferred source	• 10-year term on new licences • 10-year term on renewals • Monthly monitoring • Annual reporting
2	• High-quality nonsaline water use requested • Small-scale project • Located in an area that is neither water short nor potentially water short (white, blue, and hatched blue areas depicted in figure 2)	• Confirmation-level alternative source assessment with a 5 km radius • Qualitative environmental net effects assessment • Screening-level economic evaluation • A plan to address winter flows in locally constrained areas for surface water diversion • A plan to monitor and address impacts to overlying aquifers in locally constrained areas for groundwater diversion	• 5-year term on new licences • 10-year term on renewals • Monitoring and reporting determined on case-by-case basis • Drawdown in the production aquifer is limited to 50 per cent of the available head at a distance of 150 m from the production well over the life of the project for groundwater licences in locally constrained areas
3	• High-quality nonsaline water use requested One of the following: • Potentially water-short areas (yellow areas depicted in figure 2), or • Large-scale project in any location other than a water short area (red areas depicted in figure 2)	• Screening-level alternative source assessment with a 10 km radius • Screening-level environmental net effects assessment • Screening-level economic evaluation • Cumulative effects evaluation for large-scale projects • A plan to address winter flows in locally constrained areas for surface water diversion • A plan to monitor and address impacts to overlying aquifers in locally constrained areas for groundwater diversion	• 5-year term on new licences • 10-year term on renewals • Drawdown in the production aquifer is limited to 50 per cent of the available head at a distance of 150 m from the production well over the life of the project for groundwater licences • Plan for combined use (for large-scale projects) • Monitoring and reporting determined on a case-by-case basis

Tier	Criteria	Application content recommendations	Typical licence conditions
4	• High-quality nonsaline water use requested • Water-short area (red areas depicted in figure 2)	• Detailed-level alternative source assessment with 20 km radius • Detailed-level environmental net effects assessment • Detailed-level economic evaluation • Cumulative effects evaluation • Assess potential for combined use of alternatives • A plan for water conservation and efficiency improvement	• 5-year term on new licences • 5-year term on renewals • Drawdown in the production aquifer is limited to 50 per cent of the available head at a distance of 150 m from the production well over the life of the project for groundwater licences • Monitoring and reporting determined on a case-by-case basis • Conservation and efficiency conditions

2.2 Combined Water Use

In situations where alternative water sources may not meet the full project needs or are available in variable volumes or on an infrequent or irregular basis, they should not be discounted as potential contributors to the project water supply. Rather, those sources should be considered as potential supplements to high-quality nonsaline water that are incorporated into the project when available, thereby reducing the overall use (and increasing conservation) of high-quality nonsaline water. While water source certainty may necessitate the need for a licence for high-quality nonsaline water to meet the full project need, submitting a plan for combined use of high-quality nonsaline and alternative nonsaline water sources with the application can lead to improved transparency and demonstrated conservation effort.

2.3 Water Conservation Incentives

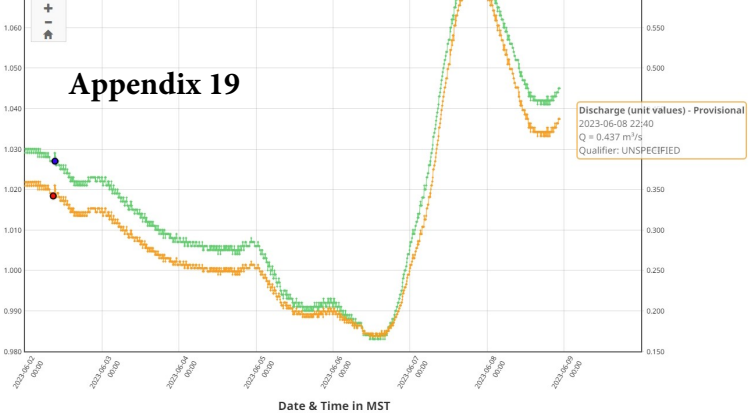
If a renewal application demonstrates extra efforts to conserve water, the application may be evaluated on the submission requirements of one risk tier lower, recognizing that tier 1 is the lowest possible and that the standard application requirements will still need to be submitted for all risk tiers.

Examples of such efforts include the following:

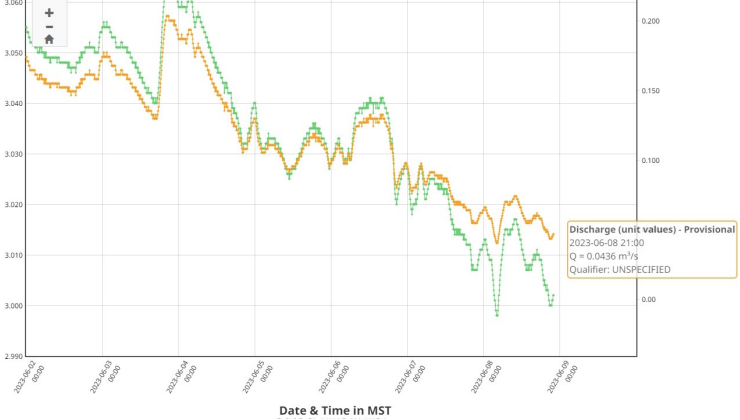
- Significant allocation reduction. This includes cancellation or amalgamation of licences on the project site which results in a reduction of high-quality nonsaline water allocation.
- Significant improvement in resource productivity and efficiency (i.e., water use intensity).
- An application that demonstrates significant combined use of alternatives.

For example, a large-scale project using high-quality nonsaline water will normally be assessed as a tier 3. If the applicant proposes to significantly lower their allocation in the renewal application, the proponent may submit the application based on a tier 2 level. If no further gains are made over the balance of the

Appendix 19



https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=05CC001



https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=05CC008

Water level (unit values) - Provisional Discharge (unit values) - Provisional

As stated in permit below, maximum allowable diversion is 0.121M3/s from the river.
They monitor the flow at Blackfalds, yet are extracting a few miles south of Bluffton.
They are limited to 10% of the flow of the river, yet using the flow rate near the terminus of the Blindman, to set the diversion rate for the headwaters is obviously ridiculous. These graphs are from June 8th 2023.

Blindman at Blackfalds - 0.426m3/s 10% = 0.0426m3/s allowable diversion
Blindman at Bluffton (near the point of diversion) - 0.0436m3/s

The 10% diversion is using almost the entire flow of the Blindman at Bluffton!

Questions:
1. Why is the river flow at the site of the diversion not used to set the maximum diversion rate?
2. How are multiple diversion licenses for a single river handled? Can they all take 10% of the river's flow at Blackfalds?
3. Why is there not a mandated target for freshwater re-use for fracking? Or a mandate for a phase-in of production water for fracking?

Alberta Energy Regulator | Alberta Environment and Parks

LICENCE TO TEMPORARILY DIVERT WATER
PROVINCE OF ALBERTA
WATER ACT, R.S.A. 2000, c.W-3 as amended

LICENCE NO.:	00493295
EFFECTIVE DATE:	April 01, 2023
EXPIRY DATE:	October 01, 2023
SOURCE OF WATER:	unnamed watercourse (watercourse)
POINT OF DIVERSION:	NW 9-43-2-W5
POINT OF USE:	See Appendix 1
LICENSEE:	Baytex Energy Ltd.
RESTRICTION:	See attached schedule(s)

Pursuant to the Water Act, R.S.A. 2000, c.W-3, as amended, a licence for temporary diversion of water is issued to the Licensee to:

divert up to 150000 cubic metres of water at a maximum rate of diversion of 0.121 cubic metres per second from the source of water for the purpose of oil and gas drilling and horizontal hydraulic fracturing completion,

SCHEDULE 1

Water Conservation Objective

Environmental Flow and Water Level Criteria

The Red Deer River tributaries have a *Temporary Diversion Licence* (TDL) maximum diversion rate, a Red Deer River mainstem *Water Conservation Objective* (WCO) and may have an *In-stream Objective* (IO) minimum flow requirement below which no abstractions are permitted. Several lakes in sub-basin 05CC have withdrawal restrictions.

Tributary Maximum Diversion Rate

The maximum rate of diversion from a tributary shall not exceed 10% of the current recorded flow measured either at the point of diversion or at a downstream *Water Survey Canada* (WSC) hydrometric station on the tributary, and applies to the cumulative sum total of all upstream concurrent TDL abstractions.

Tributary IO

The following tributaries in sub-basin 05CC have a minimum IO flow below which no abstractions are permitted:

- The Blindman River and its tributaries a flow in the Blindman River of 0.156 *cubic metres per second* (m^3/s)
- Lasthill Creek and its tributaries a flow in Lasthill Creek of 0.093 m^3/s
- The Medicine River and its tributaries: upstream of the confluence with Lasthill Creek a flow in the Medicine River of 0.093 m^3/s, and downstream of the confluence with Lasthill Creek a flow in the Medicine River of 0.187 m^3/s

Red Deer River Mainstem WCO

The Red Deer River WCO applies to the Red Deer River tributaries within sub-basin 05CC:

- A rate of flow in the Red Deer River that is 45% of the natural rate of flow or 16 m^3/s whichever is greater at any point in time

Sub-basin 05CC Lakes

- Gabriel Lake: minimum water level of 944.148 m geodetic below which no withdrawals are permitted
- Gull Lake: closed with no withdrawals permitted
- Sylvan Lake: closed with no withdrawals permitted

Environmental Flow Monitoring

Summer (Open Water) Season Tributary IO

Tributaries with Gauging Stations

The summer open water season typically runs from March 1 to October 31 however the dates may vary annually. Near real-time tributary flows in sub-basin 05CC are monitored by Water Survey Canada for the select stream(s) listed below:

- The Bindman River and its tributaries: upstream of the *Blindman River near Bluffton* (05CC008) hydrometric station use 05CC008, and downstream of 05CC008 use the *Blindman River near Blackfalds* (05CC001) Water Survey Canada hydrometric station.

- The Lasthill Creek and its tributaries use the *Lasthill Creek near Eckville* (05CC013) Water Survey Canada hydrometric station.

- The Medicine River and its tributaries upstream of Lasthill Creek subtract the flow for *Lasthill Creek near Eckville* (05CC013) from the *Medicine River near Eckville* (05CC007) Water Survey Canada hydrometric stations.

- The Medicine River and its tributaries downstream of Lasthill Creek use the *Medicine River near Eckville* (05CC007) Water Survey Canada hydrometric station.

- Wascasoo Creek and its tributaries use *Wascasoo Creek at Red Deer* (05CC011) Water Survey Canada hydrometric station.

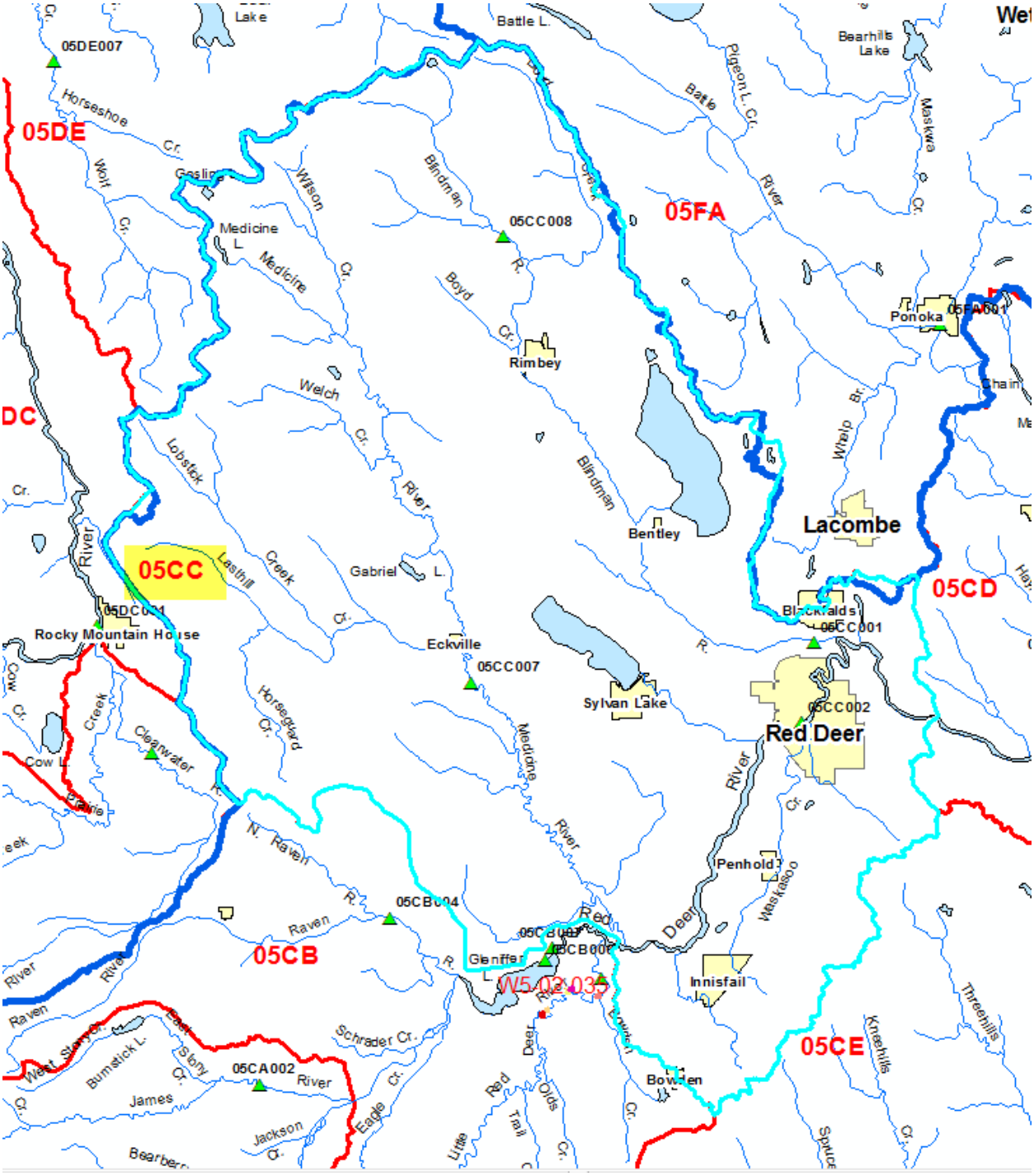
Ungauged Tributaries

- All remaining ungauged tributaries in sub-basin 05CC require a manual flow measurement.

Summer (Open Water) Season Red Deer River WCO

The summer open water season typically runs from March 1 to October 31 however the dates may vary annually. During the summer season monitor the Red Deer River WCO using the *Red Deer River at Red Deer (05CC002)* Water Survey Canada hydrometric station.

Sub-Basin 05CC General Location



FRESHWATER USE IN HYDRAULIC FRACTURING OPERATIONS

———Blindman River and tributaries———

Location: Liberty Hall, Hwy 611, Ponoka County

Date: Thursday August 8, 2024

Time: 6:30-8:30 p.m.

Agenda

6:30-6:40 p.m. **Introduction** – Chair

Freshwater is a vital resource for drinking, healthy ecosystems, recreation, agriculture, and industry. Water shortages can happen, and there is concern that industry has been allowed to continue using freshwater for hydraulic fracturing at the expense of the Blindman River and its tributaries.

6:40-6:55 p.m. **Hydraulic Fracturing Operations** – TBD, Baytex

An overview of freshwater use in hydraulic fracturing operations; an industry perspective.

6:55-7:10 p.m. **Current State of Water Use/Regulations** – TBD, AER, Water Licensing (if available)

1. A report on current water licences and trends in Blindman River sub-basin
2. A summary of water licensing regulations, monitoring, and enforcement with a focus on the Blindman River and surrounding surface waters.

7:10-7:25 p.m. **Current State of Water Policy in Alberta** – TBD, AEPA, Water Policy Branch (if available)

A review of:

1. The current Water Management Plan that covers the Blindman sub-basin.
2. Current water policies, with particular focus on those governing Upstream Oil and Gas, specifically hydraulic fracturing operations in our area.
3. The process by which water policy is created and modified.

7:25-8:30 p.m. **Moderated Q&A,** Paul McLaughlin Moderator

1. A series of relevant, set questions will be asked of the speakers to provide more insight into the above topics.
2. An opportunity for public questions to be asked that have been submitted in writing at the start of the meeting.

Additional information

For specific questions you would like answered, please submit them to friendsoftheblindman@gmail.com by Wednesday, July 31, 2024.