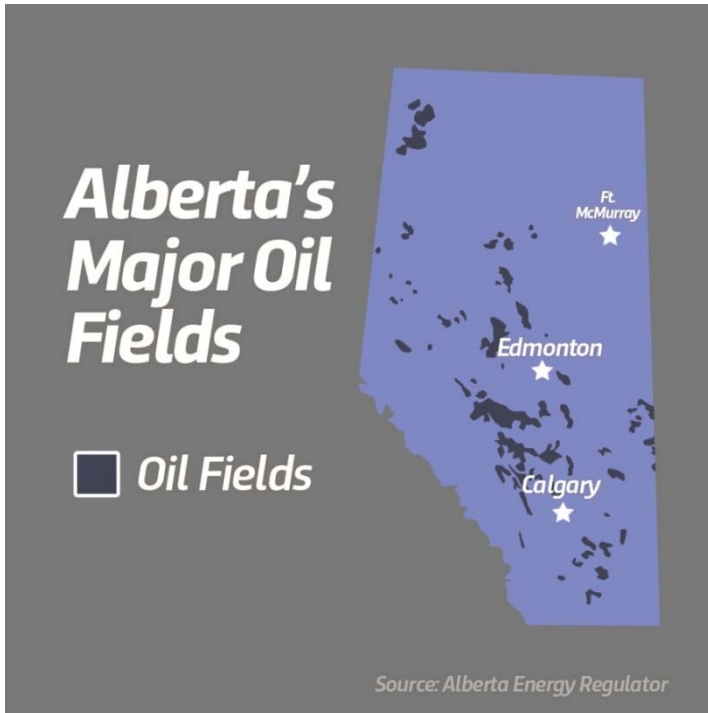




# ALBERTA'S CRUDE OIL RESOURCES



The image of an oil pumpjack on the prairie landscape is an iconic one. For many people, it's what first comes to mind when they think of oil. That makes sense, because it's the way that Alberta has long developed its crude oil resources.

However, it's not the way that the majority of Alberta's oil is produced now. In fact, Alberta's crude oil resources are a fraction of what they once were.

In 2014, Alberta's remaining established crude oil reserves stood at 1.8 billion barrels. This is far below initial established reserves of 18.9 billion barrels.

This decline has occurred across all oil producing areas in Alberta's portion of the Western Canada Sedimentary Basin. It's a reflection of the fact that Alberta has been a crude oil producer for a long time. Simply put, we've already produced most of our crude oil reserves.

Does this mean Alberta's days of producing crude oil

are nearing an end? Not necessarily. After all, 1.8 billion barrels is still a lot of oil. Plus this figure could increase, as new technologies (such as horizontal drilling and multi-stage is fracturing) make it possible to access crude oil that was previously considered inaccessible. (You can actually see this effect in the graphic below, where Alberta's total reserves increases a bit after 2009.)

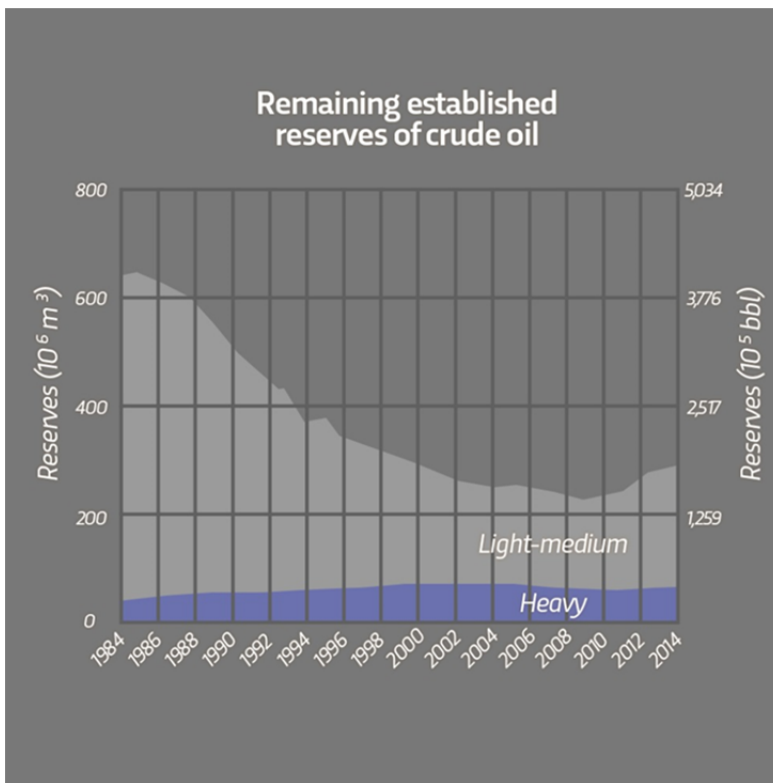
What it does mean, though, is that we've already produced much of the crude oil in Alberta that was easiest to access and easiest to extract.

Over time, as crude oil fields are depleted, the pressure in the underground formations also falls. Pressure plays a big role in helping the oil flow out of the ground and up the oil well. As pressure declines it becomes harder to extract the oil. Companies need to use more complicated technologies and processes to get the oil out.

The costs to drill and produce oil are based on many factors, but generally speaking, the more technologically complicated it is to extract the oil, the more costly it is to produce. This has consequences for royalties, because the value of Alberta's crude oil resources is influenced by how much it costs to produce them.

Another important thing to know is that Alberta's crude oil resources are not all the same. Different types of oil are generally produced in different parts of the province.

Alberta's major oil fields are largely found in the central and northern parts of the province. Alberta produces light oil, medium oil, and heavy oil from these areas. The different types of oil reflect their different characteristics in quality. Two of the most important characteristics are density and sulphur content.



Light oil was discovered in the 1920s, leading to Alberta's first oil boom. As that was subsiding, more light oil was discovered in 1947 in the Edmonton region (Leduc #1). Through the 1950s, more exploration led to more discoveries of mainly light oil across the western side of Alberta (such as fields around Drayton Valley and in the Swan Hills region). The last really major find of light oil was in the Rainbow Lake area in the northwestern part of the province in the early 1960s. Light oil has a low density.

Medium oil, which has a higher density than light oil, is typically found in the central part of the province. Medium oil can be found in the Swan Hills area. It is also found in oil fields from the Leduc area eastward, before you reach Lloydminster.

Heavy oil has a density higher than medium oil, and much higher than light oil. Heavy oil is found in the shallower areas of the Western Canada Sedimentary Basin, around Lloydminster and towards the Alberta-Saskatchewan border.

(Alberta also produces ultra heavy oil, which we call bitumen. This is found in the oil sands areas, and is not considered crude oil.)

The types of crude oil that we produce matters, for two reasons.

First, generally the heavier an oil is, the harder and more costly it is to extract. For instance, the heavy oil deposits around Lloydminster require large amounts of heat to extract (usually steam). This is more complicated than drilling a traditional well.

Second, heavier oils generally receive lower prices on the market. This is because heavier oils are harder to process than lighter oils.

Alberta's royalty framework is about realizing the value of the resources owned by Albertans. That value is influenced by how much it costs to produce our resources, and by the price that we receive for them. So it's important for us to look at the types of crude oil we have when considering how to optimize the royalty framework.