# Executive Summary

This report, supported by the Alberta Upstream Petroleum Research Fund (AUPRF), provides the first analysis of long term grizzly bear data sets to investigate grizzly bear response to the linear footprints cleared for above or below ground pipelines in Alberta, hereafter referred to as pipeline right of ways (ROWs). Using an extensive set of GPS location data from collared grizzly bears, spanning 13 years (2005-2017) and six of Alberta's seven Bear Management Areas (BMAs), we were able to determine that both male and female bears were using pipeline ROWs and roads more than expected based upon availability, during spring, summer, and fall. Den sites used by female grizzly bears were on average 3.79 km from the nearest pipeline ROW, while den sites used by males were on average 6.79 km from pipeline ROWs. Our findings indicate that during the non-denning seasons, grizzly bears were selecting for younger pipeline ROWs (mean age since last construction~6.5 years), which are known to have a greater abundance of important bear foods such as clover and dandelion. Bears were also selecting for wider corridors containing two or more pipelines within the ROW. During the spring season (May 1$^{st}$ to June 15$^{th}$), sex-age class was also an important predictor of grizzly bear use of pipeline ROWs, with adult female bears more likely to use these features than other sex-age classes. A further examination of movement metrics of collared bears including movement rate, path straightness, and tortuosity (the opposite of path straightness) highlighted key differences in grizzly bear behaviours in areas of high versus low pipeline density. In all sex-age classes, bears reduced their speed and moved more tortuously in parts of their habitat with higher densities of pipelines, which is consistent with foraging behaviour. Additionally, in areas of high pipeline density, movement rates varied between seasons and were slowest and most tortuous in Season 3, which coincides with berry ripening. There is no evidence in our study that suggests bears are using these features to facilitate faster movement or hunting behaviours, and results from our movement analyses seem to further support our hypothesis that bears are selecting pipeline ROWs as important foraging areas.

The selection of pipelines ROWs by grizzly bears, particularly in the spring by adult females who may be supporting cubs, should be a key consideration for members of the petroleum sector in order to manage both human safety and the risk of human-caused grizzly bear mortality.