Will methylmercury levels increase when the reservoir is flooded?

The production of MeHg is a natural process, and it is very common for MeHg levels to increase after a reservoir is flooded. The amount of the increase depends on the characteristics of the reservoir- its size and depth, the speed at which the water flows, the amount of carbon present etc.

The only way to predict what the increase might be is to use computer models. The first complete model for the Muskrat Falls reservoir was completed by a Harvard researcher Dr. Ryan Calder (Calder et al, 2016). This model predicted that there will be a 10-fold increase in MeHg in the river downstream of Muskrat Falls and a 2.6-fold increase in the surface waters of Lake Melville. It further modelled what this would mean in terms of human exposure.

Models always have some amount of uncertainty. The IEC wanted to understand the factors that most contributed to uncertainty. As well, the human exposure depends on how MeHg moves through the food chain and how long any species (fish, seal etc.) spends time in the water that might be most affected by any changes in the MeHg. The IEC Indigenous Knowledge Experts provided valuable contributions due to their knowledge of where fish live and feed. For example, it was noted that salmon stop eating when they enter Lake Melville; this means that they are unlikely to be impacted by any changes in MeHg in the water or other fish. The former Harvard modeller, Ryan Calder used this new information and it was found that human exposures were somewhat reduced compared to earlier model results.

The IEAC was also interested in seeing the predictions of another model being developed by Reed Harris for Nalcor and asked that it be made available by February 15, 2018 (See Recommendation #3 in the Letter from the IEAC Chair to Responsible Ministers Sept 22 2017). Unfortunately, the model was not completed by this date but the group was able to work with Reed Harris and see his preliminary findings. One notable observation was the fact that his prediction of the methylmercury levels in the reservoir waters at the highest point of production was within the same range of values predicted by the Harvard model.