ANNEX A. SENSITIVITY ANALYSIS FOR TOM MODEL ASSUMPTIONS

The TOM model is utilized to identify how grain shipments move from point of production to final export market utilizing a least cost decision rule. Stated differently, the volume and flow of grain moving from production to market (through grain elevators and on highways, rail and river) reflects all those entities engaged in the decision-making process (primarily producers and grain merchants) always choosing the minimum cost option available. But the transportation options presented does impact the outcomes and the TOM model was designed to incorporate those shipping options that were reflective of the conditions currently facing grain producers and processors. In some cases, these choices are not the same as those that were available in the past (due to industry and market changes) and likewise they do not include shipping options that could be available into the future if certain conditions were met and changes occurred. Instead, they were designed to be the most realistic given current business circumstances influencing grain movements.

The TOM model does not allow grain merchants and elevator operators to utilize rail (non-shuttle rail) to river port movements in any of the scenarios considered. This assumption increases truck grain movements and overall transportation costs relative to an assumption thatthose types of shipments would be been allowed in the model. In an earlier run of the TOM model[9], those options were allowed both in the No Action Alternative and under MO3. This model iteration found that approximately 37.5 million bushels of grain would be shipped to river ports on the Snake River utilizing non-shuttle rail under the No Action Alternative. That volume would drop to 34.7 million bushels once the Snake River ports were not available and if rail rates do not change (Scenario 1, MO3) and then jumped to 80.6 million bushels if rail rates increased to 50 percent (Scenario 3). Under those alternatives, even though rail rates increased, it would be cheaper to move via non-shuttle rail to river ports on the Columbia River as opposed to trucking to Columbia River ports. This is because the increased rail rates would push volumes away from the shuttle rail facilities. But if non-shuttle rail to river port movements are not allowed in the model, as is the case under the current results, more truck movements would occur and at a higher cost.

The rationale for removing that option came after meeting with grain shippers and discussions with the shortline railroad that operates in the region. In years past, there had been relatively significant volumes of grain moved on shortline rail lines from non-shuttle rail elevators to ports on the Snake and Columbia Rivers. But the addition of the shuttle rail facilities changed the economics of moving grain from non-shuttle rail to the river and so much of that volume that had moved via non-shuttle rail to the river is now being moved to shuttle rail facilities. Another factor that contributed was the requirement for all Class I railroads to implement Positive Train Control systems on their network. This requirement was congressionally mandated to be in

[9] The TOM model was modified significantly between the earlier and final editions, primarily related to elevators with and without rail shipping options. Comparison of results between the two is somewhat difficult but provided to allow greater context.

place by the end of 2020, but most Class I railroads have already implemented it on their networks (98%). Once implemented, the ability of shortline railroads to interchange or operate on parts of the Class I network became challenging without also adopting that technology on their locomotives. This change has impacted the ability of shortline operators to move grain from non-shuttle elevators to the river port if they must operate on the Class I network or interchange with the Class I. This is part of the reason why non-shuttle rail to river movements currently are not allowed in the model. If the shortline operators were willing to make those investments in technology and equipment, such movements could occur on the river, which would reduce future anticipated costs.

Another modeling issue involves allowing those river elevators that are located on the Snake River to also move grain to the Columbia River ports or Portland on the rail line that moves along the Snake River. Many of those river elevators between Lewiston, ID and Pasco, WA are connected on that shortline rail line which is currently operated by WATCO. Currently, those shipping options are not allowed in the TOM model results, again after discussions with those grain shippers and WATCO. Currently, grain does not move on that line in that fashion, from the Snake River ports on that rail line, primarily because as long as the river is there the barge rate is better than the rail costs to move the grain to Portland. There have been times, primarily during the river closures, when grain has moved on that rail line between Lewiston, ID and Portland, OR. But that type of movement is not very efficient (very costly) primarily because those river terminals aren't designed to loadout rail cars efficiently. They are built to receive shipments from truck or rail and loadout barges. If the Snake River was not available, movement of grain from those facilities would be possible, but still inefficient and costly without significant investments. Most of those facilities don't have the geographic space needed for expanding the rail loading capacity, certainly not the construction of shuttle loading facilities and the rail operator would still need to piece together trains from stopping and loading at multiple facilities, taking considerable time and money. In most cases, grain would be reallocated before arriving to the river terminal if the river was closed, since that would be the least costly option to get it to Portland, OR. It was because of these factors that these shipping options were not allowed in the TOM model.