

MEMORANDUM FOR THE RECORD: 16 IHR 006 – Spill gate 2 closure

SUBJECT: Ice Harbor spill gate 2 closed briefly to troubleshoot turbulent flow conditions through RSW

At the end of the day on May 16, 2016, project personnel observed that the river flow down the RSW chute in spill bay 2 looked turbulent and the flow profile was not smooth and even across the chute. A well-defined v-shaped furrow or “seam” was observed on the surface of the water, approximately 6-8’ out from the south wall of the RSW (see first photo below). Water was spraying 4-5’ up into the air adjacent to the lower south RSW wall. A school of fish were observed being sprayed up from the seam and striking the wall near the top. Project personnel speculated that debris may have been caught in the RSW transition plate or a loose plate may have been causing the seam to form. If debris were stuck in the plate could, it could possibly be dislodged by closing the spill bay 2 tainter gate and then re-opening. In an attempt to remove any stuck debris and maintain safe fish passage conditions, the project completely closed spill gate 2 from 1010 hours to 1014 hours on May 17. During that time, the flow going through each of the other spill bays was not altered. Upon re-opening the gate, the seam quickly re-formed (second photo below) as the gate finished opening. Upon further observation over the course of an hour on May 17, the seam repeated lessened and strengthened, with the splashing occurring when the seam was more pronounced. The seam also moved laterally along the chute, or disappeared and re-appeared in the middle or north side of the chute, or re-appeared as multiple small seams. The formation of the seam appeared to start in the forebay (third and fourth photos), appearing as a 90-foot long riffle or rip current coming in an arc from the southeast, with a vortex sometimes at the head of the rip current. These observations lead project personnel to believe that the seams were not caused by debris or a loose transition plate. River currents, wind, and project operations may have contributed to the formation of the rip currents and seams. Some project personnel recall periodically seeing seams of this magnitude in past years, while others do not. Personnel will continue to monitor the presence and severity of the rip currents and seams and make note of certain environmental conditions or project operations that may be contributing to its formation. Any further sightings of fish splashing out of the seams and hitting the walls will be noted in the weekly ESA report. Video was taken of the rip currents and seams for future reference.

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