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TO: Denise Koch, Director
Public Works and Engineering Department

FROM: John Bohan, Chief CIP Engineer

SUBJECT: Mendenhall River Drainage Outfall Culverts– August 2023 Glacial Outburst Flood

At the request of City Manager Koester, Engineering has begun evaluating outfall culverts into the Mendenhall River to determine if they: a) do not have backflow prevention devices and could convey high river flows back into neighborhoods, b) have a form of backflow prevention devices on them, c) do not have an effect on adjacent storm drain systems and do not require backflow prevention devices. The information gathered to date is preliminary and still under research.

Outfalls without Back Flow Prevention Devices

Some storm drainage outfalls have been identified that do not have backflow prevention devices. Installation of backflow prevention devices may help prevent flood water inundation into neighborhoods through the storm drainage systems.

- Meander Way/ Rivercourt Way area: there appear to be multiple outfalls in the Meander /Rivercourt Way area that do not currently have backflow prevention devices on them. Some of these may affect property inundation during extremely high river flow events and should have backflow prevention devices installed on them.
- Marion Drive: the outfall pipe crossing from the Taku Boulevard intersection does not have a backflow device on it. It didn't appear that the August 2023 Glacial Outburst flood backed water outside of the roadways, but given the uncertainty of the size of the next event, this outfall should have a backflow prevention device installed on it.
- Postal Way: the outfall at Postal Way does not have a backflow prevention device and doesn't appear to convey water during high river flow events.
- Clinton Drive: the outfalls at Clinton Drive do not have backflow prevention devices and don't appear to convey water during high river flow events.

Outfalls with Back Flow Prevention Devices

- Killewich Drive Outfall: adjacent to 3835 Killewich Drive. It has a backflow prevention device installed.
- Riverside Drive: at Melvin Park has a backflow prevention device installed.
- Meadow Lane: near Stikine intersection has a backflow prevention device installed.
- North End of Brandy Lane: north of 2457 Brandy – has a backflow prevention device installed.
- 2207 Radcliffe Road: adjacent to Radcliff/Berners intersection under contract to have backflow prevention device installed upon replacement of outfall pipe concurrent with adjacent bank stabilization project.

Type of Backflow Prevention Devices:

Currently, existing backflow prevention devices vary at the end of the existing pipes. They fall into 3 different varieties:

- Duck bill type: Looks as the name sounds – installed vertically on the outside of the pipe. Operation: The rubber diaphragm remains sealed closed except when the inside water pressure is greater than the water pressure outside of the pipe. (outside water pressure is typically nonexistent except during flood events.)



- Flap Gate type: hinged metal plate covering the end of the culvert outlet. Inside water pressure pushes the flapper open to drain the pipe. Outside water pressure pushes against the flapper to seal closed when the river water level is above the pipe outlet.



- In-line check valve: Is installed inside of the culvert with a pressure fit band sealing to the inside of the culvert. Functions similar to the duck bill – rubber diaphragm (intern to pipe) remains sealed except when inside water pressure is greater than the water pressure outside of the pipe. (outside water pressure is typically nonexistent except during flood events.)

