Memorandum

To: Mike Beimer, Sue Ripke
From: Daniel Boggs, P.E., Alex Volkov
Date: July 1, 2014
Re: Storm Damage

Water: Water service was not affected by the storms. Stand-by power was functional and operated correctly during all power outages. Well 6 (Bryant Park) is still minimally functional and is in the process of being replaced. This is a chronic issue not related to the storms.

Storm Water: Some issues which have been a problem in the past functioned adequately either protecting downstream property or transporting storm water. These include:

City-School detention facility: Although the outlet control structure was plugged with debris, which led to the eventual overtopping of the detention facility, the basic earth dam structure (which was repaired in April of this year) was not damaged and the outlet control functioned correctly and was not damaged.

Drainage way Southeast of Stonebrook and on Lot 32: The excess flows were contained within the graded drainage way and storm easement. There was no significant damage to the vegetated drainage way. The storm runoff did not overtop Palisades Road.

Drainage way South of the Hawkeye Ready Mix Plant: The vegetative drainage way transporting storm water runoff from the north side of Mount Vernon adequately contained the storm water runoff from this event with little damage to the drainage way, drainage way bank armament and south of the skate park, or retaining wall improvements on the southerly side of first street.

Seventh Street NE: Although the downstream issues at the intersection of IA Hwy 1 and Fifth Street NW remain, the stormwater issues on seventh street NE which occurred in the past did not occur during this storm event.

Other chronic storm water runoff issues were magnified by this significant rain event:

Fifth Street NW: Storm water flows which were not able to be contained by the storm sewer system, including the street pavement (Curbs), overflowed into adjoining residential structure basements. Although remedial storm sewer repair and maintenance work has improved the operation of this storm sewer within the past few years, the system still was not adequate for this storm event.

First Avenue (IA Hwy 1) North between Webster Street and Cass Street: Some minor improvements were made as a part of the 2010 Hot Mix Asphalt Overlay Project, 2011 Storm Sewer Project, and the 2014 IA Hwy 1 Overlay Project. These minor improvements were not enough to protect residential structures on the westerly side of IA Hwy 1 from storm damage.

A few issues which occurred have not been known to occur before:

Palisades Road West of 15th Avenue SW: The drainage way contributing to the existing 8'W x6'H reinforced concrete box culvert beneath Palisades Road overtopped Palisades Road. This led to the flooding of the standby power generator and lift station controls for the Twin Creeks Lift Station. It is not known if this was due to the inadequacy of the box culvert beneath Palisades Road or to storm water runoff surcharging behind the existing 8'Wx8'H reinforced concrete box culvert beneath U.S. Highway 30.

Sanitary Sewer: The East Side Trunkline which has been a chronic issue for over 30 years was replaced in 2011 functioned adequately. From the information received, water in basements along Fifth Street NW was from surface runoff, and the downstream surcharging was caused by issues at the WWTF. The restoration work along the drainage way which eventually becomes Hauge's Creek and Hauges Creek was adequate enough and mature enough to protect the drainage way from any significant erosion issues.

The most significant Sanitary Sewer issues are as follows:

WWTF: On the morning of Monday June 30th, the Mount Vernon Wastewater Treatment Facility (WWTF) was flooded. There were two main reasons why this occurred.

The 2011 Trunkline Project did address the hydraulic issues associated with the infiltration & inflow (I&I) contribution to the collection system, it did not address the actual I&I sources. Therefore, the excess hydraulic load was totally put upon the WWTF. The average daily wet weather flow (AWWF) for the WWTF is approximately 350,000 gallons per day (350,000 GPD). The flow measured at the beginning of the plant for Monday June 30th was between 3,000,000 and 4,000,000 gallons per day (3-4 MGD). The Average Wet Weather Flow (AWWF) design for this plant is 1.4 MGD. The hydraulic loading for Monday June 30th was approximately 10 times the average wet weather flow and was approximately twice the design average wet weather flow.

In 2009, an automatic bar screen was installed for more efficient pre-treatment. Generally grit passes through the bar screen and collects in an area just prior to the screw pumps. The grit is removed once or twice a year by contracted services. Due to the upstream collection system cleaning scouring due to the additional hydraulic loading, grit material was collected at the bar screen which was too large to pass and could not be removed by the automatic cleaning. This material built up enough to significantly obstruct the flow to the screw pumps which caused sewage bypass prior to the plant.

Twin Creeks Lift Station: As explained above, upstream runoff led to the flooding of the drainage way and overflow of the creek banks at the Twin Creeks Lift Station. Water was high enough to get into the standby power unit and the controls for the lift station. This caused the pump station to be inoperable. Calls were made to an electrician (For the pumps and controls), Alliant Energy, and a service operator (for the Standby Power Unit) to aid in getting

the pump station operable in as short of time as possible. With all service professionals on site at the same time it was determined that:

Line Power was available from Alliant Energy
The Standby Power Unit was flooded to the point being inoperable
Flood water was high enough to get in to the lift station electrical controls

From this information it was determined that if the electrical controls were still able to be used, the pump station could be put back into service using power from direct line (Alliant Energy). The electrician was able to put the pump station back into service by 5:00 AM on Monday morning, but phase protection needed to be disabled.

At this time:

The Twin creeks Lift Station is now operating

The phase protection equipment is being ordered and shipped to be installed by the electrician

The standby power unit is being inspected to determine the extent of repairs needed for the unit to be put back into operation, as well as the cost to perform the repairs or replace the unit.