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**TO:** Chairperson Vered Meltzer and Members of the Utilities Committee

**FROM:** Chris Shaw, Utilities Director

**DATE:** February 20, 2023

**RE:** *Appleton Wastewater Treatment Plant Follow Up regarding the Polymer Incident of December 26, 2023*

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**BACKGROUND:**

On Monday, December 26, 2022 a bulk load of polymer, which is a chemical used for dewatering, was unloaded into the plant's Hauled Waste Station. The polymer was mixed with hauled waste and the comingled material entered all three hauled waste tanks. Approximately half of the comingled polymer was forward fed to the primary digestion process. This resulted in pipes and equipment becoming plugged or inoperable. Anaerobic digestion equipment was impacted the greatest with loss of feed, gas mix, gas collection, heating, and circulation.

Early on December 27, Mayor Woodford established an Emergency Operations Center (EOC) as part an Incident Command Structure (ICS). The EOC supported the on-scene activities with assistance, communication efforts, and resources. The wastewater plant staff paused all solids treatment to the digesters. The plant staff received regulatory approval and returned to functional treatment operations without the anaerobic digesters.

Initial impacts of this process change were loss of methane production for heating the digesters and 17 campus buildings, pause of the Hauled Waste Program, and an undigested blended sludge production without digestion.

Staff had immediately implemented an environmental plan that ensured the comingled polymer did not reach either the sanitary or storm sewer systems. The plan proved successful and the plant effluent, which is discharged to the Fox River, was not impacted from the process changes.

Polymer incident efforts to date include inventorying, isolating, and removing the product from process equipment. In total, 75,000 gallons was removed as comingled high strength waste and polymer. Storage of the contaminated polymer has been relegated to the Lime Slurry Thickener Tank 2. Treatment assessments and repairs occurred with staff and contractors. Support operations have come from other city departments, contractors, and McMahon Associates.

### **CURRENT PLANT SAFETY STATUS:**

The contaminated polymer affected the anaerobic digesters by concentrating approximately 1,000,000 pounds of solids in the lower and upper sections of the digesters. This separation made digester feeding, withdrawal, circulation mixing, gas mix and gas withdrawal unachievable. The solids that buoyed to the top of the digester vessels constricted gas movement until uncontrollable gas releases occurred. Additionally, an access door to the gas system was opened on #2 Primary Digester and released gas to atmosphere until remedied by staff with assistance from the Appleton Fire Department.

In terms of the digesters, staff deployed a series of operational changes to resuspend solids and release gas to return the digesters to engineered design conditions. In doing so, staff were able to restart pumping, circulation, mixing, and sludge and gas withdrawal systems. Currently, the anaerobic digesters are operating within design conditions and safely producing 200,000 gallons of anaerobically digested sludge and processing 500,000 cubic feet of digester gas per day.

### **CURRENT TREATMENT CAPABILITIES:**

The anaerobic digesters were returned to service on January 10, 2023. On January 17, 2023, the Hauled Waste Program to the plant headworks returned. Headworks hauled waste accounts for approximately 20% of the total revenue from the Hauled Waste Program. From January 10 through January 22, two of the three contaminated hauled waste tanks that contained fats were converted to emulsifying tanks. After the materials in the hauled waste tanks were treated the contents were pumped out and the tanks were cleaned. The tanks were now available for hauled waste to the primary digesters. The hauled waste program to the digesters returned on January 23, 2023. The WDNR was also notified that the Appleton hauled waste program was open for permitted wastes.

### **REGULATORY COMPLIANCE STATUS:**

I previously reported that a return to anaerobic digestion would be needed to meet the Wisconsin Pollution Discharge Elimination System (WPDES) permit requirements for biosolids. However, due to positive analytical testing results, the AWWTP did meet the WPDES permit requirements even without digestion. As such, there is not a requirement to landfill the blended sludges (undigested sludge) that was created during the polymer event. In summary, there were not any regulatory issues or permit violations as a result of this incident.

### **HAULED WASTE IMPACT:**

The Hauled Waste Program was affected by a loss of waste and revenue during the event. The projected revenue not realized is estimated to be \$133,861. As of February 14, the majority of remediation expenses had been reported and have been included in this report. The remediation response expenses included salaries of city staff, mechanical contractor

work, engineering, polymer product loss, natural gas purchases. These response expenses totaled \$240,655.

Conversely, due to the hauled waste reprieve, some operating expenses were not experienced (e.g., hauled waste: electrical, chemical, biosolids generation and land application). The estimated avoided expenses totaled \$46,264.

In total, the response and hauled waste program losses are estimated to be 2.3% of projected revenues for 2023. It should be noted that the hauled waste losses are a projection and actual revenues will be recorded at year's end.

**INSURANCE CLAIM:**

The City's insurance carrier has been noticed of a claim for property damages (e.g., elevator repair, gas, and smoke alarm repairs, etc.).

**PROGRAM RECOMMENDATIONS:**

An investigative team was formed to find root causes and provide recommendations to eliminate future occurrences. That team's findings will be presented to a third party that has working experience reviewing similar industrial incidents. The report findings and corrective actions are currently being addressed to the extent possible with the open insurance claim. Forthcoming information on this matter will be reported out as it becomes available.