Thoughts on Phosphorus Removal Capital Cost & Treatment Facility Performance

MPCA TMDL STUDY ESTIMATED CAPITAL IMPROVEMENT COST OF $5.6 MILLION was made by an MPCA engineer using cost that are at least 4-5 years old

- Does the MPCA cost estimate include engineering and overhead?

- What phosphorus removal process was the basis of the cost estimate? (There are a large number of enhanced phosphorus removal processes with varying effectiveness and costs)

- The District estimate of a capital cost of $11-14 million was prepared by Don Esping, Project Engineer of from Brown & Caldwell Inc of St. Paul, Minnesota assuming a removal process technology that will result in a removal efficiency of 99% and a phosphorus discharge concentration below 0.050 mg/LP. The only moving part on this process technology is an air compressor and operating costs are very low.

- District future monthly average concentration limit will be **0.0157 mg/LP** and the treatment facility currently exceeds this concentration limit 3-4 time/year

- Current monthly average concentration discharge of phosphorus ranges from 0.111 mg/LP to 0.170/LP and averaged 0.150/mg/LP/year

- The mass loading limit in the treatment District's NPDES permit will be **1,463 lbs. /yea**r. The treatment facility currently discharges **1,243 lbs/year** or **220 lbs**/year less than the proposed limit. Phosphorus loading to the plant is 44,895 lbs. **This equates to the current phosphorus removal efficiency of 97%**,

- To meet monthly T.P concentration with a margin of error the facility must remove an additional 0.121 lbs./day or the equivalent of 44 **lbs. /year at the current flow and loading rate**. The phosphorus loading rate to the treatment facility will increase with time and the existing limits may be more restrictive with time.

- A 99% removal efficiency reduces the phosphorus load from 44,890 to a discharge of 449 lbs./year.

- On a daily basis the treatment facility discharges 3.41 lbs./day.