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MEMORANDUM

Date: March 23, 2009
To: President and Board of Trustees
Mill Creek Water Reclamation District
From: Sheaffer & Roland, Inc.
Subject: Grand Prairie Sanitary District
Proposed Wastewater Treatment Facilities

An analysis of the proposed Grand Prairie Sanitary District wastewater treatment facilities has been made by a review of the "Engineering Report, Grand Prairie Sanitary District MBR Land Application WWTP, Kane County, IL," undated, prepared by Lintech Engineering, LLC, and submitted by the Grand Prairie Sanitary District to the Chicago Metropolitan Agency for Planning (CMAP). The Grand Prairie Sanitary District application to CMAP has been assigned CMAP Water Quality Review Number 09-WQ-005.

BOD 5 Basis of Design

- Table 5 (page 11) in the Report states that the BOD5 Basis of Design is 0.17 ppd/P.E.
- The "Illinois Recommended Standards for Sewage Works" states in SUBPART F: SEWAGE TREATMENT WORKS, Section 370.520 Design, c) Design Loads, 2) Organic Design, A) New Systems Minimum Design. ii): "When garbage grinders are used in areas tributary to a domestic treatment plant, the design basis should be increased to 0.22 pounds of BOD5 and 0.25 pounds of suspended solids per capita per day."
- Increasing the basis of design from 0.17 ppd to 0.22 ppd of BOD5 would result in a 29 percent increase which would result in significant changes in the design of the treatment facilities and related construction costs.
- The basis of design for the expanded Mill Creek Water Reclamation District (MCWRD) wastewater treatment facilities to serve the Settlements of La Fox has been based on a BOD5 loading of 0.22 ppd/P.E.

Low Wastewater Influent Flow/Variable Flow

- Table 5 (page 13) in the Report states that each of the three service area activated sludge treatment facilities will have two modular units.

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- The activated sludge treatment process is susceptible to problems in providing for adequate treatment performance caused by variations in the influent flow and wastewater characteristics. This is particularly true in developing areas where there is the potential for low initial wastewater flows as well as variability as the dwelling units come on line.
- The wastewater treatment facilities of the MCWRD are not affected by the variation in the influent flow resulting from the timing of the dwelling units coming on line as well as low initial wastewater flows from the developing area.

Sludge

- The proposed wastewater treatment results in the generation of sewage sludge. Facilities for sludge include aerobic digesters and liquid sludge storage (Pages 10 and 11). Disposal of the digested and stored sludge would be by agricultural land application (Page 10). The Report is silent on any basis of design, locations, or arrangements concerning sludge disposal.
- The MCWRD wastewater reclamation and reuse system does not require any removal, treatment or handling of sludge.

Potential Odors

- The Report states that the proposed activated sludge facilities will have "minimal odor emission" (Page 9).
- Another potential source of odors is the handling and disposal of the wastewater screenings collected by the fine screens (2 min) (pages 8, 9, 10). An additional potential source of odors is the handling and disposal of the sewage sludge.
- The MCWRD water reclamation and reuse system does not generate screenings or sludge. Adequate aeration is provided in the aerated treatment cells to prevent any odor problems.

Land Application

- The design land application irrigation rate is proposed to be a weekly average of 3.5 inches/week for the 215-day irrigation period.
- In Table 7: Water Balance Calculations in the Report (Page 30), the precipitation data is stated as being on a 5 – year return period (2003-2007) for St. Charles or an annual total of 24.68 inches. This value is well below the annual average for the area.
- The analysis in the Report is based on the design approach given in the "Process Design Manual for Land Treatment of Municipal Wastewater" published by the USEPA in October 1977 and October 1981. The clear intent of the USEPA design approach is to call for the use of precipitation data having a value greater than the annual average as stated as follows in Section 5.1.2.1 Hydraulic Loading Rates (Page 5-4 of the October 1977 edition): "Design precipitation is calculated from a 10 year return frequency analysis of wetter than normal conditions...." Consequently, the use of the precipitation data given in the Report will lead to an overstatement of the permitted weekly average application rate.

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- The application rate analysis performed for the Settlements of La Fox in December 17, 2004, utilized a total precipitation value of 41.90 inches resulting in a potential weekly average application rate of 2.65 inches /week. Based on this application rate, the irrigation area for the proposed wastewater treatment facilities would need to be expanded from 67.53 acres to 89.19 acres.

In anticipation of providing wastewater service for the Settlements of La Fox, the MCWRD undertook the following steps

- Annexed the Settlements of LaFox area to the MCWRD Facility Planning Area. Annexation was approved by the Illinois Environmental Protection Agency (IEPA) on March 20, 2007.
- Obtained IEPA Permit No. 2003-GO-5061-5 on March 16, 2007 and IEPA Permit on April 4, 2007 for the construction of the additional MCWRD wastewater treatment facilities to serve the Settlements of La Fox wastewater flows.
- Constructed a forcemain from Lift Station No. 6 for future connection to the Settlements of La Fox.
Constructed an irrigation transfer line from Irrigation Pump Station No. 1 for future connection to the Settlements of La Fox.