



September 30, 2010

Ms. Tracy Balint, P.E.
Project Engineer
City of Rochester Hills
1000 Rochester Hills Drive
Rochester Hills, MI 48309

**Re: City of Rochester Hills Water Storage Tank Project
Oakland Township and City of Auburn Hills Request for Additional Water**

The City recently participated in a meeting with the City of Rochester, Auburn Hills and Oakland Township officials to determine if the adjacent communities had any interest in participating in the proposed storage tank and pump station project. From that meeting, Auburn Hills and Oakland Township provided demand data that they would like provided by the City of Rochester Hills in order to dampen the peak flows they are experiencing in their communities. The demand data was modeled in the current Rochester Hills distribution system model to determine the impacts of the demand on the proposed project. Our findings are as follows.

INTRODUCTION

A hydraulic model of the City of Rochester Hills's water distribution system, developed and calibrated by the city, was used during a previous feasibility study/analysis for the design of water storage tanks to be used to decrease the peak rate supplied by the DWSD water system. That model was altered and used for this study to determine whether or not Rochester Hills could supply the adjacent communities of Auburn Hills and / or Oakland Township with water using the current design for the water storage tanks as the basis for the study. Both communities provided a request outlining the amount of water that they are considering purchasing from Rochester Hills.

The purpose of this analysis was to determine what, if any, improvements would be necessary to provide each community with its requested amount of water. The City of Auburn Hills requested 540,000 gallons of water over an 18 hours period per day with a supply pressure of 53 psi, or a minimum hydraulic grade line (HGL) of 1,106 ft. Oakland Township requested 7,100 gpm as a maximum day demand.

AUBURN HILLS REQUEST

The analysis assumes the final water storage tanks are located on Tienken Road in the northwest quadrant of Rochester Hills and Tank B-4 located on Rochester Road, north of Avon Road, across from Arlington Drive.

The City of Auburn Hills demands were input adjacent to the northwest DWSD connection (RC-2). An average day demand of 500 gallons per minute (gpm) was used with hourly multipliers consistent with those developed for Rochester Hills in the model to total 540,000 gallons.



TETRA TECH

The results of the model indicate that the City of Rochester Hills is able to provide the City of Auburn Hills with the requested 540,000 gallons with no additional infrastructure improvements.

The 3.0 mg tank on Tienken Road fills in the allotted 6 hour time frame and contains approximately 385,000 gallons at the end of each day. The tank on Rochester Road also fills in the allocated 6 hour time frame, however empties entirely at 11pm (at the 23rd hour of 24 model hours). The City's maximum day demand continues to be at or below the City's goal of 25.81 MGD.

The supply pressure at the City of Auburn Hills connection is between 88-89 psi (HGL 1,138-1,140 ft), again meeting their desired pressure.

OAKLAND TOWNSHIP REQUEST

Oakland Township currently receives water from the City of Rochester Hills serving a small portion of their southwest water district. The Township is proposing to increase the use of Rochester Hills supply to service essentially all of their southwest pressure district.

An average day demand of approximately 3,000 gpm was requested with a maximum day demand of 7,100 gpm. The maximum day demand was analyzed in the model with and without the Auburn Hills request.

The maximum day demand goal for the City of Rochester Hills needed to be increased in the model to 22,000 gpm to realistically portray the water distribution system. If we artificially keep the maximum day demand at 15,000 gpm then the tank sizes to serve an additional 7,100 gpm maximum day demand plus the peak hour contribution is substantially large and unfeasible. Our analysis assumed a maximum day demand of 22,000 gpm provided by DWSD for the scenarios listed below.

The new maximum day demand for the City of Rochester Hills with only the demands from Oakland Township is 33,500 gpm; therefore approximately 11,500 gpm above the City's new goal of 22,000 gpm. In order to reduce the maximum day demand at or below 22,000 gpm, an additional 1.75 million gallons of water storage would be necessary (i.e. 3.0 MG at B-4, 3.0 MG at Tienken Road, and 1.75 MG additional to serve Oakland Township).

The new maximum day demand for the City of Rochester Hills with both the demands from Auburn Hills and Oakland Township is 34,000 gpm. To reduce the demands at or below 22,000 gpm, an additional 1.8 million gallons of water storage is required (i.e. 3.0 MG at B-4, 3.0 MG at Tienken Road, and 1.8 MG additional to serve Auburn Hills and Oakland Township).

Also, with the Oakland Township demands in the model, the Tienken Road tank is only able to fill to 50 percent with the existing infrastructure during the 6 hour allotted time frame. Another result of the increased demand is that both proposed water storage tanks empty completely leaving no reserve capacity for emergency purposes. The Tienken Road tank empties three hours after filling (at hour 9 of 24 model hours). The Rochester Road tank empty's 17 hours after filling (at hour 23 of 24 model hours).



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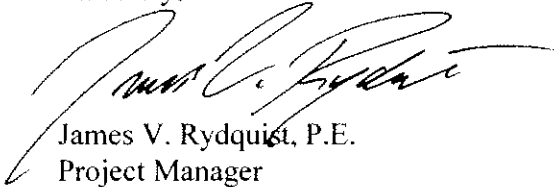
Adding demands from Oakland Township would require a dedicated fill line from the DWSD supply point to the Tienken Road tank. The need for additional storage would also necessitate a corresponding increase in capacity for the pump station in the Tienken Road and Adams Road area plus new transmission mains between Tienken Road and Oakland Township.

SUMMARY

In summary the request from Auburn Hills for 500 gpm over an 18 hour period can be accommodated with the current and proposed infrastructure. The impact being the reserve capacity in the tank is lower than originally anticipated. The Oakland Township request has much greater impacts and also changes the rate schedule currently proposed with Rochester Hills alone. To meet their requested demands the base maximum day demand would need to be increased from 15,000 gpm and thereby raising the base water rate from DWSD. This base water rate would be applied to all users in Rochester Hills and would decrease the projected savings proposed through the addition of the tanks and pump stations. This increase in base rate should be included in the agreement discussions with Auburn Hills and Oakland Township.

We trust this meets your immediate needs and allows you to respond to the neighboring communities. If you have any questions, please call.

Sincerely,



James V. Rydquist, P.E.
Project Manager