

**North Andover, Massachusetts  
Lucent Site – 1600 Osgood Street**

December 22, 2005

Mr. Mark Bobrowski.  
9 Damon Mills Square  
Suite 4A4  
Concord, MA 01742

Re: Evaluation of Water and Sewer Service  
Lucent Site, 1600 Osgood Street, North Andover, MA

Dear Mr. Bobrowski:

Weston & Sampson Engineers, Inc. is pleased to submit this letter report, which addresses the following scope of work concerning water and sewer service for the proposed development at the Lucent site at 1600 Osgood Street in North Andover:

- Review information provided by the developer on the estimated water demands and sewage flows for the proposed development, and plans for connections to the existing municipal water and sewer systems.
- Based on available information, conduct a preliminary assessment of the ability of the municipal water and sewer systems to service the proposed development. If information is not available to make an assessment, then recommend additional steps that may be required to make an assessment.
- Summarize the findings of the study.

The information provided for review through the North Andover Office of Community Development included:

- 1600 Osgood Commerce Center, North Andover, Massachusetts, Redevelopment Master Plan, by Huntress Associates, Inc., dated February 23, 2005.
- Coughlin Environmental Services, LLC, letter to Ozzy Properties, Inc., dated November 28, 2005 re: Sewer and Water System Analysis for 1600 Osgood Street, LLC, 1600 Osgood Street (Lucent Site), North Andover, MA.
- Coughlin Environmental Services, LLC, letter to Ozzy Properties, Inc., dated December 9, 2005 re: Updated Wastewater Generation Table 2, Sewer and Water System Analysis for 1600 Osgood Street, LLC, 1600 Osgood Street (Lucent Site), North Andover, MA.

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### **Assessment of Proposed Wastewater Flows on the Municipal Sewer System**

At the present time, there is no municipal sewer service in Osgood Street adjacent to the proposed project. There is, however, privately-operated sewer infrastructure in place for the existing site which utilizes a common force main with Wheelabrator North Andover, Inc. (WNA) that discharges directly to the Greater Lawrence Sanitary District (GLSD) wastewater treatment facility. The closest municipal sewerage is at the intersection of Osgood Street and Barker Street, which was installed for residential development, and discharges to the Rae's Pond wastewater pumping station on Great Pond Road.

According to Coughlin Environmental Services, LLC (CES), the existing Lucent facility utilizes an on-site wastewater pump station equipped with two 50 HP, 500 gpm pumps. Wastewater from the station is pumped through one of two 8-inch HDPE force mains to a shared 10-inch ductile iron force main which discharges directly to the GLSD wastewater treatment facility located on the west side of the airport. The force main is used by Wheelabrator North Andover as well as some other facilities on Holt Road. There was no mention of a standby generator for the pump station in the CES report that should be available in the event of a power failure.

CES estimated the maximum daily flow from the proposed development to be about 245,000 gpd based on DEP Title V guidance documents. They used a peaking factor of 2.0 to arrive at a peak wastewater flow of approximately 490,000 gpd. Their estimate of peak flow may be low when compared the peaking factors recommended in the NEIWPCC Manual TR-16, Guides for the Design of Wastewater Treatment Works. DEP Title V regulations for wastewater flows are based on 200-percent of the average daily flows. Fifty-percent of the projected maximum flow of 245,000 gpd would result in an estimated average day wastewater flow of 123,000 gpd. Based on an average day flow of 123,000 gpd, Manual TR-16 recommends a peaking factor of about 5, which would translate to a peak hourly flow rate of about 615,000 gpd.

In addition, DEP Title V design flows do not include infiltration and inflow from sewer lines. We recommend that the peak infiltration and inflow from the existing system, as well as an allowance for infiltration from the proposed new sewer lines, be included in the total estimated average, maximum and peak wastewater flows that must be pumped from the site. This may impact the ability of the pump station to handle the projected peak flows from the project unless infiltration and inflow is removed from the system. In addition, it may effect the current agreement with GLSD, which, according to CES, allows a maximum of 500,000 gpd of wastewater to be discharged from the site.

We concur with the CES recommendation to evaluate the impact on the pumping station when WNA is utilizing the option to increase flows and scour the existing force main to the GLSD plant. It may also be appropriate to confirm the pumping capacity of the existing on-site pumping station during normal operational periods when all of the other facilities along the common force main are pumping at their full, allocated rates.

It may also be appropriate at this time to review and obtain confirmation from WNA and GLSD for the proposed project wastewater improvements and operational parameters to ensure that existing agreements for wastewater disposal from the site will be suitable on a long-term basis.

## **Assessment of Proposed Demands on the Municipal Water System**

### **Water Supply and Treatment Systems**

Estimated maximum day water demands for the proposed development were provided by CES and were determined from the maximum day wastewater flows estimated from the DEP guidelines, and assuming that about 80-percent of the water used becomes wastewater. Maximum daily wastewater use was estimated to be about 245,000 gpd; therefore maximum daily water use was estimated to be about 306,000 gpd. This estimate of the maximum daily water usage appears reasonable based on the data available for review.

The Town's existing water supply and treatment facilities have adequate capacity to supply the needed volumes of water to the proposed project site. The Town's water supply source, Lake Cochichewick, has a DEP-approved firm yield of 4,660,000 gpd. The yield of lake must be able to meet the average daily water needs of the Town. The average water demands for the Town in 2004 was about 2,850,000 gpd. The average daily demand from the proposed project will be about 50-percent of the maximum daily demand of 306,000, or 153,000 gpd. Therefore, there is adequate source capacity to provide water to the proposed development.

The Town's water treatment plant must be able to provide an adequate supply of water to meet the maximum daily demands of the distribution system. Current plant capacity is over 10 mgd, with the maximum day demand of the system over the past several years ranging between 5 and 6 mgd. Therefore, the Town's water treatment plant has adequate capacity to provide water for the proposed development.

### **Water Distribution System Pressures and Fire Flows**

The existing municipal water main in Osgood Street in the vicinity of the proposed project is a relatively new 12-inch ductile iron cement-lined pipe that has good pressures and is well looped, and therefore has very good carrying capacity. A schematic of the existing water system for the Lucent Site was provided showing the location of the two existing 10-inch water main connections to the 12-inch water main in Osgood Street as well as the existing fire hydrants on the Lucent property.

We utilized a hydraulic model of the North Andover municipal water system with the software package H2ONet version 6.0 to model the impact of the proposed development on the Town's water distribution system. Using the schematic provided to verify location, we added two nodes to the model on the existing 12-inch water main in Osgood Street, which represent the two 10-inch connections that currently service the Lucent site. We split the proposed maximum day demand of the development evenly between the two nodes and ran the model to determine fire flow availability for this site. During system-wide maximum day demands, the municipal system can provide in excess of 3,500 gpm at pressures greater than 20 psi at the connection points in Osgood Street. In addition, during a fire event, pressures are not drawn below 20 psi at any point in the North Andover distribution system when a fire flow of 3,500 gpm is demanded at the entrance to the Lucent site on Osgood Street.

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CES states that “the two existing 10-inch services off of Osgood Street would be sufficient to service the proposed facilities daily demand, but due to the expansion of the facilities throughout the site, a third 8- or 10-inch water service may also be appropriate further north of the existing services. A third service would enhance fire flow protection and service pressures throughout the site and should be modeled and assessed as part of the future site utility expansion efforts.” We did not model a third water service to the Lucent site during this evaluation but we agree that a third water service, sized appropriately, would enhance fire flow and service pressures to those areas of the proposed development that do not have water service currently. Looping of water mains should be implemented whenever possible.

### **Summary**

The following summarizes the findings of our assessment of the ability of the municipal water and wastewater systems to service the proposed development at the Lucent site at 1600 Osgood Street.

#### ***Wastewater System***

At the present time, there is no municipal sewer service in Osgood Street adjacent to the proposed project. There is, however, privately operated wastewater infrastructure in place for the existing site and adjacent facilities, which discharges directly to the Greater Lawrence Sanitary District (GLSD) wastewater treatment facility.

We suggest that the projected peak wastewater flows be re-evaluated with respect to the peaking factors and allowances for infiltration and inflow. If the projected flows are revised, then the capacity of the existing pumping station should also be re-evaluated.

In addition, it may be appropriate at this time to review and obtain confirmation from WNA and GLSD for the proposed project wastewater improvements and operational parameters to ensure that existing agreements for wastewater disposal from the site will be suitable on a long-term basis.

#### ***Water System***

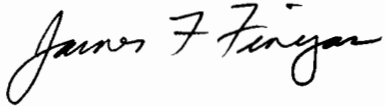
The Town’s existing water supply and treatment facilities have adequate capacity to supply the needed volumes of water to the proposed project site. The municipal water distribution system also has sufficient capacity to service the proposed average and maximum day demands (as provided by CES) and provide the necessary fire flow at the entrance to the site without drawing pressures below 20 psi at any point in the North Andover distribution system.

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If you have any questions or comments, please do not hesitate to contact us at (978) 532-1900.

Very truly yours,

WESTON & SAMPSON ENGINEERS, INC.

A handwritten signature in cursive script that reads "James F. Finegan".

James F. Finegan, P.E.  
Project Manager