

## **NOTTINGHAM COUNTRY MUD.—AN OVERVIEW OF RECENTLY COMPLETED, MAJOR ACTIVE AND PLANNED PROJECTS**

March, 2014 (Dsk RDP 729 HD 68, MUD Historical)

### **District Water Supply.**

The District depends on two wells for our water supply and has interconnect agreements with three adjoining districts for short-term (hours to a few days) supply in the event of emergency requirements. Well No. 1, located at the water plant, provides a maximum production rate of 2,500 gallons per minute (“gpm”), Well No. 2, located about 200 feet east of the Highland Knolls – Fry Road intersection, provides a maximum production rate of 1,250 gpm and Well 3 located just south of the wastewater treatment plant which provides 2500+ gpm. Maximum production rate can be maintained if groundwater tables remain steady and can be operated for 18 continuous hours before drought condition restrictions are activated.

### **Water Well No. 3.**

A study of water use and production showed that in times of high water use, Wells 1 and 2 running simultaneously (2500 gpm from Well 1 and 1250 gpm from Well 2) barely produce sufficient water to meet demand. Typically, with three ground storage tanks full, both wells recover about two feet of tank level in about six hours. If either Well stops or becomes inoperable during high demand, adequate production to meet demand is questionable. If Well 2 is inoperable, Well 1 can meet demand if demand is not unusual. If Well 1 is inoperable, Well 2 cannot meet demand and the District would need to depend on interconnections to borrow or buy water from neighbors—if available. At any rate, drought contingencies would need to be executed that involve limiting water use by odd-even watering or hand watering only, etc.

In order to provide adequate water, in the event of non-operation of one of the wells, as happened three years ago during low demand, a third well was authorized by the Board. The well is located on District property near the wastewater plant. After several years of negotiations with the U.S. Army Corps of Engineers, a permit for an easement for a transmission line from the Well to the water treatment plant thru George Bush Park was obtained and completed at a cost of \$468,488.

Well 3 is located just south of the wastewater treatment plant and provides 2500+ gpm and includes a generator and sound abatement structure. Cost was approximately \$2,300,000. Costs of the sound abatement structure were \$29,000. It is interesting to note that approximately one month after completion of Well 3, the motor for Well 1 was damaged during

a storm with several months required for rebuilding. Even during high demand periods, Wells 2 and 3 operated simultaneously and provided adequate supply and drought contingency requirements were avoided.

### **Water Well No. 2 Improvements.**

Well 2 was developed to use a submersible pump motor in order to reduce or eliminate motor noise in the neighborhood. The Well operated without problems for about ten years until pump failure occurred. The motor and pump were repaired and stored as spares and a new motor and pump were installed at a cost of approximately \$70,000. The spares were installed and performed for about three months before another failure occurred. Since this experience with low reliability of submerged motors is the same as several other Districts, it was decided to re-build the Well with a conventional line-shaft system that uses an externally mounted motor similar to Well 1. A loaned submersible system was used until the line-shaft system could be obtained (delivery time was on the order of six months) and installed with a sound abatement structure. Sound level measurements show the concept for the structure is practical and was used as a model for Well 3. Cost of Well improvements was \$198,065 and cost of the noise abatement structure was \$24,000.

### **Water Well No. 1 Improvements.**

During storm events, power outages are common, in fact, during hurricane Ike, power at the water plant was lost for several hours when fuel delivery for emergency generators was impeded by floodwaters.

In order to insure delivery of water to the District, an emergency generator was installed for a cost of \$410,509 with completion in May of 2010. The generator includes extended fuel capacity to compensate for slow fuel delivery during periods of power outage.

### **District Emergency Generators.**

The District presently has adequate generators for reduced production during power outages at the following locations:

1. Well No. 1 (for production).
2. Water Plant Booster Pumps (to maintain District water pressure and delivery).
3. Well No. 3 (for production).
4. Wastewater Treatment Plant (to prevent raw sewage overflow into Mason Creek).

5. Fry Road Lift Station (to prevent sewage overflows on the south side of the District).

### **Water Treatment Plant Improvements.**

The Water Treatment Plant has provided more than 20 years of service and, even with nominal maintenance such as tank repairs and painting, etc., updates and improvements are needed to insure compliance with water quality regulations and continued service level to the District. In general, the plant consisted of the following features: Iron removal by aeration and filtration, disinfection by bleach (changed from gaseous chlorination), and storage in three ground storage tanks (“gst”) - two at 620,000 and one at 320,000 gallons).

Nottingham country MUD is one, if not the only, MUD that used aeration and filtration for iron removal; the alternate most widely used is suspension of iron with a polyphosphate additive instead of removal. Filter systems have been an ongoing problem with leakage (annual repair costs on the order of \$70,000) and operational failures of automatic backwash of the filters. Therefore, the aeration and filtration system was replaced with a modern polyphosphate system that will insure continued water quality.

In addition, a series of changes and updates to the electrical system and a building addition were included to house the new systems.

Finally, an additional 1 million gallon ground storage tank was included to insure a full day storage, reduced start-stop cycles of the pumps and reduce the need for use of interconnection agreements.

Project costs were \$1,470,000

### **Main Waterline Cleaning.**

Water mains were cleaned this summer by a method known as “pigging” with the intent of removing scale, rust and other deposits. This process should be repeated on an 8 to 10 year basis. Cost was approximately \$145,000.

### **Park Maintenance and Improvements.**

Asphalt trail sealing was completed in July, 2012 at a cost of \$24,627 and an annual trail maintenance program is being negotiated. In addition trees were moved in order to maintain proper light for grass growth and surrounding trees.

### **Wastewater Treatment Plant (WWTP) Improvements.**

WWTP is operating with 20 year old technology and equipment that will not be able to meet EPA and Texas Commission on Environmental Quality (“TCEQ”) requirements that are expected to be initiated in the near future. Effluent does not meet requirements for nutrients and bacteria limits for future reuse for irrigation purposes. Design features include:

1. Changing the existing clarifier from a rectangular base to circular to replace the present mechanism necessary to remove solids from corners.
2. Add an additional clarifier. Necessary for use while main clarifier is constructed and will be used to improve quality of effluent.
3. Change present aeration system to modern fine-bubble system to reduce power requirements and improve plant efficiency.
4. Change disinfection from present gaseous chlorination to a modern bleach system.
5. Add a system to remove or substantially reduce phosphorus and nitrate nutrients necessary to meet future EPA and TCEQ requirements for future reuse.

The project is in preliminary design and is estimated to be advertised in 2014 or 2015 with estimated costs of \$3,500,000.

### **Sewer Line Evaluation and Repair Based on Closed Circuit Television (CCTV).**

In order to reduce or eliminate catastrophic failure of sewer lines, a system of evaluation based on CCTV review followed by appropriate repair was initiated with the intent of a full review of each line on a five year basis starting with older developments in the District. Repairs based on review of the newest developments will be completed this summer. Total cost of the first set of evaluations is estimated at \$2,900,000. Since major repairs will be completed on the older sections, future unit costs are expected to be a good deal lower on the order of \$50,000 to \$75,000 annually to maintain the system.

### **Financing Considerations.**

Financing to build and sustain District infrastructure (water, wastewater and the greenbelt park) is derived from revenue bonds (“Debt Service”), water and sewer billing and from maintenance and operation (“M & O”) taxes. By law, debt service taxes cannot be used for maintenance and operation of the District. M & O taxes are presently limited to \$0.25/\$100

valuation but can be raised if voted in by residents of the District. Water and sewer charges have not increased since 1993. Revenue for financing has been approximately half water and sewer billings and half M & O taxes. Historical valuations, tax rates and water and sewer charges are shown in tables attached.

Until the Stonelodge development was completed in 1999, the District was growing and taxes from increased property values along with water and sewer service income provided adequate finances to operate and maintain the District. With the completion of Stonelodge, no significant space is available for additional large-scale developments; housing construction will be limited to a few individual single-unit residences with only a few commercial possibilities available. The District has changed from “growth” to a “mature” district and, thus, cannot depend on increased tax revenues from additional development. With ever increasing costs of operation and maintenance and the expectation of additional regulatory requirements, a rate study is required to determine if there is a need for additional revenue to sustain the District infrastructure. The rate and tax study is scheduled to begin this spring with completion expected by mid-year. Incidentally, taxes are deductible from federal taxes.

End

Attachments Follow:

“Nottingham Country MUD Billing, Tax Rate and Valuation History”

“Nottingham Country MUD - An Overview of Recently Completed, Active and Planned Projects”