



KRJ, Inc.

d/b/a KRJ Utilities

Post Office Box 2369 ♦ Swansboro NC 28584
Phone: 252.393.8562 ♦ 919.827.8055

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In Re: North Carolina Utilities Commission Docket No. W-1075, Sub 12

This narrative is being provided to explain the background of KRJ's water and wastewater systems associated with the above referenced docket, and the methodology that was utilized in the preparation of the General Rate Case thereof.

Facilities Overview

The initial Certificate was issued to KRJ by the N C Utilities Commission (NCUC) in July 1996, for the first portion of a water only residential subdivision located south of Garner, known as Southern Trace. The original construction of the system serving Southern Trace consisted of two wells and a single hydropneumatic tank. As the subdivision grew, two contiguous extension certificates were granted; the construction of the last included a third well.

A general rate case was filed in mid-July 2004, which excluded the third well and additional hydropneumatic tank, as they had not been installed at that time.

KRJ entered in to an agreement with Management Group of NC, Inc., (MGNC) to provide day-to-day managerial services and to another firm to provide certified system operating services. MGNC began provide certified operator services in July 2004.

On 8-Sep-2004, KRJ filed an application with NCUC for a Certificate authorizing it to serve the Rockbridge Subdivision (Sub 5).

Subdivision Development

Southern Trace

Southern Trace is a single family neighborhood developed by Stafford Land Company, Inc. located on NC 50 just north of the Wake/Johnston County line. The lots are 1+ acre, and are served by the KRJ Southern Trace water system. Initially the water system was a single hydropneumatic tank and well. As the subdivision grew, a second well was installed some distance from the first. During the later stages of development a third well was installed and a second hydropneumatic tank was installed adjacent to the first.

Rockbridge

Rockbridge subdivision is located in eastern Wake County, between Poole and Grasshopper Roads, and is continuing to be developed as it proceeds into its last phases. Development has been performed by Stafford Land Company, Inc. and Rockbridge Investors, LLC.

The original concept was that Stafford Land Company (StaffLand) would assist the owner of the property, Eden Croft Development Company, in their site planning and acquisition of regulatory approvals for the subdivision of Rockbridge, with KRJ providing water and sewer services to the resulting lots. Eden Croft would 'flip' the approved project to a national builder who would develop the property and houses thereon.

The concept for the water supply system was throughout the planning and implementation of Rockbridge that of a groundwater (well) sourced system with on-site treatment. One issue that arose early on was the presence of naturally occurring radiological activity in several of the wells. The concept for the wastewater disposal system was for an on-site treatment facility to be constructed, with reclaimed water (effluent) being beneficially reused on a number of designated spray sites throughout Rockbridge. Rockbridge subdivision was approved by Wake County as a Consolidated Open Space Development (COSD). Under the COSD concept, the number of lots that would have otherwise been approved does not increase, but by using smaller lots on the more suitable portions of the site a more efficient development can be attained. The spray sites as well as the water/wastewater treatment compound are located, by easement, in the open space areas.

Originally a number of consultants were hired by StaffLand to prosecute the design and permitting agreed to with Eden Croft. Part of the wastewater treatment and disposal plan was proposed by Sheaffer International. The Sheaffer treatment system concept was ultimately determined not to be consistent with NCDENR requirements, and was therefore abandoned. However, the concept of land application of the resulting reclaimed water remained viable. As such, much of the preliminary work underlying the design and permitting of the reclaimed water reuse system remained usable in the development of the system. Also, a number of wells were installed and tested to determine the sufficiency and quality of available groundwater. Some of those wells have been developed and are in use today, where others due to either water quantity or quality were deemed unsuitable to use.

In June 2004, KRJ entered into an agreement with James R. Butler, PE, which later became JRB Engineering Associates (JRBea) to design the water treatment, elevated water storage tank, wastewater reclamation (treatment) system, and reclaimed water reuse system.

The design and construction of the water distribution and sewer collection systems would be prepared and paid for by the developer of the lots, and conveyed to KRJ as CIAC prior to being placed into service; a system very much like that with the extension of a municipal utility system into newly developing property.

In July 2005 Mr. Charles Gaddy, owner of Eden Croft, passes. His widow found herself in an unfamiliar situation regarding the future of Rockbridge. StaffLand agreed to continue the project with it becoming the developer. Multiple permits were obtained by both StaffLand for the development and KRJ for the utility systems. In November 2006, NCUC issued the Certificate to KRJ to serve Rockbridge.

It was determined that due to KRJ's lack of the significant financial resources necessary to fund the capital investment in the water and wastewater plant assets to serve Rockbridge that the funds would have to be borrowed from StaffLand. StaffLand's source of those funds was to be both internal and borrowed by StaffLand.

The water treatment system designed by JRBea initially utilized existing wells 1 & 3, while well 2 was initially held in abeyance due to elevated concentrations of uranium. The treatment system entailed a non-regenerable uranium removal system for flow originating from well 1, and the addition of hydrated lime slurry, to increase alkalinity, caustic soda to adjust the pH, and hypochlorite as a disinfectant to the combined flow from the uranium removal system (well 1) and from well 3. All wells were equipped with suitably sized submersible pumps. The flow was transmitted to the water distribution system to be installed by the developer. A 150,000 gallon elevated storage tank was installed, remote from the treatment compound, to provide storage, as required by NCDENR regulations, for the system. A permit to operate was subsequently issued by NCDENR/PWSS.

The wastewater treatment/reuse system designed by JRBea consisted of a submersible influent pump station, that will serve the entire site, a cast-in-place reinforced concrete dual-train activated sludge biological treatment system with dual mechanically cleaned secondary clarifiers, two-stage ultraviolet disinfection, chlorine disinfection, sampling and measurement facilities. The resulting reclaimed water was conveyed to a 100-day synthetically lined, long term storage pond, from which it is pumped to the reuse fields for spray application to the vegetative cover. A 5-day lined 'upset' pond was provided to accept plant effluent that may not meet the stringent requirements of the permit, for storage and re-treatment.

A 350 kW diesel generator set and automatic transfer switch were provided to assure that both the wells and the wastewater treatment facility would continue to function during periods of loss of commercial electric power.

The Rockbridge subdivision will result in the development of approximately 407 "municipal sized" lots. Unlike Southern Trace, where the lots were more 'rural' in size and suitable for septic systems, the lots at Rockbridge are 'municipal' in size and unsuitable for septic systems, therefore both public water and sewer were essential in their development.

An agreement was made between KRJ and the original builder, who had contracted to purchase all of the lots in Rockbridge, by which the builder would pay the Availability Fees on all recorded lots not connected to the system and \$ 5,000 in Tap Fees. It was understood by KRJ that the excess of tap fees would be imputed against KRJ's assets at

such time as a rate case was to be filed. Unfortunately, that builder was heavily invested in not only the Wake County market but also markets in Arizona, California, and Florida. When the Real Estate "bubble" burst in the early 2000s, they forfeited their earnest money for the lot purchases to StaffLand and exited the project.

Thereafter, several other builders were brought into the project, with those continuing to be active being Eastwood Homes and Royal Oaks Building Group. During that period, one of the lenders to Stafford Land demanded that they receive the Tap Fees, that would otherwise be paid to KRJ, at the closing of the sale of each lot to the builders.

As of the end of the Test Year (June 30, 2016) there were 236 lots served with water and sewer.



The water treatment building is located at the center top of the above picture, the long term storage pond is in the middle, the operations building to its right, and the water reclamation plant to the right of the operations building. The small square pond in the foreground is the upset pond. For scale, the small white object between the ops building and the upset pond is a full-size pick-up truck.

Although the Rockbridge systems did not commence operation until April 2007, an agreement for both Management and Certified Operator Services was entered into by KRJ with MGNC in June 2005, to provide documentation of competent personnel necessary to obtain both NCUC and NCDENR approvals. This arrangement continued until October 2010, when due to a change in business model, MGNC withdrew from the certified operator service business. A different firm was retained to provide certified operator services since.

Other than some incidental start-up glitches, both systems functioned well from Spring 2007 to March 2013, at which time the drinking water monitoring indicated non-compliant levels of uranium, which was inconsistent with the previous samples. It was determined that the resin in the non-regenerable uranium removal system had 'broken through'. A quote to remove and dispose of and re-bed the removal system was obtained and when analyzed in the context of long term operation indicated that continued use of system was economically infeasible. It was decided that well 2 be sampled and if compliant be placed into service in lieu of well 1. This was effected in approximately November 2013. However, by March 2015 this approach proved unsuccessful as the uranium concentration had again become elevated resulting in non-compliance; this time with wells 2 & 3 rather than 1 & 3.

In January 2016, a different firm was hired to provide certified operator services for both Southern Trace and Rockbridge. Approximately the same time, JRBea was retained to evaluate and ultimately design a uranium removal system to replace the original system and to treat flow from both wells 1 & 2, rather than well 1, alone, as was the original system. The replacement uranium removal system design involved four ion exchange columns each with automatic control valves, two bag pre-filters, an alarm panel with associated pressure sensors, and a brine tank. The resulting regeneration waste is routed to the sanitary sewer system. Potassium Chloride was selected as the brine salt, to prevent excess sodium being contributed to the reuse fields which could bind the soils.

Several items were re-used from the original non-regenerable system, specifically: two pressure vessels (2 were new), two bag filter units, and the original alarm panel and its associated pressure sensors. The "spent" resin from the original system was removed and disposed of by a duly licensed rad-waste contractor. Once system installation was completed (20-Jun-2016) a 'proving' sample was run using ICPE-MS, due to the near immediate availability of results; the results were exceptional, nearly 100% removal of uranium. The quarterly regulatory sampling beginning with Q3.2016 have returned uranium concentrations uniformly below Regulatory Reporting Level (aka BDL).

Treatment of the costs of this process were treated within the rate case filings as follows:

- Removal and disposal of spent resin was expensed, and adjusted to a 3-year expense period.
- 1/3 of the cost of the original system was treated as disposed-of asset. The remainder of the system, being reused in the new system, was kept on its original depreciation schedule.
- All new construction associated with the system was booked as a newly acquired asset, and placed on a 25-year depreciation.

A picture of the completed uranium removal system follows.



The two blue vessels and the alarm panel in front of them are part of the decommissioned uranium removal system for well 1.

The revenue requirement is based on an operating ratio calculation. A margin of 7.5-percent is utilized.

Financial records presented in support of this General Rate Case have been maintained, as required by the Commission, in an accrual manner. Procedurally, KRJ provides MGNC with copies of disbursement checks and supporting invoices subsequent to their issue. The cash transaction is posted, and if the invoice date is in a different month, the contra-cash entry is made to the A/P account and a second set of entries contra-A/P and expense are entered as of the date of the supporting invoice. Earned income from customer billings is posted to A/R and Income accounts as of the date of mailing of each batch of customer bills.

We at KRJ will endeavor to provide the Commission and Public Staff with any necessary, additional information to substantiate and support this Application for Rate Increase.

Robert R Stafford, Jr
President