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April 30, 1997

VIA HAND DELIVERY

Blanca S. Bayo, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399

Re: Windstream Utilities Company; Docket No. 960867-WU
Application for Amendment to Certificate
Our File No. 26067.02

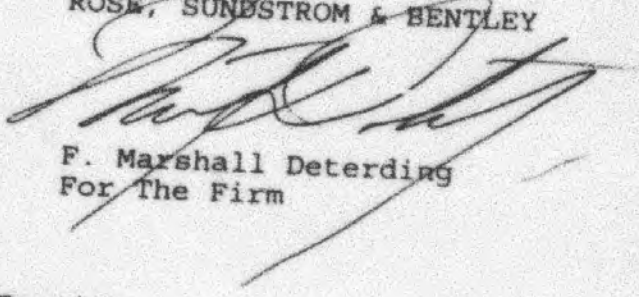
Dear Ms. Bayo:

Attached for filing in the above referenced case are the original and 15 copies of the Prefiled Rebuttal Testimonies of Mr. L.E. Dlouhy and Mr. George McDonald, P.E., filed on behalf of Windstream Utilities Company.

If you have any questions in this regard, please let me know.

Sincerely,

ROSE, SUNDBSTROM & BENTLEY



F. Marshall Deterding
For The Firm

- ACK _____
- AFA _____
- APP _____
- CAF _____
- CMU _____
- CTR _____
- EAG _____
- LEG _____
- LIN ngt 3 _____
- OPC _____
- RCH _____
- SEC _____
- WAS _____
- OTH _____

Dlouhy - 04348-97
McDonald - 04349-97

FMD/lts
Enclosures
Donna Cyrus-Williams, Esquire
Thomas Cloud, Esquire
Mr. Butch Dlouhy

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 960867-WU

WINDSTREAM UTILITIES COMPANY

APPLICATION FOR AMENDMENT OF CERTIFICATE NO. 427-W

TO ADD TERRITORY IN MARION COUNTY, FLORIDA

PREFILED DIRECT TESTIMONY OF GEORGE J. MCDONALD

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Q. Please state your name and employment address.

A. My name is George J. McDonald. I am a licensed professional engineer and principal of Berryman & Henigar, 640 E. Highway 44, Crystal River, Florida 34429.

Q. Please give a brief outline of your professional and educational background and experience.

A. I have attached hereto as Exhibit GJM-1 a copy of my resume which outlines my educational and technical background experience and education.

Q. Have you ever testified before?

A. I have not previously testified in matters concerning the PSC. I have given testimony on utility matters elsewhere.

Q. What is the purpose of your testimony here today?

A. I have been retained by Windstream Utilities in order to perform certain engineering analyses of the capacity of their water supply system in order to assess their technical ability to provide water supply to a proposed expansion of their service area in Marion County,

DOCUMENT NUMBER 04349 APR 30 5
FPSC-RECORDS/REPORTING

1 Florida.

2 Q. Does Windstream Utilities have the technical ability and
3 capacity to provide service to the area requested in the
4 extension application?

5 A. I have attached hereto as Exhibit GJM-2 the results of
6 our analysis of the capacity of Windstream Utilities
7 water supply systems. In this analysis, we have calcu-
8 lated the system's estimated residual capacity to supply
9 peak water demand and fire flow supply to the area
10 requested in the extension application. We have also
11 reviewed the utility's potential future demand and needs
12 for improvement.

13 Q. Please summarize this information.

14 A. Windstream Utilities has two water plants to serve the
15 proposed service area. The Majestic Oaks plant consists
16 of (2) 12 inch water wells, a hydropneumatic storage
17 tank, hypochlorination equipment, and a 100 Kw standby
18 generator. The other water plant at Sun Country Estates
19 consists of a single 8 inch well, hydropneumatic tank, and
20 hypochlorinator.

21 The Majestic Oaks water plant currently produces 189,000
22 gpd on average and the Sun Country Estates water plant
23 produces on average 18,000 gpd.

24 The residual capacity available to serve new territory is
25

1 the difference between the capacity of these water plants
2 to produce water and the current demand.

3 Discussions about how much capacity a water plant has
4 available is often complicated by the fact that the
5 plant's capacity can be expressed in terms of:

- 6 ● What it is physically capable of producing in one
7 day.
- 8 ● How much water it is allowed to pump out of the
9 ground by the Water Management District.
- 10 ● How much water it is allowed to put into the dis-
11 tribution system by the Department of Environmental
12 Protection.
- 13 ● How much water is available for fire flow.

14 After studying these issues, I conclude that the avail-
15 able capacity of each water plant to satisfy future peak
16 demands (not fire flow) with no additional improvement or
17 repermitting required is as follows:

18	Majestic Oaks	51,000 gpd
19	Sun Country	24,000 gpd

20 There are some improvements that would considerably
21 increase the available capacity of the water supply
22 system.

23 To understand what improvements are needed to increase
24 the capacity, it is necessary to quantify how much water
25

1 the utility will need to produce to satisfy the future
2 demand within its existing as well as proposed service
3 area.

4 We think the future demand will be about 540,000 gallons
5 per day in the existing service area and may be as much
6 as 450,000 gallons per day in the extension area.

7 Improvements need to be carried out to the water system
8 in a logical series of economic expansions to keep ahead
9 of increasing demand. We see this occurring in three
10 phases:

11 In phase one, gas chlorination would be installed at the
12 Majestic Oaks Water Plant, an interconnect to the Sun
13 Country Estates water plant would be made, and an
14 increase in the allowable Water Use Permit withdrawal
15 applied for, and a second 10,000 gallon hydropneumatic
16 tank installed. This would increase the available
17 capacity to satisfy peak demand of the Majestic Oaks
18 water plant to 171,000 gpd and provide about 740 gpm in
19 available fire flow, possibly more.

20 In the second phase, system storage would be increase to
21 over 200,000 gallons and high service pumping capacity
22 added.

23 In the third phase, system storage would be increased to
24 over 450,000 gallons and high service capacity incremen-
25

1 tally increased.

2 Q. Compare Marion County's ability to provide water service
3 to the proposed service area extension to Windstream
4 Utilities.

5 A. To provide at least 740 +/- gpm fire flow to the SR200
6 service corridor and to make available the excess 171,000
7 gpd water in the Majestic Oaks system Windstream Utili-
8 ties would need, at a minimum to:

- 9 ● increase the allowed withdrawal under their current
10 water use permits
- 11 ● interconnect their two existing water plants
- 12 ● install gas chlorination
- 13 ● install a second hydropneumatic tank
- 14 ● extend distribution lines to the area

15 To provide levels of fire flow in excess of 740 gpm,
16 Windstream would need to add a ground storage tank and
17 high service pumps.

18 Marion County has had several studies performed (PBSJ,
19 and HAI) but has no facilities in the area. An applica-
20 tion to construct a water plant has apparently been
21 filed. We understand from FDEP the water plant will
22 consist of (2) 12 inch wells and hydropneumatic tankage.
23 To offer comparable service as Windstream Utilities,
24 Marion County will need to:

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- Acquire property for the water plant (if is has not already done so)
- Obtain a water use permit
- Construct and test two wells
- Obtain a permit from the FDEP to construct a water plant
- Build the water plant
- Extend distribution lines to the area

To have expanded fire flow capacity, Marion County would likewise probably need to add a ground storage tank and high service pumps.

By simple comparison, the County's level of effort to provide service to the same area is likely to be more costly than Windstream's level of effort.

windstream\960867\2mcdonald.tmy

Education & Registrations

Graduate coursework in Wastewater Treatment Plant Design,
University of South Florida, 1989
B.S.C.E., cum laude, University of Massachusetts, 1987
B.A. Sociology, Trenton State College, 1978

Florida Professional Engineer, 844740



EXPERIENCE

Professional Engineer and Principal in firm with extensive project management experience whose responsibilities include design of water treatment plants, distribution and wastewater collections systems, pumping stations, wastewater treatment facilities and effluent disposal/reuse systems; writing of technical specifications and permit applications; design of roads and drainage systems. Skilled in computer programming, has developed software programs to assist engineering design work and also has designed in-house training programs in computer aided design and drafting, and hydraulic modeling software.

International Experience

Project Engineer, Costa Del Este, Republic
of Panama, Planta de Tratamiento
Agua Residuo (Wastewater
Treatment Plant)
Water Systems Construction Supervisor,
Republic of Kenya, (1980)
ACTION/Peace Corps, 1980-1981
Marketing Representative, West Germany
(1983-84), OMSO

with the use of custom computer simulators. New additions include oxidation ditches in a planned, multi-phased expansion. Engineering services also include the preparation of construction drawings for the effluent disposal system expansions, i.e., force mains, pumping systems, and land application systems.

Other services included coordinating two hydrogeologic investigations of effluent disposal sites, administering a protected wildlife survey, and seeking zoning special exceptions.

Representative Wastewater Treatment Projects:

Spring Hill Wastewater Reclamation Plant, Hernando County, FL. Project Manager and Principal Process Engineer for the expansion of the treatment plant from its current permitted 2.0 MGD capacity to 4.0 MGD. Engineering services include the design of a class I reliable facility producing reclaimed water for reuse on golf courses in the premier Timber Pines development. The design calls for the existing facility components to be reused for surge attenuation, sludge handling including treatment by lime stabilization. Advanced treatment is provided using a cyclical nitrogen removal process pioneered

Rainbow Springs WWTP, Marion County, FL. Project Manager and Principal Engineer for the design and permitting of the selected treatment plant expansion program. The innovative design calls for advanced nutrient control and reuse of reclaimed water onto agricultural land, golf courses and the residential community with dual potable water and reuse water service lines. A comprehensive economic alternatives analysis for a facilities expansion program to handle a service area that ultimately generate 1.6 MGD was completed. Major tasks included identification of alternatives, preliminary en-

gineering of treatment plant and transmission mains, preparation of capital and operations & maintenance costs estimates. This project is located in the environmentally sensitive Rainbow River protection zone. Special services included managing protected wildlife surveys and mitigation, stormwater management system design and permitting, special use permitting with the local zoning department, and coordinating all hydrogeologic activities.

Sugarmill Woods WWTP Expansion, Citrus County, FL. Project Manager and Principal Engineer helping to rerate the capacity of the existing facility's oxidation ditch from 0.500 MGD to approximately 0.7 MGD. Design services include expanding the plant headworks, addition of a new clarifier, and construction of chlorine contact chambers. He is also designing an engineered system for lime stabilizing waste sludge in order to meet the United States new EPA rule 503 requirements.

Brentwood WWTP Expansion, Citrus County, FL. Project Engineer, Principal Process and Permitting Engineer to enable the phased construction of the existing treatment plant to 2.30 MGD. Services included the preparation of construction plans, specifications, and other bid documents for an innovative 0.5 MGD oxidation ditch addition to the facility. The design specifically includes the capability to produce reclaimed water. Sludge is processed with a special vacuum sludge dewatering process. Components of the existing facility are used for sludge digestion and hydraulic surge attenuation. Other services include construction management and design of the site stormwater management system.

Marion Oaks WWTP Expansion, Marion County, FL. Project Manager and Principal Designer for the expansion of the Marion Oaks wastewater treatment plant from 0.200 MGD to 1.0 MGD in phases. Process design included development of the Modified

Ludzack Ettinger process for biological nitrogen removal. Sludge treatment was permitted to use lime stabilization. This project includes effluent disposal by rapid infiltration basins through 0.5 MGD. Production of reclaimed water is made possible during the 1.0 MGD expansion phase. Reclaimed water will be used irrigate in public areas such as golf courses and park tracts. The project included investigation of alternatives, design level engineering, preparation of construction drawings, regulatory permitting, construction administration and certification. Related services included obtaining special use permits from Marion County zoning department as well the design and permitting of the facility stormwater management system.

Crystal River Wastewater Treatment Plant Expansion, Crystal River, FL. Design Engineer performed design services in the planning, design, and preparation of construction plans, specifications and permit applications for an expansion to the City's wastewater treatment plant from 0.75 MGD capacity to 1.5 MGD capacity. The innovative design called for a dual oxidation ditch system with advanced nutrient removal using the Modified Ludzack Ettinger process, construction of new secondary clarifiers, conversion of the old rectangular clarifier to an effluent pumping facility and complete renovation of the aerobic sludge digester and thickener. Planning, design, and permitting of the new effluent disposal facility included 108 acres of spray irrigation zones on 226 acres, plus effluent storage and pumping facilities. Effluent is pumped to the land application site via a 4.5 mile long effluent force main.

Canterbury Lakes Wastewater Treatment Plant Expansion, Citrus County FL. Design Engineer coordinated complete engineering, surveying, planning and environmental services to establish a subregional treatment facility with planned expansions from 0.100 MGD to 0.800 MGD capacity.

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This facility included design and development of up to 80 acres of rapid infiltration basins utilized to recharge groundwater with treated effluent. State environmental permitting included preparation of a groundwater monitoring plan was completed. Helped administer Phase I construction which included inspections, contract management and facility start-up.

Oak Run WWTP, Marion County, FL
Design Engineer provided engineering services to study the treatment processes and physical condition of the treatment facility of a private utility in Central Florida. Now a matter of public record, Mr. McDonald correctly predicted several years in advance of the actual event that the treatment mode of the wastewater plant and method of wastewater disposal would lead to violations of Florida's groundwater protection rules. Assisted the Utility to modify the treatment and disposal mode to correct the groundwater problems created.

Bunt's Point Wastewater Collection System, Crystal River FL
Design Engineer performed alternative design and economic analysis studies as well as prepared construction plans and specifications for a wastewater collection system to serve an existing waterfront subdivision. Economic analysis considered the capital and operations & maintenance costs of a conventional gravity collection system versus a low pressure collection system. The selected design was a combination gravity sewer and low pressure system. Services included bid, construction administration, and preparation of an individual property owner assessment role.

Woodland Estates Wastewater Collection System, Crystal River, FL
Design Engineer performed alternative wastewater collection system design study and prepared construction plans of the selected design to provide service to an existing waterfront subdivision with 427 residential and

commercial lots on the environmentally sensitive Crystal River. Many of the developed lots had failed septic tank systems. Economic considerations included capital construction and operations & maintenance costs, and evaluation of alternative methods of computing individual lot owner assessments. Alternative collection system analysis included the preliminary design of low pressure sewer systems such as grinder and STEP systems. The selected design for which construction plans were prepared was for a gravity sewer system. Also administered project bidding and construction.

Lecanto Maintenance Facility, Industrial Waste Treatment, Citrus County, FL
Design Engineer for Waste Management's Lecanto Maintenance facility will maintain and wash municipal solid waste protection collection trucks. Designed and permitted an advanced collection, pumping and treatment system to reclaim the contaminated washwater. Collected washwater is settled and screened. Reclamation begins with air stripping to remove VOC's and oil skimmers to remove oil and grease. Supplemental process include hydrocarbon absorption, chlorination and filtration. A reverse osmosis unit deionizes the reclaimed water to make a high quality rinse water. The system is unique in that no discharge to surface or groundwater is needed.

Representative Water Supply Projects:

Crystal River Highlands Water Plant, Crystal River, FL
Project Engineer increasing demand, poor water quality and occasional introduction of air into the well pumps of this water plant prompted the Owners to make various improvements to the treatment plant. Improvements included the drilling of a new supply well, piping modifications and the installation of an emergency electrical generator. The treatment capacity and performance of the plant's chlorination system and iron filters was also evaluated.

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Pine Ridge/Citrus Springs Water Distribution System Mapping and Analysis, Pine Ridge, FL. *Project Engineer* coordinated the assembly of a computer simulation model of a very complex water supply and delivery system with five water plants, and over 100 miles of water mains. The system suffered low pressure and poor fire flow delivery problems in certain areas. The calibrated model was used to investigate several alternatives for correcting the deficiencies as well as to determine percent capacity utilized for rate setting purposes. On-going services include the design of a pressure boosting station.

Ozello Water System Hydraulic Analysis, Ozello Water Association *Project Engineer* Poor fire flow and system pressure problems caused this utility to have an extensive, computerized map and hydraulic analysis performed of this system. The analysis was acutely used to successfully locate areas of excessive system leakage.

Meadowcrest Water Supply Plant 44-486 Properties, Inc. *Design Engineer* civil designer involved with the design and specification of a ground storage tank, high service pumping system, and system hydraulic modelling

I-95/SR 206 Water Plant, Florida Department of Transportation *Project Engineer* Performed capacity analysis of an existing dual water plant supply system, effectiveness of existing treatment units, and made recommendations for upgrading plants

Floral City Water Association, Capacity And System Hydraulic Analysis *Project Engineer* Investigated the cause of the unbalanced operation of the Association's two water plant through computerized mapping and modelling. Assessed the capacity of the dual plant's high service and water treatment system.

Betz Farm/State Road 44 Off-Site Water/Sewer System, Citrus County, FL. *Senior Design Engineer* of major water and sewer utilities in west Citrus County. This project included 3.2 miles of 18" D.I.P. water main, three triplex sewage pump stations, approximately 3 miles of 10" force main, and associated utilities construction. This project included special consideration of the proposed Florida Department of Transportation 4-lane urban section construction along SR 44 and the reconstruction of 1.5 miles of North Holiday Drive. Administered the bid solicitation and construction administration services. Construction cost was \$1,600,000. The work was completed in 1990.

Homosassa Special Water District, Water Distribution System Capacity, Mapping and Analysis, Homosassa, FL. *Project Engineer* investigated low pressure problems and poor fire flow delivery of the District's water distribution and supply system. Sophisticated graphics based software able to simulate water system hydraulics was used to determine which transmission mains contributed to the problems. On-going services include the preparation construction documents to upgrade various aspects of the water system main lines and water plants.

City of Crystal River Water System Mapping and Hydraulic Analysis, Crystal River, FL. *Project Engineer*. Poor fire flow, inadequate "as-builts", and concerns about long term capacity caused the City of Crystal River to seek assistance with in developing an accurate, computer based map with a hydraulic analysis of the distribution system. Mr. McDonald was the project engineer directing the mapping over 53 miles of water mains and developing a computer model to correctly simulate present operating conditions. The analysis identified the need to complete several loops in order to enhance fire flow delivery and residual pressures.

Citrus County Jail Off-Site Water and Wastewater System, Citrus County, FL. *Project Engineer and Principal Designer* of a water distribution and wastewater collection system to connect Citrus County Jail to the County utility system. Design included computer modeling of County water system, design of backflow prevention and wastewater pumping system. Design had to meet unique and exceptional requirements to grind, aerate, and pretreat wastewater from the jail before introduction to the County's municipal collection system. Other services included construction inspection and final certifications to permitting agencies.

North Holiday Drive Reconstruction, FL. *Drainage and Environmental Engineering Designer* responsible for hydrologic analysis and project permitting for this collector road, constructed in an environmentally sensitive area. Design activities involved wetlands impact and mitigation, 100 year flood plain volume compensation design, design of wet detention ponds in closed drainage basins, as well as conveyance system design.

Representative Stormwater Management Projects

City of Inverness Master Stormwater Plan, FL. *Project Manager* coordinated the development of a Master Stormwater Plan for the City of Inverness. The project includes the compilation of the hydrologic features of the watersheds contributing runoff in the City as well as topography, soils, and conveyance systems into a Geographic Information System. Project deliverables will include an identification of all flood prone areas as well as a priority

project list for alleviating chronically flooded areas.

Black Diamond, Citrus County, FL. *Drainage Design Engineer* responsible for the design of retention ponds and stormwater conveyance systems in this premier Citrus County development.

City of Crystal River Water Reuse Land Application Facility, FL. *Drainage Design Engineer* responsible for the design and permitting of the surface water runoff management system for this reclaimed water land application site. Management systems included retention ponds, perimeter swales, as well as on-site depressional features. Hydrologic analysis had to consider modification to antecedent moisture conditions from the application of effluent.

City of Crystal River Master Stormwater Plan, FL. *Project Consultant* provided in-house peer review and in-house consulting services in the development of the City's Master Plan. Specific areas of contribution included the appropriate use of computer models, and City design and construction standards.

Publications

Applying Sludge to Agricultural Land - Within the Rules, Water/Engineering and Management, February 1995

Reducing Nitrogen for Water Reuse, Operations Forum, November 1994.

Solving Shipping Mail Package Plant Problems, Operations Forum September 1996

Windstream Utilities Water Plant Summary Capacity Analysis

Prepared by Berryman & Henigar

Crystal River Florida

April 30, 1997

At the request of Windstream Utilities, Berryman & Henigar has completed a summary, quantitative and preliminary assessment of Windstream Utilities ability to furnish water to a proposed service area expansion in Marion County. The results of our investigation are based on a site visit to the Utilities two water plants, copies of recent operating reports, and other data and information furnished by the owner.

Current Annual Average Water Production

The current annual average volume of water produced per day is 189,000 gpd for the system serving Majestic Oaks and Pidgeon Park, and 18,000 gpd for the system serving Sun Country estates. The system serves 285 active connections in Majestic Oaks, 44 connections in Pidgeon Park, and 64 active connections in Sun Country. In both systems, the maximum day demand is about 150% of the average daily demand.

Future Water Demand - Existing Service Area

Majestic Oaks is expected, at build out, to have 747 active connections, Pidgeon Park 94 connections, and Sun Country estates 208 connections. The expected demand is 483,000 from the Majestic Oaks and Pidgeon Park system, and 58,000 gpd from the Sun Country System.

Existing Water Plant Capacity

Discussions about how much capacity a water plant has available is often complicated by the fact that the plant's capacity can be expressed in terms of:

- What it is physically capable of producing in one day
- How much water it is allowed to pump out of the ground by the Water Management District
- How much water it is allowed to put into the distribution system by the Department of Environmental Protection.
- How much water is available for fire flow. This latter is itself complicated by issues of what areas the Utility is required to provide water flow to and what areas it is not by local ordinance.

The capacity of each water plant is examined with respect to each issue as follows:

Capacity of Majestic Oaks/Pidgeon Park

This water plant consists of two 12 inch water wells. In each well there is a submersible 40 Hp water pump. Water is disinfected by hypochlorination with storage in a 10,000 gallon hydropneumatic tank. A standby generator (100 Kw capacity) is available.

The plant's physical production capacity is the capacity of the limiting component in the system.

The two production wells have reportedly been tested up to 700 gpm, but apparently maximum yield has not been determined. It is thought the yield may be 1000 gpm per well.

The pumps in each well produce 500 GPM.

The maximum flow of water through the hydropneumatic tank is limited to 447 gpm for adequate chlorination contact time.

The limiting component is the well pump. Since one well or the other is considered a redundant standby, and since the well pumps are also responsible for meeting peak hour demand (estimated at two times ADF), the physical capacity of the water plant is not more than 380,000 gpd.

The plant's Water Use Permit (number 209380) limits withdrawals however to 280,000 gpd on an average day, twice that on a maximum day.

Since the plant is using hypochlorination instead of gas chlorination, FDEP will limit water distribution to 240,000 gpd.

Capacity Sun Country Estates Water Plant

This water plant consists of one 8 inch water well. In the well there is a submersible 15 Hp water pump. Water is disinfected by hypochlorination with storage in a 10,000 gallon hydropneumatic tank. No standby generator is available.

The plant's physical production capacity is the capacity of the limiting component in the system.

The production well is reported to have a maximum capacity of 347 gpm.

The pump in the well is reported to have a capacity of 325 GPM. Based on rated horsepower, we think this needs to be verified. In the absence of field verification, we have made a conservative, more realistic assumption that the pump may produce 220 gpm.

The maximum flow of water that should be put through the hydropneumatic tank is 447 gpm, chlorination contact time being a limiting factor.

From the foregoing the limiting component is the well pump. Allowing for a peak hour factor of two, the physical capacity of this water plant is 154,000 gpd.

The current Water Management District water use permit for the Sun Country Estates water plant was not available for review. The permit application documents requested an average day withdrawal of 41,800 gpd and 66800 gpd on a maximum day.

Because there is no standby well and no backup generator, FDEP will limit water distribution to 150 connections, which in this case equates to a flow of 42,000 gpd.

Fire Flow-Water Plants

Available fire flow is the difference between peak hour demand and the maximum rate at which water can be put into the system. Minimum acceptable fire flow withdrawal for practical purposes is 500 gallons per minute per fire hydrant. Fire flow requirements are based on criteria contained within Marion County's Land Development Code.

The Sun Country Estates water plant system has no fire flow capacity. In addition, the mains in the subdivision have not been sized to provide fire flow.

We understand the Majestic Oaks water distribution system was constructed before the Marion County fire flow ordinance came into effect.

The current peak hour demand of the Majestic Oaks water system is estimated to be 263 gpm. This estimate is based on the assumption that peak hourly flows are twice average daily consumption. With the ability to pump 1000 gpm into the system, the available fire flow is 737 gpm as produced by the wells. Since the water needs to be chlorinated and since insufficient contact time would exist in the existing storage tank at 737 gpm, a second storage tank would need to be added. Additional fire flow is possible by reducing system pressure, which may be acceptable in a fire emergency and provided minimum system pressure is maintained.

Available Capacity

The available capacity at each water plant to satisfy future peak demands (not fire flow) with no additional improvement or repermitting required is as follows:

Majestic Oaks	51,000 gpd
Sun Country	24,000 gpd

In the event it may be considered that addition of gas chlorination and increasing the water use permit withdrawal is not a major capital expense, then the available capacity of the Majestic Oaks system increases to 171,000 gpd to satisfy future peak demand.

Future Capacity Required

The zoning in the requested service expansion area generally limits development to 1 unit in 10 acres. High densities are of course possible near the SR200 commercial corridor. The potential for zoning changes to allow higher densities as development in the area intensifies creates the potential for a significant customer service base in the future.

Windstream has furnished estimates of potential connections to the Utility should the service area be expanded.

The potential water demand from the service area is estimated as follows from the number of anticipate future ERCs furnished by Windstream Utilities.

New Service Area			
Description	ERCs	gpd/ERC	Flow

Section 16	280	575	161000
Section 21	400	575	230000
Section 17	60	283	16980
Section 8	50	283	14150
Section 18	100	283	28300
		Total	450430

It has been assumed that development and consumption patterns in section 16 and 21 will be similar to Majestic Oaks. Consumptive patterns elsewhere have been assumed will be similar to Sun Country Estates.

Total flow from both the existing and future service area has been estimated to be as follows:

Total Projected Flow, Service Area + Existing

<i>Existing at Buildout</i>	541424
<i>Future at Buildout</i>	450430
Total Flow	991854 gpd

Water plant Upgrades

As noted above, there does exist significant reserve capacity in the system. To serve the entire service area in the future, some expansion will be needed.

Ultimate Facility Requirements

A water main will be needed to connect the Sun Country Estates water well with the Majestic Oaks water plant. This interconnection will improve the overall reliability of the water system and eliminate the need to install standby power and to drill a second well at the Sun Country Estates water plant.

Of the 1,000,000 gpd needed, 154,000 gpd will be supplied by the Sun Country Estates plant and 846,000 gpd will be supplied by the Majestic Oaks Water plant.

The wells will be redirected to discharge into a ground storage tank, which should increase their withdrawal capacity to 850 gpm each. No new wells need be driven as a result.

The peak demand served by the facility is 1164 gpm. Based on Marion County LDC requirements, the corresponding fire flow and storage capacity required is 2250 gpm and 450,000 gallons volume.

For discharge into the distribution system there will be required (4) hi service pumps: a jockey pump under 600 gpm, and (3) pumps under 1200 gpm each.

Conversion to gas chlorination is required at the Majestic Oaks facility.

We expect to have to add an additional 200 KW in standby generator capacity.

Permit Upgrades

The water use permit(s) will need to be obtained to allow a combined system withdrawal of one million gallons on an average day to serve the future, ultimate build out.

Distribution System and Improvements

Most of the mains in the existing Majestic Oaks water system appear to be 6 and 8 inch, C-900 DR 25 PVC water main. The water mains in the Sun Country Estates are reported to be older ASTM pressure class 160 PVC, with sizes ranging from 2" to 4" in diameter. It is also reported that the water mains are subject to periodic breakage, about 3 to 4 times per year.

To increase over all system reliability and to allow transmission of fire flow over to the SR200 service corridor, a 12 inch fire water main would be constructed (approximately 5,000 feet) from one system to another.

As new customers in the corridor became available, extensions would be made out to SR200. Similarly, extensions west and south of Majestic Oaks would be made to serve those areas as they develop.

Phased Improvement Program

Improvements to the Utility can be carried out in three distinct phases to minimize costs.

Phase 1

In the first phase, the two existing water plants would be interconnected with the water main referenced above. With the ability to supply fire flow from the two wells in Majestic Oaks, there will be a need for additional chlorination contact time at the well as well as gas chlorination. A second hydropneumatic tank is proposed for that purpose.

These improvements are intended to improve the reliability of service throughout the system, increase fire flow capacity. This improvements will also allow the initial expansion of capacity to serve the SR200 corridor.

Phase 2

In the second phase, a ground storage tank, high service pumping, and additional generator capacity is provided. These improvements would allow the utility to further provide service to the growing SR200 corridor as well as growth within its current service area.

It is envisioned that (3) of the (4) high service pumps of the ultimate facility would be installed. 200,000 gallons of the ultimate 450,000 gallons in storage capacity would be provided.

These improvements would be for increasing fire flow capacity as well as meeting increasing peak demand.

Phase 3

Phase 3 improvements include an increase in ground storage water tank capacity to the total volume described above, as well as adding a fourth pump to meet the ultimate high service pumping capacity required.

Expected Capital Costs

An opinion of the potential capital costs for water plant improvements necessary are described below for each phase. Cost allowances for line extensions to new service areas are excluded pending the actual development plans of these areas.

Windstream Utilities - Facility Expansion Costs

Item	Phase 1	Phase 2	Phase 3
Site Work	\$4,000	\$8,000	\$4,000
Ground Storage Tank Hydropneumatic Tank	\$11,000	\$100,000	\$150,000
Electrical Building Addition generator		\$75,000 \$35,000 \$50,000	\$25,000
Chlorination	\$8,500		
Pumps		\$33,000	\$12,000
Yard Piping 12" Interconnect, 5000 ft	\$10,000 \$175,000	\$60,000	\$30,000
Soil Testing Engineering/Permitting	\$28,148	\$2,000 \$48,735	\$2,000 \$30,105
Total	\$236,648	\$409,735	\$253,105

Operations and Maintenance

Windstream Utilities has the following resources in place to operate and maintain a water service utility:

Organization

The operations and maintenance organization is a combination of several full time personnel directly employed by the Utility as well as a contract operator.

The full time personnel consist of the Owner, who reports he is a licensed general and underground utility contractor. He reports he has been involved with the construction and operation of water systems since 1983.

The utility also has two other staff for maintenance of lines and equipment.

Aqua-Pure Inc. is the contract operator for this facility. Aqua-Pure is also a contract laboratory.

The utility performs its own billing.

Maintenance and Spare Parts

The Utility maintains some spare parts such as meters, chlorinators and some fittings. Most other required spare parts are obtainable from local suppliers.

Cross Connection Control

The Utility reportedly has a cross connection control policy. Deed restrictions in Majestic Oaks reportedly prohibit the installation of irrigation wells. The Utility indicates that it performs periodic investigations of the water system to determine if cross or unauthorized connections are occurring.

Water Conservation Program

Because of the high level of per connection water usage in this system in the Majestic Oaks service area, the Utility would probably benefit from a more effective water conservation program to discourage excessive individual water use.

Comparison of Windstream Utilities Technical Ability to Serve the Service Area to Marion County's Efforts

To provide at least 740 +/- gpm fire flow to the SR200 service corridor and to make available the excess 171,000 gpd water in the Majestic Oaks system, Windstream Utilities would need, at a minimum to:

- Increase the allowed withdrawal under their current water use permits
- Interconnect their two existing water plants
- Install gas chlorination
- Install a second hydropneumatic tank
- extend distribution lines to the area.

To provide levels of fire flow in excess of 740 gpm, Windstream would need to add a ground storage tank and high service pumps.

Marion County has had several studies performed (PBSJ, and HAI) but has no facilities in the area. An application to construct a water plant has apparently been filed. We understand from FDEP the water plant will consist of (2) 12 inch wells and a hydropneumatic tank.

To offer comparable service as Windstream Utilities, Marion County will need to:

- Acquire property for the water plant (if it has not already done so)
- Obtain a water use permit construct and test two wells
- Obtain permit from the FDEP to construct a water plant
- Build the water plant

- extend distribution lines to the area.

To have expanded fire flow capacity, Marion County would likewise probably need to add a ground storage tank and high service pumps.

By simple comparison, the County's level of effort to provide service to the same area is likely to be more costly the Windstream's level of effort.