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DIRECT TESTIMONY
OF KARL E. HANKIN
ON BEHALF OF
JEA
DOCKET NO. 981637-WS

DOCUMENT NUMBER-DATE
05207 APR 22 88
FPSC-RECORDS/REPORTING

1 Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

2 A. My name is Karl E. Hankin. My business address is

3 21 West Church Street, Jacksonville, Florida 32202-

4 3139.

5 Q. BY WHOM ARE YOU EMPLOYED AND WHAT IS YOUR CURRENT

6 POSITION?

7 A. I am employed by JEA as Director of Distribution

8 Coordination Management.

9 Q. WHAT IS THE NATURE OF YOUR WORK FOR JEA?

10 A. I am responsible for externally driven water, sewer

11 and electric distribution projects. I also

12 supervise 3 appointed managers covering developer

13 driven projects such as subdivisions, apartment

14 complexes and commercial buildings and Joint

15 Project Agreements with various government

16 agencies. I am also involved with the water and

17 wastewater Geographical Information System project

18 which is the computerized mapping of JEA's water

19 and wastewater facilities and responsible for JEA's

20 first ever Electric, Water and Sewer Master Plan.

21 Q. FOR PURPOSE OF HAVING YOU QUALIFIED AS AN EXPERT IN

22 THE FIELD OF WATER AND WASTEWATER ENGINEERING,

23 PLEASE SET FORTH YOUR EDUCATION AND PROFESSIONAL

24 EXPERIENCE.

1 A. I received a bachelor of science degree in
2 Environmental Engineering from the University of
3 Florida in 1985. I am a licensed professional
4 engineer in the State of Florida, license number
5 0045233. I have been serving as Director,
6 Distribution Coordination Management for JEA since
7 1998 fulfilling the duties I previously described.
8 I have also served as an Acting Managing Engineer
9 from 1997 to the present. In that capacity, my
10 duties include responsibility for water and
11 wastewater master planning, developer negotiations,
12 utility plan review and permitting. From 1990-
13 1997, I was employed by the City of Jacksonville,
14 Florida, serving as an Acting Managing Engineer
15 from 1996-1997. During the approximate eight years
16 I worked for the City of Jacksonville, I was
17 involved with and responsible for the design,
18 construction and permitting of numerous water and
19 wastewater facilities and projects. Prior to my
20 work with the City of Jacksonville, I was employed
21 by Flood Engineers, Architects, Planners, Inc. as a
22 project engineer from 1986-1990. In that capacity,
23 I helped design a 7.5 million gallon per day
24 wastewater treatment plant and a 1.2 million gallon
25 per day advanced wastewater treatment plant.

1 Q. WHAT ARE YOUR PROFESSIONAL AFFILIATIONS?

2 A. I am a member of the American Waterworks
3 Association and the American Public Works
4 Association.

5 Q. CAN YOU PLEASE IDENTIFY THE DOCUMENT LABELED
6 EXHIBIT ____ (KEH-1)?

7 A. Yes. It is my resume.

8 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS
9 DOCKET?

10 A. The purpose of my testimony is to identify the
11 specific facilities which will be designed,
12 constructed and permitted by JEA to provide
13 wholesale water and wastewater services to St.
14 Johns County under the recent St. Johns County/JEA
15 Water and Wastewater Utility Services Agreement
16 ("Agreement"). I will also identify the costs of
17 the facilities that JEA will design and construct
18 to provide wholesale service to the Phase I and
19 Phase II areas included in the Service Area under
20 the Agreement, and to additional territory in St.
21 Johns County not included within the Service Area
22 under the Agreement. I will also provide the
23 specific costs to provide wholesale services to
24 Allen D. Nease High School and the Walden Chase

1 Subdivision (CR 210 PUD) included in the Phase I
2 Area.

3 Q. ARE YOU FAMILIAR WITH THE WATER AND WASTEWATER
4 UTILITY SERVICES AGREEMENT ENTERED BETWEEN ST.
5 JOHNS COUNTY AND JEA ATTACHED TO MR. KELLY'S
6 TESTIMONY AS EXHIBIT __ (SDK-2)?

7 A. Yes, I am familiar with the Agreement and the
8 facilities which will be installed by JEA to
9 provide service under Options 1, 2 and/or 3 of the
10 Agreement. I also have calculated the costs of the
11 facilities JEA will provide under the three
12 different options under the Agreement and the cost
13 of facilities attributable to provide wholesale
14 water and wastewater service to the Walden Chase
15 Subdivision.

16 Q. HAVE YOU PREPARED AN EXHIBIT IDENTIFYING THE
17 ESTIMATED COSTS FOR THE FACILITIES WHICH WOULD BE
18 UTILIZED BY JEA TO PROVIDE WHOLESAL WATER AND
19 WASTEWATER SERVICES TO TERRITORY IN ST. JOHNS
20 COUNTY INCLUDING THE PHASE I AND PHASE II AREAS
21 UNDER THE AGREEMENT?

22 A. Yes. I have prepared and attached Exhibit __ (KEH-
23 2) to my testimony which identifies the facilities
24 JEA intends to design and construct to provide
25 wholesale water and wastewater services to

1 properties and developments in St. Johns County,
2 including the Phase I and Phase II Areas, the costs
3 of such facilities, as well as the conservative
4 engineering assumptions I utilized in deriving the
5 cost to provide wholesale service to Nease High
6 School and the Walden Chase Subdivision.

7 Q. PLEASE EXPLAIN HOW YOU DERIVED THE COSTS AND
8 ENGINEERING ASSUMPTIONS REFLECTED IN EXHIBIT __
9 (KEH-2)?

10 A. The costs associated with the piping, water
11 reservoir, pump station, high service pumps,
12 chlorination equipment and generator are estimates
13 based on costs JEA has experienced on past
14 projects. The engineering assumptions were derived
15 from sound engineering practice that has proven to
16 be valid for this type of work. The development
17 flow information was based on either actual
18 recorded flows or estimated flows based on number
19 of anticipated dwelling units. Based on my
20 experience in the design and construction of water
21 and wastewater facilities, it is my opinion that
22 the costs shown on Exhibit __ (KEH-2) are
23 reasonable and the engineering assumptions
24 reflected in the same exhibit and used to derive
25 the wholesale cost of service to Nease High School

1 and the Walden Chase Subdivision are both
2 reasonable and conservative.

3 Q. WHAT ARE JEA'S ANTICIPATED COSTS FOR DESIGN,
4 PERMITTING AND CONSTRUCTION OF THE FACILITIES WHICH
5 WOULD BE UTILIZED TO PROVIDE WHOLESALE SERVICE TO
6 PROPERTIES, DEVELOPMENTS AND SUBDIVISIONS WITHIN
7 ST. JOHNS COUNTY INCLUDING THE PHASE I AND PHASE II
8 AREAS UNDER THE AGREEMENT?

9 A. The total cost for the facilities which would
10 provide wholesale water and wastewater services in
11 St. Johns County including the entire Service Area
12 anticipated in the Agreement (Phases I and II) is
13 estimated to be \$5,226,000. Of the total amount, I
14 estimate a total cost of \$2,845,000 for the
15 facilities which would be utilized to provide
16 wholesale service in St. Johns County including the
17 Phase I area.

18 Q. WHAT ARE JEA'S ANTICIPATED COSTS ASSOCIATED WITH
19 PROVIDING WHOLESALE WATER AND WASTEWATER SERVICE TO
20 NEASE HIGH SCHOOL AND THE WALDEN CHASE SUBDIVISION
21 UNDER EACH OF THE THREE OPTIONS UNDER THE
22 AGREEMENT?

23 A. The costs of the facilities, including the costs
24 allocated to provide service to Nease High School
25 and the Walden Chase Subdivision, are reflected in

1 Exhibit ____ (KEH-2). Nease High School and the
2 Walden Chase Subdivision are included in the Phase
3 I Service Area under the St. Johns County/JEA
4 Agreement. JEA intends to build the same
5 facilities to provide service in the Phase I Area
6 under Options 1 and 3. In other words, the same
7 facilities will be installed and the same costs
8 will be incurred to provide wholesale service in
9 portions of St. Johns County, including the Phase I
10 Area, whether the County chooses Option 1 (service
11 only to Nease High School and Walden Chase
12 Subdivision) or Option 3 (service requested first
13 for the Marshall Creek Subdivision). The total
14 costs to provide wholesale service to Nease High
15 School and the Walden Chase Subdivision are \$7,000
16 and \$168,000, respectively.

17 **Q. HOW DID YOU DERIVE THESE COSTS?**

18 **A.** Service to the Nease High School and Walden Chase
19 Subdivision is a small part of a comprehensive
20 joint service venture between JEA and St. Johns
21 County for the provision of water and wastewater
22 services in St. Johns County. The lines installed
23 to provide service to the Phase I and Phase II
24 Areas are sized to provide service throughout the
25 Phase I and Phase II Areas and surrounding areas in

1 St. Johns County on a cost-efficient basis, taking
2 into account the economies of scale gained through
3 the installation of oversized and economically
4 sized facilities. To calculate the costs to
5 provide wholesale service to Nease High School and
6 Walden Chase, I utilized the very conservative
7 engineering assumptions reflected in Exhibit __
8 (KEH-2). I then applied the costs of the
9 facilities necessary to provide service to Nease
10 High School and Walden Chase to the ratio of the
11 specific demand of the property or development over
12 the total capacity of the line. The result is the
13 allocated cost of the facilities necessary to
14 provide wholesale water and wastewater services to
15 the property or development.

16 Q. CAN YOU GIVE AN EXAMPLE OF YOUR CALCULATIONS BY
17 DEMONSTRATING HOW YOU CALCULATED THE COST TO
18 PROVIDE WHOLESAL WASTEWATER SERVICE TO THE WALDEN
19 CHASE SUBDIVISION?

20 A. Yes. In the case of Walden Chase which is part of
21 the Phase I Area, JEA will build a specified
22 quantity of 16" force main along U.S. 1 to provide
23 wastewater service to properties in this part of
24 St. Johns County including the Phase I Area. The
25 cost of that facility is estimated to be \$591,360.

1 JEA will also need to construct a wastewater
2 pumping station and upgrade the existing 12" force
3 main in Duval County to a 16" force main to provide
4 wastewater service in this part of St. Johns County
5 including the Phase I Area. The estimated costs
6 for the facilities are \$170,000 and \$198,000,
7 respectively. With the addition of a contingency
8 cost factor of approximately 11.08%, this comes to
9 a total cost of \$1,065,676. Applying this cost
10 factor to a ratio of the estimated wastewater flow
11 of Walden Chase (conservatively estimated at 131
12 gallons per minute) over the total capacity of the
13 16" force main (1880 gallons per minute), the
14 result is an allocated cost for the 16" force main
15 for Walden Chase of \$74,257. JEA will also need to
16 construct a specified quantity of 12" force main at
17 a cost of \$108,000. By applying the same
18 methodology to the 12" force main, the result is a
19 total allocated cost to provide wholesale
20 wastewater service to the Walden Chase Subdivision
21 of \$89,000.

22 Q. BASED ON YOUR EXPERIENCE AND JUDGMENT, IS THIS A
23 REASONABLE APPROACH AND METHODOLOGY FOR THE
24 ALLOCATION OF COSTS TO PROVIDE WHOLESALE WATER AND

1 WASTEWATER SERVICES TO NEASE HIGH SCHOOL AND THE
2 WALDEN CHASE SUBDIVISION?

3 A. Yes.

4 Q. DOES THAT CONCLUDE YOUR TESTIMONY?

5 A. Yes, it does.

6

KARL E. HANKIN, P.E.

717 Valley Forge Road N., Neptune Beach, Florida 32266 (904) 247-2736 Wk. (904) 632-4485

B.S. Environmental Engineering University of Florida 1985
Licensed Professional Engineer State of Florida No. 0045233

CAREER SKILLS/KNOWLEDGE

[U1]

- Geographic Information Systems (GIS)
- Engineering Design
- Contract Administration
- Capital Program Planning
- Developer & Contract Negotiations
- Customer Service Systems
- Master Planning
- Technology as Strategy
- Strategic Planning
- Covey Principles
- Infrastructure Management
- Facilities Planning
- Change Leadership
- Hydraulic Modeling

CAREER EXPERIENCE

JEA

Director, Distribution Coordination Management 1998 - Present

Responsible for externally driven water, sewer, and electric distribution projects. Supervises three appointed managers covering developer driven projects, and Joint Project Agreements (JPA) with the Florida Department of Transportation (FDOT), the City of Jacksonville, and other agencies. Involved with the water and sewer GIS project, and responsible for JEA's first ever Electric, Water, and Sewer Master Plan.

Acting Managing Engineer 1997 - Present

Responsible for water and wastewater master planning, GIS, hydraulic modeling, developer negotiations, As-built record maintenance, the Customer Service Counter, utility plan review, and permitting.

CITY OF JACKSONVILLE, FLORIDA

Acting Managing Engineer 1996 - 1997

Responsible for water and wastewater master planning including GIS and hydraulic modeling, As-built record maintenance, developer negotiations, permitting, project funding and tracking. Responsible for the Preliminary Engineering Committee (PEC) which identified over 100 million dollars of renewal and replacement (R&R) projects to eliminate sanitary sewer overflows (SSO's). The projects identified by the PEC have been scheduled to be designed and constructed.

Professional Engineer 1990-1996

Corrosion Control - Responsible for fast tracking the 2.5 million dollar project to meet a regulatory deadline.

KARL E. HANKIN, P.E.

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GIS - Administered a contract for a 17 square mile pilot study. Developed an RFP to complete the GIS project, negotiated the award of phase 1 of the project, and administered the project which was completed in 1997.

Hydraulic Modeling - Maintained the City of Jacksonville's potable water computer model and utilized it to size treatment plants and transmission piping. Instructed in-house classes on modeling.

SISP - Project officer for the Strategic Information System Plan which involved the review of current business practices and the elimination of bottlenecks. The next step of the project is the appropriate use of computer technology to increase competitiveness.

Computer Technology - In charge of computer purchases. Chairman of the Department's Computer Technical Guidance and Standards Quality Management Board (QMB). Developed standards, policies and procedures, goals and objectives.

Computerized Maintenance of As-built Records - Maintained the City's water and sewer as-built records and prepared data for conversion to GIS.

Water Treatment Plant Design - Designed 1.5 million gallon concrete reservoir for two plants incorporating a clarifier style sloped-bottom to help control sand buildup, larger than normal tray aerators in conjunction with roof fans, and a new internal baffling system for improved treatment. Both plants have been constructed and are in operation.

Master Planning - Worked with the consultant to complete the City's Water Master Plan and provided critical review during the project.

Contamination Cleanup - Administered contracts with environmental firms to accomplish the required studies for the Boulevard Property diesel oil soil and groundwater contamination site. Wrote the specifications and administered the contract for the construction and operation of the treatment system.

FLOOD ENGINEERS, ARCHITECTS, PLANNERS, INC.

Project Engineer

1986-1990

Wastewater Treatment Plant Design - Helped design a 7.5 million gallon per day wastewater treatment plant for the City of Jacksonville. Included clarifier design and plant hydraulics. The plant is currently in operation. Helped design a 1.2 million gallon per day advanced wastewater treatment plant for the Jasper, Florida including performing the hydraulic analysis. The plant is currently in operation.

Automated Skyway Express - Involved in the Automated Skyway Express. Verified existing utility locations and obtained information on planned utilities along the route. This project is currently under construction.

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PAGE THREE

Wastewater Master Planning - Involved in the Wastewater Master Plan for the City of Jacksonville. Analyzed existing and proposed wastewater transmission systems with the FAAST computer program and recommended improvements through the year 2010. Involved in the Water and Wastewater Master Plan for Escambia County Utilities Authority. Analyzed the existing and proposed wastewater collection system using HYDRA .

JEA - Phase 1 - Walden Chase/Nease HS
Phase 2 - Marshall Creek

Docket No. 981637-WS
Exhibit (KEH-2)
Phase I and II Facilities
and Costs
Page 1 of 4

PHASE	QUANTITY	UNIT	DESCRIPTION OF ITEM	U. COST	EXTENSION
1	18480	LF	16" Force Main - PVC DR25 in US #1	\$ 32.00	\$ 591,360.00
	18480	LF	20" Water Main - PVC DR25 in US#1	\$ 45.00	\$ 831,600.00
	1	LS	500,000 Gal Reservoir w/ High Service Pumps, CL2 Booster & Standby Generator	\$ 500,000.00	\$ 500,000.00
	1	LS	Wastewater Pumping Station	\$ 170,000.00	\$ 170,000.00
	15840	LF	Duval Co - Upsize 12" FM to 16" PVC DR25	\$ 12.50	\$ 198,000.00
	5400	LF	12" Force Main - PVC DR25 in Easement	\$ 20.00	\$ 108,000.00
	5400	LF	16" Water Main - PVC DR25 in Easement	\$ 30.00	\$ 162,000.00
			Subtotal		\$ 2,560,960.00
	1	LS	Contingency	\$ 283,804.00	\$ 283,804.00
			Total		\$ 2,844,764.00
2	1	LS	Increase to 1,000,000 Gallon Reservoir, incl High Service Pumps, CL2, & Generator	\$ 300,000.00	\$ 300,000.00
	1	LS	Repump - Upsize PS in Phase 1	\$ 250,000.00	\$ 250,000.00
	23760	LF	16" Water Main - PVC DR25	\$ 32.00	\$ 760,320.00
	23760	LF	16" Force Main - PVC DR25	\$ 32.00	\$ 760,320.00
			Subtotal		\$ 2,070,640.00
	1	LS	Contingency	\$ 310,596.00	\$ 310,596.00
			Total		\$ 2,381,236.00

Engineering Assumptions:

Velocity = 3 feet/second (ft/s) for water mains and sewer force mains. This is accepted as a good engineering design velocity.

Walden Chase: Water demand = 131 gallons per minute (gpm), Sewer flow = 131 gpm. Flows for water and sewer based on 539 units with 3.5 people occupying each unit with a average flow per person of 100 gallons per day.

Nease High School: Water demand = 6 gpm, Sewer flow = 6 gpm.

Marshall Creek: Water demand = 690 gpm, Sewer flow = 627 gpm

Pipe Capacities

12" = 1,057 gpm

16" = 1,880 gpm

20" = 2,937 gpm

OPTION 1

	Sewer	Water	Total
Walden Chase	\$ 89,000	\$ 79,000	\$ 168,000
Nease High School	\$ 4,000	\$ 3,000	\$ 7,000
Available Capacity	\$1,093,000	\$1,577,000	\$2,670,000
Total	\$1,186,000	\$1,659,000	\$2,845,000

**OPTION 3 or OPTION
1 & 2**

	Sewer	Water	Total
Walden Chase	\$ 89,000	\$ 79,000	\$ 168,000
Nease High School	\$ 4,000	\$ 3,000	\$ 7,000
Marshall Creek	\$ 743,000	\$ 795,000	\$1,538,000
Available Capacity	\$1,512,000	\$2,001,000	\$3,513,000
Total	\$2,348,000	\$2,878,000	\$5,226,000

**Calculation of Cost of Wastewater
 Facilities to Serve Walden Chase Subdivision**

16 inch force main	\$591,360	
Pumping Station	170,000	
Upsize 12 inch force main to 16 inch force main	198,000	
	<u>959,360</u>	
Contingency factor	<u>x 1.1108</u>	
	\$1,065,676	
\$1,065,676 x 131/1880		\$74,257
12 inch force main	\$108,000	
Contingency factor	<u>x 1.1108</u>	
	\$119,689	
\$119,689 x 131/1057		<u>14,868</u>
TOTAL		<u>\$89,125</u>