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DOCKET NO. 070183-WS - Proposed adoption of Rule 25-30.4325, F.A.C., Water Treatment Plant Used and Useful Calculations.

WITNESS: Direct Testimony of Dwight T. Jenkins, Appearing on Behalf of the Staff of the Florida Public Service Commission.

DATE FILED: December 17, 2007

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1 DIRECT TESTIMONY OF DWIGHT T. JENKINS, ESQ., P.G.

2 Q. Would you please state your name and business address?

3 A. My name is Dwight T. Jenkins. My business address is 4049 Reid Street, Palatka,
4 Florida, 32178.

5 Q. By whom and in what capacity are you employed?

6 A. I am employed by the St. Johns River Water Management District as the Director of the
7 Division of Water Use Regulation.

8 Q. Would you please summarize your educational and professional experience?

9 A. I graduated from the University of Florida in 1981 with a Bachelor of Science degree in
10 Geology. I received my Masters of Science degree in Geology from the University of
11 Florida in 1983, and my Juris Doctor degree in 1994 from the University of Florida
12 College of Law. I am a licensed Florida Professional Geologist and a member of The
13 Florida Bar.

14 I began my professional employment as a hydrogeological consultant in 1984, and in
15 1986 I was employed by the St. Johns River Water Management District as the Manager
16 of the District's Orlando office. In this capacity, I was responsible for overseeing that
17 office's water use and compliance/enforcement programs. In 1997, I became Director of
18 the District's Division of Water Use Regulation. My responsibilities include managing
19 the District's water use water well regulatory programs which includes specific
20 responsibilities for overseeing the District's consumptive use (i.e., water use) permitting
21 and compliance programs, formulation of District water use, compliance, enforcement
22 and water shortage policies, directing staff reviews and processing of consumptive use
23 water well permit applications, coordination with local government and the regulated
24 public utilities, and testifying as an expert witness in administrative hearings.

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1 Q. Would you please summarize the purpose of your testimony?

2 A. The purpose of my testimony is to do the following:

3 (a) Explain how public water supply utilities are permitted by Florida's water
4 management districts (WMDs), focusing on the St. Johns River Water
5 Management District;

6 (b) Discuss how the aquifer is affected by pumping at wells in various locations and
7 circumstances, including whether the effects are the same if a withdrawal of the
8 same quantity of groundwater occurs over twelve hours, eighteen hours, or
9 twenty-four hours;

10 (c) Express an opinion on whether pumps should have "down time" in order for the
11 aquifer to recharge in the pumping zones;

12 (d) Opine on whether the general usage pattern of most customers reflects a need for
13 only twelve hours of pumping;

14 (e) Explain whether conservation has reduced (or can be reasonably expected to
15 reduce) the amount of water used on a per customer or per ERC basis.

16 Q. Have you attached any exhibits to your testimony?

17 A. Yes. I have attached one exhibit to my testimony: Exhibit DTJ-1 contains my
18 Curriculum Vitae.

19 Q. How do the water management districts permit water supply utilities?

20 A. The regulatory paradigm for issuing consumptive use permits (CUPs) in Florida consists
21 of three layers: (1) the enabling statutory authority and mandates in Chapter 373, Florida
22 Statutes (F.S.); (2) agency interpretation and implementation in title 40, Florida
23 Administrative Code, (F.A.C.); and (3) each water management district's "user's
24 manual," entitled Applicant's Handbook or Basis of Review, depending on the district.

25

1 While the programs are very similar from district to district, they are not identical, so one
2 must review each district's rules to obtain an understanding of the detailed requirements
3 in each district. Water utilities are permitted pursuant to the authority and requirements
4 set forth in Part II of the Florida Water Resources Act, Chapter 373, F.S. Section
5 373.216, F.S., requires Florida's WMDs to implement a program for the issuance of
6 permits authorizing the consumptive use of particular quantities of water covering those
7 areas deemed appropriate by the governing board. Starting in the early 1970s, all five
8 WMDs have implemented such programs.

9 The primary goals of the CUP programs are set forth in sections 373.219 and 373.016,
10 F.S. Section 373.219 provides:

11 The governing board or the department may require such permits for consumptive use of
12 water and may impose such reasonable conditions as are necessary to assure that such use
13 is consistent with the overall objectives of the district or department and is not harmful to
14 the water resources of the area.

15 In addition, section 373.016(d) provides that it is the policy of the Legislature "To
16 promote the availability of sufficient water for all existing and future reasonable-
17 beneficial uses and natural systems." The basic goal of this provision is to allow for
18 allocation of water to meet all reasonable-beneficial needs while, at the same time,
19 protecting and ensuring sustainability of water resources and natural systems. The
20 regulatory standard interwoven throughout WMD rules is the prevention of "harm."

21 Section 373.223, F.S., sets out the basic requirements to obtain a CUP. Section
22 373.223(1) provides that "To obtain a permit pursuant to the provisions of this chapter,
23 the applicant must establish that the proposed use of water:

24 (a) Is a reasonable-beneficial use as defined in s. 373.019;

1 (b) Will not interfere with any presently existing legal use of water; and

2 (c) Is consistent with the public interest.

3 The requirements above are typically referred to as the “three-prong test,” and the WMDs
4 have adopted comprehensive rules and technical requirements to implement it. WMD
5 rules pertaining to CUP are set forth in chapter 40, F.A.C., and in each district’s Basis of
6 Review or Applicant’s Handbook. The majority of WMD CUP requirements fall under
7 the reasonable-beneficial use prong. “Reasonable-beneficial use” is a term of art that is
8 defined in section 373.019(16) as “the use of water in such quantity as is necessary for
9 economic and efficient utilization for a purpose and in a manner which is both reasonable
10 and consistent with the public interest.” Generally, in order to obtain a permit, an
11 applicant must establish that the proposed use of water meets the following criteria.

12 Under the reasonable-beneficial use prong of the test , the applicant must:

- 13 • Demonstrate a need for the water (i.e. no “water banking”);
- 14 • Establish that the source is suitable for the use;
- 15 • Show that neither environmental nor economic harm will occur;
- 16 • Implement all feasible water conservation;
- 17 • Use lower quality sources;
- 18 • Not cause saline water intrusion; and
- 19 • Not violate state water quality standards.

20 In addition, the other two prongs of the three-prong test require that the proposed use of
21 water not interfere with existing legal uses and be consistent with the public interest.
22 WMD rules set forth comprehensive criteria for each of the above requirements, and each
23 type of use (for example, agriculture or public water supply) will have specific
24 requirements.

1 Some additional information regarding CUPs:

- 2 • When evaluating whether a proposed use meets CUP requirements and whether
3 the use will cause harm, the WMDs look at individual and cumulative impacts.
4 That is, the WMDs look to see whether the proposed use of water alone will cause
5 harm and whether all existing uses put together will cause harm.
- 6 • WMD rules allow permits to be requested and issued for many different types of
7 uses including public water supply, commercial/industrial purposes and
8 agriculture.
- 9 • CUP regulates the entire “use cycle” associated with a given water use. For
10 example, the withdrawal of water from the resource, its use by the permittee, and
11 the ultimate discharge are all covered under the permit.
- 12 • All uses of water, except one, are regulated by the CUP provisions of chapter 373.
13 The statute exempts only self-supplied domestic use. In addition, the WMDs
14 have adopted rules exempting from permitting many other uses that are either
15 regulated by another permitting program or have very little potential for causing
16 harm.
- 17 • WMDs regulate all waters in the state. This includes ground, surface, storm, and
18 reclaimed water, as well as seawater.
- 19 • Water in Florida belongs to the State of Florida. The only ownership right an
20 entity has is a “usuary” right pursuant to Florida’s regulatory requirements. An
21 entity has a right to use water only if it is doing so in accordance with Florida’s
22 regulatory requirements.
- 23 • CUPs are issued with finite permit durations. These durations range from very
24 short (less than 1 year) up to 20 years and are based on the applicant’s
25

1 demonstration that the proposed use of water will meet CUP requirements. When
2 a CUP expires, the permittee must apply for a renewal of the CUP and
3 demonstrate that the use of water will meet all permitting requirements in
4 existence at the time of renewal.

- 5 • CUPs are issued with “limiting conditions” that govern the water use. Generally,
6 limiting conditions either prohibit actions (e.g., using more water than allocated)
7 or mandate actions (e.g., hydrologic monitoring). CUPs for large water users
8 such as public water supply utilities may contain 40 or more conditions.

9 The consumptive use of water by public utilities is permitted under the regulatory scheme
10 described above. To obtain a CUP, a public utility must demonstrate it meets all
11 applicable CUP requirements included in the three-prong test. When a utility
12 demonstrates it meets these requirements, a permit will be issued for a duration (up to 20
13 years) based on the applicant’s demonstration that the proposed use meets WMD
14 requirements. The permit will contain numerous limiting conditions that govern how the
15 water is used.

16 Some of the typical limiting condition requirements placed on public water supply
17 permits include the requirements to:

- 18 • Implement a water conservation plan;
- 19 • Provide reclaimed water to users such as residential irrigation users, golf courses
20 and agricultural projects;
- 21 • Perform hydrologic monitoring;
- 22 • Develop and use alternative water supplies; and
- 23 • Submit five-year compliance reports pursuant to section 373.236(4), F.S.

24 Q. Can you explain how the aquifer is affected by pumping in various circumstances? For
25

1 example, is the aquifer affected by the amount of continuous pumping each day, i.e., 12
2 hours, 16 hours, or 24 hours a day?

3 A. To fully answer those questions, I would need to discuss very technical aspects of ground
4 and surface water hydraulics and hydrology. Instead, and for the purposes of this PSC
5 proceeding, I have attempted to provide a basic, less technical explanation below.

6 How an aquifer is affected by pumping is primarily a function of four things. These are
7 the:

- 8 • Hydraulic aspects of the aquifer;
- 9 • Design of the wells and wellfield;
- 10 • Volume of water being withdrawn; and
- 11 • Rate of withdrawal.

12 When a well is pumped in Florida, it creates a three dimensional “cone of drawdown” in
13 the aquifer. This cone of drawdown reduces the potentiometric pressure in an artesian
14 aquifer (such as the Floridan Aquifer) and can also lower water levels in water table
15 aquifers (such as the Surficial Aquifer). Lower aquifer pressure and water levels
16 generally result in a change and increase in recharge into the aquifer. The change in
17 recharge can occur from above, beside and/or below the aquifer zone being pumped.
18 Lowering of water levels and change in recharge can cause undesirable impacts or harm
19 to water resources. However, it does not always cause undesirable impacts or harm.
20 Actually, because of consumptive use regulation and permitting, withdrawals are
21 managed such that they rarely cause such impacts or harm.

22 The potential for undesirable impacts or harm due to the pumping of ground water is a
23 function of many factors. Examples of undesirable impacts or harm that can be caused
24 by the lowering of water levels and a change in recharge due to pumping include:

- 1 • lowering of water levels in lakes and wetlands, resulting in loss of habitat;
- 2 • reduction in spring flows, resulting in loss of habitat;
- 3 • saline water intrusion, reducing the usability of the water resource;
- 4 • increased sinkhole formation, which can cause personal and economic damage;
- 5 and
- 6 • interference with existing legal uses of water, impairing the ability of a water user
- 7 to access the water resource.

8 As discussed above, when a well is pumped, a cone of drawdown is created. The cone
9 “grows” in the aquifer, starting from when the well pump is turned on and will increase
10 in size until the volume of water that is being withdrawn is offset by increased recharge.
11 When the cone stops growing, hydrologists refer to it as “reaching steady state
12 conditions.” In Florida, localized steady state conditions are typically reached quickly,
13 i.e., in a matter of hours or days after a well starts pumping, although a true steady state
14 can take years to achieve. The quickness with which localized steady state conditions
15 can be reached in Florida is an important factor in the discussion of whether operating
16 wells for shorter or longer periods helps avoid harm that can be caused by pumping.

17 Another important aspect of this topic is the role of cumulative drawdowns. Most
18 concerns associated with ground water withdrawals in Florida are due to the cumulative
19 withdrawals by multiple permittees, not withdrawals from a single well or well field. For
20 example, the concerns associated with large-scale environmental impacts in central
21 Florida are due to cumulative withdrawals in the region.

22 Q. Is there a benefit from operating wells for shorter periods of time instead of longer
23 periods?

24 A. The answer to this question depends on many factors. However, because steady state
25

1 conditions are reached very quickly in Florida and because impacts of concern result
2 primarily from regional cumulative withdrawals, management of these impacts is
3 typically a function of regulating long term withdrawals. In evaluating whether a
4 proposed withdrawal will cause harm to lakes, wetlands and spring flows, the WMDs
5 generally look at the volume of water that will be used in a single month, or more
6 commonly, each year. However, since some impacts such as localized environmental
7 harm, interference and upconing saline water intrusion can be caused by short periods of
8 high volume pumping, shorter pumping periods have to be evaluated in cases where these
9 impacts are a concern.

10 The bottom line is that there is typically no benefit to operating wells or a well field for a
11 period of 12 hours versus 24 hours in Florida since localized steady state drawdown
12 conditions are quickly reached and impacts are often caused by regional cumulative
13 withdrawals. However, in some cases, such as where there are localized resource
14 impacts, interference with existing legal uses, or saline water intrusion, short-duration
15 operation of wells can be used to avoid or minimize the impacts. More importantly,
16 shifting withdrawals from one well to another may be more beneficial in addressing such
17 impacts since doing so moves withdrawals away from the point of concern.

18 Q. In view of that testimony, do you have an opinion as a professional geologist on whether
19 public water supply pumps should have "down time" each day so that the aquifer can
20 recharge in the pumping zones?

21 A. Yes, the general answer to this question is that pumps may need downtime in specific
22 cases to avoid harms such as localized resource impacts, interference with existing legal
23 uses or saline water intrusion. However, it is more important to regulate longer term
24 withdrawals of water, to prevent harm.

1 I think another way to ask and answer this question is “Do we need to manage or regulate
2 individual and cumulative withdrawals of ground water in order to prevent harm to the
3 environment and water resources due to short and long term pumping?” And the answer
4 is absolutely yes!

5 Q. For the purposes of the PSC’s proposed rule, is it reasonable to base firm reliable
6 capacity on a duration of well pumping that is less than 24 hours?

7 A. Yes, it is reasonable. It is important that a water supply utility have the ability under PSC
8 rules to install additional pumps and wells so that they have withdrawal capacity above
9 what is needed to meet typical water user demands. Although it is very specific to the
10 particular utility, utilities will typically have an installed withdrawal capacity of at least
11 120% of their peak day water demand. In some cases, the amount of “redundant”
12 installed withdrawal capacity needed can be much higher. The reason for the additional
13 installed capacity is that wells often do need to be taken off-line for short, and sometimes,
14 long periods of time. When a well is off-line, water demands will need to be met via
15 withdrawals from other wells. Examples of why wells go, or are taken, off-line include:

- 16 1. Standard maintenance and replacement of pump hardware;
- 17 2. Unanticipated pump and/or well failure;
- 18 3. Distribution system problems that isolate a well or wellfield;
- 19 4. Water quality/contamination in a well or wellfield
- 20 5. Shifting withdrawals to avoid unacceptable water resource impacts (ex. To avoid
21 saline water upconing); and
- 22 6. Shifting withdrawals to avoid interference with other existing legal uses of water.

23 Well operation of a multiple-wellfield water supply utility can be complex. A typical
24 system will have wells that are operated almost continuously to provide a base flow (this
25

1 is acceptable in areas where continuous withdrawal does not cause resource harm), wells
2 that are operated intermittently to augment the base flow to meet peak demands, wells
3 that allow for shifting of withdrawals if such are needed to address well-specific impact
4 concerns and back-up wells that may only be occasionally operated when other wells are
5 not available or during emergencies. While it may appear unwarranted to the layperson,
6 having all this additional installed capacity is necessary in order to provide reliable
7 service.

8 The bottom line is that, it is reasonable to base firm reliable capacity on something less
9 than an assumption that all wells will be pumped 24 hours a day, 7 days a week since the
10 wellfield taken as a whole cannot operate this way.

11 Q. Explain whether conservation has reduced (or can be reasonably expected to reduce) the
12 amount of water used on a per customer or per ERC basis.

13 A. Review of historical water use information throughout the state of Florida has shown that
14 implementation of water conservation measures has and will result in the reduction of the
15 amount of water used by residential and other water users. In some cases, it is anticipated
16 that water use can be reduced by 15% or more in some utility service areas. The ability
17 to reduce water use is a function of many factors including the degree of discretionary
18 use, current water use inefficiency, and cultural/social interest in conserving. However, it
19 should be noted that there is a limit to the ability to reduce water use through
20 conservation in Florida. While conservation, alone, will not be sufficient to meet long
21 term water demands in most areas, water conservation will help address water needs
22 while alternative water supplies are being developed.

23 Q. Does that conclude your testimony?

24 A. Yes.

25

EX_DTJ - 1

CURRICULUM VITAE OF
DWIGHT T. JENKINS, ESQ., P. G.

DOCUMENT NO. DATE

10972-07 12/17/07
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Exhibit DTJ-1**Curriculum Vitae of
Dwight T. Jenkins, Esq., P.G.**1. Professional Address/Contact Information

Dwight T. Jenkins, Esq., P.G.
 Director, Division of Water Use Regulation
 Department of Resource Management
 St. Johns River Water Management District
 P.O. Box 1429
 4049 Reid Street/Highway 100 West
 Palatka, FL 32178-1429
 Office Phone: (386) 329-4491
 Cell Phone: (386) 937-0529
 Email: djenkins@sjrwmd.com

2. Academic Degrees

| | | | |
|------|--------------------------------------|------|-----------------|
| J.D. | University of Florida College of Law | 1994 | Law |
| M.S. | University of Florida | 1983 | Geology |
| B.S. | University of Florida | 1981 | Geology |
| A.A. | University of Central Florida | 1979 | General Studies |

3. Relevant Professional Experience***Managerial/Technical Employment:***

**Director, Division of Water Use Regulation
 St. Johns River Water Management District
 Palatka, Florida; 1997 to present**

Manage District's water use regulatory and water well construction programs. Responsibilities include: programmatic oversight and development of 4 regulatory programs; management of 42+ member professional staff located in four service centers; formulation and drafting of District water use, compliance, and shortage rules, regulatory policies, and technical requirements; and directing staff review and processing of consumptive use permit and water well construction applications. Duties also include directing rule-making activities; coordinating with District's water supply management planning initiatives, assisting with the setting of minimum flows and levels, coordination with other agencies, local government and the regulated public, and acting as agency representative and testifying as an expert witness in administrative hearings and in civil litigation.

Hydrologist IV
St. Johns River Water Management District
Orlando, Florida; 1986 - 1991, 1994 - 1995

Manage Water Use Regulatory, and compliance/enforcement, programs for the District's Orlando Office. Participated in the formulation and drafting of District rules, regulatory policies and technical requirements. Reviewed District water use and surface water management permit applications, comprehensive plans, development of regional impact plans, performed special project research and hydrogeologic modeling, and testified as an expert witness in hydrogeology.

Research Geologist
Florida Sinkhole Research Institute
University of Central Florida
Orlando, Florida; 1984 - 1986

Performed hydrogeologic research on Florida's karst geology, focusing on sinkhole phenomenon. Developed and implemented field and office studies. Published and presented scientific publications.

Hydrogeologic Consultant
Orlando, Florida; 1984 - 1986

Contracted as a hydrogeologic consultant on an industrial ground water contamination project located in Bainbridge, Georgia. Duties included ground water sampling, water quality analysis, data review and analysis, determination of contaminant concentration and plume extent, and report drafting.

Legal Employment:

Attorney, Office of General Counsel
South Florida Water Management District
West Palm Beach, Florida; 1995 to 1997

Position was District Water Resource Program Attorney within the Office of General Counsel's Regulatory and Planning Section. Duties associated with this position related to general program support of the District's Regulatory Department, particularly the Water Use Division, Surface Water Management Division, and the District's Water Supply Planning Department. Support of the District's Water Use and Surface Water Management Divisions include: review of technical staff reports; research, analysis, and drafting of legal opinions on a variety of legal issues associated with regulatory and water use projects; conducting rulemaking, assisting with policy development; treating with regulated public; and conducting water management related administrative litigation. Support of the District's Planning Department included: attendance at intergovernmental coordination meetings; support of the District's Upper District water supply planning initiatives; review and revision of District planning documents; and general support of staff.

**Legal Intern, Office of Counsel
South Florida Water Management District
West Palm Beach, Florida; Summer 1993**

Performed legal research and other tasks related to the management and regulation of Florida's water resources. Tasks included summarizing changes to environmental laws and rules; rewriting District regulations for revision; helping with rulemaking; and working on current litigation projects.

**University of Florida, College of Law
Gainesville, Florida; 1993-1994**

Worked as a reference materials consultant in the Reference Section of the College of Law's Legal Information Center.

Teaching Employment:

**Adjunct Instructor, Department of Civil Engineering
University of Central Florida
Orlando, Florida; 1984 - 1991**

Instructed geology, geography and natural resource management courses. Assisted in instructing various engineering courses.

4. Licenses and Certifications

Licensed Florida Professional Geologist (No. 0001072)
Member of The Florida Bar (No. 0008753)

5. Professional Affiliations

American Water Resources Association
American Water Works Association

6. Publications

Kissimmee Basin Water Supply Plan Background Document: South Florida Water Management District.

Interdistrict Coordination on Water Resource Management Issues: Env. and Land Use Law Section Reporter, v. 17, No. 3, p. 23, 1996.

Statewide Water Well Regulation in Florida: Env. and Land Use Law Section Reporter, v. 17, No. 2, p. 16-17, 1996.

Development of Storm Water Management Criteria for Sensitive Karst Areas in North-central Florida, U.S.A.: Proceedings of the N.W.W.A. Second Conference on Environmental Problems in Karst Terranes and Their Solutions, Nashville, Tennessee, p. 333, 1988.

Irrigation Triggers Sinkholes in Tampa Area: in Ground Failure, Nat. Research Council Committee on Ground Failure Hazards, no. 2, Washington, D.C., 1985.

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with Beck, Barry F.; and Parker, John W.; *Cause of Localized Land Subsidence at the MacDill A.F.B., Tampa, Florida*: The Florida Sinkhole Research Inst. (Univ. of Central Florida), Rpt. 85-85-4, 1985.

with Beck, Barry F.; Wanielista, M.P.; Palmer, Carla N.; Taylor, J.S.; and McBee, J.M.; *Water On and Under the Ground (An Introduction to the Urban Hydrogeology of the Orlando Area)*: The Florida Sinkhole Research Inst. (Univ. of Central Florida), Rpt. 85-86-3, 23, p. 1985.

with Smith, Douglas L.; *Paleomagnetic Measurements in the Eastern Ouachita Mountains, Arkansas*: A Guidebook to the Geology of the Central and Southern Ouachita Mountains, Arkansas; Arkansas Geol. Commission, guidebook no. 84-2, p. 99, 1984.

Paleomagnetism of the Eastern Ouachita Mountains, Arkansas, and their Tectonic Implications: M.S. thesis, Univ. of Florida, Gainesville, 158 p., 1983.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Proposed adoption of Rule 25-30.4325, F.A.C., Water Treatment Plant Used and Useful Calculations. DOCKET NO. 070183-WS
DATED: DECEMBER 17, 2007

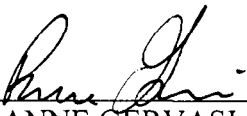
CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the DIRECT TESTIMONY OF Dwight T. Jenkins has been furnished by U.S. Mail to the following this 17th day of December, 2007:

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