

Exhibit No.: 1100

Issues: Depreciation Rates

Witness: Dr. Ronald E. White

Sponsoring Party: Aquila Networks-MPS

Case No.: ER-2004-0034 &

Before the Public Service Commission
of the State of Missouri

FILED³

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Missouri Public
Service Commission

Rebuttal Testimony

of

Dr. Ronald E. White

Exhibit No. 1100

Case No(s) ER-2004-0034

Date 3-1-04

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**TABLE OF CONTENTS OF
REBUTTAL TESTIMONY OF
DR. RONALD E. WHITE
AQUILA, INC. D/B/A AQUILA NETWORKS-MPS**

CASE NOS. ER-2004-0034

PURPOSE OF TESTIMONY.....	1
RESPONSE TO STAFF WITNESS SCHAD.....	1
DEPRECIATION PROCEDURE.....	4
DEPRECIATION TECHNIQUE.....	7
SERVICE LIFE STATISTICS.....	10
STAFF DATA CONCERNS.....	11
LIFE-SPAN CATEGORIES.....	12
FULL-MORTALITY CATEGORIES.....	15
NET SALVAGE ACCRUALS.....	18

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI
REBUTTAL TESTIMONY OF DR. RONALD E. WHITE
ON BEHALF OF AQUILA, INC.
D/B/A AQUILA NETWORKS—MPS [REDACTED]
CASE NOS. ER-2004-0034 [REDACTED]**

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

2 A. My name is Ronald E. White. My business address is 17595 S. Tamiami Trail, Suite 212,
3 Fort Myers, Florida 33908.

4 Q. Are you the same Ronald E. White who filed direct testimony on behalf of Aquila
5 Networks (“Aquila” or “Company”) in this proceeding before the Missouri Public Ser-
6 vice Commission (“Commission”)?

7 A. Yes, I am.

PURPOSE OF TESTIMONY

9 Q. What is the purpose of your rebuttal testimony?

10 A. I was asked by Aquila to respond to the pre-filed direct testimony of Commission Staff
11 (“Staff”) Witness Rosella L. Schad. In particular, I was asked to review and comment on
12 adjustments advocated by Witness Schad to the depreciation rates recommended by Fos-
13 ter Associates for electric, industrial steam and common utility properties owned and
14 operated by Aquila Networks—MPS [REDACTED]. I will also comment
15 on rates advocated by Staff for Aquila Corporate Assets shared with other business units,
16 including MPS [REDACTED].

RESPONSE TO STAFF WITNESS SCHAD

18 Q. What is the difference in the annual depreciation rates and accruals requested by the
19 Company and those advocated by Staff?

1 A. Table 1 provides a summary of the difference in annual depreciation rates and accruals
2 requested by the Company and those advocated by Staff. With the exception of Corporate
3 Assets, this comparison is based on December 31, 2001 plant and reserves reported in the
4 2002 Depreciation Rate Studies.¹

Business Unit	Accrual Rate			2002 Annualized Accrual		
	Company	Staff	Difference	Company	Staff	Difference
A	B	C	D=C-B	E	F	G=F-E
MPS						
Electric	3.41%	2.38%	-1.03%	\$36,855,198	\$25,662,385	\$-11,192,813
Corporate	11.86%	9.42%	-2.44%	6,256,676	4,970,471	-1,286,205
Total MPS	3.81%	2.70%	-1.11%	\$43,111,874	\$30,632,856	\$-12,479,018

TABLE 1. COMPANY VS STAFF RATES AND ACCRUALS

5 It can be observed from Table 1 that Staff is advocating a composite depreciation rate re-
6 duction of 1.01 percentage points from that requested by the Company. The reduction in
7 depreciation rates advocated by Staff reduces the Company's requested 2002 annualized
8 depreciation expense by \$15,166,889, or more than 26 percent.

9 The currently prescribed composite accrual rate of 2.92 percent provides an annualized
10 accrual of \$43,663,996. The reduction in depreciation rates advocated by Staff reduces
11 currently approved annualized depreciation expense by \$2,216,395. (\$43,663,996 -
12 \$41,447,601), or more than five percent.

13 Q. What is the difference in the annual depreciation rates and accruals requested by the
14 Company and those advocated by Staff for MPS operations?

¹ The comparison for Corporate Assets is based on forecasted December 31, 2002 plant and reserves reported in the 2003 Depreciation Rate Study.

1 A. Table 2 provides a summary of the difference in annual depreciation rates and accruals
2 requested by the Company and those advocated by Staff for MPS operations.

Function	Accrual Rate			2002 Annualized Accrual		
	Company	Staff	Difference	Company	Staff	Difference
A	B	C	D=C-B	E	F	G=F-E
Steam Production	4.28%	2.25%	-2.03%	\$14,910,910	\$7,847,909	\$-7,063,001
Other Production	4.05%	3.10%	-0.95%	1,199,677	918,611	-281,066
Transmission	2.04%	1.84%	-0.20%	3,087,251	2,776,780	-310,471
Distribution	3.16%	2.37%	-0.79%	16,015,491	12,006,600	-4,008,891
General Plant	4.20%	4.43%	0.23%	1,059,085	1,116,973	57,888
Common Plant	3.06%	5.22%	2.16%	582,784	995,512	412,728
Corporate	11.86%	9.42%	-2.44%	6,256,676	4,970,471	-1,286,205
Total	3.81%	2.70%	-1.11%	\$43,111,874	\$30,632,856	\$-12,479,018

TABLE 2. COMPANY VS STAFF RATES AND ACCRUALS - MPS OPERATIONS

3 It can be observed from Table 2 that Staff is advocating a composite depreciation rate re-
4 duction for MPS operations of 1.11 percentage points from that requested by the Com-
5 pany. The reduction in depreciation rates advocated by Staff reduces the Company's
6 requested 2002 annualized depreciation expense by \$12,479,018, or nearly 29 percent.
7 The currently prescribed composite accrual rate of 2.71 percent provides an annualized
8 accrual of \$30,697,758. The reduction in depreciation rates advocated by Staff reduces
9 currently approved annualized depreciation expense by \$64,902 (\$30,697,758 -
10 \$30,632,856), or approximately 0.20 percent.

11 Q.

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13 A.

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[REDACTED]

A	B	C	D=C-B	E	F	G=F-E
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

7 Q. Why are the depreciation rates and accruals advocated by Staff significantly different
8 from those requested by Aquila?

9 A. The differences in depreciation rates and accruals advocated by Staff and those requested
10 by Aquila are largely attributable to:

- 11 a) The depreciation *procedure* used to develop accrual rates;
- 12 b) The depreciation *technique* used to develop accrual rates;
- 13 c) Modification of service life statistics; and
- 14 d) Elimination of net salvage accruals.

15 **DEPRECIATION PROCEDURE**

16 Q. What is a depreciation procedure?

17 A. As discussed in my direct testimony, a depreciation procedure identifies the level of

1 grouping or sub-grouping of assets within a plant category. [REDACTED] MPS [REDACTED] are cur-
2 rently using a broad-group procedure which Staff retained. Depreciation rates requested
3 by Aquila were developed using a vintage-group procedure.

4 The level of asset grouping identified in the broad-group procedure is the total plant in
5 service from all vintages in an account. Each vintage is estimated to have the same aver-
6 age service life. The level of asset grouping identified in the vintage-group procedure is
7 the plant in service from each vintage. Average service lives (or remaining lives) are es-
8 timated for each vintage and composite life statistics are computed for a plant account.

9 Q. Why did you recommend a vintage-group procedure for [REDACTED] MPS [REDACTED]?

10 A. The matching and expense recognition principles of accounting provide that the cost of
11 an asset (or group of assets) should be allocated to operations over an estimate of the
12 economic life of the asset in proportion to the consumption of service potential. It is the
13 opinion of Foster Associates that the objectives of depreciation accounting can be more
14 nearly achieved using the vintage-group procedure (combined with the remaining-life
15 technique). Unlike the broad-group procedure in which each vintage is estimated to have
16 the same average service life, the vintage-group procedure distinguishes average service
17 lives among vintages and provides cost apportionment over the estimated weighted-
18 average remaining life or average life of a rate category.

19 Q. Has the vintage-group procedure been approved for Aquila in other jurisdictions?

20 A. Yes, it has. Foster Associates has conducted depreciation studies for Aquila in Minne-
21 sota, Michigan and Kansas. Each of these jurisdictions has approved depreciation rates
22 derived from a vintage-group procedure. Depreciation rates are also being developed for
23 Aquila in Colorado and Iowa using the vintage-group procedure. It is not unreasonable,

1 therefore, to request that Missouri also approve depreciation rates derived from a vin-
2 tage-group procedure to more nearly achieve the goals of depreciation accounting and to
3 maintain consistency in the procedure used by Aquila in all jurisdictions.

4 Q. What is the difference in depreciation rates and accruals for MPS [REDACTED] resulting from
5 a use of the vintage-group procedure rather than the broad-group procedure?

6 A. Table 4 provides a comparison of depreciation rates and accruals using the vintage-group
7 procedure, remaining-life technique and the broad-group procedure, remaining-life
8 technique combined with the parameters and redistribution of reserves requested by
9 Aquila.

Business Unit	Accrual Rate			2002 Annualized Accrual		
	VG	BG	Difference	VG	BG	Difference
A	B	C	D=C-B	E	F	G=F-E
MPS						
Electric	3.41%	3.41%	0.00%	\$36,855,198	\$36,865,997	\$10,799
Corporate	11.86%	11.85%	-0.01%	6,256,676	6,253,148	-3,528
Total MPS	3.81%	3.81%	0.00%	\$43,111,874	\$43,119,145	\$7,271
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

TABLE 4. VINTAGE-GROUP VS BROAD-GROUP RATES AND ACCRUALS

10 It can be observed from Table 4 that marginally higher depreciation rates and accruals re-
11 sult from an application of the broad-group procedure. By comparison, depreciation ac-
12 cruals derived from an application of the parameters and whole-life technique advocated
13 by Staff would be reduced by \$196,385 (\$41,447,601-\$41,251,216) by adoption of the
14 vintage-group procedure. Clearly, the procedure requested by Aquila and approved for
15 the Company in other jurisdictions was not selected to maximize depreciation expense. It
16 was selected to more nearly achieve the goals and objectives of depreciation accounting.

1 **DEPRECIATION TECHNIQUE**

2 Q. What is a depreciation technique?

3 A. As discussed in my direct testimony, a depreciation technique describes the life statistic
4 used in the formulation of a depreciation rate. Both MPS ██████████ are currently using a
5 whole-life technique. Depreciation rates requested by Aquila were developed using a
6 remaining-life technique. The whole-life technique was retained by Staff.

7 The principal distinction between a whole-life rate and a remaining-life rate is the treat-
8 ment of depreciation reserve imbalances caused largely by imprecise estimates of service
9 life statistics and net salvage rates. A reserve imbalance is measured as the difference be-
10 between a theoretical or computed reserve and the corresponding recorded reserve for a rate
11 category.

12 A remaining-life rate is equivalent to the sum of two components: a) a whole-life rate;
13 and b) an amortization of any reserve imbalance over the composite weighted average
14 remaining life of a rate category. Stated as an equation, a whole-life rate is given by

$$15 \qquad \qquad \qquad \text{Accrual Rate} = \frac{1.0 - \text{Average Net Salvage Rate}}{\text{Average Life}}$$

16 The formulation of an account accrual rate using the remaining-life technique is given by

$$17 \qquad \qquad \qquad \text{Accrual Rate} = \frac{1.0 - \text{Reserve Ratio} - \text{Future Net Salvage Rate}}{\text{Remaining Life}}$$

18 which is equivalent to

$$19 \qquad \qquad \qquad \text{Accrual Rate} = \frac{1.0 - \text{Average Net Salvage Rate}}{\text{Average Life}} + \frac{\text{Computed Reserve} - \text{Recorded Reserve}}{\text{Remaining Life}}$$

20 where both the computed reserve and the recorded reserve are expressed as ratios to the
21 plant in service.

1 Q. Why did you recommend remaining-life depreciation rates for both MPS [REDACTED]

2 A. Unlike the currently prescribed whole-life rates in which reserve imbalances are
3 addressed by the presence of compensating deviations in the estimated average service
4 life of each vintage, the remaining-life technique provides a systematic amortization of
5 these imbalances over the composite weighted average remaining life of a rate category.
6 A permanent excess or deficiency will be created in the depreciation reserve by a contin-
7 ued application of the whole-life technique if service life deviations are not exactly off-
8 setting. The likelihood of a permanent reserve imbalance is eliminated by an application
9 of the remaining-life technique.

10 Q. Has the remaining-life technique been approved for Aquila in other jurisdictions?

11 A. Yes, it has. Foster Associates has conducted depreciation studies for Aquila in Minne-
12 sota, Michigan and Kansas. Each of these jurisdictions has approved remaining-life de-
13 preciation rates. Depreciation rates are also being developed for Aquila in Colorado and
14 Iowa using the remaining-life technique. It is not unreasonable, therefore, to request that
15 Missouri also approve remaining-life depreciation rates to more nearly achieve the goals
16 of depreciation accounting and to maintain consistency in the technique used by Aquila
17 in all jurisdictions.

18 Q. What is the difference in depreciation rates and accruals for MPS [REDACTED] resulting from
19 a use of the remaining-life technique rather than the whole-life technique?

20 A. Table 5 provides a comparison of depreciation rates and accruals using the vintage-group
21 procedure, remaining-life technique and the vintage-group procedure, whole-life tech-
22 nique combined with the parameters and redistribution of reserves requested by Aquila.

23

Business Unit	Accrual Rate			2002 Annualized Accrual		
	R/L	W/L	Difference	R/L	W/L	Difference
A	B	C	D=C-B	E	F	G=F-E
MPS						
Electric	3.41%	3.59%	0.18%	\$36,855,198	\$38,784,074	\$1,928,876
Corporate	11.86%	8.09%	-3.77%	6,256,676	4,270,881	-1,985,795
Total MPS	3.81%	3.80%	-0.01%	\$43,111,874	\$43,054,955	\$-56,919
[REDACTED]						
[REDACTED]						
[REDACTED]						
[REDACTED]						
[REDACTED]						

TABLE 5. REMAINING-LIFE VS WHOLE-LIFE RATES AND ACCRUALS

1 It can be observed from Table 5 that marginally higher depreciation rates and accruals re-
 2 sult from an application of the whole-life technique. By comparison, depreciation accru-
 3 als derived from an application of the parameters and broad-group procedure advocated
 4 by Staff would be reduced by \$5,699,051 (\$41,447,601-\$35,748,550) by adoption of the
 5 remaining-life technique. Clearly, the technique requested by Aquila and approved for
 6 the Company in other jurisdictions was not selected to maximize depreciation expense. It
 7 was selected to more nearly achieve the goals and objectives of depreciation accounting.

8 Q. Why is the difference between remaining-life accruals and whole-life accruals based on
 9 parameters advocated by Staff significantly larger than the difference obtained from pa-
 10 rameters requested by Aquila?

11 A. Apart from a relatively small difference attributable to the broad-group procedure, the
 12 reserve imbalance derived from Staff parameters (i.e., service life and net salvage statis-
 13 tics) is significantly larger than the imbalance derived from parameters estimated by Fos-
 14 ter Associates. It can be observed from Table 6 that the reserve imbalance derived from
 15 Staff parameters is \$154,955,357 compared with an imbalance of \$24,230,045 derived
 16 from parameters requested by Aquila.

Business Unit	Company			Staff	
	Recorded	Computed	Imbalance	Computed	Imbalance
A	B	C	D=B-C	E	F=B-E
MPS					
Electric	\$464,379,209	\$427,919,935	\$36,459,274	\$295,974,496	\$168,404,713
Corporate	2,051,206	14,280,435	-12,229,229	15,510,562	-13,459,356
Total MPS	\$466,430,415	\$442,200,370	\$24,230,045	\$311,485,058	\$154,945,357

TABLE 6. COMPANY VS STAFF RESERVE IMBALANCES

1 As noted earlier, the difference between a remaining-life accrual and a whole-life ac-
 2 crual is the amortization of a reserve imbalance. The amortization derived from Staff pa-
 3 rameters would be \$5,699,051 compared with an amortization of \$547,279 derived from
 4 the parameters requested by Aquila. It is understandable, therefore, why Staff recom-
 5 mended that "... the net over-recovery not be reduced at this time."² The drastic reduc-
 6 tion in depreciation expense advocated by Staff would be even further reduced by
 7 adoption of the remaining-life technique.

8 **SERVICE LIFE STATISTICS**

9 Q. What is the difference in depreciation rates and accruals for MPS and L&P resulting from
 10 the modification of service life statistics advocated by Staff?

11 A. Table 7 provides a comparison of depreciation rates and accruals using service life
 12 statistics (i.e., projection life and projection curve) requested by Aquila and service life
 13 statistics advocated by Staff. The procedure, technique, net salvage rates and redistribu-
 14 tion of reserves requested by Aquila were retained in the comparison to isolate differ-
 15 ences solely attributable to the changes in service life statistics advocated by Staff.

² Schad Direct Testimony, Page 16, Lines 7-8.

Business Unit	Accrual Rate			2002 Annualized Accrual		
	Company	Staff	Difference	Company	Staff	Difference
A	B	C	D=C-B	E	F	G=F-E
MPS						
Electric	3.41%	2.53%	-0.88%	\$36,855,198	\$27,307,004	\$-9,548,194
Corporate	11.86%	15.67%	3.81%	6,256,676	8,269,416	2,012,740
Total MPS	3.81%	3.14%	-0.67%	\$43,111,874	\$35,576,420	\$-7,535,454
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

TABLE 7. COMPANY VS STAFF SERVICE LIFE STATISTICS

1 It can be observed from Table 7 that service life statistics advocated by Staff produce a
 2 composite depreciation rate reduction of 0.74 percentage points from that requested by
 3 the Company. The reduction in depreciation rates reduces the Company's requested 2002
 4 annualized depreciation expense by [REDACTED] or more than 19 percent.

7,535,454

5 **1. STAFF DATA CONCERNS**

6 Q. [REDACTED]
 7 [REDACTED]
 8 [REDACTED]
 9 [REDACTED]

10 A. [REDACTED]
 11 [REDACTED]
 12 [REDACTED]
 13 [REDACTED]

14 Q. [REDACTED]

³ Schad Direct Testimony, Page 9.
⁴ Schad Direct Testimony, Page 9. Lines 7-10.

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12 Q.

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14 A.

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16 Q.

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2. LIFE-SPAN CATEGORIES

4 Q. What is a life-span category?

5 A. Life-span categories are plant categories composed of major items of plant that will most
6 likely be retired as a single unit. A power production unit, for example, is a life-span
7 category in which all associated plant and equipment will eventually be retired at the
8 same date, regardless of the age of the equipment.

9 Plant retirements from an integrated system prior to the retirement of the entire system
10 are properly viewed as interim retirements that will be replaced in order to maintain the
11 integrity of the facility. Additionally, plant and equipment may be added to the existing
12 system (*i.e.*, interim additions) in order to expand or enhance its productive capacity
13 without extending the service life of the present system. A proper depreciation rate can
14 be developed for an integrated system using a life-span method.

15 Q. What is a life-span method?

16 A. The life-span method requires the estimation of a coterminous retirement date for all
17 plant additions to a specific facility. A composite depreciation rate is calculated for the
18 facility using the technique of harmonic weighting of the expected life span of each vin-
19 tage addition. The resulting accrual rate must be adjusted for interim retirements to the
20 extent that such retirements can be reasonably predicted. Absent this adjustment, the de-
21 preciation accumulated over the life-span of the facility will be deficient by an amount
22 equal to a portion of the interim retirements. Properly implemented, the life-span method
23 does not include plant additions or replacements of interim retirements until such activity

1 is reported. All plant accounts classified in the steam, industrial steam and other produc-
2 tion functions were identified by location and treated as life-span categories in the
3 MPS depreciation studies.

4 Q. How did Staff estimate service lives for plant classified in the production functions?

5 A. Staff treated production functions as open-ended plant categories in which additions and
6 retirements are envisioned to be recorded in perpetuity. Service lives for production plant
7 were estimated in the same manner as, for example, poles or line transformers in which
8 life indications were derived from a statistical analysis of recorded retirements. The same
9 average service life was assigned to each vintage of a plant account. No consideration
10 was given to the expectation that each vintage will be retired at a coterminous date, irre-
11 spective of age, and therefore will exhibit a unique average service life.

12 Q. How do the service lives requested by Aquila for production plant compare with those
13 advocated by Staff?

14 A. Table 8 provides a comparison of composite average and remaining services lives
15 requested by Aquila using the vintage-group procedure with those advocated by Staff us-
16 ing the broad-group procedure.

Plant	Company			Staff	
	AYFR	ASL	R/L	ASL	R/L
A	B	C	D	E	F
MPS					
Jeffery	2020-2024	36.53	19.97	44.38	29.44
Sibley	2012-2015	23.04	12.45	44.42	31.78
Other Production	2010-2024	21.15	15.57	32.21	25.58
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Table 8. Company vs Staff Production Plant Statistics

1 The procedure, net salvage treatment and rebalancing of reserves adopted by Aquila and
2 Staff were retained in the comparison to properly derive the weighted statistics used in
3 developing depreciation rates. It can be observed from Table 8 that service life statistics
4 advocated by Staff are considerably longer than those obtained from a life-span treat-
5 ment in which a year of final retirement was estimated for each generating unit.

6 Q. How was the year of final retirement estimated for each station?

7 A. A year of final retirement was estimated by Aquila for each unit at each generating
8 station. The estimated retirement dates for each unit were composited by Foster Associ-
9 ates to obtain an estimated average year of final retirement (AYFR) for each station by
10 plant account.

11 Q. Did Staff explain why a life-span treatment was not applied to production facilities?

12 A. No, they did not. No explanation was offered for abandoning the life-span treatment
13 employed by both Company and Staff in a recent Missouri Public Service Case No. ER-
14 97-394. Apparently Staff is now of the opinion that a life-span treatment is no longer
15 appropriate for production facilities. It is disconcerting that Staff is abandoning a life-
16 span treatment for no apparent reason other than to reduce depreciation expense.

17 **3. FULL-MORTALITY CATEGORIES**

18 Q. What is a full-mortality category?

19 A. Full-mortality categories are plant categories in which additions, retirements and
20 replacements are anticipated to continue with no foreseeable date at which all plant will
21 be retired irrespective of age. A pole-line account, for example, is a full mortality cate-
22 gory in which poles will most likely be added, retired and replaced indefinitely.

23 Q. How are service lives estimated for a full-mortality category?

1 A. Statistical methods of life analysis combined with engineering judgment are used to
2 examine and describe the forces of retirement acting upon a full-mortality category. The
3 descriptors most often used are survival functions expressed as probability distributions.
4 The objective of a life analysis is to quantify the attributes of the parent population from
5 which observed retirements were extracted as a random sample. Life indications obtained
6 from an analysis of observed retirement activity must be tempered with informed judg-
7 ment to the extent that future forces of retirement or failure rates are anticipated to be dif-
8 ferent from those observed in the past. The tempering of observed life indications is
9 called *life estimation*. A variety of statistical techniques have been developed for estimat-
10 ing service lives of physical property, some of which are more robust than others.

11 Q. How would you describe the life analysis technique used by Staff?

12 A. It is a mechanized version of a visual curve-fitting technique employed long before the
13 advent of computers. Prior to the availability of mechanized systems, a series of survivor
14 proportions obtained from an observed life table was typically plotted on graph paper and
15 overlaid with correspondingly scaled graphs of survivor curves such as the Iowa-type
16 curves. The type-curves were drawn with various average service lives such that both the
17 dispersion and average service life of the observed proportion surviving could be selected
18 from a visual inspection of which curve appeared to best "fit" the data.
19 A mechanized version of the same technique merely replaces the visual inspection with a
20 fit criterion, such as a minimum sum of squared differences between the observed pro-
21 portion surviving and the theoretical proportion surviving obtained from a table of the
22 points displayed in a graphical representation of a type-curve. The type-curves used in

1 such an analysis can be scaled to any average service life, thereby providing a description
2 of both the dispersion and average service life of the fitted data.

3 Q. How do the life analysis techniques used by Foster Associates in conducting depreciation
4 studies for Aquila differ from those used by Staff?

5 A. Based upon extensive independent research and development of life analysis techniques,
6 Foster Associates uses a multi-step procedure in which various estimators of the ob-
7 served hazard rates (*i.e.*, conditional probabilities of retirement) obtained from an ob-
8 served life table are first graduated without regard to the observed proportion surviving.
9 A survivorship function is then derived from a transformation of a parametric form of the
10 hazard function and numerically integrated to obtain an estimate of the expected or mean
11 service life of the population from which the retirements displayed in the observed life
12 table are viewed as a random sample. The transformed survivorship function is then fitted
13 by a weighted least-squares procedure to type-curves (*e.g.*, Iowa) to obtain a mathemati-
14 cal description or classification of the dispersion characteristics of the data.

15 Q. Will the life analysis technique used by Foster Associates produce the same dispersion
16 and service-life indications as the technique used by Staff?

17 A. Not necessarily. The techniques used by Foster Associates were designed to overcome a
18 serious limitation in the technique used by Staff. Each successive measurement of the
19 proportion surviving developed in an observed life table is dependent upon the proportion
20 surviving in prior age-intervals. One or more anomalous retirements, therefore, will dic-
21 tate the proportion surviving in subsequent age-intervals. Fitting a survivor curve to the
22 observed proportion surviving will seldom produce an accurate description of the under-
23 lying forces of mortality.

1 The techniques used by Foster Associates maximize the informational content of the data
 2 and minimize the influence of extraneous events by extracting the underlying forces of
 3 mortality from an analysis of the hazard rates.⁵ This is not to suggest that an analyst must
 4 be highly trained in actuarial statistics to conduct a depreciation study. Absent this
 5 knowledge, however, life analysis becomes an exercise in curve-fitting rather than an at-
 6 tempt to quantify the attributes of the parent population from which observed retirements
 7 were extracted as a sample. It is not surprising therefore that Witness Schad would find
 8 different curve fits and service lives than Foster Associates identified from a more rigor-
 9 ous analysis of the underlying forces of mortality.

10 **NET SALVAGE ACCRUALS**

11 Q. What is the difference in depreciation rates and accruals for MPS [REDACTED] resulting from
 12 the elimination of net salvage rates advocated by Staff?

13 A. Table 9 provides a comparison of depreciation rates and accruals using net salvage rates
 14 requested by Aquila and the elimination of net salvage advocated by Staff.

Business Unit	Accrual Rate			2002 Annualized Accrual		
	With NS	W/O NS	Difference	With NS	W/O NS	Difference
A	B	C	D=C-B	E	F	G=F-E
MPS						
Electric	3.41%	2.52%	-0.89%	\$36,855,198	\$27,250,947	\$-9,604,251
Corporate	11.86%	11.84%	-0.02%	6,256,676	6,250,191	-6,485
Total MPS	3.81%	2.96%	-0.85%	\$43,111,874	\$33,501,138	\$-9,610,736
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

TABLE 9. COMPANY VS STAFF NET SALVAGE RATES

⁵ Although some correlation can be found in the conditional proportion retired, the covariance between the hazard rates in two age-intervals is asymptotically zero. This property has permitted the development of various methods of weighting that reflect serial independence of the disturbance term.

1 The procedure, technique and service life statistics requested by Aquila were retained in
2 the comparison to isolate differences solely attributable to the elimination of net salvage
3 rates advocated by Staff. It can be observed from Table 9 that the elimination of net sal-
4 vage advocated by Staff produce a composite depreciation rate reduction of 0.84 percent-
5 age points from that requested by the Company. This reduction in depreciation rates
6 reduces the Company's requested 2002 annualized depreciation expense by ^{\$9610,736} [REDACTED]
7 or more than 22 percent.

8 Q. What is your understanding of the treatment of net salvage advocated by Staff?

9 A. It is my understanding that Staff is advocating a disallowance of an accrual for net
10 salvage as a component of depreciation rates. The treatment advocated by Staff is a cost
11 of service allowance equal to an average of the annual net salvage realized over the most
12 recent five years. This treatment is equivalent to a current period recognition of net sal-
13 vage with a revenue allowance intended to approximate net salvage associated with cur-
14 rent retirements.

15 Q. What is the theoretical basis for including net salvage in depreciation rates?

16 A. *Depreciation is a measurement of the service potential of an asset that is consumed*
17 *during an accounting interval. The cost of obtaining a bundle of service units (i.e., a fu-*
18 *ture net revenue stream) is represented by an initial capital expenditure which creates a*
19 *revenue requirement for return and depreciation, and a future expenditure which creates a*
20 *revenue requirement for cost of removal reduced by salvage proceeds. The matching*
21 *principle of accounting provides that both the initial and future expenditures should be al-*
22 *located to the accounting periods in which the service potential of an asset is consumed.*
23 The standard or criterion that should be used to determine a proper net salvage rate is,

1 therefore, cost allocation over economic life in proportion to the consumption of service
2 potential. If some other standard (such as cash flow or revenue requirements) is consid-
3 ered more important in setting depreciation rates, then cost allocation theory must be
4 abandoned as the foundation for depreciation accounting.

5 The need to include cost of removal in the development of depreciation rates is widely
6 recognized and accepted by a substantial majority of state regulatory commissions as a
7 standard ratemaking principle. The FERC Uniform System of Accounts, for example, de-
8 scribes depreciation as the "... loss in service value" where service value is defined as
9 "... the difference between original cost and net salvage value of electric plant." Net sal-
10 vage value means "the salvage value of property retired less the cost of removal."

11 The economic principle underlying both the accounting and ratemaking treatment of cost
12 of removal is that in addition to return *of* and return *on* invested capital and taxes, a
13 revenue requirement for cost of removal (or a reduction in the revenue requirement at-
14 tributable to gross salvage) is created when an asset is placed in service. It is appropriate,
15 therefore, to include a net salvage component in depreciation rates to more nearly achieve
16 the goals of depreciation accounting and to equitably distribute the revenue requirement
17 for net salvage over the period in which the assets that created the requirement are used
18 to provide utility service.

19 Q. What is your understanding of the evolution of the treatment of net salvage advocated by
20 Staff in this proceeding?

21 A. To my knowledge, the earliest attempt by Staff to deliberately reduce depreciation
22 expense by adjusting net salvage rates was introduced with a novel formulation of a
23 whole-life depreciation rate designed to provide an allowance for net salvage equal to the

1 average *realized* net salvage observed over a recent band of years.⁶ The adjustment advo-
2 cated by Staff was derived by replacing the average net salvage rate in a whole-life for-
3 mulation of the accrual rate by the product of a realized net salvage rate and the ratio of
4 the average service life to a quotient obtained by dividing the plant balance by average
5 annual retirements.

6 It can be easily demonstrated that this formulation of the accrual rate is equivalent to a
7 two-part rate in which the first term is the reciprocal of the estimated average service life
8 and the second term is the ratio of average net salvage realized during a specified band of
9 years and the balance recorded in a plant account. The application of this adjusted rate to
10 a plant account yields the sum of a whole-life accrual without net salvage and a net sal-
11 vage allowance equal the average net salvage realized over the selected band of years.

12 Although this formulation of an allowance for net salvage advocated by Staff was signifi-
13 cantly less than the average of realized and future net salvage, it is important to note that
14 the allowance was treated as a component of depreciation expense and posted to the de-
15 preciation reserve.

16 While the "net salvage allowance" advocated by Staff did not provide cost allocation of
17 net salvage over the service lives of the assets that created a salvage or cost of removal
18 requirement, the reserve treatment minimally provided an opportunity for eventual recov-
19 ery of the capital costs incurred to remove earlier retirements. Preservation of the oppor-
20 tunity for capital recovery was subsequently viewed by Staff as an obligation that
21 ratepayers should not be required to assume.

⁶ Direct Testimony of Paul W. Adam in Laclede Gas Company Case No. GR-98-324.

1 It was apparently realized that ratepayers could be relieved of the obligation for full capi-
2 tal recovery by removing net salvage from the depreciation rate and granting the corre-
3 sponding amount as a cost of service allowance. This modified treatment of net salvage
4 was advanced by Staff in recent rate applications and is again advocated by Staff in this
5 proceeding.

6 Q. What is your assessment of the cost of service treatment of net salvage now advocated by
7 Staff?

8 In my opinion, it is both wrong in theory and inequitable in its application. As noted ear-
9 lier, the theory of including a net salvage allowance in depreciation rates is predicated on
10 the proposition that, in addition to return *of* and return *on* invested capital and taxes, a
11 revenue requirement for cost of removal (or a reduction in the revenue requirement at-
12 tributable to gross salvage) is created when an asset is placed in service. It is appropriate,
13 therefore, to include net salvage as a component of a depreciation rate to equitably dis-
14 tribute the revenue requirement for net salvage over the period in which the assets that
15 created the requirement are used to provide utility service. This objective will not be
16 achieved if the net salvage rate included in a whole-life depreciation rate produces less
17 than the average of both realized and future net salvage requirements.

18 The treatment of net salvage as a cost of service allowance is inequitable to the extent
19 that realized cost of removal in excess of the cost allowance is non-recoverable. The op-
20 portunity for capital recovery, albeit untimely, was preserved when the allowance and re-
21 alized amounts were posted to the depreciation reserve.

22 Q. Does this conclude your rebuttal testimony?

23 A. Yes, it does.

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

In the matter of Aquila, Inc. d/b/a Aquila)
 Networks-MPS [REDACTED])
 for authority to file tariffs increasing electric)
 rates for the service provided to customers in)
 the Aquila Networks-MPS [REDACTED])
 [REDACTED] area)

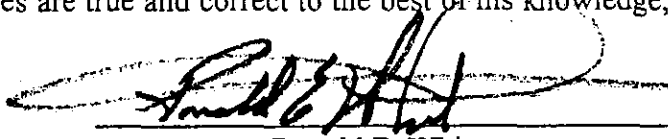
Case No. ER-2004-0034

[REDACTED])
 [REDACTED])
 [REDACTED])
 [REDACTED])

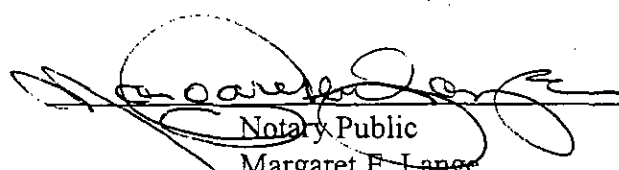
County of Lee)
) SS
 State of Florida)

AFFIDAVIT OF RONALD E. WHITE

Ronald E. White, being first duly sworn, deposes and says that he is the witness who sponsors the accompanying testimony entitled "Rebuttal Testimony of Ronald E. White;" that said testimony was prepared by him and under his direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, he would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of his knowledge, information, and belief.


 Ronald E. White

Subscribed and sworn to before me this 23rd day of January, 2004.


 Notary Public
 Margaret E. Lange

My Commission expires:

**OFFICIAL NOTARY SEAL
 MARGARET E. LANGE
 NOTARY PUBLIC STATE OF FLORIDA
 COMMISSION NO. DP050865
 MY COMMISSION EXP. OCT. 19 2005**