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1 **I. Introduction**

2

3 **Q Please state your name, address, and occupation.**

4 A My name is Marci L. Norby. My business address is 2515 Warren Ave., Suite 304,
5 Cheyenne, Wyoming, 82002. I am employed as a Senior Rate Analyst with the
6 Office of Consumer Advocate.

7

8 **Q Please describe your educational background, occupation, and experience.**

9 A I received a Master of Science degree in Finance from the University of Wyoming in
10 1999. After graduating, I was employed as a financial analyst in the banking
11 industry, where my duties included accounting, capital budgeting, financial
12 budgeting, bond portfolio management and administration, institutional investing,
13 economic analysis, and financial operations. I came to the Wyoming Public Service
14 Commission in August of 2000 and then to the Office of Consumer Advocate in May
15 of 2003.

16

17 **Q Have you testified before the Commission in previous proceedings?**

18 A Yes. I have included a list of my previous testimony before the Wyoming Public
19 Service Commission as MLN Appendix A of my testimony.

20

21 **Q On whose behalf do you appear today?**

22 A I appear in this case on behalf of the Office of Consumer Advocate (OCA).

23

24 **Q As a member of the OCA, do you advocate the interests of certain groups of
25 consumers over others?**

26 A No. As a member of OCA, it is my obligation to represent the interests of all
27 Wyoming citizens and all classes of utility customers in the state.

28

1 **Q What is the purpose of your testimony in this proceeding?**

2 A The purpose of my testimony is to provide an overview of Qwest Corporation's
3 (Qwest or Company) TSLRIC as well as the result of the OCA analysis and
4 recommendations regarding the TSLRIC inputs, models, and studies presented in
5 the dockets. I will also present the OCA's comments regarding Qwest's compliance
6 with Commission Rule § 518.

7
8 **Q Do you sponsor any exhibits in this proceeding?**

9 A Yes, I sponsor OCA Exhibit MLN-1 and Confidential Exhibit MLN-2 in this
10 proceeding. I will refer to my exhibits throughout my testimony.

11
12 **Q How is your testimony organized?**

13 A I will first discuss an overview of the theory, statutes, and Commission rules
14 regarding TSLRIC. Second, I will present the results of the OCA review and
15 recommendations of various Qwest models and inputs. Third, I will discuss an
16 overview of several questions in this case regarding compliance of the Qwest
17 TSLRIC calculations with the Commission Rules and Wyoming Statutes.

18

19

20 **II. Overview of TSLRIC**

21

22 **Q What is TSLRIC?**

23 A TSLRIC is the acronym for Total Service Long Run Incremental Cost. Wyoming
24 Statute § 37-15-103 (a)(xiii) defines TSLRIC as "the total forward-looking cost,
25 using least cost technology, for a telecommunications service or basic network
26 function that the telecommunications provider would incur if it were to initially offer
27 such telecommunications service or basic network function." The methodology
28 assumes that there are no existing facilities (a scorched node). The cost of building
29 those facilities to serve the demand for telecommunications services is determined

1 in the TSLRIC study using the least cost forward looking technology as well as the
2 most efficient network design.

3 The TSLRIC studies calculate the cost of each *service* provided to Qwest's
4 customers. The studies do not represent the embedded cost¹ of the network; rather
5 they are proxies for the forward-looking cost of the network.

6
7 TSLRIC is the incremental or additional cost a company incurs in the long run for
8 providing the service, assuming all of its other production activities remain
9 unchanged. In other words, TSLRIC represents the cost the company would avoid
10 in the long run if it ceased to provide the service in question.

11
12 **Q Is the result of the calculation of TSLRIC the stand-alone cost of providing a**
13 **particular product or service?**

14 **A** No. The stand-alone cost of a particular product or service is the total cost a
15 company would incur if that firm produced only that product, and is generally
16 regarded as the price ceiling. The stand-alone cost would include the common
17 costs as well as the cost of producing the product or service. TSLRIC does not
18 include the common costs allocated to a particular service.

19
20 If the revenue earned from a particular product exceeded the stand-alone cost then,
21 in theory, another firm that is not currently producing the product would be able to
22 profitably enter production in competition with the existing firm. The competitive
23 entry of the second firm is stimulated by the fact that the revenue earned from
24 producing the product exceeds the cost of only producing that product (its stand-
25 alone cost). If the revenue associated with producing a particular product falls
26 between the TSLRIC and the stand-alone cost then it is profit maximizing for the
27 firm to keep producing that product. In addition, no firm will wish to enter the market

1 The total current cost of owning, operating, and maintaining a utility's existing system. Under an embedded cost structure, a substantial portion reflects historical capital investments, including depreciation and return on investment.

1 and compete with the existing firm *by producing that product alone*. Therefore, the
2 stand-alone cost of providing one particular service or product can generally define
3 the potential price ceiling a provider could demand in a contestable market.
4

5 **Q What is incremental cost?**

6 A Incremental cost is the product specific cost and is the increase or decrease in costs
7 as a result of *one* more or *one* less unit of output.
8

9 **Q Why do we use the incremental costs instead of the stand-alone cost?**

10 A As I stated above, the stand-alone cost of producing the service or product is the
11 highest level of cost that might be recovered from a consumer in a contestable
12 market. Calculating the stand-alone cost for local service would include the entire
13 cost of the switch as well as other shared and common costs. The stand-alone cost
14 of providing toll service would also require the entire cost of the switch and the other
15 shared and common costs of providing only that service.
16

17 If a provider sustained prices above the stand-alone cost, there would be strong
18 evidence of a barrier to entry. Otherwise, entry by competitors would occur or users
19 would start to self-provide at a lower cost.
20

21 In contrast to the stand-alone cost, the use of the total service long run incremental
22 cost produces a price floor. The price floor is the cost of the forward looking least
23 cost network under which a company cannot operate profitably. When prices for
24 services are above the price floor, predatory pricing² is eliminated because a
25 provider cannot subsidize one service with another service in order to gain market
26 share.
27

28 **Q What are common costs and why are they *not* included in the calculation of**

1 **TSLRIC?**

2 **A** An example of a common cost is the president of a company's salary. The salary
3 cannot be attributable to any one service or product. The term common cost refers
4 to the costs incurred in the provision of some or all of a company's services that are
5 not incremental to any one service (such as the salary of the CEO). Common costs
6 are incurred in connection with the production of multiple products or services, and
7 remain unchanged as the relative proportion of those products and services varies.³
8 Common costs are only avoided by shutting down the company or by not producing
9 the particular services under study.⁴ The long run incremental cost of an individual
10 service refers to a product specific cost associated with the output of the specific
11 product. Common costs are not incremental to any individual service and are,
12 therefore, not considered in the analysis of the cost of providing any one product.
13 TSLRIC considers only the product specific costs and makes no allowance for
14 common costs associated with the multiple products or services of the company.

15

16 **Q** **How are shared costs treated in the TSLRIC calculation?**

17 **A** The Commission Rule §535 states,

18

19 A portion of the costs associated with plant, equipment, or other
20 investment that is used by a telecommunications company to offer
21 two or more services or basic network functions shall be included in
22 the TSLRIC of each service or basic network function only upon a
23 showing that a discrete component of this shared investment can
24 be identified as having been directly caused by the decision to offer
25 the service or basic network function being studied (and which will
26 be avoided if the service or basic network function being studied is
27 not offered). The costs associated with the shared investments
28 that cannot be avoided if the service or basic network function
29 being studied is not offered should be considered shared costs,
30 and should not be included in the TSLRIC for service or basic
31 network function.

32

2 Predatory pricing is the act of setting prices at very low levels in order to force other companies out of the market
3 FCC. First Report and Order re Local Competition, Common Carrier Docket 96-98, 1996, paragraph 676.
4 Comparing TSLRIC and TELRIC. Gans, Joshua, King, Stephen. Core Research. 2003.

1 Pursuant to the Commission rule shared cost can be included in the TSLRIC study
2 if those costs, in part, are avoided if the service is not offered and, thus, is directly
3 related to offering the particular service studied. An example of a shared cost would
4 be engineering costs associated with providing a group of services. The
5 engineering cost could be attributable to those services in the engineering work
6 product and therefore could be allocated directly to that group of services and
7 subsequently, in part, to a particular service.

8
9 **Q Do the results of the TSLRIC cost studies equate to the prices charged to**
10 **Qwest's customers?**

11 **A** No. As I stated above, the TSLRIC study results represent the cost, or price
12 floor, of the services. In order to prevent cross-subsidization, the Company
13 cannot charge less than the price floor for the services it offers pursuant to
14 Wyoming § 37-15-402(a).

15
16 Services provided by a telecommunications company that provides
17 noncompetitive services shall be priced to ensure that the service's
18 revenues from sale of the service recover the total service long-run
19 incremental cost of providing that service, except as provided in this
20 section.

21
22 If a company were to charge less for a service than the TSLRIC of providing that
23 service, subsidies are inevitable. When the price that consumers pay is higher than
24 the direct cost of providing each service, based on the least cost forward looking
25 technology, competitors are on a relatively level playing field with the provider. This
26 is because another facilities based provider has the opportunity to build facilities
27 matching those of the current provider using the least cost forward-looking
28 technology and efficiencies.

1 **Q Does the comparison of the prices versus TSLRIC ensure that there are no**
2 **cross subsidies in every case?**

3 **A** Not necessarily. Since TSLRIC does not include common costs, a disproportionate
4 share of common costs could be added to any one service. If a company priced its
5 product or service at the TSLRIC level, the company would suffer a loss equal to its
6 common costs (assuming that all shared costs were already appropriately
7 accounted for).

8
9 If a price for a service is higher than its TSLRIC (assuming all shared costs are
10 accounted for in the TSLRIC) but below its TSLRIC plus common costs, we could
11 assume that the service is not covering its allocated share of common costs. In the
12 exercise of calculating the TSLRIC of a service, the law only contemplates subsidies
13 related to the direct costs. Competition will dictate the cost versus pricing of the
14 portion of the common costs attributed to a service because, in a competitive
15 market, the provider is motivated to become more efficient by eliminating or
16 reducing certain common costs.

17
18 **Q If the TSLRIC studies reflect the forward-looking cost of the network, how**
19 **does Qwest recover its embedded costs of its present network?**

20 **A** The purpose of the studies is not an exercise to ensure the recovery the embedded
21 cost of the network. The TSLRIC methodology is based on the premise the cost of
22 providing the most efficient network reflects the cost to all competitors of providing
23 that service and thus it provides the basis in which competition will enter the market.

24 Therefore, the embedded cost of providing the network is not considered and is not
25 a part of this exercise, because the calculation of the cost of services based on the
26 embedded cost of the network does not promote competition going forward.

27

28 **Q How does TSLRIC promote competition?**

29 **A** As I stated above, TSLRIC plays an important role in telecommunications as the

1 market transitions to competition. The cost studies prevent cross subsidization of
2 direct costs and aids in establishing rates that would be comparable with those that
3 would arise in a competitive market (development of prices that are based on cost
4 causation). The facilities of a competitor entering the market would be built using
5 the least cost forward-looking technology. This would also include the configuration
6 of the most efficient network design based on the expected demand and the current
7 distribution of customers.

8
9 The basis of the cost causation methodology of developing rates is essential to
10 encouraging competition. The more accurately the cost to provide service to each
11 customer is calculated, the more precise the cost signals are to the customer. The
12 more accurate the costs are depicted the more accurate rates will be based on
13 those forward-looking costs and, thus, the more effective the costs will be in
14 allowing for competition and eliminating barriers to entry such as cross-
15 subsidization.

16
17 **Q How can we know for certain that the Qwest TSLRIC models presented in this**
18 **docket accurately reflect the proper cost of each service on a forward looking**
19 **basis?**

20 **A** There is no absolute right or wrong answer or perfect methodology in conducting a
21 TSLRIC study. The issue is whether the models offered in any particular case offer
22 a logical estimate of the forward-looking least cost network. The Qwest models
23 presented in this docket are based on logical calculations and assumptions and
24 provide a logical approach to calculating the TSLRIC to serve the customers in
25 Wyoming. The results of the calculations illustrate the least cost efficient network
26 for geographically distinct groups of customers. However, I will present alternative
27 *estimations* and discuss the theory and practicality of de-averaging costs.

28
29 The most accurate estimation of the forward-looking costs that Qwest (or any

1 company) incurs to serve its customers in Wyoming would require a “per customer
2 location” cost model. If development of the TSLRIC were based on the location of
3 each customer in the Qwest exchanges⁵, the cost to provide service to each
4 customer location would be different. Therefore, the price charged to each
5 customer would be based on the cost to serve that particular customer location.
6 However, it would be burdensome and cost prohibitive task to calculate the cost to
7 serve each customer location in the Qwest service areas.

8
9 **Q What is the difference between TSLRIC and TELRIC?**

10 **A** TELRIC is an acronym for Total Element Long Run Incremental Cost. TELRIC is
11 the incremental or additional cost a provider incurs in the long run to provide a
12 network *element* (assuming all other production activities remain the same).
13 Therefore, the basic difference between TSLRIC and TELRIC is that TELRIC is a
14 calculation on the *element* level and TSLRIC is a calculation on the *service* level.
15 The *services* provided to end use consumers include the *elements* necessary to
16 provide that *service*. In addition, the results of the TELRIC methodology include
17 some common costs (fully allocated costs).

18
19
20 **III. Capital Cost Model**

21
22 **Q What is the purpose of the Capital Cost Model?**

23 **A** This model calculates the capital costs factors. The model includes depreciation
24 expense, return on equity and debt, the weighted average cost of capital and
25 income tax expense.
26
27

5 The concept of the exchange is based on geography and regulation, not equipment. An exchange might have one

1 **Q Did the OCA reviewed the Company's proposed depreciation Rates?**

2 **A** Yes. The depreciation rates used by Qwest in this case are the Commission
3 prescribed depreciation rates from Docket No. 70000-TR-97-370⁶, which concluded
4 in 1998. The OCA conducted a review of the depreciation rates prescribed by the
5 Commission in the 1997 docket compared to the depreciation rates prescribed by
6 the FCC and a recent study conducted in an Illinois TELRIC Docket.⁷

7

8

9 **Q Why are the depreciation rates important in this docket?**

10 **A** TSLRIC studies are based on the cost of forward-looking efficient technology and
11 processes. The depreciation rates should also be based on the forward-looking
12 useful lives of those technologies in an efficient network in a market that is moving
13 toward competition.

14

15 The depreciation of any particular asset should reflect the recovery of the cost of
16 that asset over its life, or the length of time over which the asset provides a benefit.
17 In Docket No. 70000-TR-97-370, the Commission set the depreciation rates for
18 regulatory financial reporting as well as for forward-looking cost studies. The
19 Company has since used these rates in TSLRIC and TELRIC studies.

20

21 In the study conducted in the 1997 Wyoming docket a wide variety of information
22 was used to depict a competitive environment and shorter equipment lives
23 accounting for advances in technology and modernization of equipment, customer
24 demand for services, and meeting the challenges of a competitive environment.

25

or more central offices.

6 In the matter of the application of US West Communications for authority to implement their 1997 State Depreciation Rate Study.

7 Illinois Docket No. 02-0864, Illinois Bell Telephone Company, Filing to Increase Unbundled Loop and Nonrecurring rates.

1 The rates approved in Docket No. 70000-TR-97-370 were appropriate for use in
2 TSLRIC studies because the development of depreciation rates in that docket was
3 based on the period of time over which the assets are expected to provide the
4 benefits of use in a competitive environment. However, one must ask if the
5 depreciation rates approved in the 1997 docket are still useful today due to the span
6 of time since the last study was performed as well as any movement in the market
7 toward a more competitive environment. Concerning the forward-looking TSLRIC
8 study, it is reasonable to require the life of the assets that will encourage the use of
9 efficient technologies and encourage investment infrastructure in a competitive
10 environment.

11
12 Technological advancements continue at a rapid pace, which leads to obsolescence
13 that is more rapid. The intention of TSLRIC is to promote the development of a
14 competitive market. The depreciation rates should also take into account the
15 changes in technology as we transition into a competitive environment. The use of
16 obsolete and lagging depreciation rates only hinders that advancement by
17 discouraging investment in the network and system improvements.

18
19 **Q Should Qwest base depreciation rates on technologies that are state of the**
20 **art, but not currently expected to be used or purchased going forward?**

21 **A** In order to avoid an exercise in speculation, we are *not* looking at the useful lives of
22 equipment that is not currently expected to be utilized by the Company on a
23 forward-looking basis. This supposition arises from the fact that if a company does
24 not have a contract for a certain piece of equipment the Company does not know
25 the cost that it would pay for that equipment. This information is confidential for
26 each company and the contract price is, in part, based on the size of the company
27 and thus the amount of equipment purchased from a vendor. If the Company used
28 the list price quoted by vendors, the price used for depreciation purchased may be
29 much larger than, the price actually paid. The Company has updated the type of

1 equipment, such as switches, it uses on a forward-looking basis. The most tangible
2 cost data on a forward-looking basis is the cost the Company is currently incurring
3 and expects to incur going forward based on its contract with those vendors going
4 forward.

5
6 **Q You mentioned that you compared the Qwest depreciation rates with a recent**
7 **Illinois study and the current FCC depreciation rates. How do the**
8 **depreciation rates from the Illinois study and the FCC depreciation rates**
9 **compare to those prescribed by the Wyoming Commission in the 1997**
10 **docket?**

11 **A** As illustrated in Table 1 below, the Qwest Wyoming depreciation rates are within the
12 ranges of the forward looking study presented in Illinois in 2004. This is not
13 completely surprising because the study offered in Illinois in 2004 was the same
14 type of study conducted in Wyoming in the 1997 docket.

15 The study accepted by the Illinois commission in 2004 is based on forward-looking
16 technological changes with respect to a competitive environment. In the Illinois
17 docket, the TFI (Technologies Futures, Inc.) study significantly shortened the prior
18 state prescribed rates in Illinois. The Illinois study took into account the current
19 efficient equipment replacement by future technology considering the rapid
20 replacement of technology expected in the future as well as the line loss due to
21 increasing competitive pressure going forward. I compared the rates in the Illinois
22 case to the current prescribed Wyoming depreciation rates. I found that the
23 "significantly shortened lives" approved by the Illinois commission in 2004 are
24 comparable to those prescribed by the Wyoming Commission in the 1997 docket.
25 The FCC depreciation rates depicted in Table 1 do not take into consideration
26 competitive pressures and technology obsolescence in a competitive market.

TABLE 1	Qwest Wyoming Prescribed Lives	Projected Life from Illinois TPI Study Results	FCC 1999⁸ Prescribed Lives
Digital Switch	10	9 – 12	12 - 18
Circuit Equipment	7 – 10	7 – 9	7 - 13
Aerial Cable Metallic	15	10 – 16	20 - 26
Underground Cable Metallic	15	12 – 20	25 - 30
Buried Cable Metallic	20	12 – 20	20 - 26
Underground Cable Non-Metallic	20	15 - 20	25 - 30

1

2 **Q Did the Wyoming Commission order Qwest to conduct subsequent periodic**
3 **depreciation studies?**

4 **A** Yes. In Docket No. 70000-TR-96-323⁹, the Wyoming Public Service Commission
5 stated "We do understand that the advent of local exchange service competition will
6 sharpen the debate on depreciation lives for incumbent telecommunications service
7 providers. Therefore, we believe that, on a forward looking basis, there should be a
8 state-level, Wyoming specific re-prescription every three to five years to assure that
9 lives remain accurate and forward looking. We are anxious that depreciation be
10 neither a vehicle for confiscation of US West's property nor a method by which
11 monopoly rents are extracted from the public."¹⁰ As noted above, Qwest conducted
12 a depreciation study in Docket No. 70000-TR-97-370. I just want to note that it was
13 in this prior docket (70000-TR-96-323) that the Commission ordered subsequent
14 depreciation studies.

15

16 **Q Does the OCA recommend that Qwest conduct a depreciation study at this**
17 **time?**

18 **A** Although the Commission directed Qwest to conduct a depreciation study every
19 three to five years in Docket No 70000-TR-96-323, the OCA is not recommending
20 that the depreciation rates be changed or altered in this docket. There is no need

⁸ FCC Docket No. 98-137.

⁹ In the matter of the Application of US West Communications, Inc. for Authority to Implement Phase II of its Proposed Wyoming Price Regulation Plan for Essential and Noncompetitive Telecommunications Services.

1 for a re-prescription of rates at this time. However, I do recommend that the parties
2 continue to monitor the changing market environment and subsequent studies in
3 other jurisdictions in the future to monitor their comparison to the Qwest prescribed
4 Wyoming rates.

5
6 I am not recommending that Qwest be relieved of any further obligation to conduct
7 depreciation studies going forward as set forth by the Commission. The OCA does
8 recommend that the Commission state in its order that the Company specifically
9 address this issue in successive TSLRIC and TELRIC dockets. I recommend that
10 the Company explain in its application in ensuing filings how it is monitoring its
11 depreciation rates and how the depreciation rates compare with other relevant
12 studies conducted around the nation. I also recommend that the Commission direct
13 Qwest to conduct a new study in the future within the 3 to 5 year time period from
14 this docket.

15
16 Qwest has not updated the depreciation rates per the Commission order. However,
17 the OCA suggests that the depreciation rates are still valid because they are
18 comparable with the results of an extensive study performed in Illinois that is based
19 on forward looking shortened lives with respect to a competitive environment. In
20 addition, TFI is the company that conducted the recent Illinois study as well as the
21 previous Wyoming study.

22
23 **Q Did the OCA assess the reasonableness of the cost of capital in this docket?**

24 **A** Yes. The OCA conducted an analysis to assess the reasonableness of the return
25 on equity going forward, the cost of debt, and the capital structure. The result of the
26 OCA return on equity analysis is a range of reasonableness of 10.6% to 12.45%.
27 The return on equity used in the model is 12.35%, which is within the range of
28 reasonableness calculated by the OCA. The range of reasonableness of the

10 Docket No. 70000-TR-96-323, paragraph 170.

1 weighted average cost of capital is 8.40% to 9.23%. The weighted average cost of
2 capital used in the model is 9.19%, which is within the range of reasonableness
3 calculated by the OCA. The cost of capital reflects a forward-looking estimated
4 required return. The OCA is not recommending any changes to Qwest's proposed
5 cost of capital in this docket.
6
7

8 **IV. Expense Factors Model**

9

10 **Q What is the purpose of the Expense Factors Model?**

11 **A** The Expense Factors Model develops the investment and expense factors that aid
12 in the calculation of monthly or annual costs of forward-looking investment. The
13 model develops investment related factors that consist of the maintenance
14 applicable to a particular asset. The expense related factors developed in the
15 model (such as product management, network operations, other operating taxes)
16 are applied to investment costs and other expense amounts. Commission Rule
17 §533 allows for the application of annual charge factors such as depreciation, cost
18 of money, and expense components (although the rule does not limit the charge
19 factors to this list). Qwest includes the calculation of expense and investment
20 factors that are applied to forward looking investment in other models to produce
21 the amount of expense applied to the investment annually (or monthly).
22

23 **Q How are the factors calculated in the model?**

24 **A** The model starts with the actual operating expenses and investments for the end of
25 the year 2002 in the respective jurisdiction (Wyoming). Adjustments are made to
26 the operating expenses and investments for cost savings, inflation, and other
27 adjustments such as the elimination of those attributable to non-recurring costs,
28 which are included in the non-recurring cost model.
29

1 The adjustment for cost savings is an adjustment for an efficiency factor. The
2 efficiency factor used in this docket is the same factor used in the previous TSLRIC
3 docket (70000-TA-02-812). The use of the cost savings in the previous docket
4 stems from the stipulation reached between parties in the Company's TELRIC
5 docket 70000-TA-01-700.

6
7 The efficiency gain reflects an estimate of the gains in efficiency due to increased
8 productivity and enhanced technologies. The operating expenses in the model are
9 decreased by the efficiency factor of 12.74% (biennially), and then increased by an
10 inflation factor of 7.20% (biennially). In conducting this calculation in the model, the
11 operating expenses for the base year, 2002, are adjusted by an efficiency gain and
12 inflation factor to render the test year 2004 results.

13
14 The use of the efficiency factor of 12.74%, as mentioned above, is a biennial factor
15 that stems from the stipulation in the prior TELRIC docket. This efficiency factor in
16 that agreement was derived from the FCC Docket No. 99-345¹¹. Qwest uses the
17 two-year productivity gain of 12.74% from the stipulation, which was calculated from
18 the average efficiency gains from 1986 through 1998 and the efficiency gains from
19 1991 through 1998 in the FCC-99-345 docket (OCA Exhibit MLN-1).

20
21 The adjustments to the expense levels using the efficiency factor and the inflation
22 rate conveys a forward-looking element to the base year used in the model. After
23 the adjustments, the ratio of the expense levels to the investment levels results in
24 cost factors for operating the network, based on the experience of operating the
25 network. The inclusion of the historical data does not deter from the forward-looking
26 nature of the studies, rather it includes the experience the Company does have in
27 operating the network. It is reasonable to estimate the cost of operating the network

11 FCC-99-345. In the matter of Price Cap Performance Review for Local Exchange Carriers CC Docket NO. 94-1
and In the Matter of Access Charge Reform FCC Docket NO. 96-262.

1 based on the analysis of historical trends of the embedded cost of the operation and
2 maintenance of the current network.

3
4 Investment related factors are based on the proportion of maintenance and capital
5 costs related to the investment. The model calculates these factors by dividing the
6 developed operating expenses (adjusted for cost savings, inflation, and items
7 attributed to other studies) and dividing those expenses by the investment amount
8 that is adjusted by a current cost to booked cost ratio.

9
10 The expense related factors (direct network and marketing, support assets,
11 common costs, and uncollectibles) are calculated by dividing the operating expense,
12 which are adjusted for cost savings, inflation, and items attributed to other studies
13 as noted above, by the total directly attributable expenses such as total marketing
14 support assets, common costs, and uncollectibles. The expense and investment
15 factors are applied to investment costs and other expense amounts in other studies.

16
17 **Q Why does the efficiency factor calculated in the previous Qwest TELRIC filing
18 continue to be appropriate in this forward-looking study?**

19 **A** The efficiency factor is based on the 1999 Total Factor Productivity (TFP) FCC staff
20 study. The TFP study measures the ratio of an index of outputs (of a firm, industry,
21 or the economy as a whole) to an index of inputs. The productivity growth is
22 measured by calculating the changes in this ratio over a period of time.

23
24 The study included a total LEC output index and uses quantity indexes for the
25 revenue of local, intrastate, and interstate service. These measures are aggregated
26 for each year in the study. The input indexes include *quantity* of capital, labor and
27 materials, as well as the labor, capital, and material prices. The calculation of the
28 total factor productivity is the measure of the productivity component of the factor
29 and is measured by the percentage change in the total output less the percentage

1 change in the input quantity. The study calculates the TFP differential by taking the
2 U.S. Nonfarm Business Sector TFP growth rate less the LEC's TFP growth rate.
3 The input price differential is then calculated by taking the difference in the LEC
4 input Price growth rate and the US Nonfarm Business Sector Input Price growth
5 rate. The efficiency factor is calculated from the difference of the TFP differential
6 (outputs) and the input price differential. The study has not been updated since
7 1999; but it is the most current data available.

8
9 **Q Does the OCA agree that the inflation factor in the Expense Factors model is**
10 **reasonable?**

11 **A** Yes. The basis for the Qwest inflation rate is a study performed by Joel Popkin and
12 Company (Popkin study). The study estimated a two-year inflation rate of 7.20% for
13 the years 2002 to 2004. The 7.20% two-year inflation rate is based on the annual
14 changes in the current active employee cost during this period. Qwest uses this
15 wage driven inflation rate because wages and salaries are primarily drivers of
16 operating expenses.

17
18
19 **V. Loop Model**

20
21 **Q What is the purpose of the Loop Model and how does it calculate the loop**
22 **investment?**

23 **A** The loop model estimates the cost of providing the investment in distribution and
24 feeder plant. Feeder cable is the portion of the loop that originates from the central
25 office and connects to the distribution cable. The distribution plant branches off
26 from the feeder cable to customer locations. In order to estimate the cost of
27 providing the investment the model includes necessary stand-by capacity, differing
28 engineering loop designs based on the density of an area, differing loop lengths,
29 and type and amount of investment needed in each engineering design.

1 Stand-by capacity of the loop is factored into the necessary investment using fill
2 factors in the model. Extra capacity is needed in the provisioning of the loop in
3 order to account for forecasted growth of end-users, administrative purposes, and
4 replacement of bad lines, and allows the Company the capacity to serve the
5 demand as it arises.

6
7 Fill factors are used in the model to account for the relationship between the
8 capacity of the plant that will be provisioned and the amount of plant actually used.
9 In the construction of the loop investment, the Company would not want to build the
10 loop plant to exactly match the amount of plant that would be fully utilized at the
11 time of construction. The Company must account for such items as growth in
12 demand and bad pairs. If the construction of the distribution portion of the loop only
13 met the demand at the time of construction, reinforcement of the lines would soon
14 follow. Reinforcement of those existing lines is costly due to the nature of
15 placement in various areas. For example, going back to reinforce more distribution
16 lines in a city residential area may include tearing up and replacing pavement.
17 Therefore, the design of the feeder and distribution cable of the loop is designed to
18 account for growth in demand.

19
20 Qwest uses a distribution fill factor of 4% for idle and dedicated lines and 8.12% for
21 additional lines. The fill factors included in the model are derived from Qwest's
22 average actual number of idle and additional lines in Wyoming. The Company does
23 not use fill factors in the standard distribution design (2 pairs per site), rather the
24 studies assume a two pairs per site design. The cable size of the distribution design
25 reflects this assumption. The model implies the fill factor because the program
26 develops the total investment required for a given distribution area, then divides this
27 by the number of working lines.

28 The feeder fill factors are set at a default of 65% for all wire center sizes in the
29 model. The 65% fill factor is a default Qwest value. There is actual state-by-state

1 data included in the model, however this data is indicated as the last updated in
2 1997. The average fill factor for the Wyoming data is 58.8%, not including idle
3 dedicated lines. Qwest uses the 65% feeder fill factor to reasonably reflect the
4 support of the current demand as well as growth going forward.

5
6 The OCA is concerned that the actual utilization numbers have not been updated
7 for the TSLRIC model since 1997. In fact, the utilization numbers in the previous
8 TELRIC docket were updated in the year 2000; however, those numbers are not
9 used in this docket. The numbers used in the previous TELRIC docket include
10 updated data, but are not significantly different. The 2000 data indicated a
11 statewide average utilization of 56.1%. The data used in this docket indicate a
12 statewide utilization of 58.8%. In addition, the same default of 65% was used in that
13 docket. The lack of update of the utilization numbers does not effect the calculation
14 of TSLRIC as Qwest uses the 65% feeder fill factor as a Qwest default average.

15
16 Feeder plant is managed and calculated from a fill perspective, whereas the
17 distribution investment is designed to avoid reinforcement. Qwest reflects different
18 loop designs in the model based on the density and prospect for growth within a
19 wire center. The model includes four different sizes of wire centers¹² by using wire
20 center groups. The groups are “very small” (1 to 2500 working lines), “small” (2501
21 to 10,000 working lines), “medium” (10,001 to 30,000 working lines), and “large”
22 (over 30,000 working lines). The density of the wire centers will dictate such items
23 as the amount of investment needed, whether or not fiber will be used, and if pair
24 gain¹³ will be needed.

25 In addition, the loop length varies by wire center group. The data including the
26 length of the loop is gathered from a statistical sample of loops. Specifically, Qwest

12 A wire center is defined by Qwest as geographic area served by a central office.

13 A transmission system that uses concentrators or multiplexers so that fewer wire pairs may be used than would otherwise be required to provide service to a given number of subscribers. A Pair Gain device uses digital technology to allow one line to carry the signals of two or more lines.

1 states that it is "a statistical sample, or a census of the universe of all loops."¹⁴ The
2 measurement of loop length varies by wire center group and by type of service.

3
4 Feeder cable design uses a standard Qwest engineering design. The engineering
5 design specifies items such as the size of the cable used based on the
6 characteristics of different wire center groups and type of subscriber.

7
8 Distribution cable designs include typical distribution profiles used in various density
9 groups (DG). The Loop Model includes distribution design for five density groups as
10 indicated in Table 2.

11

TABLE 2	Description
DG1	very high density - high-rise structures such as offices and apartments.
DG2	high density - multi-building offices and industrial parks, campuses, condos, apartments, and town homes.
DG3	Medium density - suburban residential subdivisions
DG4	Low density - suburban large acreages
DG5	Very low density - sparsely populated urban or rural areas, ranches, and farms.

12
13 The model assumes two pairs per site¹⁵ for each density group. This is a change
14 from the previous docket where the Company included two pairs per site in DG1,
15 DG2, and DG5 and three pairs per site in DG3 and DG4.

16
17 Two pairs per site used in DG1 and DG2, because there is more flexibility to
18 rearrange pairs in these two groups in higher density areas. For example, when
19 there are several pairs per site brought into a large building, such as an apartment
20 complex, it is unlikely that all of the apartments will use more than two pairs per site.
21 Many may only use one pair per site. Therefore, additional pairs will be available for

¹⁴ TELRIC Loopmod User Manual, Page 1.7.

¹⁵ A pair is formally defined as the two wires of a circuit, which make up a subscriber's loop from his location to the central office. A pair per site would allow for the use of one telecommunications line, or one phone. Two pairs per site would allow a consumer at that site to have two phones.

1 those who will use more than two pairs per site.

2
3 In the previous case three pairs per site was used on DG3 and DG4 due to the
4 higher costs to build additional pairs per site out to each home, after the initial
5 provisioning, in a subdivision or larger lot size subdivision. Therefore, it was
6 reasonable to include more pairs initially to allow for more flexibility within the
7 Density Groups and to avoid building further reinforcement of the lines later. In
8 addition, it is more likely that families with multiple occupants per household will live
9 in these Density Groups. Therefore, in the previous docket it was assumed that
10 there was a higher probability that more lines would be needed. In this docket, the
11 loop is designed for two pairs per site for all density groups. The change in DG3
12 and DG4 is primarily because of line losses due to competition for the second and
13 third subscriber lines. The OCA does not take issue with this change in the
14 distribution design. Making this change, *ceteris paribus*, decreases the overall
15 average investment in the loop by approximately 0.38%.

16
17 In DG5, the distribution is designed for two pairs per site. In this Density Group, the
18 demand characteristics for more pairs per site do not outweigh the investment. In
19 this group, customers are more dispersed; the potential growth, in most cases, is
20 most likely not as high as in DG3 and 4; therefore, if Qwest were to put more pairs
21 per site in this density group, there could be a large amount of investment in lines
22 that are never used.

23
24 After the frequency of the loop length is determined (on the per wire center basis
25 and type of subscriber) the model applies the per kilofoot investment. Basically, this
26 is a weighted average calculation that determines the incremental investment for the
27 average per wire center group loop. The statewide average loop investment is
28 produced from the model by a weighted average of the investment per month by
29 wire center group.

1 The design of the efficient forward-looking loop is affected by the density and
2 expected growth of the wire center. Qwest has broken down differing wire centers
3 by size and used them to group differing loop designs. The groupings are very
4 small, small, medium, and large. The wire center groupings allow for the calculation
5 of cost of different design characteristics of the loop with differing sizes of cable with
6 differing uses of fiber and pair gain. After the design characteristics for differing
7 wire center sizes are calculated in the model, a weighted average of those elements
8 allows Qwest to calculate an average loop cost for its Wyoming customers *within*
9 *each density zone*¹⁶.

10
11 **Q Does the Loop Model separate the cost of the loop between toll service usage**
12 **of the loop and the provision of basic exchange service?**

13 **A** No. One hundred percent of the cost of the loop is assigned to the basic exchange
14 service. It is a generally accepted economic practice in Wyoming to assign the cost
15 of the loop to the provision of basic exchange service.¹⁷ The cost of the loop is not
16 a usage-based cost. In other words, the cost of provisioning the loop remains
17 constant no matter how much usage is placed on the loop. The cost of the loop is a
18 fixed cost to the customer for access to the public switched network.

19
20 Any allocation of the cost of the loop to usage based factors such as toll services
21 would be arbitrary allocations and create subsidies simply because usage is not a
22 cost driver for the loop. Therefore, 100% of the loop costs are assigned to the
23 provision of basic exchange service.

24
25 **Q How do the costs per loop differ in the various wire center sizes?**

26 **A** In tab "NACInvSum" in the Loop Model Qwest presents the 2004 unbundled loop

¹⁶ The four density zones in the model are the base rate area (those closest to the central office) and other zones (zones 1, 2, and 3, which are progressively further from the central office).

¹⁷ In Wyoming, it is generally acceptable to assign 100% of the cost of the loop to the basic exchange service. However, this issue is still somewhat controversial in other jurisdictions.

1 average investments. The cost per unbundled loop, generally, decreases from the
2 very small wire center group to the large wire center group. However, the small wire
3 center group cost per loop (and length of loop) is higher than the very small wire
4 center group. This is primarily due to the use of more investment and the general
5 distribution of customers in the small wire center versus the very small wire center.
6 In general, the characteristic of the average very small wire center is such that the
7 customers are clustered closer to the community. The average small wire center
8 generally has more population and longer loops, thus more investment and higher
9 costs.

10
11 ****Begin Confidential Testimony ***

12
13 ***End Confidential Testimony*** The unbundled differences in cost to the
14 ratepayer could be more significant for small wire centers due to the fact that in
15 higher density areas such as Cheyenne the per loop cost will be spread to more
16 ratepayers than in a smaller area.

17
18 **Q How are the costs allocated to the different zones in Qwest's results?**

19 **A** Based on the investment and engineering designs calculated for each Density
20 Group, wire center size, as well as other assumptions, the Loop Model can be run to
21 calculate each zone. There are differing costs in each zone based on differing
22 investment costs based on the different loop lengths, engineering designs, density
23 zones, as well as other assumptions. Within the calculation of each zone, the
24 model will calculate the average Wyoming unbundled loop for each zone as well as
25 a per wire center basis. For example, this data is input into study number 8613 for
26 each respective zone cost, which incorporates the data from the models (loop,
27 switching, and transport) to calculate the recurring TSLRIC for Flat Rate Residential
28 Service.

29

1 **Q Are you recommending any changes to the inputs of the Loop model or its**
2 **methodology?**

3 **A** No. However, I am offering discussion of the alternatives to the zone cost scheme
4 in Section X. (Geography and Disaggregated Costs) of my testimony.
5
6

7 **VI. Switching Model**
8

9 **Q What is the purpose of the Switching Model?**

10 **A** The Switching Model develops the investments for switching calls, minute of use,
11 costs of originating and terminating calls, and features. This model has four major
12 parts:

- 13
- 14 1. The Core calculates the Average Busy Season Busy Hour (ABSBH)¹⁸ per
15 unit investments and port unit investments by functional category.
 - 16 2. The Calls portion of the model develops average busy hour investment
17 by type of service. The Call portion of the model essentially calculates the
18 cost to setup and maintain the call during the busy hour.
 - 19 3. The Usage portion of the model computes the investment per annual call
20 set up and conversation minute. This data is then used to develop the
21 cost per minute of use and the cost per message.
 - 22 4. The Ports portion of the model develops the investment of switching
23 ports¹⁹ and terminations.
24

25 The Core portion of the model develops the investment costs of using the switch
26 resources by functional category of the switch with the required efficient capacity to

18 Average Busy Season is the months with the highest average busy hour 100 call seconds of a telephone conversation. The call volumes during this time have proven to be stable and predictable. The busy hour is that time period in which the most traffic is carried over the network, which aids in the engineering of the capacity utilize and required on the system

1 serve the demand on the system. This investment cost is separated into the various
2 functional categories of the switch to develop the per functional category TSLRIC by
3 using partitioning ratios. The demand for each end office switch is then applied to
4 the functional category. A weighted average unit investment for each functional
5 category is developed using all end offices switches.

6
7 The outputs of the Core portion of the model are the inputs of the Calls portion of
8 the model. The Calls portion of the model takes the functional costs and develops
9 the cost per minute of use by calculating how much of the functional category
10 resource is required to maintain various call types. This portion of the model
11 computes the amount of functional category investment required to set up a call
12 during the ABSBH and how much investment is required for every 100 seconds of a
13 telephone conversation in the busy hour.

14
15 The Port portion of the model uses outputs of the Core model to develop the
16 network port elements such as the feature investment. The cost of the features is
17 calculated on an average *recurring* cost per feature for all features. The average
18 cost development can create subsidies. However, the recurring costs of each
19 feature developed in the previous case did not vary significantly from the average
20 cost of those features in this case.

21
22 **Q How is the switch investment used Switching Model considered forward**
23 **looking?**

24 **A** The model assumes digital switches, digital line, and forward-looking demand. In
25 the application, Qwest states that it no longer purchases the Nortel DMS10 or
26 Ericsson AXE switches. Therefore, the forward-looking switches are limited to the
27 Lucent 5ESS and Nortel DFMS100 switches.

19 A port is the interface device between the switch and the circuit.

1 The Commission Rule §524, states in part:

2 The technologies that provide the most efficient means of
3 supplying the necessary capacity, given this topology should be
4 assumed. Each study shall clearly identify the technologies, the
5 capacity assumed for each technology used in the study, and a
6 statement of whether the technology(ies) assumed in the study is
7 the most efficient and least cost.
8

9 In addition, Commission Rule §525 states:

10 Forward-looking technology shall be defined to mean that a
11 telecommunications company will include in its TSLRIC studies the
12 technology, or mix of technologies, that would be chosen in the
13 long run as the most economically efficient choice for the provision
14 of a given basic network function or service. The
15 telecommunications company must clearly explain within work
16 papers or source documents the choice of each technology; the
17 cost of each technology; the source of the technology and its cost,
18 or the method by which the cost was determined.
19

20 The technology of the switches in this study indicated above include the switches
21 that Qwest has a contract to buy now and going forward. If the Company included
22 those technologies that it does not utilize, yet are available for sale, the first element
23 of speculation would arise from the cost to purchase such equipment. The second
24 element of speculation would be the configuration of that equipment with its
25 network. We do not want to speculate concerning technology not currently in use
26 that which *may or may not* be used in the future because it introduces too many
27 variables in the analysis and calculation of cost that may render the results
28 insignificant. Therefore, the OCA agrees with the use of the switching equipment in
29 the Switching Model presented in this docket, as it is the equipment the Company
30 has a contract to purchase and use going forward. This reflects a forward-looking
31 aspect of investment used in switching.
32

33 **Q What recommendations is the OCA making regarding the Switching Model?**

34 **A** Commission Rule §525 above illustrates that the Company must provide work

1 papers that clearly explain the choice of technology. Commission Rule §524 above
2 states that the Company must state whether the technology is the least cost and
3 most efficient. The OCA recommends that Qwest file such documentation in regard
4 to the choice of least cost forward looking technology and an explanation as to why
5 the technology chosen is the least cost forward looking technology. The OCA
6 recommends that this information be included in subsequent filings.
7
8

9 **VII. Transport Model**

10 11 **Q What is the purpose of the Transport Model?**

12 **A** The Transport Model develops the transport investment requirement between two
13 end offices, and between end offices and tandem offices. The model develops the
14 investment for channel termination equipment²⁰, SONET equipment²¹, fiber,
15 conduit²², and multiplexing equipment²³. The model assumes 100% fiber
16 backbone²⁴ that supports a Ring, Point to Point, and Back-to-Back network
17 architecture. It sorts the point pairs into mileage bands (over 0 to 8, over 8 to 25,
18 over 25 to 50, and over 50) and reports the value for fixed and distance sensitive
19 investments.
20

21 Qwest has changed the method by which the mix of equipment configuration, fill
22 factors, and type of trunk ports used in the model. The changes made to the
23 Transport Model serve to accurately reflect the efficient network configuration based
24 on demand and type of configuration.
25

20 Channel termination equipment is terminates the transmission facility on the company's side of the loop.

21 SONET stands for Synchronous Optical Network, which allows for flexibility needed to transport several digital signals with different capacities.

22 Conduit is the metal pipe in which the cable is placed.

23 Multiplexing equipment is used to transmit two or more signals over a single channel.

24 Backbone is that portion of the transmission network that carries the heaviest traffic.

1 **Q How is the investment costs in the Transport Model considered forward**
2 **looking?**

3 A Qwest uses the most current technology to develop the investments. Embedded
4 investments, such as electrical pair gain systems and copper, are not included in
5 the model; rather, the model uses 100% SONET and fiber, which reflects a forward
6 look at the network.

7

8 **Q Does the OCA recommend any changes to the Transport Model in this case?**

9 A No. The OCA agrees that the Transport Model accurately reflects a forward-looking
10 investment development for transport costs.

11

12

13 **VIII. Non-Recurring Cost Model**

14

15 **Q What is the purpose of the Non-Recurring Cost Model?**

16 A The Non-Recurring Cost Model (NRC) calculates the one-time costs associated with
17 establishing service to the end user. The model's inputs are the labor rate,
18 probability of occurrence of the activity, labor time, and expense factors. The model
19 calculates the non-recurring costs associated with providing each one-time service
20 to the end user by multiplying the quantity of the time required to complete each
21 task by the probability of occurrence of the task, and then multiplies that number by
22 the labor rate. The total direct cost is then multiplied by the directly attributable
23 expense factors to get the TSLRIC. The OCA is not recommending any changes to
24 the Non-Recurring Cost Model.

25

26

27

1 **IX. Price / Cost Comparison**

2
3 **Q How are the results of the Qwest studies presented in terms of the cost**
4 **differences for basic exchange service?**

5 **A** The costs and pricing structure for basic exchange service are broken into four
6 zones (inside the base rate area (IBRA), Zone 1, Zone 2, and Zone 3). Customers
7 located in the IBRA zone are closest to the central office. This group also has the
8 highest density of consumers. Zone 1 includes those customers in the next zone,
9 which is further from the central office. The cost of basic exchange service for Zone
10 1 customers is higher than the cost for those customers IBRA. In each subsequent
11 zone the costs increase to each customer in the zone. As the distance of the zones
12 from the central office increases, the distance of the loop increases, density of end-
13 users decreases, and the investment costs and expenses increase. The decrease
14 in the density contributes to the increased cost because it costs more to serve each
15 consumer as the length of the loop grows and costs are shared between fewer
16 consumers. The different costs for each zone are indicated in the Qwest Price Cost
17 Comparison, column I, lines, 196, 204, 212, 220.

18
19 **Q Do the results of the models included in the cost/price comparison contain**
20 **cross subsidies?**

21 **A** Yes. There are several instances where the price is below cost. In the price/cost
22 comparison provided by Qwest, the price is now below the TSLRIC of service in 28
23 items. The OCA recommends that the Commission direct Qwest to adjust those
24 prices that are now below TSLRIC.

25
26 **Q Are you recommending that Qwest increase the prices of those services listed**
27 **above in this docket?**

28 **A** No. This docket consists of the approval of the TSLRIC costs based on the relevant
29 inputs and models presented by the Company. Thus, Qwest is not proposing any

1 price changes in this docket. The OCA recommends that the Commission direct the
2 Company to file price changes in a separate docket with the Commission and state
3 such specifically in its Order in this docket.
4
5

6 **X. Geography and Disaggregated Costs**

7

8 **Q Are the costs in Qwest's study de-averaged pursuant to Commission Rule**
9 **§541?**

10 **A** The rule states:

11 Telecommunications companies, which prepare and file TSLRIC
12 studies in accordance with these rules shall design the studies to
13 reflect the differences in costs associated with providing local
14 exchange service to geographically distinct groups of customers.
15 Telecommunications companies shall provide cost information for
16 groups of customers disaggregated to the smallest practical size,
17 which shall consider factors as defined in Section 519(a) and (d),
18 inclusive. TSLRIC numbers for local exchange service shall not be
19 expressed as a company wide or statewide average costs unless
20 the telecommunications company can demonstrate that there are
21 no significant differences in the cost of providing
22 telecommunication services to geographically disparate groups of
23 customers.
24

25 I am going to answer this question in two components. The first involves the cost
26 information based on "geographically distinct groups of customers." The second
27 concern is providing this information to the "smallest practical size".
28

29 The results of the Qwest studies reflect the differences in cost to the end-user
30 based on the density of the customers and distance of those end-users from the
31 central office. The per zone results reflect a degree of disaggregated customer
32 costs based on the distance from the central office and the density of the consumer
33 groups.
34

1 There are different methods that can be used to de-average customer costs
2 geographically. The zone methodology allows the cost to be calculated for differing
3 distances from the central office. The loop is the largest incremental cost of
4 providing service to the customer. Density of the customer groups and their
5 respective distances from the central office are cost drivers in the calculation of
6 Qwest TSLRIC. In the models, Qwest has distinguished, among other things,
7 between the different density groups, difference in cost of the investment levels
8 dependant on distance, and differences in costs dependant on the wire center size
9 and engineering design based on density of customer groups. The zone
10 methodology provides for a granular level of disaggregated costs between customer
11 groups.

12
13 The rule also requires disaggregating the consumer cost to the "smallest practical
14 size." This is the more difficult portion of the rule to apply because the use of the
15 smallest unit to calculate the cost to the customer may not be a practical exercise.
16 For instance, the optimum (most accurate) method of calculating TSLRIC would be
17 based on *each customer location* in each of the Qwest exchanges. In such a cost
18 study, the cost to provide service to *each customer location* would be different.
19 Therefore, the price charged to each customer would be based on the cost to serve
20 that particular customer location. However, this calculation would be burdensome
21 and expensive, and thus not *practical*. In fact, if the study were conducted across
22 the state of Wyoming in each Qwest exchange, all of our grandchildren might be
23 employed in geographically determining the location of each household and the
24 costs to serve each one. The factor of practicality must be a consideration in
25 conducting the TSLRIC study.

26
27 **Q What level of disaggregation is practical?**

28 **A** In determining the level of practicality the level of disaggregation in which the study
29 will yield useful data without providing diminishing returns and burdensome expense

1 in conducting the study should be determined. It is inevitable that within each
2 company's TSLRIC study there will be an element of averaging and various
3 assumptions. The study should include a balance between the level of
4 disaggregated costs that gives the most accurate results without entering a zone of
5 excessive disaggregated costs that involves undue diminishing returns²⁵ in expense
6 and the effort of conducting the study.

7
8 In the Qwest Loop Model, the different wire center sizes is used to calculate
9 investment needed and the amount and type of investment needed to satisfy
10 demand in a particular size of wire center. This data is then averaged across all
11 wire centers. For example, the average of the very small, small, medium and large
12 Zone 1 results are averaged for the Qwest statewide Wyoming Zone 1 cost.
13 Therefore, there is an element of averaging in the Qwest studies.

14
15 Alternatives to calculating TSLRIC to the smallest *practical* size could be calculation
16 at the particular wire center size level including the zones within the respective wire
17 center or a specific wire center by wire center basis including zones. The proper
18 measure of practicality is an argument that each company must make in the
19 presentation of the study it prepares.

20
21 **Q In Silver Star's petition to intervene in this case, they assert that Qwest has**
22 **failed to comply with Commission Rule §541 because the TSLRIC results in**
23 **this case are not disaggregated to the wire center level. Is the wire center**
24 **level results the more accurate method?**

25 Silver Star states in its petition that the manner in which the Qwest results are
26 calculated does not account for geographically distinct groups. However, the result

²⁵ Diminishing returns refers to the notion that the return that a company receives for additional effort decreases as the number of units / output increases. A yield rate that after a certain point fails to increase proportionately to additional outlays of capital or investments of time and labor.

1 of the Qwest TSLRIC calculation is based on the density of consumers and the
2 distance of the consumer from the central office. The Qwest method, therefore,
3 accounts for geographic distinction within the wire center and, in this respect,
4 complies with the Commission rule.

5
6 Silver Star's petition essentially implies that the geography element based on the
7 size of the wire center served by the provider is the primary cost driver in the
8 calculation of the TSLRIC costs. However, consider that an average cost is used
9 for all customers in a wire center. Now compare that to geographically distinct zone
10 costs within the wire center. The zone costs within a wire center de-average the
11 cost to the consumer and more accurately reflect the cost to serve each
12 geographically distinct customer group *within* the wire center.

13
14 The heart of the argument in Silver Star's Petition to Intervene is that the costing
15 methodology presented by Qwest in this case, as well as previous TSLRIC dockets,
16 is an average of the zones across all sizes of wire centers. Therefore, the cost to a
17 consumer in Zone 1 in Afton is the same for a consumer in Zone 1 in Cheyenne.

18
19 The cost to serve each size wire center is different. In each individual wire center,
20 there are differences that are not accounted for in the averaging of the universe of
21 loops in the Qwest Loop Model. Each individual wire center will have differences in
22 loop length, topography, placement costs, transport requirement, required switching
23 capacity, and specific factors. Average wire center costs will not account for *each*
24 specific wire center differences in forward-looking costs to serve.

25
26 **Q Is Qwest the only company in Wyoming that has used some degree of**
27 **averaging in its TSLRIC studies?**

28 **A** No. All companies that have completed their TSLRIC studies have used a degree
29 of averaging. There is no way around this factor except conducting studies on a per

1 customer location.

2
3 In the cases of several considerably smaller companies in Wyoming, TSLRIC
4 studies were conducted at the wire center level. However, most of these smaller
5 companies have only one wire center or exchange. The results of the small rural
6 company TSLRIC studies conducted at the wire center level are average costs
7 throughout the entire wire center. Therefore, the customer living 10 feet from the
8 central office that has less investment attributed to their location, thus less costs to
9 serve the customer, pays the same rate based on the same cost as the customer
10 located 20 miles away from the central office. The further the customer is from the
11 central office, the more investment it takes to serve that customer and, therefore,
12 the more it will cost to serve that customer.

13
14 The method of average cost throughout a wire center does not disaggregate the
15 costs to the customer to the same degree as the zone methodology. The use of the
16 zone methodology calculates the costs to serve the customer to a level of
17 disaggregated costs that takes into consideration the investment needed based on
18 the distance and density considerations that largely determine the investment
19 required.

20
21 **Q Using the Qwest weighted average cost of the wire centers, which size of wire**
22 **center in the Qwest studies does the proposed cost most closely compare?**

23 **A ***Begin Confidential Testimony *****

24 *****End Confidential Testimony*****

25
26 **Q If the studies were conducted on a per wire center basis and incorporated the**
27 **use of the zone costs, would the costs differ significantly from the small wire**
28 **center to the large wire center?**

29 **A I calculated the monthly costs in study #8613 on a per wire center and zone basis**

1 by using the Qwest data from the Loop Model. I only changed the loaded
2 investment for the loop and drop in the study. *** Begin Confidential Testimony***
3
4
5
6

7 ***End Confidential Testimony***
8

9 **Q What would be the results if the calculation of cost by wire center size were**
10 **used to derive a weighted average cost across the differing sizes of wire**
11 **centers?**

12 **A ***Begin Confidential Testimony*****
13
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26 ***End Confidential Testimony***
27

28 Although I have used the Qwest data to calculate per wire center and zone basis
29 estimates of cost, the Qwest model was not designed to calculate the results on the

1 wire center level. I have used this data only to produce estimates of the differences
2 between the wire center size costs by zone and a weighted average wire center cost
3 that this model could produce. The important point this confidential exhibit
4 illustrates is the difference between the average cost in each size wire center and
5 the zone costs for each wire center. The zone costs in the wire centers reflect a
6 more accurate costing methodology than an average cost across the wire center.
7 The cost drivers of density and distance are an important consideration when
8 conducting a TSLRIC study. It would be a mistake to average the cost across the
9 wire centers when we already have a higher degree of disaggregated customer
10 costs through the zone costs in the Qwest studies. In addition, the use of the
11 average cost across the wire centers would also require the Wyoming Commission
12 to file a request with the FCC for a change in the basis upon the federal USF
13 support is calculated.²⁶

14
15 **Q Would it be more accurate if Qwest conducted its studies based on the**
16 **forward looking costs and efficiencies to serve each individual wire center**
17 **(For example conducting a study of the costs to serve the Afton area, then the**
18 **Cody area, etc)?**

19 **A** It would be more accurate, but it may not be practical. Commission Rule §541
20 contemplates conducting a study at the *smallest practical size*. The practicality of
21 conducting a study depends on the cost of conducting the study and the accuracy of
22 the results. Each study, no matter what size the company is that conducts the study
23 or where that company is located, will involve a degree of averaging of the cost to
24 serve the consumers. In the case of Silver Star, RT, or Range, or any other
25 company in Wyoming, there is also degree of averaging and assumptions in the
26 models.

27

²⁶ In the matter of the Wyoming Public Service Commission Petition for Waiver of Targeting Requirements Found in Sections 54.309 and 54.311 of the Commission Rules. Docket No. DA 01-612, March 9, 2001.

1 As I stated above, the rural LEC's have predominantly conducted studies on a wire
2 center level. However, there is an appealing argument that can be made that the
3 smaller rural local exchange carrier should disaggregate further in that they should
4 also incorporate the use of costing by zones in their TSLRIC models and results.
5 This would be a more accurate method. Those companies *may* argue that it was
6 not cost effective to further disaggregate by zones. My point is that, for all
7 companies, there is a line of practicality to be drawn somewhere with respect to
8 these studies. Each company must make their own argument as to where that line
9 must be drawn. In a competitive market in a rural area, any company wishing to
10 compete in that area, may well contemplate the request of further disaggregated
11 customer costs for the rural LEC as well.

12
13 **Q If Qwest were to re-calculate its TSLRIC on a per wire center basis, would you**
14 **advocate that it only conduct that study for the Afton area due to its Rule §202**
15 **status in that wire center?**

16 **A** No. If Qwest were ordered to conduct such a study and re-structure its rates, it
17 would not be prudent to conduct such a study for only one wire center. If the Afton
18 wire center prices are restructured based on costs from such a study, there would
19 be an inconsistency between the Afton area and all other Qwest wire centers in the
20 state. If the studies were conducted in a different manner, all wire centers must be
21 included; otherwise, the differences in methodology would create a disparity.

22
23 **Q If the studies were conducted at a more disaggregated level, would this**
24 **increase the size of the state USF fund?**

25 **A** Probably. This is dependant on the degree in which the costs are disaggregated
26 and the ensuing results of the model.

27
28 **Q If the Commission changed the methodology that Qwest uses in its TSLRIC**
29 **models and studies, would the same type of changes need to be made to the**

1 **TELRIC models and studies?**

2 A Yes. Many of the same models are used in the TELRIC dockets. For instance, the
3 same Loop Model does is used in the TELRIC and TSLRIC filing.

4
5 The relationship between the TELRIC UNE's and the TSLRIC service offerings is
6 important. The Commission should *avoid* setting the UNE rates too high, so that
7 when the UNE's are combined into the respective services, the resulting direct costs
8 are equal to or greater than the TSLRIC service cost. We must also ensure that a
9 competing carrier has the ability to enter the market without encouraging one form
10 of entry over another. For example, a competing carrier should be indifferent to
11 entering the market as a facilities-based provider or a reseller. In addition, the
12 Commission should ensure that the relationship between TELRIC and TSLRIC
13 affords Qwest the opportunity to recover costs, but will face a competitive
14 disadvantage in offering its services.

15
16 **Q How do the TELRIC costs and the TSLRIC costs compare?**
17 A compared the entry scenarios versus the Qwest retail price. I compared the Qwest
18 retail price of the CustomChoice bundled packaged service with the resale discount
19 price and the TELRIC UNE-P²⁷ Price. I used the CustomChoice package in this
20 comparison instead of the 1FR basic exchange service because it includes the
21 Features that are included in each of the wholesale prices and, thus, provides for a
22 more straightforward comparison.

23

UNE-P	Avoided Cost Discount @ 13%	Qwest Retail Price	SLC	Total Retail
\$ 29.08	\$ 28.70	\$ 32.99	\$ 6.50	\$ 39.49

²⁷ UNE-P is the unbundled network platform. UNE's include the switching, transport, and loop facilities. When all of the elements are combined into a complete set of end-to-end circuit, it is called UNE-P or UNE-Platform.

1 The total retail price of \$39.49 is above the wholesale prices indicated in Table 3. In
2 this example, the retail price is above the wholesale prices. Qwest would have the
3 opportunity to decrease its retail price in order to compete with its competitors. In
4 addition, the wholesale prices included in Table 3 do not include such items as
5 advertising and marketing that the competitor will incur.

6
7 **Q Does the data show that Qwest has been gaining or losing market share in**
8 **Afton?**

9 **A** The data in the Switching model illustrates that Qwest has lost a number of working
10 lines in the Afton area since the previous TSLRIC case filed in 2002.

11
12 **Q How do the differences between Qwest and Silver Star and the results of their**
13 **respective TSLRIC studies and subsequent pricing structures affect the ability**
14 **for each company to compete in the Afton area?**

15 **A** The zone averages allow Qwest customers to benefit from the Qwest economies of
16 scale. Table 4 depicts the pricing structure to the end-user in Afton.

17

Table 4 - Local Exchange Prices Adjusted for Federal & State USF		
	Qwest	Silver Star
Base Rate Area	\$23.10	\$23.10
Zone 1	\$31.67	\$34.81
Zone 2	\$31.67	\$34.81
Zone 3	\$31.67	\$34.81

18
19 Silver Star serves the Afton area as a competitor. Thus, not having to conduct a
20 TSLRIC study for that market, Silver Star is able to price its services in the Afton
21 area without regard for cost.

22
23 As illustrated in Table 4, Silver Star competes effectively with Qwest on price inside
24 the base rate area (IBRA). However, it has higher prices, impeding competition, in

1 zones 1 through 3.

2
3 **Q What are your recommendations regarding the methodology of costing by**
4 **zones in this case?**

5 A As I stated above, the zone methodology complies with the Commission Rule §541.
6 The different zones represent a geographical distinction of the costs to serve the
7 customers based on density and distance. The zone methodology is superior to
8 averaging cost across the wire centers because it provides a greater granularity and
9 disaggregation of costs. However, an alternative is to conduct the studies based on
10 a per wire center per zone methodology. This would include a calculation of wire
11 center size data in Wyoming as well as changes in the switching costs, transport per
12 wire center size, as well as other changes in the cost models. I am not
13 recommending any specific changes in this case.

14
15 The matter of practicality is not a calculation that I have made or am equipped to
16 make in this case. In my opinion, this is a question for the Company to answer and
17 a policy decision the Commission must make. I am not making a recommendation
18 on the *smallest practical size* factor. My intention is to provide alternative
19 discussions that may assist the Commission in making an informed policy decision
20 in this case.

21
22
23 **XI. Other OCA Concerns**

24
25 **Q Has Qwest complied with Commission Rule §518 by filing all work papers and**
26 **source data?**

27 A No. The Company has not complied with this rule. The rule specifically requires
28 that a company must "file a complete set of work papers and source documents", "a
29 narrative explanation of all formulas", and "each diskette must contain a "read me"

1 or similar file that defines the contents of each file of the diskette and contains an
2 explanation of the definitions, formulas, equations, and data provided on the
3 diskette." I will say that the studies provided are actually very well cross-referenced
4 by Qwest. However, the "read me" files, or technical documents, for the most part,
5 have been omitted from the filing. These documents are invaluable to the analysis
6 of the TSLRIC studies.

7
8 Not all such documents are omitted, however. This docket does include the Non-
9 recurring cost Model, the NAC Model documentation, and Switching Cost Model
10 User Guides/Technical Manuals as well as some of the various "studies" read me
11 files. However, the NAC Model Documentation omits previously included
12 documentation, such as discussions on the forward-looking architecture, utilizations,
13 and assumptions. This is pertinent and useful information. All documents should
14 be submitted for the TSLRIC filing and the OCA recommends just that.

15
16 In addition, the Retail Cost Program is not included in the filing. Although each
17 model can be run independently, the Retail Cost Program allows the user to make
18 changes in one model that will affect another model and not have to mechanically
19 make those changes in each of the models affected by the changes.

20
21 Because there is a concurrent TELRIC filing at this time, The OCA has been able to
22 utilize the TELRIC documents where applicable. However, the fact remains that in
23 the future any person may wish to look at the documents or a TSLRIC study that
24 may be filed when we do not have a concurrent TELRIC docket. In addition, if any
25 person studies a copy of this filing in the future for comparison purposes (or other)
26 they will not find these documents present. Therefore, the OCA recommends that
27 the Commission direct the Company in its order to file all pertinent documents
28 required by Rule §518. Otherwise, the docket *simply is not* complete and does not
29 comply with the Commission rules.

1 **Q Does Qwest conduct TSLRIC studies on all of its services?**

2 A No. Qwest does not conduct TSLRIC studies on those items that represent less
3 than 5% of total revenues. The services not studied include mainly competitive and
4 obsolete serves. ****Begin Confidential Testimony****

5 ****End*

6 *Confidential Testimony****

7

8 **Q Do the Commission rules allow a company to exclude studies that represent a
9 low level of revenues?**

10 A No. Commission Rule § 518 states that a company “shall file TSLRIC studies for all
11 of their noncompetitive and competitive services.”

12

13 **Q Does the fact that certain services are not studied concern the OCA?**

14 A When all services provided by a company are not studied, the analysis to determine
15 whether subsidies exist between competitive and noncompetitive services is not
16 complete. However, the items not studied represent a fairly insignificant amount of
17 revenue.

18

19

20 **XII. Conclusions**

21

22 **Q Please summarize your recommendations in this case.**

23 A The OCA recommends that the depreciation rates utilized by Qwest in this case be
24 deemed appropriate. However, the OCA recommends that the Commission state in
25 its order that Qwest specifically address the depreciation issue in successive
26 TSLRIC and TELRIC dockets. I recommend that the Company be required to
27 explain in its application in ensuing filings how it is monitoring its depreciation rates
28 and how the depreciation rates compare with other studies conducted around the
29 nation as well as why the depreciation rates are relevant or need to be changed. I

1 also recommend that the Commission state in its order that Qwest must conduct a
2 new study within the 3 to 5 years from the close of this docket. The OCA
3 recommends that the Commission find the cost of capital presented by Qwest is
4 within a forward-looking range of reasonableness and is applicable. The OCA also
5 recommends that Qwest update the actual utilization numbers that are included for
6 comparison of the feeder fill in its next TSLRIC filing.

7
8 The OCA contends that the costs presented by Qwest are disaggregated costs and
9 reflect differences in costs to geographically distinct customers groups, pursuant to
10 the Commission Rule § 541. However, the OCA is not making any
11 recommendations regarding the practicality of further disaggregating costs; rather
12 the OCA has provided a discussion of the alternative approaches in order to aid the
13 Commission in deciding this issue.

14
15 Qwest has not complied with Commission Rule §518 in this case. The OCA
16 recommends that the Commission direct Qwest to file a complete set of model
17 documentation in electronic form to complete the docket file for future reference to
18 this file. The OCA also recommends that those documents include a discussion of
19 the choices made by Qwest regarding the least cost forward-looking technology
20 included in the models.

21
22 **Q Does this conclude your testimony?**

23 **A Yes it does.**