**BEFORE THE NORTH DAKOTA PUBLIC SERVICE COMMISSION**

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| In the Matter of the Application of MONTANA-DAKOTA UTILITIES CO., a Division of MDU Resources Group, Inc., for Authority to Establish Increased Rates for Electric Service | ) ) ) ) ) | Case No. PU-16-__ |

**DIRECT TESTIMONY AND EXHIBITS**

**OF**

**EARL M. ROBINSON**

## On The Subject of Depreciation

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## I. WITNESS INTRODUCTION

**Q1. Please state your name, occupation and business address.**

**A.** My name is Earl M. Robinson. I am a Principal of AUS Consultants. AUS Consultants is a consulting firm specializing in preparing various financial studies including depreciation, valuation, revenue requirements, cost of service, rate of return, and other analysis and studies for the utility industry and numerous other entities. AUS Consultants provides a wide spectrum of consulting services. My office is located at 792 Old Highway 66, Suite 200, Tijeras, NM 87059.

**Q2. Have you prepared an appendix which contains your qualifications and experience?**

**A.** Yes. Appendix A to my direct testimony contains a summary of my qualifications and experience.

## II. PURPOSE OF TESTIMONY

**Q3. What is the purpose of your testimony?**

**A.** The purpose of my testimony is to set forth the results of my depreciation review and analysis of the plant in service of Montana-Dakota Utilities Co.-Electric Division and Common Plant ("Company") which was conducted in the process of preparing depreciation studies of the Company's electric and common plant assets as of December 31, 2014. Reports of my review and analyses are contained in Exhibit No. ___(EMR-1), titled "Montana-Dakota Utilities Co-Electric Division Depreciation Study as of December 31, 2014" and Exhibit No._____(EMR-2), the "Montana-Dakota Utilities Co.-Common Plant Depreciation Study as of December

31, 2014". In preparing the report, I investigated and analyzed the Company's historical plant data and reviewed the Company's past experience and future expectations to determine the remaining lives of the Company's electric and common plant assets. The studies utilized the resulting remaining lives, the results of a salvage analysis, the Company's vintaged plant in service investment and depreciation reserve to develop recommended average remaining life depreciation rates and depreciation expense related to the Company's plant in service.

## III. BACKGROUND

**Q4. How is depreciation defined?**

**A.** Depreciation is defined in the 1996 NARUC "Public Utility Depreciation Practices" publication as follows: "Depreciation**,** as applied to depreciable utility plant, means the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and requirements of public authorities."

**Q5. Why is depreciation important to the revenue requirements of a utility company?**

**A.** Depreciation is important because, as the above definition describes, depreciation expense enables a company to recover in a timely manner

the capital costs related to its plant in service benefiting the company's customers. Appropriate depreciation rates will allow recovery of a company's investments in depreciable assets over a life that provides for full recovery of the investments, less net salvage. Without the appropriate recovery of depreciation costs, the Company ultimately will not be able to meet its financial obligations related to the continued provision of service to customers. Furthermore, the inclusion of the appropriate level of depreciation recovery in revenue requirements serves to reduce overall costs (total of depreciation and return) to customers as opposed to a situation where an inadequate level of annual depreciation expense is currently being provided in rates.

## IV. DEPRECIATION STUDY OVERVIEW

**Q6. What is your professional opinion with regard to the results of the depreciation study that you performed?**

**A.** In my opinion, the proposed depreciation rates resulting from the completed comprehensive depreciation study are reasonable and appropriate given that they incorporate the service life and net salvage parameters currently anticipated for each of the Company's property group investments over their average remaining lives.

**Q7. What steps were involved in preparing the service life and salvage database that you utilized?**

**A.** My comprehensive depreciation analyses included a detailed analysis of the Company's fixed capital books and records through December 31, 2014. The Company's historical investment cost records for each account

have been assembled into a depreciation database upon which detailed service life and salvage analysis were performed using standard depreciation procedures.

**Q8. What is the purpose of the historical database?**

**A.** The historical service life and net salvage data is a basic depreciation study tool that is assembled to prepare a depreciation study. The historical database is used to make assessments and judgments concerning the service life and salvage factors that have actually been achieved, and (along with information relative to current and prospective factors) to determine the appropriate future lives over which to recover the Company's depreciable fixed capital investments. In accordance with this standard depreciation analysis, the Company's depreciation database compiled through December 31, 2014, which contains detailed vintage level information, was used to develop observed life tables. The development of the observed life tables from the historical information was completed by grouping like aged investments within each property category and identifying the level of retirements that occur through each successive age to develop the applicable observed life tables. The resulting observed lives were then fitted to standard Iowa Curves to estimate each property group's historically achieved average service life.

Likewise, the net salvage database was used as a basis to identify historical experience and trends and to determine each property group's recommended net salvage factors. This was accomplished by preparing

various three year rolling band analyses of salvage components as well as a forecast based on the Company's historical salvage experience.

**Q9. In the preparation of the depreciation study, have you utilized information from additional sources when estimating service life and salvage parameters?**

**A.** Yes. In addition to the historical data obtained from the Company's books and records, information was obtained from Company personnel relative to current operations and future expectations with respect to depreciation. Discussions were held with Company planning and operations management. In addition, physical inspections were also conducted of various representative sites of the Company's operating property.

**Q10. Please briefly describe the information included in the depreciation study reports**.

**A.** The electric depreciation study report is divided into eight (8) sections, while the Common Plant depreciation study report is divided into seven (7) sections. Section 1 of each of the reports contains a brief narrative summary of the respective report. Two key portions of each of the reports are Sections 2 and 4. Section 2 includes the summary schedules listing the present and proposed depreciation rates for each depreciable property group and other depreciation rate development schedules. Section 4 contains a narrative description of the factors considered in selecting service life parameters for the Company's property. The various other sections of the report contain detailed information and/or documentation supporting the schedules contained in Sections 2 and 4. Section 3 of the

reports contain a general narrative explaining methods, procedures, and techniques, etc. universally used in the preparation of depreciation studies. In addition, Section 5 is the graphical presentation of the average service life analysis, Section 6 is the detailed Average Remaining Life calculations, and Section 8 for the Electric study, (Section 7 for the Common Plant study) is the detailed Net Salvage analysis schedules. Section 7 of the Electric study is the supporting calculations for the theoretical depreciation reserve calculations used to allocate the booked depreciation reserves relative to selected sub-account levels.

**Q11. What was the source of the data utilized as a basis for determining the depreciation rates?**

**A.** As previously discussed, all of the historical data utilized in the course of performing the detailed service life and salvage study was obtained from the Company's books and records. Historical vintaged data (additions, retirements, adjustments, and balances) were obtained for each depreciable property group.

**Q12. Are there standard methods utilized to complete a service life analysis of a company's historical property investments?**

**A.** Yes. As discussed in Section 3 of the depreciation study report as well as later in this testimony, the two most common methods are the Retirement Rate Method and the Simulated Plant Record Method. The method chosen to study a company's historical data is dependent upon whether aged or un-aged data is available. If specific aged data is available, the

Retirement Rate Method is used. If only un-aged data is available, the Simulated Plant Record Method is used.

**Q13. Were your studies prepared utilizing one of these accepted standard methods?**

**A.** Yes. Aged plant records for the Company's property is available for a period of years, therefore, the Retirement Rate Method of life analysis was utilized in the depreciation studies of the Company's property.

## V. METHODS, PROCEDURES & TECHNIQUES

**Q14. Please describe the depreciation methods, procedures, and techniques commonly utilized to develop depreciation rates for utility property**.

**A.** Inherent in all depreciation calculations is an overall method, such as the Straight Line Method (which is the most widely used approach within the utility industry) to depreciate property. Other methods available to develop average service lives and depreciation rates are accelerated and/or deferral approaches such as the Sum of the Years Digits Method or Sinking Fund Method.

In addition, there are several procedures that can be used to arrange or group property by sub-groups of vintages to develop applicable service lives. These procedures include the Broad Group, the Equal Life Group and other procedures. Due to the existence of very large quantities of property units within utility operating property, utility property is typically grouped into homogeneous categories as opposed to being depreciated on an individual unit basis. While the Equal Life Group procedure is

viewed as being the more definitive procedure for identifying the life characteristics of utility property and as a basis for developing service lives and depreciation rates, the Broad Group Procedure is more widely utilized throughout the utility industry by regulatory commissions as a basis for depreciation rates. My comments on the Equal Life Group procedure are discussed later in my testimony.

The distinction between the two procedures is in the manner in which recovery of the cost is achieved. Under the Broad Group Procedure, the useful life and resulting depreciation rate is based upon the overall average life of all of the property within the group, while under the Equal Life Group Procedure, the useful life and resulting depreciation rate is based upon separately recovering the investment in each equal life group within the property category over the actual life of the property in that group.

A brief example (with a property group that has three units/three equal life groups of like property) will demonstrate the difference between the two procedures. The example incorporates the assumption that unit No. 1 (or equal life group of property) will retire after one year, unit No. 2 (or equal life group) will retire after two years, and Unit No. 3 (or equal life group) will retire after three years. Accordingly, the average life of all three (groups) is two (2) years (1+2+3)÷3. Under the Broad Group Procedure, the average useful life and resulting depreciation rate is calculated based upon the two (2) year average life. The resulting annual depreciation rates would be fifty (50) percent in every year. Conversely,

under the Equal Life Group Procedure, each year's average life and resulting depreciation rate is calculated by using the period of time during which the portion of the property group remains in service. Since unit No. 1 (or that portion of the account) was retired from service after one year, the entire investment for that property is recovered over one (1) year. Likewise, since unit No. 2 (or that portion of the account) will have a service life of two years, the recovery of that portion of the account will occur over two years. Lastly, unit No. 3 (or that portion of the account) is recovered over three years. Hence, the useful average life for the property group in the first year is 1.64 years and the first year's annual depreciation rate is 61.11 percent. In the second year, the useful average life of the surviving group is 2.4 years and the second year's depreciation rate drops to 41.67 percent. This occurs because during the first year, unit No. 1 (or that portion of the account) was fully recovered. Likewise, in year three the useful life of the surviving group is 3 years and the depreciation rate further drops to 33.33 percent. See the following Table EMR-1 (BG and ELG).

**BG Average Life Calculation**

| Year | | Investment | Recovery Period (Yrs) | ASL (Years) | Weight |
|---|---|---|---|---|---|
| **1** | Group # 1 | 300 | 2 | | 150 |
| | Group # 2 | 300 | 2 | | 150 |
| | Group # 3 | 300 | 2 | | 150 |
| | Total | 900 | | 2.00 | 450 |
| **2** | Group # 1 | 0 | 0 | | 0 |
| | Group # 2 | 300 | 2 | | 150 |
| | Group # 3 | 300 | 2 | | 150 |
| | Total | 600 | | 2.00 | 300 |
| **3** | Group # 1 | 0 | 0 | | 0 |
| | Group # 2 | 0 | 0 | | 0 |
| | Group # 3 | 300 | 2 | | 150 |
| | Total | 300 | | 2.00 | 150 |
| **Grand Total** | | 1,800 | | 2.00 | 900 |

**BG Depreciation Rate Calculation**

| Investment | Recovery Period (Yrs) | Annual Rate-% | Recovery Amount |
|---|---|---|---|
| 300 | 2 | | 150 |
| 300 | 2 | | 150 |
| 300 | 2 | | 150 |
| 900 | | 50.00% | 450 |
| 0 | 0 | | 0 |
| 300 | 2 | | 150 |
| 300 | 2 | | 150 |
| 600 | | 50.00% | 300 |
| 0 | 0 | | 0 |
| 0 | 0 | | 0 |
| 300 | 2 | | 150 |
| 300 | | 50.00% | 150 |
| 1,800 | | 50.00% | 900 |

**ELG Average Life Calculation**

| Year | | Investment | Recovery Period (Yrs) | ASL (Years) | Weight |
|---|---|---|---|---|---|
| **1** | Group # 1 | 300 | 1 | | 300 |
| | Group # 2 | 300 | 2 | | 150 |
| | Group # 3 | 300 | 3 | | 100 |
| | Total | 900 | | 1.64 | 550 |
| **2** | Group # 1 | 0 | 0 | | 0 |
| | Group # 2 | 300 | 2 | | 150 |
| | Group # 3 | 300 | 3 | | 100 |
| | Total | 600 | | 2.40 | 250 |
| **3** | Group # 1 | 0 | 0 | | 0 |
| | Group # 2 | 0 | 0 | | 0 |
| | Group # 3 | 300 | 3 | | 100 |
| | Total | 300 | | 3.00 | 100 |
| **Grand Total** | | 1,800 | | 2.00 | 900 |

**ELG Depreciation Rate Calculation**

| Investment | Recovery Period (Yrs) | Annual Rate-% | Recovery Amount |
|---|---|---|---|
| 300 | 1 | | 300 |
| 300 | 2 | | 150 |
| 300 | 3 | | 100 |
| 900 | | 61.11% | 550 |
| 0 | 0 | | 0 |
| 300 | 2 | | 150 |
| 300 | 3 | | 100 |
| 600 | | 41.67% | 250 |
| 0 | 0 | | 0 |
| 0 | 0 | | 0 |
| 300 | 3 | | 100 |
| 300 | | 33.33% | 100 |
| 1,800 | | 50.00% | 900 |

Finally, the depreciable investment needs to be recovered over a defined period of time (through use of a technique), such as the Whole Life or Average Remaining Life of the property group. The distinction between the Whole Life and Average Remaining Life Techniques is that under the Whole Life Technique, the depreciation rate is based on a snapshot and determines the recovery of the investment and average net salvage over the average service life of the property group for that moment in time. The Whole Life technique requires either frequent updates to keep the "snapshot" current or the use of an artificial deferred account that holds "excess" or "deficient" depreciation reserves. In comparison, under the Average Remaining Life Technique, the resulting annual depreciation rate incorporates the recovery of the investment (and future net salvage) less any recovery experienced to date over the average remaining life of the property group. The Average Remaining Life Technique is clearly superior in that it incorporates all of the current and future cost components in setting the proposed annual depreciation rate as opposed to only some of the current and future cost components as is the case with the Whole Life Technique. This means that any changes that occur in between depreciation studies are automatically trued-up in the subsequent study. No artificial deferral account needs to be established to accomplish such a true-up.

The depreciation methods, procedures, and techniques can be used interchangeably. For example, one could use the Straight Line Method

with the Broad Group Procedure and the Average Remaining Life Technique, or the Straight Line Method with the Equal Life Group Procedure and Average Remaining Life Technique, or combinations thereof.

**Q15. Which of these methods, procedures and techniques did you use in your depreciation studies?**

**A.** The depreciation rates set forth in my depreciation study reports were developed utilizing the Straight Line Method, the Broad Group Procedure, and the Average Remaining Life Technique.

**Q16. If you did not use the Equal Life Group Procedure in the development of the Company's depreciation rates, why did you spend time explaining the process?**

**A.** The discussion of the various/significant methods, procedures, and techniques, and specifically the Equal Life Group Procedure, is an ongoing education process. That is, the discussion is presented to insure that there is an understanding of principal available depreciation processes and their benefits, notwithstanding any unwillingness and/or objection to the use of a more defined and correct procedure, i.e. the Equal Life Group Procedure.

**Q17. Why did you utilize the method, procedure, and technique incorporated within the proposed depreciation rates?**

**A.** The Straight Line Method is widely understood, recognized, and utilized almost exclusively for depreciating utility property.

The Broad Group Procedure recovers the Company's investments over the average period of time in which the property is providing service to the Company's customers. While I have used the Equal Life Group procedure in other studies, I used the Broad Group Procedure in this study because it is consistent with depreciation methods and procedures generally accepted by regulatory Commissions plus it is the approach underlying the Company's current depreciation rates.

Finally, the amount of annual depreciation must be based upon the productive life over which the un-depreciated capital investment is recovered (the Average Remaining Life Technique). The utilization of the Average Remaining Life Technique to develop the applicable annual depreciation expense (over the average remaining life) assures that the Company's property investment is fully recovered over the useful life of the property, and that inter-generational inequities are avoided as current and future customers will pay their fair share of depreciation expense. The determination of the productive remaining life for each property group relies on a study of both past experience and future expectations and develops the appropriate total life and applicable depreciation rates for each of the Company's property groups. The Average Remaining Life Technique incorporates all of the Company's fixed capital cost components, thereby better assuring full recovery of the Company's embedded net plant investment and related costs. The Average Remaining Life Technique gives consideration not only to the average service life and survival

characteristics plus the net salvage component, but also recognizes the level of depreciation which has been accrued to date in developing the proposed depreciation rate. The Average Remaining Life Technique is used by regulated companies and regulatory agencies because it allows full recovery by the end of the property's useful life -- no more and no less.

## VI. GROUP DEPRECIATION

**Q18. Please explain the utilization of group depreciation**.

**A.** Group depreciation is utilized to depreciate property when more than one item of property is being depreciated. Such an approach is appropriate because all of the items within a specific group typically do not have identical service lives, but have lives which are dispersed over a range of time. Utilizing group depreciation allows for a uniform application of depreciation rates to groups of similar property in lieu of performing extensive depreciation calculations on an item-by-item basis. The Broad Group approach is a recognized common group depreciation procedure.

The Broad Group Procedure recovers the investment within the asset group over the average service life of the property group. Given that there is dispersion within each property group, there are variations of retirement ages for the many investments within each property group. That is, some properties retire early (before average service life) while others retire at older ages (after average service life). This dispersion of retirement ages defines the survival pattern experienced by the applicable property group.

**Q19. What factors influence the determination of the recommended annual depreciation rates included in your depreciation reports?**

**A.** The depreciation rates reflect four principal factors: (1) the plant in service by vintage, (2) the book depreciation reserve, (3) the future net salvage, and (4) the composite remaining life for the property group. Factors considered in arriving at the service life are the average age, realized life and the survival characteristics of the property. The net salvage estimate is influenced by both past experience and future estimates of the cost of removal and gross salvage amounts.

**Q20. Please explain further the assumptions considered when utilizing your depreciation approach**.

**A.** According to the approach, the Company will recover its un-depreciated fixed capital investment through annual depreciation expense in each year throughout the useful life of the property. The Average Remaining Life Technique incorporates the future life expectancy of the property, the vintaged surviving plant in service, the survival characteristics, together with the book depreciation reserve balance and future net salvage in developing the amounts for each property account. Accordingly, Average Remaining Life depreciation meets the objective of providing a Straight Line recovery of the Company's fixed capital property investments.

**Q21. Do you have additional comments related to the group approach that you have used?**

**A.** Yes, my depreciation calculations, as applied in this study, follow a group depreciation approach. The group approach refers to the method of calculating annual depreciation based on the summation of the investment in any one plant group rather than calculation of depreciation for each individual unit of plant. In theory, each unit achieves average service life by the time of retirement. Accordingly, the full cost of the investment will be credited to plant in service when the retirement occurs, and likewise the depreciation reserve will be debited with an equal retirement cost. No gain or loss is recognized at the time of property retirement because of the assumption that the property was retired at average service life.

## VII. NET SALVAGE

**Q22. What are the net salvage factors included in the determination of depreciation rates?**

**A.** Net salvage is the difference between gross salvage, or the proceeds received when an asset is disposed of, and the cost of removing the asset from service. Net salvage is said to be positive if gross salvage exceeds the cost of removal. If the cost of removal exceeds gross salvage, the result is negative salvage. Many retired assets generate little, if any, positive salvage. Instead, numerous Company asset groups generate negative net salvage at the end of their lives due to the cost of removal.

The cost of removal includes costs such as demolishing, dismantling, tearing down, disconnecting or otherwise retiring/removing plant, as well as any environmental clean-up costs associated with the property. Net salvage includes any proceeds received from any sale of plant.

Net salvage experience is studied for a period of years to determine the trends which have occurred in the past. These trends are considered, together with any changes that are anticipated in the future, to determine the future net salvage factor for remaining life depreciation purposes. The net salvage percentage is determined by comparing the total net positive or negative salvage to the book cost of the property investment retired.

The method used to estimate the retirement cost is a standard analysis approach which is used to identify a company's historical experience with regard to what the end of life cost will be relative to the cost of the plant when first placed into service. This information, along with knowledge about the average age of the historical retirements that have occurred to date, allows an estimation of the level of retirement cost that will be experienced by the Company at the end of each property group's useful life. The study methodology utilized has been extensively set forth in depreciation textbooks and has been the accepted practice by depreciation professionals for many decades. Furthermore, the cost of removal analysis is the current standard practice used for mass assets by essentially all depreciation professionals in estimating future net salvage for the purpose of identifying the applicable depreciation rate for a property group. There is a direct relationship between the installation of specific plant and its corresponding removal. The installation is its beginning of life cost while the removal is its end of life cost. Also, it is important to note that Average Remaining Life depreciation rates incorporate future net

salvage which is typically more representative of recent versus long-term historical average net salvage.

The Company's historical net salvage experience was analyzed to identify the historical net salvage factor for each applicable property group and is included in Section 8 of the Electric Division study and Section 7 of the Common Plant study. This analysis routinely finds that historical retirements have occurred at average ages significantly shorter than the property group's average service life. The occurrence of historical retirements at an age which is significantly younger than the average service life of the property category demonstrates that the historical data does not appropriately recognize the true level of retirement cost at the end of the property group's useful life. An additional level of cost to retire will occur due to the passage of time until all the current plant is retired at end of its life. That is, the level of retirement costs will increase over time until the average service life is attained. The additional inflation in the estimate of retirement cost is related to those additional years' cost increases (primarily the result of higher labor costs over time) that will occur prior to the end of the property group's average life.

To provide further explanation of the issue, several general principles surrounding property retirements and related net salvage should be highlighted. As property continues to age, assets that typically generate positive salvage when retired will generate a lower percentage of positive salvage as compared to the original cost of the property. By comparison, if

the class of assets is one that typically generates negative net salvage (cost of removal) with increasing age at retirement, the negative net salvage percentage as compared to original cost will typically be greater. This situation is routinely driven by the higher labor costs that occur with the passage of time.

A simple example will aid in understanding the above net salvage analysis and the required adjustment to the historical results. Assume the following scenario: A company has two cars, Car #1 and Car #2, each purchased for $20,000. Car #1 is retired after 2 years and Car #2, is retired after 10 years. Accordingly, the average life of the two cars is six (6) years. Car #1 generates 75% salvage or $15,000 when retired and Car #2 generates 5% salvage or $1,000 when retired.

| | **Unit Cost** | **Ret. Age (Yrs.)** | **% Salv.** | **Salvage Amount** |
|---|---|---|---|---|
| Car #1 | $20,000 | 2 | 75% | $15,000 |
| Car #2 | $20,000 | 10 | 5% | $ 1,000 |
| Total | $40,000 | 6 | 40% | $16,000 |

Assume an analysis of the experienced net salvage at year three (3). Based upon the Car #1 retirement, which was retired at a young age (2 yrs.) as compared to the average six (6) year life of the property group, the analysis indicates that the property group would generate 75% salvage. This indication is incorrect, however, because it is the result of basing the

estimate on incomplete data. That is, the estimate is based upon the salvage generated from a retirement that occurred at an age which is far less than the average service life of the property group. The actual total net salvage that occurred over the average life of the assets (which experienced a six (6) year average life for the property group) is 40%, as opposed to the initial incorrect estimate of 75%.

This is exactly the situation that occurs with the majority of the Company's historical net salvage data, except that most of the Company's property groups routinely experience negative net salvage (cost of removal) as opposed to positive salvage.

## VIII. DEPRECIATION STUDY ANALYSIS

**Q23. Please explain what factors affect the length of the average service life that the Company's property may achieve.**

**A.** Several factors contribute to the length of the average service life which the property achieves. The three major factors are: (1) physical; (2) functional; and (3) contingent casualties.

The physical factor includes such things as deterioration, wear and tear and the action of the natural elements. The functional factor includes inadequacy, obsolescence and requirements of governmental authorities. Obsolescence occurs when it is no longer economically feasible to use the property to provide service to customers or when technological advances have provided a substitute with superior performance. The remaining factor, contingent casualties, includes retirements caused by accidental damage or construction activity of one type or another.

In performing the life analysis for any property being studied, both past experience and future expectations must be considered in order to fully evaluate the circumstances that may have a bearing on the remaining life of the property. This ensures the selection of an average service life which best represents the expected life of each property investment.

**Q24. What study procedures were utilized to determine service lives for the Company's property?**

**A.** Several study procedures were used to determine the prospective service lives recommended for the Company's plant in service. These include the review and analysis of historical, as well as anticipated, retirements, current and future construction technology, historical experience and future expectations of salvage and the cost of removal.

Service lives are affected by many different factors, some of which can be determined from studying past experience, others of which must rely heavily on future expectations. When physical characteristics are the controlling factor in determining the service life of property, historical experience is a useful tool in selecting service lives. In cases where there are changes in technology, regulatory requirements, Company policy or the development of a less costly alternative, historical experience is of lesser or little value. However, even when considering physical factors, the future lives of various properties may vary from those experienced in the recent past.

While a number of methods are available to study historical data, as I mentioned previously, the two methods most commonly utilized to determine average service lives for a company's property are the Retirement Rate Method and the Simulated Plant Record Method. Aged plant records for the Company's property is available for a period of years, therefore, the Retirement Rate Method of life analysis was utilized in the depreciation studies of the Company's property.

**Q25. Please explain the use of the retirement rate method.**

**A.** With this method of analysis, the Company's actuarial service life data, which is sorted by age, is used to develop a survivor curve (observed life table). This survivor curve is the basis upon which smooth curves (standard Iowa Curves) are matched or fitted to then determine the average service life being experienced by the property account under study. Computer processing provides the capability to review various experience bands throughout the life of the account to observe trends and changes. For each experience band analysis, an "observed life table" is constructed using the exposure and retirement experience within the selected band of years. In some cases, the total life cycle of the property has not been achieved and the experienced life table, when plotted, results in a "stub curve." It is the "stub curve," or the total life curve, if the total life curve is achieved, which is matched or fitted to the standard Iowa Curves. The matching process is performed both by computer analysis, using a least squares technique, and by overlaying the observed life tables on the

selected smooth curves for visual reference. The fitted smooth curve is a benchmark which provides a basis to determine the estimated average service life for the property group under study.

**Q26. Do the depreciation study reports contain charts which compare the analysis of the Company's actual historical data to the service life parameters you are proposing as a basis for your recommended annual depreciation rates?**

**A.** Yes. Graphical representations of the Company's plant balances versus simulated plant balances based upon the estimated lives and Iowa Curves are contained in Section 5 of the reports.

**Q27. You have referred to the use of the Iowa or smoothed survivor curves. Can you generally describe these curves and their purpose?**

**A.** The preparation of a depreciation study typically incorporates smoothed curves to represent the experienced or estimated survival characteristics of the property. The "smoothed" or standard survivor curves are the "Iowa" family of curves developed at Iowa State University and which are widely used and accepted throughout the utility industry. The shape of the curves within the Iowa family is dependent upon whether the maximum rate of retirement occurs before, during or after the average service life. If the maximum retirement rate occurs earlier in life, it is a left (L) mode curve; if it occurs at average life, it is a symmetrical (S) mode curve; if it occurs after average life, it is a right (R) mode curve. In addition, there is the origin (O) mode curve for plant which has heavy retirements at the beginning of life.

At any particular point in time, actual Company plant may not have completed its life cycle. Therefore, the survivor table generated from the Company data is not complete. This situation requires that an estimate be made with regard to the incomplete segment of the property group's life experience. Further, actual company experience often varies from age interval to age interval, making its utilization for average service estimation difficult. Accordingly, the Iowa Curves are used to both extend Company experience to zero percent surviving as well as to smooth actual Company data.

**Q28. What is the principal reason for completing the detailed historical life and salvage analysis?**

**A.** The detailed historical analysis is prepared as a tool from which to make informed assessments as to the appropriate service life and salvage parameters over which to recover the Company's plant investment. However, in addition to the available historic data, consideration must be given to current events, the Company's ongoing operations, Company management's future plans, and general industry events which are anticipated to impact the lives that will be achieved by plant in service.

## IX. COMPREHENSIVE DEPRECIATION STUDY RESULTS AS OF 12-31-14

**Q29. What is the basis for the Company's currently approved Electric depreciation rates?**

**A.** As shown in Exhibit No. ___(EMR-1), Table 1, pages 2-1 to 2-2, the prior depreciation rates for the plant were based upon depreciation parameters

set forth in a study completed using the Company's Electric plant investment data through December 31, 2008. The current account level depreciation rates composite to an annual depreciation rate of 2.88 percent when applied to each of the December 31, 2014 plant in service account balances.

**Q30. What are the most notable changes in annual depreciation rates and expense between the present and proposed depreciation rates as set forth in Section 2 of the Montana-Dakota Electric depreciation report?**

**A.** With regard to plant in service, several of the proposed rates reflect changes (as outlined in Section 4 of the study) from the current depreciation rates.

The most notable depreciation/amortization occurred relative to Account 344.10 – Generators, Account 344.20 – Generators-Wind Farm, Account 353 – Station Equipment, Account 355 – Poles and Fixtures, and Account 370 – Meters.

The depreciation rate for Account 344.10 – Generators increased from 2.60 percent to 3.00 percent. The Company has multiple Other Production units including Glendive, Glendive II, Miles City, Heskett III, Ormat Generation, and Portable Generators at various locations. Not all of the various locations have investments in each of the Other Production property accounts.

The depreciation rate for the Company's investment in this property category is being developed via the Life Span Method. An interim

retirement rate was identified for each property group based upon an analysis of the Company's total account historical experience to date. Using the location and vintage level surviving investments for each generating facility's location property, the estimated interim retirement rate and Company management's provided probable retirement/rehabilitation dates, an implicit average service life and average remaining life was produced via the life span approach. The developed depreciation rates do not include any proposed component for the recovery of either interim or terminal (decommission cost) net salvage. The end of life terminal negative net salvage (decommissioning cost), is addressed separately in this rate case. Company management requested that interim negative net salvage not be included in the development of the proposed depreciation rates related to its generating facilities at this time.

Similarly like the forgoing accounts, the ongoing additional new investments added to existing life span property class investments (absent changes in underlying parameters) automatically reduces the implicit average life and increases the required depreciation rate due to the fact that in each successive year there is a shorter period of time over which to recover the added investments.

The depreciation rate for Account 344.2-Generators-Wind Farm increased from 5.06 percent to 5.52 percent. The Company has 2 wind farm sites, namely, Diamond Willow and Cedar Hills. Diamond Willow currently has 20 turbine units while the Cedar Hills is comprise of 13

turbine units. The capacity of each of the Diamond Hills turbines is 1.5 MW and the Cedar Hills turbines are 1.5 MW each.

The depreciation rate for the Company's investment in this property category is being developed via the Life Span Method. An interim retirement rate was identified for each property group based upon an analysis of the Company's total account historical experience to date. Using the location and vintage level surviving investments for each generating facility's location property, the estimated interim retirement rate and Company management's provided probable retirement/rehabilitation dates, an implicit average service life and average remaining life was produced via the life span approach. The developed depreciation rates do not include any proposed component for the recovery of either interim or terminal (decommission cost) net salvage. The end of life terminal negative net salvage (decommissioning cost), is addressed separately in this rate case. Company management requested that interim negative net salvage not be included in the development of the proposed depreciation rates related to its generating facilities at this time.

Similarly, like the forgoing accounts, the ongoing additional new investments added to existing life span property class investments (absent changes in underlying parameters) automatically reduces the implicit average life and increases the required depreciation rate due to the fact that in each successive year there is a shorter period of time over which to recover the added investments.

The proposed depreciation rate for Account 353– Station Equipment, declined from 1.88 percent to 1.58 percent. The proposed depreciation rate is the result of combined changes of the average service life parameters as well as the changes to plant in service and the applicable book depreciation reserve. The proposed average service life was changed in accordance with the life indication developed through an analysis of the Company's historical data and consideration of future expectations. The resulting proposed average service life is sixty (60) years, while the average service life underlying the present depreciation rate is forty-five (45) years. Both the future net salvage underlying the proposed depreciation rates and the net salvage underlying the present depreciation rates is negative 10 percent.

The costs included in this account investment are related to numerous transmission substation equipment (including items such as transformers, voltage regulators, circuit breakers, etc.) used to transform power to different voltages. Currently, there are nearly 100 stations operating at voltages between 69Kv through 138 & 345Kv facilities. During the last several years the Company has been in an increasing growth mode having increased its plant investment by approximately a third. To date the activity has been more on the growth side as opposed to replacement of existing facilities. In future years it is anticipated that replacement of existing facilities will likely occur at higher levels, thus the average service life should be monitored closely. At the current estimated

average service life, the recovery period is longer than the maximum average service life for the property group identified in an industry survey.

The proposed depreciation rate for Account 355 – Poles and Fixtures, increased from 2.40 percent to 2.99 percent. The proposed depreciation rate is the result of combined changes of both the average service life and net salvage parameters. The proposed average service life changed in accordance with the life indication developed through an analysis of the Company's historical data and consideration of future expectations. The resulting proposed average service life is fifty (50) years, which is an increase from the forty-five (45) year average service life underlying the present depreciation rate. The future net salvage underlying the proposed depreciation rates is negative fifty (50) percent while the future net salvage underlying the present depreciation rates is negative thirty-five (35) percent and is reflective of the increased level of negative net salvage being experienced by the company.

During the last several years the Company has been in an increasing growth mode having increased its plant investment by approximately a third. Historically, the activity has been more on the growth side as opposed to replacement of existing facilities, however, during the most recent study year replacements/retirements have accelerated rather dramatically. In fact while the overall and more recent 5 year experience band analysis produced life indication of an estimated 57 years' average service life, the current 2014 band produced an average

service life indication of 45 years. In future years it is anticipated that replacement of existing facilities will likely occur at higher levels.

Over the immediate coming 5 years management anticipates building approximately 100 miles of pole transmission line of which one half is expected to meet continued growth/expansion while the remaining one half is expected to be replacement of existing property with further activity in more distant years. This significant increase in plant activity can be anticipated to continue the shorter life presently being experienced. Based upon the available recent study result a reduction to the longer than normal average service life for the Company's property is proposed. At the present time, an average service life of 50 years is estimated for the property group. As additional activity occurs in future years a further reduction will likely be warranted. Even at the estimated average service life of a 50-R3 life and curve, the recovery period is at the higher end of the industry range of service lives.

The proposed depreciation rate for Account 370– Meters, increased from 3.44 percent to 7.19 percent. The proposed depreciation rate is the result of combined changes of both the average service life and net salvage parameters. The resulting proposed composite average service life twenty (20) years, while the average service life underlying the present depreciation rate is thirty-five (35) years. The future net salvage underlying the proposed depreciation rates is negative 5 percent while the future net salvage underlying the present depreciation rates is 0 percent.

In more recent years, the Company replaced the overwhelming majority of its electric meters in conjunction with an AMR conversion project. Accordingly, the historical analysis of recent data, in which there was a wholesale change out of property, produced a shorter life indication for the property group than might be experienced for the current property. That is, the conversion project resulted in the Company now having a completely different automated metering reading (AMR) technology of Meters than which previously existed. This current new technologically driven property is routinely influenced by greater levels of upgrades, obsolescence, etc. than the prior mechanical meters.

For example, while the AMR technology provides improved efficiencies and enhanced technology capabilities, it only captures a limited part of the ultimate transformation to the current state of the art meter reading and plant utilization capabilities. Advanced Meter Infrastructure (AMI) and related Smart Grid will further expand the control capabilities of the electric network. Accordingly, it is only a matter of time until it will be necessary to complete further upgrades to its present Meter facilities. Thus, an average service life of 20 years is initially estimated for the present property group investment. The life of this property group needs to be monitored on an ongoing basis in conjunction with changing technology and the Company's needs to address such rapid changes.

**Q31. What is the basis for the Company's currently approved Common Plant depreciation rates?**

**A.** As shown in Exhibit No. ___(EMR-2), Table 1, pages 2-1 to 2-2 of the Common Plant Depreciation Study, the prior depreciation rates for the plant were based upon depreciation parameters set forth in a study completed using the Company's plant investment data through December 31, 2008. The current account level depreciation rates composite to an annual depreciation rate of 3.89 percent when applied to each of the December 31, 2014 plant in service account balances.

**Q32. What are the most notable changes in annual depreciation rates and expense between the present and proposed depreciation rates as set forth in Section 2 of the Montana-Dakota Common Plant depreciation report?**

**A.** With regard to plant in service, several of the proposed rates reflect changes (as outlined in Section 4 of the study) from the current depreciation rates.

The most notable depreciation/amortization change occurred relative to Account 392.20 - Transportation Equipment - Cars & Trucks.

The depreciation rate relative to Account 392.20 - Transportation Equipment - Cars & Trucks increased from 4.11 percent to 6.65 percent. Contributing to the depreciation expense increase is the change in the estimated average service life from seven to nine years while the future net salvage estimate remained at 20%. However, the more significant driver of the depreciation rate increase is the fact that the current book depreciation reserve is currently lower than required in comparison to the current age of

the property group's investment.

## X. NET CHANGE FROM 12-31-08 BOOK DEPRECIATION RATES TO PROPOSED DEPRECIATION

**Q33. What is the net change to the composite electric depreciation rate under the proposed depreciation rates as applied to the December 31, 2014 plant in service in comparison to the application of the present depreciation rates?**

**A.** Application of the proposed account level depreciation rates to the Company's plant in service as of December 31, 2014 produces a composite depreciation rate of 2.94 percent. By comparison, the application of the December 31, 2014 plant in service to the present account level depreciation rates to the Company's plant in service as of December 31, 2014 produces a composite depreciation rate of 2.88 percent.

**Q34. What is the net change in electric annual depreciation expense under the proposed depreciation rates in comparison to the present depreciation rates?**

**A.** Exhibit No.___(EMR-1), Section 2, Table 1, pages 2-1 to 2-2 produces a net increase in annualized depreciation expense of $826,685 when applying the proposed depreciation rates to the Company's plant in service investment as of December 31, 2014 in comparison to the depreciation expense produced by applying the current depreciation rates.

**Q35. Have you prepared an exhibit which compares the composite depreciation rates produced when applying the proposed account**

**level deprecation rates to the Company's December 31, 2014 Common plant in service balances as compared to applying to the present depreciation rates?**

A. Yes, that information is contained on Exhibit No.___(EMR-2), Pages 2-1 to 2-2 of the Common Plant Depreciation Study which shows the application of the proposed depreciation study account level depreciation rates to the Company's December 31, 2014 Common Plant in Service produces a composite depreciation rate of 4.30%, as compared to the application of the present account level depreciation rates that produces a composite depreciation rate of 3.89%.

**Q36. What is the net change to the Company's Common Plant depreciation expense when applying the proposed depreciation rates to the December 31, 2014 plant in service in comparison to the annual depreciation expense when applying the present depreciation rates?**

A. Exhibit No. ___(EMR-2) shows the application of the proposed December 31, 2014 depreciation study account level depreciation rates to the Company's Common plant in service as of December 31, 2014, which, as shown on page 2-1 of the exhibit, produces a net increase of annual depreciation expense of $275,554 as compared to that produced by applying the present depreciation rates.

## XI. RECOMMENDATION

**Q37. What is your recommendation in this proceeding?**

**A.** I recommend that the proposed depreciation rates set forth in the comprehensive depreciation study reports be uniformly and prospectively adopted by the Commission for regulatory purposes as well as by the Company for accounting purposes.

**Q38. Does this conclude your direct testimony?**

**A.** Yes, it does.

# PROFESSIONAL QUALIFICATIONS
# OF
# EARL M. ROBINSON, CDP
# AUS CONSULTANTS

Experience includes approximately 40 years of service in the public utility field. Mr. Robinson has performed services in the areas of depreciation, original cost, valuation, cost of service, and bill analysis within numerous regulatory jurisdictions and property tax agencies throughout the Eastern, Midwestern, Southwestern, and Pacific regions of the United States, Canada plus various areas of the Caribbean.

## EXPERIENCE

1977 to Date

AUS Consultants. Various positions - currently Principal. Mr. Robinson has prepared studies and coordinated analysis related to valuation, depreciation, original cost, trended original cost, cost of service, bill analysis, as well as analysis of expenses, revenues and income for various municipal and an extensive number of investor-owned electric, gas, water, wastewater, and telecommunications utilities.

Studies prepared have required the review of company records, inspection of property, the preparation of property inventories and original costs, preparation and review of mortality studies, selection of proper service lives, life characteristics and analysis of salvage, and analysis of capital recovery impact of changing depreciation methods.

During his many years of experience, Mr. Robinson has been involved in and/or responsible for an extensive quantity of comprehensive depreciation studies. Numerous early year's depreciation studies were prepared manually without the convenience of computer software systems. Subsequent, during the mid/late 1970's, Mr. Robinson became responsible for the completion of the many depreciation studies performed for the firm's clients. As part of that responsibility, Mr. Robinson was involved in not only performing the studies, but also in assisting AUS Consultants' MIS department in developing and testing various computer depreciation models. The studies performed by Mr. Robinson or under his direction have included all types of utilities, including electric, gas, water, wastewater, and telecommunications. During Mr. Robinson's career he has been involved in the preparation of more than a hundred depreciation related projects.

A Certified Depreciation Professional (CDP), Mr. Robinson, as a Principal of AUS Consultants provides services to the firm's clients with regard to depreciation and cost based valuation issues. With more than forty (40) years' experience, he began his career as a staff member of the Plant Accounting Department of United Telephone (now Sprint) Eastern Group Headquarters subsequent to which he has spent the past thirty-five (35) plus years, as a consultant, preparing depreciation and valuation studies for gas, pipeline, electric, telecommunications, water, and wastewater utilities. In conjunction with the provision of these services, Mr. Robinson has testified on many occasions before numerous regulatory agencies (including state, federal, and property tax agencies throughout the U.S., Canada, and the Caribbean in support of the many studies completed for his diverse list of clients. In addition he has negotiated depreciation rates with various state regulatory agencies, the FCC Staff, and the FERC Staff. Mr. Robinson has also participated in several FCC, State, Company three-way depreciation re-prescription meetings.

With regard to valuation matters Mr. Robinson has been involved with the development of cost indexes from the earliest part of his career through the present. During his earlier years, he assisted and/or developed and utilized cost indexes to prepare reproduction cost and related fair value determinations for various of the firm's regulated utility clients. Subsequently, he attained extensive experience in preparing custom indexes, replacement cost, and depreciated replacement cost studies, having been responsible for preparing many such cost studies relative to various clients within the telecommunications industry during

**PROFESSIONAL QUALIFICATIONS**
**OF**
**EARL M. ROBINSON, CDP**
**AUS CONSULTANTS**

the past twenty (20) plus year period.

He is also responsible for developing and publishing the firm's AUS Telephone Plant Index (successor to the Handy Whitman and C A Turner Telephone Construction Cost Index), a reproduction cost index subscribed to by various operating companies, regulatory agencies, and consultants.

Mr. Robinson is a founding member and past President of the Society of Depreciation Professionals, a professional organization that provides depreciation training, as well as provides a forum for discussion of depreciation issues. He is also a member of the American Gas Association (AGA) Accounting Services Committee and past chairman of the Statistics, Bibliography, Court Regulatory Sub-Committee of the AGA Depreciation Committee. As a member of that organization, he co-authored a publication entitled "An Introduction to Net Salvage of Public Utility Plant". Mr. Robinson has completed various previous presentations on the subject of depreciation studies as well as depreciated replacement cost to industry organizations and to property tax appraiser staffs.

1975 to 1977

Gannett, Fleming, Corddry & Carpenter, Inc. Valuation Analyst in the Valuation Division where his duties and responsibilities included the classifications, analysis and coordination of data in the development of depreciation rates for various companies including telephone, gas, water and electric utilities.

1971 to 1975

Weber, Fick & Wilson (Acquired by AUS Consultants), Public Utility Analyst engaged in the unitization and subsequent application of costs in the pricing of inventories for original cost determination, depreciation and salvage studies to determine proper annual depreciation rates and trended original cost studies used in the determination of utility rate base.

1966 to 1971

United Telephone Company of Pennsylvania (now Sprint/United Telephone Company of Pa.). As a staff member of the Plant Accounting Department, his duties and responsibilities included various plant accounting ledgers, unitization of location and mass property accounts, as well as special studies related to insurance and tax valuations of utility plant in service.

**TESTIMONY**

Jurisdictions testified in include Alberta, Arizona, California, Connecticut, Delaware, District of Columbia, FERC, Florida, Indiana, Illinois, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Montana, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Nevada, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, and Virgin Islands. Extensive expert testimony has been presented on the subjects including Depreciation, Capital Recovery, Plant in Service Measures of Value, Depreciated Reproduction Cost, and Depreciated Replacement Cost. Numerous additional depreciation studies have been completed and filed in various different jurisdictions for which testimony appearances were not required.

**PERSONAL**

Education:

# PROFESSIONAL QUALIFICATIONS
# OF
# EARL M. ROBINSON, CDP
# AUS CONSULTANTS

Graduate of Harrisburg Area Community College with an Associate of Arts Degree in Accounting, and has undertaken further studies at University Center of Harrisburg. Successfully completed numerous programs related to service life and salvage estimation, forecasting, and evaluation sponsored by Depreciation Programs, Inc. at Calvin College Campus, Grand Rapids, Michigan. In addition, Mr. Robinson successfully completed cost of service seminars sponsored by the American Water Works Association. He received his CDP (Certified Depreciation Professional) designation by Exam during 1996.

**List of Clients Served**

CATV

Storer Broadcasting Company
(DE, MD, MN)

Cable Television Consortium

ELECTRIC

Atlantic City Electric d/b/a Conectiv Power Delivery
Borough of Butler - Electric Dept.
Conectiv Power Delivery
Consolidated Edison Co of NY
Consolidated Hydro, Inc.
Delmarva Power and Light Company
Delaware
Maryland
Duquesne Light Company
Hershey Electric Company
Kentucky Utilities
Lockhart Power Company
Louisville Gas & Electric Co. - Elec. Div.
Montana – Dakota Utilities Co – Elec. Div
Nantahala Power and Light Company
New York State Electric and Gas Corp
Northern Indiana Public Service Co
Pennsylvania Power Company
Philadelphia Electric Company
Potomac Electric Power Company
Maryland
Washington DC
Progress Energy - Carolinas
Progress Energy - Florida, Inc.
Public Service Company of New Mexico
Public Service Electric & Gas Company
Rochester Gas and Electric Corporation
The United Illuminating Company
Wellsboro Electric Company
Vermont Electric Power, Inc.

GAS

ATCO Gas
ATCO Pipelines
Atlanta Gas Light Company
Bay State Gas Company
C & T Enterprises, Inc.
Valley Cities Waverly Gas Company
Canadian Western Natural
Gas Company Limited
Cascade Natural Gas Corporation
Citizens Gas & Coke Utility
Columbia Gas of Pennsylvania, Inc.
Connecticut Natural Gas Corporation
Consolidated Edison Co of New York
East Ohio Gas
North Carolina Gas Service
North Penn Gas
Northern Indiana Public Service Co.
Northern Utilities, Inc.-Maine
Northern Utilities, Inc.-New Hampshire
Oklahoma Natural Gas Company
Pacific Gas & Electric Company
Paiute Pipeline
Pennsylvania Gas & Water Company
PG Energy Inc.
Pennsylvania and Southern Gas Company
Valley Cities Division
Waverly Division
Pipeline Industry Group

**PROFESSIONAL QUALIFICATIONS**
**OF**
**EARL M. ROBINSON, CDP**
**AUS CONSULTANTS**

Elkton Gas Service
Granite State Gas Transmission, Inc.
Great Plains Natural Gas Co.
Kansas Gas Service
Louisville Gas & Electric Co. - Gas Division
Montana Dakota Utilities - Gas Division
National Fuel Gas Distr. Corp., NY
National Fuel Gas Supply
New York State Electric & Gas Corp
NICOR Gas Company
Northeast Heat & Light Company
Providence Gas Company
Public Service Electric & Gas Co
Public Service Company of New Mexico
Roanoke Gas Company
Rochester Gas and Electric Corporation
Saxonburg Heat & Light Company
Sierra Pacific Power Co/NV Energy
Southern Connecticut Gas Company
Southwest Gas Corporation
T.W. Phillips Gas & Oil Company
Williams Companies

GENERAL CLIENTS

Arthur Andersen
Pricewaterhouse Coopers
Electric Utility Consultants, Inc.
Ernst & Young
Standard & Poors

REGULATORY AND GOVERNMENTAL

Regulatory Commission of Alaska
- Alaska Electric Light & Power Company
- Interior Telephone Company, Inc
- Fairbanks Water & Wastewater
- Mukluk Telephone Company, Inc
- TDX North Slope Generating
- United KUC, Inc
- United Utilities, Inc.

Arizona Corporation Commission
- Mountain States Telephone & Telegraph
- Southwest Gas Corporation

Baltimore County, MD
Bensalem Township - Water
Bethlehem Authority - Water
Borough of Butler, NJ
Borough of Media Water Works
City of New Orleans, LA
Delaware Public Service Commission
Delaware River Port Authority
Diamond State Telephone Company
Kansas Corporation Commission
- Southwest Bell

Public Service Comm. of Nevada
- Nevada Bell

Town of Waterford, CT
- Northeast Utilities

Washington, D.C. - PSC
- C&P Telephone Company
- Potomac Electric Power Company

TELECOMMUNICATIONS

Ace Telephone Association - IA & MN
Air Touch Communications
ALLTEL Pennsylvania, Inc.
AT&T-Advance Solutions, Inc-CA
BellSouth Telecommunications
Buffalo Valley Telephone Company
Paging Industry Study Group
- AirTouch Paging
- Mobile Comm

Paging Network, Inc.
- Skytel
- USA Mobile Communications

**PROFESSIONAL QUALIFICATIONS**
**OF**
## EARL M. ROBINSON, CDP
**AUS CONSULTANTS**

Cellular Industry Study Group
  AT&T Wireless
BellSouth Communications
  GTE Mobilnet
Brighthouse Networks-Citrus County
Cable & Wireless
Chenango & Unadilla Telephone Company
Cingular Wireless
  Cingular Wireless – California
  Cingular Wireless – Houston
  Cingular Wireless - Massachusetts
Commonwealth Telephone Company
CTC of Michigan
CTC of Virginia
Denver & Ephrata Telephone & Telegraph Co.
  D & E Network
  D & E System
Embarq Florida, Inc.
Empire Telephone Corporation
Illinois Consolidated Telephone Co.
Jamestown Telephone Corporation
Leesport Telephone Company
Lewisberry Telephone Company
Los Angeles Cellular Telephone Co.
MCI International, Inc.
MCI Telecommunications Corp.
MFS Communication Company, Inc.
Marianna & Scenery Hill Tel. Co.
Mid State Telephone Company
Motorola, Inc.
Nevada Bell
New Jersey Telephone Company
The North-Eastern Pennsylvania Tel. Co.
Pacific Bell
Pactel Cellular
Quaker State Telephone Company
Qwest Communications Corporation
  Qwest – Arizona
  Qwest – Iowa
  Qwest -- Montana
  Qwest -- Washington
RCA Global Communications, Inc.
SBC Ameritech Corporation
  SBC -- Arkansas
  SBC -- Kansas
  SBC -- Michigan
  SBC -- Missouri
  SBC -- Ohio
  SBC -- Oklahoma
  SBC – Wisconsin
  SBC – West – California
  SBC – West – Nevada
Southwestern Bell Telephone Company
Standard Telephone Company
Telecommunications d'Haiti
Telephone Utilities of Pennsylvania
United Telephone Company of New Jersey
Verizon Wireless
  Verizon – California
  Verizon – Kentucky
  Verizon – Massachusetts
  Verizon -- Montana
  Verizon – South Carolina
  Verizon -- Utah
  Verizon -- Washington
  Verizon – Wyoming
  Verizon – Total Company
Virgin Islands Telephone Corporation
Williams Communication
WilTel, Inc.

<u>WATER</u>

Arizona Water Company
Artesian Water Company
City of Auburn
Bethlehem Authority – Water
California Water Service Company
California-American Water Company
  Citizens Water – California
  Citizens Water – Arizona
Clinton Water Company
Columbia Water Company
Commonwealth Water Company
Consumers New Jersey Water Company
Dauphin Consolidated Water Supply Co.
Dominguez Water Company
Elizabethville Water Company
City of Fairfax
Garden State Water Company
Hackensack Water Company
Monarch Utilities, Inc.
Monmouth Consolidated Water Company
New Haven Water Company
New Jersey Water Company
New Mexico-American Water Company, Inc.
Newtown Artesian Water Company
New York-American Water Company
Ohio-American Water Company
Palm Coast Utility Corporation
Pennichuck East Utility
Pennichuck Water Works
Pennsylvania-American Water Company
Pennsylvania Gas & Water Company
Pennsylvania Water Company
  Erie & Sayre Divisions
Philadelphia Suburban Water Company
Pinelands Water Company
Public Service Water Company

# PROFESSIONAL QUALIFICATIONS
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Hawaii Water Service
Ka'anapali Water
Kona Water
Waikoloa Village Water
Waikoloa Resort Water
Waikoloa Resort Irrigation
Hershey Water Company
Illinois-American Water Company
Indian Rock Water Company
Indianapolis Water Company
Iowa-American Water Company
Keystone Water Company
Manufacturers Water Company
Masury Water Company
Middlesex Water Company
Monarch Utilities, Inc.
Riverton Consolidated Water Company
Roaring Creek Water Company
Rock Springs Water Company
Shenango Valley Water Company
Southern California Water Company
Spring Valley Water Company
Spring Valley Water Company
Tidewater Utilities, Inc.
United Water - Delaware
United Water - Toms River
United Water - New Jersey
United Water - Pennsylvania
United Water - Virginia
Virginia American Water Company
Western Pennsylvania Water Company
York Water Company

STEAM

Consolidated Edison Co of New York

WASTEWATER

California - American Water Company
Citizens Sewer – Arizona
Hawaii Water Service Company-Wastewater
Kona Wastewater
Pukalani Wastewater Company
Wailoloa Resort Wastewater
Illinois-American Company – Wastewater
Monarch Utilities, Inc.
New Jersey Water Company
Sewer Districts
Palm Coast Utility Corporation
Pinelands Sewer Company
Wynnewood Sewer Company

## PROFESSIONAL QUALIFICATIONS

CDP (Certified Depreciation Professional) by Exam during October, 1996

## PROFESSIONAL AFFILIATIONS

American Water Works Association
American Gas Association
American Railway Engineering Association
Pennsylvania Gas Association
Pennsylvania Municipal Authorities Association
Member AGA Accounting Services Committee
Society of Depreciation Professionals-Founding Member, Chairman Coordinating and Membership Committees, Treasurer, President, and Past President

## PUBLICATIONS

AGA/EEI Depreciation Accounting Committee, Contributing Author 1989, "An Introduction to Net Salvage of Public Utility Plant"

"Replacement Cost and Service Life Studies", *Journal of Property Tax Management*, Fall 1994, Volume 6, Issue 2

**PROFESSIONAL QUALIFICATIONS**
**OF**
**EARL M. ROBINSON, CDP**
**AUS CONSULTANTS**

**SPEECHES AND PRESENTATIONS**

*"Depreciated Replacement Cost",* Institute of Property Taxation - 18th Annual Conference, San Francisco, CA

*"RCNLD Issues for Utilities"*, The National Association of Railroad & Public Utilities Tax Representative, 1997 Annual Conference, North Lake Tahoe, NV

*"Useful Service Lives of Cellular Industry Assets"*, State of Florida, Department of Revenue, Industry/Government Task Force (April 1997)

*"Appraisal and Valuation Issues Associated with Technology Changes within the Wireless Industry",* 30th Annual Wichita Program - Appraisal for Ad Valorem Taxation of Communications, Energy, and Transportation Program, Wichita State University - July 30-August 3, 2000

*"Physical/Functional Obsolescence, Residual Values/Floors (Net Salvage)",* 32th Annual Wichita Program - Appraisal for Ad Valorem Taxation of Communications, Energy, and Transportation Program Wichita State University - July 28-August 1, 2002

*"Depreciation Study Preparation"*, AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, Lake Tahoe, Nevada - October 28, 2002

*"Use of Replacement Cost to Value High Tech Equipment"* Southeastern Association of Tax Administrators, 53rd. Annual Conference, Savannah, Georgia - July 14-July 16, 2003

*"Property Tax: Use of Replacement Cost in the Appraisal of Telecommunications Companies",* Western States Association of Tax Representatives (WSATR), WSATA 2003 Annual Meeting, Austin, TX - Sept. 9, 2003

*"Replacement Cost & Depreciated Replacement Cost Presentation",* Southwestern Bell Telephone Company – Arkansas PSC – Tax Division - August, 2003

*"Valuation of Assets"*, AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, Scottsdale, Arizona - December 9, 2003

"*Property Tax: Use of Replacement Cost in the Appraisal of Telecommunications Companies",* Oklahoma State Board of Equalization Public Service Valuation Guidelines Subcommittee – Oklahoma City, OK – Feb 5, 2004

"*Net Salvage Issues In Rate Cases",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, San Antonio, Texas - May 17, 2004

"*Current Depreciation Issues: Point-Counterpoint",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, Savannah, Georgia – November 14, 2006

*"Depreciation & Cost of Removal",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, Tucson, Arizona – October 24, 2007

*"Whole Life versus Remaining Life",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, San Francisco, California – May 21, 2008

*"Obsolescence-Measuring the Impact for Industries Experiencing Change"* *"Depreciation & Cost of Removal",* IPT 32nd Annual

**PROFESSIONAL QUALIFICATIONS**
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**EARL M. ROBINSON, CDP**
**AUS CONSULTANTS**

Conference, Atlanta, Georgia, June 23, 2008

*"An Alternative to IFRS Unit Depreciation",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, Baltimore, Maryland – May 18, 2009

*"Alternative to IFRS Unit Depreciation",* Society of Depreciation Professionals, Albuquerque, New Mexico, – October 5, 2009

*"Depreciation Training"*, Regulatory Commission of Alaska (RCA), Anchorage, Alaska, October 26 & 28, 2010

*"Physical Depreciation – The Uses and Abuses of Iowa Curves and Other Errors"*, IPT Property Tax Symposium, Austin, Texas, November 2, 2010

*"Preparing To Be A Depreciation Witness",* AGA Accounting Services Committee/EEI Property Accounting & Valuation Committee, New Orleans, Louisiana – May 19, 2011

*"Depreciation – The Last 25 Years & More",* Society of Depreciation Professionals, Atlanta, Georgia, – September 20, 2011

*"A Roadmap to Replacement Cost",* 42nd Annual Wichita Program - Appraisal for Ad Valorem Taxation of Communications, Energy, and Transportation Program, Wichita State University - July 29-August 2, 2012

**DEPRECIATION TRAINING INSTRUCTOR-CLASSES**

Regulatory Commission of Alaska, Anchorage, AK, Oct 2012

EUCI Depreciation Training, Houston, TX, Nov 8-9, 2012

EUCI Depreciation Training, Denver, CO, May 6-7, 2013

EUCI Depreciation Training, Chicago, IL, Nov 14-15, 2013

EUCI Depreciation Training, Pasadena, CA, Apr 22-23, 2014

EUCI Depreciation Training, Newport Beach, CA, Dec 16-17, 2014

EUCI Depreciation Training, Denver, CO, Jun 24-25, 2015

EUCI Depreciation Training, Anaheim, CA, Apr 25-26, 2016

# PROFESSIONAL QUALIFICATIONS
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# EARL M. ROBINSON, CDP
# AUS CONSULTANTS

## SUMMARY OF TESTIMONY APPEARANCES – HEARINGS & DEPOSITIONS (PLUS DECLARATIONS)

| Jurisdiction | Client | Docket/Application | Subject |
|---|---|---|---|
| Alberta | Canadian Western Natural Gas Company Limited | 980413 | Depreciation |
| | ATCO Pipelines | 1292783 | Depreciation |
| | | Appl. 1527976, Proc ID 13 | Depreciation |
| Arizona | Arizona Corp. Comm./ Mtn. Bell | 9981-E-1051 | RCN/RCND * |
| | Arizona Corp. Comm./ Southwest Gas Corp. | U-1551-80-70 | RCN/RCND * |
| | Qwest Corporation-Arizona | TX2001-000662 | Property Tax Valuation Deposition |
| California (PUC & State Board of Equalization) | MCI Telecommunications Corporation | 274 | Replacement Cost/ Depr. Repl. Cost |
| | | SAU87-38 | Replacement Cost/ Depr. Repl. Cost |
| | | SAU91-101 | Replacement Cost/ Depr. Repl. Cost |
| | SBC-California | SAU 279 Declaration | Property Tax Valuation |
| | SBC-California | January 31, 2005 Declaration | Property Tax Valuation |
| | Southern California Water Company | ABJ-4 | Depreciation |
| Connecticut | Connecticut Natural Gas Corp | 08-12-06 | Depreciation |
| | | 13-06-08 | Depreciation |
| | Southern Connecticut Gas Co. | 89-09-06 | P.I.S. Measures of Value and Depreciation |
| | | 08-12-07 | Depreciation |
| Delaware | Artesian Water Company | 82-20 | Depreciation |
| | | 87-3 | Depreciation |
| | United Water - Delaware | 96-164 | Depreciation |
| | | 98-98 | Depreciation |
| | Delaware Public Service Comm./ Diamond State Telephone Co. | 81-8 | P.I.S. Measures of Value and Depreciation |
| | Delmarva Power & Light Company | 05-304 | Depreciation |

**PROFESSIONAL QUALIFICATIONS**
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|---|---|---|---|
| | Tidewater Utilities, Inc/<br>Public Water and Supply, Inc | 99-466 | Depreciation |
| District of Columbia | Potomac Electric Power Co. | F.C. 869 | Depreciation |
| | Washington, DC PSC/C&P Tel Corp. | F.C. 777 | Depreciation |
| | Washington, DC PSC/<br>Potomac Electric Power Co. | F.C. 785<br>F.C. 813 | Capital Recovery/<br>Depreciation |
| FERC | Granite State Gas<br>Transmission, Inc. | RP91-164-000 | Depreciation |
| | Paiute Pipeline | RP96-306-000 | Depreciation |
| | Public Service Company of NM | ER-11-1915-000 | Depreciation |
| Florida (County of Duval) | BellSouth Telecommunications | Petitions<br>1795-1800 | Replacement Cost/<br>Depr. Repl. Cos |
| (County of Lee) | Sprint-Florida, Inc (Embarq) | Case No. 02-CA-013330-1 | Replacement Cost |
| (County of St. Lucie) | BellSouth Telecommunications | 1999 Petitions | Replacement Cost/<br>Depr. Repl. Cost |
| (County of Citrus) | Embarq | Case No. 2003-CA4473,<br>2004-CA4565, 2005-CA5010 | Property Tax<br>Valuation Deposition |
| (County of Lee) | Embarq | Case No. 02-13330 CA-WCM | Property Tax<br>Valuation Deposition |
| | Progress Energy – Florida<br>Progress Energy – Florida | 050078-EI<br>090079-EI | Depreciation<br>Depreciation |
| Illinois | Illinois - American<br>Water Company | 00-0340<br>02-0690<br>07-0507 | Depreciation<br>Depreciation<br>Depreciation |
| | Illinois Consolidated<br>Telephone Co. | 81-0264<br>82-0623 | RCN/RCND *<br>RCN/RCND * |
| Indiana | Northern Indiana Public<br>Service Company | Cause No. 41746 | Depreciation |
| Iowa (Dept of Rev) | Qwest Corporation-Iowa | 883 | Property Tax<br>Valuation Deposition |

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| Kansas | Kansas Gas Service | 03-KGSG-602-RTS | Depreciation |
| Kentucky | Kentucky Utilities | Case No. 2003-00434 | Depreciation |
| | Louisville Gas & Electric<br>Electric<br>Gas | Case No. 2003-00433 | Depreciation |
| Maryland | Columbia Gas of Maryland, Inc. | 9316 | Depreciation |
| | Delmarva Power & Light Company | 9093 | Depreciation |
| | Potomac Electric Power Company | 9092 | Depreciation |
| Massachusetts | Bay State Gas Company | 92-111<br>DTE 05-27 | Depreciation<br>Depreciation |
| Montana | Montana-Dakota Utilities Co-Gas | Docket #2012.9.100 | Depreciation |
| | Montana-Dakota Utilities Co-Elec | Docket # 2007.7.79<br>Docket # 2010.8.82<br>Docket # 2015.6.51 | Depreciation<br>Depreciation<br>Depreciation |
| | Qwest Corporation-Montana | 06DORFC001<br>06DOTFC017 | Property Tax<br>Valuation Deposition |
| Nevada | Southwest Gas Corporation | 04-3011 | Depreciation |
| New Jersey | Atlantic City Electric<br>d/b/a Conectiv Power Delivery | ER03020110 | Depreciation |
| | Borough of Butler/<br>Butler Elec. Dept. | 792-84 | Valuation of Plant<br>in Service<br>Customer Revenue<br>and Purchase Power |
| | Commonwealth Water Co. | 842-100 | Depreciation |
| | Consumers NJ Water Company | WR00030174 | Depreciation |
| | Garden State Water Co. | WR91091483 | Depreciation |
| | Middlesex Water Company | WR8602-240<br>WR90080884J<br>WR96110818 | Depreciation<br>Depreciation<br>Depreciation |

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|---|---|---|---|
| | Monmouth Cons. Water Co. | 8312-1113 | Depreciation |
| | New Jersey Water Company | 834-292 | Depreciation |
| | Public Service Electric & Gas | GR05100845 | Depreciation |
| | United Water Resources<br>(formerly Hackensack<br>Water Co.) | 8506-663<br>WR90080792J<br>WR95070303 | Depreciation<br>Depreciation<br>Depreciation |
| | Toms River Water Company | WR95050219 | Depreciation |
| New Hampshire | Northern Utilities, Inc. | DR91-081 | Depreciation |
| New Mexico | New-Mexico American<br>Water Company, Inc. | 2813<br>03-00206-UT | Depreciation<br>Depreciation |
| | Public Service Company of NM | 08-00273-UT<br>10-00086-UT | Depreciation<br>Depreciation |
| New York | New York-American Water Co. | 28911 | Depreciation |
| | New York State Elec. & Gas Corp.<br>Electric Business & Common Plant | 05-E-1222 | Depreciation |
| | New York State Elec. & Gas Corp-Elec. | 09-E-0715 | Depreciation |
| | New York State Elec. & Gas Corp-Gas | 09-G-0716 | Depreciation |
| | Rochester Gas and Elec. Corp-Elec. | 09-E-0717 | Depreciation |
| | Rochester Gas and Elec. Corp-Gas | 09-G-0718 | Depreciation |
| | Spring Valley Water Co., Inc. | 89-W-1151<br>92-W-0645 | Depreciation<br>Depreciation |
| North Carolina | Nantahala Power and Light Co. | E-13, SUB157 | Depreciation |
| North Dakota | Montana-Dakota Utilities Co-Gas | Case No. PU-399-02-183 | Depreciation |
| Oklahoma<br>(State Board of<br>Equalization) | SWBT-Oklahoma | EQ-2004-10 | Property Tax<br>Valuation Deposition |
| Pennsylvania | Borough of Media Water Works | R-912150 | Depreciation |
| | Columbia Gas of Penna. | R-80031129 | Depreciation and<br>Valuation |
| | Commonwealth Telephone Co. | I-00920020 | Depreciation |
| | Keystone Water Company | R-842755 | Capital Recovery/Depreciation |

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|---|---|---|---|
| | | R-842756 | Capital Recovery/Depreciation |
| | | R-842759 | Capital Recovery/Depreciation |
| | Mid Penn Tel. Corp. | R-80071264 | Depreciation |
| | Penna.-American Water Co. | R-891208 | Depreciation |
| | Penna. Gas & Water Co. - | R-821961 | Depreciation |
| | Gas Division | R-832475 | Depreciation |
| | Penna. Gas & Water Co. - | R-822102 | Depreciation |
| | Water Division | R-850178 | Capital Recovery/Depreciation |
| | | R-870853 | Capital Recovery/Depreciation |
| | Penna. Gas & Water Co. - | R-901726 | PIS Meas. of |
| | Scranton Division | | Value/Depreciation |
| | | R-922482 | Depreciation |
| | Penna. Gas & Water Co. - | R-911966 | PIS Meas. of |
| | Spring Brook Division | | Value/Depreciation |
| | Nesbitt Service Area | | |
| | Crystal Lake Service Area | R-922404 | PIS Meas. of |
| | | | Value/Depreciation |
| | Cease town/Watres | | |
| | Service Area | R-93266 | Depreciation |
| | Penna. Power Company | R-811510 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-821918 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-832409 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-842740 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-850267 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-870732 | PIS Meas. of |
| | | | Value/Depreciation |
| | Pennsylvania & Southern | | |
| | Gas Company | R-870686 | Depreciation |
| | PG Energy Inc. | R-963612 | PIS Meas. Of Value/Depr |
| | | R-984280 | PIS Meas. Of Value/Depr |
| | | R-00061365 | PIS Meas. OFValue/Depr |
| | Philadelphia Suburban | R-911892 | Depreciation |
| | Water Company | R-922476 | PIS Meas. of |
| | | | Value/Depreciation |
| | | R-932868 | PIS Meas. of |
| | | | Value/Depreciation |

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|---|---|---|---|
| | Riverton Consolidated Water Co. | R-842675 | Capital Recovery/Depreciation |
| | United Water - Pennsylvania | R-00973947 | Depreciation |
| | Western Pennsylvania Water Company | R-842621 | Capital Recovery/Depreciation |
| | | R-842622 | Capital Recovery/Depreciation |
| | | R-842623 | Capital Recovery/Depreciation |
| | | R-842624 | Capital Recovery/Depreciation |
| | | R-842625 | Capital Recovery/Depreciation |
| | Wellsboro Electric Company | R-00016356 | Depreciation |
| Rhode Island | Providence Gas Company | 1914 | Depreciation |
| | | 2286 | Depreciation |
| South Carolina | Lockhart Power Company | 87-435-E | Depreciation |
| Tennessee (Board of Equalization) | Bellsouth – Tennessee | 67-5-903 | Property Tax Valuation Deposition |
| Utah | Verizon Wireless | 05-0826, 05-0829 | Property Tax Valuation Deposition & Hearing |
| Virgin Islands | Virgin Islands Tel. Corp. | 264 | Depreciation |
| | | 314 | Depreciation |
| | | 316 | Depreciation |

* Reproduction Cost New/Reproduction Cost New Depreciated.