



**CALCULATED ANNUAL DEPRECIATION RATES  
APPLICABLE TO PLANT IN SERVICE  
As of December 31, 2018**

Prepared for

Cascade Natural Gas Corporation

Prepared March 2020

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March 23, 2020

Cascade Natural Gas Corporation  
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Attention: Mr. Garret Senger  
Executive Vice President, Regulatory Affairs, Customer Service & Gas Supply  
Montana-Dakota Utilities

Dear Garret,

In accordance to your request, we have conducted a depreciation study of Cascade Natural Gas Corporation ("CNGC" or the "Company") and developed depreciation accrual rates for plant in service as of December 31, 2018. Our study presents a description of the methods used in the estimation of depreciation and net salvage, the statistical analyses of service life, and the summary and detailed tabulations of annual and accrued depreciation.

We gratefully acknowledge the assistance of CNGC personnel in the completion of the review.

Respectfully submitted,

A handwritten signature in blue ink, appearing to be "LEK", is written over a faint, light blue circular watermark or stamp.

LEK/TA  
Project 03751



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SECTION 1

# 1 STUDY HIGHLIGHTS

Pursuant to a request of Cascade Natural Gas Corporation (“CNGC” or the “Company”), Concentric Energy Advisors (“Concentric”) conducted a depreciation study related to the transmission, distribution and general plant accounts, as of December 31, 2018. The purpose of this study was to determine the annual depreciation accrual rates and amounts applicable to the original cost of natural gas plant, as of December 31, 2018.

The depreciation rates are based on the Straight-Line Method using the Average Life Group (“ALG”) Procedure and were applied on a Remaining Life basis. The calculations were based on attained ages and estimated average service life and forecasted net salvage characteristic for each depreciable group of assets. Variances between the calculated accrued depreciation and the book accumulated depreciation, as at December 31, 2018, are amortized over the composite remaining life of account.

CNGC’s accounting policy has not changed since the last depreciation study was prepared. However, in the completion of this assignment, Concentric has reviewed the detailed depreciation calculations used in prior studies and has refined the remaining

life calculations to enhance the accuracy of the calculations.

Concentric recommends the calculated annual depreciation accrual rates set forth herein apply specifically to natural gas plant in service, as of December 31, 2018. The annual depreciation accrual rates are summarized by Tables related to:

- the total required annual accrual amounts;
- the annual accrual requirements related to the recovery of the original cost of the investment; and
- the annual accrual amount related to the recovery of the expected net salvage requirements at the time of retirement.

Supporting data and calculations are also provided in this report.

Finally, this study results in an annual depreciation expense accrual related to the recovery of original cost (i.e. excluding net salvage requirement) of \$31.9 million, when applied to depreciable plant balances, as of December 31, 2018. The study results are summarized at an aggregate functional group level as follows:

SUMMARY OF ORIGINAL COST, ACCRUAL PERCENTAGES AND AMOUNTS

Plant Group	Original Cost	Annual Accrual	
Transmission Plant	23,378,569	1.48%	347,009
Distribution Plant	916,095,085	2.91%	26,620,450
General Plant	66,834,063	7.46%	4,987,022
Total Gas Plant Studied	1,006,307,717	3.18%	31,954,480



## SECTION 2

# 2 INTRODUCTION

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## 2.1 Scope

This study sets forth the results of the depreciation study for the natural gas transmission, distribution and general plant assets of CNGC, to determine the annual depreciation accrual rates and amounts for book purposes applicable to the original cost of investment as of December 31, 2018. The rates and amounts are based on the Straight-Line Method, incorporating the ALG Procedure applied on a Remaining Life Basis. This study also describes the concepts, methods and judgments which underlie the recommended annual depreciation accrual rates related to the CNGC gas assets in service, as of December 31, 2018.

The service life estimates resulting from the study were based on:

- informed professional judgment which incorporated analyses of historical plant retirement data recorded through December 31, 2018;
- a review of CNGC company practice and outlook, as they relate to plant operation and retirement; and
- consideration of current practice in the gas system industry, including knowledge of service life estimates used for other gas system companies.

The depreciation accrual rates presented herein are based on generally-accepted methods and procedures for calculating depreciation. The estimated survivor curves used in this study are based on studies incorporating actual data through 2018 for most accounts.

## 2.2 Plan of Study

This study is presented in the following order:

Section 1	Study Highlights, presents a summary of the depreciation study and results.
Section 2	Introduction, contains statements with respect to the plan and the basis of the study.
Section 3	Development of Depreciation Parameters, presents descriptions of the methods used and factors considered in the service life study.
Section 4	Calculation of Annual and Accrued Depreciation presents the methods and procedures used in the calculation of depreciation.
Section 5	Results of Study, presents summaries by depreciable group of annual and accrued depreciation in Tables 1, 1A, and 1B.
Section 6	Presents Retirement Rate Analysis
Section 7	Presents Net Salvage Calculations
Section 8	Presents Detailed Depreciation Calculations
Section 9	Estimation of Survivor Curves, is an overview of lowa curves and the Retirement Rate Analysis.



## 2.3 Depreciation

For most accounts, the annual and accrued depreciation were calculated by the Straight-Line Method using the ALG Procedure applied on a remaining life basis. For certain general plant accounts, the annual and accrued depreciation are based on amortization accounting. Both types of calculations were based on original cost, attained ages and an estimate of service lives.

Amortization accounting has been recommended for certain general plant accounts because of the disproportionate plant accounting effort required in these accounts. Many regulated utilities in North America have received approval to adopt amortization accounting for accounts.

### 2.3.1 Service Life Estimates

The service life estimates used in the depreciation and amortization calculations were based on informed professional judgment which incorporated a review of management's plans, policies and outlook, a general knowledge of the gas utility industry and comparisons of the service life estimates from our studies of other gas utilities. The use of survivor curves to reflect the expected dispersion of retirement provides a consistent method of estimating depreciation for gas system plant. Iowa type survivor curves were used to depict the estimated survivor curves for the plant accounts not subject to amortization accounting.

The procedure for estimating service lives consisted of compiling historical data for the plant accounts or depreciable groups, analyzing this history using widely accepted techniques, forecasting the survivor characteristics for each depreciable group based on interpretations of the historical data analyses, and operational staff interviews. The combination of the historical experience and the estimated future yielded survivor curves from which the average service lives were derived.

A general understanding of the function of the plant and information, with respect to the reasons for past retirements and the expected future causes of retirement, were obtained through discussions with management personnel. In addition to the on-going retirement of plant due to physical and economic forces, significant future retirements may be caused by obsolescence resulting from the introduction of increased digital technology into some asset accounts.

The resultant depreciation rates are summarized in the Total, Life, and Net Salvage tables of this study. Concentric recommends that depreciation rates should be reviewed periodically to reflect the changes that result from plant and reserve account activity. A depreciation reserve deficiency or surplus will develop if future capital expenditures vary significantly from those anticipated in this study.



## SECTION 3

### **3 DEVELOPMENT OF DEPRECIATION PARAMETERS**

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#### 3.1 Depreciation

Depreciation, in public utility regulation, is the loss in service value not restored by current maintenance incurred 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 causes to be given consideration are, wear and tear, deterioration, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and the requirements of public authorities. When considering the action of the elements, the average service life calculations have considered large catastrophic events that have occurred and impacted the life estimates of utilities across North America. The average service life of utilities has been influenced by events including forest fires, earthquakes, tornadoes, ice storms, wind storms, large scale flooding, fires, actions of third parties and other natural forces of nature.

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a period of time by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing gas system utility service. Normally, the period of time over which the fixed capital cost is allocated to the cost of service is equal to the period of time over which an item renders service, that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the straight-line method of depreciation.

The calculation of annual and accrued depreciation, based on the Straight-Line Method, requires the estimation of survivor curves and is described in the following sections of this report. The development of the proposed depreciation rates also requires the selection of group depreciation procedures, as discussed below.

#### 3.2 Study Depreciation Methods and Procedures

##### 3.2.1 Depreciation Procedures

When more than a single item of property is under consideration, a group procedure for depreciation is appropriate because normally all of the items within a group do not have identical service lives but have lives that are dispersed over a range of time. There are two primary group procedures, namely, the Average Life Group (ALG) and Equal Life Group (ELG) procedures.

In the ALG Procedure, the rate of annual depreciation is based on the average service life of the group. This rate is applied to the surviving balances of the group's cost. A characteristic of this procedure is that the cost of plant retired prior to average life is not fully recouped at the time of retirement, whereas the cost of plant retired subsequent to the average life is more than fully recouped. Over the entire life cycle, the portion of cost not recouped prior to average life is balanced by the cost recouped subsequent to average life.

In the Equal Life Group Procedure, also known as the Unit Summation Procedure, the property group is subdivided according to service life. That is, each equal life group includes that portion of the





property which experiences the life of that specific group. The relative size of each equal life group is determined from the property's life dispersion curve. The calculated depreciation for the property group is the summation of the calculated depreciation based on the service life of each equal life unit.

For most accounts, the annual and accrued depreciation were calculated by the Straight-Line Method using the ALG Procedure. For certain general plant accounts, the annual and accrued depreciation are based on amortization accounting. Both types of calculations were based on original cost, attained ages and an estimate of service lives.

While the Equal Life Group Procedure provides an enhanced matching of depreciation expense to the consumption of service value, the Straight-Line Method, Average Life Group Procedure is a commonly used depreciation calculation that has been widely accepted in jurisdictions throughout North America including CNGC in prior studies. Concentric recommends its continued use.

Amortization accounting is used for certain general plant accounts because of the disproportionate plant accounting effort required in these accounts. Many regulated utilities in North America have received approval to adopt amortization accounting for these accounts. This study calculates the annual and accrued depreciation using the Straight-Line Method and ALG Procedure for most accounts. For certain general plant accounts, the annual and accrued depreciation are based on amortization accounting. Both types of calculations were based on original cost, attained ages and estimates of service lives. Variances between the calculated accrued depreciation and the book accumulated depreciation are amortized over the composite remaining life of each account within the remaining life calculations.

Continued monitoring and maintenance of the accumulated depreciation reserve at the account level is recommended. Concentric has determined an amortization amount to correct the present variance with the calculated accrued depreciation (theoretical reserve) over the composite remaining life of each account.

### 3.3 Changes Since Last CNGC Full Depreciation Study

The depreciation rates calculated in this study were calculated on the same manner as used in the prior full depreciation study – i.e. using the straight-line method, the ALG Procedure applied on a remaining life basis. However, Concentric notes that in the application of the remaining life basis, the prior study calculated the remaining life on a broad average basis, whereas Concentric incorporates a refinement into the remaining life calculations based on a weighted investment by vintage approach. The vintage approach weighs the calculations of remaining life on an allocation of the actual book accumulated depreciation account by the Calculated Accumulated Depreciation (CAD) factor determined for each vintage of plant in service. This method is described as a CAD weighted calculation in the textbook *Depreciation Systems* by Frank K. Wolf and W. Chester Fitch, published by the Iowa State University in 1994 under the title “Adjustments” within the Broad Group Model.

In contrast, the remaining life calculations in prior studies was based on a broad averaging of the composite remaining life. This method is also discussed as the Amortization Method (AM) in *Depreciation Systems* under the title “Adjustments” within the Broad Group Model.



When depreciation rates are calculated utilizing a remaining life technique, the depreciation rate is established by dividing the undepreciated value of each group of assets (after consideration to the net salvage requirements) by the composite remaining life of the group of assets. This calculation is made for each vintage surviving investment as of the date of the study (December 31, 2018), and then composited into a calculation for the account or group as a whole. This calculation requires two estimates:

1. The actual booked accumulated depreciation for each vintage within each account.

CNGC does not track the booked accumulated depreciation reserve by vintage within each account. Rather the depreciation expense is calculated at an account level and booked to accumulated depreciation at the same account level. Concentric notes that this is the practice employed by virtually all regulated utilities. As such, the accumulated depreciation by account is allocated within the account to each vintage, on the basis of the calculated accumulated depreciation by vintage. The calculated accumulated depreciation is a function of the estimated survivor curve, the average service life estimate, the net salvage estimates and the achieved age of each vintage.

2. The estimated remaining life of each vintage with each account. The estimated remaining life of each vintage is a direct function of the achieved age of each vintage, the estimated survivor curve and the average service life estimate.

Once the above two estimates are determined (the allocated booked reserve by vintage and the average remaining life of each vintage), an annual accrual requirement for each vintage is determined by dividing the net book value for each vintage (considering the estimated future salvage requirements) by the average remaining life of the vintage. The annual requirement for each vintage is summed at the account level and divided into the sum of the accounts original cost surviving as of December 31, 2018.

This process results in each vintage's calculated net book value to be depreciated over an appropriate remaining life. This vintage weighting on CAD approach to the remaining life calculations is widely considered to be the most accurate. Concentric agrees and views this methodology as the correct and most appropriate calculation.

For this study and forward, MDU Energy Capital, LLC, parent corporation of CNGC, has decided as a Utility Group to combine Accounts 381 – Meters, and 382 – Meter Installations, together into one account called 381 – Meters & Meter Installations.

CNGC has also decided to align the General Plant accounts they amortize to the same procedures as those used by parent corporation MDU Energy Capital, LLC. CNGC has always done their depreciation studies independently, however, MDU Energy Capital, LLC would prefer to sync the General Plant accounts across the Utility Group going forward.

### 3.4 Estimation of Survivor Curves

The use of an average service life for a property group implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each



of the units, or by constructing a survivor curve plotting the number of units which survive at successive ages using the retirement rate method of analysis.

The range of survivor characteristics usually experienced by utility and industrial properties is encompassed by a system of generalized survivor curves known as the Iowa type curves. The Iowa curves were sorted into three groups according to whether the mode was to the left, approximately coincident with, or to the right of the average-life ordinate. The curves in each of these three groups were then sub-classified in accordance with the height of the mode, taking into consideration the distance of the mode to the left or right of the average life. The Iowa curves are described as L-type (i.e. left-moded), R-type (i.e. right-moded), and S-type (i.e. symmetrical). Further development resulted in the introduction of O-type curves (i.e. origin-moded) where the greatest frequency of retirement occurs at the origin, or immediately after age zero. Individual type curves are further depicted with numerical subscripts which represent the relative heights of the modes of the frequency curves within each family.

The program used by Concentric for statistical smooth curve fitting utilizes an internal “goodness-of-fit” criterion which is the Residual Measure. This Residual Measure is based on a least squared solution of the differences between the stub curve (or original data points) and smooth survivor curve, which also requires a balancing of the differences above and below the stub curve.

The criterion of “goodness-of-fit” is the mean square of the differences between the points on the stub and fitted smooth survivor curves. The residual measure or standard error of estimate, shown in the output format, is the square root of this mean square. As such, the lower the residual measure the better the statistical fit between the analyzed Iowa curve and the observed data points. Concentric follows the widely-used practice of fitting Iowa curves up to 1% of the maximum exposures. This standard practice is utilized to minimize the influence of typically small retirements applied to similarly small exposures which may unduly affect the Iowa curve fitting process. Concentric does however recognize the observed data points beyond the 1% of maximum exposures, if it is determined that the additional data is a valid consideration for life recommendation.

A discussion of the general concept of survivor curves and retirement rate method is presented in Section 9 of this report.

### 3.5 Survivor Curve Judgments

The service life estimates used in the depreciation and amortization calculations were based on informed professional judgment which incorporated a review of management’s plans, policies and outlook, a general knowledge of the natural gas utility industry and comparisons of the service life estimates from our studies of other gas utilities. The use of survivor curves to reflect the expected dispersion of retirement provides a consistent method of estimating depreciation for transmission and distribution assets. Iowa type survivor curves were used to depict the estimated survivor curves for plant accounts not subject to amortization accounting.

The procedure for estimating service lives consisted of compiling and analyzing historical data for the plant accounts using widely accepted techniques and forecasting the survivor characteristics for each depreciable group. The estimates were based on interpretations of the historical data analyses and the probable future and were verified by management and operational staff. The combination



of the historical experience and the estimated future yielded estimated survivor curves from which the average service lives were derived.

The following discussion dealing with the Company's accounts by function, which comprise the investment analyzed, presents an overview of the factors considered by Concentric in the determination of the average service life estimates.

### 3.5.1 Account 367.1 – Transmission - Mains

The assets in this account represent 2.2% of the total plant studied. The currently approved interim Iowa 65-S5 curve was analyzed for reasonableness using actual plant additions (placement band) over the 1957-2018 period, and retirement experience (experience band) covering 1974 through 2018. The result of the analysis for this account is provided in Section 6 of this report. The percent surviving throughout the observation period is similar to the percentage surviving at the same age intervals in the last depreciation study, which considered actual experience through December 31, 2013. The recommended retirement rate analysis provides a statistical residual measure of 0.1481 which indicates a very good fit. Therefore, the depreciation rates calculated within this study have incorporated the slightly adjusted use of the interim Iowa 70-S5 curve, compared to the previous 65-S5 curve.

The updated net salvage study, included in Section 7 of this report, indicates a continuing trend of net salvage percentages. Concentric recommends the continued use of the currently approved -20%.

### 3.5.2 Account 376.1 – Distribution – Mains - Steel

The assets in this account represent 15.4% of the total plant studied. The currently approved interim Iowa 75-R4 curve was analyzed for reasonableness using actual plant additions (placement band) over the period of 1953 through 2018, and retirement experience (experience band) covering 1974 through 2018. The result of the analysis for this account is provided in Section 6 of this report. While the percent surviving throughout the observation period is similar to the percentage surviving at the same age intervals in the last depreciation study, which considered actual experience through December 31, 2013, the retirement rate analysis provides a statistical residual measure of 0.0826 which indicates a very good fit to a 75-R4 Iowa curve. Therefore, the depreciation rates calculated within this study have incorporated the continued use of the Iowa 75-R4 interim curve, as it continues to be a strong fit to the historic retirement experience.

The updated net salvage study, included in Section 7 of this report, indicates a trend to more negative net salvage percentages. As a result, Concentric recommends using -110% net salvage instead of the currently approved -100%.

### 3.5.3 Account 376.2 – Distribution – Mains – High Pressure

The assets in this account represent 16.8% of the total plant studied. The currently approved interim Iowa 85-R2.5 curve was analyzed for reasonableness using actual plant additions (placement band) over the period of 1957 through 2018, and retirement experience (experience band) covering 1978 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the retirement rate analysis, the percent surviving throughout the observation period is virtually the same as indicated by the smoothed Iowa curve currently approved.



Given the account did not experience any significant changes in the historic retirement trends since the previous study, Concentric is recommending the continued use of the Iowa 85-R2.5 curve, and as such, has incorporated the use of the interim curve into the depreciation rate calculations presented in this report. The recommended retirement rate analysis provides a statistical residual measure of 0.0883 which indicates an excellent fit.

The updated net salvage study, included in Section 7 of this report, indicates a trend to slightly more negative net salvage percentages. As a result, Concentric recommends using -25% net salvage instead of the currently approved -23%.

#### 3.5.4 Account 376.3 – Distribution – Mains – Plastic (Polyethylene)

The assets in this account represent 18.0% of the total plant studied. The currently approved interim Iowa 36-L3 curve was analyzed for reasonableness using actual plant additions (placement band) over the period of 1960 through 2018, and retirement experience (experience band) covering 1986 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the retirement rate analysis, the percent surviving throughout the observation period shows an increase from the previous study as indicated by the smoothed Iowa curve currently approved.

Concentric is therefore recommending the use of the interim Iowa 45-R4 curve and has incorporated the use of the curve into the depreciation rate calculations presented in this report. The recommended retirement rate analysis provides a statistical residual measure of 0.0564 which indicates an excellent fit.

The updated net salvage study, included in Section 7 of this report, indicates a trend to more negative net salvage percentages. As a result, Concentric recommends using -35% net salvage instead of the currently approved -30%.

#### 3.5.5 Account 380.1 – Distribution – Services - Steel

The assets in this account represent 7.5% of the total plant studied. The currently approved interim Iowa 56-R5 curve was analyzed for reasonableness using actual plant additions (placement band) over the period of 1953 through 2018, and retirement experience (experience band) covering 1974 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the retirement rate analysis, the percent surviving throughout the observation period shows a slight increase from the previous study as indicated by the smoothed Iowa curve currently approved.

Concentric is therefore recommending the use of the interim Iowa 60-R4 curve and has incorporated the use of the curve into the depreciation rate calculations presented in this report. The recommended retirement rate analysis provides a statistical residual measure of 0.0948 which indicates an excellent fit.

The updated net salvage study, included in Section 7 of this report, indicates a continuing trend of net salvage percentages. Concentric recommends the continued use of the currently approved -160%.



### 3.5.6 Account 380.3 – Distribution – Services – Plastic (Polyethylene)

The assets in this account represent 17.3% of the total plant studied. The currently approved Iowa 35-S4 curve was analyzed for reasonableness incorporating actual plant additions (placement band) over the 1961-2018 period, and retirement experience (experience band) covering 1985 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the retirement rate analysis, the percent surviving throughout the observation period is virtually the same as indicated by the smoothed Iowa curve currently approved.

As a result, Concentric recommends the continued use of the Iowa 35-S4 as an interim curve and has incorporated the use of the curve into the depreciation rate calculations presented in this report. Concentric notes that the retirement rate analysis provides a statistical residual measure of 0.0415 which indicates a very good fit.

The updated net salvage study, included in Section 7 of this report, indicates a trend to more negative net salvage percentages. As a result, Concentric recommends using -40% net salvage instead of the currently approved -30%.

### 3.5.7 Account 381.00 – Meters & Meter Installations

The assets in this account represent 9.8% of the total plant studied. This plant group contains CNGC's investment applicable to both Meters and Meter Installations. This account contains the combined plant of the two asset types, where in previous studies it was separate. MDU Energy Capital, LLC, CNGC's parent corporation, has decided as a Utility Group to combine the assets of these accounts going forward.

The currently approved Iowa 42-S2 curve for Meters, was analyzed for reasonableness incorporating actual plant additions (placement band) over the 1953-2018 period and retirement experience (experience band) covering 1974 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the retirement rate analysis, the percent surviving throughout the observation period shows a slight decrease with the new account structure as compared to the percent surviving at the same age intervals presented in the last study. As a result, Concentric recommends using the Iowa 40-S0.5 curve and has incorporated the use of the curve into the depreciation rate calculations presented in this report. Concentric notes that the retirement rate analysis provides a statistical residual measure of 0.2258 which indicates a very good fit.

The updated net salvage study based on the new combined account as mentioned above, and included in Section 7 of this report, indicates an increasing trend of net salvage percentages. Concentric recommends using -5% net salvage instead of the currently approved -15% for meter installations.

### 3.5.8 Account 390.1 – Structures & Improvements

The assets in this account represent 2.0% of the total plant studied and 29.9% of the General Plant studied. It is the largest account within the General plant group. The currently approved Iowa 45-R3 curve was analyzed for reasonableness incorporating actual plant additions (placement band) over the 1956-2018 period and retirement experience (experience band) covering 1974 through 2018. The result of the analysis for this account is provided in Section 6 of this report. As noted in the





retirement rate analysis, the percent surviving throughout the observation period shows a decrease as compared to the percent surviving at the same age intervals presented in the last study. As a result, Concentric recommends using the Iowa 37-S1 curve and has incorporated the use of the curve into the depreciation rate calculations presented in this report. Concentric notes that the retirement rate analysis provides a statistical residual measure of 0.4205 which indicates a very good fit.



SECTION 4

## 4 CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

### 4.1 Amortization Accounting

Amortization is the gradual extinguishment of an amount in an account by distributing such amount over a fixed period, over the life of the asset or liability to which it applies, or over the period during which it is anticipated the benefit will be realized. Normally, the distribution of the amount is in equal amounts to each year of the amortization period.

The calculation of annual and accrued amortization requires the selection of an amortization period. The amortization periods used in this report were based on judgment which incorporated:

- a consideration of the period during which the assets will render most of their service;
- the amortization period and service lives used by other utilities; and
- the service life estimates previously used for the asset under depreciation accounting.

Amortization accounting is proposed for numerous accounts. The accounts and their amortization periods are as follows:

Account	Title	Amortization Period in Years
391.3	Computer Equipment – Server & Workstation	5
391.4	Office Equipment	15
391.5	Office Furniture & Fixtures	15
393.0	Stores Equipment	30
394.1	Tools, Shop & Garage Equipment	20
395.0	Laboratory Equipment	20
397.1	Radio Communication Equipment - Fixed	15
397.2	Supervisory & Telemetry Equipment	10
397.3	Telephone & Telex Equip.	10
397.4	Radio Communication Equipment - Mobile	15
398.0	Miscellaneous Equipment	25

For the purposes of calculating annual amortization amounts as of December 31, 2018, the book depreciation reserve for each plant account or subaccount is assigned or allocated to vintages. The book reserve assigned to vintages with an age greater than the amortization period is equal to the vintage's original cost. The remaining book reserve is allocated among vintages with an age less than the amortization period in proportion to the calculated accrued amortization. The calculated accrued amortization is equal to the original cost multiplied by the ratio of the vintage's age to its amortization period. The annual amortization amount is determined by dividing the future amortizations (original cost less allocated book reserve) by the remaining period of amortization for the vintage.





## 4.2 Monitoring of Book Accumulated Depreciation

The calculated accrued depreciation or amortization represents that portion of the depreciable cost which will not be allocated to expense through future depreciation accruals, if current forecasts of service life characteristics and net salvage materialize and are used as a basis for depreciation accounting. Thus, the calculated accrued depreciation provides a measure of the book accumulated depreciation. The use of this measure is recommended in the amortization of book accumulated depreciation variances to insure complete recovery of capital over the life of the property.

The recommended amortization of the variance between the book accumulated depreciation and the calculated accrued depreciation is based on an amortization period equal to the composite remaining life for each property group where the variance exceeds 5% of the calculated accrued depreciation.

The composite remaining life for use in the calculation of accumulated depreciation variances is derived by developing the composite sum of the individual vintage remaining lives.



## SECTION 5

# 5 RESULT OF STUDY

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## 5.1 Qualification of Results

The calculated annual and accrued depreciation are the principal results of the study. Continued surveillance and periodic revisions are normally required to maintain continued use of appropriate annual depreciation accrual rates. An assumption that accrual rates can remain unchanged over a long period of time implies a disregard for the inherent variability in service lives and salvage, and for the change of the composition of property in service. The annual accrual rates and the accrued depreciation were calculated in accordance with the Straight-Line Method using the Average Life Group Procedure, based on estimates which reflect considerations of current historical evidence and expected future conditions.

## 5.2 Description of Detailed Tabulations

The service life estimates were based on judgment that incorporated statistical analysis of retirement data, discussions with management and consideration of estimates made for other electric transmission assets. The results of the statistical analysis of service life are presented in Section 6 of this report.

For each depreciable group analyzed by the Retirement Rate Method, there is a chart depicting the original and estimated survivor curves followed by a tabular presentation of the original life table(s) plotted on the chart. The survivor curves estimated for the depreciable groups are shown as dark smooth curves on the charts. Each smooth survivor curve is denoted by a numeral followed by the curve type designation. The numeral used is the average life derived from the entire curve from 100% to 0% surviving. The titles of the chart indicate the group, the symbol used to plot the points of the original life table, and the experience and placement bands of the life tables which were plotted. The experience band indicates the range of years for which retirements were used to develop the stub survivor curve. The placements indicate, for the related experience band, the range of years of installations which appear in the experience.

The tables of the calculated annual depreciation applicable to depreciable assets, as of December 31, 2018, are presented in account sequence in Section 8 of this report. The tables indicate the estimated average survivor curves used in the calculations. The tables set forth, for each installation year, the original cost, the calculated accrued depreciation and the calculated annual accrual.

CASCADE NATURAL GAS CO.

TABLE 1. SUMMARY OF SERVICE LIFE AND NET SALVAGE ESTIMATES AND CALCULATED ANNUAL AND ACCRUED DEPRECIATION RELATED TO THE RECOVERY OF AVERAGE ORIGINAL COST IN GAS PLANT AS OF DECEMBER 31, 2018

- TOTAL -

ACCOUNT	DESCRIPTION	ESTIMATED SURVIVOR CURVE	NET SALVAGE PERCENT	SURVIVING ORIGINAL COST AS OF 12/31/2018	CALCULATED ACCRUED DEPRECIATION	BOOK RESERVE	ANNUAL ACCRUAL AMOUNT	REMAINING RATE	REMAINING LIFE
<b>TRANSMISSION PLANT</b>									
365.2	RIGHTS OF WAY	85-S5	0	1,026,089	621,350	799,584	6,656	0.65	33.5
367.1	MAINS	70-S5	-20	22,171,657	13,712,219	14,757,046	332,040	1.50	33.9
369.1	MEAS & REG STATION EQUIPMENT	55-R5	-10	180,823	177,548	150,427	8,313	4.60	5.9
<b>TOTAL TRANSMISSION PLANT</b>				<b>23,378,569</b>	<b>14,511,117</b>	<b>15,707,058</b>	<b>347,009</b>	<b>1.48</b>	
<b>DISTRIBUTION PLANT</b>									
374.2	LAND RIGHTS	60-R3	0	2,157,343	700,339	718,975	35,446	1.64	40.5
375.1	STRUCTURES AND IMPROVEMENTS	45-R3.5	-5	1,465,897	1,103,659	1,350,500	10,505	0.72	12.7
376.1	MAINS - STEEL	75-R4	-110	155,217,590	115,054,967	107,167,551	4,586,467	2.95	48.5
376.2	MAINS - HIGH PRESSURE	85-R2.5	-25	169,538,277	33,255,150	41,072,416	2,361,896	1.39	71.7
376.3	MAINS - PLASTIC (POLYETHYLENE)	45-R4	-35	181,660,978	59,266,169	52,259,408	5,725,036	3.15	34.1
377.0	COMPRESSOR STATION EQUIP.	35-R3	-5	2,097,767	932,258	1,463,847	36,048	1.72	20.2
378.0	MEAS & REG STATION EQUIP-GENERAL	65-R1.5	-40	33,041,936	6,604,969	9,310,074	651,661	1.97	55.7
380.1	SERVICES - STEEL	60-R4	-160	75,145,608	97,314,326	112,918,721	2,609,846	3.47	30.1
380.3	SERVICES - PLASTIC (POLYETHYLENE)	35-S4	-40	174,291,651	73,258,064	65,649,703	7,428,198	4.26	24.5
381.0	METERS & METER INSTALLATIONS	40-S0.5	-5	98,675,779	25,806,156	23,701,282	2,688,094	2.72	30.0
383.0	REGULATORS	42-R2	0	11,160,435	3,898,780	3,817,600	269,856	2.42	27.3
385.0	INDUSTRIAL MEAS. & REG. STATION EQUIPMENT	43-R2	-5	11,641,826	3,216,819	4,748,136	217,398	1.87	31.7
<b>TOTAL DISTRIBUTION PLANT</b>				<b>916,095,085</b>	<b>420,411,656</b>	<b>424,178,213</b>	<b>26,620,450</b>	<b>2.91</b>	
<b>GENERAL PLANT</b>									
390.1	STRUCTURES & IMPROVEMENTS	37-S1	0	20,016,528	6,823,686	11,512,733	288,257	1.44	24.4
390.2	LEASEHOLD IMPROVEMENTS	15-L2	0	7,933	1,289	15,849	-	-	12.6
391.2	COMPUTER SOFTWARE	10-SQ	0	2,994,410	2,855,580	2,994,410	-	-	0.5
391.3	COMPUTER EQUIPMENT - SERVER & WORKSTATION	5-SQ	0	3,129,482	2,255,432	1,073,697	1,377,593	44.02	1.4
391.4	OFFICE EQUIPMENT	15-SQ	0	332,876	187,390	(118,388)	87,782	26.37	6.6
391.5	OFFICE FURNITURE & FIXTURES	15-SQ	0	1,830,810	930,934	214,356	347,894	19.00	7.4
392.1	TRANSPORTATION EQUIPMENT - TRAILERS	20-S3	10	321,766	129,354	181,562	8,665	2.69	11.1
392.2	TRANSPORTATION EQUIPMENT	11-L1.5	20	16,815,650	4,313,742	5,757,432	990,541	5.89	7.5
393.0	STORES EQUIPMENT	30-SQ	0	66,925	46,255	30,028	5,619	8.40	9.3
394.1	TOOLS, SHOP, & GARAGE EQUIPMENT	20-SQ	0	8,836,244	3,553,294	2,276,264	941,519	10.66	12.0
394.2	CNG EQUIPMENT	31-R4	0	131,231	112,484	120,288	1,994	1.52	4.4
395.0	LABORATORY EQUIPMENT	20-SQ	0	119,908	90,264	64,581	17,448	14.55	4.9
396.1	WORK EQUIPMENT - TRAILERS	20-L2	30	959,325	172,064	227,141	28,452	2.97	14.9
396.2	POWER OPERATED EQUIPMENT	15-L1.5	35	4,030,055	312,148	(889,290)	388,282	9.63	13.2
397.1	RADIO COMMUNICATION EQUIP. (FIXED)	15-SQ	0	385,135	243,338	236,357	20,618	5.35	5.5
397.2	SUPERVISORY & TELEMETERING EQUIP.	10-SQ	0	4,998,747	3,829,318	3,758,909	276,304	5.53	2.3
397.3	TELEPHONE & TELEX EQUIP.	10-SQ	0	535,710	388,624	243,942	115,816	21.62	2.7
397.4	RADIO COMMUNICATION EQUIP. (MOBILE)	15-SQ	0	1,240,360	423,996	386,097	86,712	6.99	9.9
398.0	MISCELLANEOUS EQUIPMENT	25-SQ	0	80,968	21,763	17,002	3,525	4.35	18.3
<b>TOTAL GENERAL PLANT</b>				<b>66,834,063</b>	<b>26,690,955</b>	<b>28,102,970</b>	<b>4,987,022</b>	<b>7.46</b>	
<b>TOTAL GAS PLANT STUDIED</b>				<b>1,006,307,717</b>	<b>461,613,728</b>	<b>467,988,241</b>	<b>31,954,480</b>	<b>3.18</b>	
<b>PLANT NOT STUDIED</b>									
301.0	ORGANIZATION			152,066		-			
302.0	FRANCHISES			211,825		211,825			
303.0	MISC. INTANGIBLE PLANT			44,171,295		17,326,335			
365.1	LAND & LAND RIGHTS			224,536		-			
372.0	TRANSMISSION ARO			87,720		31,955			
374.0	LAND (DISTRIBUTION)			506,464		184			
375.2	LEASEHOLD IMPROVEMENT			-		(655)			
386.0	CNG REFUELING			-		(562)			
388.0	ARO DISTRIBUTION PLANT			22,097,038		4,372,545			
389.0	LAND & LAND RIGHTS (GENERAL)			3,468,084		1,006,015			
<b>TOTAL PLANT</b>				<b>1,077,226,744</b>		<b>490,935,882</b>			

CASCADE NATURAL GAS CO.

TABLE 1A. SUMMARY OF SERVICE LIFE AND NET SALVAGE ESTIMATES AND CALCULATED ANNUAL AND ACCRUED DEPRECIATION RELATED TO THE RECOVERY OF AVERAGE ORIGINAL COST IN GAS PLANT AS OF DECEMBER 31, 2018

- LIFE -

ACCOUNT	DESCRIPTION	ESTIMATED SURVIVOR CURVE	NET SALVAGE PERCENT	SURVIVING ORIGINAL COST AS OF 12/31/2018	CALCULATED ACCRUED DEPRECIATION	BOOK RESERVE	ANNUAL ACCRUAL AMOUNT	RATE	REMAINING LIFE
<b>TRANSMISSION PLANT</b>									
365.2	RIGHTS OF WAY	85-S5	0	1,026,089	621,350	799,584	6,656	0.65	33.5
367.1	MAINS	70-S5	0	22,171,657	11,426,849	13,081,804	240,636	1.09	33.9
369.1	MEAS & REG STATION EQUIPMENT	55-R5	0	180,823	161,408	298,684	-	-	5.9
<b>TOTAL TRANSMISSION PLANT</b>				<b>23,378,569</b>	<b>12,209,606</b>	<b>14,180,072</b>	<b>247,293</b>	<b>1.06</b>	
<b>DISTRIBUTION PLANT</b>									
374.2	LAND RIGHTS	60-R3	0	2,157,343	700,339	718,975	35,446	1.64	40.5
375.1	STRUCTURES AND IMPROVEMENTS	45-R3.5	0	1,465,897	1,051,104	1,292,353	9,466	0.65	12.7
376.1	MAINS - STEEL	75-R4	0	155,217,590	54,788,080	70,008,331	1,605,721	1.03	48.5
376.2	MAINS - HIGH PRESSURE	85-R2.5	0	169,538,277	26,604,120	36,328,210	1,831,223	1.08	71.7
376.3	MAINS - PLASTIC (POLYETHYLENE)	45-R4	0	181,660,978	43,900,866	42,055,033	4,109,410	2.26	34.1
377.0	COMPRESSOR STATION EQUIP.	35-R3	0	2,097,767	887,865	1,399,919	34,039	1.62	20.2
378.0	MEAS & REG STATION EQUIP-GENERAL	65-R1.5	0	33,041,936	4,717,835	7,855,928	439,137	1.33	55.7
380.1	SERVICES - STEEL	60-R4	0	75,145,608	37,428,587	49,430,042	771,066	1.03	30.1
380.3	SERVICES - PLASTIC (POLYETHYLENE)	35-S4	0	174,291,651	52,327,189	45,672,022	5,379,098	3.09	24.5
381.0	METERS & METER INSTALLATIONS	40-S0.5	0	98,675,779	24,577,291	22,285,625	2,573,433	2.61	30.0
383.0	REGULATORS	42-R2	0	11,160,435	3,898,780	3,827,319	269,361	2.41	27.3
385.0	INDUSTRIAL MEAS. & REG. STATION EQUIPMENT	43-R2	0	11,641,826	3,063,637	4,772,319	196,840	1.69	31.7
<b>TOTAL DISTRIBUTION PLANT</b>				<b>916,095,085</b>	<b>253,945,692</b>	<b>285,646,076</b>	<b>17,254,240</b>	<b>1.88</b>	
<b>GENERAL PLANT</b>									
390.1	STRUCTURES & IMPROVEMENTS	37-S1	0	20,016,528	6,823,686	11,303,519	296,338	1.48	24.4
390.2	LEASEHOLD IMPROVEMENTS	15-L2	0	7,933	1,289	15,849	-	-	12.6
391.2	COMPUTER SOFTWARE	10-SQ	0	2,994,410	2,855,580	2,994,410	-	-	0.5
391.3	COMPUTER EQUIPMENT - SERVER & WORKSTATION	5-SQ	0	3,129,482	2,255,432	1,073,697	1,377,593	44.02	1.4
391.4	OFFICE EQUIPMENT	15-SQ	0	332,876	187,390	(118,388)	87,782	26.37	6.6
391.5	OFFICE FURNITURE & FIXTURES	15-SQ	0	1,830,810	930,934	214,356	347,894	19.00	7.4
392.1	TRANSPORTATION EQUIPMENT - TRAILERS	20-S3	0	321,766	143,726	181,562	11,468	3.56	11.1
392.2	TRANSPORTATION EQUIPMENT	11-L1.5	0	16,815,650	5,392,178	5,768,816	1,468,056	8.73	7.5
393.0	STORES EQUIPMENT	30-SQ	0	66,925	46,255	30,028	5,619	8.40	9.3
394.1	TOOLS, SHOP, & GARAGE EQUIPMENT	20-SQ	0	8,836,244	3,553,294	2,281,015	939,424	10.63	12.0
394.2	CNG EQUIPMENT	31-R4	0	131,231	112,484	120,288	1,994	1.52	4.4
395.0	LABORATORY EQUIPMENT	20-SQ	0	119,908	90,264	64,581	17,448	14.55	4.9
396.1	WORK EQUIPMENT - TRAILERS	20-L2	0	959,325	245,806	227,141	49,705	5.18	14.9
396.2	POWER OPERATED EQUIPMENT	15-L1.5	0	4,030,055	480,228	(890,967)	512,490	12.72	13.2
397.1	RADIO COMMUNICATION EQUIP. (FIXED)	15-SQ	0	385,135	243,338	236,357	20,618	5.35	5.5
397.2	SUPERVISORY & TELEMETERING EQUIP.	10-SQ	0	4,998,747	3,829,318	3,763,214	272,643	5.45	2.4
397.3	TELEPHONE & TELEX EQUIP.	10-SQ	0	535,710	388,624	243,942	115,816	21.62	2.8
397.4	RADIO COMMUNICATION EQUIP. (MOBILE)	15-SQ	0	1,240,360	423,996	386,097	86,712	6.99	9.9
398.0	MISCELLANEOUS EQUIPMENT	25-SQ	0	80,968	21,763	17,002	3,525	4.35	18.3
<b>TOTAL GENERAL PLANT</b>				<b>66,834,063</b>	<b>28,025,585</b>	<b>27,912,518</b>	<b>5,615,125</b>	<b>8.40</b>	
<b>TOTAL GAS PLANT STUDIED</b>				<b>1,006,307,717</b>	<b>294,180,883</b>	<b>327,738,667</b>	<b>23,116,657</b>	<b>2.30</b>	
<b>PLANT NOT STUDIED</b>									
301.0	ORGANIZATION			152,066					
302.0	FRANCHISES			211,825					
303.0	MISC. INTANGIBLE PLANT			44,171,295					
365.1	LAND & LAND RIGHTS			224,536					
372.0	TRANSMISSION ARO			87,720					
374.0	LAND (DISTRIBUTION)			506,464					
388.0	ARO DISTRIBUTION PLANT			22,097,038					
389.0	LAND & LAND RIGHTS (GENERAL)			3,468,084					
<b>TOTAL PLANT</b>				<b>1,077,226,744</b>					

CASCADE NATURAL GAS CO.

TABLE 1B. SUMMARY OF SERVICE LIFE AND NET SALVAGE ESTIMATES AND CALCULATED ANNUAL AND ACCRUED DEPRECIATION RELATED TO THE RECOVERY OF AVERAGE ORIGINAL COST IN GAS PLANT AS OF DECEMBER 31, 2018

- NET SALVAGE -

ACCOUNT	DESCRIPTION	ESTIMATED SURVIVOR CURVE	NET SALVAGE PERCENT	SURVIVING ORIGINAL COST AS OF 12/31/2018	CALCULATED ACCRUED DEPRECIATION	BOOK RESERVE	ANNUAL ACCRUAL AMOUNT	RATE
<b>TRANSMISSION PLANT</b>								
365.2	RIGHTS OF WAY	85-S5	0	1,026,089	-	-	-	-
367.1	MAINS	70-S5	-20	22,171,657	2,285,370	1,675,242	91,404	0.41
369.1	MEAS & REG STATION EQUIPMENT	55-R5	-10	180,823	16,141	(148,257)	8,313	4.60
<b>TOTAL TRANSMISSION PLANT</b>				<b>23,378,569</b>	<b>2,301,511</b>	<b>1,526,985</b>	<b>99,717</b>	<b>0.43</b>
<b>DISTRIBUTION PLANT</b>								
374.2	LAND RIGHTS	60-R3	0	2,157,343	-	-	-	-
375.1	STRUCTURES AND IMPROVEMENTS	45-R3.5	-5	1,465,897	52,555	58,147	1,039	0.07
376.1	MAINS - STEEL	75-R4	-110	155,217,590	60,266,887	37,159,220	2,980,746	1.92
376.2	MAINS - HIGH PRESSURE	85-R2.5	-25	169,538,277	6,651,030	4,744,206	530,673	0.31
376.3	MAINS - PLASTIC (POLYETHYLENE)	45-R4	-35	181,660,978	15,365,303	10,204,375	1,615,626	0.89
377.0	COMPRESSOR STATION EQUIP.	35-R3	-5	2,097,767	44,393	63,928	2,009	0.10
378.0	MEAS & REG STATION EQUIP-GENERAL	65-R1.5	-40	33,041,936	1,887,134	1,454,146	212,524	0.64
380.1	SERVICES - STEEL	60-R4	-160	75,145,608	59,885,739	63,488,679	1,838,780	2.45
380.3	SERVICES - PLASTIC (POLYETHYLENE)	35-S4	-40	174,291,651	20,930,876	19,977,681	2,049,100	1.18
381.0	METERS & METER INSTALLATIONS	40-S0.5	-5	98,675,779	1,228,865	1,415,657	114,661	0.12
383.0	REGULATORS	42-R2	0	11,160,435	-	(9,719)	495	-
385.0	INDUSTRIAL MEAS. & REG. STATION EQUIPMENT	43-R2	-5	11,641,826	153,182	(24,183)	20,558	0.18
<b>TOTAL DISTRIBUTION PLANT</b>				<b>916,095,085</b>	<b>166,465,964</b>	<b>138,532,137</b>	<b>9,366,210</b>	<b>1.02</b>
<b>GENERAL PLANT</b>								
390.1	STRUCTURES & IMPROVEMENTS	37-S1	0	20,016,528	-	209,214	(8,081)	(0.04)
390.2	LEASEHOLD IMPROVEMENTS	15-L2	0	7,933	-	-	-	-
391.2	COMPUTER SOFTWARE	10-SQ	0	2,994,410	-	-	-	-
391.3	COMPUTER EQUIPMENT - SERVER & WORKSTATION	5-SQ	0	3,129,482	-	-	-	-
391.4	OFFICE EQUIPMENT	15-SQ	0	332,876	-	-	-	-
391.5	OFFICE FURNITURE & FIXTURES	15-SQ	0	1,830,810	-	-	-	-
392.1	TRANSPORTATION EQUIPMENT - TRAILERS	20-S3	10	321,766	(14,373)	-	(2,803)	(0.87)
392.2	TRANSPORTATION EQUIPMENT	11-L1.5	20	16,815,650	(1,078,436)	(11,384)	(477,515)	(2.84)
393.0	STORES EQUIPMENT	30-SQ	0	66,925	-	-	-	-
394.1	TOOLS, SHOP, & GARAGE EQUIPMENT	20-SQ	0	8,836,244	-	(4,751)	2,095	0.02
394.2	CNG EQUIPMENT	31-R4	0	131,231	-	-	-	-
395.0	LABORATORY EQUIPMENT	20-SQ	0	119,908	-	-	-	-
396.1	WORK EQUIPMENT - TRAILERS	20-L2	30	959,325	(73,742)	-	(21,252)	(2.22)
396.2	POWER OPERATED EQUIPMENT	15-L1.5	35	4,030,055	(168,080)	1,677	(124,208)	(3.08)
397.1	RADIO COMMUNICATION EQUIP. (FIXED)	15-SQ	0	385,135	-	-	-	-
397.2	SUPERVISORY & TELEMETERING EQUIP.	10-SQ	0	4,998,747	-	(4,305)	3,661	0.07
397.3	TELEPHONE & TELEX EQUIP.	10-SQ	0	535,710	-	-	-	-
397.4	RADIO COMMUNICATION EQUIP. (MOBILE)	15-SQ	0	1,240,360	-	-	-	-
398.0	MISCELLANEOUS EQUIPMENT	25-SQ	0	80,968	-	-	-	-
<b>TOTAL GENERAL PLANT</b>				<b>66,834,063</b>	<b>(1,334,630)</b>	<b>190,451</b>	<b>(628,103)</b>	<b>(0.94)</b>
<b>TOTAL GAS PLANT STUDIED</b>				<b>1,006,307,717</b>	<b>167,432,845</b>	<b>140,249,574</b>	<b>8,837,823</b>	<b>0.88</b>
<b>PLANT NOT STUDIED</b>								
301.0	ORGANIZATION			152,066				
302.0	FRANCHISES			211,825				
303.0	MISC. INTANGIBLE PLANT			44,171,295				
365.1	LAND & LAND RIGHTS			224,536				
372.0	TRANSMISSION ARO			87,720				
374.0	LAND (DISTRIBUTION)			506,464				
388.0	ARO DISTRIBUTION PLANT			22,097,038				
389.0	LAND & LAND RIGHTS (GENERAL)			3,468,084				
<b>TOTAL PLANT</b>				<b>1,077,226,744</b>				



SECTION 6

## **6 RETIREMENT RATE ANALYSIS**

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# Cascade Natural Gas Corporation

## Account 365.2 - Rights of Way

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	1,028,664	0	0.00000	1.00000	100.00
0.5	1,028,664	0	0.00000	1.00000	100.00
1.5	1,028,664	0	0.00000	1.00000	100.00
2.5	1,028,664	0	0.00000	1.00000	100.00
3.5	1,028,664	0	0.00000	1.00000	100.00
4.5	1,028,664	0	0.00000	1.00000	100.00
5.5	1,028,664	0	0.00000	1.00000	100.00
6.5	1,028,664	0	0.00000	1.00000	100.00
7.5	1,028,664	0	0.00000	1.00000	100.00
8.5	1,028,664	0	0.00000	1.00000	100.00
9.5	1,028,664	0	0.00000	1.00000	100.00
10.5	1,028,664	0	0.00000	1.00000	100.00
11.5	1,028,664	0	0.00000	1.00000	100.00
12.5	1,028,664	0	0.00000	1.00000	100.00
13.5	1,028,664	0	0.00000	1.00000	100.00
14.5	1,028,664	0	0.00000	1.00000	100.00
15.5	1,028,664	2,575	0.00250	0.99750	100.00
16.5	1,026,089	0	0.00000	1.00000	99.75
17.5	1,026,089	0	0.00000	1.00000	99.75
18.5	1,026,089	0	0.00000	1.00000	99.75
19.5	1,026,089	0	0.00000	1.00000	99.75
20.5	1,026,089	0	0.00000	1.00000	99.75
21.5	1,026,089	0	0.00000	1.00000	99.75
22.5	1,026,089	0	0.00000	1.00000	99.75
23.5	1,026,089	0	0.00000	1.00000	99.75
24.5	1,026,089	0	0.00000	1.00000	99.75
25.5	1,026,089	0	0.00000	1.00000	99.75
26.5	1,026,089	0	0.00000	1.00000	99.75
27.5	1,026,089	0	0.00000	1.00000	99.75
28.5	1,026,089	0	0.00000	1.00000	99.75
29.5	1,026,089	0	0.00000	1.00000	99.75
30.5	1,026,089	0	0.00000	1.00000	99.75
31.5	1,026,089	0	0.00000	1.00000	99.75
32.5	1,026,089	0	0.00000	1.00000	99.75
33.5	1,026,089	0	0.00000	1.00000	99.75
34.5	1,026,089	0	0.00000	1.00000	99.75
35.5	1,026,089	0	0.00000	1.00000	99.75
36.5	1,026,089	0	0.00000	1.00000	99.75
37.5	1,016,187	0	0.00000	1.00000	99.75
38.5	1,016,187	0	0.00000	1.00000	99.75
39.5	1,016,187	0	0.00000	1.00000	99.75

# Cascade Natural Gas Corporation

## Account 365.2 - Rights of Way

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	1,016,187	0	0.00000	1.00000	99.75
41.5	1,016,187	0	0.00000	1.00000	99.75
42.5	1,016,187	0	0.00000	1.00000	99.75
43.5	1,016,187	0	0.00000	1.00000	99.75
44.5	1,016,187	0	0.00000	1.00000	99.75
45.5	1,016,187	0	0.00000	1.00000	99.75
46.5	702,278	0	0.00000	1.00000	99.75
47.5	702,278	0	0.00000	1.00000	99.75
48.5	699,752	0	0.00000	1.00000	99.75
49.5	699,752	0	0.00000	1.00000	99.75
50.5	699,752	0	0.00000	1.00000	99.75
51.5	687,305	0	0.00000	1.00000	99.75
52.5	657,519	0	0.00000	1.00000	99.75
53.5	329,034	0	0.00000	1.00000	99.75
54.5	28,483	0	0.00000	1.00000	99.75
<b>Totals:</b>	<b>53,387,011</b>	<b>2,575</b>			

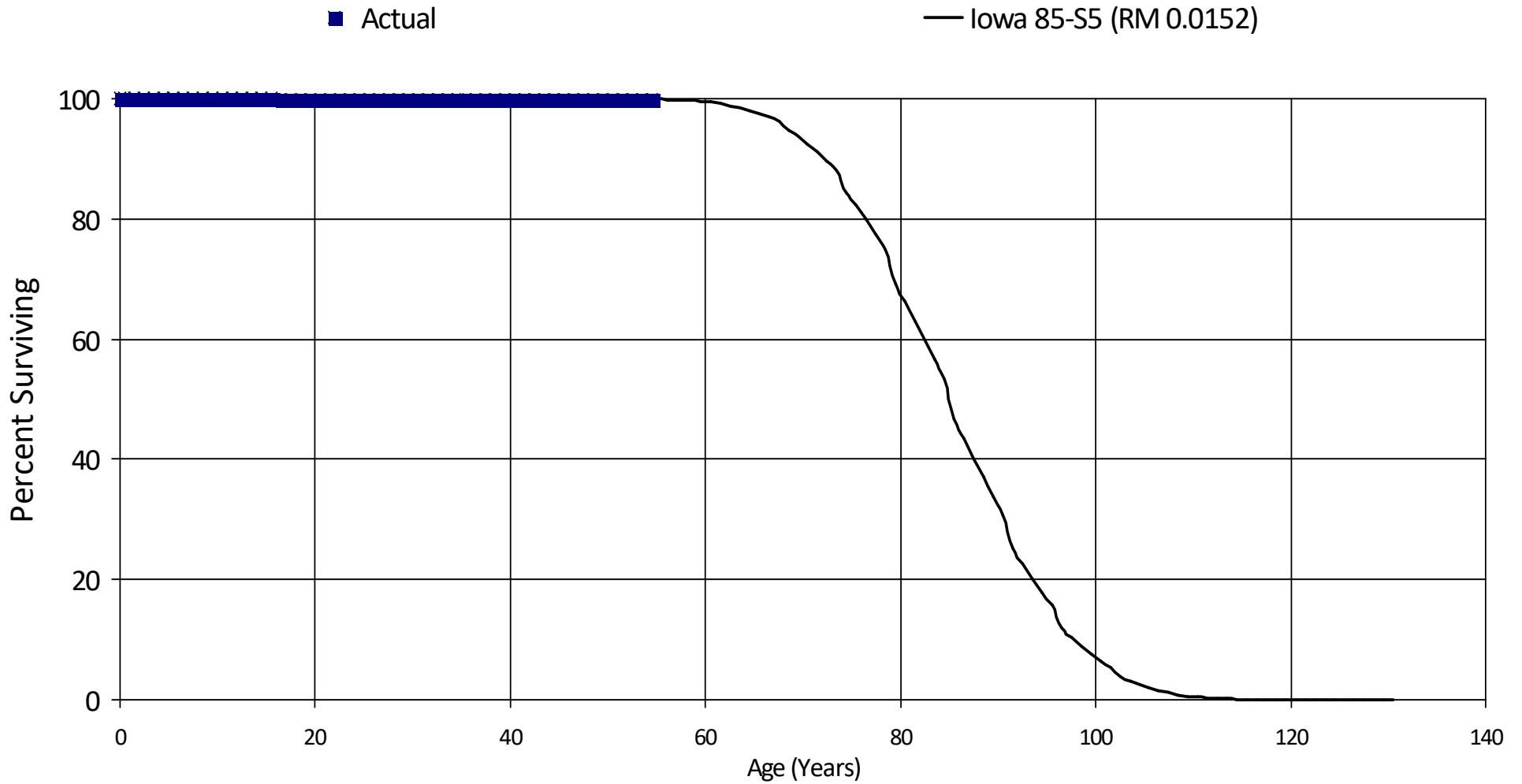


# Cascade Natural Gas Corporation

## Account 365.2 - Rights of Way

Placement Band - 1963 - 2018 Experience Band - 1981 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 367.1 - Mains

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	22,387,235	0	0.00000	1.00000	100.00
0.5	22,387,235	0	0.00000	1.00000	100.00
1.5	22,001,262	0	0.00000	1.00000	100.00
2.5	22,001,262	0	0.00000	1.00000	100.00
3.5	22,000,952	0	0.00000	1.00000	100.00
4.5	22,000,952	0	0.00000	1.00000	100.00
5.5	21,902,569	0	0.00000	1.00000	100.00
6.5	21,904,119	0	0.00000	1.00000	100.00
7.5	21,812,702	0	0.00000	1.00000	100.00
8.5	21,132,775	3,678	0.00017	0.99983	100.00
9.5	21,069,695	0	0.00000	1.00000	99.98
10.5	20,816,019	0	0.00000	1.00000	99.98
11.5	20,796,837	0	0.00000	1.00000	99.98
12.5	20,795,955	0	0.00000	1.00000	99.98
13.5	20,795,955	12,957	0.00062	0.99938	99.98
14.5	20,782,998	0	0.00000	1.00000	99.92
15.5	20,782,998	0	0.00000	1.00000	99.92
16.5	20,782,998	0	0.00000	1.00000	99.92
17.5	20,733,120	0	0.00000	1.00000	99.92
18.5	20,650,341	4,494	0.00022	0.99978	99.92
19.5	19,606,574	0	0.00000	1.00000	99.90
20.5	19,606,574	0	0.00000	1.00000	99.90
21.5	19,606,027	0	0.00000	1.00000	99.90
22.5	15,955,395	0	0.00000	1.00000	99.90
23.5	15,955,395	13,642	0.00086	0.99914	99.90
24.5	15,078,870	0	0.00000	1.00000	99.81
25.5	14,743,912	361	0.00002	0.99998	99.81
26.5	14,728,143	0	0.00000	1.00000	99.81
27.5	14,633,891	0	0.00000	1.00000	99.81
28.5	14,633,891	0	0.00000	1.00000	99.81
29.5	14,633,891	0	0.00000	1.00000	99.81
30.5	14,619,661	0	0.00000	1.00000	99.81
31.5	14,619,661	0	0.00000	1.00000	99.81
32.5	14,619,661	0	0.00000	1.00000	99.81
33.5	14,619,661	0	0.00000	1.00000	99.81
34.5	14,619,661	0	0.00000	1.00000	99.81
35.5	8,282,747	0	0.00000	1.00000	99.81
36.5	8,070,963	0	0.00000	1.00000	99.81
37.5	8,046,273	19,134	0.00238	0.99762	99.81
38.5	8,027,139	0	0.00000	1.00000	99.57
39.5	8,027,139	0	0.00000	1.00000	99.57

# Cascade Natural Gas Corporation

## Account 367.1 - Mains

### RETIREMENT RATE ANALYSIS

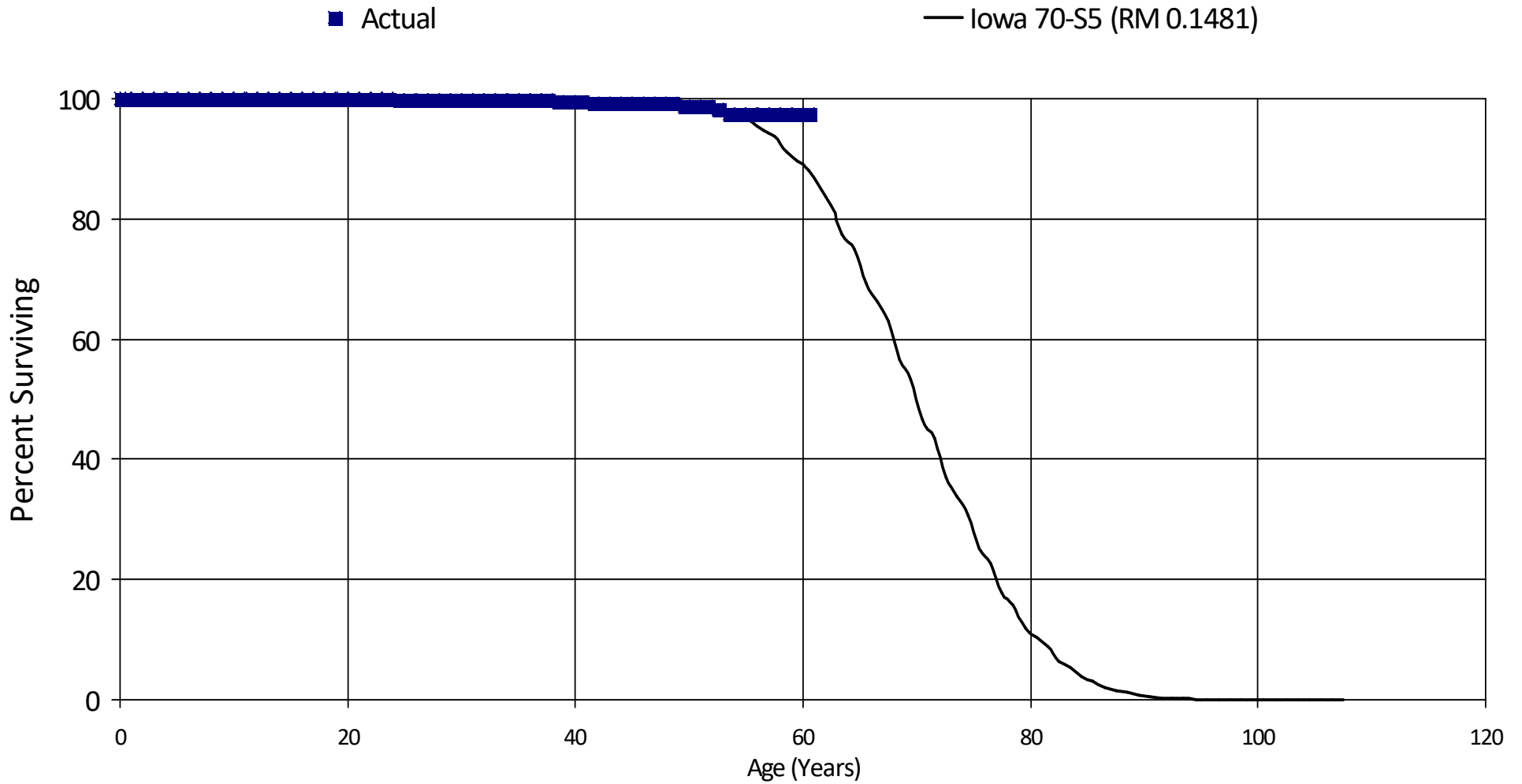
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	8,027,139	17,284	0.00215	0.99785	99.57
41.5	7,920,499	0	0.00000	1.00000	99.36
42.5	7,920,499	0	0.00000	1.00000	99.36
43.5	7,920,499	0	0.00000	1.00000	99.36
44.5	7,908,297	0	0.00000	1.00000	99.36
45.5	7,424,607	0	0.00000	1.00000	99.36
46.5	7,326,250	0	0.00000	1.00000	99.36
47.5	6,050,268	4,169	0.00069	0.99931	99.36
48.5	6,046,099	29,893	0.00494	0.99506	99.29
49.5	6,016,206	1,274	0.00021	0.99979	98.80
50.5	6,014,932	0	0.00000	1.00000	98.78
51.5	5,876,895	35,776	0.00609	0.99391	98.78
52.5	5,166,605	39,000	0.00755	0.99245	98.18
53.5	3,790,899	42	0.00001	0.99999	97.44
54.5	3,278,199	0	0.00000	1.00000	97.44
55.5	2,059,348	0	0.00000	1.00000	97.44
56.5	2,059,348	0	0.00000	1.00000	97.44
57.5	1,616,061	0	0.00000	1.00000	97.44
58.5	1,616,061	0	0.00000	1.00000	97.44
59.5	1,616,061	0	0.00000	1.00000	97.44
60.5	1,247,828	33,874	0.02715	0.97285	97.44
<b>Totals:</b>	<b>827,175,698</b>	<b>215,578</b>			

# Cascade Natural Gas Corporation

## Account 367.1 - Mains

Placement Band - 1957 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 369.1 - Meas. & Reg. Station Equip.

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	211,019	0	0.00000	1.00000	100.00
0.5	211,019	0	0.00000	1.00000	100.00
1.5	211,019	0	0.00000	1.00000	100.00
2.5	211,019	0	0.00000	1.00000	100.00
3.5	211,019	0	0.00000	1.00000	100.00
4.5	211,019	0	0.00000	1.00000	100.00
5.5	211,019	0	0.00000	1.00000	100.00
6.5	211,019	0	0.00000	1.00000	100.00
7.5	211,019	0	0.00000	1.00000	100.00
8.5	211,019	0	0.00000	1.00000	100.00
9.5	211,019	0	0.00000	1.00000	100.00
10.5	211,019	0	0.00000	1.00000	100.00
11.5	211,019	0	0.00000	1.00000	100.00
12.5	211,019	0	0.00000	1.00000	100.00
13.5	211,019	0	0.00000	1.00000	100.00
14.5	211,019	0	0.00000	1.00000	100.00
15.5	211,019	0	0.00000	1.00000	100.00
16.5	211,019	0	0.00000	1.00000	100.00
17.5	211,019	0	0.00000	1.00000	100.00
18.5	211,019	0	0.00000	1.00000	100.00
19.5	211,019	2,992	0.01418	0.98582	100.00
20.5	208,027	0	0.00000	1.00000	98.58
21.5	208,027	0	0.00000	1.00000	98.58
22.5	208,027	0	0.00000	1.00000	98.58
23.5	208,027	0	0.00000	1.00000	98.58
24.5	208,027	0	0.00000	1.00000	98.58
25.5	208,027	0	0.00000	1.00000	98.58
26.5	208,027	0	0.00000	1.00000	98.58
27.5	208,027	0	0.00000	1.00000	98.58
28.5	208,027	0	0.00000	1.00000	98.58
29.5	208,027	0	0.00000	1.00000	98.58
30.5	208,027	0	0.00000	1.00000	98.58
31.5	208,027	0	0.00000	1.00000	98.58
32.5	208,027	0	0.00000	1.00000	98.58
33.5	208,027	0	0.00000	1.00000	98.58
34.5	208,027	0	0.00000	1.00000	98.58
35.5	208,027	0	0.00000	1.00000	98.58
36.5	208,027	0	0.00000	1.00000	98.58
37.5	208,027	0	0.00000	1.00000	98.58
38.5	208,027	0	0.00000	1.00000	98.58
39.5	208,027	0	0.00000	1.00000	98.58

# Cascade Natural Gas Corporation

## Account 369.1 - Meas. & Reg. Station Equip.

### RETIREMENT RATE ANALYSIS

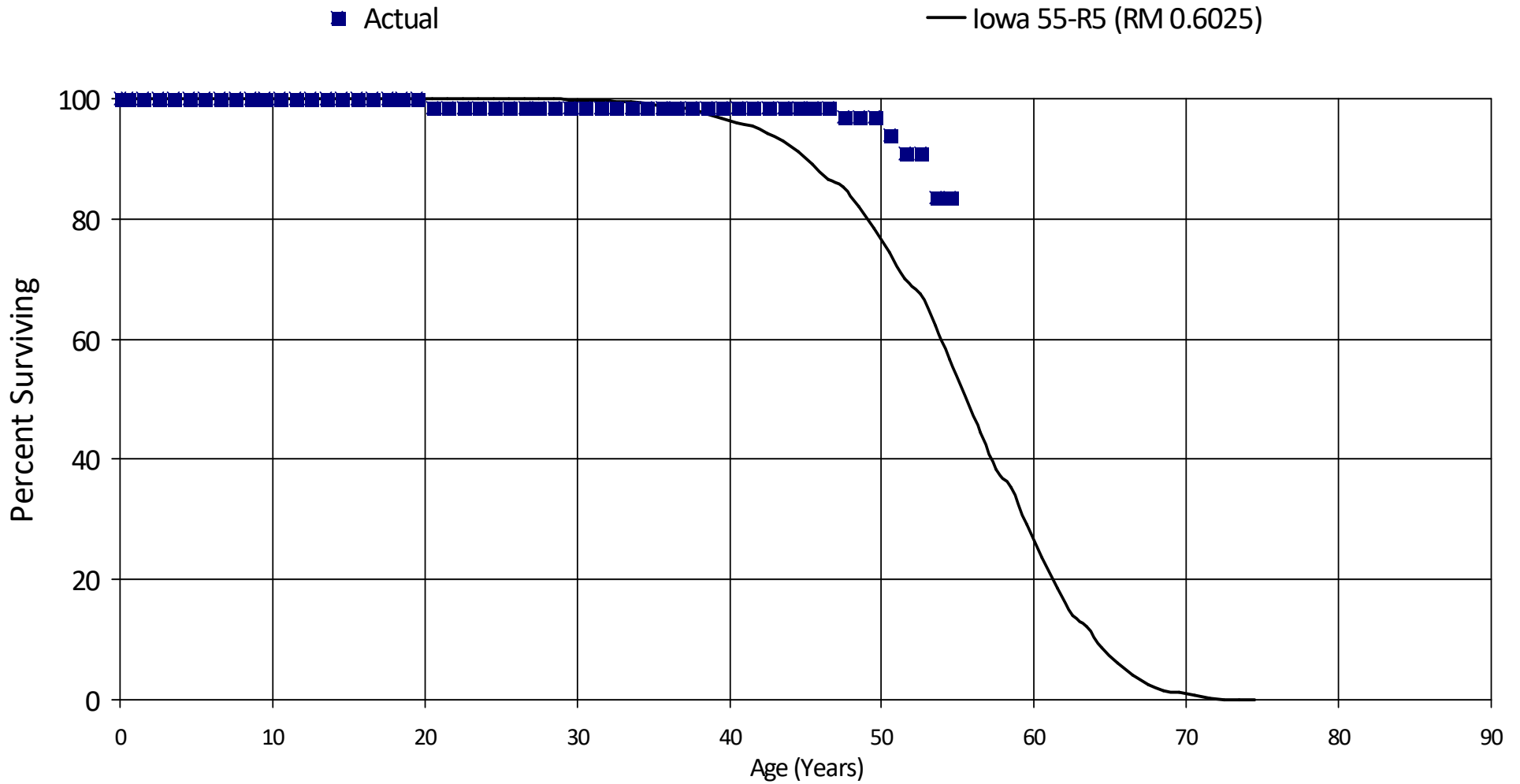
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	208,027	0	0.00000	1.00000	98.58
41.5	208,027	0	0.00000	1.00000	98.58
42.5	208,027	0	0.00000	1.00000	98.58
43.5	208,027	0	0.00000	1.00000	98.58
44.5	208,027	412	0.00198	0.99802	98.58
45.5	207,616	0	0.00000	1.00000	98.38
46.5	207,616	2,928	0.01410	0.98590	98.38
47.5	204,687	0	0.00000	1.00000	96.99
48.5	204,687	0	0.00000	1.00000	96.99
49.5	204,128	6,573	0.03220	0.96780	96.99
50.5	184,058	5,814	0.03159	0.96841	93.87
51.5	159,773	0	0.00000	1.00000	90.90
52.5	141,467	11,478	0.08114	0.91886	90.90
53.5	115,379	0	0.00000	1.00000	83.52
54.5	102,864	0	0.00000	1.00000	83.52
<b>Totals:</b>	<b>11,364,361</b>	<b>30,197</b>			

# Cascade Natural Gas Corporation

## Account 369.1 - Meas. & Reg. Station Equip.

Placement Band - 1963 - 2018 Experience Band - 1983 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 374.2 - Land Rights

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	2,178,325	0	0.00000	1.00000	100.00
0.5	2,178,325	0	0.00000	1.00000	100.00
1.5	2,178,325	0	0.00000	1.00000	100.00
2.5	2,022,356	0	0.00000	1.00000	100.00
3.5	2,022,356	0	0.00000	1.00000	100.00
4.5	2,022,356	0	0.00000	1.00000	100.00
5.5	2,005,092	0	0.00000	1.00000	100.00
6.5	1,951,365	0	0.00000	1.00000	100.00
7.5	1,951,365	0	0.00000	1.00000	100.00
8.5	1,951,365	0	0.00000	1.00000	100.00
9.5	1,951,365	0	0.00000	1.00000	100.00
10.5	1,951,365	0	0.00000	1.00000	100.00
11.5	1,495,570	0	0.00000	1.00000	100.00
12.5	1,495,570	0	0.00000	1.00000	100.00
13.5	1,495,570	0	0.00000	1.00000	100.00
14.5	1,495,570	0	0.00000	1.00000	100.00
15.5	1,495,570	0	0.00000	1.00000	100.00
16.5	1,495,570	0	0.00000	1.00000	100.00
17.5	1,495,570	0	0.00000	1.00000	100.00
18.5	1,495,570	0	0.00000	1.00000	100.00
19.5	1,495,570	0	0.00000	1.00000	100.00
20.5	1,495,570	0	0.00000	1.00000	100.00
21.5	1,495,570	0	0.00000	1.00000	100.00
22.5	1,495,570	0	0.00000	1.00000	100.00
23.5	1,493,527	0	0.00000	1.00000	100.00
24.5	1,493,527	0	0.00000	1.00000	100.00
25.5	167,003	0	0.00000	1.00000	100.00
26.5	167,003	0	0.00000	1.00000	100.00
27.5	167,003	0	0.00000	1.00000	100.00
28.5	167,003	0	0.00000	1.00000	100.00
29.5	167,003	0	0.00000	1.00000	100.00
30.5	67,380	20,982	0.31140	0.68860	100.00
31.5	46,398	0	0.00000	1.00000	68.86
32.5	33,862	0	0.00000	1.00000	68.86
33.5	25,802	0	0.00000	1.00000	68.86
34.5	25,802	0	0.00000	1.00000	68.86
35.5	25,802	0	0.00000	1.00000	68.86
36.5	25,802	0	0.00000	1.00000	68.86
37.5	10,896	0	0.00000	1.00000	68.86
38.5	10,896	0	0.00000	1.00000	68.86
39.5	10,896	0	0.00000	1.00000	68.86



# Cascade Natural Gas Corporation

## Account 374.2 - Land Rights

### RETIREMENT RATE ANALYSIS

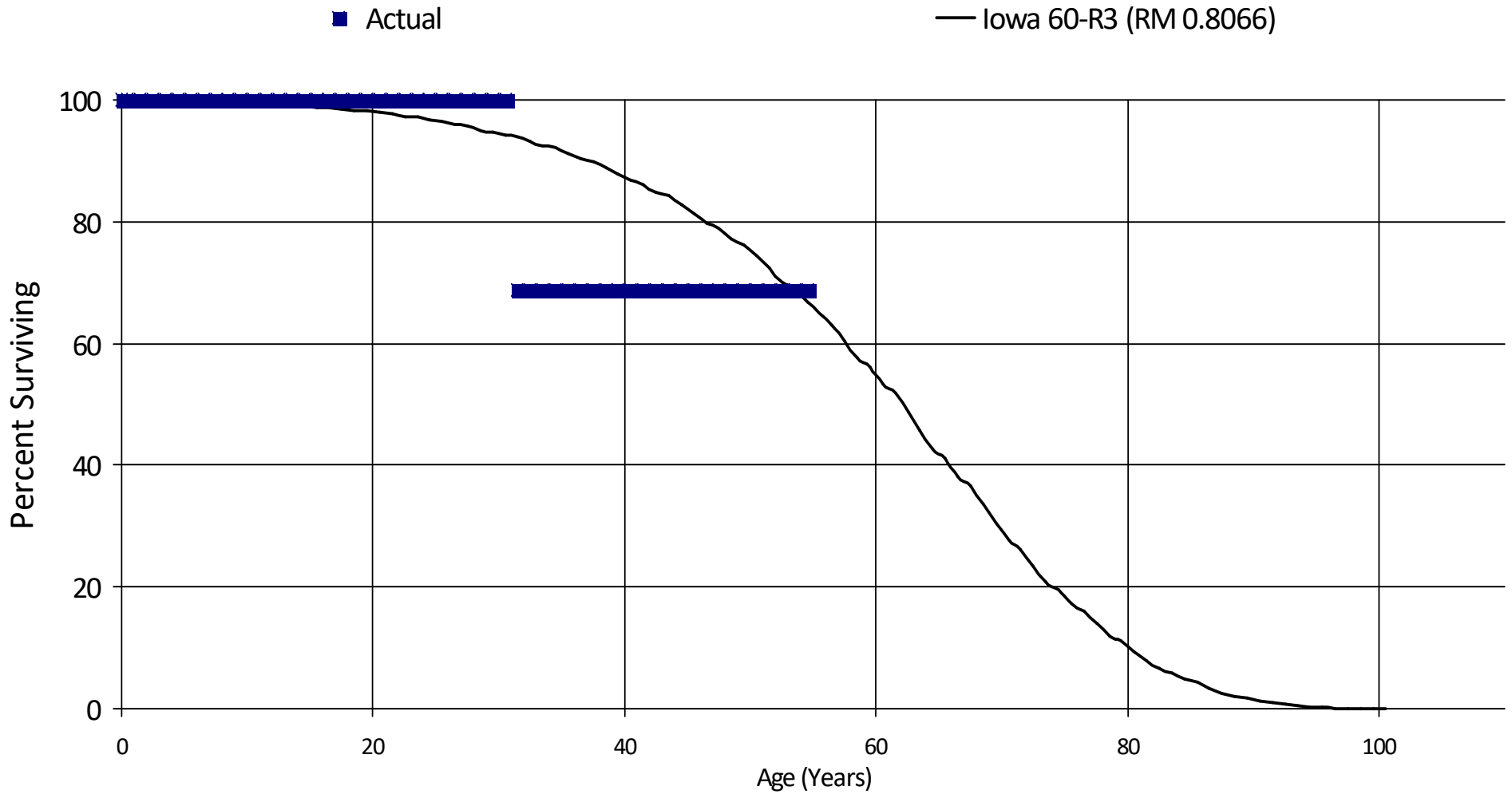
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	10,896	0	0.00000	1.00000	68.86
41.5	10,896	0	0.00000	1.00000	68.86
42.5	10,896	0	0.00000	1.00000	68.86
43.5	10,896	0	0.00000	1.00000	68.86
44.5	1,415	0	0.00000	1.00000	68.86
45.5	1,415	0	0.00000	1.00000	68.86
46.5	1,415	0	0.00000	1.00000	68.86
47.5	1,415	0	0.00000	1.00000	68.86
48.5	1,415	0	0.00000	1.00000	68.86
49.5	1,415	0	0.00000	1.00000	68.86
50.5	1,415	0	0.00000	1.00000	68.86
51.5	1,415	0	0.00000	1.00000	68.86
52.5	1,415	0	0.00000	1.00000	68.86
53.5	1,415	0	0.00000	1.00000	68.86
54.5	1,200	0	0.00000	1.00000	68.86
<b>Totals:</b>	<b>46,475,339</b>	<b>20,982</b>			

# Cascade Natural Gas Corporation

## Account 374.2 - Land Rights

Placement Band - 1963 - 2018 Experience Band - 2014 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 375.1 - Structures and Improvements

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	1,579,925	0	0.00000	1.00000	100.00
0.5	1,574,890	0	0.00000	1.00000	100.00
1.5	1,569,074	0	0.00000	1.00000	100.00
2.5	1,567,315	0	0.00000	1.00000	100.00
3.5	1,567,315	662	0.00042	0.99958	100.00
4.5	1,566,653	6,733	0.00430	0.99570	99.96
5.5	1,559,920	1,210	0.00078	0.99922	99.53
6.5	1,520,379	2,665	0.00175	0.99825	99.45
7.5	1,509,683	9,928	0.00658	0.99342	99.28
8.5	1,499,755	0	0.00000	1.00000	98.63
9.5	1,499,755	0	0.00000	1.00000	98.63
10.5	1,499,755	1,535	0.00102	0.99898	98.63
11.5	1,498,220	1,040	0.00069	0.99931	98.53
12.5	1,497,180	950	0.00063	0.99937	98.46
13.5	1,496,230	0	0.00000	1.00000	98.40
14.5	1,496,230	0	0.00000	1.00000	98.40
15.5	1,496,230	4,721	0.00316	0.99684	98.40
16.5	1,491,510	33,018	0.02214	0.97786	98.09
17.5	1,458,492	0	0.00000	1.00000	95.92
18.5	1,458,492	0	0.00000	1.00000	95.92
19.5	1,458,492	2,115	0.00145	0.99855	95.92
20.5	1,451,581	0	0.00000	1.00000	95.78
21.5	1,451,581	23,855	0.01643	0.98357	95.78
22.5	1,427,726	0	0.00000	1.00000	94.21
23.5	1,427,726	609	0.00043	0.99957	94.21
24.5	1,423,839	0	0.00000	1.00000	94.17
25.5	1,405,611	0	0.00000	1.00000	94.17
26.5	1,401,089	0	0.00000	1.00000	94.17
27.5	1,380,873	8,908	0.00645	0.99355	94.17
28.5	1,369,841	0	0.00000	1.00000	93.56
29.5	1,350,127	0	0.00000	1.00000	93.56
30.5	1,311,757	0	0.00000	1.00000	93.56
31.5	1,293,801	4,283	0.00331	0.99669	93.56
32.5	1,271,794	0	0.00000	1.00000	93.25
33.5	897,066	0	0.00000	1.00000	93.25
34.5	886,137	0	0.00000	1.00000	93.25
35.5	847,280	0	0.00000	1.00000	93.25
36.5	847,280	11,797	0.01392	0.98608	93.25
37.5	754,989	0	0.00000	1.00000	91.95
38.5	746,201	0	0.00000	1.00000	91.95
39.5	737,543	0	0.00000	1.00000	91.95

# Cascade Natural Gas Corporation

## Account 375.1 - Structures and Improvements

### RETIREMENT RATE ANALYSIS

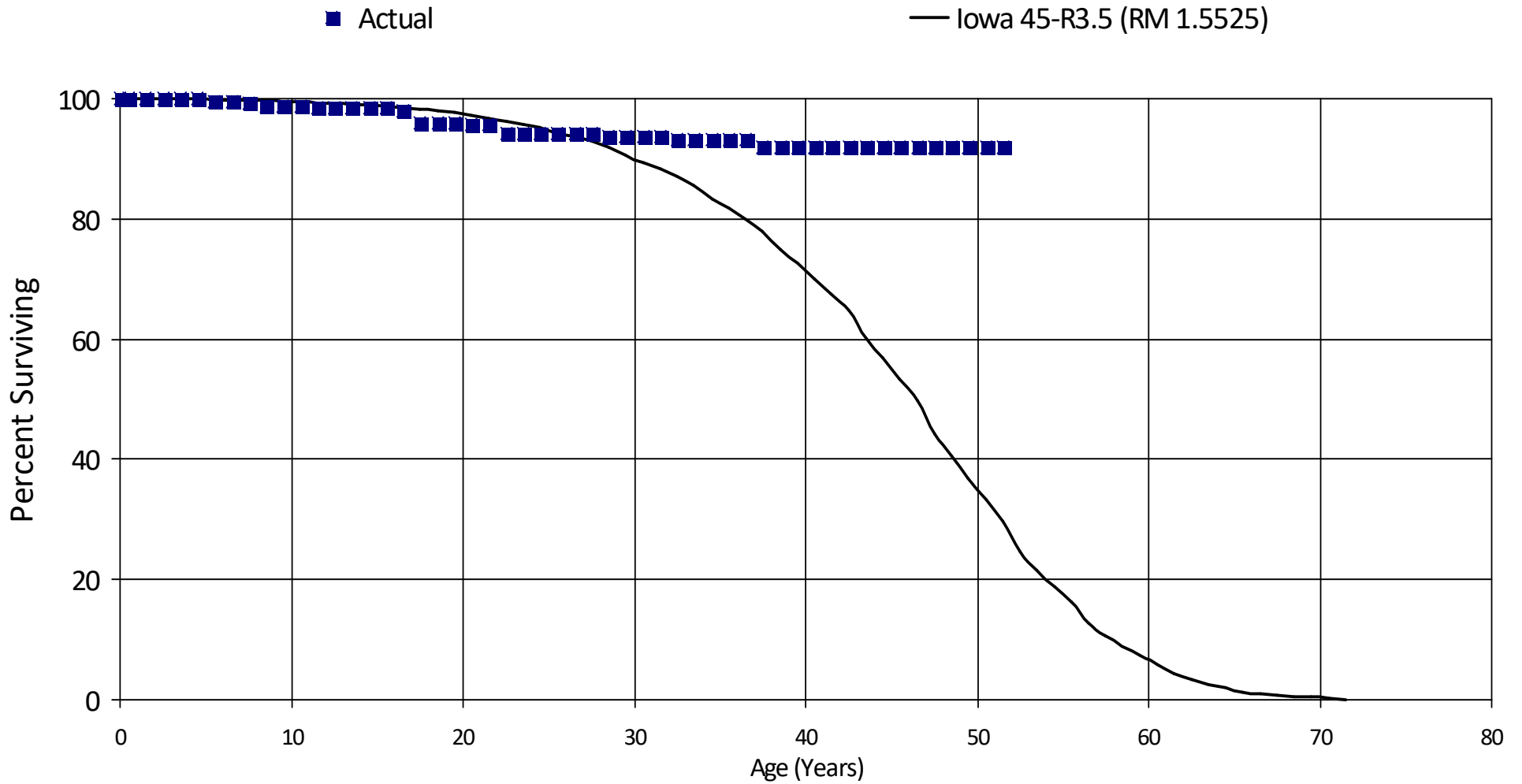
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	731,995	0	0.00000	1.00000	91.95
41.5	547,591	0	0.00000	1.00000	91.95
42.5	547,325	0	0.00000	1.00000	91.95
43.5	170,569	0	0.00000	1.00000	91.95
44.5	167,269	0	0.00000	1.00000	91.95
45.5	32,655	0	0.00000	1.00000	91.95
46.5	32,655	0	0.00000	1.00000	91.95
47.5	32,655	0	0.00000	1.00000	91.95
48.5	25,513	0	0.00000	1.00000	91.95
49.5	25,513	0	0.00000	1.00000	91.95
50.5	25,453	0	0.00000	1.00000	91.95
51.5	18,061	0	0.00000	1.00000	91.95
<b>Totals:</b>	57,906,596	114,029			

# Cascade Natural Gas Corporation

## Account 375.1 - Structures and Improvements

Placement Band - 1960 - 2018 Experience Band - 1975 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 376.1 - Mains - Steel

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	160,462,238	18,826	0.00012	0.99988	100.00
0.5	152,813,663	6,139	0.00004	0.99996	99.99
1.5	146,015,285	29,501	0.00020	0.99980	99.99
2.5	141,168,789	3,950	0.00003	0.99997	99.97
3.5	135,691,727	30,702	0.00023	0.99977	99.97
4.5	129,256,866	86,801	0.00067	0.99933	99.95
5.5	125,793,082	7,516	0.00006	0.99994	99.88
6.5	122,821,314	2,990	0.00002	0.99998	99.87
7.5	122,289,548	1,454	0.00001	0.99999	99.87
8.5	121,652,290	2,085	0.00002	0.99998	99.87
9.5	120,110,801	11,916	0.00010	0.99990	99.87
10.5	117,887,710	7,467	0.00006	0.99994	99.86
11.5	117,347,253	51,865	0.00044	0.99956	99.85
12.5	115,935,310	42,493	0.00037	0.99963	99.81
13.5	115,278,654	53,500	0.00046	0.99954	99.77
14.5	114,781,423	42,366	0.00037	0.99963	99.72
15.5	114,072,438	35,512	0.00031	0.99969	99.68
16.5	113,237,106	79,642	0.00070	0.99930	99.65
17.5	112,011,025	77,656	0.00069	0.99931	99.58
18.5	110,787,260	116,806	0.00105	0.99895	99.51
19.5	108,524,200	179,032	0.00165	0.99835	99.41
20.5	102,011,649	579,878	0.00568	0.99432	99.25
21.5	99,158,119	119,315	0.00120	0.99880	98.69
22.5	95,743,227	65,151	0.00068	0.99932	98.57
23.5	92,032,562	62,475	0.00068	0.99932	98.50
24.5	88,622,182	63,595	0.00072	0.99928	98.43
25.5	85,107,001	129,894	0.00153	0.99847	98.36
26.5	80,196,064	151,972	0.00190	0.99810	98.21
27.5	77,389,051	69,546	0.00090	0.99910	98.02
28.5	73,795,442	52,804	0.00072	0.99928	97.93
29.5	71,413,910	64,478	0.00090	0.99910	97.86
30.5	68,406,347	111,885	0.00164	0.99836	97.77
31.5	65,028,265	102,495	0.00158	0.99842	97.61
32.5	63,177,741	109,354	0.00173	0.99827	97.46
33.5	60,944,435	84,655	0.00139	0.99861	97.29
34.5	59,266,712	157,562	0.00266	0.99734	97.15
35.5	57,548,240	82,364	0.00143	0.99857	96.89
36.5	54,673,498	159,204	0.00291	0.99709	96.75
37.5	50,793,307	106,332	0.00209	0.99791	96.47
38.5	47,735,908	124,543	0.00261	0.99739	96.27
39.5	44,052,148	86,002	0.00195	0.99805	96.02

# Cascade Natural Gas Corporation

## Account 376.1 - Mains - Steel

### RETIREMENT RATE ANALYSIS

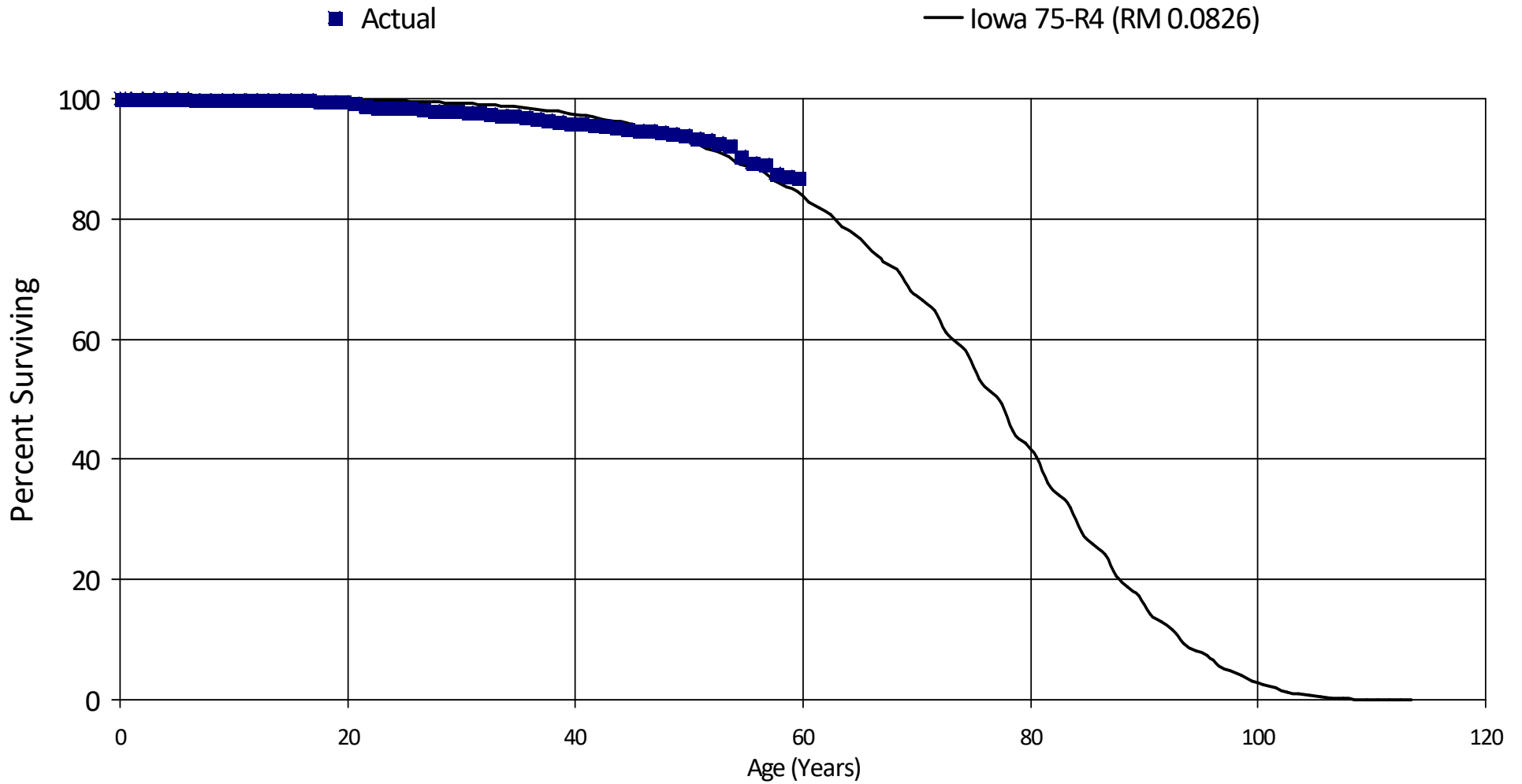
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	40,925,585	96,940	0.00237	0.99763	95.83
41.5	39,784,859	47,893	0.00120	0.99880	95.60
42.5	38,851,414	101,471	0.00261	0.99739	95.49
43.5	37,206,890	104,457	0.00281	0.99719	95.24
44.5	35,049,211	78,181	0.00223	0.99777	94.97
45.5	32,584,256	36,825	0.00113	0.99887	94.76
46.5	31,237,313	76,454	0.00245	0.99755	94.65
47.5	29,491,563	90,915	0.00308	0.99692	94.42
48.5	26,422,036	78,125	0.00296	0.99704	94.13
49.5	24,463,455	88,196	0.00361	0.99639	93.85
50.5	22,374,389	99,666	0.00445	0.99555	93.51
51.5	20,833,361	94,834	0.00455	0.99545	93.09
52.5	18,748,065	100,733	0.00537	0.99463	92.67
53.5	15,800,004	314,180	0.01988	0.98012	92.17
54.5	13,704,396	141,934	0.01036	0.98964	90.34
55.5	11,901,255	32,909	0.00277	0.99723	89.40
56.5	10,492,617	189,180	0.01803	0.98197	89.15
57.5	8,004,728	50,898	0.00636	0.99364	87.54
58.5	6,572,728	8,562	0.00130	0.99870	86.98
59.5	6,099,515	3,702	0.00061	0.99939	86.87
<b>Totals:</b>	<b>4,525,581,436</b>	<b>5,207,778</b>			

# Cascade Natural Gas Corporation

## Account 376.1 - Mains - Steel

Placement Band - 1953 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves





# Cascade Natural Gas Corporation

## Account 376.2 - Mains - High Pressure

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	173,211,627	2,423	0.00001	0.99999	100.00
0.5	158,365,726	16,704	0.00011	0.99989	100.00
1.5	147,011,397	5,247	0.00004	0.99996	99.99
2.5	132,462,965	80,429	0.00061	0.99939	99.99
3.5	126,010,679	499,386	0.00396	0.99604	99.93
4.5	122,377,467	0	0.00000	1.00000	99.53
5.5	118,525,064	13,575	0.00011	0.99989	99.53
6.5	104,080,305	22,036	0.00021	0.99979	99.52
7.5	100,287,237	27,116	0.00027	0.99973	99.50
8.5	95,764,939	5,708	0.00006	0.99994	99.47
9.5	92,704,340	27,628	0.00030	0.99970	99.46
10.5	82,756,751	341,987	0.00413	0.99587	99.43
11.5	81,702,380	141,701	0.00173	0.99827	99.02
12.5	78,269,328	37,857	0.00048	0.99952	98.85
13.5	76,517,331	181,896	0.00238	0.99762	98.80
14.5	74,625,089	327,110	0.00438	0.99562	98.56
15.5	74,248,175	73,844	0.00099	0.99901	98.13
16.5	73,522,365	187,008	0.00254	0.99746	98.03
17.5	72,878,297	57,787	0.00079	0.99921	97.78
18.5	71,520,594	21,895	0.00031	0.99969	97.70
19.5	66,640,043	15,363	0.00023	0.99977	97.67
20.5	64,409,430	39,127	0.00061	0.99939	97.65
21.5	52,583,376	11,844	0.00023	0.99977	97.59
22.5	50,523,713	404,320	0.00800	0.99200	97.57
23.5	42,494,719	14,443	0.00034	0.99966	96.79
24.5	40,423,794	37,892	0.00094	0.99906	96.76
25.5	26,357,522	49,865	0.00189	0.99811	96.67
26.5	16,980,928	115,856	0.00682	0.99318	96.49
27.5	16,047,661	77,250	0.00481	0.99519	95.83
28.5	15,684,394	97,893	0.00624	0.99376	95.37
29.5	14,328,226	30	0.00000	1.00000	94.77
30.5	14,067,514	23,917	0.00170	0.99830	94.77
31.5	13,088,702	29,820	0.00228	0.99772	94.61
32.5	10,946,861	1,295	0.00012	0.99988	94.39
33.5	10,742,594	0	0.00000	1.00000	94.38
34.5	10,742,594	8,532	0.00079	0.99921	94.38
35.5	10,732,471	2,516	0.00023	0.99977	94.31
36.5	9,120,471	12,024	0.00132	0.99868	94.29
37.5	8,506,158	1,929	0.00023	0.99977	94.17
38.5	8,196,156	6,431	0.00078	0.99922	94.15
39.5	7,955,578	1,671	0.00021	0.99979	94.08

# Cascade Natural Gas Corporation

## Account 376.2 - Mains - High Pressure

### RETIREMENT RATE ANALYSIS

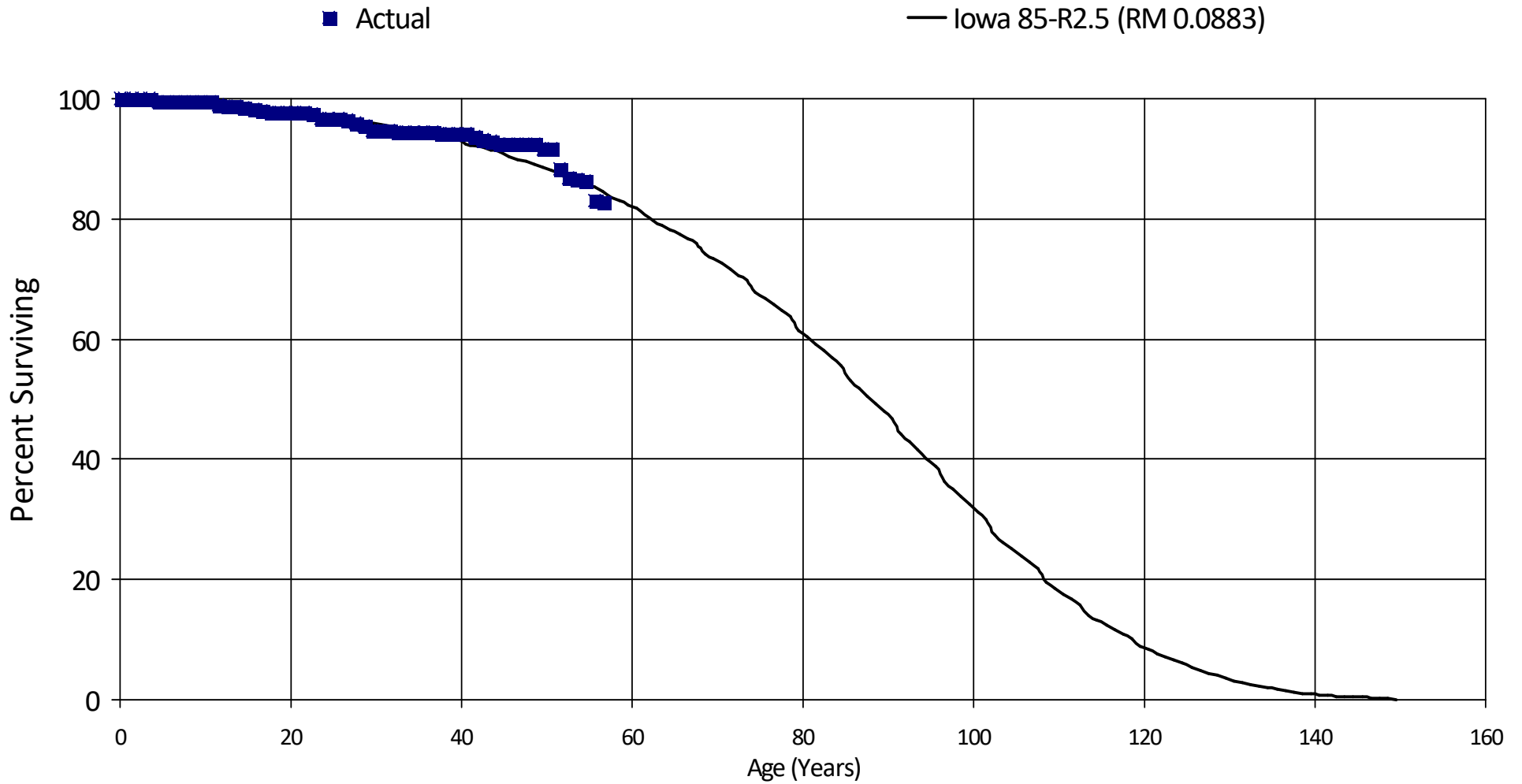
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	7,953,907	26,407	0.00332	0.99668	94.06
41.5	7,927,500	58,863	0.00743	0.99257	93.75
42.5	7,855,638	15,422	0.00196	0.99804	93.05
43.5	7,826,755	42,968	0.00549	0.99451	92.87
44.5	7,753,002	462	0.00006	0.99994	92.36
45.5	7,549,248	1,275	0.00017	0.99983	92.35
46.5	7,220,261	1,264	0.00018	0.99982	92.33
47.5	4,284,563	2,090	0.00049	0.99951	92.31
48.5	4,212,361	26,182	0.00622	0.99378	92.26
49.5	4,123,938	2,682	0.00065	0.99935	91.69
50.5	3,652,722	131,676	0.03605	0.96395	91.63
51.5	3,335,273	57,418	0.01722	0.98278	88.33
52.5	2,923,824	12,781	0.00437	0.99563	86.81
53.5	2,780,905	2,742	0.00099	0.99901	86.43
54.5	2,764,902	110,945	0.04013	0.95987	86.34
55.5	2,085,880	1,068	0.00051	0.99949	82.88
56.5	2,034,252	62,350	0.03065	0.96935	82.84
<b>Totals:</b>	<b>2,653,699,893</b>	<b>3,579,950</b>			

# Cascade Natural Gas Corporation

## Account 376.2 - Mains - High Pressure

Placement Band - 1957 - 2018 Experience Band - 1978 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 376.3 - Mains - Plastic (Polyethylene)

### RETIREMENT RATE ANALYSIS

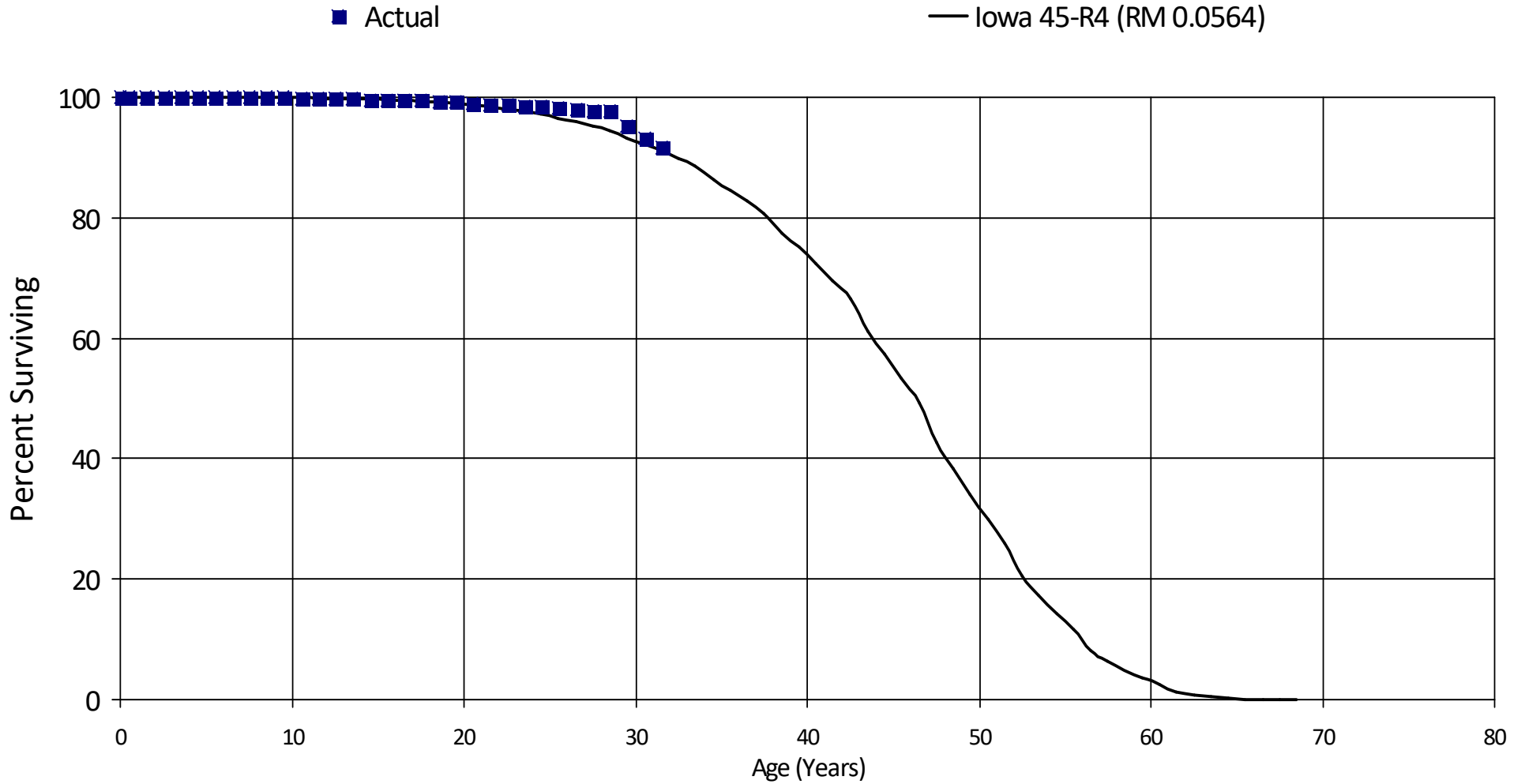
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	182,740,103	146	0.00000	1.00000	100.00
0.5	166,146,599	3,198	0.00002	0.99998	100.00
1.5	144,186,684	2,475	0.00002	0.99998	100.00
2.5	129,807,886	12,133	0.00009	0.99991	100.00
3.5	116,502,758	782	0.00001	0.99999	99.99
4.5	110,169,270	12,030	0.00011	0.99989	99.99
5.5	104,467,124	8,044	0.00008	0.99992	99.98
6.5	99,474,428	27,603	0.00028	0.99972	99.97
7.5	99,008,621	23,769	0.00024	0.99976	99.94
8.5	98,804,835	27,578	0.00028	0.99972	99.92
9.5	96,183,990	54,968	0.00057	0.99943	99.89
10.5	89,909,043	32,631	0.00036	0.99964	99.83
11.5	82,360,370	55,728	0.00068	0.99932	99.79
12.5	77,224,324	47,229	0.00061	0.99939	99.72
13.5	70,595,159	38,365	0.00054	0.99946	99.66
14.5	63,880,166	37,685	0.00059	0.99941	99.61
15.5	59,674,546	48,708	0.00082	0.99918	99.55
16.5	54,326,915	27,994	0.00052	0.99948	99.47
17.5	48,919,848	74,761	0.00153	0.99847	99.42
18.5	43,732,427	65,842	0.00151	0.99849	99.27
19.5	38,583,803	91,150	0.00236	0.99764	99.12
20.5	32,983,448	48,218	0.00146	0.99854	98.89
21.5	26,449,029	21,957	0.00083	0.99917	98.75
22.5	22,886,404	30,510	0.00133	0.99867	98.67
23.5	19,414,953	25,465	0.00131	0.99869	98.54
24.5	15,441,884	30,951	0.00200	0.99800	98.41
25.5	11,311,964	30,789	0.00272	0.99728	98.21
26.5	7,256,083	11,706	0.00161	0.99839	97.94
27.5	4,756,065	3,824	0.00080	0.99920	97.78
28.5	3,317,498	83,751	0.02525	0.97475	97.70
29.5	2,850,605	59,496	0.02087	0.97913	95.23
30.5	1,895,172	35,454	0.01871	0.98129	93.24
31.5	423,931	10	0.00002	0.99998	91.50
<b>Totals:</b>	<b>2,125,685,935</b>	<b>1,074,950</b>			

# Cascade Natural Gas Corporation

## Account 376.3 - Mains - Plastic (Polyethylene)

Placement Band - 1960 - 2018 Experience Band - 1986 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

Account 377.0 - Compressor Station Equip.

## RETIREMENT RATE ANALYSIS

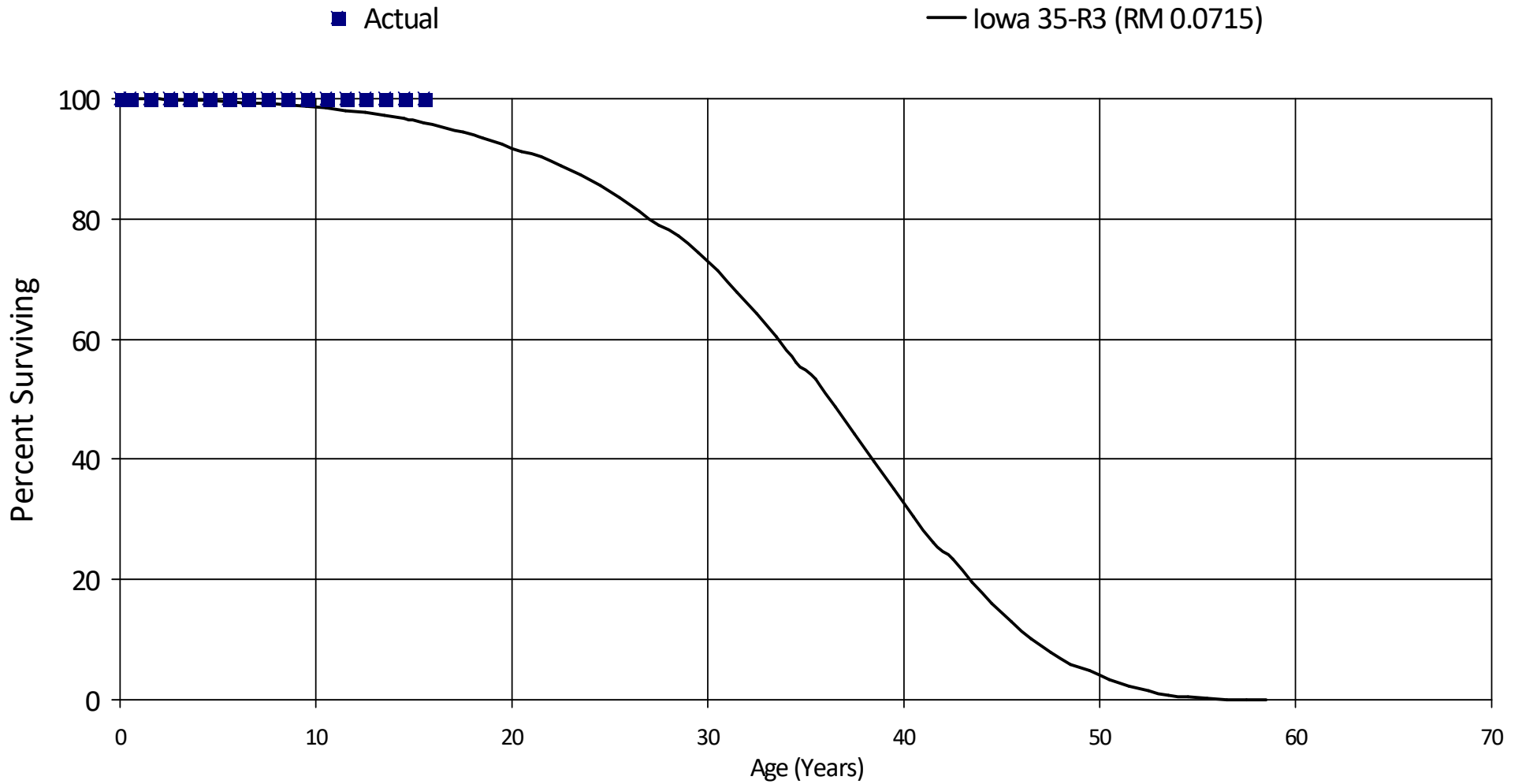
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	2,097,767	0	0.00000	1.00000	100.00
0.5	2,097,767	0	0.00000	1.00000	100.00
1.5	2,097,767	0	0.00000	1.00000	100.00
2.5	2,097,767	0	0.00000	1.00000	100.00
3.5	2,097,767	0	0.00000	1.00000	100.00
4.5	2,000,731	0	0.00000	1.00000	100.00
5.5	2,000,731	0	0.00000	1.00000	100.00
6.5	2,000,731	0	0.00000	1.00000	100.00
7.5	2,000,731	0	0.00000	1.00000	100.00
8.5	2,000,731	0	0.00000	1.00000	100.00
9.5	2,000,731	0	0.00000	1.00000	100.00
10.5	2,000,731	0	0.00000	1.00000	100.00
11.5	1,997,764	0	0.00000	1.00000	100.00
12.5	1,997,764	0	0.00000	1.00000	100.00
13.5	1,990,220	0	0.00000	1.00000	100.00
14.5	1,990,220	0	0.00000	1.00000	100.00
15.5	2,010,151	0	0.00000	1.00000	100.00
<b>Totals:</b>	<b>34,480,067</b>	<b>0</b>			

# Cascade Natural Gas Corporation

## Account 377.0 - Compressor Station Equip.

Placement Band - 2002 - 2018 Experience Band - 2018 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 378.0 - Meas. And Reg. Station Equip. - General

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	34,369,367	0	0.00000	1.00000	100.00
0.5	32,590,583	19,229	0.00059	0.99941	100.00
1.5	28,904,300	28,726	0.00099	0.99901	99.94
2.5	26,307,237	17,056	0.00065	0.99935	99.84
3.5	23,756,127	43,531	0.00183	0.99817	99.78
4.5	22,308,302	13,558	0.00061	0.99939	99.60
5.5	21,389,522	29,881	0.00140	0.99860	99.54
6.5	19,437,721	131,978	0.00679	0.99321	99.40
7.5	18,853,064	8,610	0.00046	0.99954	98.73
8.5	18,438,609	29,546	0.00160	0.99840	98.68
9.5	16,340,341	14,771	0.00090	0.99910	98.52
10.5	13,534,288	15,746	0.00116	0.99884	98.43
11.5	12,663,363	7,358	0.00058	0.99942	98.32
12.5	12,166,676	11,800	0.00097	0.99903	98.26
13.5	11,429,654	105,089	0.00919	0.99081	98.16
14.5	9,377,962	13,862	0.00148	0.99852	97.26
15.5	9,210,713	41,111	0.00446	0.99554	97.12
16.5	9,077,711	22,978	0.00253	0.99747	96.69
17.5	8,713,458	31,180	0.00358	0.99642	96.45
18.5	8,269,825	29,195	0.00353	0.99647	96.10
19.5	8,112,491	56,396	0.00695	0.99305	95.76
20.5	6,923,353	21,109	0.00305	0.99695	95.09
21.5	5,807,111	26,275	0.00452	0.99548	94.80
22.5	4,921,160	9,748	0.00198	0.99802	94.37
23.5	4,646,833	27,701	0.00596	0.99404	94.18
24.5	4,441,784	18,419	0.00415	0.99585	93.62
25.5	3,659,029	8,283	0.00226	0.99774	93.23
26.5	3,361,165	16,881	0.00502	0.99498	93.02
27.5	3,205,741	35,005	0.01092	0.98908	92.55
28.5	3,090,890	13,951	0.00451	0.99549	91.54
29.5	3,019,612	37,509	0.01242	0.98758	91.13
30.5	2,915,327	117,927	0.04045	0.95955	90.00
31.5	2,521,335	25,890	0.01027	0.98973	86.36
32.5	2,306,283	45,317	0.01965	0.98035	85.47
33.5	2,072,834	9,602	0.00463	0.99537	83.79
34.5	1,855,262	5,479	0.00295	0.99705	83.40
35.5	1,747,889	116,629	0.06673	0.93327	83.15
36.5	1,442,547	9,561	0.00663	0.99337	77.60
37.5	1,290,238	3,467	0.00269	0.99731	77.09
38.5	1,258,738	14,359	0.01141	0.98859	76.88
39.5	1,161,885	11,215	0.00965	0.99035	76.00



# Cascade Natural Gas Corporation

## Account 378.0 - Meas. And Reg. Station Equip. - General

### RETIREMENT RATE ANALYSIS

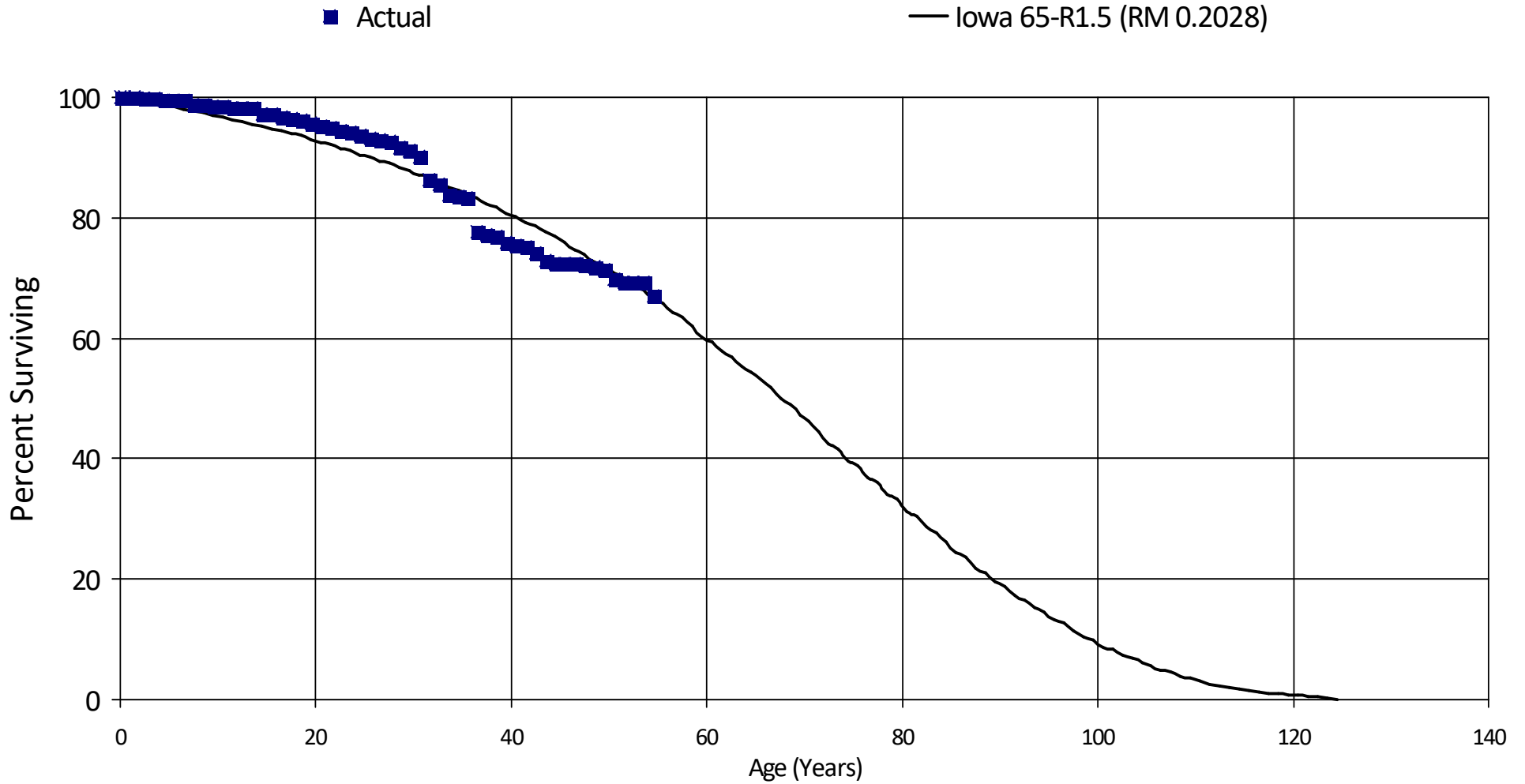
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	1,101,721	2,101	0.00191	0.99809	75.27
41.5	1,086,223	14,423	0.01328	0.98672	75.13
42.5	1,034,883	16,741	0.01618	0.98382	74.13
43.5	957,923	7,273	0.00759	0.99241	72.93
44.5	804,553	817	0.00102	0.99898	72.38
45.5	781,924	666	0.00085	0.99915	72.31
46.5	756,933	619	0.00082	0.99918	72.25
47.5	730,780	4,117	0.00563	0.99437	72.19
48.5	612,077	3,662	0.00598	0.99402	71.78
49.5	581,773	13,384	0.02301	0.97699	71.35
50.5	538,746	3,200	0.00594	0.99406	69.71
51.5	484,719	613	0.00126	0.99874	69.30
52.5	453,738	0	0.00000	1.00000	69.21
53.5	414,001	13,887	0.03354	0.96646	69.21
54.5	359,799	0	0.00000	1.00000	66.89
<b>Totals:</b>	<b>437,600,123</b>	<b>1,327,431</b>			

# Cascade Natural Gas Corporation

Account 378.0 - Meas. And Reg. Station Equip. - General

Placement Band - 1953 - 2018 Experience Band - 1974 - 2018

## Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 380.1 - Services - Steel

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	79,840,804	0	0.00000	1.00000	100.00
0.5	79,751,458	4,688	0.00006	0.99994	100.00
1.5	79,717,077	6,155	0.00008	0.99992	99.99
2.5	79,583,264	471	0.00001	0.99999	99.98
3.5	79,495,756	1,751	0.00002	0.99998	99.98
4.5	79,452,797	1,171	0.00001	0.99999	99.98
5.5	79,384,002	3,850	0.00005	0.99995	99.98
6.5	79,330,301	4,454	0.00006	0.99994	99.98
7.5	79,296,756	9,609	0.00012	0.99988	99.97
8.5	79,256,685	10,014	0.00013	0.99987	99.96
9.5	79,193,391	21,043	0.00027	0.99973	99.95
10.5	79,042,533	9,876	0.00012	0.99988	99.92
11.5	78,930,323	17,684	0.00022	0.99978	99.91
12.5	78,808,641	38,549	0.00049	0.99951	99.89
13.5	78,695,221	56,048	0.00071	0.99929	99.84
14.5	78,585,958	47,994	0.00061	0.99939	99.77
15.5	78,452,929	49,198	0.00063	0.99937	99.71
16.5	78,334,967	75,639	0.00097	0.99903	99.65
17.5	78,129,578	65,041	0.00083	0.99917	99.55
18.5	77,918,154	119,360	0.00153	0.99847	99.47
19.5	77,628,629	84,590	0.00109	0.99891	99.32
20.5	77,191,459	509,136	0.00660	0.99340	99.21
21.5	73,726,011	94,989	0.00129	0.99871	98.56
22.5	69,434,666	94,208	0.00136	0.99864	98.43
23.5	63,150,447	102,308	0.00162	0.99838	98.30
24.5	56,631,015	77,656	0.00137	0.99863	98.14
25.5	51,022,500	84,240	0.00165	0.99835	98.01
26.5	45,713,473	71,253	0.00156	0.99844	97.85
27.5	40,182,322	105,982	0.00264	0.99736	97.70
28.5	35,884,246	68,828	0.00192	0.99808	97.44
29.5	32,357,525	98,273	0.00304	0.99696	97.25
30.5	29,583,083	91,099	0.00308	0.99692	96.95
31.5	26,940,942	79,680	0.00296	0.99704	96.65
32.5	25,179,723	70,437	0.00280	0.99720	96.36
33.5	23,548,195	88,226	0.00375	0.99625	96.09
34.5	22,174,497	81,882	0.00369	0.99631	95.73
35.5	21,084,401	64,801	0.00307	0.99693	95.38
36.5	19,763,817	96,641	0.00489	0.99511	95.09
37.5	18,261,002	97,756	0.00535	0.99465	94.63
38.5	16,721,711	96,713	0.00578	0.99422	94.12
39.5	15,535,400	108,740	0.00700	0.99300	93.58

# Cascade Natural Gas Corporation

## Account 380.1 - Services - Steel

### RETIREMENT RATE ANALYSIS

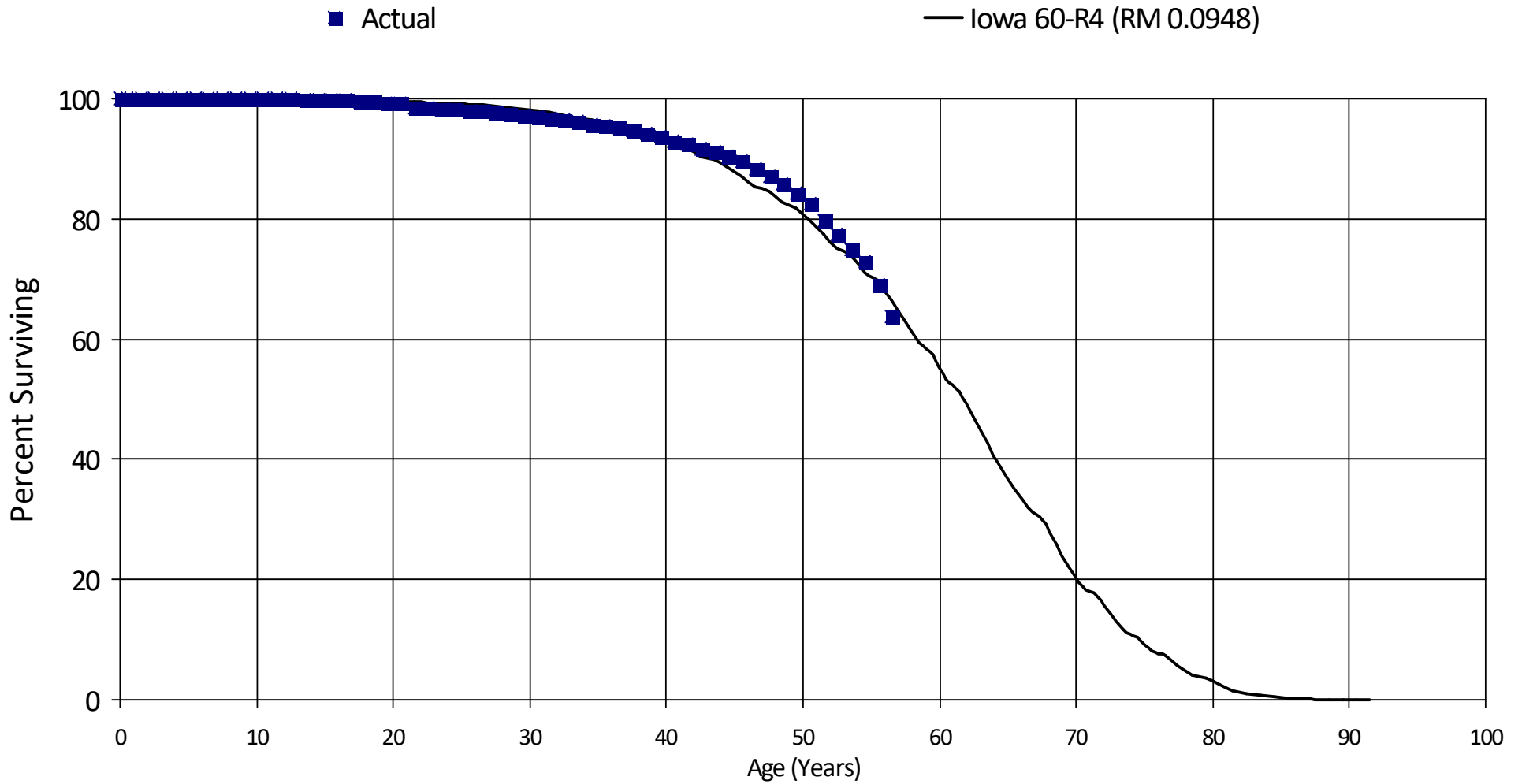
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	14,509,419	97,188	0.00670	0.99330	92.92
41.5	13,976,128	101,960	0.00730	0.99270	92.30
42.5	13,162,157	88,837	0.00675	0.99325	91.63
43.5	12,411,326	88,976	0.00717	0.99283	91.01
44.5	11,422,086	98,300	0.00861	0.99139	90.36
45.5	10,429,949	150,971	0.01447	0.98553	89.58
46.5	9,394,438	140,889	0.01500	0.98500	88.28
47.5	8,363,961	109,427	0.01308	0.98692	86.96
48.5	7,611,213	127,650	0.01677	0.98323	85.82
49.5	6,331,145	150,189	0.02372	0.97628	84.38
50.5	5,012,516	164,737	0.03287	0.96713	82.38
51.5	4,015,783	114,145	0.02842	0.97158	79.67
52.5	3,246,956	111,759	0.03442	0.96558	77.41
53.5	2,537,044	62,139	0.02449	0.97551	74.75
54.5	1,997,798	108,212	0.05417	0.94583	72.92
55.5	1,589,787	124,205	0.07813	0.92187	68.97
56.5	1,006,117	21,734	0.02160	0.97840	63.58
<b>Totals:</b>	<b>2,549,933,480</b>	<b>4,671,351</b>			

# Cascade Natural Gas Corporation

## Account 380.1 - Services - Steel

Placement Band - 1953 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



**Cascade Natural Gas Corporation**  
**Account 380.3 - Services - Plastic (Polyethylene)**

**RETIREMENT RATE ANALYSIS**

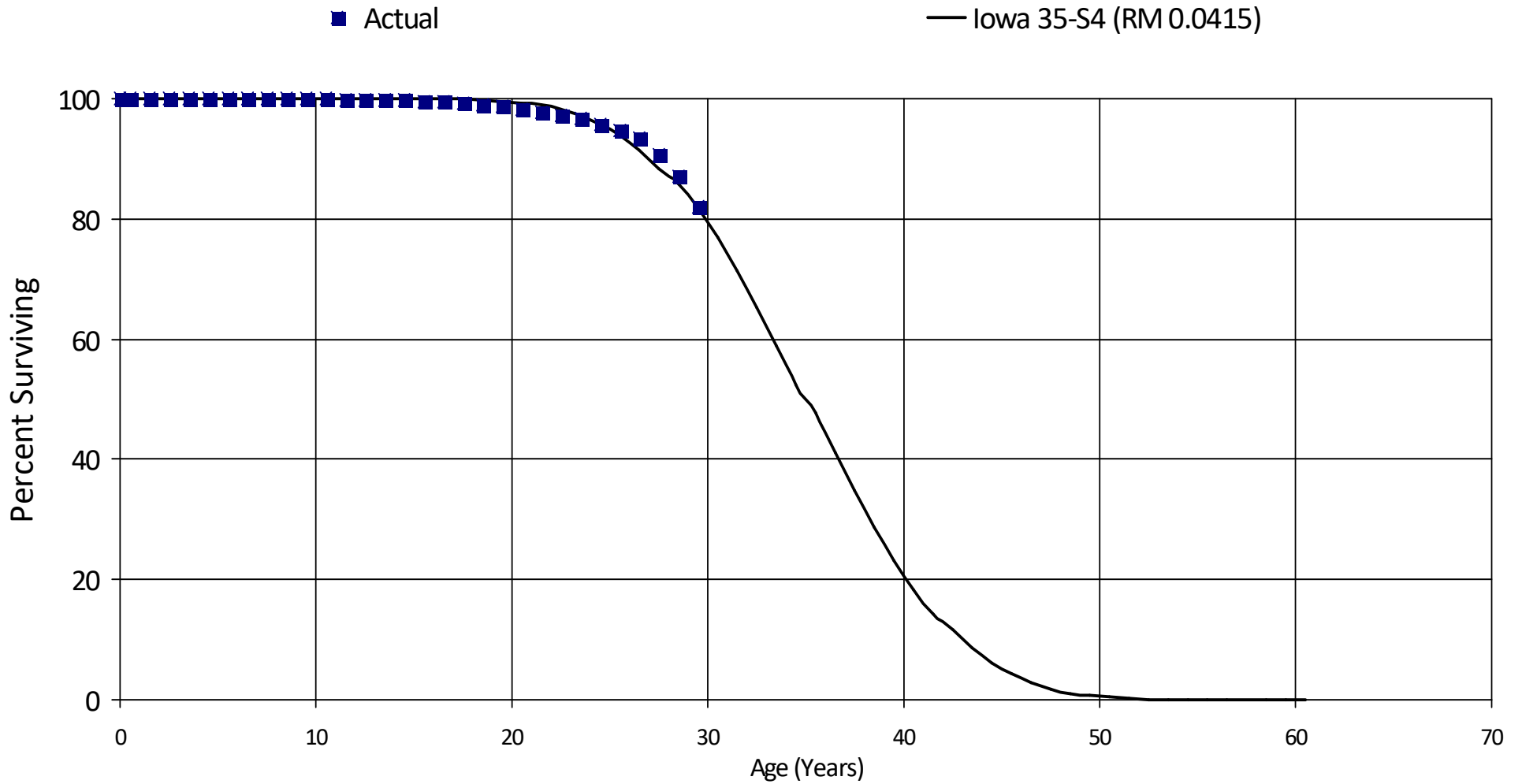
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	175,722,868	0	0.00000	1.00000	100.00
0.5	154,144,521	3,625	0.00002	0.99998	100.00
1.5	140,590,520	6,464	0.00005	0.99995	100.00
2.5	131,231,315	5,602	0.00004	0.99996	100.00
3.5	120,297,437	4,869	0.00004	0.99996	100.00
4.5	114,014,397	12,086	0.00011	0.99989	100.00
5.5	106,024,377	4,861	0.00005	0.99995	99.99
6.5	101,877,927	13,685	0.00013	0.99987	99.99
7.5	98,763,227	35,537	0.00036	0.99964	99.98
8.5	96,720,952	20,761	0.00021	0.99979	99.94
9.5	93,333,494	26,613	0.00029	0.99971	99.92
10.5	86,872,047	26,855	0.00031	0.99969	99.89
11.5	78,284,815	23,597	0.00030	0.99970	99.86
12.5	73,013,816	35,845	0.00049	0.99951	99.83
13.5	66,858,489	75,547	0.00113	0.99887	99.78
14.5	58,344,277	60,218	0.00103	0.99897	99.67
15.5	51,430,686	68,003	0.00132	0.99868	99.57
16.5	44,318,457	66,156	0.00149	0.99851	99.44
17.5	38,632,373	120,765	0.00313	0.99687	99.29
18.5	33,378,279	66,024	0.00198	0.99802	98.98
19.5	26,994,677	171,488	0.00635	0.99365	98.78
20.5	19,441,655	69,270	0.00356	0.99644	98.15
21.5	14,338,109	71,640	0.00500	0.99500	97.80
22.5	11,746,090	69,542	0.00592	0.99408	97.31
23.5	9,030,386	105,415	0.01167	0.98833	96.73
24.5	6,139,107	61,927	0.01009	0.98991	95.60
25.5	4,074,929	55,243	0.01356	0.98644	94.64
26.5	2,216,144	62,994	0.02843	0.97157	93.36
27.5	1,099,444	44,078	0.04009	0.95991	90.71
28.5	570,304	33,149	0.05813	0.94187	87.07
29.5	348,610	3,711	0.01065	0.98935	82.01
<b>Totals:</b>	<b>1,959,853,727</b>	<b>1,425,570</b>			

# Cascade Natural Gas Corporation

## Account 380.3 - Services - Plastic (Polyethylene)

Placement Band - 1961 - 2018 Experience Band - 1985 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 381.0 - Meters

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	117,962,190	1,136	0.00001	0.99999	100.00
0.5	98,451,769	21,566	0.00022	0.99978	100.00
1.5	94,410,302	197,606	0.00209	0.99791	99.98
2.5	88,111,860	102,024	0.00116	0.99884	99.77
3.5	85,755,813	28,509	0.00033	0.99967	99.65
4.5	83,379,826	16,880	0.00020	0.99980	99.62
5.5	81,767,790	63,945	0.00078	0.99922	99.60
6.5	80,855,759	56,480	0.00070	0.99930	99.52
7.5	79,577,424	264,841	0.00333	0.99667	99.45
8.5	78,568,230	276,090	0.00351	0.99649	99.12
9.5	76,872,840	152,094	0.00198	0.99802	98.77
10.5	71,470,138	356,696	0.00499	0.99501	98.57
11.5	68,824,511	406,480	0.00591	0.99409	98.08
12.5	65,514,102	144,294	0.00220	0.99780	97.50
13.5	60,094,747	7,994,242	0.13303	0.86697	97.29
14.5	43,911,793	145,165	0.00331	0.99669	84.35
15.5	41,263,801	69,664	0.00169	0.99831	84.07
16.5	38,787,185	67,548	0.00174	0.99826	83.93
17.5	36,251,969	61,586	0.00170	0.99830	83.78
18.5	33,886,634	87,580	0.00258	0.99742	83.64
19.5	31,878,596	167,341	0.00525	0.99475	83.42
20.5	29,415,132	152,049	0.00517	0.99483	82.98
21.5	27,564,585	181,081	0.00657	0.99343	82.55
22.5	26,014,867	383,260	0.01473	0.98527	82.01
23.5	23,817,104	643,005	0.02700	0.97300	80.80
24.5	21,275,376	545,873	0.02566	0.97434	78.62
25.5	19,257,083	435,510	0.02262	0.97738	76.60
26.5	17,351,798	514,944	0.02968	0.97032	74.87
27.5	15,572,781	220,816	0.01418	0.98582	72.65
28.5	14,410,304	712,825	0.04947	0.95053	71.62
29.5	12,672,052	375,687	0.02965	0.97035	68.08
30.5	11,469,026	192,403	0.01678	0.98322	66.06
31.5	10,673,826	113,102	0.01060	0.98940	64.95
32.5	10,114,070	173,503	0.01715	0.98285	64.26
33.5	9,613,920	180,826	0.01881	0.98119	63.16
34.5	9,242,856	372,961	0.04035	0.95965	61.97
35.5	8,663,147	103,771	0.01198	0.98802	59.47
36.5	8,216,079	73,041	0.00889	0.99111	58.76
37.5	7,826,236	159,841	0.02042	0.97958	58.24
38.5	7,368,054	168,754	0.02290	0.97710	57.05
39.5	6,943,326	244,440	0.03521	0.96479	55.74



# Cascade Natural Gas Corporation

## Account 381.0 - Meters

### RETIREMENT RATE ANALYSIS

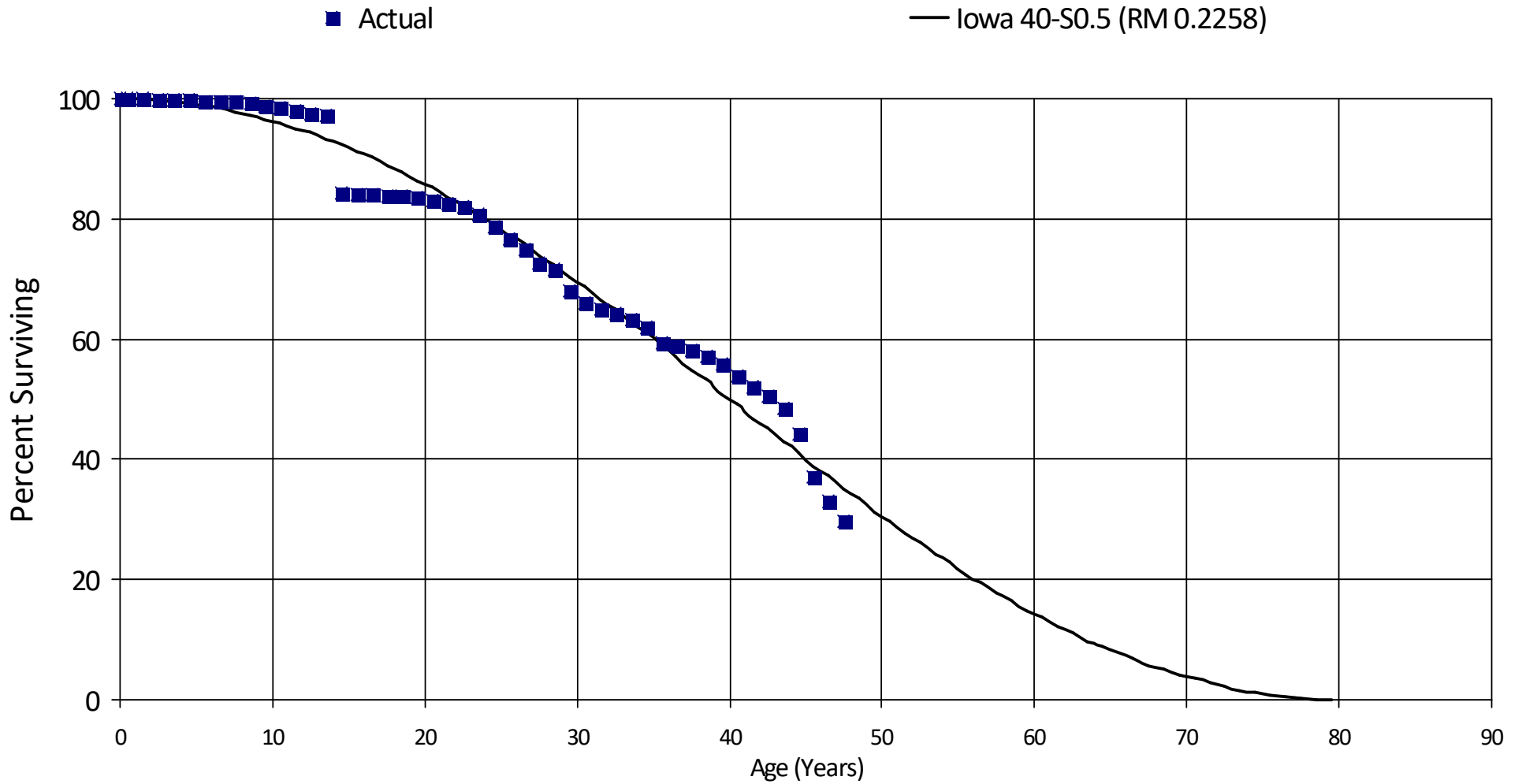
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	6,474,839	219,091	0.03384	0.96616	53.78
41.5	6,044,866	164,850	0.02727	0.97273	51.96
42.5	5,608,993	226,192	0.04033	0.95967	50.54
43.5	5,068,349	453,645	0.08951	0.91049	48.50
44.5	4,118,780	670,932	0.16290	0.83710	44.16
45.5	2,971,199	325,526	0.10956	0.89044	36.97
46.5	2,258,059	215,102	0.09526	0.90474	32.92
47.5	1,808,797	227,859	0.12597	0.87403	29.78
<b>Totals:</b>	<b>1,789,432,784</b>	<b>19,132,656</b>			

# Cascade Natural Gas Corporation

## Account 381.0 - Meters

Placement Band - 1953 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 383.0 - Regulators

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	13,559,942	0	0.00000	1.00000	100.00
0.5	12,610,984	0	0.00000	1.00000	100.00
1.5	11,977,322	33,550	0.00280	0.99720	100.00
2.5	11,697,679	87,057	0.00744	0.99256	99.72
3.5	11,413,056	219,947	0.01927	0.98073	98.98
4.5	10,943,893	463,534	0.04236	0.95764	97.07
5.5	10,230,316	134,663	0.01316	0.98684	92.96
6.5	9,842,396	107,938	0.01097	0.98903	91.74
7.5	9,536,490	82,625	0.00866	0.99134	90.73
8.5	9,273,042	0	0.00000	1.00000	89.94
9.5	9,075,465	11,737	0.00129	0.99871	89.94
10.5	8,851,272	16,433	0.00186	0.99814	89.82
11.5	8,706,832	6,253	0.00072	0.99928	89.65
12.5	8,581,504	467	0.00005	0.99995	89.59
13.5	8,478,630	9,443	0.00111	0.99889	89.59
14.5	8,346,759	23,943	0.00287	0.99713	89.49
15.5	8,257,119	19,991	0.00242	0.99758	89.23
16.5	8,149,883	23,360	0.00287	0.99713	89.01
17.5	7,697,497	57,488	0.00747	0.99253	88.75
18.5	7,401,956	14,424	0.00195	0.99805	88.09
19.5	6,970,324	8,918	0.00128	0.99872	87.92
20.5	6,254,621	43,305	0.00692	0.99308	87.81
21.5	5,538,598	20,237	0.00365	0.99635	87.20
22.5	5,005,134	19,661	0.00393	0.99607	86.88
23.5	4,569,647	24,806	0.00543	0.99457	86.54
24.5	4,010,853	44,215	0.01102	0.98898	86.07
25.5	3,548,624	25,373	0.00715	0.99285	85.12
26.5	3,047,872	30,458	0.00999	0.99001	84.51
27.5	2,614,735	20,725	0.00793	0.99207	83.67
28.5	2,343,723	24,684	0.01053	0.98947	83.01
29.5	2,186,015	18,079	0.00827	0.99173	82.14
30.5	2,069,397	5,487	0.00265	0.99735	81.46
31.5	1,881,677	17,821	0.00947	0.99053	81.24
32.5	1,722,211	27,174	0.01578	0.98422	80.47
33.5	1,558,756	16,630	0.01067	0.98933	79.20
34.5	1,471,704	25,228	0.01714	0.98286	78.35
35.5	1,414,535	27,575	0.01949	0.98051	77.01
36.5	1,349,507	32,466	0.02406	0.97594	75.51
37.5	1,281,526	24,622	0.01921	0.98079	73.69
38.5	1,138,215	12,888	0.01132	0.98868	72.27
39.5	1,104,586	86,385	0.07821	0.92179	71.45

# Cascade Natural Gas Corporation

## Account 383.0 - Regulators

### RETIREMENT RATE ANALYSIS

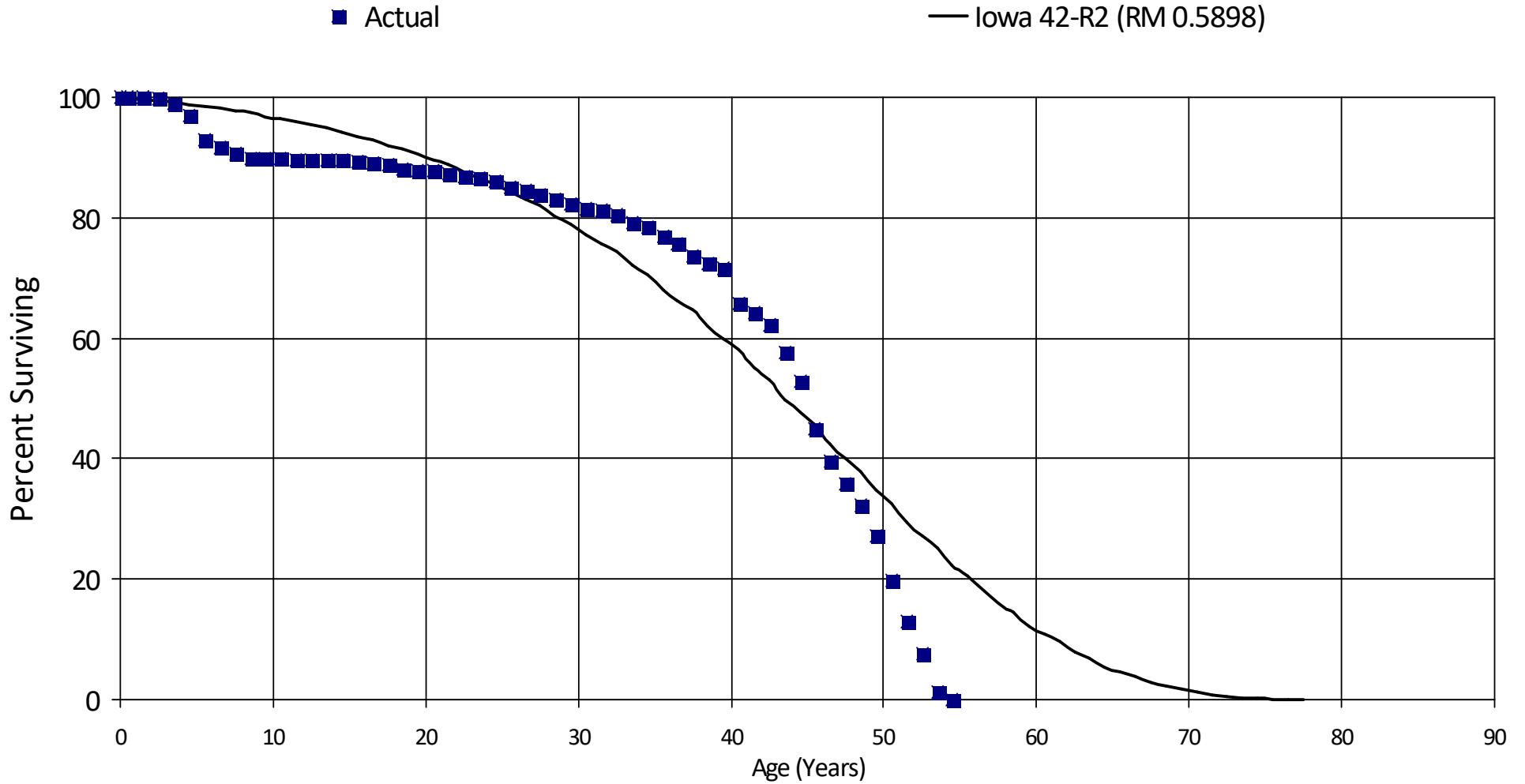
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	969,703	23,501	0.02424	0.97576	65.86
41.5	942,946	29,766	0.03157	0.96843	64.26
42.5	905,367	68,565	0.07573	0.92427	62.23
43.5	808,072	65,363	0.08089	0.91911	57.52
44.5	615,822	93,071	0.15113	0.84887	52.87
45.5	444,018	51,717	0.11647	0.88353	44.88
46.5	392,301	37,028	0.09439	0.90561	39.65
47.5	312,001	31,407	0.10066	0.89934	35.91
48.5	232,786	36,295	0.15592	0.84408	32.30
49.5	164,926	45,428	0.27544	0.72456	27.26
50.5	98,412	33,379	0.33918	0.66082	19.75
51.5	32,868	13,396	0.40756	0.59244	13.05
52.5	1,160	959	0.82695	0.17305	7.73
53.5	43	43	1.00773	-0.00773	1.34
54.5	0	0	0.00000	0.00000	-0.01
<b>Totals:</b>	261,634,723	2,399,508			

# Cascade Natural Gas Corporation

## Account 383.0 - Regulators

Placement Band - 1962 - 2018 Experience Band - 1975 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 385.0 - Industrial Meas. & Reg. Station Equip.

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	12,657,139	3,396	0.00027	0.99973	100.00
0.5	11,791,360	9,823	0.00083	0.99917	99.97
1.5	11,112,803	13,578	0.00122	0.99878	99.89
2.5	10,573,946	42,010	0.00397	0.99603	99.77
3.5	10,190,323	104,246	0.01023	0.98977	99.37
4.5	9,779,557	26,150	0.00267	0.99733	98.35
5.5	8,652,203	205,809	0.02379	0.97621	98.09
6.5	8,116,240	37,551	0.00463	0.99537	95.76
7.5	7,829,168	38,391	0.00490	0.99510	95.32
8.5	7,694,690	28,549	0.00371	0.99629	94.85
9.5	6,730,553	36,793	0.00547	0.99453	94.50
10.5	6,015,622	74,263	0.01235	0.98765	93.98
11.5	5,322,193	2,284	0.00043	0.99957	92.82
12.5	5,111,310	35,109	0.00687	0.99313	92.78
13.5	4,629,217	14,090	0.00304	0.99696	92.14
14.5	4,361,318	16,663	0.00382	0.99618	91.86
15.5	4,055,222	44,806	0.01105	0.98895	91.51
16.5	3,905,357	14,977	0.00383	0.99617	90.50
17.5	3,823,766	26,999	0.00706	0.99294	90.15
18.5	3,754,893	6,532	0.00174	0.99826	89.51
19.5	3,743,736	15,165	0.00405	0.99595	89.35
20.5	3,668,013	8,044	0.00219	0.99781	88.99
21.5	3,500,393	4,033	0.00115	0.99885	88.80
22.5	3,019,120	25,272	0.00837	0.99163	88.70
23.5	2,712,867	34,675	0.01278	0.98722	87.96
24.5	2,636,283	48,369	0.01835	0.98165	86.84
25.5	1,738,617	9,846	0.00566	0.99434	85.25
26.5	1,372,533	0	0.00000	1.00000	84.77
27.5	1,343,148	1,861	0.00139	0.99861	84.77
28.5	1,260,965	903	0.00072	0.99928	84.65
29.5	1,227,755	1,205	0.00098	0.99902	84.59
30.5	1,187,405	25,485	0.02146	0.97854	84.51
31.5	1,136,203	1,283	0.00113	0.99887	82.70
32.5	1,028,398	1,800	0.00175	0.99825	82.61
33.5	994,879	3,623	0.00364	0.99636	82.47
34.5	918,835	13,065	0.01422	0.98578	82.17
35.5	671,673	5,556	0.00827	0.99173	81.00
36.5	420,188	0	0.00000	1.00000	80.33
37.5	317,110	0	0.00000	1.00000	80.33
38.5	251,140	2,095	0.00834	0.99166	80.33
39.5	218,741	15,009	0.06862	0.93138	79.66

**Cascade Natural Gas Corporation**  
**Account 385.0 - Industrial Meas. & Reg. Station Equip.**

**RETIREMENT RATE ANALYSIS**

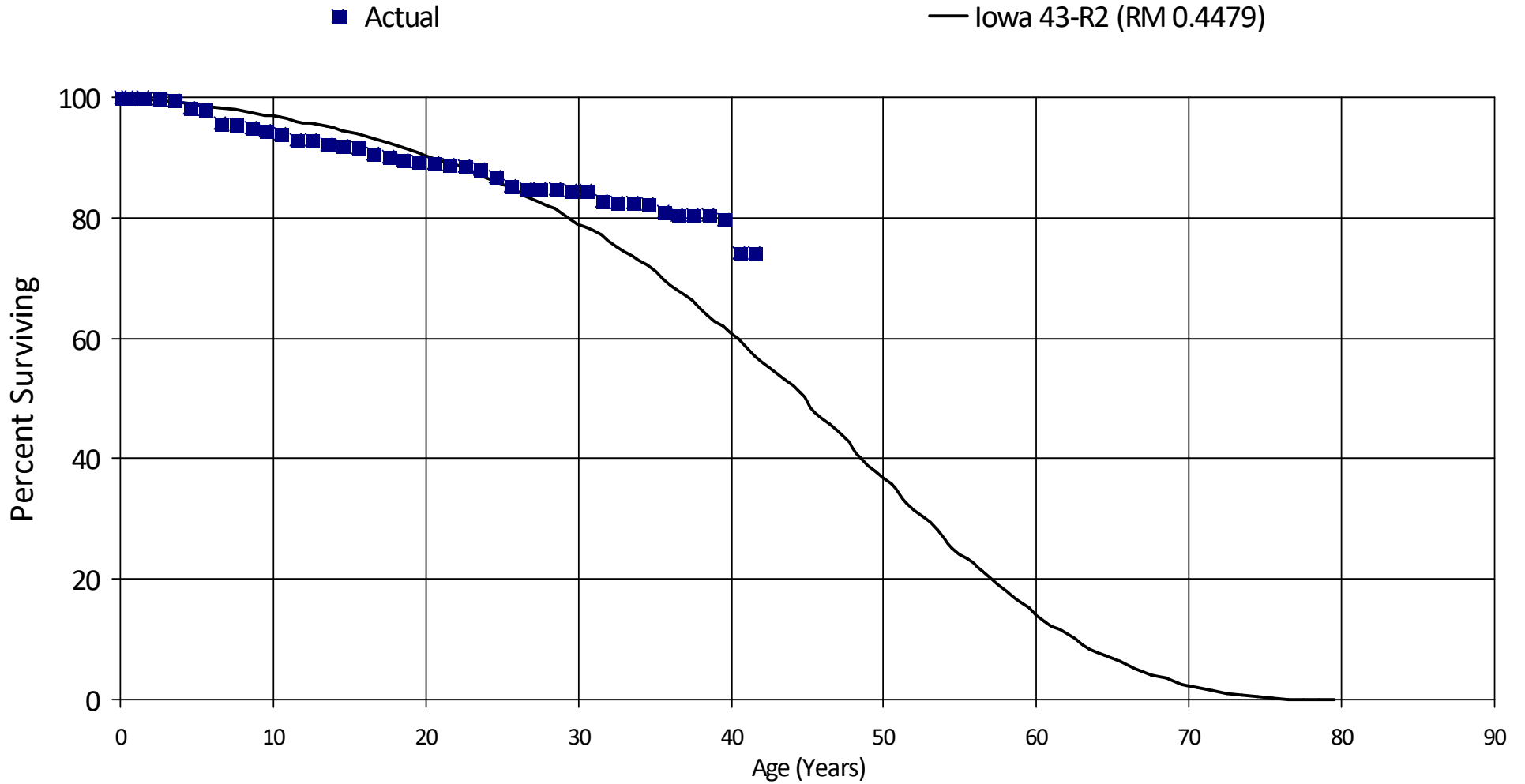
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	160,936	0	0.00000	1.00000	74.19
41.5	138,181	469	0.00339	0.99661	74.19
<b>Totals:</b>	<b>179,774,001</b>	<b>999,777</b>			

# Cascade Natural Gas Corporation

Account 385.0 - Industrial Meas. & Reg. Station Equip.

Placement Band - 1961 - 2018 Experience Band - 1975 - 2018

## Actual and Smooth Survivor Curves





# Cascade Natural Gas Corporation

## Account 390.1 - Structures and Improvements

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	29,322,688	0	0.00000	1.00000	100.00
0.5	28,938,733	23,800	0.00082	0.99918	100.00
1.5	28,717,701	91,899	0.00320	0.99680	99.92
2.5	28,483,107	93,697	0.00329	0.99671	99.60
3.5	26,924,433	990,936	0.03680	0.96320	99.27
4.5	25,053,305	82,533	0.00329	0.99671	95.62
5.5	24,578,431	78,130	0.00318	0.99682	95.31
6.5	24,455,379	12,876	0.00053	0.99947	95.01
7.5	24,377,529	56,532	0.00232	0.99768	94.96
8.5	16,731,372	46,567	0.00278	0.99722	94.74
9.5	16,515,918	109,264	0.00662	0.99338	94.48
10.5	16,373,214	8,024	0.00049	0.99951	93.85
11.5	16,269,186	108,333	0.00666	0.99334	93.80
12.5	16,070,883	109,253	0.00680	0.99320	93.18
13.5	15,620,350	10,600	0.00068	0.99932	92.55
14.5	15,609,749	348,950	0.02235	0.97765	92.49
15.5	12,528,875	67,195	0.00536	0.99464	90.42
16.5	12,443,261	45,241	0.00364	0.99636	89.94
17.5	12,379,950	381,537	0.03082	0.96918	89.61
18.5	11,991,282	136,915	0.01142	0.98858	86.85
19.5	11,822,641	9,969	0.00084	0.99916	85.86
20.5	11,742,520	4,518	0.00038	0.99962	85.79
21.5	11,731,819	186,590	0.01590	0.98410	85.76
22.5	11,396,718	691,825	0.06070	0.93930	84.40
23.5	10,226,763	1,607,156	0.15715	0.84285	79.28
24.5	8,593,766	56,317	0.00655	0.99345	66.82
25.5	8,536,046	139,962	0.01640	0.98360	66.38
26.5	8,370,785	206,139	0.02463	0.97537	65.29
27.5	8,157,479	18,865	0.00231	0.99769	63.68
28.5	8,096,517	1,052,582	0.13000	0.87000	63.53
29.5	7,012,393	2,467	0.00035	0.99965	55.27
30.5	6,934,597	53,892	0.00777	0.99223	55.25
31.5	6,615,273	271,345	0.04102	0.95898	54.82
32.5	6,261,080	673,314	0.10754	0.89246	52.57
33.5	5,544,930	39,473	0.00712	0.99288	46.92
34.5	5,208,922	3,372	0.00065	0.99935	46.59
35.5	4,811,135	253,458	0.05268	0.94732	46.56
36.5	4,528,471	17,740	0.00392	0.99608	44.11
37.5	2,799,632	24,327	0.00869	0.99131	43.94
38.5	2,761,725	8,385	0.00304	0.99696	43.56
39.5	2,680,858	250,937	0.09360	0.90640	43.43

# Cascade Natural Gas Corporation

## Account 390.1 - Structures and Improvements

### RETIREMENT RATE ANALYSIS

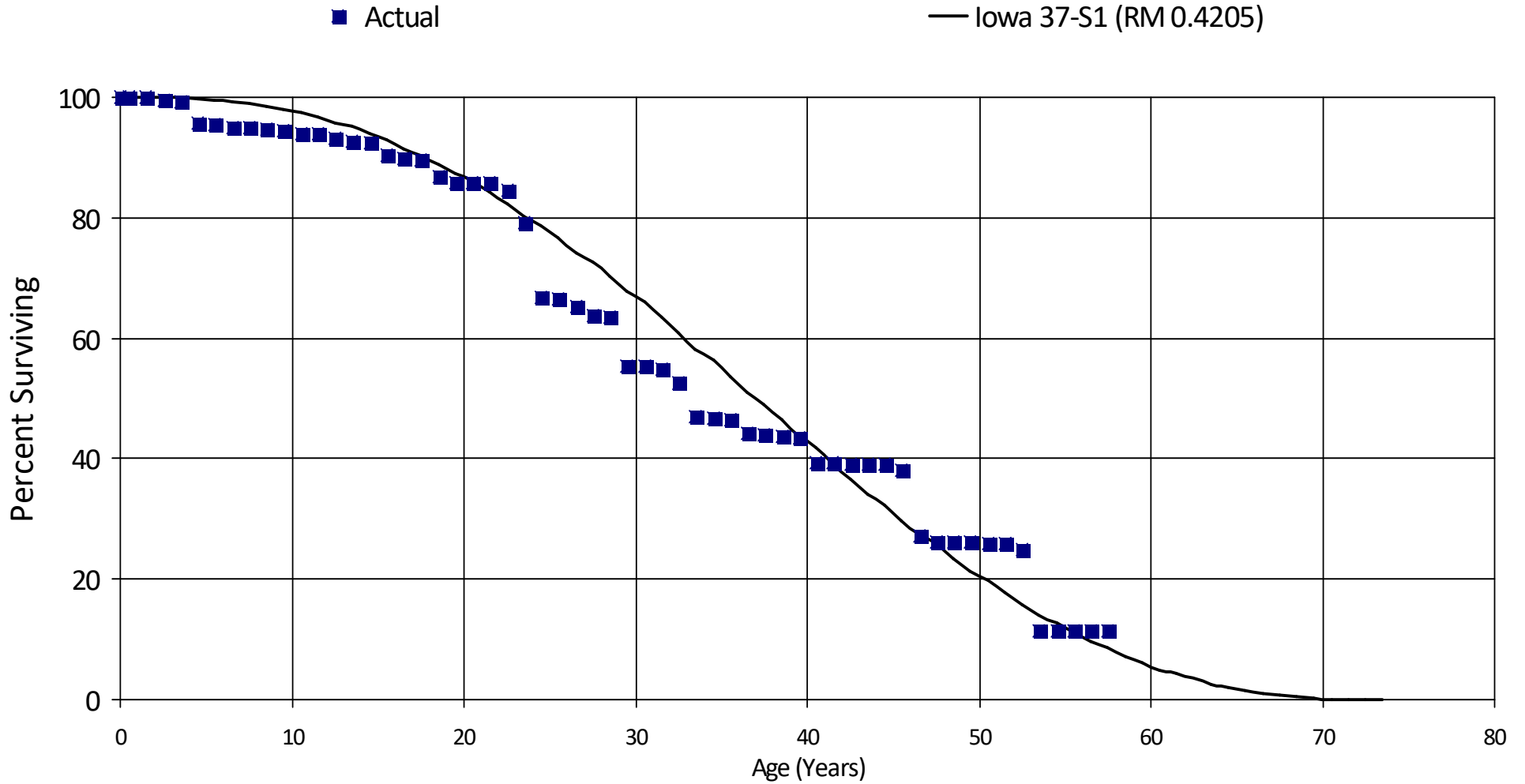
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	2,346,300	3,445	0.00147	0.99853	39.36
41.5	1,957,660	6,755	0.00345	0.99655	39.30
42.5	1,946,053	1,566	0.00080	0.99920	39.16
43.5	1,942,538	218	0.00011	0.99989	39.13
44.5	1,849,540	45,434	0.02457	0.97543	39.13
45.5	1,796,166	521,624	0.29041	0.70959	38.17
46.5	1,259,973	38,603	0.03064	0.96936	27.09
47.5	1,209,355	0	0.00000	1.00000	26.26
48.5	1,134,984	0	0.00000	1.00000	26.26
49.5	901,602	9,745	0.01081	0.98919	26.26
50.5	872,843	1,739	0.00199	0.99801	25.98
51.5	542,335	21,581	0.03979	0.96021	25.93
52.5	516,950	280,533	0.54267	0.45733	24.90
53.5	42,156	0	0.00000	1.00000	11.39
54.5	40,493	0	0.00000	1.00000	11.39
55.5	40,493	0	0.00000	1.00000	11.39
56.5	40,493	0	0.00000	1.00000	11.39
57.5	0	0	0.00000	0.00000	11.39
<b>Totals:</b>	575,659,348	9,306,158			

# Cascade Natural Gas Corporation

## Account 390.1 - Structures and Improvements

Placement Band - 1956 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 390.2 - Leasehold Improvements

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	375,632	0	0.00000	1.00000	100.00
0.5	375,632	398	0.00106	0.99894	100.00
1.5	375,234	0	0.00000	1.00000	99.89
2.5	367,301	5,068	0.01380	0.98620	99.89
3.5	362,232	6,498	0.01794	0.98206	98.51
4.5	355,734	3,400	0.00956	0.99044	96.74
5.5	352,334	18,108	0.05139	0.94861	95.82
6.5	334,226	13,741	0.04111	0.95889	90.90
7.5	320,485	1,099	0.00343	0.99657	87.16
8.5	319,386	17,117	0.05359	0.94641	86.86
9.5	302,269	5,325	0.01762	0.98238	82.21
10.5	296,944	11,950	0.04024	0.95976	80.76
11.5	284,994	16,174	0.05675	0.94325	77.51
12.5	268,820	133,898	0.49810	0.50190	73.11
13.5	134,922	3,675	0.02724	0.97276	36.69
14.5	131,247	10,006	0.07624	0.92376	35.69
15.5	121,241	22,131	0.18254	0.81746	32.97
16.5	99,110	41,808	0.42184	0.57816	26.95
17.5	57,302	6,891	0.12026	0.87974	15.58
18.5	50,410	2,491	0.04941	0.95059	13.71
19.5	47,919	0	0.00000	1.00000	13.03
20.5	47,919	6,758	0.14103	0.85897	13.03
21.5	41,161	7,234	0.17575	0.82425	11.19
22.5	33,927	288	0.00849	0.99151	9.22
23.5	33,639	1,511	0.04492	0.95508	9.14
24.5	32,128	9,653	0.30045	0.69955	8.73
25.5	22,476	815	0.03626	0.96374	6.11
26.5	21,661	0	0.00000	1.00000	5.89
27.5	21,661	925	0.04270	0.95730	5.89
28.5	20,736	2,640	0.12731	0.87269	5.64
29.5	18,097	297	0.01641	0.98359	4.92
30.5	17,800	683	0.03837	0.96163	4.84
31.5	17,117	0	0.00000	1.00000	4.65
32.5	17,117	0	0.00000	1.00000	4.65
33.5	17,117	0	0.00000	1.00000	4.65
34.5	17,117	0	0.00000	1.00000	4.65
35.5	17,117	0	0.00000	1.00000	4.65
36.5	17,117	1,968	0.11497	0.88503	4.65
37.5	15,149	1,301	0.08588	0.91412	4.12
38.5	13,848	0	0.00000	1.00000	3.77
39.5	13,848	0	0.00000	1.00000	3.77

# Cascade Natural Gas Corporation

## Account 390.2 - Leasehold Improvements

### RETIREMENT RATE ANALYSIS

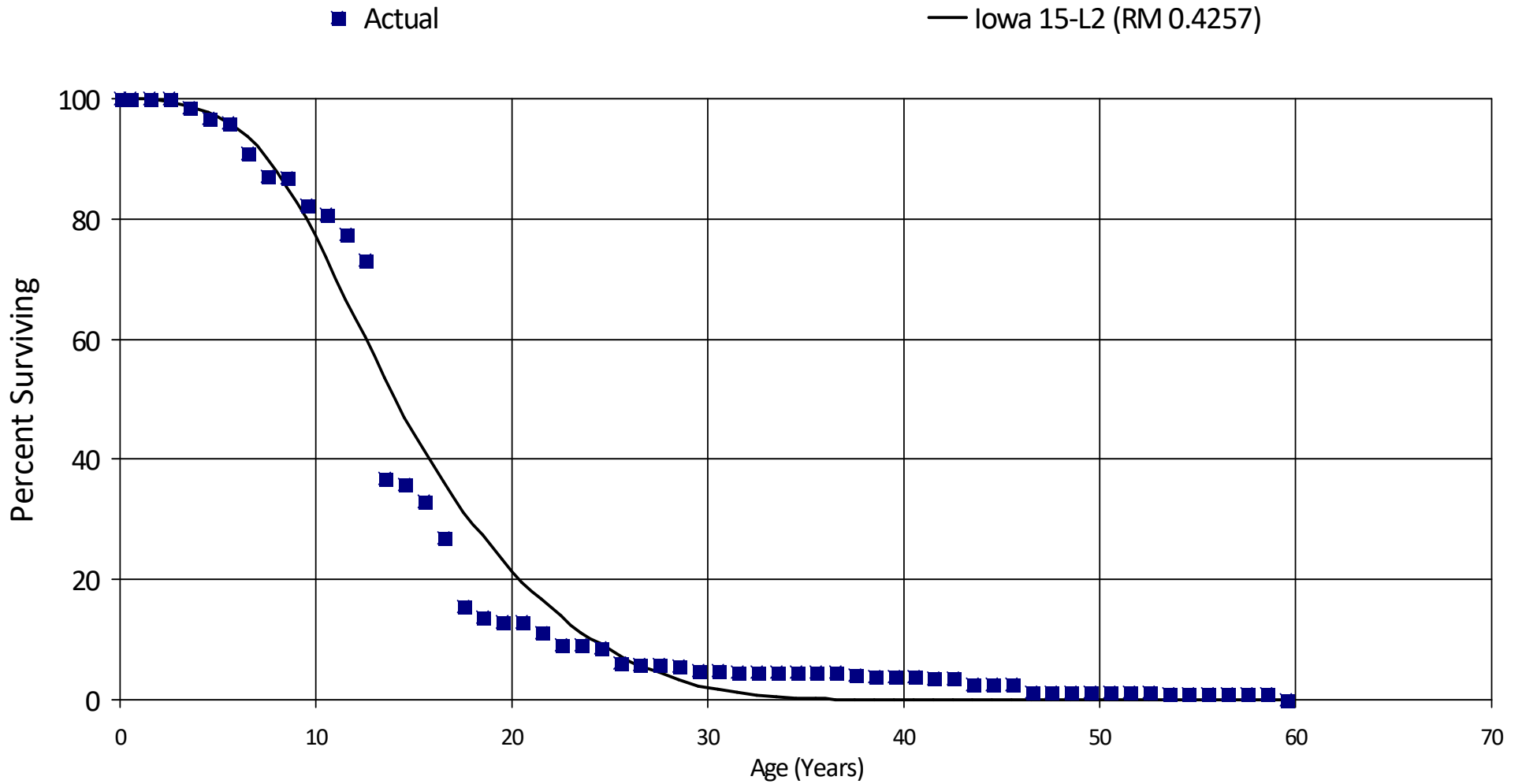
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	13,848	1,181	0.08528	0.91472	3.77
41.5	12,667	0	0.00000	1.00000	3.45
42.5	12,667	3,022	0.23856	0.76144	3.45
43.5	9,646	0	0.00000	1.00000	2.63
44.5	9,646	400	0.04147	0.95853	2.63
45.5	9,245	4,982	0.53888	0.46112	2.52
46.5	4,263	0	0.00000	1.00000	1.16
47.5	4,263	0	0.00000	1.00000	1.16
48.5	4,263	0	0.00000	1.00000	1.16
49.5	4,263	0	0.00000	1.00000	1.16
50.5	4,263	0	0.00000	1.00000	1.16
51.5	4,263	0	0.00000	1.00000	1.16
52.5	4,263	340	0.07976	0.92024	1.16
53.5	3,923	103	0.02625	0.97375	1.07
54.5	3,820	0	0.00000	1.00000	1.04
55.5	3,820	446	0.11675	0.88325	1.04
56.5	3,375	0	0.00000	1.00000	0.92
57.5	3,375	0	0.00000	1.00000	0.92
58.5	3,375	3,375	1.00013	-0.00013	0.92
59.5	0	0	0.00000	0.00000	0.00
<b>Totals:</b>	<b>5,909,373</b>	<b>367,700</b>			

# Cascade Natural Gas Corporation

## Account 390.2 - Leasehold Improvements

Placement Band - 1956 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 392.1 - Trailers

### RETIREMENT RATE ANALYSIS

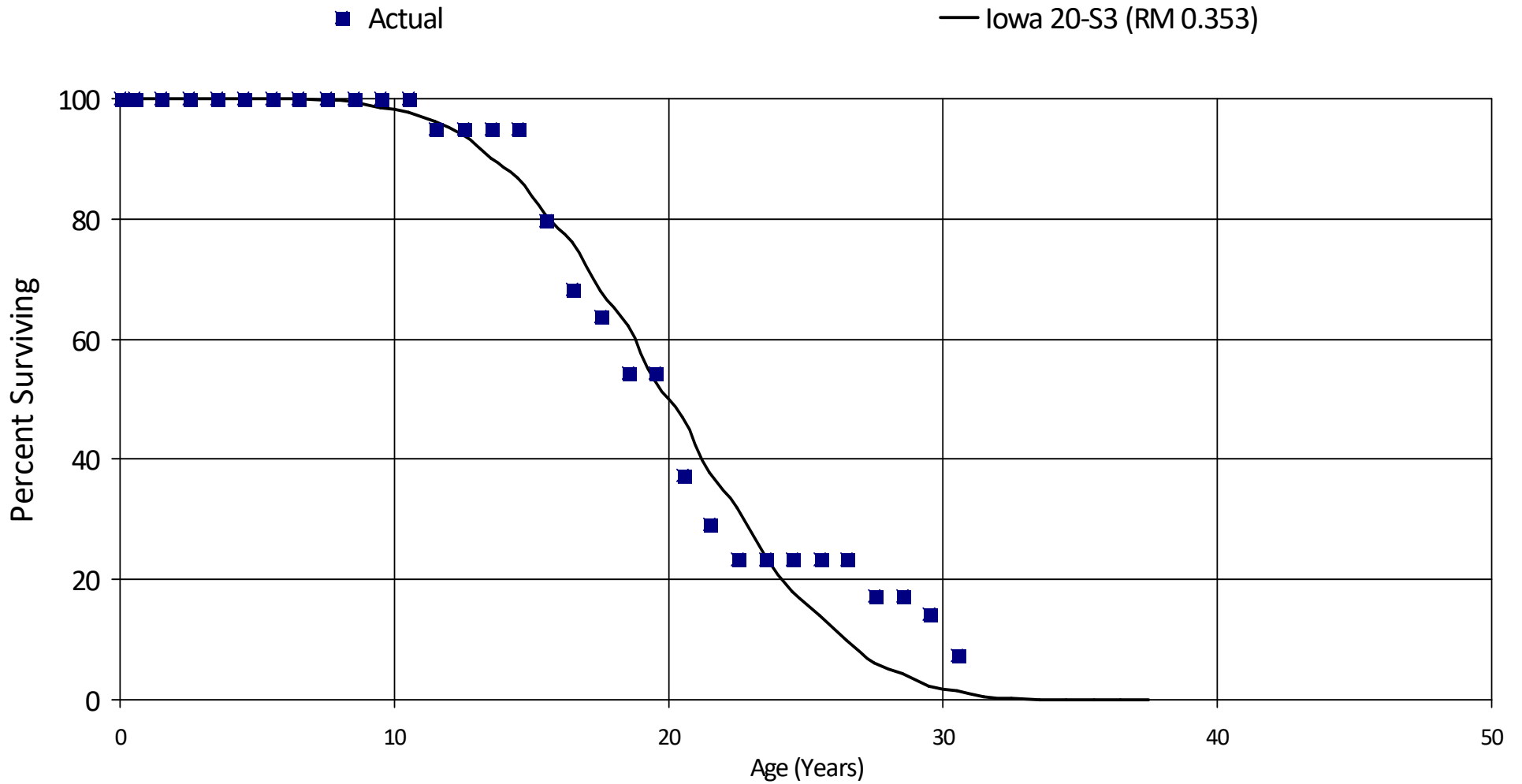
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	558,930	0	0.00000	1.00000	100.00
0.5	558,930	0	0.00000	1.00000	100.00
1.5	558,930	0	0.00000	1.00000	100.00
2.5	558,930	0	0.00000	1.00000	100.00
3.5	558,930	0	0.00000	1.00000	100.00
4.5	543,512	0	0.00000	1.00000	100.00
5.5	540,960	0	0.00000	1.00000	100.00
6.5	450,424	0	0.00000	1.00000	100.00
7.5	358,700	0	0.00000	1.00000	100.00
8.5	358,700	0	0.00000	1.00000	100.00
9.5	358,700	0	0.00000	1.00000	100.00
10.5	303,536	15,345	0.05055	0.94945	100.00
11.5	269,761	0	0.00000	1.00000	94.94
12.5	269,761	0	0.00000	1.00000	94.94
13.5	252,346	0	0.00000	1.00000	94.94
14.5	252,346	40,670	0.16117	0.83883	94.94
15.5	211,676	30,011	0.14178	0.85822	79.64
16.5	181,665	12,162	0.06695	0.93305	68.35
17.5	169,503	25,191	0.14862	0.85138	63.77
18.5	144,312	0	0.00000	1.00000	54.29
19.5	144,312	45,109	0.31258	0.68742	54.29
20.5	99,203	21,899	0.22075	0.77925	37.32
21.5	77,304	15,480	0.20025	0.79975	29.08
22.5	41,044	0	0.00000	1.00000	23.26
23.5	41,044	0	0.00000	1.00000	23.26
24.5	41,044	0	0.00000	1.00000	23.26
25.5	41,044	0	0.00000	1.00000	23.26
26.5	41,044	10,627	0.25892	0.74108	23.26
27.5	30,417	0	0.00000	1.00000	17.24
28.5	25,176	4,507	0.17902	0.82098	17.24
29.5	20,669	9,796	0.47394	0.52606	14.15
30.5	10,874	4,935	0.45384	0.54616	7.44
<b>Totals:</b>	<b>8,073,726</b>	<b>235,732</b>			

# Cascade Natural Gas Corporation

## Account 392.1 - Trailers

Placement Band - 1960 - 2018 Experience Band - 2010 - 2018

### Actual and Smooth Survivor Curves





# Cascade Natural Gas Corporation

## Account 392.2 - Transportation Equipment

### RETIREMENT RATE ANALYSIS

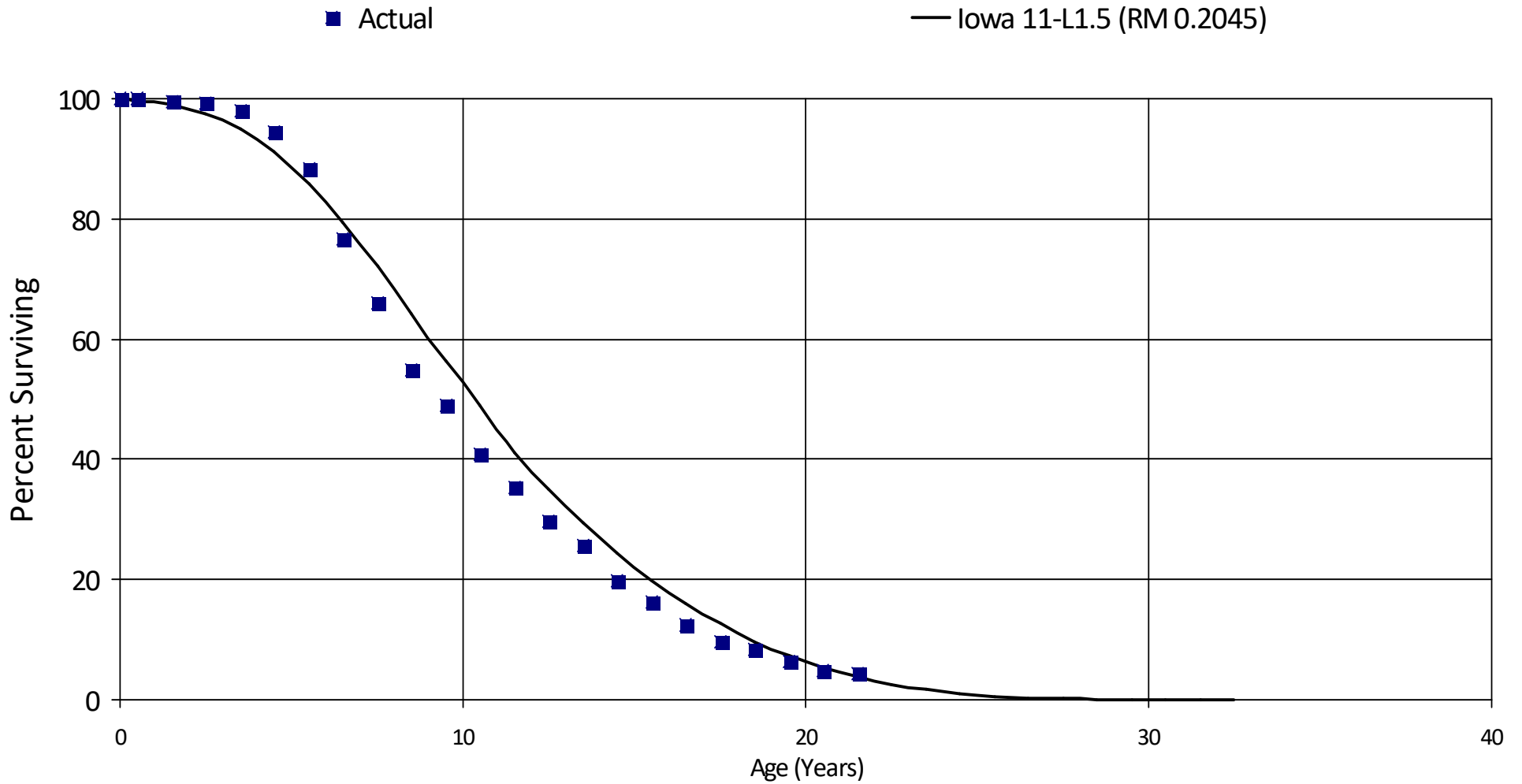
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	30,332,428	31,273	0.00103	0.99897	100.00
0.5	28,550,389	94,288	0.00330	0.99670	99.90
1.5	26,615,053	82,997	0.00312	0.99688	99.57
2.5	24,544,038	338,505	0.01379	0.98621	99.26
3.5	21,622,364	764,633	0.03536	0.96464	97.89
4.5	19,645,909	1,285,883	0.06545	0.93455	94.43
5.5	16,163,301	2,129,331	0.13174	0.86826	88.25
6.5	12,965,232	1,817,019	0.14015	0.85985	76.62
7.5	10,113,634	1,691,416	0.16724	0.83276	65.88
8.5	7,998,849	872,067	0.10902	0.89098	54.86
9.5	6,739,201	1,122,934	0.16663	0.83337	48.88
10.5	3,465,374	461,512	0.13318	0.86682	40.74
11.5	2,954,267	475,715	0.16103	0.83897	35.31
12.5	2,478,552	342,522	0.13819	0.86181	29.62
13.5	2,093,406	461,381	0.22040	0.77960	25.53
14.5	1,603,560	291,894	0.18203	0.81797	19.90
15.5	1,311,666	301,158	0.22960	0.77040	16.28
16.5	967,006	218,961	0.22643	0.77357	12.54
17.5	736,290	93,751	0.12733	0.87267	9.70
18.5	642,538	163,134	0.25389	0.74611	8.46
19.5	479,405	118,505	0.24719	0.75281	6.31
20.5	357,899	36,969	0.10329	0.89671	4.75
21.5	320,931	162,596	0.50664	0.49336	4.26
<b>Totals:</b>	<b>222,701,293</b>	<b>13,358,444</b>			

# Cascade Natural Gas Corporation

## Account 392.2 - Transportation Equipment

Placement Band - 1959 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 394.2 - Vehicle CNG Equipment

### RETIREMENT RATE ANALYSIS

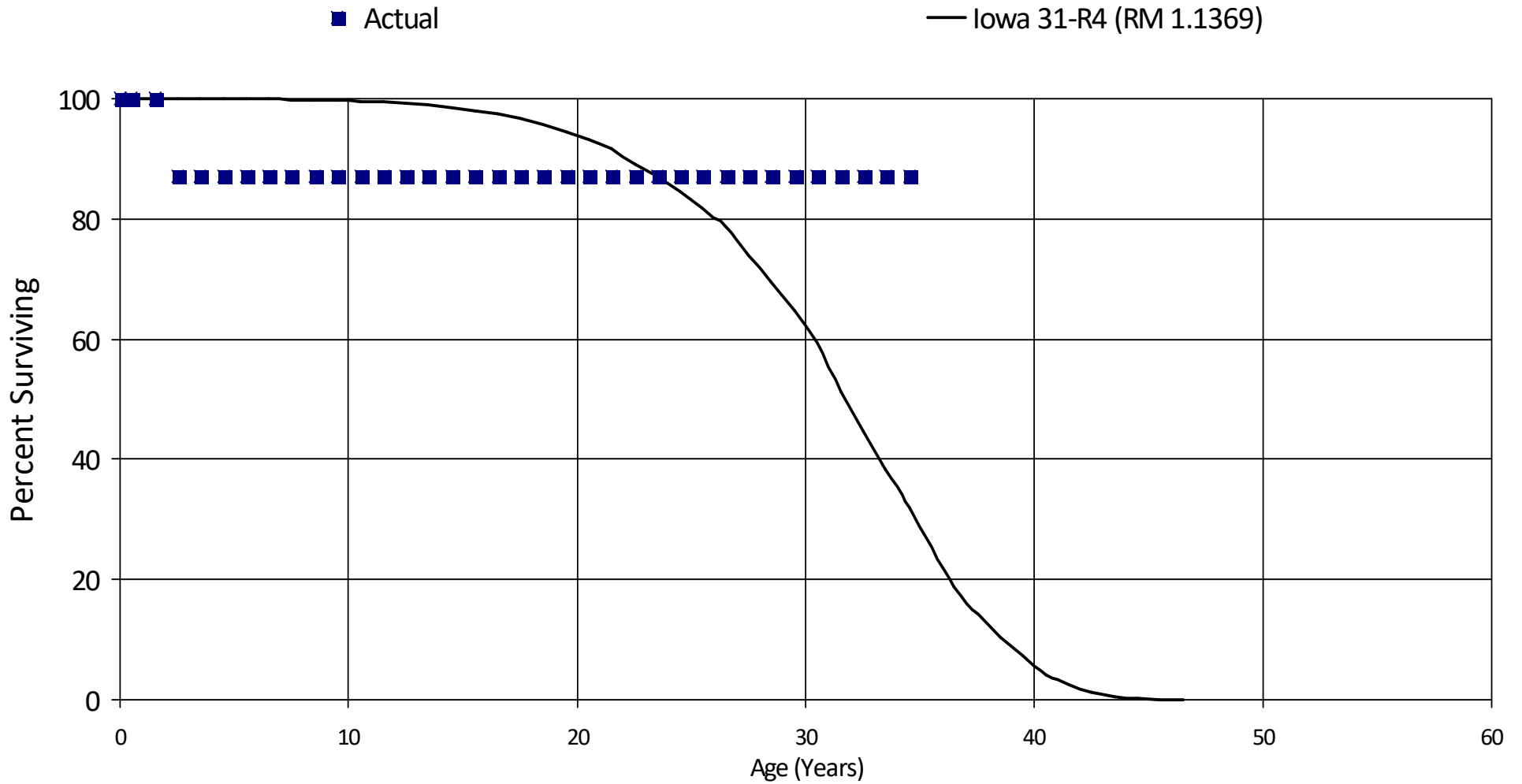
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	150,576	0	0.00000	1.00000	100.00
0.5	150,576	0	0.00000	1.00000	100.00
1.5	150,576	19,345	0.12847	0.87153	100.00
2.5	127,445	0	0.00000	1.00000	87.15
3.5	127,445	0	0.00000	1.00000	87.15
4.5	127,445	0	0.00000	1.00000	87.15
5.5	127,445	0	0.00000	1.00000	87.15
6.5	127,445	0	0.00000	1.00000	87.15
7.5	127,445	0	0.00000	1.00000	87.15
8.5	127,445	0	0.00000	1.00000	87.15
9.5	127,445	0	0.00000	1.00000	87.15
10.5	127,445	0	0.00000	1.00000	87.15
11.5	127,445	0	0.00000	1.00000	87.15
12.5	127,445	0	0.00000	1.00000	87.15
13.5	127,445	0	0.00000	1.00000	87.15
14.5	127,445	0	0.00000	1.00000	87.15
15.5	127,445	0	0.00000	1.00000	87.15
16.5	127,445	0	0.00000	1.00000	87.15
17.5	127,445	0	0.00000	1.00000	87.15
18.5	127,445	0	0.00000	1.00000	87.15
19.5	127,445	0	0.00000	1.00000	87.15
20.5	127,445	0	0.00000	1.00000	87.15
21.5	127,445	0	0.00000	1.00000	87.15
22.5	127,445	0	0.00000	1.00000	87.15
23.5	127,445	0	0.00000	1.00000	87.15
24.5	127,445	0	0.00000	1.00000	87.15
25.5	125,939	0	0.00000	1.00000	87.15
26.5	120,932	0	0.00000	1.00000	87.15
27.5	120,932	0	0.00000	1.00000	87.15
28.5	120,932	0	0.00000	1.00000	87.15
29.5	120,932	0	0.00000	1.00000	87.15
30.5	114,960	0	0.00000	1.00000	87.15
31.5	92,678	0	0.00000	1.00000	87.15
32.5	65,728	0	0.00000	1.00000	87.15
33.5	60,207	0	0.00000	1.00000	87.15
34.5	52,868	0	0.00000	1.00000	87.15
<b>Totals:</b>	<b>4,379,061</b>	<b>19,345</b>			

# Cascade Natural Gas Corporation

## Account 394.2 - Vehicle CNG Equipment

Placement Band - 1983 - 2018 Experience Band - 1987 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 396.1 - Trailers-Work Equipment

### RETIREMENT RATE ANALYSIS

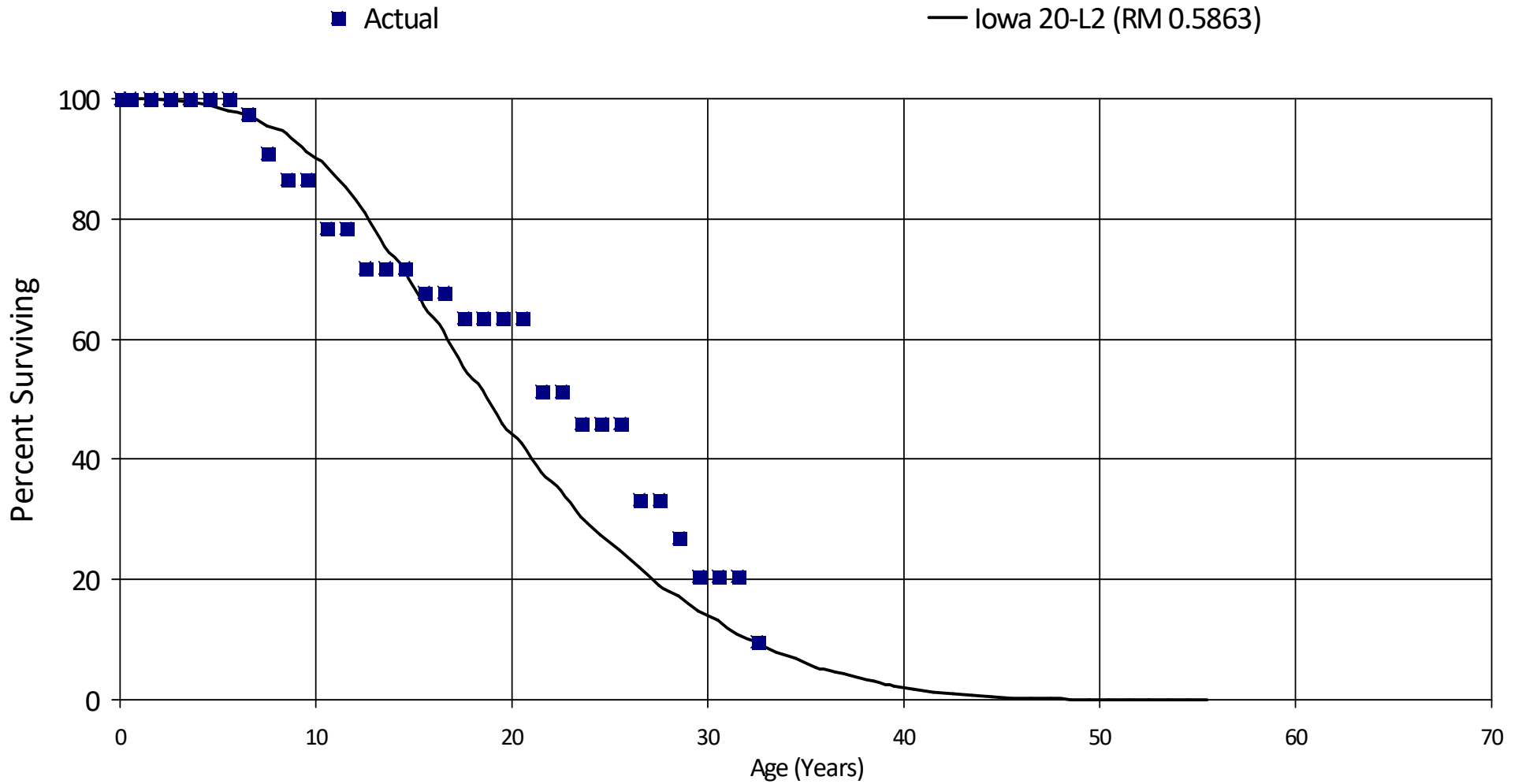
Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	1,186,651	0	0.00000	1.00000	100.00
0.5	1,131,585	0	0.00000	1.00000	100.00
1.5	1,052,974	0	0.00000	1.00000	100.00
2.5	1,006,553	0	0.00000	1.00000	100.00
3.5	811,225	0	0.00000	1.00000	100.00
4.5	550,566	0	0.00000	1.00000	100.00
5.5	505,275	12,512	0.02476	0.97524	100.00
6.5	396,958	26,799	0.06751	0.93249	97.52
7.5	341,058	16,285	0.04775	0.95225	90.94
8.5	324,773	0	0.00000	1.00000	86.60
9.5	324,773	30,424	0.09368	0.90632	86.60
10.5	275,733	0	0.00000	1.00000	78.49
11.5	275,733	23,587	0.08554	0.91446	78.49
12.5	252,146	0	0.00000	1.00000	71.78
13.5	224,024	0	0.00000	1.00000	71.78
14.5	224,024	12,127	0.05413	0.94587	71.78
15.5	199,385	0	0.00000	1.00000	67.89
16.5	199,385	13,016	0.06528	0.93472	67.89
17.5	186,369	0	0.00000	1.00000	63.46
18.5	186,369	0	0.00000	1.00000	63.46
19.5	186,369	0	0.00000	1.00000	63.46
20.5	173,245	33,520	0.19348	0.80652	63.46
21.5	125,829	0	0.00000	1.00000	51.18
22.5	114,444	11,612	0.10146	0.89854	51.18
23.5	102,833	0	0.00000	1.00000	45.99
24.5	91,643	0	0.00000	1.00000	45.99
25.5	78,147	21,707	0.27777	0.72223	45.99
26.5	42,528	0	0.00000	1.00000	33.22
27.5	42,528	7,952	0.18698	0.81302	33.22
28.5	34,576	8,186	0.23676	0.76324	27.01
29.5	26,390	0	0.00000	1.00000	20.62
30.5	26,390	0	0.00000	1.00000	20.62
31.5	18,195	9,601	0.52767	0.47233	20.62
32.5	0	0	0.00000	0.00000	9.74
<b>Totals:</b>	10,718,680	227,328			

# Cascade Natural Gas Corporation

## Account 396.1 - Trailers-Work Equipment

Placement Band - 1981 - 2018 Experience Band - 2009 - 2018

### Actual and Smooth Survivor Curves



# Cascade Natural Gas Corporation

## Account 396.2 - Power Operated Equipment

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
0	17,854,449	558,998	0.03131	0.96869	100.00
0.5	13,594,824	7,155,472	0.52634	0.47366	96.87
1.5	6,619,142	3,317,331	0.50117	0.49883	45.88
2.5	3,279,113	61,525	0.01876	0.98124	22.89
3.5	3,358,947	3,849	0.00115	0.99885	22.46
4.5	3,233,217	17,320	0.00536	0.99464	22.43
5.5	3,283,388	79,763	0.02429	0.97571	22.31
6.5	3,196,745	53,021	0.01659	0.98341	21.77
7.5	3,128,594	42,625	0.01362	0.98638	21.41
8.5	3,081,026	100,879	0.03274	0.96726	21.12
9.5	2,984,299	98,443	0.03299	0.96701	20.43
10.5	2,873,292	158,585	0.05519	0.94481	19.76
11.5	2,714,707	81,118	0.02988	0.97012	18.67
12.5	2,632,373	195,330	0.07420	0.92580	18.11
13.5	2,347,743	316,408	0.13477	0.86523	16.77
14.5	1,965,260	276,535	0.14071	0.85929	14.51
15.5	1,688,725	206,961	0.12255	0.87745	12.47
16.5	1,324,103	50,430	0.03809	0.96191	10.94
17.5	1,218,634	159,714	0.13106	0.86894	10.52
18.5	1,058,459	165,033	0.15592	0.84408	9.14
19.5	893,426	229,921	0.25735	0.74265	7.71
20.5	612,036	158,965	0.25973	0.74027	5.73
21.5	403,789	18,526	0.04588	0.95412	4.24
22.5	385,263	10,040	0.02606	0.97394	4.05
23.5	375,223	115,548	0.30795	0.69205	3.94
24.5	259,674	25,731	0.09909	0.90091	2.73
25.5	228,144	27,254	0.11946	0.88054	2.46
26.5	200,890	54,569	0.27164	0.72836	2.17
27.5	146,321	14,712	0.10055	0.89945	1.58
28.5	128,327	5,487	0.04276	0.95724	1.42
29.5	122,841	607	0.00494	0.99506	1.36
30.5	122,233	9,158	0.07492	0.92508	1.35
31.5	113,075	11,630	0.10285	0.89715	1.25
32.5	69,157	954	0.01379	0.98621	1.12
33.5	64,632	0	0.00000	1.00000	1.10
34.5	59,671	616	0.01032	0.98968	1.10
35.5	59,055	6,186	0.10475	0.89525	1.09
36.5	52,869	10,051	0.19011	0.80989	0.98
37.5	38,313	599	0.01563	0.98437	0.79
38.5	36,611	9,844	0.26888	0.73112	0.78
39.5	23,363	0	0.00000	1.00000	0.57

# Cascade Natural Gas Corporation

## Account 396.2 - Power Operated Equipment

### RETIREMENT RATE ANALYSIS

Age at Begin of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retmt Ratio	Survivor Ratio	% Surviving
40.5	16,208	3,575	0.22056	0.77944	0.57
41.5	12,633	11,020	0.87229	0.12771	0.44
42.5	1,613	62	0.03843	0.96157	0.06
43.5	1,552	0	0.00000	1.00000	0.06
44.5	0	0	0.00000	0.00000	0.06
<b>Totals:</b>	<b>85,863,960</b>	<b>13,824,395</b>			

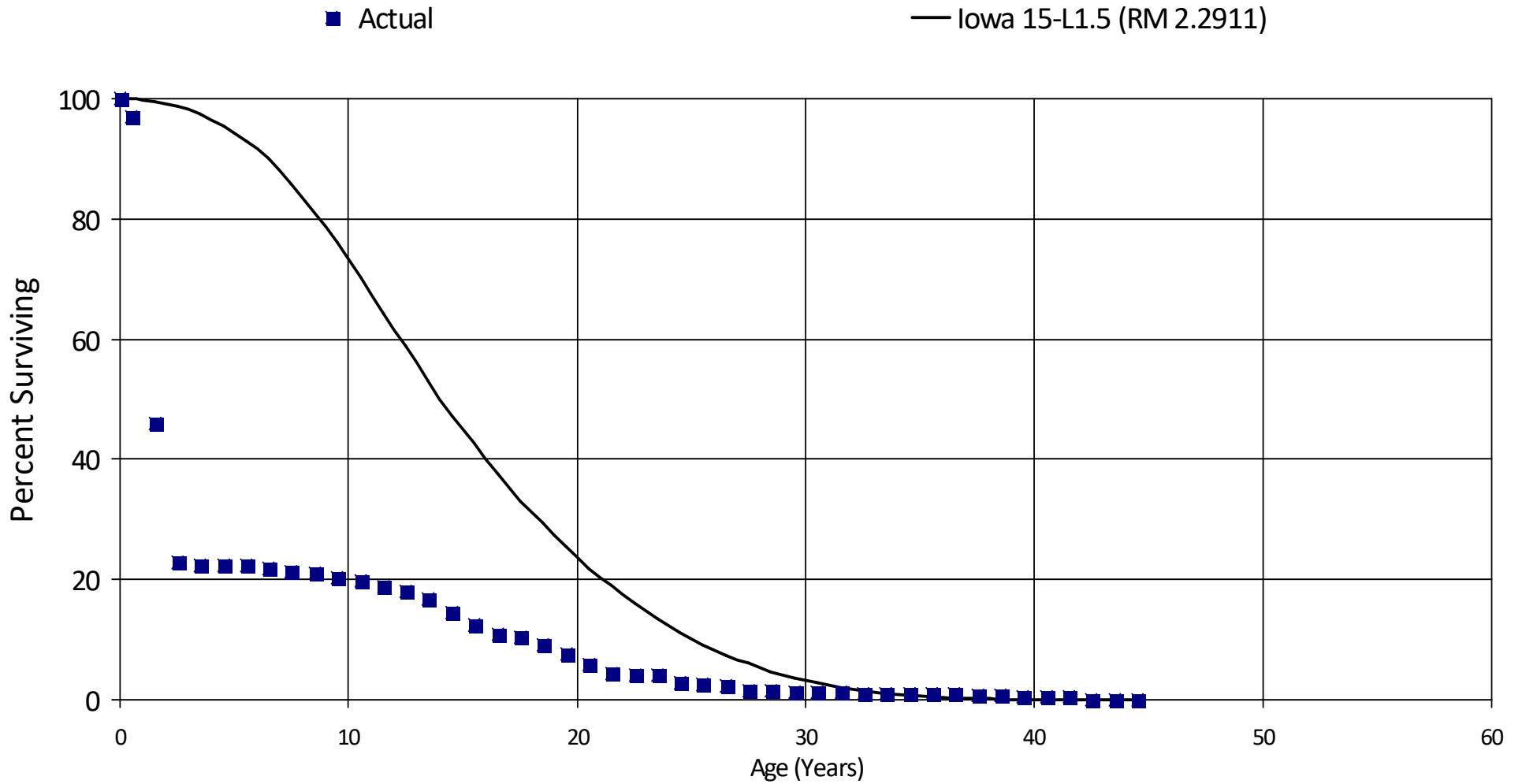


# Cascade Natural Gas Corporation

## Account 396.2 - Power Operated Equipment

Placement Band - 1953 - 2018 Experience Band - 1974 - 2018

### Actual and Smooth Survivor Curves





SECTION 7

## **7 NET SALVAGE CALCULATIONS**

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Cascade Natural Gas  
367.1 - MAINS  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	4,494	-1,021	-23	0	0	-1,021	-23	-340	-23	-204	-23	-1,021	-23
1984	0	0		0		0		-340	-23	-204	-23	-1,021	
1985	0	0		0		0		-340	-23	-204	-23	-1,021	
1986	0	0		0		0		0	0	-204	-23	-1,021	
1987	0	0		0		0		0	0	-204	-23	-1,021	
1988	14,003	-2,734	-20	0	0	-2,734	-20	-911	-20	-547	-20	-1,877	-20
1989	0	0		0		0		-911	-20	-547	-20	-1,877	
1990	0	0		0		0		-911	-20	-547	-20	-1,877	
1991	0	0		0		0		0	0	-547	-20	-1,877	
1992	0	0		0		0		0	0	-547	-20	-1,877	
1993	0	0		0		0		0	0	0	0	-1,877	
1994	0	0		0		0		0	0	0	0	-1,877	
1995	0	0		0		0		0	0	0	0	-1,877	
1996	0	0		0		0		0	0	0	0	-1,877	
1997	0	0		0		0		0	0	0	0	-1,877	
1998	0	0		0		0		0	0	0	0	-1,877	
1999	0	0		0		0		0	0	0	0	-1,877	
2000	0	0		0		0		0	0	0	0	-1,877	
2001	0	0		0		0		0	0	0	0	-1,877	
2002	0	0		0		0		0	0	0	0	-1,877	
2003	0	0		0		0		0	0	0	0	-1,877	
2004	0	0		0		0		0	0	0	0	-1,877	
2005	17,284	-2,380	-14	0	0	-2,380	-14	-793	-14	-476	-14	-2,045	-17
2006	0	2,380		0		2,380		0	0	0	0	-939	
2007	0	0		0		0		0	0	0	0	-939	
2008	0	0		0		0		793	0	0	0	-939	
2009	0	0		0		0		0	0	0	0	-939	
2010	0	0		0		0		0	0	476	0	-939	
2011	79,596	-777	-1	0	0	-777	-1	-259	-1	-155	-1	-906	-4
2012	29,893	-118,444	-396	0	0	-118,444	-396	-39,740	-109	-23,844	-109	-20,496	-85
2013	0	0		0		0		-39,740	-109	-23,844	-109	-20,496	
2014	0	0		0		0		-39,481	-396	-23,844	-109	-20,496	
2015	56,184	-72,687	-129	0	0	-72,687	-129	-24,229	-129	-38,382	-116	-27,952	-97
2016	0	0		0		0		-24,229	-129	-38,226	-222	-27,952	
2017	0	-5,231		0		-5,231		-25,973	-139	-15,584	-139	-25,112	
2018	72,916	-105,058	-144	0	0	-105,058	-144	-36,763	-151	-36,595	-142	-33,995	-112
<b>TOTAL</b>	<b>274,370</b>	<b>-305,952</b>	<b>-112</b>	<b>0</b>	<b>0</b>	<b>-305,952</b>	<b>-112</b>						

Previously Approved: -20%  
Recommended: -20%

**Cascade Natural Gas**  
**369.1 - MEAS. & RE. STATION EQUIP.**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	2,992	-13	0	0	0	-13	0	-4	0	-3	0	-13	0
1984	0	0		0		0		-4	0	-3	0	-13	
1985	0	0		0		0		-4	0	-3	0	-13	
1986	0	0		0		0		0	0	-3	0	-13	
1987	0	0		0		0		0	0	-3	0	-13	
1988	0	0		0		0		0	0	0	0	-13	
1989	0	0		0		0		0	0	0	0	-13	
1990	0	0		0		0		0	0	0	0	-13	
1991	0	0		0		0		0	0	0	0	-13	
1992	0	0		0		0		0	0	0	0	-13	
1993	0	0		0		0		0	0	0	0	-13	
1994	0	0		0		0		0	0	0	0	-13	
1995	0	0		0		0		0	0	0	0	-13	
1996	0	0		0		0		0	0	0	0	-13	
1997	0	0		0		0		0	0	0	0	-13	
1998	0	0		0		0		0	0	0	0	-13	
1999	0	0		0		0		0	0	0	0	-13	
2000	0	0		0		0		0	0	0	0	-13	
2001	0	0		0		0		0	0	0	0	-13	
2002	0	0		0		0		0	0	0	0	-13	
2003	0	0		0		0		0	0	0	0	-13	
2004	0	0		0		0		0	0	0	0	-13	
2005	0	0		0		0		0	0	0	0	-13	
2006	0	0		0		0		0	0	0	0	-13	
2007	0	0		0		0		0	0	0	0	-13	
2008	0	0		0		0		0	0	0	0	-13	
2009	0	0		0		0		0	0	0	0	-13	
2010	0	0		0		0		0	0	0	0	-13	
2011	2,928	-27,296	-932	0	0	-27,296	-932	-9,099	-932	-5,459	-932	-13,654	-461
2012	0	0		0		0		-9,099	-932	-5,459	-932	-13,654	
2013	6,984	-2,357	-34	0	0	-2,357	-34	-9,884	-299	-5,930	-299	-9,889	-230
2014	5,814	-34,240	-589	0	0	-34,240	-589	-12,199	-286	-12,778	-406	-15,976	-341
2015	0	-17,495		0		-17,495		-18,030	-423	-16,277	-518	-16,280	
2016	0	0		0		0		-17,245	-890	-10,818	-423	-16,280	
2017	0	0		0		0		-5,832	0	-10,818	-423	-16,280	
2018	11,478	0	0	0	0	0	0	0	0	-10,347	-299	-16,280	-270
<b>TOTAL</b>	<b>30,196</b>	<b>-81,400</b>	<b>-270</b>	<b>0</b>		<b>-81,400</b>	<b>-270</b>						

Previously Approved -10%  
Recommended: -10%

**Cascade Natural Gas**  
**375.1 - STRUCTURES & IMPROVEMENTS**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		65		65		22	0	13	0	65	
1979	0	0		0		0		22	0	13	0	65	
1980	0	0		0		0		22	0	13	0	65	
1981	37,415	0	0	0	0	0	0	0	0	13	0	65	0
1982	0	0		0		0		0	0	13	0	65	
1983	0	0		0		0		0	0	0	0	65	
1984	0	0		0		0		0	0	0	0	65	
1985	33,979	-2,690	-8	23,305	69	20,615	61	6,872	61	4,123	29	10,340	29
1986	0	0		0		0		6,872	61	4,123	61	10,340	
1987	421	0	0	0	0	0	0	6,872	60	4,123	60	10,340	29
1988	0	0		0		0		0	0	4,123	60	10,340	
1989	0	0		0		0		0	0	4,123	60	10,340	
1990	0	0		0		0		0	0	0	0	10,340	
1991	0	0		0		0		0	0	0	0	10,340	
1992	1,000	-2,933	-293	0	0	-2,933	-293	-978	-293	-587	-293	5,916	24
1993	0	0		0		0		-978	-293	-587	-293	5,916	
1994	0	0		0		0		-978	-293	-587	-293	5,916	
1995	0	0		0		0		0	0	-587	-293	5,916	
1996	0	0		0		0		0	0	-587	-293	5,916	
1997	32,999	0	0	24,227	73	24,227	73	8,076	73	4,845	73	10,494	40
1998	0	0		0		0		8,076	73	4,845	73	10,494	
1999	0	0		0		0		8,076	73	4,845	73	10,494	
2000	0	0		0		0		0	0	4,845	73	10,494	
2001	0	0		6,060		6,060		2,020	0	6,057	92	9,607	
2002	0	0		6,060		6,060		4,040	0	2,424	0	9,016	
2003	0	0		0		0		4,040	0	2,424	0	7,728	
2004	0	0		0		0		2,020	0	2,424	0	6,762	
2005	0	0		0		0		0	0	2,424	0	6,762	
2006	0	0		0		0		0	0	1,212	0	6,762	
2007	0	0		0		0		0	0	0	0	6,010	
2008	0	0		0		0		0	0	0	0	6,010	
2009	0	0		0		0		0	0	0	0	6,010	
2010	0	0		0		0		0	0	0	0	6,010	
2011	0	0		0		0		0	0	0	0	6,010	
2012	0	0		0		0		0	0	0	0	6,010	
2013	0	0		0		0		0	0	0	0	6,010	
2014	0	0		0		0		0	0	0	0	6,010	
2015	0	0		0		0		0	0	0	0	6,010	
2016	0	0		0		0		0	0	0	0	6,010	
2017	4,283	-400	-9	0	0	-400	-9	-133	-9	-80	-9	5,369	49
2018	0	0		0		0		-133	-9	-80	-9	5,369	
<b>TOTAL</b>	<b>110,097</b>	<b>-6,023</b>	<b>-5</b>	<b>59,717</b>		<b>53,694</b>	<b>49</b>						

Previously Approved -5%  
Recommended: -5%

Cascade Natural Gas  
376.1 - MAINS - STEEL  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	14,427	-5,133	-36	1,983	14	-3,150	-22	-1,050	-22	-630	-22	-3,150	-22
1979	81,536	-10,986	-13	0	0	-10,986	-13	-4,712	-15	-2,827	-15	-7,068	-15
1980	102,319	-15,958	-16	154	0	-15,804	-15	-9,980	-15	-5,988	-15	-9,980	-15
1981	46,447	-7,677	-17	142	0	-7,534	-16	-11,441	-15	-7,495	-15	-9,368	-15
1982	73,143	-19,542	-27	735	1	-18,807	-26	-14,048	-19	-11,256	-18	-11,256	-18
1983	83,883	-18,950	-23	1,789	2	-17,161	-20	-14,501	-21	-14,058	-18	-12,240	-18
1984	33,892	-6,168	-18	2,217	7	-3,951	-12	-13,306	-21	-12,651	-19	-11,056	-18
1985	41,976	-6,689	-16	0	0	-6,689	-16	-9,267	-17	-10,828	-19	-10,510	-18
1986	30,791	-15,498	-50	0	0	-15,498	-50	-8,712	-25	-12,421	-24	-11,064	-20
1987	56,530	-14,224	-25	29	0	-14,195	-25	-12,127	-28	-11,499	-23	-11,377	-20
1988	23,131	-8,696	-38	0	0	-8,696	-38	-12,796	-35	-9,806	-26	-11,134	-21
1989	26,158	-10,584	-40	7	0	-10,577	-40	-11,156	-32	-11,131	-31	-11,087	-22
1990	42,408	-19,531	-46	0	0	-19,531	-46	-12,935	-42	-13,699	-38	-11,737	-23
1991	19,899	-46,910	-236	218	1	-46,692	-235	-25,600	-87	-19,938	-59	-14,234	-29
1992	173,824	-41,099	-24	5,511	3	-35,588	-20	-33,937	-43	-24,217	-42	-15,657	-28
1993	81,475	-41,372	-51	40	0	-41,332	-51	-41,204	-45	-30,744	-45	-17,262	-30
1994	60,472	-39,554	-65	2,176	4	-37,378	-62	-38,099	-36	-36,104	-48	-18,445	-32
1995	45,577	-10,763	-24	848	2	-9,915	-22	-29,542	-47	-34,181	-45	-17,971	-31
1996	94,310	-65,873	-70	0	0	-65,873	-70	-37,722	-56	-38,017	-42	-20,492	-34
1997	87,207	-51,674	-59	8,202	9	-43,472	-50	-39,754	-53	-39,594	-54	-21,641	-35
1998	32,681	-34,191	-105	1,438	4	-32,754	-100	-47,366	-66	-37,878	-59	-22,171	-37
1999	31,634	-15,473	-49	5,169	16	-10,304	-33	-28,843	-57	-32,464	-56	-21,631	-37
2000	38,374	-67,601	-176	-423	-1	-68,025	-177	-37,027	-108	-44,085	-78	-23,648	-41
2001	206,933	-28,561	-14	0	0	-28,561	-14	-35,630	-39	-36,623	-46	-23,853	-37
2002	46,805	-10,911	-23	0	0	-10,911	-23	-35,832	-37	-30,111	-42	-23,335	-37
2003	5,689	-1,885	-33	0	0	-1,885	-33	-13,786	-16	-23,937	-36	-22,510	-37
2004	9,922	-6,988	-70	0	0	-6,988	-70	-6,595	-32	-23,274	-38	-21,935	-37
2005	331,738	-208,809	-63	0	0	-208,809	-63	-72,561	-63	-51,431	-43	-28,609	-42
2006	68,978	-92,233	-134	0	0	-92,233	-134	-102,677	-75	-64,165	-69	-30,803	-45
2007	39,086	-53,462	-137	0	0	-53,462	-137	-118,168	-81	-72,675	-80	-31,559	-47
2008	64,679	-59,396	-92	0	0	-59,396	-92	-68,363	-119	-84,178	-82	-32,457	-48
2009	84,345	-44,502	-53	0	0	-44,502	-53	-52,453	-84	-91,680	-78	-32,833	-48
2010	42,011	-75,464	-180	0	0	-75,464	-180	-59,788	-94	-65,011	-109	-34,125	-51
2011	115,023	-108,194	-94	0	0	-108,194	-94	-76,054	-95	-68,204	-99	-36,303	-53
2012	121,595	-206,769	-170	0	0	-206,769	-170	-130,143	-140	-98,865	-116	-41,174	-59
2013	204,986	-322,026	-157	0	0	-322,026	-157	-212,330	-144	-151,391	-133	-48,975	-66
2014	353,989	-333,704	-94	0	0	-333,704	-94	-287,500	-127	-209,232	-125	-56,671	-69
2015	170,273	-249,523	-147	0	0	-249,523	-147	-301,751	-124	-244,043	-126	-61,746	-74
2016	384,153	-476,967	-124	0	0	-476,967	-124	-353,398	-117	-317,798	-129	-72,392	-79
2017	83,110	-412,511	-496	0	0	-412,511	-496	-379,667	-179	-358,946	-150	-80,895	-89
2018	819,496	-1,099,397	-134	0	0	-1,099,397	-134	-662,958	-155	-514,420	-142	-105,737	-97
<b>TOTAL</b>	<b>4,474,903</b>	<b>-4,365,449</b>	<b>-98</b>	<b>30,235</b>		<b>-4,335,214</b>	<b>-97</b>						

Previously Approved: -100%  
Recommended: -110%

Cascade Natural Gas  
376.2 - MAINS - HIGH PRESSURE  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	76,629	-22,225	-29	12,160	16	-10,065	-13	-3,355	-13	-2,013	-13	-10,065	-13
1979	2,123	-260	-12	0	0	-260	-12	-3,442	-13	-2,065	-13	-5,162	-13
1980	0	0		0		0		-3,442	-13	-2,065	-13	-5,162	
1981	4,265	0	0	0	0	0	0	-87	-4	-2,065	-12	-5,162	-12
1982	16,869	-351	-2	0	0	-351	-2	-117	-2	-2,135	-11	-3,558	-11
1983	0	0		0		0		-117	-2	-122	-3	-3,558	
1984	0	0		0		0		-117	-2	-70	-2	-3,558	
1985	0	0		0		0		0	0	-70	-2	-3,558	
1986	68,916	-4,091	-6	9,819	14	5,728	8	1,909	8	1,075	6	-1,237	-3
1987	0	0		0		0		1,909	8	1,146	8	-1,237	
1988	1,129	-185	-16	0	0	-185	-16	1,848	8	1,109	8	-1,026	-3
1989	528	-44	-8	0	0	-44	-8	-76	-14	1,100	8	-863	-3
1990	0	0		0		0		-76	-14	1,100	8	-863	
1991	67,644	-5,838	-9	0	0	-5,838	-9	-1,961	-9	-1,213	-9	-1,574	-5
1992	675	-390	-58	0	0	-390	-58	-2,076	-9	-1,291	-9	-1,426	-5
1993	3,899	-1,705	-44	0	0	-1,705	-44	-2,644	-11	-1,595	-11	-1,457	-5
1994	178,869	-4,834	-3	0	0	-4,834	-3	-2,309	-4	-2,553	-5	-1,794	-4
1995	61,691	-8,748	-14	0	0	-8,748	-14	-5,095	-6	-4,303	-7	-2,426	-6
1996	59,899	-12,210	-20	373	1	-11,837	-20	-8,473	-8	-5,503	-9	-3,211	-7
1997	125,622	-1,804	-1	0	0	-1,804	-1	-7,463	-9	-5,785	-7	-3,102	-6
1998	26,514	-32,851	-124	840	3	-32,011	-121	-15,217	-22	-11,847	-13	-5,167	-10
1999	39,163	-5,908	-15	0	0	-5,908	-15	-13,241	-21	-12,061	-19	-5,217	-11
2000	10,341	-2,332	-23	131	1	-2,202	-21	-13,373	-53	-10,752	-21	-5,028	-11
2001	101,804	0	0	0	0	0	0	-2,703	-5	-8,385	-14	-5,028	-10
2002	20,645	-14,972	-73	0	0	-14,972	-73	-5,724	-13	-11,018	-28	-5,613	-11
2003	0	0		0		0		-4,991	-12	-4,616	-13	-5,613	
2004	0	0		0		0		-4,991	-73	-3,435	-13	-5,613	
2005	74,391	-13,239	-18	0	0	-13,239	-18	-4,413	-18	-5,642	-14	-6,037	-12
2006	100,542	-18,958	-19	0	0	-18,958	-19	-10,732	-18	-9,434	-24	-6,717	-12
2007	31,761	-4,708	-15	0	0	-4,708	-15	-12,302	-18	-7,381	-18	-6,616	-12
2008	330,276	-35,522	-11	0	0	-35,522	-11	-19,729	-13	-14,485	-13	-7,993	-12
2009	78,908	-2,479	-3	0	0	-2,479	-3	-14,236	-10	-14,981	-12	-7,742	-11
2010	92,892	-23,558	-25	0	0	-23,558	-25	-20,519	-12	-17,045	-13	-8,430	-12
2011	118,019	-28,091	-24	0	0	-28,091	-24	-18,042	-19	-18,871	-14	-9,249	-13
2012	204,693	-45,424	-22	0	0	-45,424	-22	-32,358	-23	-27,015	-16	-10,696	-14
2013	259,151	-61,566	-24	0	0	-61,566	-24	-45,027	-23	-32,223	-21	-12,653	-15
2014	16,423	-93,305	-568	0	0	-93,305	-568	-66,765	-42	-50,389	-36	-15,640	-19
2015	545,441	-149,271	-27	0	0	-149,271	-27	-101,380	-37	-75,531	-33	-20,412	-21
2016	92,309	-129,074	-140	0	0	-129,074	-140	-123,883	-57	-95,728	-43	-24,159	-25
2017	18,446	-74,903	-406	0	0	-74,903	-406	-117,749	-54	-101,624	-55	-25,851	-27
2018	892,670	-276,164	-31	0	0	-276,164	-31	-160,047	-48	-144,543	-46	-33,925	-28
<b>TOTAL</b>	<b>3,723,147</b>	<b>-1,075,005</b>	<b>-29</b>	<b>23,323</b>		<b>-1,051,683</b>	<b>-28</b>						

Previously Approved -23%  
Recommended: -25%

Cascade Natural Gas  
376.3 - MAINS - PLASTIC (POLYETHYLENE)  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	0	0		0		0		0	0	0	0		
1986	106	0	0	0	0	0	0	0	0	0	0		0
1987	0	0		0		0		0	0	0	0		
1988	154	0	0	0	0	0	0	0	0	0	0		0
1989	0	0		0		0		0	0	0	0		
1990	0	0		0		0		0	0	0	0		
1991	899	0	0	0	0	0	0	0	0	0	0		0
1992	0	0		0		0		0	0	0	0		
1993	7,337	0	0	0	0	0	0	0	0	0	0		0
1994	807	-589	-73	0	0	-589	-73	-196	-7	-118	-7	-589	-6
1995	18,560	-57	0	0	0	-57	0	-216	-2	-129	-2	-323	-2
1996	9,476	-2,858	-30	0	0	-2,858	-30	-1,168	-12	-701	-10	-1,168	-9
1997	1,067	0	0	0	0	0	0	-972	-10	-701	-9	-1,168	-9
1998	14,411	-889	-6	1,563	11	675	5	-728	-9	-566	-6	-707	-5
1999	34,658	-4,090	-12	1,129	3	-2,962	-9	-762	-5	-1,040	-7	-1,158	-7
2000	12,636	-902	-7	287	2	-615	-5	-967	-5	-1,152	-8	-1,068	-6
2001	53,469	0	0	0	0	0	0	-1,192	-4	-580	-2	-1,068	-4
2002	29,597	-28,916	-98	0	0	-28,916	-98	-9,844	-31	-6,364	-22	-5,046	-19
2003	10,131	-1,942	-19	0	0	-1,942	-19	-10,286	-33	-6,887	-25	-4,658	-19
2004	13,612	-825	-6	0	0	-825	-6	-10,561	-59	-6,460	-27	-4,232	-18
2005	103,760	-23,323	-22	0	0	-23,323	-22	-8,697	-20	-11,001	-26	-6,141	-20
2006	58,236	-14,782	-25	0	0	-14,782	-25	-12,976	-22	-13,957	-32	-6,927	-21
2007	76,107	-17,169	-23	0	0	-17,169	-23	-18,425	-23	-11,608	-22	-7,780	-21
2008	70,356	-57,465	-82	0	0	-57,465	-82	-29,805	-44	-22,713	-35	-11,602	-29
2009	15,120	-1,909	-13	0	0	-1,909	-13	-25,514	-47	-22,930	-35	-10,910	-29
2010	94,017	-19,403	-21	0	0	-19,403	-21	-26,259	-44	-22,145	-35	-11,476	-28
2011	85,486	-1,083	-1	0	0	-1,083	-1	-7,465	-12	-19,406	-28	-10,826	-24
2012	99,213	-21,980	-22	0	0	-21,980	-22	-14,155	-15	-20,368	-28	-11,482	-24
2013	24,179	-21,978	-91	0	0	-21,978	-91	-15,014	-22	-13,270	-21	-12,066	-26
2014	59,851	-34,574	-58	0	0	-34,574	-58	-26,177	-43	-19,804	-27	-13,250	-28
2015	40,167	-24,731	-62	0	0	-24,731	-62	-27,094	-65	-20,869	-34	-13,824	-30
2016	43,809	-21,672	-49	0	0	-21,672	-49	-26,992	-56	-24,987	-47	-14,198	-31
2017	33,427	-25,014	-75	0	0	-25,014	-75	-23,806	-61	-25,594	-64	-14,690	-32
2018	68,476	-39,258	-57	0	0	-39,258	-57	-28,648	-59	-29,050	-59	-15,758	-34
<b>TOTAL</b>	<b>1,079,126</b>	<b>-365,409</b>	<b>-34</b>	<b>2,979</b>		<b>-362,430</b>	<b>-34</b>						

Previously Approved: -30%  
Recommended: -35%



Cascade Natural Gas  
 377.0 - COMPRESSOR STATION EQUIP.  
 SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	0	0		0		0		0	0	0	0		
1986	0	0		0		0		0	0	0	0		
1987	0	0		0		0		0	0	0	0		
1988	0	0		0		0		0	0	0	0		
1989	0	0		0		0		0	0	0	0		
1990	0	0		0		0		0	0	0	0		
1991	0	0		0		0		0	0	0	0		
1992	0	0		0		0		0	0	0	0		
1993	0	0		0		0		0	0	0	0		
1994	0	0		0		0		0	0	0	0		
1995	0	0		0		0		0	0	0	0		
1996	0	0		0		0		0	0	0	0		
1997	0	0		0		0		0	0	0	0		
1998	0	0		0		0		0	0	0	0		
1999	0	0		0		0		0	0	0	0		
2000	0	0		0		0		0	0	0	0		
2001	0	0		0		0		0	0	0	0		
2002	0	0		0		0		0	0	0	0		
2003	0	0		0		0		0	0	0	0		
2004	0	0		0		0		0	0	0	0		
2005	0	0		0		0		0	0	0	0		
2006	0	0		0		0		0	0	0	0		
2007	0	0		0		0		0	0	0	0		
2008	0	0		0		0		0	0	0	0		
2009	0	0		0		0		0	0	0	0		
2010	0	0		0		0		0	0	0	0		
2011	0	0		0		0		0	0	0	0		
2012	0	0		0		0		0	0	0	0		
2013	0	0		0		0		0	0	0	0		
2014	0	0		0		0		0	0	0	0		
2015	0	0		0		0		0	0	0	0		
2016	0	0		0		0		0	0	0	0		
2017	0	0		0		0		0	0	0	0		
2018	0	0		0		0		0	0	0	0		
<b>TOTAL</b>	<b>0</b>	<b>0</b>		<b>0</b>		<b>0</b>							

Previously Approved -5%  
 Recommended: -5%

**Cascade Natural Gas**  
**378.0 - MEAS. & REG. STATION EQUIP. GENERAL**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	2,239	-5,892	-263	34	2	-5,858	-262	-1,953	-262	-1,172	-262	-5,858	-262
1979	6,446	-477	-7	0	0	-477	-7	-2,112	-73	-1,267	-73	-3,168	-73
1980	5,897	-1,039	-18	0	0	-1,039	-18	-2,458	-51	-1,475	-51	-2,458	-51
1981	482	-478	-99	0	0	-478	-99	-665	-16	-1,570	-52	-1,963	-52
1982	15,333	-921	-6	1,159	8	238	2	-426	-6	-1,523	-25	-1,523	-25
1983	1,600	-374	-23	0	0	-374	-23	-205	-4	-426	-7	-1,331	-25
1984	5,222	-216	-4	0	0	-216	-4	-117	-2	-374	-7	-1,172	-22
1985	9,333	-3,033	-32	0	0	-3,033	-32	-1,208	-22	-773	-12	-1,405	-24
1986	19,091	-2,371	-12	0	0	-2,371	-12	-1,873	-17	-1,151	-11	-1,512	-21
1987	9,007	-2,099	-23	0	0	-2,099	-23	-2,501	-20	-1,619	-18	-1,571	-21
1988	24,315	-98	0	0	0	-98	0	-1,523	-9	-1,563	-12	-1,437	-16
1989	7,092	-1,049	-15	0	0	-1,049	-15	-1,082	-8	-1,730	-13	-1,405	-16
1990	3,526	-298	-8	0	0	-298	-8	-482	-4	-1,183	-9	-1,319	-16
1991	1,398	-416	-30	0	0	-416	-30	-588	-15	-792	-9	-1,255	-16
1992	16,416	-1,808	-11	0	0	-1,808	-11	-841	-12	-734	-7	-1,292	-15
1993	0	0	0	0	0	0	0	-741	-12	-714	-13	-1,292	-15
1994	576	-7,821	-1,358	1	0	-7,820	-1,358	-3,209	-57	-2,068	-47	-1,700	-21
1995	36,635	-1,609	-4	0	0	-1,609	-4	-3,143	-25	-2,331	-21	-1,694	-17
1996	14,319	-4,497	-31	0	0	-4,497	-31	-4,642	-27	-3,147	-23	-1,850	-19
1997	10,113	-1,067	-11	0	0	-1,067	-11	-2,391	-12	-2,999	-24	-1,809	-18
1998	0	-2,478	0	0	0	-2,478	0	-2,681	-33	-3,494	-28	-1,842	-18
1999	51,803	-5,262	-10	0	0	-5,262	-10	-2,936	-14	-2,983	-13	-2,005	-17
2000	21,992	-32,226	-147	-7,680	-35	-39,906	-181	-15,882	-65	-10,642	-54	-3,728	-31
2001	68,233	-3,968	-6	0	0	-3,968	-6	-16,378	-35	-10,536	-35	-3,738	-26
2002	0	-3,968	0	0	0	-3,968	0	-15,947	-53	-11,116	-39	-3,748	-26
2003	0	0	0	0	0	0	0	-2,645	-12	-10,621	-37	-3,748	-26
2004	0	0	0	0	0	0	0	-1,323	0	-9,568	-53	-3,748	-26
2005	107,960	-58,028	-54	156,619	145	98,591	91	32,864	91	18,131	51	346	2
2006	5,149	-3,261	-63	1	0	-3,260	-63	31,777	84	18,273	81	207	1
2007	6,555	1,514	23	0	0	1,514	23	32,282	81	19,369	81	255	2
2008	16,841	-5,981	-36	0	0	-5,981	-36	-2,576	-27	18,173	67	33	0
2009	445	-5,052	-1,136	0	0	-5,052	-1,136	-3,173	-40	17,162	63	-143	-1
2010	28,198	-12,269	-44	0	0	-12,269	-44	-7,767	-51	-5,010	-44	-547	-3
2011	172,750	-27,936	-16	0	0	-27,936	-16	-15,085	-22	-9,945	-22	-1,430	-7
2012	101,231	-52,148	-52	0	0	-52,148	-52	-30,784	-31	-20,677	-32	-3,015	-13
2013	48,241	-159,322	-330	0	0	-159,322	-330	-79,802	-74	-51,345	-73	-7,752	-31
2014	12,323	-48,439	-393	0	0	-48,439	-393	-86,636	-161	-60,023	-83	-8,949	-37
2015	57,580	-14,163	-25	0	0	-14,163	-25	-73,975	-188	-60,402	-77	-9,098	-36
2016	127,924	-74,659	-58	22,283	17	-52,376	-41	-38,326	-58	-65,290	-94	-10,300	-36
2017	123,311	-49,134	-40	0	0	-49,134	-40	-38,558	-37	-64,687	-88	-11,349	-37
2018	119,157	-310,081	-260	0	0	-310,081	-260	-137,197	-111	-94,839	-108	-19,211	-58
<b>TOTAL</b>	<b>1,258,731</b>	<b>-902,425</b>	<b>-72</b>	<b>172,417</b>		<b>-730,008</b>	<b>-58</b>						

Previously Approved: -40%  
Recommended: **-40%**

**Cascade Natural Gas**  
**380.1 - SERVICES - STEEL**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	78,833	-41,449	-53	8,706	11	-32,743	-42	-10,914	-42	-6,549	-42	-32,743	-42
1979	98,427	-39,821	-40	0	0	-39,821	-40	-24,188	-41	-14,513	-41	-36,282	-41
1980	76,821	-48,264	-63	429	1	-47,835	-62	-40,133	-47	-24,080	-47	-40,133	-47
1981	57,141	-44,956	-79	252	0	-44,705	-78	-44,120	-57	-33,021	-53	-41,276	-53
1982	60,768	-42,630	-70	249	0	-42,381	-70	-44,973	-69	-41,497	-56	-41,497	-56
1983	57,332	-47,720	-83	2,566	4	-45,154	-79	-44,080	-75	-43,979	-63	-42,106	-59
1984	55,711	-47,084	-85	0	0	-47,084	-85	-44,873	-77	-45,432	-74	-42,817	-62
1985	60,223	-47,203	-78	0	0	-47,203	-78	-46,480	-80	-45,305	-78	-43,366	-64
1986	58,693	-44,851	-76	148	0	-44,703	-76	-46,330	-80	-45,305	-77	-43,514	-65
1987	71,296	-53,666	-75	0	0	-53,666	-75	-48,524	-77	-47,562	-78	-44,529	-66
1988	61,480	-53,924	-88	0	0	-53,924	-88	-50,765	-80	-49,316	-80	-45,384	-68
1989	63,546	-57,373	-90	82	0	-57,291	-90	-54,960	-84	-51,358	-81	-46,376	-70
1990	64,409	-73,170	-114	0	0	-73,170	-114	-61,462	-97	-56,551	-89	-48,437	-73
1991	55,678	-58,456	-105	0	0	-58,456	-105	-62,972	-103	-59,301	-94	-49,153	-75
1992	42,056	-72,949	-173	0	0	-72,949	-173	-68,192	-126	-63,158	-110	-50,739	-79
1993	39,763	-75,067	-189	0	0	-75,067	-189	-68,824	-150	-67,386	-127	-52,259	-83
1994	61,153	-100,882	-165	440	1	-100,442	-164	-82,819	-174	-76,017	-144	-55,094	-88
1995	54,628	-78,902	-144	4	0	-78,897	-144	-84,802	-164	-77,162	-152	-56,416	-91
1996	44,878	-52,259	-116	0	0	-52,259	-116	-77,199	-144	-75,923	-157	-56,197	-92
1997	55,055	-71,281	-129	0	0	-71,281	-129	-67,479	-131	-75,589	-148	-56,952	-94
1998	77,121	-91,990	-119	11,673	15	-80,317	-104	-67,952	-115	-76,639	-131	-58,064	-94
1999	78,581	-99,573	-127	3,801	5	-95,773	-122	-82,457	-117	-75,705	-122	-59,778	-96
2000	78,485	-74,245	-95	-6,216	-8	-80,461	-103	-85,517	-110	-76,018	-114	-60,677	-96
2001	98,852	-79,032	-80	0	0	-79,032	-80	-85,089	-100	-81,373	-105	-61,442	-95
2002	411,704	-77,650	-19	0	0	-77,650	-19	-79,048	-40	-82,647	-55	-62,091	-79
2003	28,028	-62,566	-223	0	0	-62,566	-223	-73,083	-41	-79,096	-57	-62,109	-81
2004	3,289	-19,890	-605	0	0	-19,890	-605	-53,369	-36	-63,920	-52	-60,545	-82
2005	272,667	-427,791	-157	466,617	171	38,825	14	-14,543	-14	-40,063	-25	-56,996	-70
2006	120,507	-188,914	-157	-1	0	-188,915	-157	-56,660	-43	-62,039	-37	-61,545	-75
2007	63,812	-204,304	-320	0	0	-204,304	-320	-118,131	-78	-87,370	-89	-66,304	-81
2008	160,809	-246,608	-153	0	0	-246,608	-153	-213,276	-185	-124,178	-100	-72,120	-86
2009	104,781	-168,496	-161	0	0	-168,496	-161	-206,469	-188	-153,899	-106	-75,132	-89
2010	96,057	-288,447	-300	0	0	-288,447	-300	-234,517	-195	-219,354	-201	-81,596	-96
2011	89,367	-264,706	-296	0	0	-264,706	-296	-240,550	-249	-234,512	-228	-86,981	-102
2012	79,293	-317,994	-401	0	0	-317,994	-401	-290,382	-329	-257,250	-243	-93,582	-110
2013	302,413	-438,584	-145	0	0	-438,584	-145	-340,428	-217	-295,645	-220	-103,165	-113
2014	175,775	-655,652	-373	0	0	-655,652	-373	-470,743	-253	-393,077	-265	-118,097	-126
2015	201,340	-636,216	-316	3,600	2	-632,616	-314	-575,617	-254	-461,910	-272	-131,637	-137
2016	297,380	-893,839	-301	-3,600	-1	-897,439	-302	-728,569	-324	-588,457	-279	-151,273	-149
2017	150,600	-637,955	-424	0	0	-637,955	-424	-722,670	-334	-652,449	-289	-163,440	-159
2018	369,372	-1,490,630	-404	0	0	-1,490,630	-404	-1,008,675	-370	-862,858	-361	-195,811	-179
<b>TOTAL</b>	<b>4,478,126</b>	<b>-8,516,989</b>	-190	<b>488,750</b>		<b>-8,028,240</b>	-179						

Previously Approved -160%  
Recommended: **-160%**

**Cascade Natural Gas**  
**380.3 - SERVICES - PLASTIC (POLYETHYLENE)**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	621	-374	-60	0	0	-374	-60	-125	-60	-75	-60	-374	-60
1986	0	-85		0		-85		-153	-74	-92	-74	-230	
1987	0	-241		0		-241		-234	-113	-140	-113	-234	
1988	607	-538	-89	0	0	-538	-89	-288	-142	-248	-101	-310	-101
1989	0	-31		0		-31		-270	-134	-254	-103	-254	
1990	593	-909	-153	0	0	-909	-153	-493	-123	-361	-150	-363	-120
1991	1,788	-1,107	-62	0	0	-1,107	-62	-682	-86	-565	-95	-469	-91
1992	1,047	-1,524	-146	0	0	-1,524	-146	-1,180	-103	-822	-102	-601	-103
1993	7,351	-1,106	-15	0	0	-1,106	-15	-1,246	-37	-935	-43	-657	-49
1994	1,259	-2,238	-178	0	0	-2,238	-178	-1,623	-50	-1,377	-57	-815	-61
1995	4,638	-1,627	-35	0	0	-1,627	-35	-1,657	-38	-1,520	-47	-889	-55
1996	3,693	-2,773	-75	0	0	-2,773	-75	-2,213	-69	-1,854	-52	-1,046	-58
1997	11,367	-3,864	-34	0	0	-3,864	-34	-2,754	-42	-2,321	-41	-1,263	-50
1998	25,188	-5,070	-20	0	0	-5,070	-20	-3,902	-29	-3,114	-34	-1,535	-37
1999	31,922	-9,963	-31	0	0	-9,963	-31	-6,299	-28	-4,659	-30	-2,097	-35
2000	24,605	-5,216	-21	-855	-3	-6,071	-25	-7,035	-26	-5,548	-29	-2,345	-33
2001	6,272	0	0	0	0	0	0	-5,345	-26	-4,994	-25	-2,345	-31
2002	16,976	-73,895	-435	0	0	-73,895	-435	-26,655	-167	-19,000	-91	-6,554	-81
2003	2,843	-1,094	-38	0	0	-1,094	-38	-24,996	-287	-18,205	-110	-6,251	-80
2004	5,284	-987	-19	0	0	-987	-19	-25,325	-303	-16,409	-147	-5,974	-78
2005	94,632	-34,434	-36	0	0	-34,434	-36	-12,172	-36	-22,082	-88	-7,397	-61
2006	53,598	-16,073	-30	0	0	-16,073	-30	-17,165	-34	-25,297	-73	-7,810	-56
2007	59,131	-15,574	-26	0	0	-15,574	-26	-22,027	-32	-13,633	-32	-8,163	-51
2008	41,943	-31,961	-76	0	0	-31,961	-76	-21,203	-41	-19,806	-39	-9,197	-54
2009	68,125	-22,464	-33	0	0	-22,464	-33	-23,333	-41	-24,101	-38	-9,750	-50
2010	76,872	-8,160	-11	0	0	-8,160	-11	-20,862	-33	-18,846	-31	-9,687	-45
2011	136,156	-34,611	-25	0	0	-34,611	-25	-21,745	-23	-22,554	-30	-10,645	-41
2012	42,030	-16,978	-40	0	0	-16,978	-40	-19,916	-23	-22,835	-31	-10,880	-41
2013	79,921	-24,648	-31	0	0	-24,648	-31	-25,412	-30	-21,372	-27	-11,371	-40
2014	85,594	-57,782	-68	0	0	-57,782	-68	-33,136	-48	-28,436	-34	-12,972	-43
2015	83,989	-64,304	-77	0	0	-64,304	-77	-48,911	-59	-39,665	-46	-14,683	-46
2016	149,236	-62,096	-42	0	0	-62,096	-42	-61,394	-58	-45,162	-51	-16,212	-45
2017	87,482	-29,418	-34	0	0	-29,418	-34	-51,940	-49	-47,650	-49	-16,625	-44
2018	227,749	-137,855	-61	0	0	-137,855	-61	-76,456	-49	-70,291	-55	-20,299	-47
<b>TOTAL</b>	<b>1,432,512</b>	<b>-669,001</b>	<b>-47</b>	<b>-855</b>		<b>-669,856</b>	<b>-47</b>						

Previously Approved -30%  
Recommended: -40%

**Cascade Natural Gas**  
**381.0 - METERS & METER INSTALLATIONS**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	51,934	-9,630	-19	7,767	15	-1,863	-4	-621	-4	-373	-4	-1,863	-4
1979	62,431	-9,822	-16	5,362	9	-4,461	-7	-2,108	-6	-1,265	-6	-3,162	-6
1980	33,101	-18,422	-56	66,216	200	47,795	144	13,824	28	8,294	28	13,824	28
1981	39,249	-19,395	-49	9,743	25	-9,652	-25	11,228	25	6,364	17	7,955	17
1982	50,173	-30,065	-60	14,373	29	-15,691	-31	7,484	18	3,226	7	3,226	7
1983	46,157	-22,836	-49	11,615	25	-11,220	-24	-12,188	-27	1,354	3	818	2
1984	56,064	-14,525	-26	36,908	66	22,383	40	-1,510	-3	6,723	15	3,899	8
1985	69,822	-9,277	-13	25,404	36	16,126	23	9,096	16	389	1	5,427	11
1986	183,139	-8,728	-5	16,989	9	8,261	5	15,590	15	3,972	5	5,742	9
1987	304,433	-10,969	-4	17,431	6	6,462	2	10,283	6	8,402	6	5,814	6
1988	213,512	-7,190	-3	5,267	2	-1,923	-1	4,267	2	10,262	6	5,111	5
1989	228,061	-10,950	-5	13,951	6	3,000	1	2,513	1	6,385	3	4,935	4
1990	208,783	-7,955	-4	-27,539	-13	-35,494	-17	-11,472	-5	-3,939	-2	1,825	2
1991	155,102	-11,266	-7	28,316	18	17,050	11	-5,148	-3	-2,181	-1	2,912	2
1992	153,882	-10,218	-7	16,792	11	6,574	4	-3,957	-2	-2,159	-1	3,156	3
1993	124,346	-7,510	-6	21,135	17	13,625	11	12,416	9	951	1	3,811	3
1994	238,399	-17,131	-7	30,007	13	12,876	5	11,025	6	2,926	2	4,344	3
1995	210,780	-8,224	-4	8,712	4	489	0	8,996	5	10,122	6	4,130	3
1996	112,655	-7,934	-7	6,566	6	-1,368	-1	3,999	2	6,439	4	3,840	3
1997	121,621	-7,707	-6	67,352	55	59,645	49	19,588	13	17,053	11	6,631	5
1998	152,782	-16,592	-11	97,402	64	80,810	53	46,362	36	30,490	18	10,163	8
1999	123,674	-8,882	-7	18,964	15	10,082	8	50,179	38	29,931	21	10,159	8
2000	64,144	-23,518	-37	19,274	30	-4,243	-7	28,883	25	28,985	25	9,533	7
2001	26,183	-1,665	-6	0	0	-1,665	-6	1,391	2	28,926	30	9,066	7
2002	130	-3,037	-2,336	0	0	-3,037	-2,336	-2,982	-10	16,389	22	8,582	7
2003	243,440	-1,153	0	0	0	-1,153	0	-1,951	-2	-3	0	8,208	7
2004	110,971	-90	0	0	0	-90	0	-1,427	-1	-2,038	-2	7,901	6
2005	107,967	-29,860	-28	0	0	-29,860	-28	-10,368	-7	-7,161	-7	6,552	5
2006	440,569	-6,234	-1	0	0	-6,234	-1	-12,061	-5	-8,075	-4	6,111	5
2007	150,247	-12,497	-8	0	0	-12,497	-8	-16,197	-7	-9,967	-5	5,491	4
2008	625,361	-12,445	-2	0	0	-12,445	-2	-10,392	-3	-12,225	-4	4,912	3
2009	153,873	-5,078	-3	0	0	-5,078	-3	-10,007	-3	-13,223	-4	4,600	3
2010	91,531	-8,074	-9	0	0	-8,074	-9	-8,532	-3	-8,865	-3	4,216	3
2011	108,820	-4,228	-4	0	0	-4,228	-4	-5,793	-5	-8,464	-4	3,968	3
2012	223,692	-4,429	-2	0	0	-4,429	-2	-5,577	-4	-6,851	-3	3,728	2
2013	452,283	-7,634	-2	0	0	-7,634	-2	-5,430	-2	-5,889	-3	3,412	2
2014	7,461	-35,313	-473	0	0	-35,313	-473	-15,792	-7	-11,936	-7	2,366	2
2015	874,106	-31,725	-4	0	0	-31,725	-4	-24,890	-6	-16,666	-5	1,468	1
2016	787,913	-19,614	-2	0	0	-19,614	-2	-28,884	-5	-19,743	-4	928	0
2017	1,048,330	-10,835	-1	0	0	-10,835	-1	-20,725	-2	-21,024	-3	634	0
2018	10,646,826	-64,348	-1	5,072	0	-59,277	-1	-29,908	-1	-31,353	-1	-827	0
<b>TOTAL</b>	<b>19,103,949</b>	<b>-557,004</b>	<b>-3</b>	<b>523,078</b>		<b>-33,925</b>	<b>0</b>						

Previously Approved: -15% (Installations, accounts merged)  
Recommended: -5%

**Cascade Natural Gas**  
**385.0 - INDUSTRIAL MEAS. & REG. STATION EQUIP.**  
**SUMMARY OF BOOK SALVAGE**

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	0	0		0		0		0	0	0	0		
1986	16,671	0		0		0		0	0	0	0		0
1987	12,866	-189	-1	0	0	-189	-1	-63	-1	-38	-1	-189	-1
1988	25,254	-1,645	-7	2,268	9	622	2	144	1	87	1	217	1
1989	13,316	-790	-6	0	0	-790	-6	-119	-1	-71	-1	-119	-1
1990	46,027	-586	-1	0	0	-586	-1	-251	-1	-189	-1	-236	-1
1991	154,029	-7,414	-5	0	0	-7,414	-5	-2,930	-4	-1,671	-3	-1,671	-3
1992	95,068	-968	-1	5,368	6	4,400	5	-1,200	-1	-753	-1	-659	-1
1993	6,570	-1,345	-20	1,612	25	267	4	-915	-1	-825	-1	-527	-1
1994	10,792	-301	-3	0	0	-301	-3	1,456	4	-727	-1	-499	-1
1995	49,747	-368	-1	0	0	-368	-1	-134	-1	-683	-1	-484	-1
1996	17,042	-2,185	-13	0	0	-2,185	-13	-951	-4	363	1	-654	-1
1997	19,659	-707	-4	0	0	-707	-4	-1,087	-4	-659	-3	-659	-2
1998	44,967	-1,187	-3	0	0	-1,187	-3	-1,360	-5	-949	-3	-703	-2
1999	32,805	-286	-1	0	0	-286	-1	-727	-2	-946	-3	-671	-2
2000	23,078	0	0	0	0	0	0	-491	-1	-873	-3	-671	-2
2001	38,112	0	0	40,313	106	40,313	106	13,342	43	7,626	24	2,256	5
2002	0	0		40,313		40,313		26,875	132	15,830	57	4,793	
2003	0	0		5,625		5,625		28,750	226	17,193	91	4,845	
2004	0	0		0		0		15,313	0	17,250	141	4,845	
2005	51,459	32	0	0	0	32	0	1,886	11	17,256	96	4,562	12
2006	71,186	13	0	0	0	13	0	15	0	9,196	37	4,310	11
2007	18,083	-355	-2	0	0	-355	-2	-104	0	1,063	4	4,064	10
2008	16,482	3,474	21	0	0	3,474	21	1,044	3	633	2	4,035	11
2009	0	-226		3,389		3,163		2,094	18	1,265	4	3,993	
2010	2,444	-360	-15	0	0	-360	-15	2,093	33	1,187	5	3,795	11
2011	33,088	-4,708	-14	0	0	-4,708	-14	-635	-5	243	2	3,425	10
2012	5,842	-2,709	-46	0	0	-2,709	-46	-2,592	-19	-228	-2	3,170	9
2013	11,431	-1,061	-9	0	0	-1,061	-9	-2,826	-17	-1,135	-11	3,001	9
2014	6,433	0	0	0	0	0	0	-1,257	-16	-1,768	-15	3,001	9
2015	39,920	-3,126	-8	0	0	-3,126	-8	-1,396	-7	-2,321	-12	2,765	8
2016	53,802	-6,922	-13	0	0	-6,922	-13	-3,349	-10	-2,764	-12	2,406	7
2017	14,836	-7,369	-50	0	0	-7,369	-50	-5,806	-16	-3,696	-15	2,057	6
2018	81,439	-14,624	-18	0	0	-14,624	-18	-9,638	-19	-6,408	-16	1,482	4
<b>TOTAL</b>	<b>1,012,449</b>	<b>-55,915</b>	<b>-6</b>	<b>98,888</b>		<b>42,973</b>	<b>4</b>						

Previously Approved: -10%  
Recommended: -5%

Cascade Natural Gas

392.1 - TRANSPORTATION EQUIPMENT - TRAILERS  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	93,139	0	0	25,465	27	25,465	27	8,488	27	5,093	27	25,465	27
1979	102,201	0	0	31,885	31	31,885	31	19,116	29	11,470	29	28,675	29
1980	91,750	0	0	23,803	26	23,803	26	27,051	28	16,231	28	27,051	28
1981	90,102	0	0	27,836	31	27,836	31	27,841	29	21,798	29	27,247	29
1982	159,473	0	0	74,149	46	74,149	46	41,930	37	36,628	34	36,628	34
1983	153,520	0	0	53,402	35	53,402	35	51,796	39	42,215	35	39,423	34
1984	325,297	0	0	151,199	46	151,199	46	92,917	44	66,078	40	55,391	38
1985	220,593	0	0	91,852	42	91,852	42	98,818	42	79,688	42	59,949	39
1986	424,394	0	0	120,484	28	120,484	28	121,179	37	98,218	38	66,675	36
1987	297,320	0	0	79,301	27	79,301	27	97,213	31	99,248	35	67,938	35
1988	305,463	0	0	77,033	25	77,033	25	92,273	27	103,974	33	68,765	33
1989	332,862	0	0	93,630	28	93,630	28	83,322	27	92,460	29	70,837	33
1990	413,685	-20	0	-109,748	-27	-109,768	-27	20,299	6	52,136	15	56,944	25
1991	283,745	0	0	106,591	38	106,591	38	30,151	9	49,358	15	60,490	26
1992	497,464	-516	0	78,887	16	78,371	16	25,065	6	49,172	13	61,682	24
1993	355,787	-1,203	0	118,737	33	117,534	33	100,832	27	57,272	15	65,173	25
1994	630,057	-175	0	151,723	24	151,548	24	115,818	23	68,855	16	70,254	25
1995	330,994	-89	0	112,832	34	112,744	34	127,275	29	113,358	27	72,615	26
1996	506,336	0	0	79,280	16	79,280	16	114,524	23	107,896	23	72,965	25
1997	686,241	0	0	151,774	22	151,774	22	114,599	23	122,576	24	76,906	24
1998	706,136	0	0	143,724	20	143,724	20	124,926	20	127,814	22	80,088	24
1999	243,562	0	0	60,480	25	60,480	25	118,660	22	109,601	22	79,196	24
2000	255,685	-794	0	16,011	6	15,217	6	73,141	18	90,095	19	76,415	23
2001	195,736	0	0	0	0	0	0	25,232	11	74,239	18	76,415	23
2002	251,991	0	0	0	0	0	0	5,072	2	43,884	13	76,415	22
2003	100,299	0	0	0	0	0	0	0	0	15,139	7	76,415	22
2004	422,331	0	0	0	0	0	0	0	0	3,043	1	76,415	21
2005	391,641	0	0	2,500	1	2,500	1	833	0	500	0	73,335	20
2006	153,475	0	0	0	0	0	0	833	0	500	0	73,335	20
2007	-6,961	0	0	0	0	0	0	833	0	500	0	73,335	20
2008	452,237	0	0	0	0	0	0	0	0	500	0	73,335	19
2009	81,518	0	0	0	0	0	0	0	0	500	0	73,335	18
2010	1,433	0	0	0	0	0	0	0	0	0	0	73,335	18
2011	0	0	0	0	0	0	0	0	0	0	0	73,335	18
2012	0	0	0	0	0	0	0	0	0	0	0	73,335	18
2013	65,973	0	0	4,724	7	4,724	7	1,575	7	945	3	70,590	18
2014	29,165	0	0	10,400	36	10,400	36	5,041	16	3,025	16	68,275	18
2015	50,715	0	0	0	0	0	0	5,041	10	3,025	10	68,275	18
2016	20,183	0	0	700	3	700	3	3,700	11	3,165	10	65,773	18
2017	29,026	0	0	600	2	600	2	433	1	3,285	8	63,445	18
2018	40,670	0	0	8,000	20	8,000	20	3,100	10	3,940	12	61,533	18
<b>TOTAL</b>	<b>9,785,237</b>	<b>-2,796</b>	<b>0</b>	<b>1,787,258</b>		<b>1,784,462</b>	<b>18</b>						

Previously Approved: 3%  
Recommended: 10%

Cascade Natural Gas  
 392.2 - TRANSPORTATION EQUIPMENT  
 SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	0	0		0		0		0	0	0	0		
1986	0	0		0		0		0	0	0	0		
1987	0	0		0		0		0	0	0	0		
1988	0	0		0		0		0	0	0	0		
1989	0	0		0		0		0	0	0	0		
1990	0	0		0		0		0	0	0	0		
1991	0	0		0		0		0	0	0	0		
1992	0	0		0		0		0	0	0	0		
1993	0	0		0		0		0	0	0	0		
1994	0	0		0		0		0	0	0	0		
1995	0	0		0		0		0	0	0	0		
1996	0	0		0		0		0	0	0	0		
1997	0	0		0		0		0	0	0	0		
1998	0	0		0		0		0	0	0	0		
1999	0	0		0		0		0	0	0	0		
2000	0	0		0		0		0	0	0	0		
2001	0	0		0		0		0	0	0	0		
2002	0	0		0		0		0	0	0	0		
2003	0	0		0		0		0	0	0	0		
2004	0	0		0		0		0	0	0	0		
2005	0	0		0		0		0	0	0	0		
2006	0	0		0		0		0	0	0	0		
2007	0	0		0		0		0	0	0	0		
2008	0	0		0		0		0	0	0	0		
2009	81,870	0	0	26,231	32	26,231	32	8,744	32	5,246	32	26,231	32
2010	263,133	0	0	31,336	12	31,336	12	19,189	17	11,513	17	28,784	17
2011	380,985	0	0	63,344	17	63,344	17	40,304	17	24,182	17	40,304	17
2012	382,742	0	0	56,614	15	56,614	15	50,431	15	35,505	16	44,381	16
2013	1,040,799	-2,644	0	233,339	22	230,694	22	116,884	19	81,644	19	81,644	19
2014	796,899	0	0	239,525	30	239,525	30	175,611	24	124,303	22	107,957	22
2015	381,010	-154	0	92,512	24	92,358	24	187,526	25	136,507	23	105,729	22
2016	878,267	0	0	254,627	29	254,627	29	195,503	29	174,764	25	124,341	24
2017	684,469	-8,071	-1	260,574	38	252,503	37	199,829	31	213,942	28	138,581	26
2018	1,183,341	-515	0	299,381	25	298,866	25	268,665	29	227,576	29	154,610	25
<b>TOTAL</b>	<b>6,073,515</b>	<b>-11,384</b>	<b>0</b>	<b>1,557,483</b>		<b>1,546,099</b>	<b>25</b>						

Previously Approved: 15%  
 Recommended: 20%



Cascade Natural Gas  
396.1 - WORK EQUIPMENT TRAILERS  
SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	39,314	0	0	14,123	36	14,123	36	4,708	36	2,825	36	14,123	36
1979	31,792	0	0	14,624	46	14,624	46	9,583	40	5,750	40	14,374	40
1980	53,141	0	0	18,925	36	18,925	36	15,891	38	9,535	38	15,891	38
1981	29,150	0	0	12,076	41	12,076	41	15,208	40	11,950	39	14,937	39
1982	6,015	0	0	5,590	93	5,590	93	12,197	41	13,068	41	13,068	41
1983	34,490	0	0	16,141	47	16,141	47	11,269	49	13,471	44	13,580	42
1984	16,973	0	0	7,098	42	7,098	42	9,610	50	11,966	43	12,654	42
1985	16,909	0	0	4,973	29	4,973	29	9,404	41	9,175	44	11,694	41
1986	58,109	0	0	16,412	28	16,412	28	9,494	31	10,043	38	12,218	38
1987	10,057	0	0	1,890	19	1,890	19	7,758	27	9,303	34	11,185	38
1988	136,200	0	0	23,331	17	23,331	17	13,878	20	10,741	23	12,289	31
1989	17,874	0	0	900	5	900	5	8,707	16	9,501	20	11,340	30
1990	6,583	0	0	-3,992	-61	-3,992	-61	6,747	13	7,708	17	10,161	29
1991	65,789	0	0	18,111	28	18,111	28	5,006	17	8,048	17	10,729	29
1992	92,432	0	0	32,302	35	32,302	35	15,474	28	14,130	22	12,167	30
1993	56,689	0	0	22,357	39	22,357	39	24,256	34	13,936	29	12,804	31
1994	0	0	0	0	0	0	0	18,220	37	13,756	31	12,804	31
1995	29,910	0	0	12,479	42	12,479	42	11,612	40	17,050	35	12,785	31
1996	66,966	0	0	13,239	20	13,239	20	8,573	27	16,075	33	12,810	30
1997	29,164	0	0	15,426	53	15,426	53	13,715	33	12,700	35	12,948	31
1998	84,316	0	0	27,918	33	27,918	33	18,861	31	13,812	33	13,696	31
1999	73,441	0	0	900	1	900	1	14,748	24	13,992	25	13,087	29
2000	14,215	0	0	0	0	0	0	9,606	17	11,496	21	13,087	28
2001	84,024	0	0	84,185	100	84,185	100	28,362	50	25,686	45	16,319	34
2002	47,762	0	0	83,254	174	83,254	174	55,813	115	39,251	65	19,229	40
2003	0	0	0	5,625	0	5,625	0	57,688	131	34,793	79	18,662	40
2004	40,776	0	0	0	0	0	0	29,626	100	34,613	93	17,915	39
2005	175,392	0	0	784,520	447	784,520	447	263,382	366	191,517	275	47,400	94
2006	61,634	0	0	0	0	0	0	261,507	282	174,680	268	47,400	89
2007	146,531	0	0	0	0	0	0	261,507	205	158,029	186	47,400	81
2008	110,582	0	0	0	0	0	0	0	0	156,904	147	47,400	75
2009	106,048	0	0	2,025	2	2,025	2	675	1	157,309	131	45,720	71
2010	0	0	0	0	0	0	0	675	1	405	0	45,720	71
2011	20,079	0	0	4,000	20	4,000	20	2,008	5	1,205	2	44,230	70
2012	0	0	0	0	0	0	0	1,333	20	1,205	3	44,230	70
2013	42,458	0	0	13,279	31	13,279	31	5,760	28	3,861	11	43,162	69
2014	31,366	0	0	10,425	33	10,425	33	7,901	32	5,541	30	42,071	69
2015	33,587	0	0	6,305	19	6,305	19	10,003	28	6,802	27	40,917	68
2016	16,285	0	0	6,400	39	6,400	39	7,710	28	7,282	29	39,839	68
2017	11,612	0	0	13,501	116	13,501	116	8,735	43	9,982	37	39,041	68
2018	48,352	0	0	19,600	41	19,600	41	13,167	52	11,246	40	38,469	67
<b>TOTAL</b>	<b>1,946,018</b>	<b>0</b>	<b>0</b>	<b>1,307,941</b>		<b>1,307,941</b>	<b>67</b>						

Previously Approved: 25%  
Recommended: 30%

Cascade Natural Gas  
 396.2 - POWER OPERATED EQUIPMENT  
 SUMMARY OF BOOK SALVAGE

Year	Regular Retirements	Cost of Removal Amount	Cost of Removal Percent	Gross Salvage Amount	Gross Salvage Percent	Net Salvage Amount	Net Salvage Percent	3-Year Amount	3-Year Percent	5-Year Amount	5-Year Percent	Historical Amount	Historical Percent
1978	0	0		0		0		0	0	0	0		
1979	0	0		0		0		0	0	0	0		
1980	0	0		0		0		0	0	0	0		
1981	0	0		0		0		0	0	0	0		
1982	0	0		0		0		0	0	0	0		
1983	0	0		0		0		0	0	0	0		
1984	0	0		0		0		0	0	0	0		
1985	0	0		0		0		0	0	0	0		
1986	0	0		0		0		0	0	0	0		
1987	0	0		0		0		0	0	0	0		
1988	0	0		0		0		0	0	0	0		
1989	0	0		0		0		0	0	0	0		
1990	0	0		0		0		0	0	0	0		
1991	0	0		0		0		0	0	0	0		
1992	0	0		0		0		0	0	0	0		
1993	0	0		0		0		0	0	0	0		
1994	0	0		0		0		0	0	0	0		
1995	0	0		0		0		0	0	0	0		
1996	0	0		0		0		0	0	0	0		
1997	0	0		0		0		0	0	0	0		
1998	0	0		0		0		0	0	0	0		
1999	0	0		0		0		0	0	0	0		
2000	0	0		0		0		0	0	0	0		
2001	0	0		0		0		0	0	0	0		
2002	0	0		0		0		0	0	0	0		
2003	0	0		0		0		0	0	0	0		
2004	0	0		0		0		0	0	0	0		
2005	0	0		0		0		0	0	0	0		
2006	0	0		0		0		0	0	0	0		
2007	0	0		0		0		0	0	0	0		
2008	0	0		0		0		0	0	0	0		
2009	-67,123	0	0	251,218	-374	251,218	-374	83,739	-374	50,244	-374	251,218	-374
2010	380,791	0	0	8,348	2	8,348	2	86,522	83	51,913	83	129,783	83
2011	557,269	0	0	250,309	45	250,309	45	169,958	59	101,975	59	169,958	59
2012	444,437	0	0	297,237	67	297,237	67	185,298	40	161,422	61	201,778	61
2013	1,293,132	0	0	860,465	67	860,465	67	469,337	61	333,515	64	333,515	64
2014	1,117,253	0	0	953,395	85	953,395	85	703,699	74	473,951	62	436,829	70
2015	2,357,120	-275	0	1,791,515	76	1,791,240	76	1,201,700	76	830,529	72	630,316	73
2016	1,851,131	0	0	1,495,027	81	1,495,027	81	1,413,221	80	1,079,473	76	738,405	74
2017	1,232,439	0	0	923,469	75	923,469	75	1,403,245	77	1,204,719	77	758,968	75
2018	2,361,292	-1,952	0	1,941,160	82	1,939,208	82	1,452,568	80	1,420,468	80	876,992	76
<b>TOTAL</b>	<b>11,527,740</b>	<b>-2,227</b>	<b>0</b>	<b>8,772,143</b>		<b>8,769,916</b>	<b>76</b>						

Previously Approved 25%  
 Recommended: 35%



SECTION 8

## **8 DETAILED DEPRECIATION CALCULATIONS**

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# Cascade Natural Gas Corporation

Account #: 365.2 - Rights of Way

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S5  
ASL: 85  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1963	28,482.65	18,585	23,916	0.8397	4,567	29.54	155	55.5
1964	300,551.57	192,614	247,866	0.8247	52,686	30.53	1,726	54.5
1965	328,484.33	206,683	265,970	0.8097	62,514	31.52	1,983	53.5
1966	29,786.49	18,393	23,669	0.7946	6,117	32.51	188	52.5
1967	12,447.39	7,540	9,703	0.7796	2,744	33.51	82	51.5
1970	2,525.77	1,441	1,855	0.7342	671	36.50	18	48.5
1972	313,908.91	171,724	220,983	0.7040	92,926	38.50	2,414	46.5
1981	9,902.30	4,369	5,622	0.5677	4,280	47.50	90	37.5
<b>TOTAL</b>	<b>1,026,089.41</b>	<b>621,350</b>	<b>799,584</b>		<b>226,505</b>		<b>6,656</b>	

COMPOSITE ANNUAL ACCRUAL RATE	0.65%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.78
COMPOSITE AVERAGE AGE (YEARS)	51.49
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	33.53

# Cascade Natural Gas Corporation

Account #: 367.1 - Mains

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S5  
ASL: 70  
Net Salvage: -20%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1957	1,213,954.56	1,231,385	1,325,212	1.0916	131,533	10.83	12,146	61.5
1958	368,232.55	369,419	397,568	1.0797	44,312	11.48	3,860	60.5
1961	443,286.63	428,366	461,006	1.0400	70,938	13.63	5,204	57.5
1963	1,218,851.75	1,144,398	1,231,597	1.0105	231,025	15.23	15,169	55.5
1964	512,657.49	473,933	510,045	0.9949	105,144	16.07	6,542	54.5
1965	1,336,705.83	1,215,777	1,308,415	0.9788	295,632	16.94	17,448	53.5
1966	674,514.00	603,176	649,136	0.9624	160,281	17.84	8,986	52.5
1967	138,037.00	121,270	130,510	0.9455	35,134	18.75	1,874	51.5
1971	1,275,982.00	1,037,610	1,116,673	0.8751	414,506	22.56	18,370	47.5
1972	98,357.00	78,331	84,300	0.8571	33,728	23.54	1,433	46.5
1973	483,690.00	377,045	405,774	0.8389	174,654	24.53	7,121	45.5
1974	12,202.00	9,305	10,014	0.8206	4,629	25.52	181	44.5
1977	89,356.33	63,564	68,408	0.7656	38,820	28.50	1,362	41.5
1981	24,690.00	15,872	17,081	0.6918	12,547	32.50	386	37.5
1982	211,784.00	132,516	142,613	0.6734	111,528	33.50	3,329	36.5
1983	6,336,913.90	3,856,457	4,150,306	0.6549	3,453,991	34.50	100,115	35.5
1988	14,230.33	7,440	8,007	0.5627	9,069	39.50	230	30.5
1991	94,252.00	44,433	47,819	0.5073	65,284	42.50	1,536	27.5
1992	15,408.04	7,000	7,533	0.4889	10,957	43.50	252	26.5
1993	334,958.63	146,425	157,582	0.4705	244,368	44.50	5,491	25.5
1994	862,882.00	362,410	390,025	0.4520	645,433	45.50	14,185	24.5
1996	3,650,632.00	1,408,101	1,515,394	0.4151	2,865,365	47.50	60,323	22.5
1997	547.42	202	217	0.3967	440	48.50	9	21.5
1999	1,039,273.00	347,414	373,886	0.3598	873,242	50.50	17,292	19.5
2000	82,779.00	26,253	28,253	0.3413	71,082	51.50	1,380	18.5
2001	49,877.88	14,963	16,104	0.3229	43,750	52.50	833	17.5

# Cascade Natural Gas Corporation

Account #: 367.1 - Mains

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S5  
ASL: 70  
Net Salvage: -20%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2006	882.19	189	203	0.2306	855	57.50	15	12.5
2007	19,181.81	3,782	4,070	0.2122	18,948	58.50	324	11.5
2008	253,676.18	45,662	49,141	0.1937	255,270	59.50	4,290	10.5
2009	59,401.24	9,674	10,411	0.1753	60,870	60.50	1,006	9.5
2010	679,927.28	99,075	106,624	0.1568	709,288	61.50	11,533	8.5
2011	89,867.08	11,554	12,435	0.1384	95,406	62.50	1,526	7.5
2013	98,382.75	9,276	9,983	0.1015	108,076	64.50	1,676	5.5
2015	310.22	19	20	0.0646	352	66.50	5	3.5
2017	385,972.62	9,925	10,681	0.0277	452,486	68.50	6,606	1.5
<b>TOTAL</b>	<b>22,171,656.71</b>	<b>13,712,219</b>	<b>14,757,046</b>		<b>11,848,942</b>		<b>332,040</b>	

<b>COMPOSITE ANNUAL ACCRUAL RATE</b>	1.50%
<b>THEORETICAL ACCUMULATED DEPRECIATION FACTOR</b>	0.67
<b>COMPOSITE AVERAGE AGE (YEARS)</b>	36.36
<b>DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)</b>	33.92

# Cascade Natural Gas Corporation

Account #: 369.1 - Meas. & Reg. Station Equip.

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R5  
ASL: 55  
Net Salvage: -10%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1963	102,864.36	102,350	86,715	0.8430	26,435	5.25	5,035	55.5
1964	12,514.34	12,340	10,455	0.8354	3,311	5.70	581	54.5
1965	14,610.43	14,267	12,087	0.8273	3,984	6.18	645	53.5
1966	18,306.45	17,688	14,986	0.8186	5,151	6.69	770	52.5
1967	18,470.25	17,645	14,950	0.8094	5,368	7.23	742	51.5
1968	13,498.07	12,739	10,793	0.7996	4,055	7.81	519	50.5
1969	558.90	521	441	0.7892	174	8.42	21	49.5
<b>TOTAL</b>	<b>180,822.80</b>	<b>177,548</b>	<b>150,427</b>		<b>48,478</b>		<b>8,313</b>	

COMPOSITE ANNUAL ACCRUAL RATE	4.60%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.83
COMPOSITE AVERAGE AGE (YEARS)	54.17
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	5.91

# Cascade Natural Gas Corporation

Account #: 374.2 - Land Rights

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R3  
ASL: 60  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1963	1,200.30	913	937	0.7805	263	14.38	18	55.5
1964	214.47	161	165	0.7711	49	14.93	3	54.5
1974	9,480.78	6,132	6,295	0.6639	3,186	21.20	150	44.5
1981	14,906.50	8,374	8,597	0.5767	6,310	26.29	240	37.5
1985	8,059.59	4,107	4,217	0.5232	3,843	29.42	131	33.5
1986	12,536.41	6,221	6,386	0.5094	6,150	30.23	203	32.5
1988	99,623.33	46,720	47,963	0.4814	51,660	31.86	1,621	30.5
1993	1,326,524.00	528,600	542,666	0.4091	783,858	36.09	21,719	25.5
1995	2,043.01	755	775	0.3792	1,268	37.84	34	23.5
2007	455,794.12	84,732	86,987	0.1908	368,807	48.85	7,550	11.5
2012	53,727.42	5,691	5,842	0.1087	47,885	53.64	893	6.5
2013	17,264.18	1,549	1,591	0.0921	15,674	54.62	287	5.5
2016	155,968.81	6,386	6,556	0.0420	149,413	57.54	2,597	2.5
<b>TOTAL</b>	<b>2,157,342.92</b>	<b>700,339</b>	<b>718,975</b>		<b>1,438,368</b>		<b>35,446</b>	

COMPOSITE ANNUAL ACCRUAL RATE	1.64%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.33
COMPOSITE AVERAGE AGE (YEARS)	20.73
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	40.52



# Cascade Natural Gas Corporation

Account #: 375.1 - Structures and Improvements

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R3.5  
ASL: 45  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1963	13,919.18	13,169	14,615	1.0500	0	4.45	0	55.5
1965	591.99	553	622	1.0500	0	4.94	0	53.5
1966	3,549.33	3,296	3,727	1.0500	0	5.20	0	52.5
1967	7,392.96	6,818	7,763	1.0500	0	5.48	0	51.5
1968	59.25	54	62	1.0500	0	5.77	0	50.5
1970	7,142.07	6,428	7,499	1.0500	0	6.43	0	48.5
1973	134,613.73	117,447	141,344	1.0500	0	7.61	0	45.5
1974	3,300.74	2,845	3,466	1.0500	0	8.06	0	44.5
1975	376,756.09	320,464	393,886	1.0455	1,708	8.55	200	43.5
1976	265.82	223	274	1.0306	5	9.06	1	42.5
1977	184,403.87	152,269	187,155	1.0149	6,469	9.61	673	41.5
1978	5,548.45	4,507	5,539	0.9984	286	10.19	28	40.5
1979	8,657.24	6,910	8,493	0.9811	597	10.79	55	39.5
1980	8,788.02	6,886	8,464	0.9631	763	11.42	67	38.5
1981	80,494.64	61,865	76,039	0.9446	8,481	12.06	703	37.5
1983	38,856.59	28,649	35,213	0.9062	5,586	13.40	417	35.5
1984	10,929.51	7,881	9,687	0.8863	1,789	14.10	127	34.5
1985	374,727.31	264,001	324,486	0.8659	68,977	14.81	4,659	33.5
1986	17,725.07	12,187	14,979	0.8451	3,632	15.53	234	32.5
1987	17,955.55	12,034	14,791	0.8238	4,062	16.28	250	31.5
1988	38,369.94	25,037	30,773	0.8020	9,516	17.04	559	30.5
1989	19,714.55	12,508	15,373	0.7798	5,327	17.81	299	29.5
1990	2,123.84	1,308	1,608	0.7572	622	18.60	33	28.5
1991	20,215.84	12,075	14,842	0.7342	6,385	19.40	329	27.5
1992	4,522.28	2,615	3,214	0.7107	1,534	20.22	76	26.5
1993	18,228.12	10,187	12,521	0.6869	6,619	21.05	314	25.5

# Cascade Natural Gas Corporation

Account #: 375.1 - Structures and Improvements

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R3.5

ASL: 45

Net Salvage: -5%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1994	3,277.21	1,767	2,172	0.6627	1,269	21.89	58	24.5
1998	4,796.80	2,196	2,699	0.5627	2,337	25.38	92	20.5
2011	8,030.44	1,384	1,701	0.2119	6,731	37.61	179	7.5
2012	38,330.46	5,733	7,047	0.1838	33,200	38.59	860	6.5
2016	1,758.77	102	125	0.0710	1,722	42.52	40	2.5
2017	5,816.43	202	248	0.0426	5,859	43.51	135	1.5
2018	5,034.69	58	72	0.0142	5,215	44.50	117	0.5
<b>TOTAL</b>	<b>1,465,896.78</b>	<b>1,103,659</b>	<b>1,350,500</b>		<b>188,692</b>		<b>10,505</b>	

COMPOSITE ANNUAL ACCRUAL RATE 0.72%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.92

COMPOSITE AVERAGE AGE (YEARS) 37.44

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 12.73

# Cascade Natural Gas Corporation

Account #: 376.1 - Mains - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 75  
Net Salvage: -110%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1953	783.00	1,286	1,198	1.5297	447	16.35	27	65.5
1957	5,703,620.98	8,937,480	8,324,784	1.4596	3,652,820	19.04	191,887	61.5
1958	354,539.69	548,634	511,023	1.4414	233,510	19.73	11,833	60.5
1959	464,652.05	709,847	661,185	1.4230	314,585	20.44	15,391	59.5
1960	1,381,102.54	2,082,288	1,939,540	1.4043	960,775	21.15	45,419	58.5
1961	2,298,708.85	3,419,052	3,184,664	1.3854	1,642,624	21.88	75,077	57.5
1962	1,375,728.96	2,017,934	1,879,598	1.3663	1,009,433	22.61	44,638	56.5
1963	1,661,207.18	2,402,089	2,237,417	1.3469	1,251,118	23.36	53,564	55.5
1964	1,781,427.99	2,538,238	2,364,233	1.3272	1,376,766	24.11	57,096	54.5
1965	2,847,327.67	3,996,000	3,722,061	1.3072	2,257,327	24.88	90,737	53.5
1966	1,990,461.98	2,750,324	2,561,780	1.2870	1,618,190	25.65	63,083	52.5
1967	1,441,361.80	1,959,888	1,825,531	1.2665	1,201,328	26.44	45,440	51.5
1968	2,000,869.01	2,676,141	2,492,682	1.2458	1,709,143	27.23	62,761	50.5
1969	1,880,455.43	2,472,756	2,303,240	1.2248	1,645,716	28.04	58,699	49.5
1970	2,978,612.96	3,848,789	3,584,941	1.2036	2,670,146	28.85	92,546	48.5
1971	1,669,296.24	2,118,437	1,973,211	1.1821	1,532,312	29.68	51,634	47.5
1972	1,310,118.41	1,632,061	1,520,177	1.1603	1,231,071	30.51	40,350	46.5
1973	2,386,774.27	2,916,890	2,716,927	1.1383	2,295,299	31.35	73,207	45.5
1974	2,053,221.15	2,460,262	2,291,603	1.1161	2,020,162	32.21	62,727	44.5
1975	1,543,053.38	1,811,788	1,687,584	1.0937	1,552,828	33.07	46,962	43.5
1976	885,552.59	1,018,200	948,399	1.0710	911,262	33.94	26,852	42.5
1977	1,043,785.51	1,174,479	1,093,964	1.0481	1,097,985	34.81	31,539	41.5
1978	3,040,560.90	3,345,911	3,116,537	1.0250	3,268,641	35.70	91,561	40.5
1979	3,559,217.17	3,827,543	3,565,151	1.0017	3,909,205	36.59	106,829	39.5
1980	2,951,067.57	3,099,102	2,886,648	0.9782	3,310,594	37.49	88,296	38.5
1981	3,720,986.82	3,813,095	3,551,694	0.9545	4,262,378	38.40	110,995	37.5

# Cascade Natural Gas Corporation

Account #: 376.1 - Mains - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 75  
Net Salvage: -110%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1982	2,792,377.83	2,789,934	2,598,674	0.9306	3,265,319	39.32	83,051	36.5
1983	1,560,909.45	1,519,281	1,415,129	0.9066	1,862,781	40.24	46,294	35.5
1984	1,593,067.42	1,509,236	1,405,773	0.8824	1,939,669	41.17	47,119	34.5
1985	2,123,952.95	1,956,664	1,822,527	0.8581	2,637,774	42.10	62,657	33.5
1986	1,748,028.45	1,564,407	1,457,162	0.8336	2,213,698	43.04	51,437	32.5
1987	3,266,196.61	2,836,821	2,642,347	0.8090	4,216,666	43.98	95,875	31.5
1988	2,943,085.10	2,477,982	2,308,108	0.7842	3,872,371	44.93	86,187	30.5
1989	2,328,727.21	1,898,561	1,768,408	0.7594	3,121,919	45.88	68,041	29.5
1990	3,524,062.70	2,778,649	2,588,163	0.7344	4,812,369	46.84	102,740	28.5
1991	2,655,042.08	2,021,952	1,883,340	0.7093	3,692,248	47.80	77,241	27.5
1992	4,781,043.15	3,511,820	3,271,073	0.6842	6,769,118	48.77	138,806	26.5
1993	3,451,586.08	2,441,719	2,274,331	0.6589	4,974,000	49.74	100,010	25.5
1994	3,347,904.68	2,277,271	2,121,156	0.6336	4,909,444	50.71	96,820	24.5
1995	3,645,513.60	2,380,233	2,217,060	0.6082	5,438,519	51.68	105,232	23.5
1996	3,295,577.62	2,061,599	1,920,269	0.5827	5,000,444	52.66	94,960	22.5
1997	2,273,652.36	1,359,941	1,266,713	0.5571	3,507,957	53.64	65,400	21.5
1998	6,333,518.01	3,614,151	3,366,389	0.5315	9,933,999	54.62	181,875	20.5
1999	2,146,254.87	1,165,618	1,085,711	0.5059	3,421,425	55.60	61,532	19.5
2000	1,146,108.98	590,807	550,305	0.4802	1,856,523	56.59	32,807	18.5
2001	1,146,438.31	559,281	520,941	0.4544	1,886,580	57.58	32,766	17.5
2002	799,821.05	368,042	342,812	0.4286	1,336,812	58.57	22,826	16.5
2003	666,618.59	288,263	268,502	0.4028	1,131,397	59.56	18,997	15.5
2004	443,731.85	179,563	167,253	0.3769	764,584	60.55	12,628	14.5
2005	614,162.54	231,463	215,595	0.3510	1,074,146	61.54	17,454	13.5
2006	1,360,078.15	474,741	442,196	0.3251	2,413,968	62.53	38,603	12.5
2007	532,990.37	171,203	159,466	0.2992	959,814	63.53	15,108	11.5

# Cascade Natural Gas Corporation

Account #: 376.1 - Mains - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 75  
Net Salvage: -110%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2008	2,211,173.90	648,645	604,178	0.2732	4,039,287	64.52	62,602	10.5
2009	1,539,404.53	408,657	380,642	0.2473	2,852,107	65.52	43,531	9.5
2010	635,803.87	151,045	140,690	0.2213	1,194,498	66.52	17,958	8.5
2011	528,775.29	110,859	103,259	0.1953	1,007,169	67.51	14,918	7.5
2012	2,964,251.69	538,676	501,748	0.1693	5,723,180	68.51	83,538	6.5
2013	3,376,983.49	519,334	483,732	0.1432	6,607,933	69.51	95,068	5.5
2014	6,404,158.40	805,897	750,650	0.1172	12,698,082	70.51	180,100	4.5
2015	5,473,111.42	535,728	499,002	0.0912	10,994,532	71.50	153,761	3.5
2016	4,816,994.89	336,809	313,719	0.0651	9,801,970	72.50	135,194	2.5
2017	6,792,239.17	284,951	265,417	0.0391	13,998,286	73.50	190,448	1.5
2018	7,629,748.83	106,649	99,338	0.0130	15,923,135	74.50	213,731	0.5
<b>TOTAL</b>	<b>155,217,589.59</b>	<b>115,054,967</b>	<b>107,167,551</b>		<b>218,789,387</b>		<b>4,586,467</b>	

COMPOSITE ANNUAL ACCRUAL RATE	2.95%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.69
COMPOSITE AVERAGE AGE (YEARS)	27.50
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	48.53

# Cascade Natural Gas Corporation

Account #: 376.2 - Mains - High Pressure

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R2.5

ASL: 85

Net Salvage: -25%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1957	859,264.54	647,768	800,038	0.9311	274,042	33.74	8,123	61.5
1958	267,791.67	199,225	246,056	0.9188	88,683	34.41	2,577	60.5
1959	51,217.00	37,590	46,427	0.9065	17,594	35.09	501	59.5
1960	137,934.64	99,839	123,308	0.8940	49,110	35.78	1,373	58.5
1961	562,293.45	401,248	495,569	0.8813	207,298	36.48	5,683	57.5
1962	50,560.00	35,557	43,916	0.8686	19,284	37.18	519	56.5
1963	568,077.82	393,598	486,120	0.8557	223,977	37.89	5,912	55.5
1964	13,261.00	9,049	11,176	0.8428	5,400	38.60	140	54.5
1965	130,137.74	87,420	107,970	0.8297	54,702	39.32	1,391	53.5
1966	354,031.02	234,032	289,046	0.8164	153,492	40.05	3,833	52.5
1967	185,772.42	120,801	149,197	0.8031	83,018	40.78	2,036	51.5
1968	468,534.23	299,574	369,995	0.7897	215,673	41.52	5,194	50.5
1969	62,240.36	39,113	48,308	0.7762	29,493	42.27	698	49.5
1970	70,111.46	43,286	53,461	0.7625	34,179	43.02	795	48.5
1971	2,934,434.21	1,778,987	2,197,173	0.7488	1,470,870	43.78	33,600	47.5
1972	327,712.47	194,996	240,834	0.7349	168,807	44.54	3,790	46.5
1973	203,292.00	118,665	146,560	0.7209	107,555	45.31	2,374	45.5
1974	30,785.19	17,619	21,761	0.7069	16,720	46.08	363	44.5
1975	13,461.00	7,550	9,325	0.6927	7,502	46.86	160	43.5
1976	12,999.00	7,141	8,819	0.6785	7,429	47.65	156	42.5
1979	234,146.00	120,402	148,705	0.6351	143,977	50.03	2,878	39.5
1980	308,073.00	154,766	191,146	0.6205	193,945	50.84	3,815	38.5
1981	602,288.16	295,387	364,824	0.6057	388,036	51.65	7,513	37.5
1982	1,609,484.00	770,043	951,057	0.5909	1,060,798	52.47	20,219	36.5
1983	1,591.00	742	916	0.5760	1,072	53.29	20	35.5
1985	202,971.90	89,713	110,801	0.5459	142,914	54.94	2,601	33.5

# Cascade Natural Gas Corporation

Account #: 376.2 - Mains - High Pressure

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R2.5

ASL: 85

Net Salvage: -25%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1986	2,112,020.11	907,558	1,120,897	0.5307	1,519,129	55.78	27,234	32.5
1987	954,895.19	398,535	492,219	0.5155	701,400	56.62	12,388	31.5
1988	260,682.53	105,560	130,374	0.5001	195,479	57.46	3,402	30.5
1989	1,258,275.07	493,803	609,881	0.4847	962,962	58.31	16,513	29.5
1990	286,016.61	108,655	134,196	0.4692	223,324	59.17	3,774	28.5
1991	817,411.50	300,214	370,785	0.4536	650,979	60.03	10,845	27.5
1992	9,326,728.05	3,307,235	4,084,664	0.4380	7,573,746	60.89	124,389	26.5
1993	14,028,381.10	4,795,758	5,923,093	0.4222	11,612,383	61.75	188,044	25.5
1994	2,056,482.39	676,697	835,768	0.4064	1,734,835	62.62	27,702	24.5
1995	7,624,674.00	2,410,872	2,977,594	0.3905	6,553,249	63.50	103,203	23.5
1996	2,047,819.07	621,053	767,043	0.3746	1,792,731	64.38	27,847	22.5
1997	11,786,927.66	3,421,771	4,226,124	0.3585	10,507,535	65.26	161,012	21.5
1998	2,215,249.63	614,235	758,622	0.3425	2,010,440	66.15	30,394	20.5
1999	4,858,655.75	1,283,624	1,585,364	0.3263	4,487,955	67.03	66,950	19.5
2000	1,299,915.82	326,349	403,063	0.3101	1,221,832	67.93	17,987	18.5
2001	457,059.71	108,718	134,274	0.2938	437,050	68.83	6,350	17.5
2002	651,966.10	146,449	180,874	0.2774	634,084	69.73	9,094	16.5
2003	49,804.31	10,526	13,000	0.2610	49,255	70.63	697	15.5
2004	1,710,345.75	338,662	418,271	0.2446	1,719,661	71.54	24,039	14.5
2005	1,714,139.99	316,473	390,866	0.2280	1,751,809	72.45	24,181	13.5
2006	3,291,351.70	563,465	695,918	0.2114	3,418,271	73.36	46,597	12.5
2007	712,383.90	112,360	138,772	0.1948	751,708	74.27	10,121	11.5
2008	9,919,960.67	1,430,555	1,766,835	0.1781	10,633,116	75.19	141,410	10.5
2009	3,054,892.26	399,138	492,963	0.1614	3,325,652	76.12	43,692	9.5
2010	4,495,182.21	526,213	649,909	0.1446	4,969,069	77.04	64,500	8.5
2011	3,771,032.09	390,011	481,691	0.1277	4,232,100	77.97	54,280	7.5

# Cascade Natural Gas Corporation

Account #: 376.2 - Mains - High Pressure

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R2.5  
ASL: 85  
Net Salvage: -25%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2012	14,431,185.06	1,295,159	1,599,611	0.1108	16,439,370	78.90	208,364	6.5
2013	3,852,402.22	292,920	361,776	0.0939	4,453,727	79.83	55,790	5.5
2014	3,133,825.72	195,203	241,089	0.0769	3,676,193	80.76	45,518	4.5
2015	6,371,857.81	309,089	381,746	0.0599	7,583,076	81.70	92,814	3.5
2016	14,543,184.63	504,549	623,153	0.0428	17,555,828	82.64	212,435	2.5
2017	11,337,624.90	236,305	291,853	0.0257	13,880,178	83.58	166,065	1.5
2018	14,843,478.03	103,327	127,616	0.0086	18,426,731	84.53	217,999	0.5
<b>TOTAL</b>	<b>169,538,276.82</b>	<b>33,255,150</b>	<b>41,072,416</b>		<b>170,850,430</b>		<b>2,361,896</b>	

COMPOSITE ANNUAL ACCRUAL RATE	1.39%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.24
COMPOSITE AVERAGE AGE (YEARS)	14.69
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	71.66



# Cascade Natural Gas Corporation

Account #: 376.3 - Mains - Plastic (Polyethylene)

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 45  
Net Salvage: -35%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1981	48,398.51	49,350	43,516	0.8991	21,822	11.01	1,982	37.5
1982	66,284.82	66,216	58,387	0.8809	31,097	11.70	2,658	36.5
1984	60,702.93	58,040	51,179	0.8431	30,770	13.13	2,344	34.5
1985	185,859.40	173,593	153,070	0.8236	97,840	13.87	7,056	33.5
1986	58,498.66	53,314	47,011	0.8036	31,962	14.62	2,186	32.5
1987	1,435,787.87	1,275,332	1,124,555	0.7832	813,758	15.39	52,870	31.5
1988	895,936.60	774,615	683,036	0.7624	526,479	16.18	32,538	30.5
1989	383,141.90	322,007	283,938	0.7411	233,304	16.99	13,736	29.5
1990	1,434,743.39	1,170,476	1,032,096	0.7194	904,808	17.81	50,814	28.5
1991	2,488,311.23	1,967,534	1,734,921	0.6972	1,624,299	18.64	87,127	27.5
1992	4,025,092.22	3,079,788	2,715,680	0.6747	2,718,195	19.50	139,430	26.5
1993	4,098,970.11	3,029,715	2,671,526	0.6518	2,862,084	20.36	140,560	25.5
1994	3,947,603.32	2,813,558	2,480,924	0.6285	2,848,340	21.24	134,087	24.5
1995	3,440,940.48	2,360,228	2,081,189	0.6048	2,564,080	22.14	115,834	23.5
1996	3,540,668.33	2,332,464	2,056,708	0.5809	2,723,194	23.04	118,188	22.5
1997	6,486,200.86	4,094,406	3,610,344	0.5566	5,146,027	23.96	214,790	21.5
1998	5,509,204.76	3,324,404	2,931,375	0.5321	4,506,051	24.89	181,069	20.5
1999	5,082,782.85	2,924,250	2,578,529	0.5073	4,283,228	25.82	165,872	19.5
2000	5,112,660.48	2,796,453	2,465,842	0.4823	4,436,250	26.77	165,731	18.5
2001	5,379,072.52	2,788,359	2,458,705	0.4571	4,803,043	27.72	173,264	17.5
2002	5,298,922.47	2,594,177	2,287,479	0.4317	4,866,066	28.68	169,661	16.5
2003	4,167,935.00	1,919,670	1,692,716	0.4061	3,933,996	29.65	132,693	15.5
2004	6,676,627.28	2,880,525	2,539,974	0.3804	6,473,472	30.62	211,421	14.5
2005	6,581,936.47	2,646,911	2,333,979	0.3546	6,551,635	31.60	207,363	13.5
2006	5,080,318.84	1,893,609	1,669,736	0.3287	5,188,694	32.58	159,282	12.5
2007	7,516,042.28	2,579,637	2,274,658	0.3026	7,871,999	33.56	234,569	11.5

# Cascade Natural Gas Corporation

Account #: 376.3 - Mains - Plastic (Polyethylene)

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 45  
Net Salvage: -35%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2008	6,219,978.24	1,950,662	1,720,045	0.2765	6,676,926	34.55	193,275	10.5
2009	2,593,267.03	736,313	649,262	0.2504	2,851,648	35.54	80,248	9.5
2010	180,017.50	45,758	40,349	0.2241	202,675	36.53	5,549	8.5
2011	438,203.50	98,329	86,704	0.1979	504,870	37.52	13,456	7.5
2012	4,984,652.49	969,776	855,124	0.1716	5,874,156	38.51	152,516	6.5
2013	5,690,115.94	937,039	826,257	0.1452	6,855,399	39.51	173,507	5.5
2014	6,332,706.28	853,496	752,592	0.1188	7,796,562	40.51	192,472	4.5
2015	13,292,995.30	1,393,771	1,228,992	0.0925	16,716,552	41.50	402,760	3.5
2016	14,376,322.84	1,076,880	949,565	0.0661	18,458,471	42.50	434,285	2.5
2017	21,956,716.87	986,934	870,253	0.0396	28,771,315	43.50	661,384	1.5
2018	16,593,358.03	248,579	219,191	0.0132	22,181,843	44.50	498,461	0.5
<b>TOTAL</b>	<b>181,660,977.60</b>	<b>59,266,169</b>	<b>52,259,408</b>		<b>192,982,912</b>		<b>5,725,035</b>	

COMPOSITE ANNUAL ACCRUAL RATE	3.15%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.29
COMPOSITE AVERAGE AGE (YEARS)	11.09
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	34.13

# Cascade Natural Gas Corporation

Account #: 377.0 - Compressor Station Equip.

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R3  
ASL: 35  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2002	1,990,220.44	915,613	1,437,711	0.7224	652,020	19.66	33,157	16.5
2005	7,543.34	2,884	4,529	0.6004	3,392	22.25	152	13.5
2007	2,966.80	975	1,531	0.5162	1,584	24.04	66	11.5
2014	97,036.19	12,785	20,075	0.2069	81,813	30.61	2,673	4.5
<b>TOTAL</b>	<b>2,097,766.77</b>	<b>932,258</b>	<b>1,463,847</b>		<b>738,808</b>		<b>36,048</b>	

COMPOSITE ANNUAL ACCRUAL RATE	1.72%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.70
COMPOSITE AVERAGE AGE (YEARS)	15.93
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	20.19

# Cascade Natural Gas Corporation

Account #: 378.0 - Meas. And Reg. Station Equip. - General

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R1.5

ASL: 65

Net Salvage: -40%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1953	2,039.12	1,948	2,745	1.3464	109	20.65	5	65.5
1957	142,684.48	130,363	183,754	1.2878	16,004	22.58	709	61.5
1958	13,308.02	12,015	16,936	1.2726	1,695	23.08	73	60.5
1959	4,374.01	3,901	5,499	1.2571	625	23.59	26	59.5
1960	30,375.03	26,751	37,707	1.2414	4,818	24.11	200	58.5
1961	58,307.55	50,690	71,451	1.2254	10,180	24.64	413	57.5
1962	60,403.67	51,818	73,041	1.2092	11,524	25.17	458	56.5
1963	48,306.86	40,877	57,619	1.1928	10,011	25.71	389	55.5
1964	40,315.22	33,638	47,414	1.1761	9,027	26.26	344	54.5
1965	39,737.30	32,679	46,062	1.1592	9,570	26.82	357	53.5
1966	30,367.48	24,604	34,680	1.1420	7,834	27.38	286	52.5
1967	50,827.19	40,554	57,163	1.1247	13,995	27.96	501	51.5
1968	29,642.74	23,281	32,816	1.1071	8,684	28.54	304	50.5
1969	26,643.08	20,588	29,021	1.0892	8,280	29.12	284	49.5
1970	114,586.20	87,080	122,744	1.0712	37,677	29.72	1,268	48.5
1971	25,534.21	19,074	26,886	1.0529	8,862	30.32	292	47.5
1972	24,324.26	17,851	25,162	1.0345	8,892	30.93	288	46.5
1973	21,811.62	15,718	22,156	1.0158	8,380	31.54	266	45.5
1974	146,097.64	103,325	145,643	0.9969	58,894	32.16	1,831	44.5
1975	60,219.18	41,774	58,883	0.9778	25,424	32.79	775	43.5
1976	36,917.07	25,104	35,385	0.9585	16,299	33.43	488	42.5
1977	13,396.71	8,925	12,580	0.9390	6,176	34.07	181	41.5
1978	48,948.66	31,925	45,000	0.9193	23,528	34.72	678	40.5
1979	82,492.83	52,640	74,199	0.8995	41,291	35.37	1,167	39.5
1980	28,034.16	17,490	24,653	0.8794	14,595	36.03	405	38.5
1981	142,746.82	87,007	122,641	0.8592	77,205	36.70	2,104	37.5

# Cascade Natural Gas Corporation

Account #: 378.0 - Meas. And Reg. Station Equip. - General

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R1.5

ASL: 65

Net Salvage: -40%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1982	188,713.53	112,291	158,281	0.8387	105,918	37.37	2,834	36.5
1983	101,894.39	59,142	83,363	0.8181	59,289	38.05	1,558	35.5
1984	207,970.05	117,648	165,831	0.7974	125,327	38.74	3,235	34.5
1985	188,132.48	103,630	146,073	0.7764	117,313	39.43	2,976	33.5
1986	189,161.25	101,368	142,884	0.7554	121,942	40.12	3,039	32.5
1987	276,064.97	143,773	202,656	0.7341	183,835	40.82	4,504	31.5
1988	66,775.63	33,763	47,590	0.7127	45,896	41.53	1,105	30.5
1989	57,327.27	28,108	39,620	0.6911	40,638	42.24	962	29.5
1990	79,846.03	37,920	53,451	0.6694	58,334	42.95	1,358	28.5
1991	138,543.97	63,649	89,717	0.6476	104,245	43.67	2,387	27.5
1992	289,580.70	128,521	181,157	0.6256	224,256	44.39	5,051	26.5
1993	764,335.64	327,230	461,248	0.6035	608,821	45.12	13,493	25.5
1994	177,348.35	73,127	103,076	0.5812	145,211	45.86	3,167	24.5
1995	264,578.01	104,894	147,854	0.5588	222,555	46.59	4,777	23.5
1996	859,676.61	327,097	461,062	0.5363	742,485	47.33	15,686	22.5
1997	1,095,132.73	399,111	562,570	0.5137	970,616	48.08	20,188	21.5
1998	1,132,742.50	394,533	556,117	0.4909	1,029,723	48.83	21,088	20.5
1999	128,139.07	42,553	59,981	0.4681	119,413	49.58	2,408	19.5
2000	412,452.89	130,244	183,587	0.4451	393,847	50.34	7,824	18.5
2001	341,274.71	102,180	144,028	0.4220	333,757	51.10	6,532	17.5
2002	91,890.98	26,000	36,648	0.3988	91,999	51.86	1,774	16.5
2003	153,387.84	40,863	57,599	0.3755	157,144	52.63	2,986	15.5
2004	1,946,602.72	486,235	685,375	0.3521	2,039,868	53.40	38,198	14.5
2005	725,222.11	169,043	238,275	0.3286	777,035	54.18	14,342	13.5
2006	489,328.44	105,850	149,201	0.3049	535,858	54.96	9,751	12.5
2007	855,178.49	170,576	240,437	0.2812	956,813	55.74	17,166	11.5

# Cascade Natural Gas Corporation

Account #: 378.0 - Meas. And Reg. Station Equip. - General

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R1.5

ASL: 65

Net Salvage: -40%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2008	2,791,282.61	509,503	718,174	0.2573	3,189,622	56.53	56,428	10.5
2009	2,068,721.81	342,420	482,660	0.2333	2,413,551	57.32	42,110	9.5
2010	405,845.25	60,244	84,917	0.2092	483,267	58.11	8,317	8.5
2011	452,677.92	59,424	83,761	0.1850	549,988	58.91	9,337	7.5
2012	1,921,920.93	219,170	308,932	0.1607	2,381,757	59.71	39,892	6.5
2013	905,221.63	87,546	123,401	0.1363	1,143,909	60.51	18,905	5.5
2014	1,404,293.15	111,392	157,013	0.1118	1,808,997	61.32	29,502	4.5
2015	2,534,054.88	156,724	220,911	0.0872	3,326,766	62.13	53,547	3.5
2016	2,568,336.57	113,783	160,383	0.0624	3,435,288	62.94	54,578	2.5
2017	3,667,053.84	97,825	137,889	0.0376	4,995,986	63.76	78,354	1.5
2018	1,778,784.68	15,970	22,511	0.0127	2,467,788	64.58	38,211	0.5
<b>TOTAL</b>	<b>33,041,935.74</b>	<b>6,604,969</b>	<b>9,310,074</b>		<b>36,948,636</b>		<b>651,661</b>	

COMPOSITE ANNUAL ACCRUAL RATE 1.97%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.28

COMPOSITE AVERAGE AGE (YEARS) 11.87

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 55.72

# Cascade Natural Gas Corporation

Account #: 380.1 - Services - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 60  
Net Salvage: -160%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1953	6,116.00	14,156	15,902	2.6000	0	6.59	0	65.5
1956	64,168.18	145,417	166,837	2.6000	0	7.70	0	62.5
1957	56,268.28	126,502	146,298	2.6000	0	8.12	0	61.5
1958	94,345.03	210,313	244,043	2.5867	1,254	8.56	147	60.5
1959	90,598.91	200,137	232,235	2.5633	3,322	9.02	368	59.5
1960	205,428.47	449,417	521,495	2.5386	12,619	9.51	1,326	58.5
1961	443,610.80	960,520	1,114,569	2.5125	38,819	10.03	3,869	57.5
1962	459,465.83	983,968	1,141,777	2.4850	52,834	10.58	4,994	56.5
1963	299,798.41	634,580	736,354	2.4562	43,122	11.15	3,866	55.5
1964	477,108.09	997,539	1,157,525	2.4261	82,956	11.75	7,060	54.5
1965	598,152.18	1,234,531	1,432,525	2.3949	122,670	12.37	9,916	53.5
1966	654,681.61	1,333,020	1,546,810	2.3627	155,362	13.01	11,940	52.5
1967	831,996.40	1,670,382	1,938,279	2.3297	224,912	13.67	16,454	51.5
1968	1,168,439.54	2,311,870	2,682,649	2.2959	355,294	14.34	24,776	50.5
1969	1,152,418.47	2,246,042	2,606,264	2.2616	390,025	15.02	25,961	49.5
1970	643,321.18	1,234,479	1,432,465	2.2267	240,170	15.72	15,281	48.5
1971	889,587.69	1,679,842	1,949,256	2.1912	363,672	16.42	22,144	47.5
1972	884,539.35	1,642,794	1,906,267	2.1551	393,536	17.14	22,959	46.5
1973	893,837.58	1,631,818	1,893,530	2.1184	430,448	17.87	24,088	45.5
1974	900,263.68	1,614,602	1,873,553	2.0811	467,133	18.61	25,098	44.5
1975	661,994.12	1,165,614	1,352,556	2.0432	368,629	19.37	19,034	43.5
1976	712,011.67	1,230,023	1,427,295	2.0046	423,935	20.13	21,056	42.5
1977	436,102.50	738,644	857,108	1.9654	276,759	20.91	13,233	41.5
1978	917,241.01	1,522,056	1,766,164	1.9255	618,663	21.71	28,501	40.5
1979	1,089,598.71	1,770,079	2,053,965	1.8851	778,992	22.51	34,605	39.5
1980	1,441,535.20	2,290,766	2,658,160	1.8440	1,089,831	23.33	46,718	38.5

# Cascade Natural Gas Corporation

Account #: 380.1 - Services - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 60  
Net Salvage: -160%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1981	1,406,173.78	2,184,034	2,534,310	1.8023	1,121,742	24.16	46,435	37.5
1982	1,255,782.79	1,904,715	2,210,194	1.7600	1,054,841	25.00	42,197	36.5
1983	1,008,213.69	1,491,983	1,731,268	1.7172	890,088	25.85	34,433	35.5
1984	1,285,472.48	1,854,183	2,151,558	1.6737	1,190,671	26.71	44,572	34.5
1985	1,561,091.48	2,192,655	2,544,315	1.6298	1,514,523	27.59	54,900	33.5
1986	1,681,538.33	2,297,427	2,665,890	1.5854	1,706,110	28.47	59,925	32.5
1987	2,551,042.87	3,386,601	3,929,745	1.5404	2,702,966	29.36	92,049	31.5
1988	2,676,169.16	3,448,053	4,001,053	1.4951	2,956,987	30.27	97,697	30.5
1989	3,457,893.48	4,318,677	5,011,308	1.4492	3,979,215	31.18	127,627	29.5
1990	4,192,093.27	5,068,550	5,881,447	1.4030	5,017,996	32.10	156,332	28.5
1991	5,459,898.66	6,382,064	7,405,622	1.3564	6,790,115	33.03	205,603	27.5
1992	5,224,786.62	5,895,654	6,841,201	1.3094	6,743,244	33.96	198,564	26.5
1993	5,530,859.50	6,015,403	6,980,156	1.2620	7,400,078	34.90	212,028	25.5
1994	6,417,123.81	6,715,893	7,792,991	1.2144	8,891,531	35.85	248,030	24.5
1995	6,190,011.15	6,222,531	7,220,504	1.1665	8,873,525	36.80	241,116	23.5
1996	4,196,356.51	4,044,097	4,692,691	1.1183	6,217,836	37.76	164,666	22.5
1997	2,956,312.00	2,725,662	3,162,805	1.0698	4,523,606	38.72	116,818	21.5
1998	352,580.00	310,288	360,052	1.0212	556,656	39.69	14,025	20.5
1999	170,164.54	142,588	165,456	0.9723	276,971	40.66	6,811	19.5
2000	146,383.14	116,475	135,156	0.9233	245,441	41.64	5,895	18.5
2001	129,750.53	97,740	113,415	0.8741	223,936	42.62	5,255	17.5
2002	68,764.58	48,875	56,714	0.8248	122,074	43.60	2,800	16.5
2003	85,035.18	56,815	65,927	0.7753	155,165	44.58	3,480	15.5
2004	53,215.44	33,281	38,618	0.7257	99,742	45.57	2,189	14.5
2005	74,870.82	43,618	50,613	0.6760	144,051	46.56	3,094	13.5
2006	103,997.71	56,125	65,127	0.6262	205,267	47.55	4,317	12.5



# Cascade Natural Gas Corporation

Account #: 380.1 - Services - Steel

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R4  
ASL: 60  
Net Salvage: -160%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2007	102,333.72	50,831	58,983	0.5764	207,085	48.54	4,267	11.5
2008	129,815.59	58,896	68,342	0.5265	269,178	49.53	5,435	10.5
2009	53,279.24	21,878	25,386	0.4765	113,140	50.52	2,239	9.5
2010	30,461.98	11,195	12,990	0.4264	66,211	51.52	1,285	8.5
2011	29,091.25	9,436	10,949	0.3764	64,688	52.51	1,232	7.5
2012	49,851.11	14,017	16,265	0.3263	113,348	53.51	2,118	6.5
2013	67,623.34	16,092	18,672	0.2761	157,148	54.51	2,883	5.5
2014	41,208.14	8,024	9,311	0.2260	97,830	55.51	1,763	4.5
2015	87,036.78	13,184	15,298	0.1758	210,997	56.50	3,734	3.5
2016	127,657.71	13,814	16,029	0.1256	315,881	57.50	5,493	2.5
2017	29,693.00	1,928	2,237	0.0753	74,965	58.50	1,281	1.5
2018	89,346.12	1,933	2,243	0.0251	230,057	59.50	3,866	0.5
<b>TOTAL</b>	<b>75,145,608.39</b>	<b>97,314,326</b>	<b>112,918,721</b>		<b>82,459,861</b>		<b>2,609,846</b>	

COMPOSITE ANNUAL ACCRUAL RATE	3.47%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	1.50
COMPOSITE AVERAGE AGE (YEARS)	31.19
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	30.12

# Cascade Natural Gas Corporation

Account #: 380.3 - Services - Plastic (Polyethylene)

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: S4

ASL: 35

Net Salvage: -40%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1981	14,065.15	17,406	15,598	1.1090	4,093	4.06	1,008	37.5
1982	1,137.22	1,393	1,248	1.0977	344	4.38	79	36.5
1983	1,589.67	1,925	1,725	1.0853	500	4.72	106	35.5
1984	7,468.19	8,933	8,005	1.0719	2,450	5.10	481	34.5
1985	7,038.61	8,304	7,442	1.0573	2,412	5.50	438	33.5
1986	34,820.90	40,465	36,263	1.0414	12,487	5.95	2,100	32.5
1987	137,180.77	156,770	140,488	1.0241	51,565	6.43	8,019	31.5
1988	135,947.25	152,507	136,668	1.0053	53,658	6.95	7,715	30.5
1989	188,545.64	207,223	185,701	0.9849	78,263	7.52	10,402	29.5
1990	485,062.63	521,194	467,064	0.9629	212,023	8.14	26,054	28.5
1991	1,053,705.49	1,104,338	989,644	0.9392	485,543	8.80	55,183	27.5
1992	1,803,542.45	1,839,149	1,648,140	0.9138	876,819	9.51	92,234	26.5
1993	2,002,251.58	1,981,419	1,775,635	0.8868	1,027,517	10.26	100,147	25.5
1994	2,785,863.68	2,667,993	2,390,903	0.8582	1,509,306	11.06	136,493	24.5
1995	2,646,161.87	2,445,367	2,191,399	0.8281	1,513,228	11.90	127,194	23.5
1996	2,520,379.89	2,240,840	2,008,114	0.7968	1,520,418	12.77	119,036	22.5
1997	5,034,275.36	4,293,201	3,847,322	0.7642	3,200,663	13.68	233,964	21.5
1998	7,381,534.13	6,019,258	5,394,116	0.7308	4,940,032	14.61	338,039	20.5
1999	6,317,577.70	4,910,428	4,400,446	0.6965	4,444,163	15.57	285,461	19.5
2000	5,133,330.15	3,790,687	3,396,997	0.6618	3,789,665	16.54	229,137	18.5
2001	5,619,927.55	3,929,295	3,521,210	0.6266	4,346,689	17.52	248,089	17.5
2002	7,044,225.96	4,646,275	4,163,727	0.5911	5,698,190	18.51	307,838	16.5
2003	6,853,372.44	4,247,786	3,806,623	0.5554	5,788,098	19.50	296,753	15.5
2004	8,438,666.05	4,893,754	4,385,503	0.5197	7,428,629	20.50	362,337	14.5
2005	6,119,481.93	3,304,338	2,961,159	0.4839	5,606,115	21.50	260,740	13.5
2006	5,247,402.82	2,623,650	2,351,166	0.4481	4,995,198	22.50	222,006	12.5

# Cascade Natural Gas Corporation

Account #: 380.3 - Services - Plastic (Polyethylene)

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S4  
ASL: 35  
Net Salvage: -40%  
Truncation Year:

Year	Original Cost	Calculated Depreciation	Accumulated Depreciation	Allocated Actual Booked Amount	Actual Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2007	8,560,376.09	3,937,750	3,937,750	3,528,787	0.4122	8,455,739	23.50	359,818	11.5
2008	6,434,834.73	2,702,627	6,640,377	2,421,940	0.3764	6,586,829	24.50	268,850	10.5
2009	3,366,696.40	1,279,344	7,919,721	1,146,475	0.3405	3,566,900	25.50	139,878	9.5
2010	2,006,738.25	682,291	8,602,012	611,430	0.3047	2,198,003	26.50	82,944	8.5
2011	3,101,014.90	930,304	9,532,316	833,686	0.2688	3,507,735	27.50	127,554	7.5
2012	4,141,588.52	1,076,813	10,609,129	964,978	0.2330	4,833,246	28.50	169,588	6.5
2013	7,977,934.81	1,755,146	12,364,275	1,572,861	0.1972	9,596,247	29.50	325,297	5.5
2014	6,278,170.68	1,130,071	13,494,346	1,012,705	0.1613	7,776,734	30.50	254,975	4.5
2015	10,928,277.05	1,529,959	15,024,305	1,371,062	0.1255	13,928,526	31.50	442,175	3.5
2016	9,352,740.92	935,274	15,959,579	838,139	0.0896	12,255,698	32.50	377,098	2.5
2017	13,550,375.96	813,022	16,772,601	728,584	0.0538	18,241,942	33.50	544,536	1.5
2018	21,578,347.29	431,567	17,204,168	386,745	0.0179	29,822,941	34.50	864,433	0.5
<b>TOTAL</b>	<b>174,291,650.68</b>	<b>73,258,064</b>	<b>172,762,132</b>	<b>65,649,703</b>		<b>178,358,608</b>		<b>7,428,198</b>	

COMPOSITE ANNUAL ACCRUAL RATE	4.26%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.38
COMPOSITE AVERAGE AGE (YEARS)	10.58
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	24.49

# Cascade Natural Gas Corporation

Account #: 381.0 - Meters

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S0.5  
ASL: 40  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1957	33,921.91	29,990	27,544	0.8120	8,074	6.32	1,278	61.5
1958	22,174.52	19,406	17,823	0.8038	5,460	6.66	820	60.5
1959	29,331.22	25,404	23,332	0.7955	7,466	7.01	1,066	59.5
1960	27,865.63	23,882	21,934	0.7871	7,325	7.35	996	58.5
1961	36,475.66	30,928	28,405	0.7787	9,894	7.70	1,285	57.5
1962	60,948.01	51,117	46,947	0.7703	17,048	8.05	2,118	56.5
1963	50,176.69	41,617	38,223	0.7618	14,463	8.40	1,721	55.5
1964	94,347.37	77,370	71,059	0.7532	28,005	8.76	3,197	54.5
1965	123,281.94	99,934	91,783	0.7445	37,663	9.12	4,130	53.5
1966	128,585.24	103,008	94,606	0.7357	40,408	9.48	4,261	52.5
1967	174,161.89	137,844	126,601	0.7269	56,269	9.85	5,713	51.5
1968	172,813.47	135,098	124,079	0.7180	57,375	10.22	5,615	50.5
1969	178,882.03	138,086	126,823	0.7090	61,003	10.59	5,759	49.5
1970	294,220.40	224,201	205,914	0.6999	103,017	10.97	9,390	48.5
1971	234,160.05	176,084	161,722	0.6906	84,146	11.35	7,412	47.5
1972	387,614.15	287,544	264,091	0.6813	142,904	11.74	12,173	46.5
1973	476,648.75	348,696	320,255	0.6719	180,226	12.13	14,857	45.5
1974	495,924.11	357,639	328,469	0.6623	192,252	12.53	15,347	44.5
1975	314,452.13	223,457	205,231	0.6527	124,944	12.93	9,664	43.5
1976	271,022.98	189,703	174,230	0.6429	110,344	13.34	8,275	42.5
1977	210,882.41	145,326	133,473	0.6329	87,954	13.75	6,398	41.5
1978	224,046.77	151,941	139,548	0.6229	95,701	14.17	6,756	40.5
1979	255,973.59	170,745	156,818	0.6126	111,954	14.59	7,674	39.5
1980	298,340.88	195,638	179,680	0.6023	133,578	15.02	8,894	38.5
1981	316,801.78	204,113	187,465	0.5917	145,177	15.46	9,393	37.5
1982	343,296.79	217,189	199,474	0.5811	160,987	15.90	10,126	36.5

# Cascade Natural Gas Corporation

Account #: 381.0 - Meters

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S0.5  
ASL: 40  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1983	206,748.55	128,357	117,888	0.5702	99,198	16.35	6,068	35.5
1984	190,237.60	115,822	106,375	0.5592	93,375	16.81	5,556	34.5
1985	326,647.29	194,883	178,987	0.5480	163,992	17.27	9,495	33.5
1986	446,653.72	260,934	239,651	0.5365	229,335	17.74	12,924	32.5
1987	602,797.32	344,538	316,435	0.5249	316,502	18.23	17,365	31.5
1988	827,339.45	462,241	424,538	0.5131	444,168	18.72	23,732	30.5
1989	1,025,427.20	559,491	513,857	0.5011	562,842	19.21	29,292	29.5
1990	941,659.73	501,233	460,350	0.4889	528,393	19.72	26,791	28.5
1991	1,264,073.02	655,679	602,199	0.4764	725,078	20.24	35,824	27.5
1992	1,469,774.93	742,030	681,506	0.4637	861,757	20.77	41,496	26.5
1993	1,472,419.82	722,582	663,645	0.4507	882,396	21.30	41,417	25.5
1994	1,898,722.15	904,452	830,680	0.4375	1,162,978	21.85	53,217	24.5
1995	1,814,502.79	837,680	769,355	0.4240	1,135,873	22.41	50,679	23.5
1996	1,368,637.30	611,322	561,460	0.4102	875,610	22.98	38,096	22.5
1997	1,698,497.75	732,657	672,898	0.3962	1,110,525	23.57	47,121	21.5
1998	2,296,122.51	954,543	876,686	0.3818	1,534,243	24.16	63,495	20.5
1999	1,920,458.21	767,691	705,074	0.3671	1,311,407	24.77	52,940	19.5
2000	2,303,748.46	883,292	811,247	0.3521	1,607,689	25.39	63,311	18.5
2001	2,467,667.73	904,947	831,135	0.3368	1,759,916	26.03	67,612	17.5
2002	2,406,952.44	841,590	772,945	0.3211	1,754,355	26.68	65,755	16.5
2003	2,502,827.48	831,401	763,588	0.3051	1,864,381	27.35	68,179	15.5
2004	8,188,712.10	2,573,827	2,363,893	0.2887	6,234,255	28.03	222,444	14.5
2005	5,275,060.29	1,561,538	1,434,171	0.2719	4,104,642	28.72	142,905	13.5
2006	2,903,928.58	805,250	739,570	0.2547	2,309,555	29.44	78,459	12.5
2007	2,288,931.58	590,822	542,631	0.2371	1,860,747	30.17	61,682	11.5
2008	5,250,608.20	1,252,173	1,150,039	0.2190	4,363,099	30.91	141,132	10.5

# Cascade Natural Gas Corporation

Account #: 381.0 - Meters

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S0.5  
ASL: 40  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2009	1,419,299.03	309,922	284,643	0.2006	1,205,621	31.68	38,055	9.5
2010	744,353.38	147,195	135,189	0.1816	646,382	32.47	19,909	8.5
2011	1,221,855.19	215,812	198,210	0.1622	1,084,738	33.27	32,603	7.5
2012	848,086.58	131,435	120,715	0.1423	769,776	34.10	22,577	6.5
2013	1,595,155.89	211,820	194,543	0.1220	1,480,371	34.94	42,367	5.5
2014	2,347,478.04	258,320	237,250	0.1011	2,227,602	35.81	62,210	4.5
2015	2,254,023.00	195,458	179,515	0.0796	2,187,209	36.70	59,603	3.5
2016	6,100,835.40	383,048	351,805	0.0577	6,054,072	37.61	160,978	2.5
2017	4,019,901.07	153,637	141,105	0.0351	4,079,791	38.54	105,848	1.5
2018	19,509,284.41	252,576	231,975	0.0119	20,252,774	39.51	512,640	0.5
<b>TOTAL</b>	<b>98,675,778.56</b>	<b>25,806,156</b>	<b>23,701,282</b>		<b>79,908,285</b>		<b>2,688,093</b>	

COMPOSITE ANNUAL ACCRUAL RATE	2.72%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.24
COMPOSITE AVERAGE AGE (YEARS)	13.11
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	30.04

# Cascade Natural Gas Corporation

Account #: 383.0 - Regulators

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R2  
ASL: 42  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1965	157.94	131	129	0.8152	29	7.03	4	53.5
1966	18,312.25	15,098	14,784	0.8073	3,529	7.37	479	52.5
1967	32,164.33	26,253	25,707	0.7992	6,458	7.72	837	51.5
1968	21,086.67	17,032	16,677	0.7909	4,409	8.08	546	50.5
1969	31,565.33	25,219	24,694	0.7823	6,872	8.44	814	49.5
1970	47,807.77	37,762	36,976	0.7734	10,832	8.83	1,227	48.5
1971	43,271.88	33,774	33,071	0.7643	10,201	9.22	1,107	47.5
1973	78,733.12	59,903	58,656	0.7450	20,077	10.04	1,999	45.5
1974	126,886.51	95,232	93,249	0.7349	33,638	10.48	3,210	44.5
1975	28,730.49	21,257	20,814	0.7245	7,916	10.93	725	43.5
1976	7,812.82	5,695	5,576	0.7137	2,237	11.39	196	42.5
1977	3,255.52	2,336	2,287	0.7026	968	11.86	82	41.5
1978	48,498.41	34,236	33,523	0.6912	14,975	12.35	1,212	40.5
1979	20,740.06	14,392	14,092	0.6795	6,648	12.86	517	39.5
1980	118,689.13	80,897	79,212	0.6674	39,477	13.37	2,952	38.5
1981	35,514.93	23,756	23,262	0.6550	12,253	13.91	881	37.5
1982	37,452.91	24,566	24,054	0.6423	13,398	14.45	927	36.5
1983	31,941.60	20,525	20,098	0.6292	11,844	15.01	789	35.5
1984	70,421.17	44,289	43,367	0.6158	27,054	15.59	1,736	34.5
1985	136,281.35	83,805	82,060	0.6021	54,221	16.17	3,353	33.5
1986	141,644.98	85,078	83,307	0.5881	58,338	16.77	3,478	32.5
1987	182,233.43	106,797	104,574	0.5738	77,660	17.39	4,467	31.5
1988	98,539.21	56,278	55,107	0.5592	43,433	18.01	2,411	30.5
1989	133,023.91	73,951	72,411	0.5443	60,613	18.65	3,250	29.5
1990	250,288.05	135,261	132,445	0.5292	117,844	19.30	6,105	28.5
1991	402,678.25	211,256	206,858	0.5137	195,821	19.97	9,808	27.5

# Cascade Natural Gas Corporation

Account #: 383.0 - Regulators

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R2

ASL: 42

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1992	475,378.80	241,762	236,728	0.4980	238,651	20.64	11,562	26.5
1993	418,014.19	205,755	201,471	0.4820	216,543	21.33	10,154	25.5
1994	533,988.05	253,970	248,682	0.4657	285,306	22.02	12,954	24.5
1995	415,826.01	190,758	186,786	0.4492	229,040	22.73	10,075	23.5
1996	513,227.22	226,647	221,928	0.4324	291,299	23.45	12,421	22.5
1997	672,717.51	285,393	279,450	0.4154	393,267	24.18	16,263	21.5
1998	706,786.01	287,392	281,408	0.3982	425,378	24.92	17,068	20.5
1999	417,207.11	162,191	158,814	0.3807	258,393	25.67	10,065	19.5
2000	238,053.25	88,239	86,402	0.3630	151,652	26.43	5,737	18.5
2001	429,025.94	151,164	148,017	0.3450	281,009	27.20	10,331	17.5
2002	87,244.92	29,122	28,516	0.3268	58,729	27.98	2,099	16.5
2003	65,697.46	20,697	20,266	0.3085	45,431	28.77	1,579	15.5
2004	122,427.85	36,246	35,492	0.2899	86,936	29.57	2,940	14.5
2005	102,406.54	28,355	27,764	0.2711	74,642	30.37	2,458	13.5
2006	119,075.46	30,662	30,023	0.2521	89,052	31.19	2,856	12.5
2007	128,006.96	30,454	29,820	0.2330	98,187	32.01	3,068	11.5
2008	212,455.88	46,345	45,380	0.2136	167,076	32.84	5,088	10.5
2009	197,576.88	39,154	38,338	0.1940	159,238	33.68	4,728	9.5
2010	180,822.77	32,190	31,520	0.1743	149,303	34.52	4,325	8.5
2011	197,968.31	31,218	30,568	0.1544	167,400	35.38	4,732	7.5
2012	253,257.10	34,743	34,020	0.1343	219,237	36.24	6,050	6.5
2013	250,042.95	29,134	28,527	0.1141	221,516	37.11	5,970	5.5
2014	249,216.55	23,844	23,347	0.0937	225,869	37.98	5,947	4.5
2015	197,566.63	14,753	14,446	0.0731	183,120	38.86	4,712	3.5
2016	246,092.93	13,172	12,898	0.0524	233,195	39.75	5,866	2.5
2017	633,661.27	20,415	19,990	0.0315	613,671	40.65	15,098	1.5



# Cascade Natural Gas Corporation

Account #: 383.0 - Regulators

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R2  
ASL: 42  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2018	948,958.53	10,221	10,008	0.0105	938,951	41.55	22,599	0.5
<b>TOTAL</b>	11,160,435.10	3,898,780	3,817,600		7,342,835		269,856	

COMPOSITE ANNUAL ACCRUAL RATE	2.42%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.34
COMPOSITE AVERAGE AGE (YEARS)	18.23
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	27.33

# Cascade Natural Gas Corporation

Account #: 385.0 - Industrial Meas. & Reg. Station Equip.

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION  
 BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
 Survivor Curve: R2  
 ASL: 43  
 Net Salvage: -5%  
 Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1961	24,699.02	22,118	25,934	1.0500	0	6.33	0	57.5
1966	4,689.50	4,010	4,924	1.0500	0	7.98	0	52.5
1967	178.60	151	188	1.0500	0	8.34	0	51.5
1968	2,978.79	2,494	3,128	1.0500	0	8.71	0	50.5
1970	419.20	343	440	1.0500	0	9.49	0	48.5
1971	11,974.04	9,679	12,573	1.0500	0	9.90	0	47.5
1972	2,603.62	2,078	2,734	1.0500	0	10.32	0	46.5
1973	30,290.91	23,852	31,805	1.0500	0	10.75	0	45.5
1974	826.47	642	868	1.0500	0	11.20	0	44.5
1975	17,986.48	13,763	18,886	1.0500	0	11.66	0	43.5
1976	25,532.00	19,241	26,809	1.0500	0	12.14	0	42.5
1977	22,755.19	16,876	23,893	1.0500	0	12.63	0	41.5
1978	42,796.82	31,214	44,937	1.0500	0	13.13	0	40.5
1979	30,303.42	21,720	31,819	1.0500	0	13.65	0	39.5
1980	65,970.14	46,428	68,823	1.0432	445	14.18	31	38.5
1981	103,077.75	71,173	105,504	1.0235	2,727	14.72	185	37.5
1982	245,928.71	166,458	246,751	1.0033	11,474	15.28	751	36.5
1983	234,097.63	155,182	230,036	0.9827	15,766	15.85	995	35.5
1984	72,421.23	46,974	69,632	0.9615	6,410	16.44	390	34.5
1985	31,718.46	20,110	29,811	0.9399	3,493	17.04	205	33.5
1986	106,521.94	65,950	97,761	0.9178	14,087	17.65	798	32.5
1987	25,716.49	15,530	23,022	0.8952	3,981	18.27	218	31.5
1988	39,145.12	23,033	34,143	0.8722	6,959	18.90	368	30.5
1989	32,306.89	18,498	27,421	0.8488	6,501	19.55	333	29.5
1990	80,322.33	44,698	66,259	0.8249	18,079	20.21	895	28.5
1991	29,384.97	15,871	23,527	0.8006	7,327	20.88	351	27.5

# Cascade Natural Gas Corporation

Account #: 385.0 - Industrial Meas. & Reg. Station Equip.

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION  
 BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
 Survivor Curve: R2  
 ASL: 43  
 Net Salvage: -5%  
 Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1992	356,238.02	186,473	276,421	0.7759	97,629	21.56	4,528	26.5
1993	849,297.53	430,190	637,700	0.7509	254,063	22.26	11,415	25.5
1994	41,908.73	20,508	30,400	0.7254	13,604	22.96	592	24.5
1995	280,980.67	132,590	196,547	0.6995	98,483	23.68	4,160	23.5
1996	477,239.76	216,753	321,308	0.6733	179,794	24.40	7,369	22.5
1997	159,576.20	69,613	103,192	0.6467	64,363	25.14	2,561	21.5
1998	60,558.00	25,316	37,527	0.6197	26,059	25.88	1,007	20.5
1999	4,624.09	1,848	2,739	0.5924	2,116	26.64	79	19.5
2000	41,874.40	15,952	23,647	0.5647	20,321	27.40	742	18.5
2001	66,613.77	24,119	35,752	0.5367	34,192	28.17	1,214	17.5
2002	105,057.99	36,030	53,410	0.5084	56,901	28.96	1,965	16.5
2003	289,433.58	93,672	138,857	0.4798	165,049	29.75	5,549	15.5
2004	253,809.03	77,183	114,414	0.4508	152,085	30.55	4,979	14.5
2005	446,983.84	127,104	188,414	0.4215	280,919	31.35	8,959	13.5
2006	208,599.35	55,158	81,764	0.3920	137,265	32.17	4,267	12.5
2007	619,165.87	151,247	224,204	0.3621	425,920	33.00	12,908	11.5
2008	678,138.33	151,863	225,117	0.3320	486,928	33.83	14,394	10.5
2009	935,588.07	190,322	282,126	0.3015	700,241	34.67	20,198	9.5
2010	96,086.72	17,557	26,026	0.2709	74,865	35.52	2,108	8.5
2011	249,520.38	40,381	59,859	0.2399	202,137	36.37	5,557	7.5
2012	330,154.09	46,479	68,899	0.2087	277,763	37.23	7,460	6.5
2013	1,101,204.54	131,651	195,155	0.1772	961,110	38.10	25,223	5.5
2014	306,519.16	30,088	44,601	0.1455	277,244	38.98	7,112	4.5
2015	341,613.21	26,171	38,795	0.1136	319,899	39.86	8,025	3.5
2016	525,278.31	28,840	42,751	0.0814	508,791	40.75	12,485	2.5
2017	668,735.04	22,099	32,759	0.0490	669,412	41.65	16,074	1.5

# Cascade Natural Gas Corporation

Account #: 385.0 - Industrial Meas. & Reg. Station Equip.

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: R2  
ASL: 43  
Net Salvage: -5%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2018	862,381.82	9,527	14,122	0.0164	891,378	42.55	20,950	0.5
<b>TOTAL</b>	<b>11,641,826.22</b>	<b>3,216,819</b>	<b>4,748,136</b>		<b>7,475,781</b>		<b>217,398</b>	

COMPOSITE ANNUAL ACCRUAL RATE	1.87%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.41
COMPOSITE AVERAGE AGE (YEARS)	13.79
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	31.68

# Cascade Natural Gas Corporation

Account #: 390.1 - Structures and Improvements

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: S1

ASL: 37

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1961	40,493.30	35,404	40,493	1.0000	0	4.65	0	57.5
1964	1,662.34	1,412	1,662	1.0000	0	5.58	0	54.5
1965	194,261.60	163,300	194,262	1.0000	0	5.90	0	53.5
1966	3,803.27	3,164	3,803	1.0000	0	6.22	0	52.5
1967	328,768.75	270,611	328,769	1.0000	0	6.55	0	51.5
1968	19,014.38	15,481	19,014	1.0000	0	6.88	0	50.5
1969	233,381.77	187,898	233,382	1.0000	0	7.21	0	49.5
1970	74,371.04	59,193	74,371	1.0000	0	7.55	0	48.5
1971	12,014.47	9,450	12,014	1.0000	0	7.90	0	47.5
1972	14,568.79	11,322	14,569	1.0000	0	8.25	0	46.5
1973	7,940.17	6,094	7,940	1.0000	0	8.60	0	45.5
1974	92,779.76	70,302	92,780	1.0000	0	8.96	0	44.5
1975	1,949.28	1,458	1,949	1.0000	0	9.33	0	43.5
1976	4,851.74	3,579	4,852	1.0000	0	9.71	0	42.5
1977	385,195.72	280,202	385,196	1.0000	0	10.09	0	41.5
1978	83,621.10	59,954	83,621	1.0000	0	10.47	0	40.5
1979	72,482.00	51,196	72,482	1.0000	0	10.87	0	39.5
1980	13,579.75	9,445	13,580	1.0000	0	11.27	0	38.5
1981	1,711,098.51	1,171,144	1,711,099	1.0000	0	11.68	0	37.5
1982	29,206.32	19,661	29,206	1.0000	0	12.09	0	36.5
1983	394,414.69	260,979	394,415	1.0000	0	12.52	0	35.5
1984	296,534.98	192,736	296,535	1.0000	0	12.95	0	34.5
1985	42,835.64	27,329	42,836	1.0000	0	13.39	0	33.5
1986	82,848.50	51,843	82,849	1.0000	0	13.85	0	32.5
1987	265,431.90	162,780	265,432	1.0000	0	14.31	0	31.5
1988	75,328.94	45,234	75,329	1.0000	0	14.78	0	30.5

# Cascade Natural Gas Corporation

Account #: 390.1 - Structures and Improvements

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: S1

ASL: 37

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1989	31,541.84	18,528	31,542	1.0000	0	15.27	0	29.5
1990	42,096.80	24,165	42,097	1.0000	0	15.76	0	28.5
1991	7,167.03	4,016	7,167	1.0000	0	16.27	0	27.5
1992	25,298.65	13,820	25,299	1.0000	0	16.79	0	26.5
1993	1,402.24	746	1,402	1.0000	0	17.32	0	25.5
1994	25,841.67	13,364	25,761	0.9969	80	17.87	4	24.5
1995	478,129.42	240,020	462,684	0.9677	15,445	18.43	838	23.5
1996	148,511.23	72,245	139,266	0.9377	9,245	19.00	487	22.5
1997	6,182.61	2,909	5,608	0.9070	575	19.59	29	21.5
1998	70,151.37	31,856	61,409	0.8754	8,743	20.20	433	20.5
1999	31,726.10	13,872	26,742	0.8429	4,984	20.82	239	19.5
2000	7,130.80	2,995	5,773	0.8095	1,358	21.46	63	18.5
2001	18,070.28	7,266	14,008	0.7752	4,063	22.12	184	17.5
2002	18,418.92	7,069	13,627	0.7398	4,792	22.80	210	16.5
2003	2,731,924.75	997,036	1,921,973	0.7035	809,951	23.50	34,471	15.5
2005	341,280.01	111,119	214,204	0.6276	127,076	24.95	5,093	13.5
2006	89,970.62	27,447	52,909	0.5881	37,062	25.71	1,441	12.5
2007	96,004.11	27,260	52,548	0.5474	43,456	26.49	1,640	11.5
2008	33,440.47	8,768	16,902	0.5054	16,538	27.30	606	10.5
2009	168,885.75	40,510	78,091	0.4624	90,795	28.12	3,228	9.5
2010	7,589,624.77	1,646,365	3,173,678	0.4182	4,415,947	28.97	152,411	8.5
2011	64,974.89	12,563	24,218	0.3727	40,757	29.85	1,366	7.5
2012	44,921.78	7,600	14,651	0.3261	30,271	30.74	985	6.5
2013	392,341.79	56,671	109,244	0.2784	283,097	31.66	8,943	5.5
2014	880,191.69	104,866	202,148	0.2297	678,043	32.59	20,804	4.5
2015	1,464,977.31	136,713	263,539	0.1799	1,201,438	33.55	35,813	3.5

# Cascade Natural Gas Corporation

Account #: 390.1 - Structures and Improvements

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: S1

ASL: 37

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2016	142,695.20	9,568	18,445	0.1293	124,250	34.52	3,599	2.5
2017	197,232.43	7,971	15,366	0.0779	181,867	35.50	5,122	1.5
2018	383,954.95	5,186	9,996	0.0260	373,959	36.50	10,245	0.5
<b>TOTAL</b>	<b>20,016,528.19</b>	<b>6,823,686</b>	<b>11,512,733</b>		<b>8,503,795</b>		<b>288,257</b>	

COMPOSITE ANNUAL ACCRUAL RATE 1.44%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.58

COMPOSITE AVERAGE AGE (YEARS) 16.43

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 24.39

# Cascade Natural Gas Corporation

Account #: 390.2 - Leasehold Improvements

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: L2  
ASL: 15  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2016	7,933.28	1,289	7,933	1.0000	0	12.56	0	2.5
<b>TOTAL</b>	<b>7,933.28</b>	<b>1,289</b>	<b>7,933</b>		<b>0</b>		<b>0</b>	

COMPOSITE ANNUAL ACCRUAL RATE	0.00%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	2.00
COMPOSITE AVERAGE AGE (YEARS)	2.50
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	12.56



# Cascade Natural Gas Corporation

Account #: 391.2 - Software

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: SQ  
ASL: 10  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2008	217,819.12	217,819	217,819	1.0000	0	0.00	0	11.5
2009	2,776,590.49	2,637,761	2,776,590	1.0000	0	0.50	0	9.5
<b>TOTAL</b>	<b>2,994,409.61</b>	<b>2,855,580</b>	<b>2,994,410</b>		<b>0</b>		<b>0</b>	

COMPOSITE ANNUAL ACCRUAL RATE	0.00%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	1.00
COMPOSITE AVERAGE AGE (YEARS)	9.65
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	0.46

# Cascade Natural Gas Corporation

Account #: 391.3 - Comp Equip-Server & Workstation

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 5

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2009	107,976.40	107,976	51,402	0.4760	56,574	0.00	56,574	10.5
2010	462,168.14	462,168	220,015	0.4760	242,153	0.00	242,153	9.5
2011	181,866.58	181,867	86,577	0.4760	95,289	0.00	95,289	8.5
2012	112,934.81	112,935	53,763	0.4760	59,172	0.00	59,172	7.5
2013	373,142.11	373,142	177,634	0.4760	195,508	0.00	195,508	6.5
2014	503,653.66	453,288	215,788	0.4284	287,866	0.50	287,866	4.5
2015	560,645.25	392,452	186,826	0.3332	373,819	1.50	249,213	3.5
2016	74,473.14	37,237	17,726	0.2380	56,747	2.50	22,699	2.5
2017	295,526.76	88,658	42,206	0.1428	253,321	3.50	72,377	1.5
2018	457,095.64	45,710	21,760	0.0476	435,336	4.50	96,741	0.5
<b>TOTAL</b>	<b>3,129,482.49</b>	<b>2,255,432</b>	<b>1,073,697</b>		<b>2,055,786</b>		<b>1,377,592</b>	

COMPOSITE ANNUAL ACCRUAL RATE 44.02%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.34

COMPOSITE AVERAGE AGE (YEARS) 4.93

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 1.40

# Cascade Natural Gas Corporation

Account #: 391.4 - Office Equipment

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION  
 BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
 Survivor Curve: SQ  
 ASL: 15  
 Net Salvage: 0%  
 Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2005	17,745.63	15,971	-10,090	-0.5686	27,836	1.50	18,557	13.5
2006	2,999.77	2,500	-1,579	-0.5265	4,579	2.50	1,832	12.5
2007	26,760.88	20,517	-12,962	-0.4844	39,723	3.50	11,349	11.5
2008	7,259.88	5,082	-3,211	-0.4422	10,470	4.50	2,327	10.5
2009	48,346.00	30,619	-19,344	-0.4001	67,690	5.50	12,307	9.5
2010	138,148.97	78,284	-49,458	-0.3580	187,607	6.50	28,863	8.5
2011	4,069.21	2,035	-1,285	-0.3159	5,355	7.50	714	7.5
2012	63,056.89	27,325	-17,263	-0.2738	80,320	8.50	9,449	6.5
2014	12,852.97	3,856	-2,436	-0.1895	15,289	10.50	1,456	4.5
2016	5,183.84	864	-546	-0.1053	5,730	12.50	458	2.5
2017	1,839.81	184	-116	-0.0632	1,956	13.50	145	1.5
2018	4,612.25	154	-97	-0.0211	4,709	14.50	325	0.5
<b>TOTAL</b>	<b>332,876.10</b>	<b>187,390</b>	<b>-118,388</b>		<b>451,264</b>		<b>87,782</b>	

COMPOSITE ANNUAL ACCRUAL RATE	26.37%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	-0.36
COMPOSITE AVERAGE AGE (YEARS)	8.44
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	6.56

# Cascade Natural Gas Corporation

Account #: 391.5 - Office Furniture & Fixtures

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: SQ  
ASL: 15  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1998	2,185.40	2,185	503	0.2303	1,682	0.00	1,682	21.5
2001	3,748.75	3,749	863	0.2303	2,886	0.00	2,886	18.5
2002	148,865.71	148,866	34,278	0.2303	114,588	0.00	114,588	17.5
2003	43,861.12	43,861	10,099	0.2303	33,762	0.00	33,762	16.5
2005	34,677.24	31,210	7,186	0.2072	27,491	1.50	18,327	13.5
2008	11,785.67	8,250	1,900	0.1612	9,886	4.50	2,197	10.5
2009	9,817.40	6,218	1,432	0.1458	8,386	5.50	1,525	9.5
2010	456,671.69	258,781	59,586	0.1305	397,085	6.50	61,090	8.5
2011	6,695.96	3,348	771	0.1151	5,925	7.50	790	7.5
2012	748,912.13	324,529	74,726	0.0998	674,187	8.50	79,316	6.5
2013	142,882.84	52,390	12,063	0.0844	130,820	9.50	13,771	5.5
2014	47,111.69	14,134	3,254	0.0691	43,857	10.50	4,177	4.5
2015	130,262.62	30,395	6,999	0.0537	123,264	11.50	10,719	3.5
2016	10,725.42	1,788	412	0.0384	10,314	12.50	825	2.5
2017	2,187.86	219	50	0.0230	2,137	13.50	158	1.5
2018	30,418.39	1,014	233	0.0077	30,185	14.50	2,082	0.5
<b>TOTAL</b>	<b>1,830,809.89</b>	<b>930,934</b>	<b>214,356</b>		<b>1,616,454</b>		<b>347,894</b>	

COMPOSITE ANNUAL ACCRUAL RATE	19.00%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.12
COMPOSITE AVERAGE AGE (YEARS)	7.88
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	7.37

# Cascade Natural Gas Corporation

Account #: 392.1 - Trailers

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: S3  
ASL: 20  
Net Salvage: 10%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1986	4,506.60	3,844	4,056	0.9000	0	1.04	0	32.5
1990	5,240.63	4,317	4,717	0.9000	0	1.69	0	28.5
1996	20,780.08	15,788	18,702	0.9000	0	3.12	0	22.5
2005	17,414.25	9,868	14,425	0.8284	1,248	7.41	168	13.5
2007	18,429.81	9,182	13,423	0.7283	3,164	8.93	354	11.5
2008	55,164.55	25,395	37,125	0.6730	12,523	9.77	1,282	10.5
2011	91,723.58	30,792	45,014	0.4908	37,537	12.54	2,993	7.5
2012	90,535.83	26,415	38,616	0.4265	42,867	13.52	3,171	6.5
2013	2,552.66	631	923	0.3615	1,375	14.51	95	5.5
2014	15,417.68	3,121	4,563	0.2959	9,313	15.50	601	4.5
<b>TOTAL</b>	<b>321,765.67</b>	<b>129,354</b>	<b>181,562</b>		<b>108,027</b>		<b>8,665</b>	

COMPOSITE ANNUAL ACCRUAL RATE	2.69%
THEORETICAL ACCUMULATED DEPRECIATION FACTOR	0.56
COMPOSITE AVERAGE AGE (YEARS)	9.79
DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)	11.07

# Cascade Natural Gas Corporation

Account #: 392.2 - Transportation Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: L1.5

ASL: 11

Net Salvage: 20%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1998	3,000.00	1,862	2,400	0.8000	0	2.47	0	20.5
2001	11,755.93	6,755	9,016	0.7669	389	3.10	126	17.5
2002	43,501.67	24,261	32,381	0.7444	2,421	3.33	727	16.5
2004	28,465.21	14,856	19,828	0.6966	2,944	3.82	770	14.5
2005	42,624.42	21,451	28,631	0.6717	5,468	4.08	1,340	13.5
2007	49,594.49	23,074	30,797	0.6210	8,879	4.60	1,929	11.5
2008	2,150,892.35	958,819	1,279,728	0.5950	440,986	4.87	90,541	10.5
2009	387,581.85	164,889	220,076	0.5678	89,990	5.15	17,473	9.5
2010	423,368.16	170,758	227,910	0.5383	110,785	5.45	20,312	8.5
2011	1,034,579.87	391,343	522,323	0.5049	305,341	5.80	52,655	7.5
2012	1,068,737.17	372,800	497,573	0.4656	357,416	6.20	57,614	6.5
2013	2,196,725.16	688,648	919,133	0.4184	838,247	6.69	125,307	5.5
2014	1,211,822.42	328,037	437,828	0.3613	531,630	7.28	73,047	4.5
2015	2,583,168.09	569,795	760,501	0.2944	1,306,034	7.97	163,930	3.5
2016	1,988,018.97	326,792	436,167	0.2194	1,154,248	8.74	132,069	2.5
2017	1,841,047.67	188,319	251,348	0.1365	1,221,490	9.59	127,324	1.5
2018	1,750,766.71	61,282	81,793	0.0467	1,318,820	10.52	125,379	0.5
<b>TOTAL</b>	<b>16,815,650.14</b>	<b>4,313,742</b>	<b>5,757,432</b>		<b>7,695,088</b>		<b>990,541</b>	

COMPOSITE ANNUAL ACCRUAL RATE 5.89%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.34

COMPOSITE AVERAGE AGE (YEARS) 4.89

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 7.47

# Cascade Natural Gas Corporation

Account #: 393.0 - Stores Equipment

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 30

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1988	1,291.71	1,292	839	0.6492	453	0.00	453	31.5
1989	3,217.24	3,164	2,054	0.6384	1,163	0.50	1,163	29.5
1991	1,138.43	1,044	677	0.5951	461	2.50	184	27.5
1993	3,909.21	3,323	2,157	0.5518	1,752	4.50	389	25.5
1996	36,739.95	27,555	17,888	0.4869	18,852	7.50	2,514	22.5
2001	4,462.17	2,603	1,690	0.3787	2,772	12.50	222	17.5
2005	16,166.50	7,275	4,723	0.2921	11,444	16.50	694	13.5
<b>TOTAL</b>	<b>66,925.21</b>	<b>46,255</b>	<b>30,028</b>		<b>36,897</b>		<b>5,619</b>	

COMPOSITE ANNUAL ACCRUAL RATE 8.40%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.45

COMPOSITE AVERAGE AGE (YEARS) 20.76

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 9.27

# Cascade Natural Gas Corporation

Account #: 394.1 - Tools,Shop,Garage Equip

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 20

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1988	90,786.24	90,786	58,158	0.6406	32,628	0.00	32,628	31.5
1989	156,667.54	156,668	100,362	0.6406	56,305	0.00	56,305	30.5
1990	107,561.14	107,561	68,904	0.6406	38,657	0.00	38,657	29.5
1991	117,455.82	117,456	75,243	0.6406	42,213	0.00	42,213	28.5
1992	349,538.88	349,539	223,917	0.6406	125,622	0.00	125,622	27.5
1993	65,501.40	65,501	41,961	0.6406	23,541	0.00	23,541	26.5
1994	71,508.59	71,509	45,809	0.6406	25,700	0.00	25,700	25.5
1995	51,717.37	51,717	33,131	0.6406	18,587	0.00	18,587	24.5
1996	46,694.68	46,695	29,913	0.6406	16,782	0.00	16,782	23.5
1997	81,214.35	81,214	52,026	0.6406	29,188	0.00	29,188	22.5
1998	122,959.21	122,959	78,769	0.6406	44,191	0.00	44,191	21.5
1999	13,146.61	12,818	8,211	0.6246	4,935	0.50	4,935	19.5
2000	18,165.94	16,803	10,764	0.5926	7,402	1.50	4,935	18.5
2001	101,836.32	89,107	57,082	0.5605	44,754	2.50	17,902	17.5
2002	133,543.71	110,174	70,578	0.5285	62,966	3.50	17,990	16.5
2003	92,208.97	71,462	45,779	0.4965	46,430	4.50	10,318	15.5
2004	22,843.86	16,562	10,610	0.4644	12,234	5.50	2,224	14.5
2005	701,910.22	473,789	303,513	0.4324	398,397	6.50	61,292	13.5
2006	70,658.61	44,162	28,290	0.4004	42,368	7.50	5,649	12.5
2007	161,037.71	92,597	59,318	0.3683	101,720	8.50	11,967	11.5
2008	294,309.81	154,513	98,982	0.3363	195,328	9.50	20,561	10.5
2009	314,726.65	149,495	95,768	0.3043	218,959	10.50	20,853	9.5
2010	232,783.32	98,933	63,377	0.2723	169,406	11.50	14,731	8.5
2011	593,612.92	222,605	142,602	0.2402	451,011	12.50	36,081	7.5
2012	654,777.66	212,803	136,323	0.2082	518,455	13.50	38,404	6.5
2013	480,911.97	132,251	84,721	0.1762	396,191	14.50	27,324	5.5



# Cascade Natural Gas Corporation

Account #: 394.1 - Tools,Shop,Garage Equip

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 20

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2014	667,688.16	150,230	96,238	0.1441	571,450	15.50	36,868	4.5
2015	699,893.05	122,481	78,462	0.1121	621,431	16.50	37,662	3.5
2016	525,339.24	65,667	42,067	0.0801	483,272	17.50	27,616	2.5
2017	207,127.25	15,535	9,952	0.0480	197,176	18.50	10,658	1.5
2018	1,588,116.58	39,703	25,434	0.0160	1,562,683	19.50	80,138	0.5
<b>TOTAL</b>	<b>8,836,243.78</b>	<b>3,553,294</b>	<b>2,276,264</b>		<b>6,559,979</b>		<b>941,521</b>	

COMPOSITE ANNUAL ACCRUAL RATE 10.66%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.26

COMPOSITE AVERAGE AGE (YEARS) 9.05

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 11.96

# Cascade Natural Gas Corporation

Account #: 394.2 - Vehicle CNG Equipment

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: R4

ASL: 31

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1983	52,868.18	47,946	51,272	0.9698	1,596	2.89	553	35.5
1984	7,338.48	6,582	7,038	0.9591	300	3.20	94	34.5
1985	5,520.85	4,891	5,231	0.9475	290	3.53	82	33.5
1986	26,950.00	23,554	25,188	0.9346	1,762	3.91	451	32.5
1987	22,282.39	19,176	20,507	0.9203	1,776	4.32	411	31.5
1988	5,971.65	5,050	5,400	0.9043	571	4.79	119	30.5
1992	5,007.52	3,855	4,122	0.8232	886	7.14	124	26.5
1993	1,505.67	1,126	1,204	0.7998	302	7.82	39	25.5
2016	3,786.28	305	326	0.0861	3,460	28.50	121	2.5
<b>TOTAL</b>	<b>131,231.02</b>	<b>112,484</b>	<b>120,288</b>		<b>10,943</b>		<b>1,994</b>	

COMPOSITE ANNUAL ACCRUAL RATE 1.52%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.92

COMPOSITE AVERAGE AGE (YEARS) 32.43

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 4.43

# Cascade Natural Gas Corporation

Account #: 395.0 - Laboratory Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 20

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1994	30,186.25	30,186	21,597	0.7155	8,589	0.00	8,589	25.5
1995	1,231.79	1,232	881	0.7155	350	0.00	350	24.5
1997	7,827.34	7,827	5,600	0.7155	2,227	0.00	2,227	22.5
1998	341.14	341	244	0.7155	97	0.00	97	21.5
2000	1,322.80	1,224	875	0.6618	447	1.50	298	18.5
2005	40,294.62	27,199	19,460	0.4829	20,835	6.50	3,205	13.5
2007	38,704.22	22,255	15,923	0.4114	22,782	8.50	2,680	11.5
<b>TOTAL</b>	<b>119,908.16</b>	<b>90,264</b>	<b>64,581</b>		<b>55,328</b>		<b>17,447</b>	

COMPOSITE ANNUAL ACCRUAL RATE 14.55%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.54

COMPOSITE AVERAGE AGE (YEARS) 16.65

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 4.94

# Cascade Natural Gas Corporation

Account #: 396.1 - Trailers-Work Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: L2

ASL: 20

Net Salvage: 30%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1986	8,594.63	4,593	6,016	0.7000	0	4.73	0	32.5
1987	8,195.00	4,312	5,694	0.6948	42	4.96	8	31.5
1992	13,912.29	6,721	8,874	0.6379	865	6.20	140	26.5
1993	13,495.68	6,401	8,451	0.6262	996	6.45	154	25.5
1994	11,189.96	5,209	6,878	0.6147	955	6.70	143	24.5
1996	11,385.40	5,104	6,739	0.5919	1,230	7.19	171	22.5
1997	13,895.65	6,112	8,070	0.5808	1,657	7.43	223	21.5
1998	13,124.05	5,663	7,477	0.5697	1,710	7.67	223	20.5
2003	12,512.00	4,830	6,378	0.5097	2,380	8.97	265	15.5
2005	28,122.18	10,179	13,440	0.4779	6,245	9.66	647	13.5
2008	18,616.05	5,804	7,664	0.4117	5,368	11.09	484	10.5
2011	29,101.43	6,971	9,204	0.3163	11,167	13.16	849	7.5
2012	95,805.11	20,238	26,722	0.2789	40,341	13.96	2,889	6.5
2013	45,290.22	8,229	10,866	0.2399	20,837	14.81	1,407	5.5
2014	260,659.55	39,361	51,972	0.1994	130,490	15.69	8,319	4.5
2015	195,327.67	23,272	30,727	0.1573	106,002	16.60	6,387	3.5
2016	46,421.19	3,999	5,280	0.1138	27,214	17.54	1,552	2.5
2017	78,611.19	4,101	5,415	0.0689	49,612	18.51	2,680	1.5
2018	55,065.42	963	1,271	0.0231	37,275	19.50	1,911	0.5

# Cascade Natural Gas Corporation

Account #: 396.1 - Trailers-Work Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: L2  
ASL: 20  
Net Salvage: 30%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
<b>TOTAL</b>	959,324.67	172,064	227,141		444,386		28,452	
<b>COMPOSITE ANNUAL ACCRUAL RATE</b>				2.97%				
<b>THEORETICAL ACCUMULATED DEPRECIATION FACTOR</b>				0.24				
<b>COMPOSITE AVERAGE AGE (YEARS)</b>				6.59				
<b>DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)</b>				14.88				

# Cascade Natural Gas Corporation

Account #: 396.2 - Power Operated Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: L1.5

ASL: 15

Net Salvage: 35%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1974	1,551.85	975	-2,778	-1.7901	3,787	0.50	3,787	44.5
1978	7,155.00	4,205	-11,980	-1.6744	16,631	1.44	11,571	40.5
1979	3,404.26	1,987	-5,661	-1.6629	7,874	1.53	5,145	39.5
1980	1,102.50	638	-1,817	-1.6484	2,534	1.65	1,538	38.5
1981	4,505.37	2,582	-7,355	-1.6325	10,284	1.78	5,790	37.5
1984	4,961.25	2,751	-7,839	-1.5800	11,064	2.20	5,025	34.5
1985	3,570.90	1,956	-5,574	-1.5609	7,895	2.36	3,350	33.5
1986	32,288.32	17,463	-49,751	-1.5408	70,738	2.52	28,082	32.5
1990	3,281.83	1,673	-4,765	-1.4521	6,899	3.24	2,131	28.5
1993	5,799.73	2,802	-7,983	-1.3764	11,753	3.85	3,052	25.5
1997	49,281.69	21,841	-62,224	-1.2626	94,257	4.77	19,750	21.5
1998	51,468.84	22,258	-63,411	-1.2320	96,865	5.02	19,294	20.5
2000	461.63	189	-540	-1.1690	840	5.53	152	18.5
2001	55,038.49	21,965	-62,576	-1.1370	98,351	5.79	16,985	17.5
2002	157,662.00	61,131	-174,157	-1.1046	276,637	6.05	45,708	16.5
2004	66,073.95	24,096	-68,647	-1.0389	111,595	6.58	16,948	14.5
2005	89,300.15	31,498	-89,736	-1.0049	147,781	6.86	21,542	13.5
2006	1,215.09	413	-1,178	-0.9692	1,967	7.15	275	12.5
2008	8,412.94	2,624	-7,476	-0.8886	12,944	7.80	1,659	10.5
2010	4,943.04	1,367	-3,894	-0.7877	7,107	8.62	825	8.5
2011	15,130.27	3,856	-10,986	-0.7261	20,821	9.12	2,283	7.5
2012	6,880.36	1,582	-4,507	-0.6551	8,980	9.69	926	6.5
2014	54,839.64	9,353	-26,646	-0.4859	62,291	11.06	5,630	4.5
2016	22,698.63	2,281	-6,497	-0.2862	21,252	12.68	1,676	2.5
2018	3,379,027.70	70,662	-201,312	-0.0596	2,397,680	14.52	165,159	0.5

# Cascade Natural Gas Corporation

Account #: 396.2 - Power Operated Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: L1.5  
ASL: 15  
Net Salvage: 35%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
<b>TOTAL</b>	4,030,055.43	312,148	-889,290		3,508,826		388,283	
<b>COMPOSITE ANNUAL ACCRUAL RATE</b>				9.63%				
<b>THEORETICAL ACCUMULATED DEPRECIATION FACTOR</b>				-0.22				
<b>COMPOSITE AVERAGE AGE (YEARS)</b>				3.09				
<b>DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)</b>				13.21				

# Cascade Natural Gas Corporation

Account #: 397.1 - Radio Comm Equip-Fixed

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 15

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1972	20,742.93	20,743	20,148	0.9713	595	0.00	595	47.5
1974	7,023.94	7,024	6,822	0.9713	202	0.00	202	45.5
1975	8,794.58	8,795	8,542	0.9713	252	0.00	252	44.5
1976	4,550.33	4,550	4,420	0.9713	131	0.00	131	43.5
1979	18,927.03	18,927	18,384	0.9713	543	0.00	543	40.5
1981	16,185.76	16,186	15,721	0.9713	464	0.00	464	38.5
1982	12,670.23	12,670	12,307	0.9713	363	0.00	363	37.5
1983	5,272.00	5,272	5,121	0.9713	151	0.00	151	36.5
1985	2,259.99	2,260	2,195	0.9713	65	0.00	65	34.5
1986	7,067.06	7,067	6,864	0.9713	203	0.00	203	33.5
1987	11,300.52	11,301	10,976	0.9713	324	0.00	324	32.5
1988	3,705.42	3,705	3,599	0.9713	106	0.00	106	31.5
1989	727.66	728	707	0.9713	21	0.00	21	30.5
1990	20,177.33	20,177	19,598	0.9713	579	0.00	579	29.5
1992	851.50	852	827	0.9713	24	0.00	24	27.5
1995	3,656.00	3,656	3,551	0.9713	105	0.00	105	24.5
2005	4,548.60	4,094	3,976	0.8742	572	1.50	381	13.5
2007	2,692.67	2,064	2,005	0.7447	688	3.50	197	11.5
2008	1,660.44	1,162	1,129	0.6799	531	4.50	118	10.5
2009	763.47	484	470	0.6152	294	5.50	53	9.5
2010	18,079.02	10,245	9,951	0.5504	8,128	6.50	1,250	8.5
2011	12,451.90	6,226	6,047	0.4857	6,405	7.50	854	7.5
2012	65,376.55	28,330	27,517	0.4209	37,859	8.50	4,454	6.5
2013	91,896.32	33,695	32,729	0.3561	59,168	9.50	6,228	5.5
2014	43,753.81	13,126	12,750	0.2914	31,004	10.50	2,953	4.5



# Cascade Natural Gas Corporation

Account #: 397.1 - Radio Comm Equip-Fixed

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
Survivor Curve: SQ  
ASL: 15  
Net Salvage: 0%  
Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
<b>TOTAL</b>	385,135.06	243,338	236,357		148,778		20,617	
<b>COMPOSITE ANNUAL ACCRUAL RATE</b>				5.35%				
<b>THEORETICAL ACCUMULATED DEPRECIATION FACTOR</b>				0.61				
<b>COMPOSITE AVERAGE AGE (YEARS)</b>				18.10				
<b>DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS)</b>				5.52				

# Cascade Natural Gas Corporation

Account #: 397.2 - Supervisory & Telemeter Equip

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION  
 BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life  
 Survivor Curve: SQ  
 ASL: 10  
 Net Salvage: 0%  
 Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
1986	25,300.84	25,301	24,836	0.9816	465	0.00	465	33.5
1988	26,130.71	26,131	25,650	0.9816	480	0.00	480	31.5
1989	38,171.29	38,171	37,469	0.9816	702	0.00	702	30.5
1990	374,740.67	374,741	367,850	0.9816	6,890	0.00	6,890	29.5
1991	104,586.46	104,586	102,663	0.9816	1,923	0.00	1,923	28.5
1992	79,161.82	79,162	77,706	0.9816	1,456	0.00	1,456	27.5
1993	223,964.67	223,965	219,847	0.9816	4,118	0.00	4,118	26.5
1994	109,584.56	109,585	107,570	0.9816	2,015	0.00	2,015	25.5
1995	123,157.70	123,158	120,893	0.9816	2,264	0.00	2,264	24.5
1996	244,896.52	244,897	240,394	0.9816	4,503	0.00	4,503	23.5
1997	184,967.13	184,967	181,566	0.9816	3,401	0.00	3,401	22.5
1998	151,560.86	151,561	148,774	0.9816	2,787	0.00	2,787	21.5
1999	160,198.75	160,199	157,253	0.9816	2,946	0.00	2,946	20.5
2000	98,078.02	98,078	96,275	0.9816	1,803	0.00	1,803	19.5
2002	20,534.35	20,534	20,157	0.9816	378	0.00	378	17.5
2003	49,255.47	49,255	48,350	0.9816	906	0.00	906	16.5
2004	401,036.59	401,037	393,663	0.9816	7,374	0.00	7,374	15.5
2005	68,491.85	68,492	67,232	0.9816	1,259	0.00	1,259	14.5
2006	21,713.69	21,714	21,314	0.9816	399	0.00	399	13.5
2007	13,115.99	13,116	12,875	0.9816	241	0.00	241	12.5
2008	121,257.53	121,258	119,028	0.9816	2,230	0.00	2,230	11.5
2009	389,036.75	369,585	362,789	0.9325	26,247	0.50	26,247	9.5
2010	186,523.53	158,545	155,630	0.8344	30,894	1.50	20,596	8.5
2011	161,891.71	121,419	119,186	0.7362	42,705	2.50	17,082	7.5
2012	106,243.98	69,059	67,789	0.6380	38,455	3.50	10,987	6.5
2013	5,957.19	3,276	3,216	0.5399	2,741	4.50	609	5.5

# Cascade Natural Gas Corporation

Account #: 397.2 - Supervisory & Telemeter Equip

CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 10

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2014	195,965.06	88,184	86,563	0.4417	109,402	5.50	19,891	4.5
2015	865,524.17	302,933	297,363	0.3436	568,161	6.50	87,409	3.5
2016	102,870.27	25,718	25,245	0.2454	77,626	7.50	10,350	2.5
2017	334,519.73	50,178	49,255	0.1472	285,264	8.50	33,560	1.5
2018	10,308.81	515	506	0.0491	9,803	9.50	1,032	0.5
<b>TOTAL</b>	<b>4,998,746.67</b>	<b>3,829,318</b>	<b>3,758,909</b>		<b>1,239,838</b>		<b>276,304</b>	

COMPOSITE ANNUAL ACCRUAL RATE 5.53%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.75

COMPOSITE AVERAGE AGE (YEARS) 14.26

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 2.34

# Cascade Natural Gas Corporation

Account #: 397.3 - Telephone & Telex Equip

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 10

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2010	134,305.54	114,160	71,659	0.5336	62,647	1.50	41,765	8.5
2011	153,405.36	115,054	72,220	0.4708	81,185	2.50	32,474	7.5
2012	233,702.68	151,907	95,353	0.4080	138,350	3.50	39,529	6.5
2013	13,577.13	7,467	4,687	0.3452	8,890	4.50	1,976	5.5
2018	719.10	36	23	0.0314	697	9.50	73	0.5
<b>TOTAL</b>	<b>535,709.81</b>	<b>388,624</b>	<b>243,942</b>		<b>291,768</b>		<b>115,816</b>	

COMPOSITE ANNUAL ACCRUAL RATE 21.62%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.46

COMPOSITE AVERAGE AGE (YEARS) 7.25

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 2.75

# Cascade Natural Gas Corporation

Account #: 397.4 - Radio Comm Equip-Mobile

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 15

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2008	9,482.31	6,638	6,044	0.6374	3,438	4.50	764	10.5
2009	8,087.88	5,122	4,664	0.5767	3,423	5.50	622	9.5
2010	1,367.71	775	706	0.5160	662	6.50	102	8.5
2011	8,645.49	4,323	3,936	0.4553	4,709	7.50	628	7.5
2012	142,625.40	61,804	56,280	0.3946	86,346	8.50	10,158	6.5
2013	496,799.30	182,160	165,877	0.3339	330,922	9.50	34,834	5.5
2014	523,828.29	157,148	143,102	0.2732	380,727	10.50	36,260	4.5
2016	30,168.26	5,028	4,579	0.1518	25,590	12.50	2,047	2.5
2017	5,293.67	529	482	0.0911	4,812	13.50	356	1.5
2018	14,061.71	469	427	0.0304	13,635	14.50	940	0.5
<b>TOTAL</b>	<b>1,240,360.02</b>	<b>423,996</b>	<b>386,097</b>		<b>854,263</b>		<b>86,712</b>	

COMPOSITE ANNUAL ACCRUAL RATE 6.99%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.31

COMPOSITE AVERAGE AGE (YEARS) 5.13

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 9.87

# Cascade Natural Gas Corporation

Account #: 398.0 - Miscellaneous Equipment

## CALCULATED ANNUAL ACCRUAL AND ACCRUED DEPRECIATION

BASED ON ORIGINAL COST AS OF December 31, 2018

ALG - Remaining Life

Survivor Curve: SQ

ASL: 25

Net Salvage: 0%

Truncation Year:

Year	Original Cost	Calculated Accumulated Depreciation	Allocated Actual Booked Amount	Accumulated Depreciation Factor	Net Book Value	ALG Remaining Life	Annual Accrual	Average Age
2005	4,840.56	2,614	2,042	0.4219	2,799	11.50	243	13.5
2008	821.88	345	270	0.3281	552	14.50	38	10.5
2009	1,976.32	751	587	0.2969	1,390	15.50	90	9.5
2010	29,124.02	9,902	7,736	0.2656	21,388	16.50	1,296	8.5
2011	1,267.88	380	297	0.2344	971	17.50	55	7.5
2012	6,531.10	1,698	1,327	0.2031	5,205	18.50	281	6.5
2014	30,360.51	5,465	4,269	0.1406	26,091	20.50	1,273	4.5
2015	2,659.13	372	291	0.1094	2,368	21.50	110	3.5
2016	2,097.65	210	164	0.0781	1,934	22.50	86	2.5
2018	1,288.62	26	20	0.0156	1,268	24.50	52	0.5
<b>TOTAL</b>	<b>80,967.67</b>	<b>21,763</b>	<b>17,002</b>		<b>63,965</b>		<b>3,525</b>	

COMPOSITE ANNUAL ACCRUAL RATE 4.35%

THEORETICAL ACCUMULATED DEPRECIATION FACTOR 0.21

COMPOSITE AVERAGE AGE (YEARS) 6.72

DIRECTED WEIGHTED ALG COMPOSITE REMAINING LIFE (YEARS) 18.28



## SECTION 9

# 9 ESTIMATION OF SURVIVOR CURVES

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## 9.1 Average Service Life

All assets have a service life, which is defined as “the period of time from its installation until it is retired from service”<sup>1</sup>. All account groups of property are made up of various assets with differing service lives and investment values. To calculate a depreciation rate, one must first calculate an average life for all assets in a single account. This can be done by ascertaining the age at retirement for every asset in an account and plotting it as a percentage of the units surviving at each age interval (a “Survivor Curve”). From the average life for each account, remaining lives can then be found which are then used to calculate the annual depreciation accruals and ultimately depreciation rate. A discussion of the general concept of survivor curves is presented and the Iowa type survivor curves are reviewed.

## 9.2 Survivor Curves

A survivor curve is defined as “a graph of the percent of units remaining in service expressed as a function of age”<sup>2</sup>. To calculate the average life of the group, the remaining life expectancy, the probable life and the frequency curve, one must first create a survivor curve. Figure 1, shows a typical 40-R4 smoothed survivor curve as well as the accompanying derived curves. The type 40-R4 refers to the Iowa type curve, whose designation will be explained in further detail in the next section

To calculate the average service life, one must calculate the area under the survivor curve and divide by the percent surviving at age zero. The remaining life is equal to the area under the survivor curve and to the right of the current age, divided by the percent surviving at the current age. In Figure 1, for example, the hatched area to the right of age 45 divided by 28.9% surviving balance represents the remaining life for an asset that has reached that age. The probable life is “the total life expectancy of the property surviving at any age and is equal to the remaining life plus the current age”<sup>3</sup> The probable life for an entire account is calculated after calculating the probable life for each year of age. The frequency curve is calculated by taking the difference between the percent surviving on successive years on the survivor curve<sup>4</sup>. Alternatively, frequency can be empirically determined by finding the amount of retirements at any given age. Plotting retirement frequency from the youngest to oldest ages and then taking the cumulative frequencies will generate percent surviving versus age.

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<sup>1</sup> Wolf, Frank K. and W. Chester Fitch, *Depreciation Systems* (Iowa State University Press, 1994), 21.

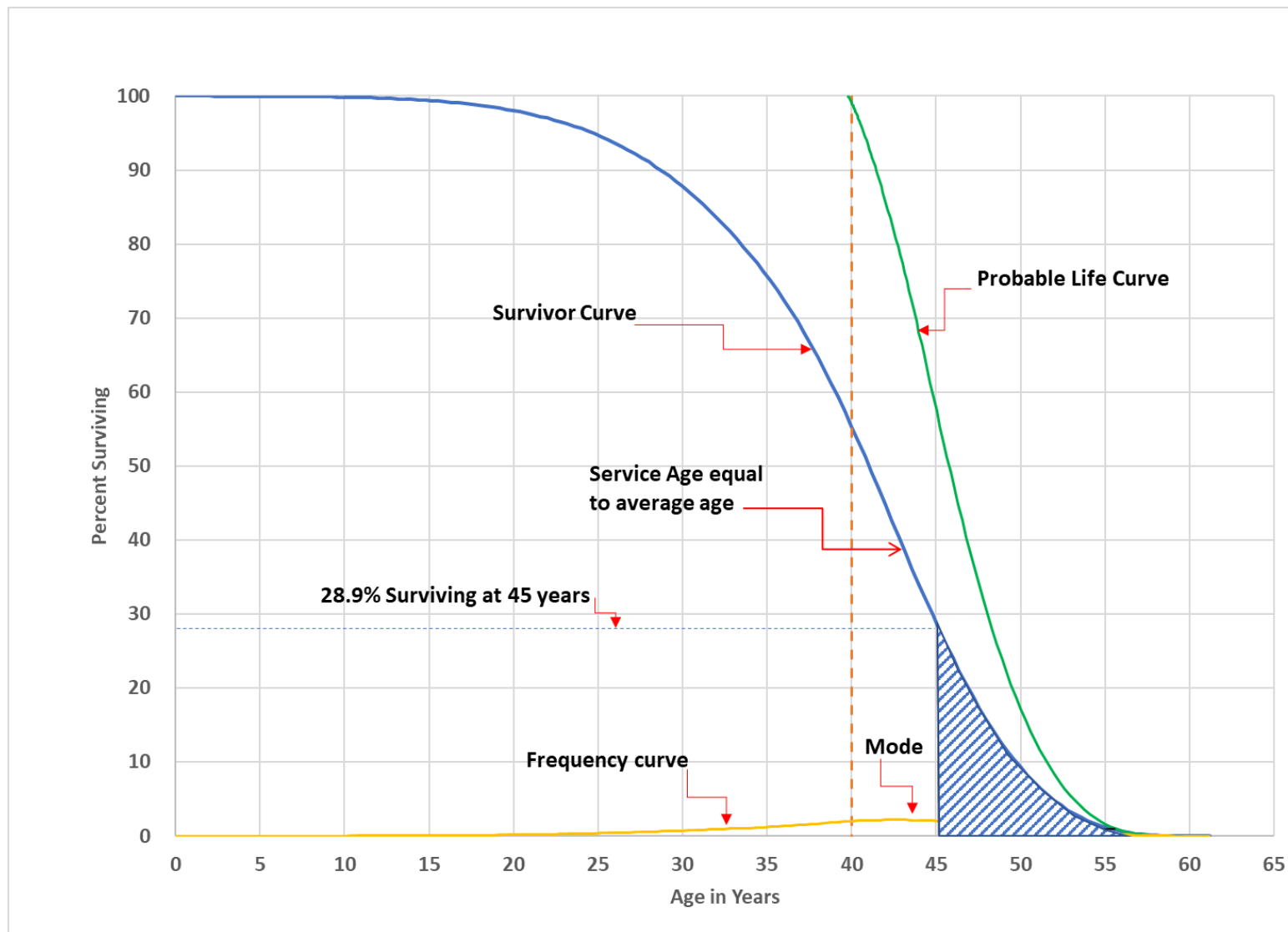
<sup>2</sup> *Ibid*, 23.

<sup>3</sup> *Ibid*, 29.

<sup>4</sup> *Ibid*, 23-24.



FIGURE 1: TYPICAL SURVIVOR CURVE (40-R4) AND DERIVED CURVES







### 9.3 Iowa Type Curves

In 1931, Robley Winfrey and Edwin Kurtz of the Engineering Research Institute at Iowa State University published Bulletin 103, which laid the groundwork for what would eventually be known as the Iowa Curves. *"The 13 type curves can be used as valuable aids in forecasting the probable future service lives of individual items and of groups of items of different kinds of physical equipment"*<sup>5</sup>. The 13 curves described in Bulletin 103 eventually became a series of 22 generalized survivor curves which are used throughout the regulated utility industry. These 22 curves were described in Bulletin 125, published in 1967 by Harold A. Cowles, which became known as the Iowa curves.

The Iowa curves are organized with three variables: the average life of the plant; the location of the mode; and the variation of the life. All Iowa curves have both a letter and a number to represent the shape and height of the mode. The L curves, or left-moded curves, are used when the mode of the curve should be to the left of the average life. There are six L curves are presented in Figure 2. The R curves, or right-moded, are used when the mode of the curve should be to the right of the average life. There are six R curves, which are presented in Figure 3. The S curves, or symmetrically-moded, are used when the mode is equal to the average life. There are seven S curves, which are presented in Figure 4. The O curves, or origin curves, are used when the mode occurs at age 0. There are four O curves, which are presented in Figure 5. There are some occasions where it is appropriate to use a half curve. In these cases, the curve is assumed to be exactly half way between the two curves.

In addition to Bulletin 125, Iowa curves have also been presented in subsequent Experiment Station bulletins and in the text *Engineering Valuation and Depreciation*<sup>6</sup>. In 1957, Frank V. B. Couch, Jr., an Iowa State College graduate student, submitted a thesis<sup>7</sup> presenting his development of the fourth family consisting of the four O-type survivor curves.

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<sup>5</sup> *Ibid*, 21

<sup>6</sup> Marston, Anson, Robley Winfrey and Jean C. Hempstead, *Engineering Valuation and Depreciation* (The Iowa State University Press, 1953)

<sup>7</sup> Couch, Frank V. B., Jr., *Classification of Type O Retirement Characteristics of Industrial Property* Unpublished M.S. Thesis (Engineering Valuation, Library, Iowa State College, Ames, Iowa, 1957)



FIGURE 2: LEFT MODAL OR "L" IOWA TYPE SURVIVOR CURVES

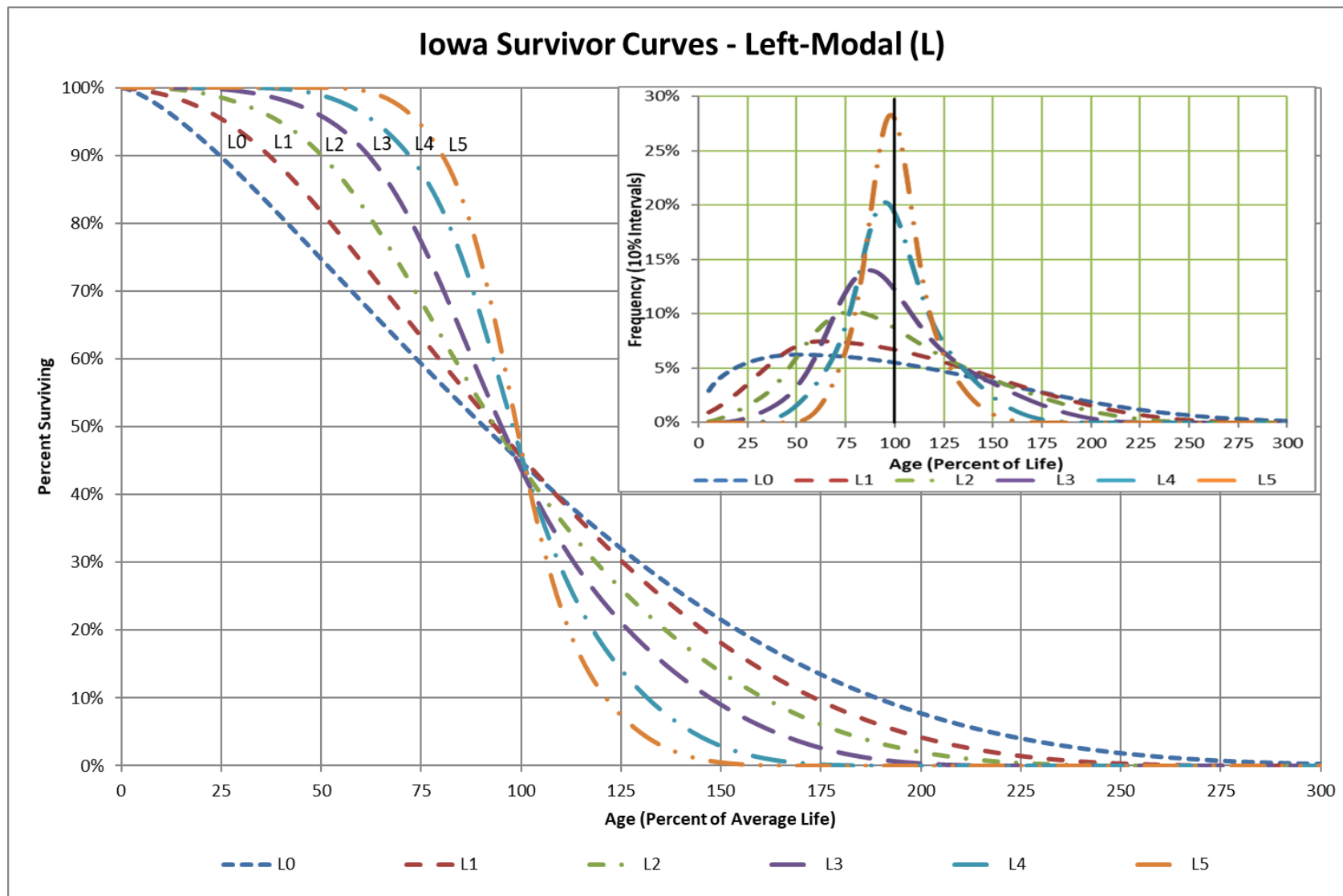




FIGURE 3: SYMMETRICAL OR "S" IOWA TYPE SURVIVOR CURVES

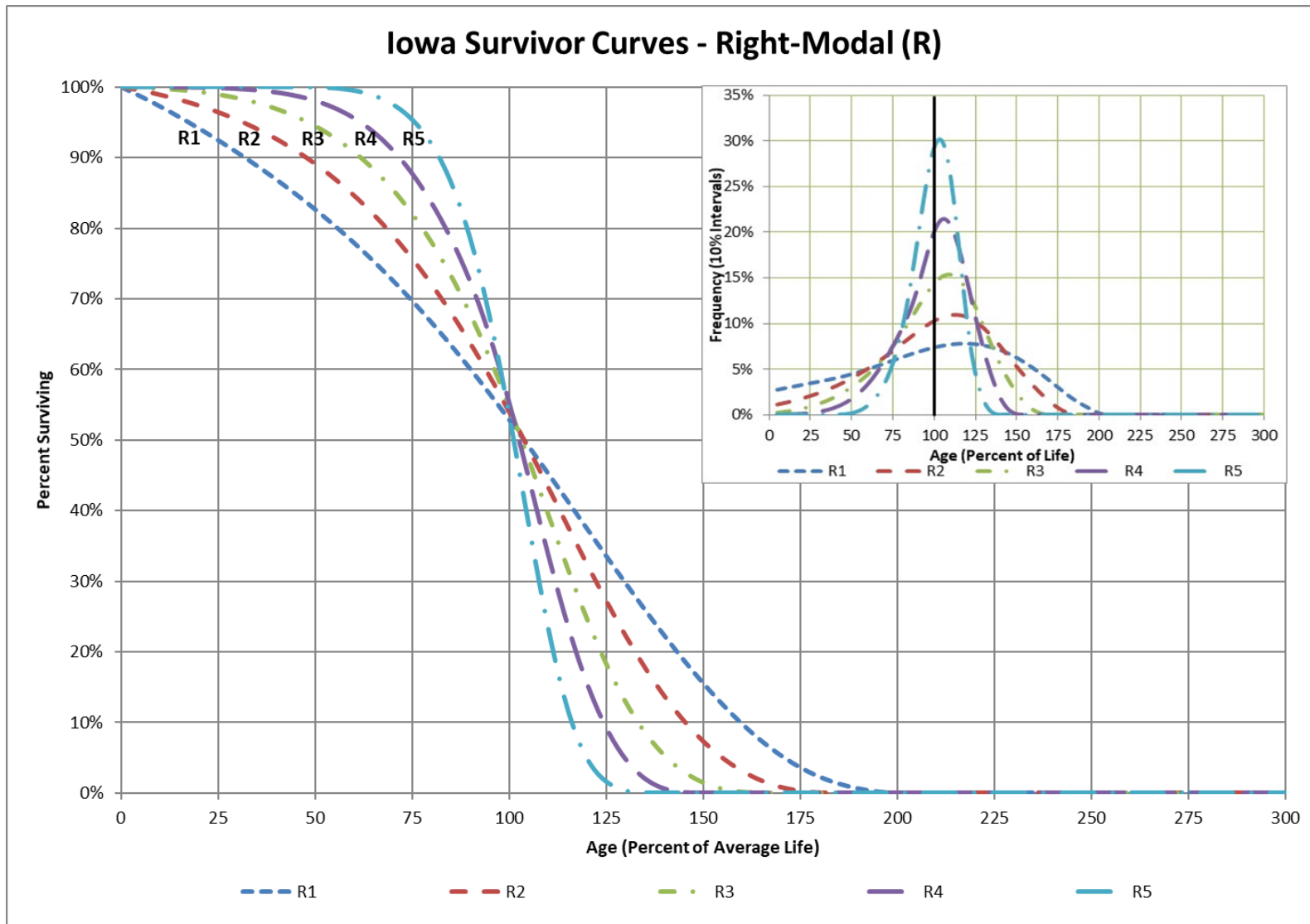




FIGURE 4: RIGHT MODAL OR "R" IOWA TYPE SURVIVOR CURVES

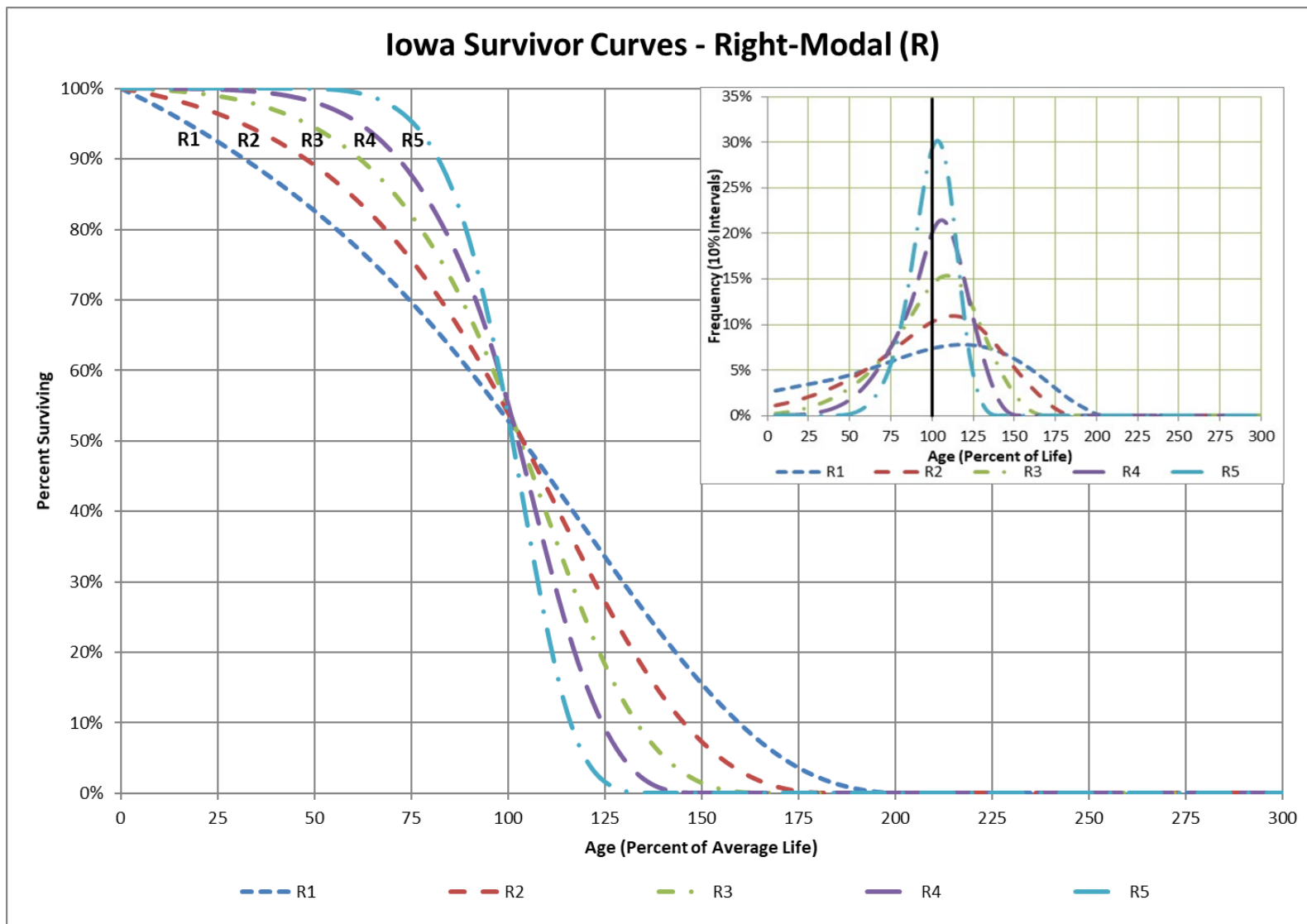
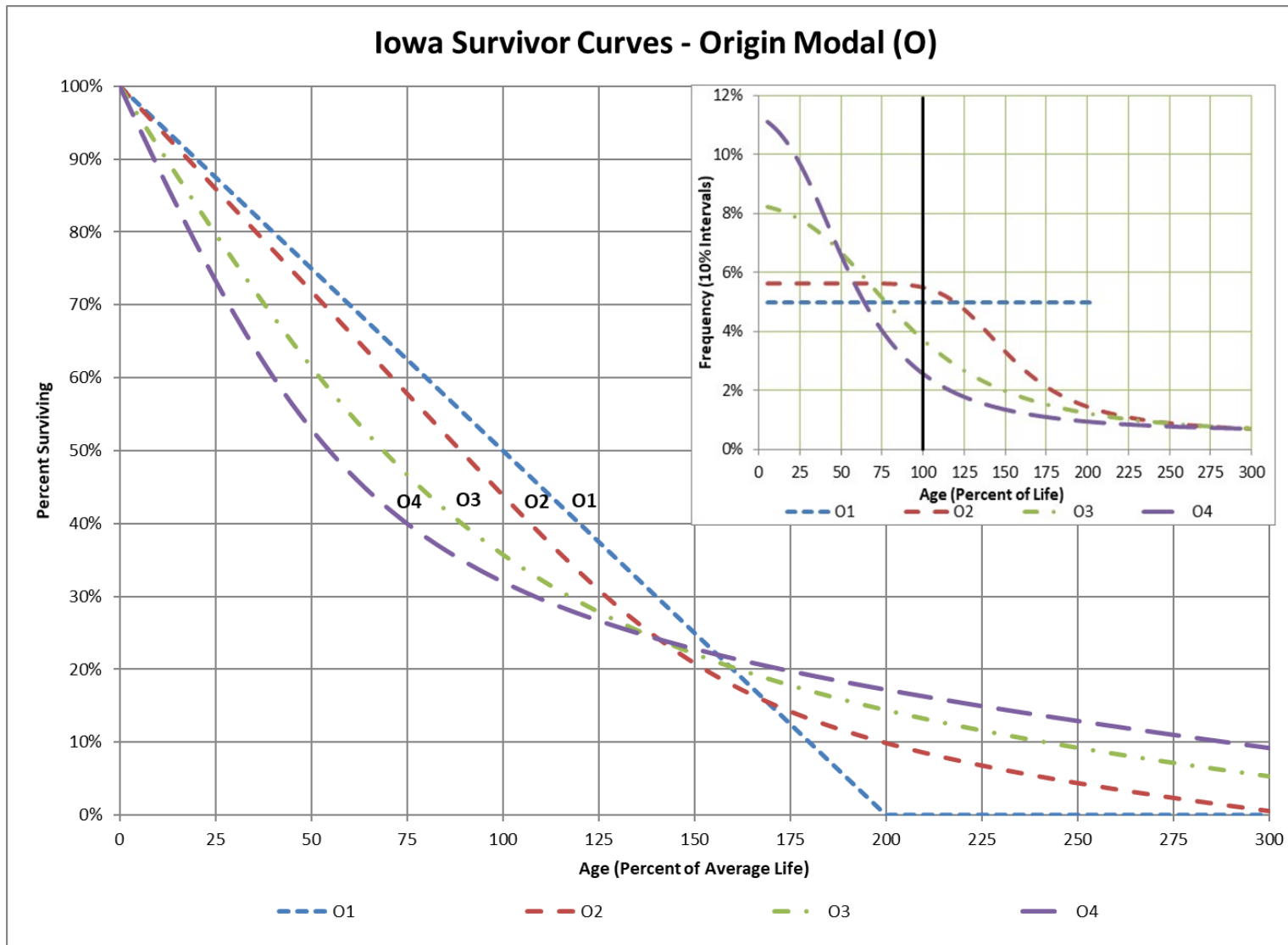




FIGURE 5: ORIGIN MODAL OR "O" IOWA TYPE SURVIVOR CURVES





## 9.4 Retirement Rate Method of Analysis

The Retirement Rate Method is a widely accepted actuarial method used to create survivor curves. This method is also referred to as an original life table. These survivor curves can then be used to determine the average service life of a plant account. The Retirement Rate Method is thoroughly explained in several publications, including *Statistical Analyses of Industrial Property Retirements*,<sup>8</sup> *Engineering Valuation and Depreciation*<sup>9</sup> and *Depreciation Systems*.<sup>10</sup>

The Retirement Rate Method is a subgroup of the placement and the Experience Band Methods, as described in “Depreciation Systems”. The Placement Band Method creates a survivor curve which describes the life characteristics of assets placed into service during a selected timeframe. The Experience Band Method creates a survivor curve which describes the life characteristics of assets removed from service during a selected time frame. The Retirement Rate Method creates both placement and experience bands to give the most complete or representative data. An example of the calculations used in the development of a life table follows. The example includes schedules of annual aged property transactions, a schedule of plant exposed to retirement, a life table and illustrations of smoothing the stub survivor curve.

## 9.5 Schedules of Annual Transactions in Plant Records

The property group used to illustrate the Retirement Rate Method is observed for the experience band 2007-2016 during which there were placements during the years 2007-2017. In order to illustrate the summation of the aged data by age interval, the data was compiled in the manner presented in Schedules 1 and 2. In Schedule 1 (pg. 7-21), the year of installation (year placed) and the year of retirement are shown. The age interval during which a retirement occurred is determined from this information. In the example which follows, \$10,000 of the asset invested in 2002 were retired in 2007. The \$10,000 retirement occurred during the age interval between 4 ½ and 5 ½ years (2007 - 2002) on the basis that approximately one-half of the amount of property was installed prior to and after July 1 of each year. That is, on the average, property installed during a year is placed in service at the midpoint of the year for the purpose of the analysis. All retirements also are stated as occurring at the midpoint of a one-year age interval of time, except the first age interval which encompasses only one-half year.

The total retirements occurring in each age interval in a band are determined by summing the amounts for each transaction year-installation year combination for that age interval. For example, the total of \$143,000 retired for age interval 4½-5½ is the sum of the retirements entered on Schedule 1 immediately above the stair step line drawn on the table beginning with the 2007 retirements of 2002 installations and ending with the 2016 retirements of the 2011 installations. Thus, the total amount of 143 for age interval 4½-5½ equals the sum of:

$$\$10 + \$12 + \$13 + \$11 + \$13 + \$13 + \$15 + \$17 + \$19 + \$20 = \$143 \text{ k}$$

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<sup>8</sup> Anson, Winfrey & Hempstead, *supra* note 6

<sup>9</sup> Anson, Winfrey & Hempstead, *supra* note 6

<sup>10</sup> Wolf & Fitch, *supra* note 1



Other transactions which affect the group are recorded in a similar manner in Schedule 2 (pg.7-22). The entries illustrated include transfers and sales. The entries which are credits to the plant account are shown in parentheses. The items recorded on this schedule are not totaled with the retirements but are used in developing the exposures at the beginning of each age interval.



SCHEDULE 1: RETIREMENTS FOR EACH YEAR 2007 – 2016

Summarized by age interval												
Experience Band 2007-2016											Placement Band 2002-2016	
Year Placed	Retirements, Thousands of Dollars										Total During Age Interval	Age Interval
	During Year											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2002	10	11	12	13	14	16	23	24	25	26	26	13½-14½
2003	11	12	13	15	16	18	20	21	22	19	44	12½-13½
2004	11	12	13	14	16	17	19	21	22	18	64	11½-12½
2005	8	9	10	11	11	13	14	15	16	17	83	10½-11½
2006	9	10	11	12	13	14	16	17	19	20	93	9½-10½
2007	4	9	10	11	12	13	14	15	16	20	105	8½-9½
2008		5	11	12	13	14	15	16	18	20	113	7½-8½
2009			6	12	13	15	16	17	19	19	124	6½-7½
2010				6	13	15	16	17	19	19	131	5½-6½
2011					7	14	16	17	19	20	143	4½-5½
2012						8	18	20	22	23	146	3½-4½
2013							9	20	22	25	150	2½-3½
2014								11	23	25	151	1½-2½
2015									11	24	153	½-1½
2016										13	80	0-½
<b>Total</b>	<b>53</b>	<b>68</b>	<b>86</b>	<b>106</b>	<b>128</b>	<b>157</b>	<b>196</b>	<b>231</b>	<b>273</b>	<b>308</b>	<b>1,606</b>	





SCHEDULE 2: OTHER TRANSACTIONS FOR EACH YEAR 2003 – 2012

Summarized by age interval

Experience Band 2003-2012

Placement Band 1998-2012

Placed (1)	Acquisitions, Transfers and Sales, Thousands of Dollars										Total During Age Interval (12)	Age Interval (13)	
	During Year												
	2003 (2)	2004 (3)	2005 (4)	2006 (5)	2007 (6)	2008 (7)	2009 (8)	2010 (9)	2011 (10)	2012 (11)			
1998	-	-	-	-	-	-	60 <sup>a</sup>	-	-	-	-	-	13½-14½
1999	-	-	-	-	-	-	-	-	-	-	-	-	12½-13½
2000	-	-	-	-	-	-	-	-	-	-	-	-	11½-12½
2001	-	-	-	-	-	-	-	(5) <sup>b</sup>	-	-	60	-	10½-11½
2002	-	-	-	-	-	-	-	6 <sup>a</sup>	-	-	-	-	9½-10½
2003	-	-	-	-	-	-	-	-	-	-	(5)	-	8½-9½
2004	-	-	-	-	-	-	-	-	-	-	-	-	7½-8½
2005	-	-	-	-	-	-	-	-	-	-	-	-	6½-7½
2006	-	-	-	-	-	-	-	(12) <sup>b</sup>	-	-	-	-	5½-6½
2007	-	-	-	-	-	-	-	-	22 <sup>a</sup>	-	-	-	4½-5½
2008	-	-	-	-	-	-	-	(19) <sup>b</sup>	-	-	10	-	3½-4½
2009	-	-	-	-	-	-	-	-	-	-	-	-	2½-3½
2010	-	-	-	-	-	-	-	-	-	(102) <sup>c</sup>	(121)	-	1½-2½
2011	-	-	-	-	-	-	-	-	-	-	-	-	½-1½
2012	-	-	-	-	-	-	-	-	-	-	-	-	0-½
<b>Total</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>60</b>	<b>(30)</b>	<b>22</b>	<b>(102)</b>	<b>(50)</b>		

<sup>a</sup> Transfer Affecting Exposures at Beginning of Year

<sup>b</sup> Transfer Affecting Exposures at End of Year

<sup>c</sup> Sale with Continued Use

Parentheses denote Credit amount.



## 9.6 Schedule of Plant Exposed to Retirement

The development of the amount of plant exposed to retirement at the beginning of each age interval is illustrated in Schedule 3 (pg. 7-24). The surviving plant at the beginning of each year from 2007 through 2016 is recorded by year in the portion of the table titled "Annual Survivors at the Beginning of the Year." The last amount entered in each column is the amount of new plant added to the group during the year. The amounts entered in Schedule 3 for each successive year following the beginning balance or addition, are obtained by adding or subtracting the net entries shown on Schedules 1 and 2. For the purpose of determining the plant exposed to retirement, transfers-in are considered as being exposed to retirement in this group at the beginning of the year in which they occurred, and the sales and transfers-out are considered to be removed from the plant exposed to retirement at the beginning of the following year. Thus, the amounts of plant shown at the beginning of each year are the amounts of plant from each placement year considered to be exposed to retirement at the beginning of each successive transaction year. For example, the exposures for the installation year 2012 are calculated in the following manner:

Exposures at age 0	=	amount of addition	=	\$750,000
Exposures at age ½	=	\$750,000 - \$ 8,000	=	\$742,000
Exposures at age 1½	=	\$742,000 - \$18,000	=	\$724,000
Exposures at age 2½	=	\$724,000 - \$20,000 - \$19,000	=	\$685,000
Exposures at age 3½	=	\$685,000 - \$22,000	=	\$663,000

For the entire experience band 2007-2016, the total exposures at the beginning of an age interval are obtained by summing diagonally in a manner similar to the summing of the retirements during an age interval (Schedule 1). For example, the figure of 3,789, shown as the total exposures at the beginning of age interval 4½-5½, is obtained by summing:

$$\$255 + \$268 + \$ 284 + \$311 + \$334 + \$374 + \$405 + \$448 + \$501 + \$609 + \$3,789k$$



SCHEDULE 3: PLANT EXPOSED TO RETIREMENT AT THE BEGINNING OF EACH YEAR 2003 - 2012

SUMMARIZED BY AGE INTERVAL

Experience Band 2007 - 2016											Placement Band 2002-2016	
Year Placed	Exposures, Thousands of Dollars										Total at Beginning of Age Interval	Age Interval
	Annual Survivors at the Beginning of the Year											
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2002	255	245	234	222	209	195	239	216	192	167	167	13½-14½
2003	279	268	256	243	228	212	194	174	153	131	323	12½-13½
2004	307	296	284	271	257	241	224	205	184	162	531	11½-12½
2005	338	330	321	311	300	289	276	262	242	226	823	10½-11½
2006	376	367	257	346	334	321	307	267	280	261	1,097	9½-10½
2007	420 <sup>a</sup>	416	407	397	386	374	361	347	332	316	1,503	8½-9½
2008		460 <sup>a</sup>	455	444	432	419	405	390	374	356	1,952	7½-8½
2009			510 <sup>a</sup>	504	492	479	464	448	431	412	2,463	6½-7½
2010				580 <sup>a</sup>	574	561	546	530	501	482	3,057	5½-6½
2011					660 <sup>a</sup>	653	639	623	628	609	3,789	4½-5½
2012						750 <sup>a</sup>	742	724	685	663	4,332	3½-4½
2013							850 <sup>a</sup>	841	821	799	4,955	2½-3½
2014								960 <sup>a</sup>	949	923	5,719	1½-2½
2015									1,080 <sup>a</sup>	1,069	6,579	½-1½
2016										1,220 <sup>a</sup>	7,490	0-½
<b>Total</b>	<b>1,975</b>	<b>2,382</b>	<b>2,824</b>	<b>3,318</b>	<b>3,872</b>	<b>4,494</b>	<b>5,247</b>	<b>6,017</b>	<b>6,852</b>	<b>7,799</b>	<b>44,780</b>	

<sup>a</sup> Additions during the year.



## 9.7 Original Life Tables

The original life table, illustrated in Schedule 4 (pg. 7-25) is developed from the totals shown on the schedules of retirements and exposures, Schedules 1 and 3, respectively. The exposures at the beginning of the age interval are obtained from the corresponding age interval of the exposure schedule, and the retirements during the age interval are obtained from the corresponding age interval of the retirement schedule. The retirement ratio is the result of dividing the retirements during the age interval by the exposures at the beginning of the age interval. The percent surviving at the beginning of each age interval is derived from survivor ratios, each of which equals one minus the retirement ratio. The percent surviving is developed by starting with 100% at age zero and successively multiplying the percent surviving at the beginning of each interval by the survivor ratio, i.e., one minus the retirement ratio for that age interval. The calculations necessary to determine the percent surviving at age 5½ are as follows:

Percent surviving at age 4½	=	88.15	
Exposures at age 4½	=	\$3,789,000	
Retirements from age 4½ to 5½	=	\$143,000	
Retirement Ratio	=	$\$143,000 \div \$3,789,000$	= 0.0377
Survivor Ratio	=	$1.000 - 0.0377$	= 0.9623
Percent surviving at age 5½	=	$(88.15) \times (0.9623)$	= 84.83

The totals of the exposures and retirements (columns 2 and 3) are shown for the purpose of checking with the respective totals in Schedules 1 and 3. The ratio of the total retirements to the total exposures, other than for each age interval, is meaningless. The original survivor curve is plotted from the original life table (column 6, Schedule 4). When the curve terminates at a percent surviving greater than zero, it is called a stub survivor curve. Survivor curves developed from retirement rate studies generally are stub curves.



SCHEDULE 4: ORIGINAL LIFE TABLE - CALCULATED BY THE RETIREMENT RATE METHOD

Experience Band 2007-2016			Placement Band 2002-2016		
Age at Beginning of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retirement Ratio	Survivor Ratio	% Surviving at Beginning of Age Interval
0.0	7,490	80	0.0107	0.9893	100.00
0.5	6,579	153	0.0233	0.9767	98.93
1.5	5,719	151	0.0264	0.9736	96.62
2.5	4,955	150	0.0303	0.9697	94.07
3.5	4,332	146	0.0337	0.9663	91.22
4.5	3,789	143	0.0377	0.9623	88.15
5.5	3,057	131	0.0429	0.9571	84.83
6.5	2,463	124	0.0503	0.9497	81.19
7.5	1,952	113	0.0579	0.9421	77.11
8.5	1,503	105	0.0699	0.9301	72.65
9.5	1,097	93	0.0848	0.9152	67.57
10.5	823	83	0.1009	0.8991	61.84
11.5	531	64	0.1205	0.8795	55.60
12.5	323	44	0.1362	0.8638	48.90
13.5	167	26	0.1557	0.8443	42.24
<b>Total</b>	<b>44,780</b>	<b>1,606</b>			

Exposure and Retirement Amounts are in Thousands of Dollars

- Column 2 from Schedule 3, Column 12, Plant Exposed to Retirement.
- Column 3 from Schedule 1, Column 12, Retirements for Each Year.
- Column 4 = Column 3 divided by Column 2.
- Column 5 = 1.0000 minus Column 4.
- Column 6 = Column 5 multiplied by Column 6 as of the Preceding Age Interval.



## 9.8 Smoothing the Original Survivor Curve

The smoothing of the original survivor curve eliminates any irregularities and serves as the basis for the preliminary extrapolation to 0% surviving of the original stub curve. Even if the original survivor curve is complete from 100% to 0%, it is desirable to eliminate any irregularities, as there is still an extrapolation for the vintages which have not yet lived to the age at which the curve reaches 0%. In this study, the smoothing of the original curve with established type curves was used to eliminate irregularities in the original curve.

The Iowa type curves are used in this study to smooth those original stub curves which are expressed as percentages surviving at ages in years. Each original survivor curve was compared to the Iowa curves using visual and mathematical matching in order to determine the better fitting smooth curves. In Figures 6, 7, and 8, the original curve developed in Schedule 4 is compared with the L, S, and R Iowa type curves which most nearly fit the original survivor curve. In Figure 6, the L1 curve with an average life between 12 and 13 years appears to be the best fit. In Figure 7, the S0 type curve with a 12-year average life appears to be the best fit and appears to be better than the L1 fitting. In Figure 8, the R1 type curve with a 12-year average life appears to be the best fit and appears to be better than either the L1 or the S0.

In Figure 9, the three fittings, 12-L1, 12-S0 and 12-R1 are drawn for comparison purposes. It is probable that the 12-R1 Iowa curve would be selected as the most representative of the plotted survivor characteristics of the group.



FIGURE 6: ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH A L1 IOWA TYPE CURVE ORIGINAL AND SMOOTH SURVIVOR CURVES

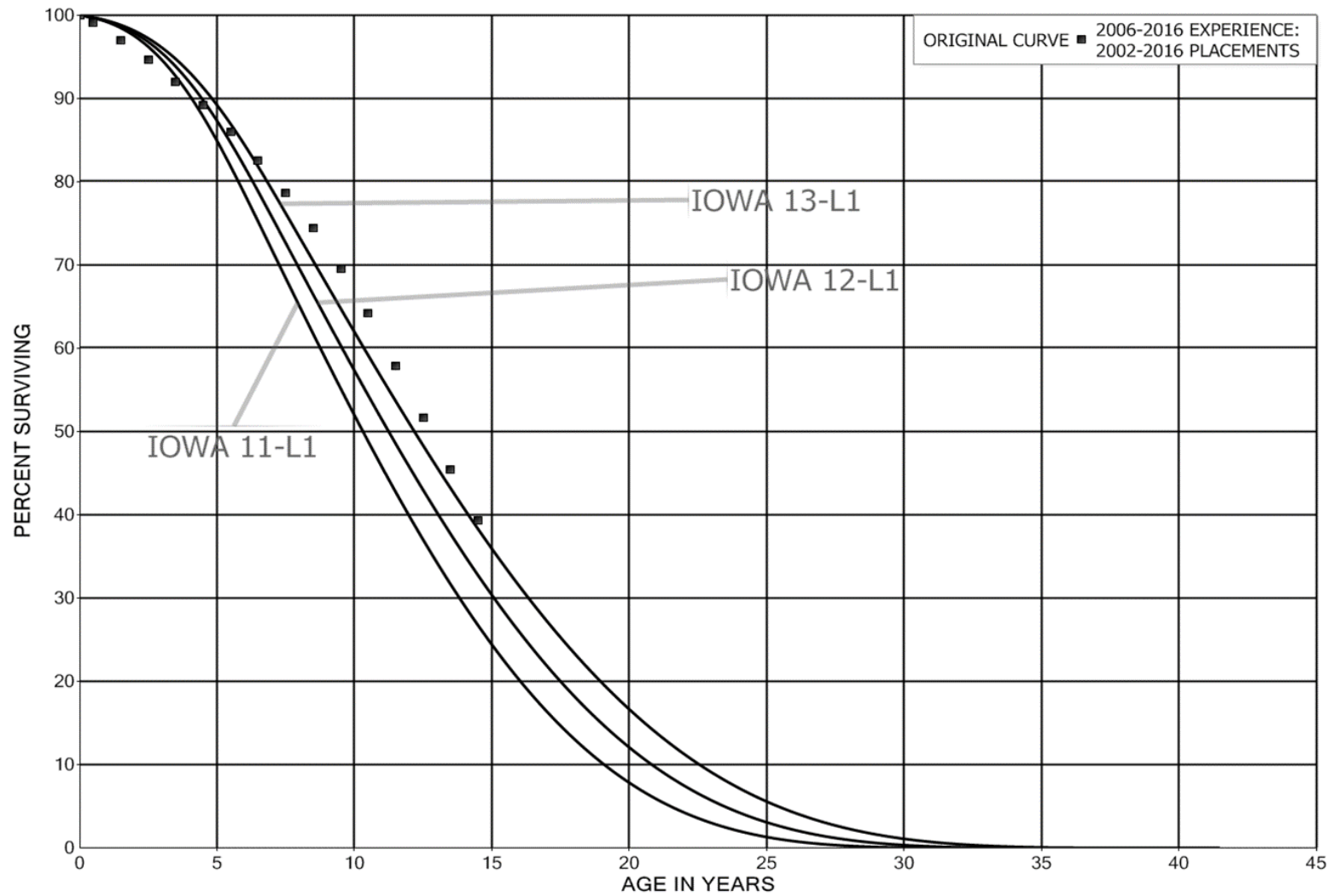




FIGURE 7: ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH A SO IOWA TYPE CURVE ORIGINAL AND SMOOTH SURVIVOR CURVES

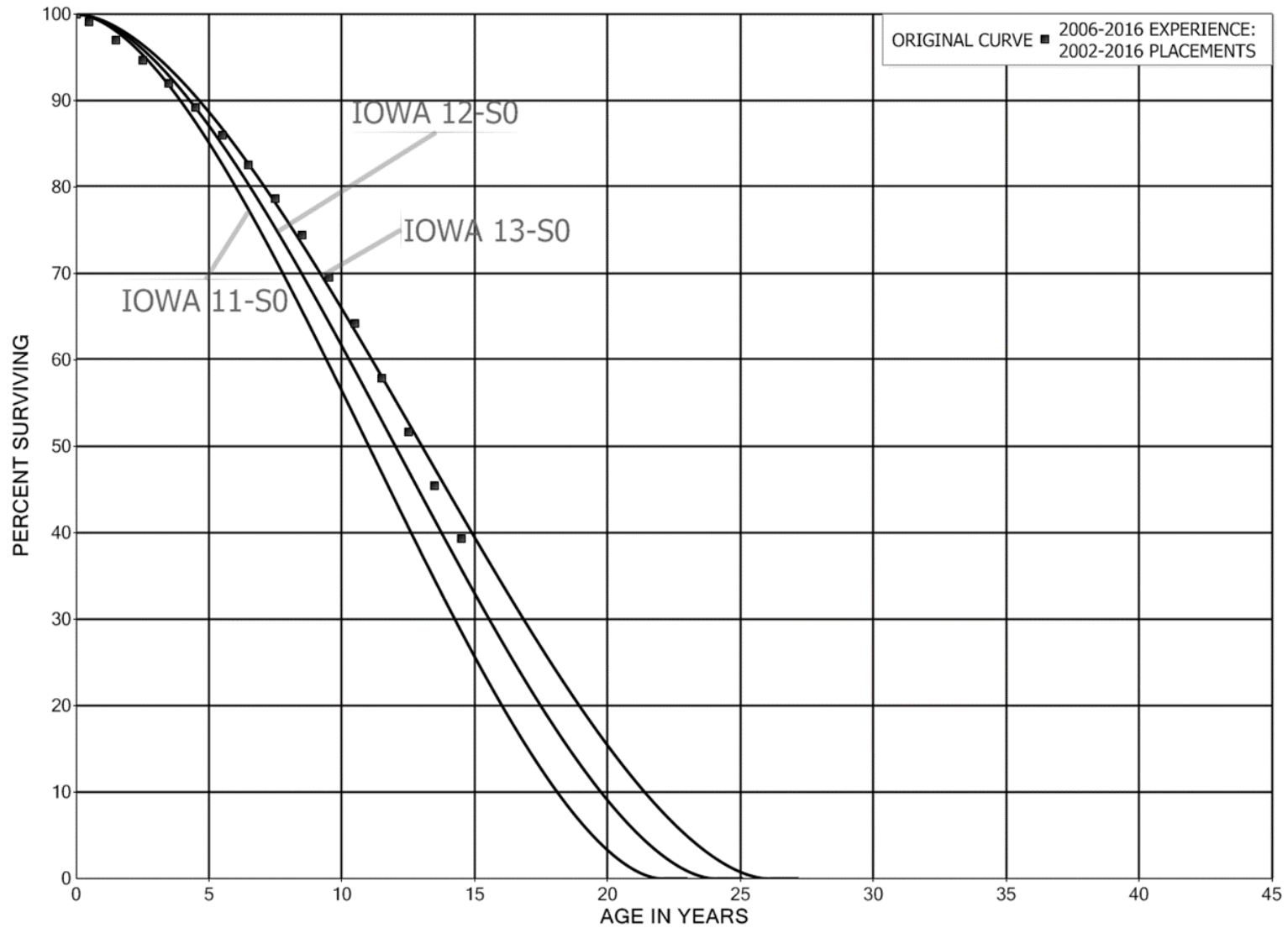






FIGURE 8: ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH A R1 IOWA TYPE CURVE ORIGINAL AND SMOOTH SURVIVOR CURVES

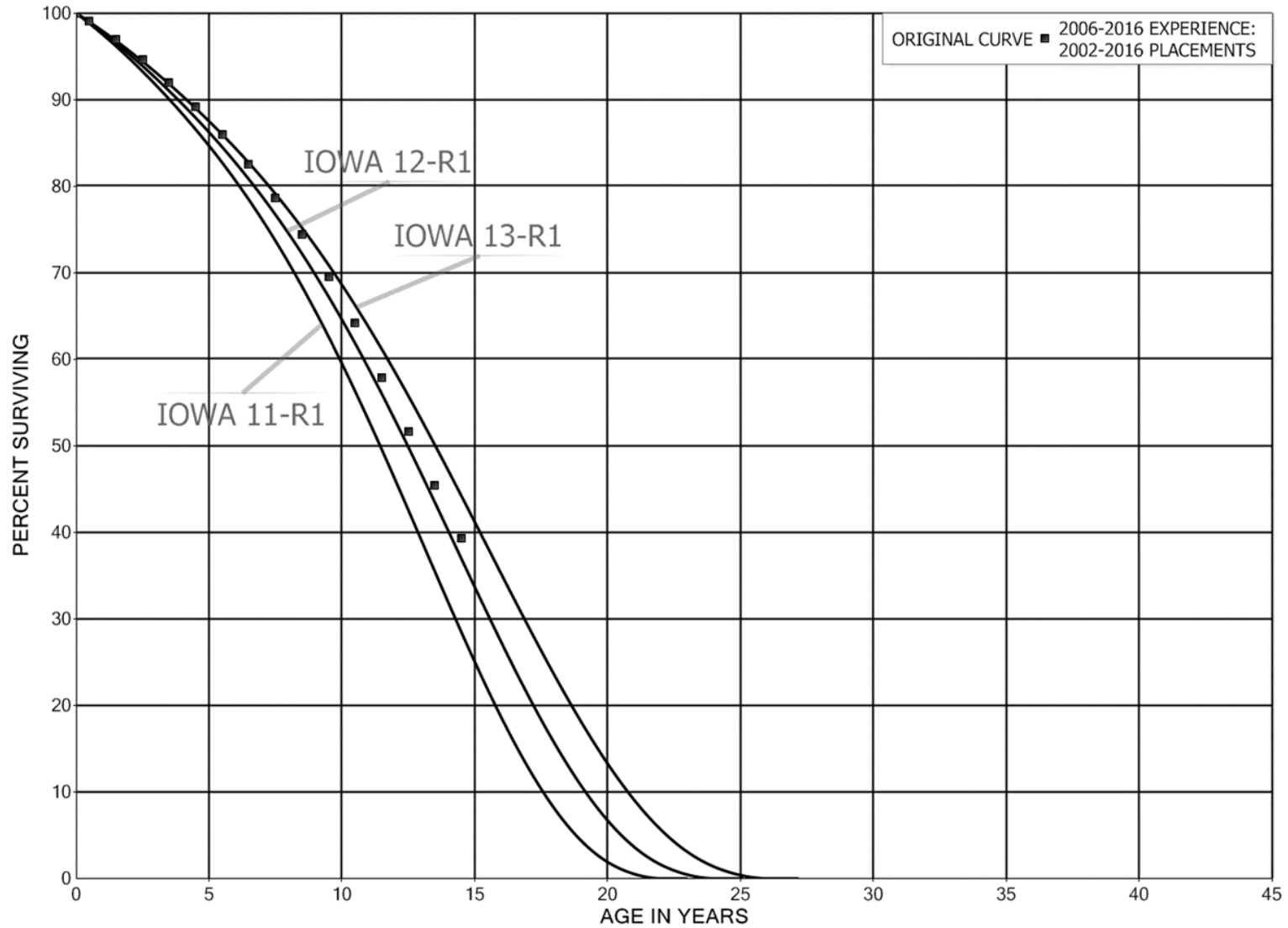




FIGURE 9: ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH A L1 IOWA TYPE CURVE ORIGINAL AND SMOOTH SURVIVOR CURVES

