EXHIBIT
BHPL
TMO-1

RESERVE CAPACITY INTEGRATION AGREEMENT

dated as of May 5, 1987

between

PACIFICORP, dba PACIFIC POWER & LIGHT COMPANY

and

BLACK HILLS CORPORATION, dba BLACK HILLS POWER AND LIGHT COMPANY

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EXHIBITS

Exhibit A - Combustion Turbines situated at Rapid City, South Dakota

Exhibit B - Calculation of average annual production cost

RESERVE CAPACITY INTEGRATION AGREEMENT

This Reserve Capacity Integration Agreement, dated as of the 5th day of May, 1987, by and between Pacific Power & Light Company, an assumed business name of PacifiCorp, a Maine corporation (Pacific), and Black Hills Power and Light Company, an assumed business name of Black Hills Corporation, a South Dakota corporation (Black Hills).

RECITALS

WHEREAS Pacific and Black Hills are joint lessees of the 330 megawatt Wyodak Power Facility in Gillette, Wyoming; and

WHEREAS Pacific, by virtue of a December 31, 1983 Power Sales Agreement, is Black Hills' principal outside supplier of firm electric power and energy; and

WHEREAS Pacific and Black Hills have significant diversity of load patterns and wholesale marketing opportunities; and

WHEREAS the aforementioned circumstances create opportunities for the integration of the parties' reserve capacity for the purpose of increasing Black Hills' system reliability, better matching Black Hills loads and resources, and enhancing Pacific's wholesale marketing opportunities;

NOW, THEREFORE, Pacific and Black Hills wish to exchange and integrate their reserve capacity upon the following terms and conditions:

Section 1. Term. This Agreement shall commence on July 1, 1987 and terminate on June 30, 2012.

Section 2. Definitions.

(a) "Operating and Maintenance Costs" shall mean all costs of repairs, operating and maintenance expenses, administrative, accounting and general expenses, other than property tax and insurance expenses, incurred by Black Hills in the operation and maintenance of the Combustion Turbines, and including but not limited to:

1. repair costs, losses, damages, judgments, defense costs and expense sustained or incurred by Black Hills,

directly or indirectly, in connection with the performance of services to be performed hereunder except for such repair costs, losses, damages, judgments, defense costs and expenses sustained or incurred as a result of Black Hills' negligence;

2. an appropriate allocation for administration and general expenses;

3. costs of acquiring and maintaining an inventory of fuel oil for Pacific's account as required herein; provided, Black Hills shall pay the costs associated with acquiring and maintaining fuel oil in the storage tanks for its purposes;

4. costs of electric power and energy, at applicable rates, furnished by Black Hills to service the Combustion Turbines, including heating the fuel oil inventory for which Pacific is responsible; and

5. any taxes levied specifically on operators of combustion turbines or the generation from combustion turbines.

(b) "Combustion Turbines" shall mean those facilities situated at Rapid City, South Dakota and described in Exhibit A to this Agreement.

(c) "Incremental Cost of Generation" means for any hour the highest average annual production cost ($/MWh) of any of Pacific's owned or leased coal-fired plant (excluding lease costs) which was operating during such hour where such production cost shall be determined from Pacific's most recently filed FERC Form No. 1 or its successor form and where the fuel cost component of production cost shall be increased by 7% for system losses. An example of a calculation of average annual production cost is contained in Exhibit B to this Agreement.

Section 3. Exchange of Reserve Capacity.

(a) Black Hills maintains the Combustion Turbines on its system to satisfy its system reserve requirements. Black Hills warrants that the Combustion Turbines are in good working order as of the date of this Agreement.

(b) Black Hills hereby assigns to Pacific the right to use the Combustion Turbines as specified in this Agreement.

(c) Black Hills shall retain day-to-day operational control of the Combustion Turbines and keep all necessary operating

permits in place. Black Hills shall maintain liability and property insurance on the Combustion Turbines consistent with prudent utility practice and show Pacific as an additional insured, provided that showing Pacific as an additional insured does not increase the insurance premium paid by Black Hills. Black Hills shall be responsible for maintaining the Combustion Turbines in good working order and shall run them for Pacific's account when requested by Pacific to do so. Black Hills shall proceed with any required repair of the Combustion Turbines with all reasonable dispatch. Any insurance proceeds associated with damage to the Combustion Turbines shall be applied to the cost of repair. Pacific shall reimburse to Black Hills the Operation and Maintenance Costs of the Combustion Turbines and Pacific shall pay all fuel costs associated with Pacific's use of them.

(d) If the Combustion Turbines suffer sufficient wear or obsolescence that they cannot be kept in good working order at a reasonable cost, they shall be replaced at Pacific's expense, in which event Pacific shall be responsible for insurance and property taxes thereon. Upon the termination of this Agreement, Black Hills shall pay Pacific an amount equal to the then-depreciated book value of any Combustion Turbines replaced by Pacific and ownership of such Combustion Turbines shall then transfer to Black Hills.

(e) For the Term of this Agreement, Pacific will make available up to 100 megawatts of capacity from its system to meet Black Hills' reserve requirements. Such reserve capacity shall be available to Black Hills only at such time as consistent with prudent utility practice, Black Hills would, absent this Agreement, have made use of the Combustion Turbines. At such times as Black Hills makes use of its right to this system reserve capacity, it shall pay Pacific for energy taken with the capacity based upon Pacific's then-prevailing Incremental Cost of Generation, not to exceed fuel costs associated with operating the Combustion Turbines. If Black Hills concludes that because of transmission outages, or low voltage conditions on Black Hills' system, it is necessary for it to operate the Combustion Turbines in lieu of taking reserve system capacity from Pacific, it may do so, but shall be responsible for paying the associated fuel costs as well as a pro rata share of any taxes levied on the basis of the level of generation from the Combustion Turbines. Black Hills' right to use the Combustion Turbines, when required by prudent utility practice to do so, shall be superior to Pacific's.

(f) Pacific will maintain an inventory of no less than 250,000 gallons of fuel for its use of the Combustion Turbines and Black Hills shall maintain an inventory of no less than 250,000 gallons for its purposes.

(g) In consideration of the benefits to it from this exchange of reserve capacity, Pacific will pay Black Hills $50,000 each month of the Term of this Agreement.

Section 4. Relocation of Combustion Turbines. If agreeable to Black Hills, Pacific at its cost, may relocate the Combustion Turbines based upon terms and conditions to be negotiated by the parties.

Section 5. Fuel. All fuel stored and used on behalf of Pacific shall be charged to Pacific for any governmental allocations and restrictions on use which may be applicable during the Term, and all fuel stored and used on behalf of Black Hills shall be charged to Black Hills for such purposes.

During the Term of this Agreement, by mutual agreement, the parties may elect to convert the Combustion Turbines to burn natural gas, in which case the provisions of this Agreement related to fuel costs shall be amended accordingly. Neither party shall unreasonably withhold its consent to such a conversion if the other party is prepared to pay the cost of the conversion.

Section 6. Points of Delivery. The deliveries of power and energy contemplated by this Agreement shall be made to the Wyodak Substation point of interconnection between Pacific's system and Black Hills' system as defined in the Wyodak Substation Construction, Ownership and Operation Agreement among Pacific, Black Hills and Tri-County Electric Association, Inc. dated September 28, 1981 or to any other point of interconnection as mutually agreed upon by the parties which has an adequate capacity to accommodate such deliveries. Neither party shall unreasonably withhold its consent to establishing such other points of interconnection; however, nothing herein shall be interpreted as an agreement by any party to incur additional costs.

Section 7. Schedules. The parties shall schedule all deliveries of power and energy required by this Agreement in accordance with normal scheduling practices. Such schedules of power and energy shall be deemed to be delivered during the hours and in the amounts scheduled; provided, that if scheduled deliveries are interrupted due to forces beyond either party's control, including but not limited to loss of facilities, such scheduled deliveries shall be adjusted to reflect such interruptions. While recognizing that reserve capacity may be required on an emergency basis, the parties shall nevertheless use their best efforts, consistent with prudent utility practice, to minimize rapid changes in deliveries hereunder.

Section 8. Payment Schedules. Black Hills shall mail to Pacific, first class postage prepaid, an invoice for all Operation and Maintenance Costs by the third working day of each month. Invoices shall be based on the estimated costs for that month and later invoices adjusted as actual costs are determined. Pacific shall mail to Black Hills, first class postage prepaid, an invoice for all energy acquired hereunder by Black Hills during the prior month, while taking system capacity, by the third working day of each month. The parties shall pay such invoices by the 15th of each month. Each monthly payment shall be made in immediately available funds by the due date. Simple interest shall accrue on any amount not paid when due at a rate of 125 percent of the prime rate as established by the Morgan Guaranty Trust Company of New York during the period of delinquency.

Section 9. Uncontrollable Forces. Neither party to this Agreement shall be considered to be in default in the performance of any obligation hereunder if failure to perform shall be due to uncontrollable forces. The term "uncontrollable forces" means any cause beyond the control of the party affected, including, but not limited to, failure of facilities, flood, earthquake, storm, fire, lightening, epidemic, war, riot, civil distrubance, labor disturbance, sabotage, restraint by court order or public authority, by which exercise of due foresight, such party could not reasonably have been expected to avoid, and by which exercise of due diligence shall be able to overcome. The parties shall not, however, be relieved of liability for failure of performance if such failure is due to causes arising out of removable or remediable causes which it fails to remove or remedy with reasonable dispatch. Any party rendered unable to fulfill any obligation by reason of uncontrollable forces shall exercise due diligence to remove such inability with all reasonable dispatch. Nothing contained herein, however, shall be construed to require a party to prevent or settle a strike against its will. It is specifically understood and agreed that Pacific's delivery of capacity under this Agreement comes from its system and does not depend upon the existence, operation or the efficiency of any particular generating resource.

Section 10. Limitation of Liability. Neither party shall be liable for any consequential losses or damages, including, but not limited to, damages for lost profits arising from its breach of this Agreement, whether or not such losses or damages are caused by a party's negligence.

Section 11. Government Regulations. The parties shall submit this Agreement for filing with the Federal Energy

Regulatory Commission. The terms, conditions and prices for service specified herein shall remain in effect for the term hereof and shall not be subject to change through application to the Federal Energy Regulatory Commission pursuant to the provisions of Section 205 of the Federal Power Act, absent the agreement of the parties hereto. The parties covenant that neither shall request relief from any of the provisions of this Agreement pursuant to the provisions of Section 206 of the Federal Power Act, absent the agreement of the parties hereto. The foregoing statutory references are intended to include any subsequent similar enactments.

Section 12. Arbitration. If any dispute arises under this Agreement as to any factual matter, the parties shall submit the factual dispute to a board of three arbiters, one to be selected by each party and the parties to agree on the selection of a third arbiter. If the parties are unable to agree on the third arbiter, the parties shall request the senior district judge of the United States District Court of the District of Wyoming to submit a list of five persons. Each party shall alternately strike one name from the list, the first exercise to be determined by lot. The last person remaining on the list shall serve as the third arbiter. The arbiters shall not take into account the relative value of each party's rights and obligations under this Agreement in resolving any issue. Except as otherwise set forth herein, the arbitration shall be held under the rules of the American Arbitration Association. The arbiters shall render their decision in writing not later 30 days after the matter has been submitted to them. The decision of the majority of the board of arbiters of the factual dispute shall be binding upon the parties. The arbiters may in their discretion award arbitration costs and attorneys fees to either party.

Section 13. Notices. Any notice, demand, or request under this Agreement shall be deemed properly served, given, or made if delivered in person or sent by registered or certified mail, postage paid and return receipt requested, to the person so designated as its authorized representative. The titles and addresses of the authorized representatives hereunder are as follows:

For Black Hills: Vice President and Chief
Operating Officer
Black Hills Power and Light Company
625 Ninth Street
PO Box 1400
Rapid City, SD 57709

For Pacific: Vice President, Power Systems
Pacific Power & Light Company
920 SW Sixth Avenue
Portland, OR 97204

Section 14. Assignment. This Agreement shall not be assigned to any third party without the written consent of the other and such consent shall not be withheld unreasonably. No assignment of this Agreement shall operate to discharge the assignor of any duty or obligation hereunder without the written consent of the other party.

Section 15. Choice of Law. This Agreement shall be subject to and be construed under the laws of the State of Wyoming.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed in their respective names by their respective officers thereunder duly authorized.

PACIFICORP, dba
PACIFIC POWER & LIGHT COMPANY

By: Robert M Smith
Date: 5/11/97

Attest: Sally A. Mofziger
Secretary

BLACK HILLS CORPORATION, dba
BLACK HILLS POWER AND LIGHT COMPANY

By: Daniel S Landguth
Date: May 5, 1997 Vice President

Attest: Jeanne L Kelly
Secretary

Exhibit A
to
Reserve Capacity Integration Agreement

COMBUSTION TURBINES

4 - G.E. Model Series 5001-P Combustion Turbines S/N 244781, 244782, 245137, 245252. Including Site preparation and Inertial Separator Silencers

1 - 16' x 20' Concrete Block Battery House including wiring

3 - 66' x 40' 1 million gallon fuel oil tanks, pumps and heaters

1 - 20' x 24' concrete block foam house, foam equipment and distribution system for fire protection of the three oil tanks

Fuel Unloading Station including spill prevention structure, pumps and flow meters

Remote metering and control equipment

Unit transformers 13.2/69 KV

MISCELLANEOUS ITEMS INCLUDING BUT NOT NECESSARILY LIMITED TO THE FOLLOWING:

1 - 15 KVA dry type transformer

Chain link fence

Certain test equipment

Work benches and cabinets

5 - 400 watt mercury vapor lamps

Spare parts

RESERVE CAPACITY INTEGRATION AGREEMENT

EXAMPLE

Determine the following Pacific Power & Light Costs associated with Jim Bridger Plant for calendar year 1985 using FERC Form 1:

1. Fuel Cost in $/mWh.
2. Production Cost in $/mWh.
3. Production Cost with losses in $/mWh.

1. F = Fuel Cost in $/mWh: *(Pg 402)*

- Fuel Cost = $104,860,108 *(Line 21)*.
- Net Generation = 8,752,283 mWh *(Line 12)*.
- F = $104,860,108 ÷ 8,752,283 mWh = **11.98 $/mWh.**

2. P = Production Cost in $/mWh: *(Pg 402)*

- Production Cost = $145,514,760 *(Line 34)*.
- Net Generation = 8,752,283 mWh *(Line 12)*.
- P = $145,514,760 ÷ 8,752,283 mWh = **16.63 $/mWh.**

3. Production Cost with losses in $/mWh:

- Losses = 7.00%.
- Production Cost with losses = (1.07 x F) + (P - F)
  = (1.07 x 11.98) + (16.63 - 11.98) = **17.47 $/mWh.**

Name of Respondent	This Report is:	Date of Report (Mo, Da, Yr)	Year of Report
PacifiCorp dba Pacific Power & Light Company	(1) ☒ An Original (2) ☐ A Resubmission		Dec. 31, 1983

STEAM-ELECTRIC GENERATING PLANT STATISTICS (Large Plants)

1. Report data for Plant in Service only.
2. Large plants are steam plants with installed capacity (name plate rating) of 25,000 Kw or more. Report on this page conventional and nuclear generating plants of 10,000 Kw or more, and internal combustion plants of 10,000 Kw or more, and gas turbine plants.
3. Indicate by a footnote any plant leased or operated as a joint facility.
4. If net peak demand for 60 minutes is not available, give data which is available, specifying period.
5. If any employees attend more than one plant, report on line 11 the approximate average number of employees assignable to each plant.
6. If gas is used and purchased on a therm basis, report the Btu content of the gas and the quantity of fuel burned as converted to Mcf.
7. Quantities of fuel burned (line 38) and average cost per unit of fuel burned (line 41) should be consistent with charges to expense accounts 501 and 547 (line 43) as shown on line 21.
8. If more than one fuel is burned in a plant, furnish only the composite heat rate for all fuels burned.

Line No.	Item (a)	Plant Name: Jim Bridger-Fossil Only (b)			Plant Name: Jim Bridger-Total (f) (c)		
1	Kind of Plant (Internal Comb., Gas Turbine or Nuclear)	Steam			Steam		
2	Type of Plant Construction (Conventional, Outdoor Boiler, Full Outdoor, Etc.)	Semi-Outdoor			Semi-Outdoor		
3	Year Originally Constructed	1974			1974		
4	Year Last Unit was Installed	1979			1979		
5	Total Installed Capacity (Maximum Generator Name Plate Ratings in MW) Turbine (1)	1,356 (1)			2,034 (1)		
6	Net Peak Demand on Plant--MW (60 minutes)	1,390			1,973		
7	Plant Hours Connected to Load	8,760			8,760		
8	Net Continuous Plant Capability (Megawatts)						
9	When Not Limited by Condenser Water	1,356			2,034		
10	When Limited by Condenser Water	Not Applicable			Not Applicable		
11	Average Number of Employees	511			511		
12	Net Generation, Exclusive of Plant Use--Kwh	8,752,283			13,198,391		
13	Cost of Plant:						
14	Land and Land Rights	$ 1,090 973			$ 1,826,270		
15	Structures and Improvements	113,277,099			162,377,779		
16	Equipment Costs	453,886,018			681,726,964		
17	Total Cost	$ 568,254,090			$ 845,729,017 (g)		
18	Cost per KW of Installed Capacity (Line 5)	$ 419			$ 416		
19	Production Expenses:						
20	Operation Supervision and Engineering	$ 1,807,013			$ 3,105,392		
21	Fuel	104,860,108			157,930,817		
22	Coolants and Water (Nuclear Plants Only)						
23	Steam Expenses	4,198,397			6,697,654		
24	Steam From Other Sources						
25	Steam Transferred (Cr.)						
26	Electric Expenses	2,329,568			3,628,508		
27	Misc. Steam (or Nuclear) Power Expenses	2,824,190			4,476,513		
28	Rents	68,882			107,223		
29	Maintenance Supervision and Engineering	3,028,361			4,739,091		
30	Maintenance of Structures	2,852,888			4,344,529		
31	Maintenance of Boiler (or Reactor) Plant	17,006,983			25,486,441		
32	Maintenance of Electric Plant	3,570,760			5,543,859		
33	Maint. of Misc. Steam (or Nuclear) Plant	2,967,252			4,423,625		
34	Total Production Expenses	$ 145,314,760			$ 220,639,151 (g)		
35	Expenses per Net KWH (3 Mills--2 places)	16.61			16.72		
36	Fuel: Kind (Coal, Gas, Oil, or Nuclear)	Coal	Oil		Coal	Oil	
37	Unit (Coal--tons of 2,000 lb.) (Oil--Barrels of 42 gals.) (Gas--Mcf) (Nuclear--indicate)	Ton	Barrel		Ton	Barrel	
38	Quantity (Units) of Fuel Burned	4,830,385	12,645		7,285,711	48,968	
39	Avg. Heat Cont. of Fuel Burned (Btu per lb. of coal per gal. of oil, or per Mcf of gas) (Also see # 8 nuclear)	9,483	141,000		9,483	141,000	
40	Average Cost of Fuel per Unit, as Delivered f.o.b. Plant During Year	$20.4084	$25.9748		$20.8561	$26.9748	
41	Average Cost of Fuel per Unit Burned	$21.4716	$35.0502		$21.4454	$34.8373	
42	Avg Cost of Fuel Burned per Million Btu	$ 1.1321	$ 5.9186		$ 1.1307	$ 5.8827	
	Avg. Cost of Fuel Burned per Kwh Net Gen.	Composite rate: $0.0120			Composite rate: $0.0170		
	Average Btu per Kwh Net Generation	Composite rate: 10,490			Composite rate: 10,49?		

See Page 403-b For Footnotes

0-132-26-677

EXHIBIT
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TMO-2

Electric Power Generation Resources of Black Hills 1996		
Resource	Fuel Source	Capacity
Neil Simpson Unit #1	Coal	18 MW
Neil Simpson Unit #2	Coal	80 MW
Osage Station	Coal	30 MW
Ben French Station	Coal Diesel	22 MW 10 MW
Kirk Station	Coal	16 MW
Wyodak Plant (20 percent interest	Coal	64 MW
PacifiCorp Colstrip Contract	PacificCorp system delivery	75 MW
PacificCorp Reserve Integration Agreement	PacificCorp system delivery	100 MW
Total Capacity		415 MW

EXHIBIT
BHPL
TMO-3

Neil Simpson Unit 2
STARTUP MILESTONE TARGET DATES

ACTIVITY	TARGET COMPLETION	ACTUAL
Reliable Power Source from Constr Power	10/01/94	11/16/94
DCIS Check out	11/15/94	11/23/94
DCIS Ready for I/O Checkout	12/15/94	11/21/94
Energize Permanent Aux Power	01/01/95	11/22/94
Service Air	02/01/95	12/16/94
Service Water (Available for Hydro)	02/15/95	11/21/94
Demineralizer Functional & Water Available	03/15/95	P 01/15/95
Condensate Pump Operations	04/01/95	P 01/10/95
Start System Hydrostatic Testing (Demin Water)	04/01/95	11/18/94*
Hydro Boiler	04/15/95	P 01/20/95
Turbine Lube Oil Flush	04/21/95	P 03/01/95
Turbine on Turning Gear	05/01/95	P 03/15/95
DA Cleaning	05/01/95	P 03/15/95
Pre-Boiler Cleaning	05/15/95	P 04/01/95
DCIS I/O CHECKOUT	05/30/95	05/30/95
Boiler Chemical Cleaning	06/01/95	P 04/15/95
Steam Blow	07/01/95	P 05/15/95
Condensor Vaccum	07/15/95	P 06/01/95
Start Steam Admission	08/01/95	P 06/15/95
First Fire on Coal	08/15/95	P 07/01/95
Screen Run	09/01/95	P 07/15/95
Screen Removal & Bearing Inspection	10/01/95	P 08/01/95
Commercial Operation	11/15/95	P 08/27/95

* Available from PP&L

P = Projected

January 6, 1995

EXHIBIT
BHPL
TMO-4

CONSTRUCTION PROGRESS REPORT #17

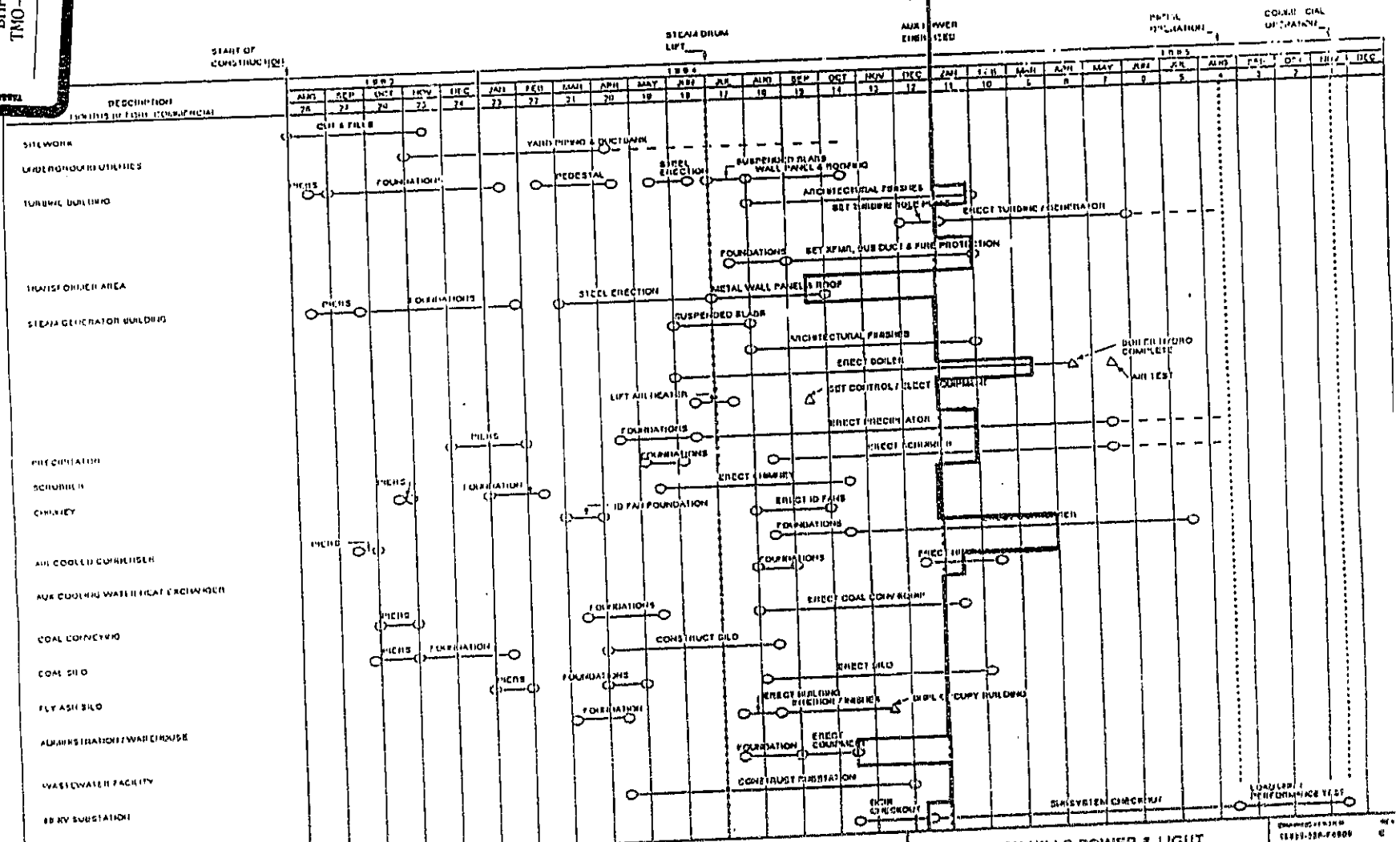


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TMO-5

Anticipated Contract Expiration and Retirement of Existing Power Generation Resources of Black Hills		
Resource	Originating Year	Expiration or Retirement
Neil Simpson	1969	2012
Osage	1948-1952	2010
Ben French 22 MW 10 MW diesels	 1960 1965	2010
Kirk 16 MW #4	1956	2006
Wyodak Plant (20% interest)	1978	
PacifiCorp Colstrip Contract	1983	2023
PacificCorp Reserve Integration Agreement	1987	2012 (contract expiration) (4 25-MW CTs)[1]

[1]Black Hills' four 25 MW combustion turbines will survive the PacifiCorp contract

EXHIBIT
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TMO-6

1980 THROUGH 1994 MONTHLY DEMAND

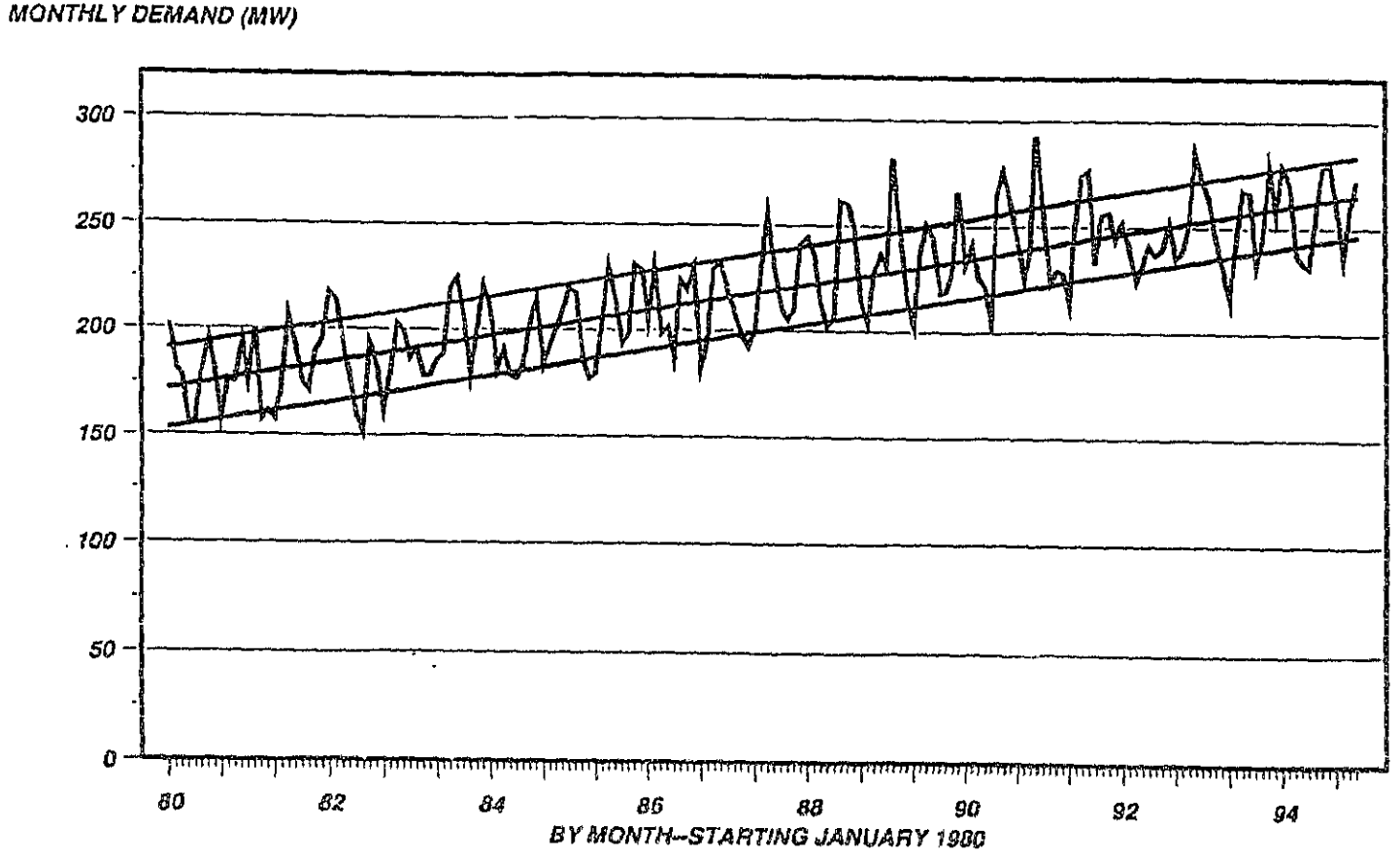


EXHIBIT
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1980 THROUGH 1994 MONTHLY ENERGY

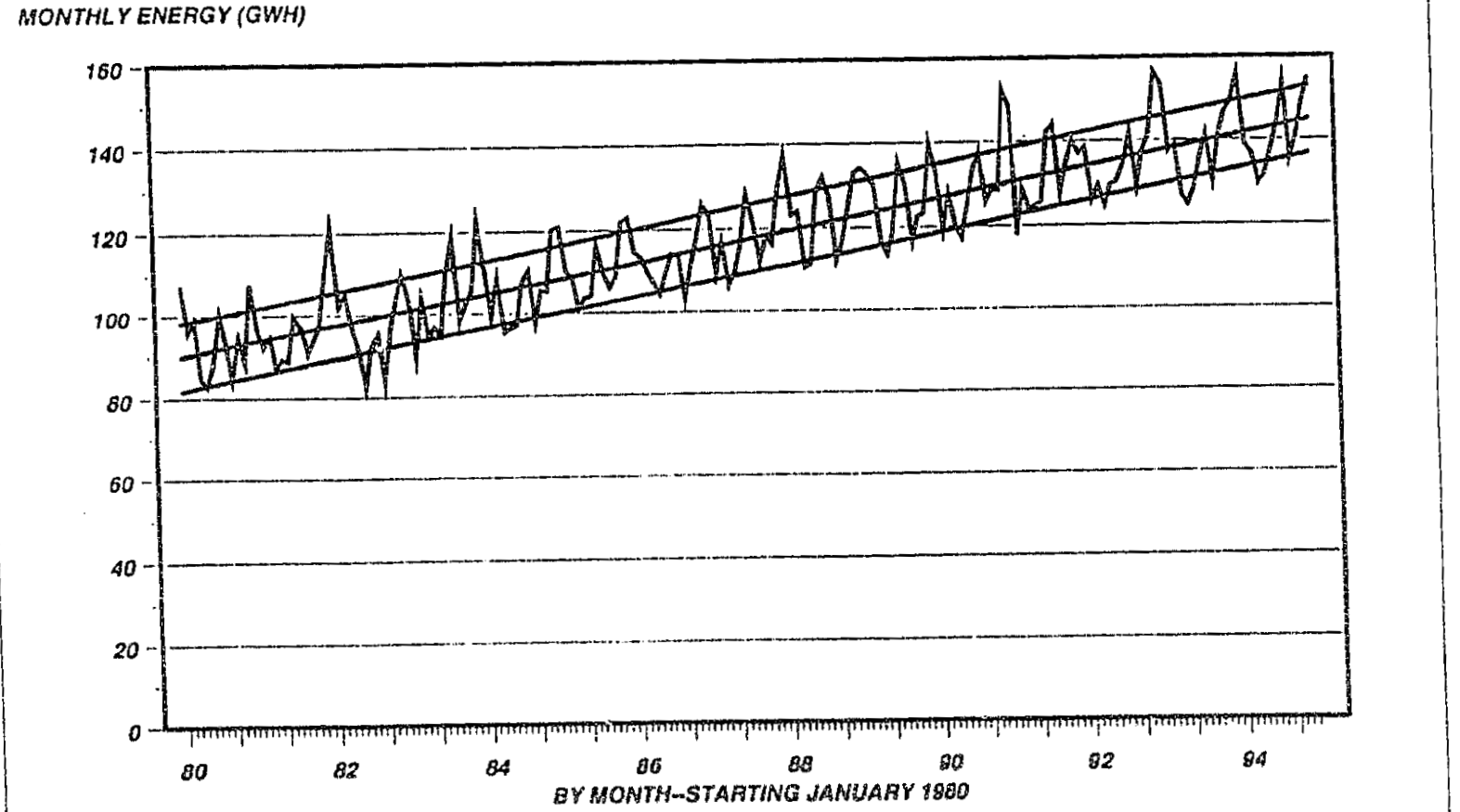
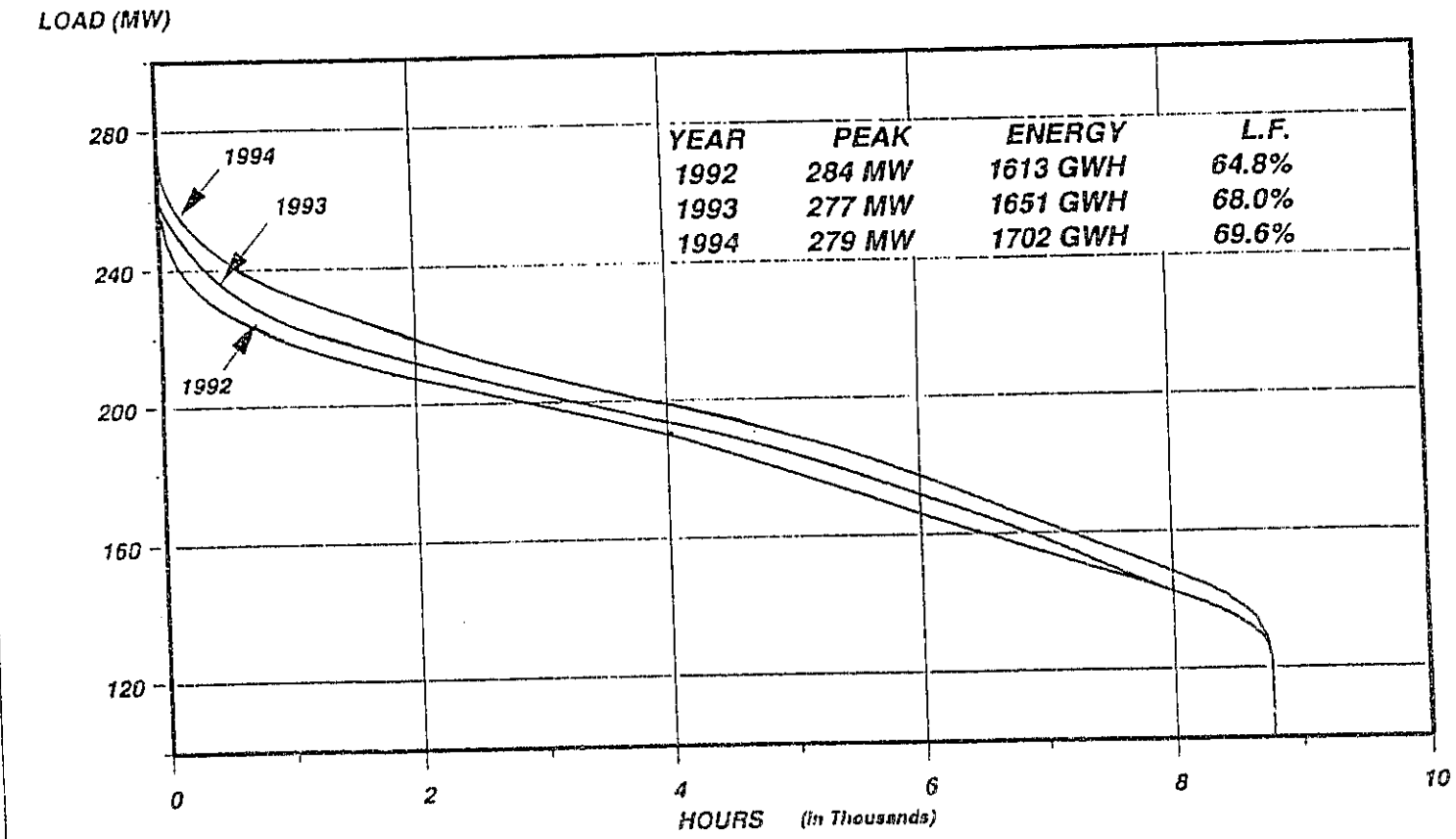


EXHIBIT
BIPL
TMO-S

BHPL LOAD DURATION CURVES

FOR THE YEARS 1992, 1993, 1994



YEAR	PEAK	ENERGY	L.F.
1992	284 MW	1613 GWH	64.8%
1993	277 MW	1651 GWH	68.0%
1994	279 MW	1702 GWH	69.6%

EXHIBIT
BHPL
TMO-9

ECONOMIC FACTORS ASSOCIATED WITH THE BLACK HILLS REGION AND IMPLICATIONS FOR ELECTRIC ENERGY NEEDS

By: Michael K. Madden
University of South Dakota

October 1992

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SECTION I

INTRODUCTION

This report concerns economic trends which have been experienced in the Black Hills Power and Light service area since 1969. Past trends in economic time series are very useful in the development of projections about the future.

The major purpose of this study involves the documentation of basic economic and demographic characteristics of the South Dakota Counties of Butte, Custer, Fall River, Lawrence, Meade and Pennington. Part of the service area of Black Hills Power and Light Company lies in the Wyoming counties of Weston and Cambell. Because the Wyoming segment of its total market is quite moderate, this document concentrates on economic factors associated with the Black Hills Region in South Dakota.

The primary economic variables studied herein consist of income and employment and the primary demographic variables are population and the age distribution of the Black Hills Power and Light service area. This information is statistically analyzed for the purpose of developing inferences about the future.

Movements in economic and demographic phenomena are shown to be highly correlative with utility service demand. Therefore a secondary component of this study concerns implications for future electric energy needs.

Market Infrastructure

Electric energy is marketed in the Black Hills by a combination of Black Hills Power and Light Company, an investor owned utility, and a number of rural electric cooperatives. Generally, the Black Hills Power and Light service area includes municipalities and urbanized areas surrounding cities and towns as well as a major portion of the Black Hills National Forest, while the rural areas of the region are served by cooperatives.

Exceptions to this observation exist, however. Much of the 190 corridor between Rapid City and Sturgis is

served by Black Hills Power and Light and considerable areas which are now in or near some Black Hills cities and towns are served by cooperatives as urban expansion has evolved around them. Because most of the growth which has and will take place in the Black Hills is traced to urban expansion, it is apparent that future growth will have an influence on future electric energy requirements.

SECTION II
INCOME AND EMPLOYMENT TRENDS

Statistics relating to income and employment pertain to the counties. Similar statistics for cities and towns are not available. It is known, however, that little if any growth in real income and employment has occurred in the agricultural sector, so it is probable that virtually all growth which has taken place in the Black Hills pertains to the more urban areas of the region. These urban areas are most highly correlative with the demand for electric energy supplied by Black Hills Power and Light Combany.

A second general observation is that the largest communities in the Black Hills region have experienced the largest growth during the last two decades. The counties which contain these communities arithmetically dominate the movements in regional economic and demographic statistics.

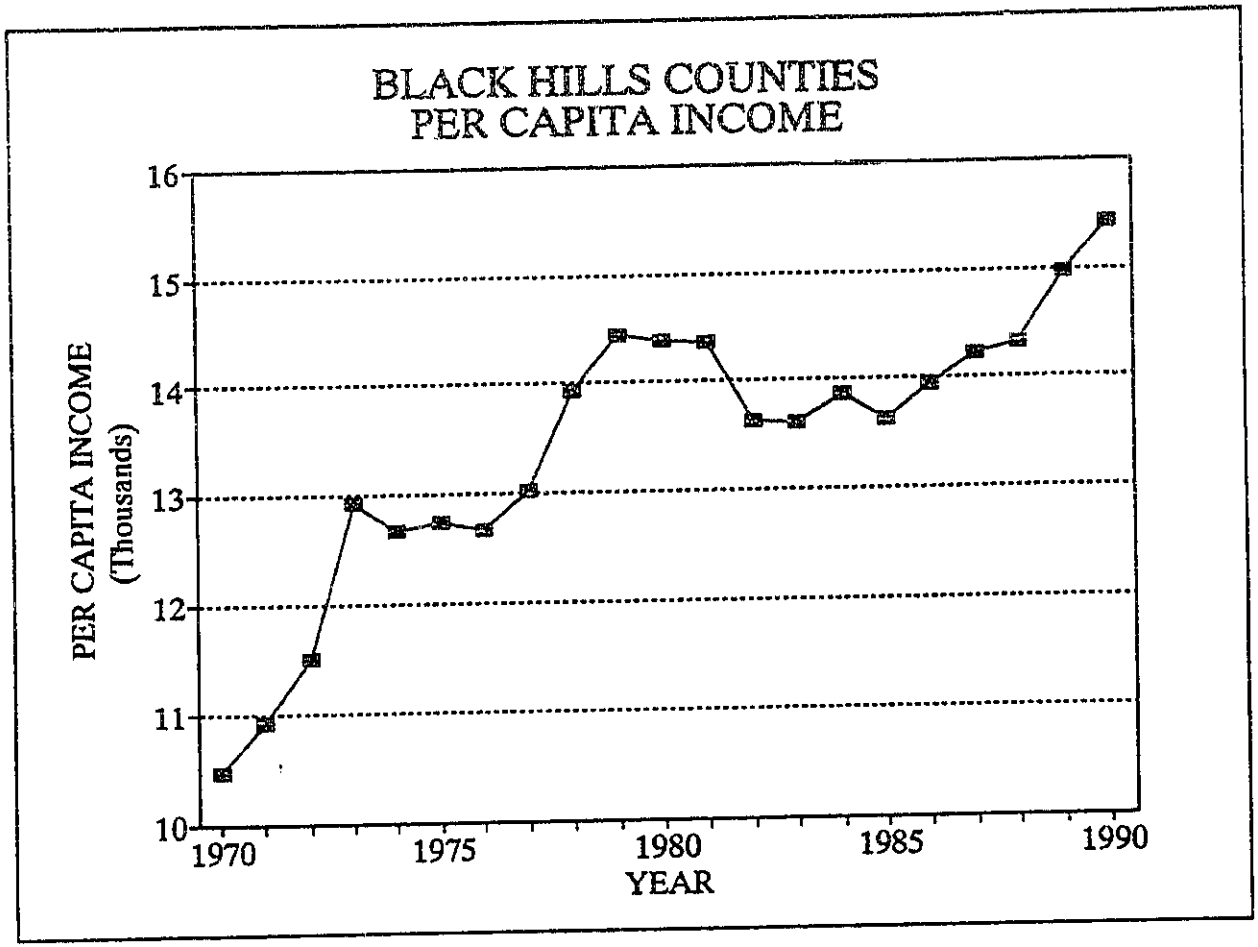
The six counties included within the study area vary individually with respect to income and employment trends. Lawrence and Pennington Counties have experienced the largest growth in employment and income. Growth rates have been more moderate in Custer and Meade Counties and little or no growth has occurred in Butte and Fall River Counties.

Since all Black Hills cities and towns in these counties are served primarily by Black Hills Power and Light Company, economic variables are aggregated into region wide statistics.

Per Capita Income

The following graph traces the trend in real per capita income from 1970 to 1990, the latest year for which data is available. All data points are expressed in 1990 dollars enabling one to make year to year comparisons without the impacts of intervening price inflation. Overall it is apparent that real per capita income has risen substanially during the last two decades averaging about 2% per year. Growth in per capita income was higher in the 1970's than the 1980's. It is also observed that real per capita income experienced

GRAPH 1


BLACK HILLS COUNTIES
PER CAPITA INCOME
PER CAPITA INCOME
(Thousands)
16
15
14
13
12
11
10
1970
1975
1980
1985
1990
YEAR

cyclical declines on two occassions during the 1970 - 1990 period. The first occurred during the mid nineteen seventies and the second occurred in the early nineteen eighties. Both of these downward cycles in real per capita income came as a result of unanticipated price inflation which caused the real value of per capita income to fall even as money income rose.

Real per capita income rose at a compounded rate of 2.5% during the 1970 - 1990 period for the entire state of South Dakota which is slightly higher than the 2.2% increase in the Black Hills Region.

Real Personal Income

The following two graphs illustrate the growth pattern in personal income in the Black Hills. Personal income is expressed in 1990 dollars to remove the effects of inflation and are in terms of billions of dollars. Graph 2 represents personal income from all sources. Increased real wages and increased employment levels both contribute to growth in personal income.

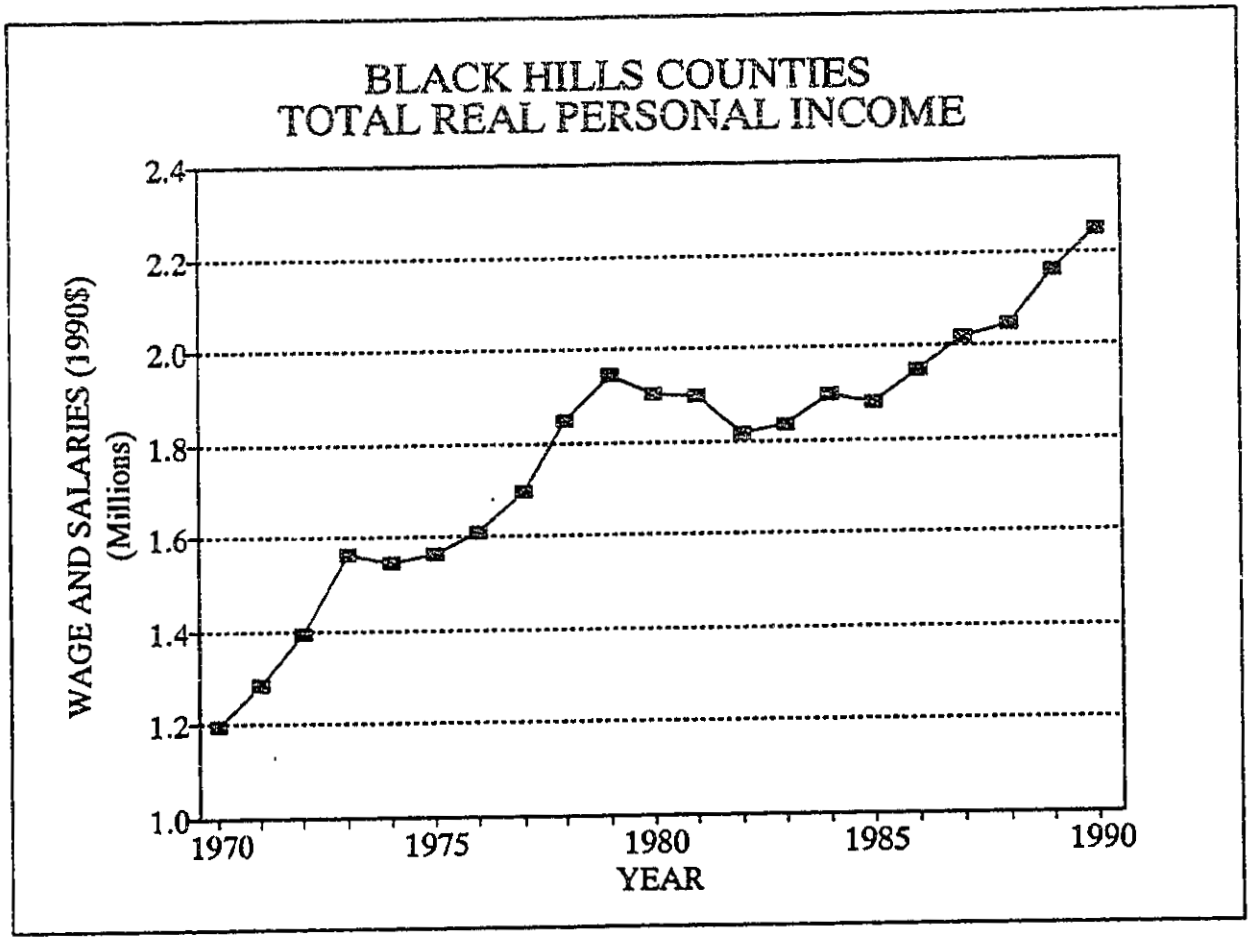
As shown on the graph income grew in real terms from about $1.2 billion in 1970 to nearly $2.3 billion in 1990.

Graph 3 excludes farm income. When comparing these two graphics it is apparent that most income in the Black Hills is non farm income making up nearly 96% of all personal income. This accounts for the pattern of both series to be quite similar.

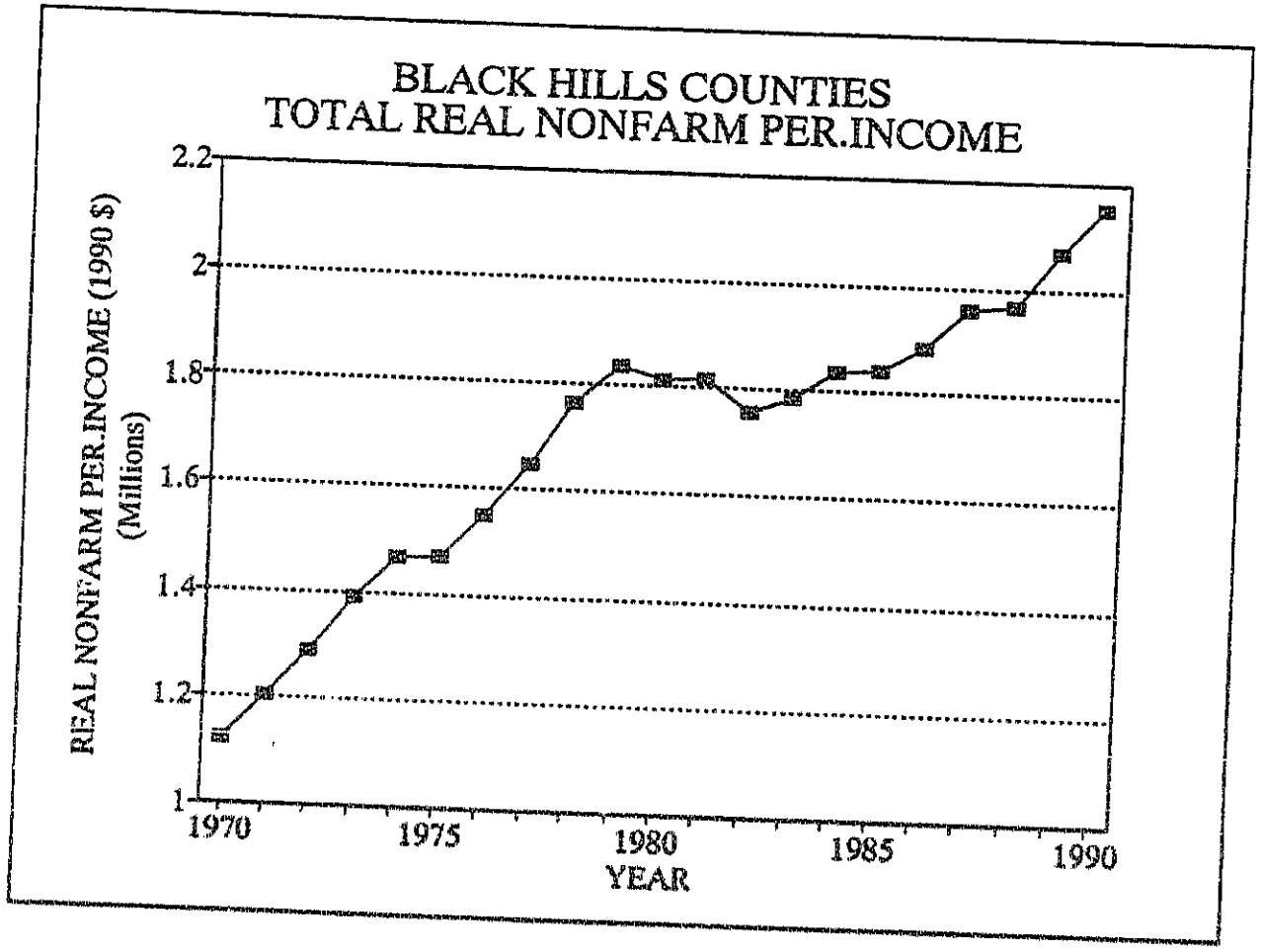
It is also noteworthy that the growth in non farm personal income experienced real increases in the 1970's which are higher than that which was generated in the nineteen eighties.

When comparing movements in aggregate personal income with per capita income (Graph 1) the two downward cyclical movements in aggregate personal income is less pronounced. This is explained by the fact that increases in employment somewhat offset the drops in per capita personal income during these periods.

GRAPH 2


BLACK HILLS COUNTIES
TOTAL REAL PERSONAL INCOME
WAGE AND SALARIES (1990$)
(Millions)
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
1970
1975
1980
1985
1990
YEAR

GRAPH 3


BLACK HILLS COUNTIES
TOTAL REAL NONFARM PER.INCOME
REAL NONFARM PER.INCOME (1990 $)
(Millions)
2.2
2
1.8
1.6
1.4
1.2
1
1970
1975
1980
1985
1990
YEAR

In comparison with statewide movements in aggregate personal income, the Black Hills Region experienced larger average growth than did the entire state. In the Black Hills average growth was a compounded 3.4% in contrast with 2.8% for the entire state.

This observation contrasts with comparisons with per capita changes in income where it was found that the entire state experienced larger average increases than did the Black Hills.

This observation is explained by the fact that employment and population growth in the Black Hills has significantly exceeded similar measures for the state as a whole.

Personal Income, Black Hills And The State

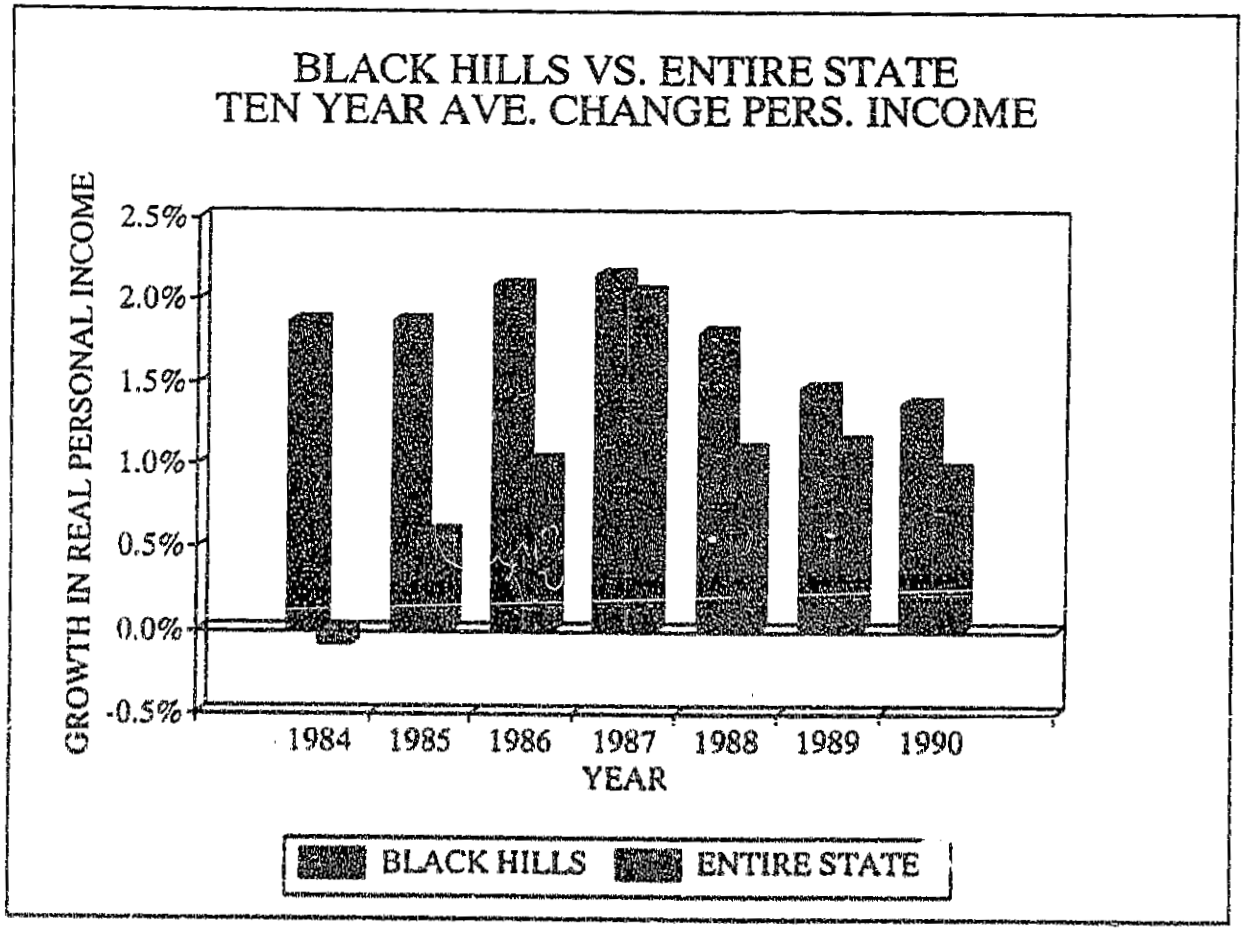
A clearer picture of the differences between aggregate income growth patterns in the Black Hills and the entire state can be gained by comparing long run changes.

The following graphs are the result of generating ten year moving averages of annual growth rates of real personal income. This process was performed on total personal income, non farm personal income and personal income earned in wages and salaries. The moving averages cover the years 1974 to 1990 for both the Black Hills Region and the entire state.

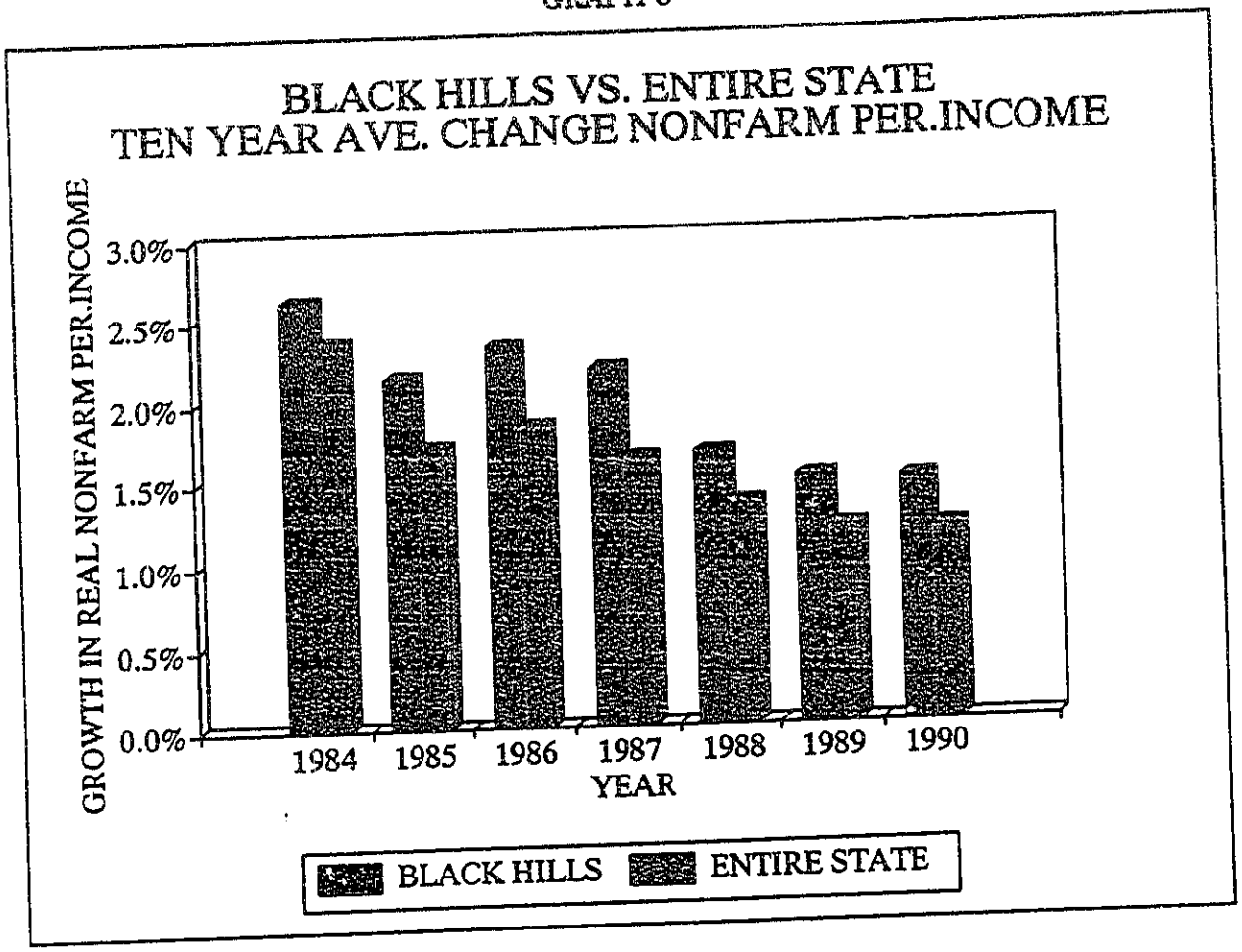
Graphs 4 through 6 illustrate that each measure of personal income growth in the Black Hills is significantly higher than that experienced in the entire state. Moreover, this was true for every year of each time series analyzed.

Moving averages have the effect of removing short run aberations in time series' so the remaining pattern of moving averages which is generated provide inferences about long run changes.

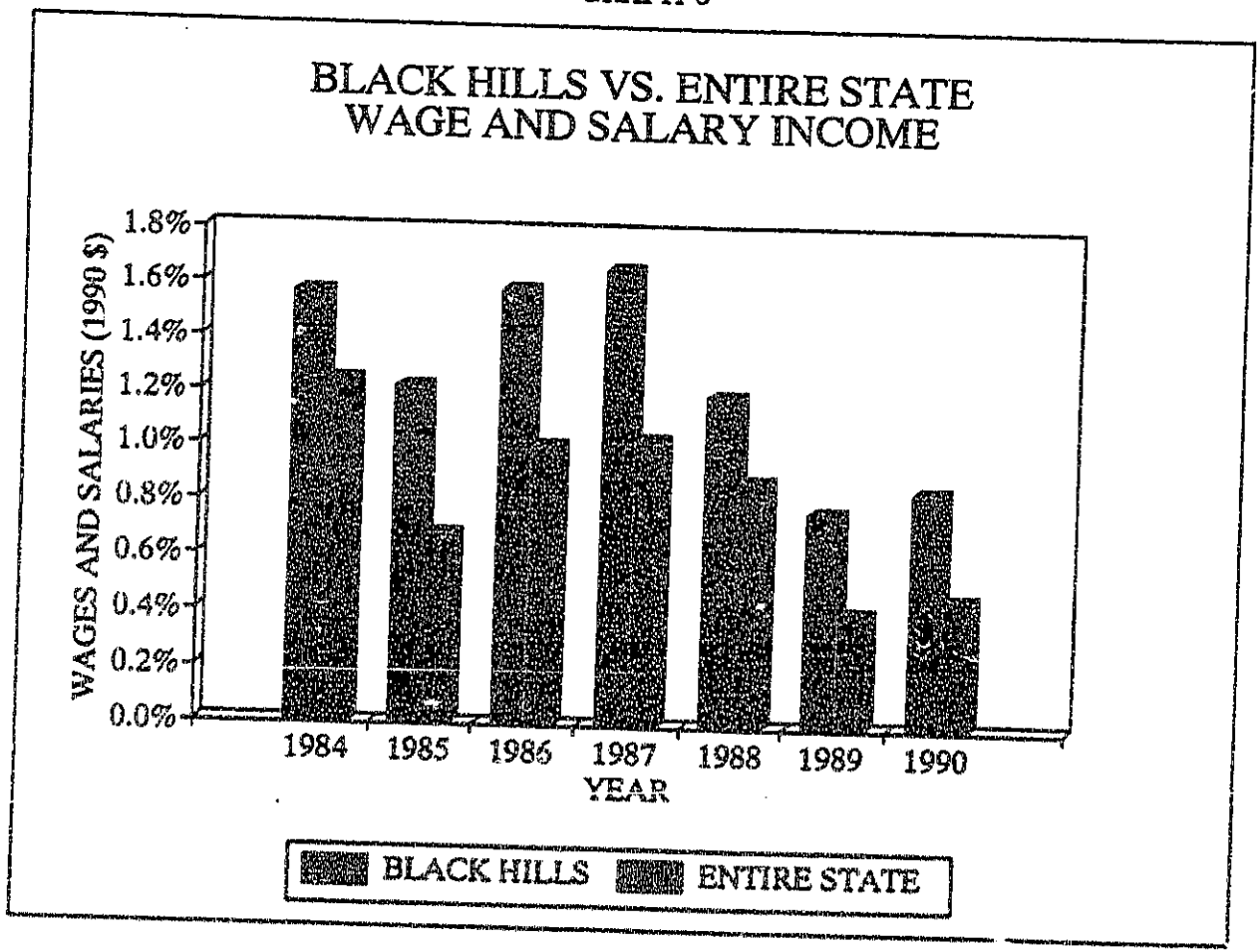
GRAPH 4


BLACK HILLS VS. ENTIRE STATE
TEN YEAR AVE. CHANGE PERS. INCOME
GROWTH IN REAL PERSONAL INCOME
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
-0.5%
1984
1985
1986
1987
1988
1989
1990
YEAR
BLACK HILLS
ENTIRE STATE

GRAPH 5


BLACK HILLS VS. ENTIRE STATE
TEN YEAR AVE. CHANGE NONFARM PER.INCOME
GROWTH IN REAL NONFARM PER.INCOME
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
1984
1985
1986
1987
1988
1989
1990
YEAR
BLACK HILLS
ENTIRE STATE

GRAPH 6


BLACK HILLS VS. ENTIRE STATE
WAGE AND SALARY INCOME
WAGES AND SALARIES (1990 $)
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
1984
1985
1986
1987
1988
1989
1990
YEAR
BLACK HILLS
ENTIRE STATE

EMPLOYMENT

Employment is a basic indicator of economic vitality of any region. Total employment is a statistical series which encompasses all working people including private entrepreneurs. Other employment series' are self explanatory. Wage and salary employment includes that component of the work force receiving wages and salaries. Private employment includes all non public workers. Non farm employment excludes farm and ranch workers.

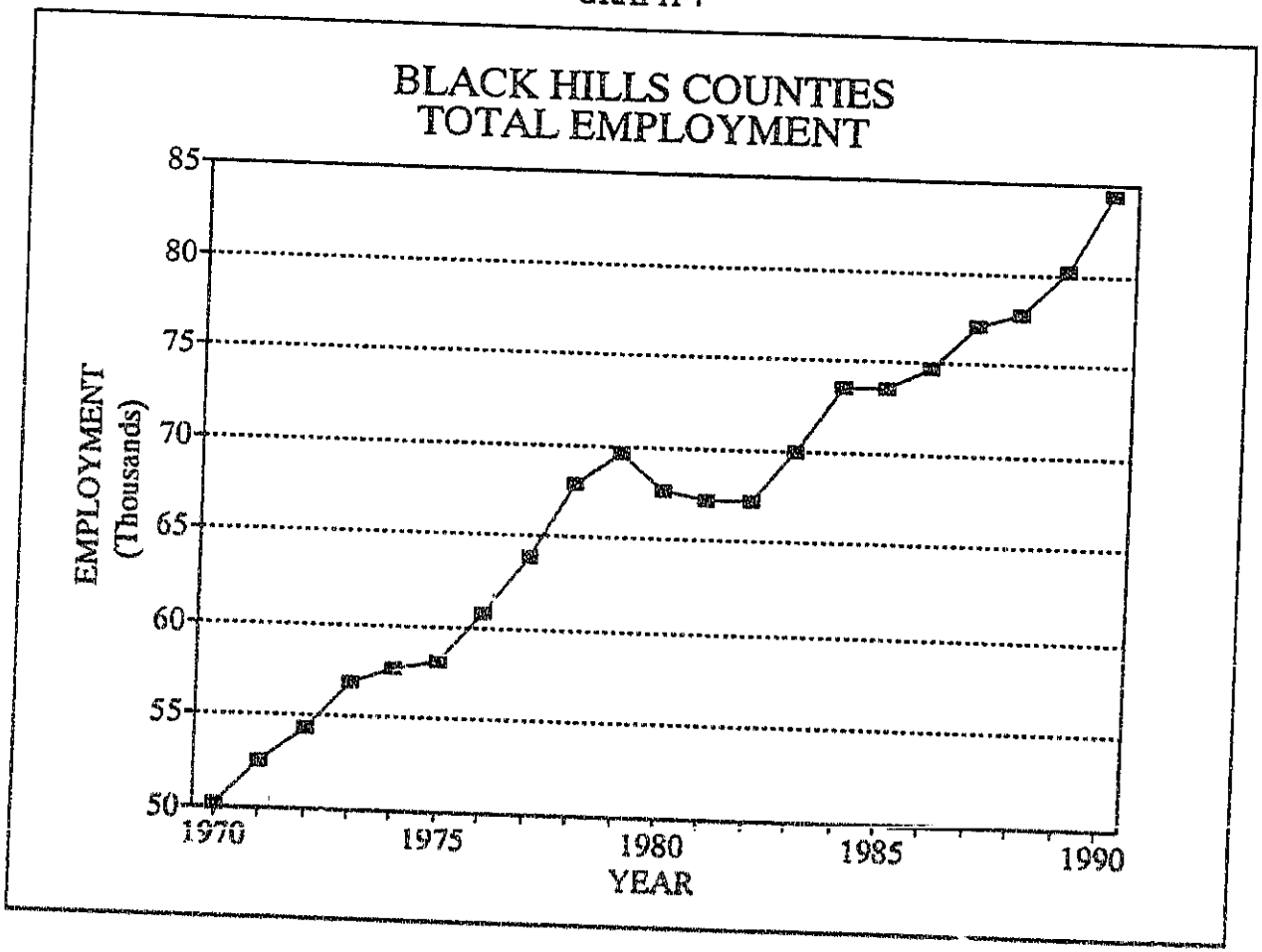
The following graphics represent these various measures of employment and the movements they have experienced since 1970.

Total employment in the six Black Hills Counties has moved from about 50,000 in 1970 to nearly 85,000 in 1990, a twenty year increase of 70%. As will be shown, this exceeds similar increases for the entire state by a considerable margin.

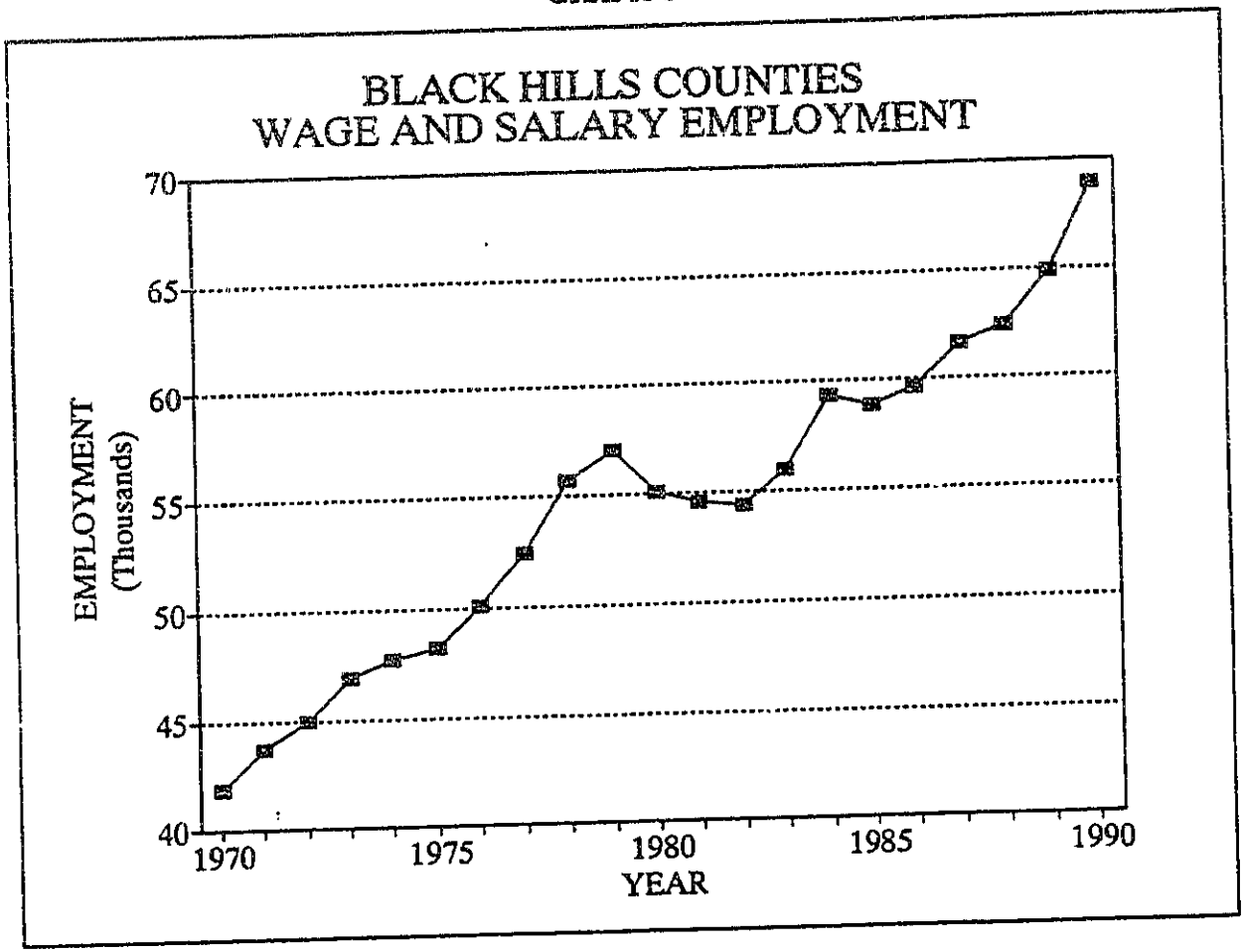
The business cycle downturn in the early nineteen eighties is the only instance during this twenty year period which witnessed decreases in employment. An exception to this observation is the proprietor classification which experienced flat levels of employment during this recession.

When comparing the 1970's with the 1980's, it is apparent that employment trends are quite similar. Both decades represent periods where employment growth of all forms was significant and steady except for the economic contraction which occurred in the region in the early nineteen eighties.

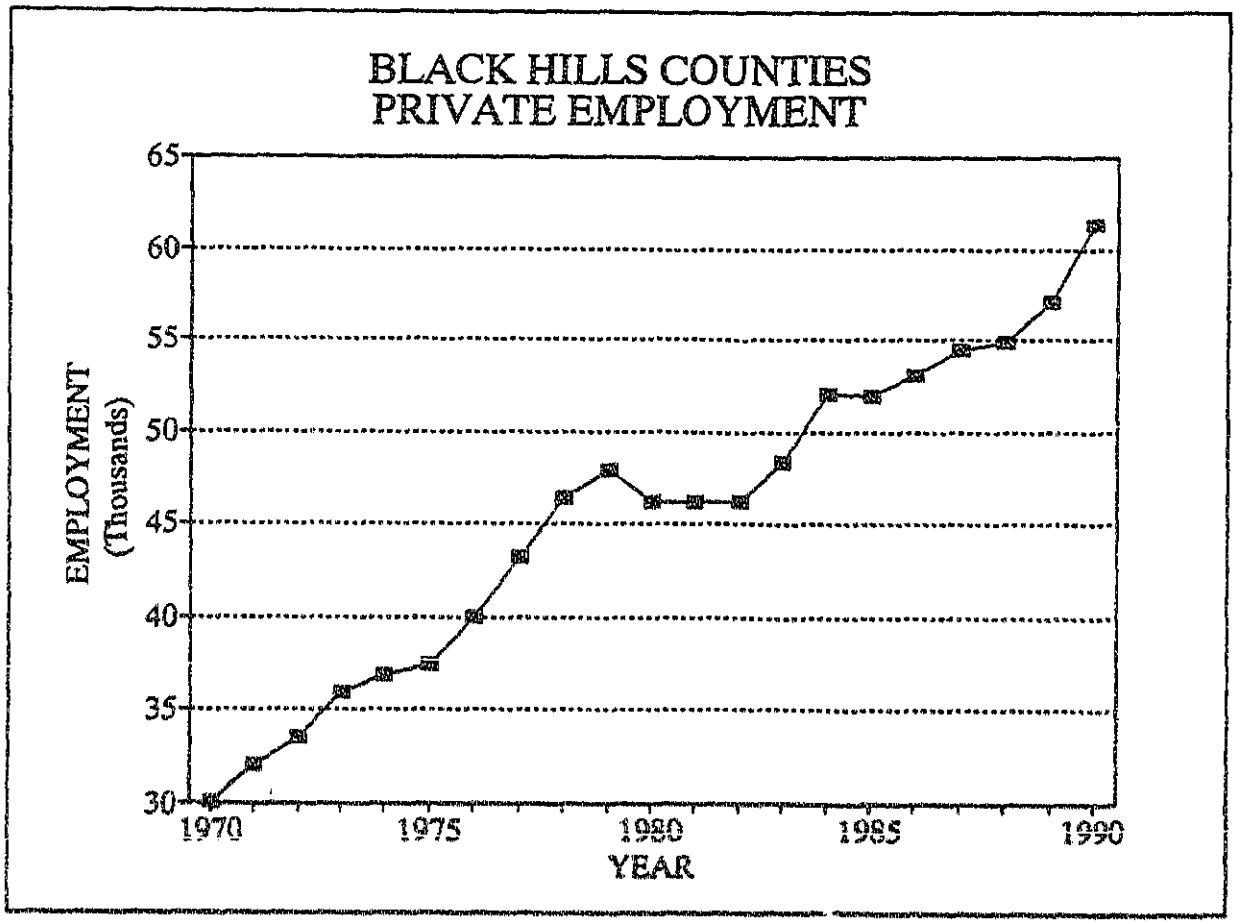
GRAPH 7


BLACK HILLS COUNTIES
TOTAL EMPLOYMENT
EMPLOYMENT
(Thousands)
85
80
75
70
65
60
55
50
1970
1975
1980
1985
1990
YEAR

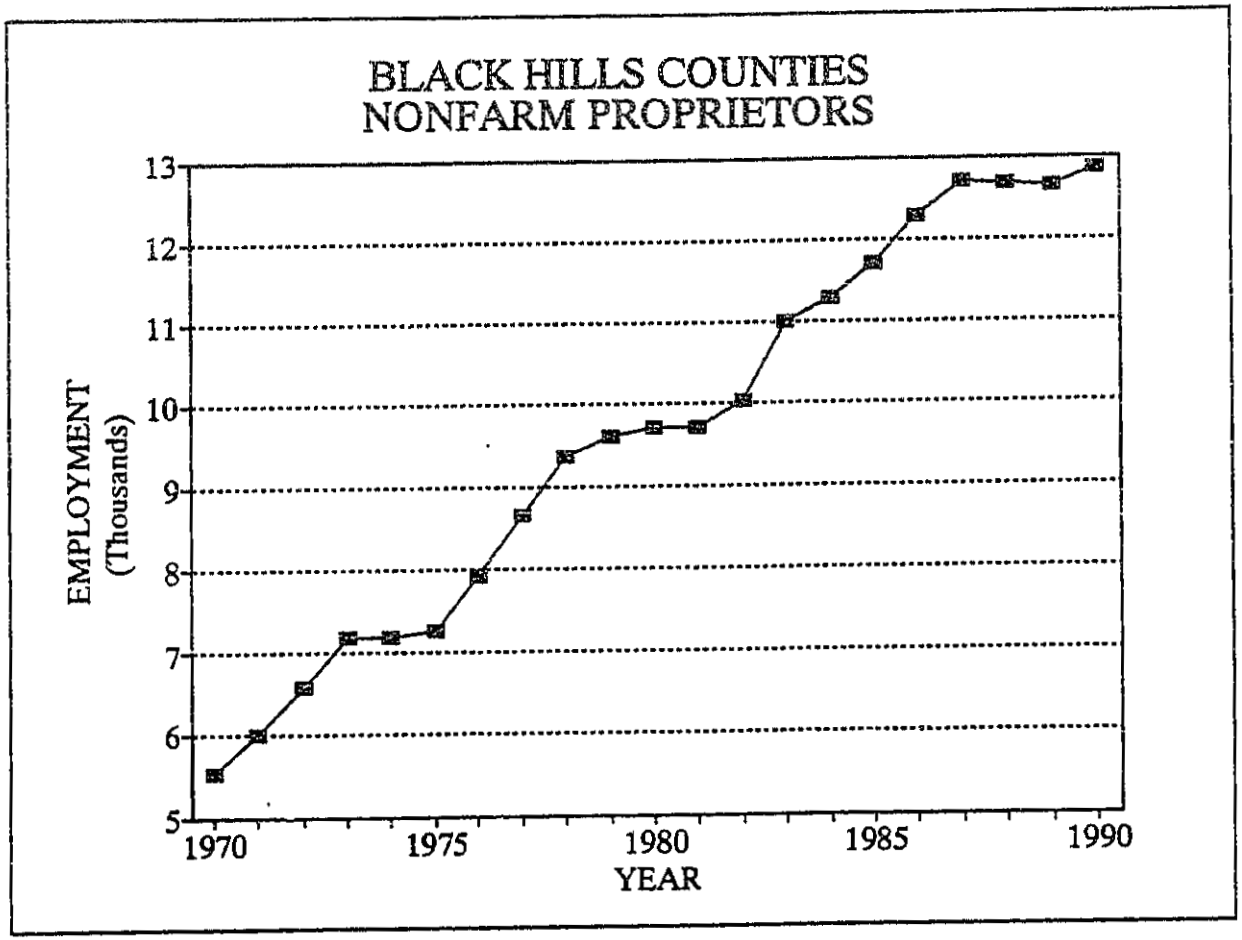
GRAPH 8


BLACK HILLS COUNTIES
WAGE AND SALARY EMPLOYMENT
EMPLOYMENT
(Thousands)
70
65
60
55
50
45
40
1970
1975
1980
1985
1990
YEAR

GRAPH 9


BLACK HILLS COUNTIES
PRIVATE EMPLOYMENT
EMPLOYMENT
(Thousands)
65
60
55
50
45
40
35
30
1970
1975
1980
1985
1990
YEAR

GRAPH 10


BLACK HILLS COUNTIES
NONFARM PROPRIETORS
EMPLOYMENT
(Thousands)
13
12
11
10
9
8
7
6
5
1970
1975
1980
1985
1990
YEAR

Employment Growth, Black Hills and the State

The growth in employment in the Black Hills region is on a decidedly higher trend than that experienced for the entire state.

As in the case of personal income series' ten year moving averages were computed regarding measures of employment for both the Black Hills Region and the State of South Dakota. Moving averages are a method of removing year to year aberrations in a series so that longer run trends can be examined.

In all cases, employment growth rates in the Black Hills Region are decidedly higher than for the state as a whole.

The following table summarizes comparisons for various employment definitions for the decade of the nineteen eighties. The percentage growth rates are computed as arithmetic means of the ten year moving averages which occurred during the decade.

TABLE 1

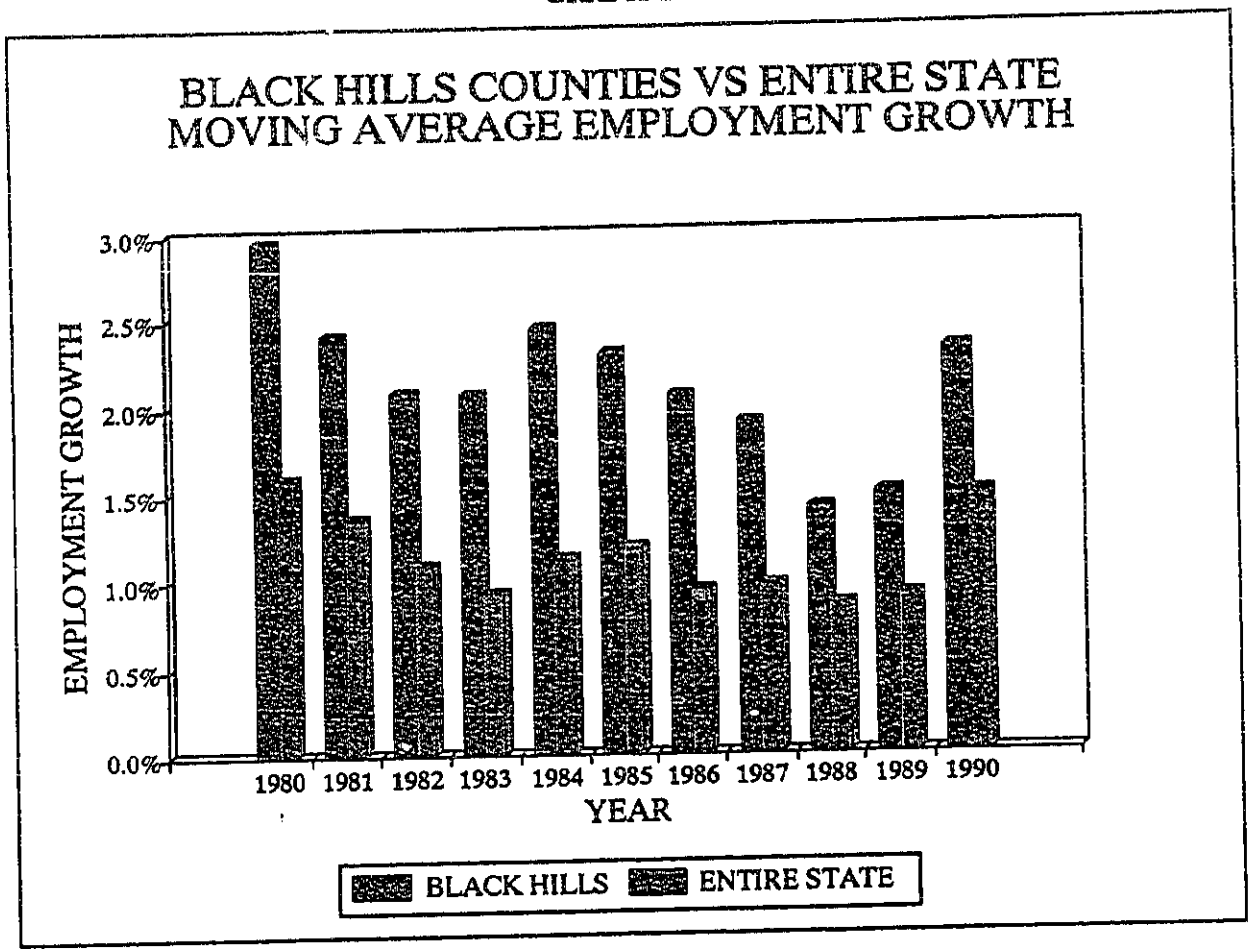
AVERAGE GROWTH RATES BLACK HILLS AND ENTIRE STATE 1980-1990

	Black Hills	Entire State
Total Employment	2.04%	1.08%
Wage and Salary	1.81%	1.14%
Private	2.79%	2.07%
Proprietors	3.94%	2.72%

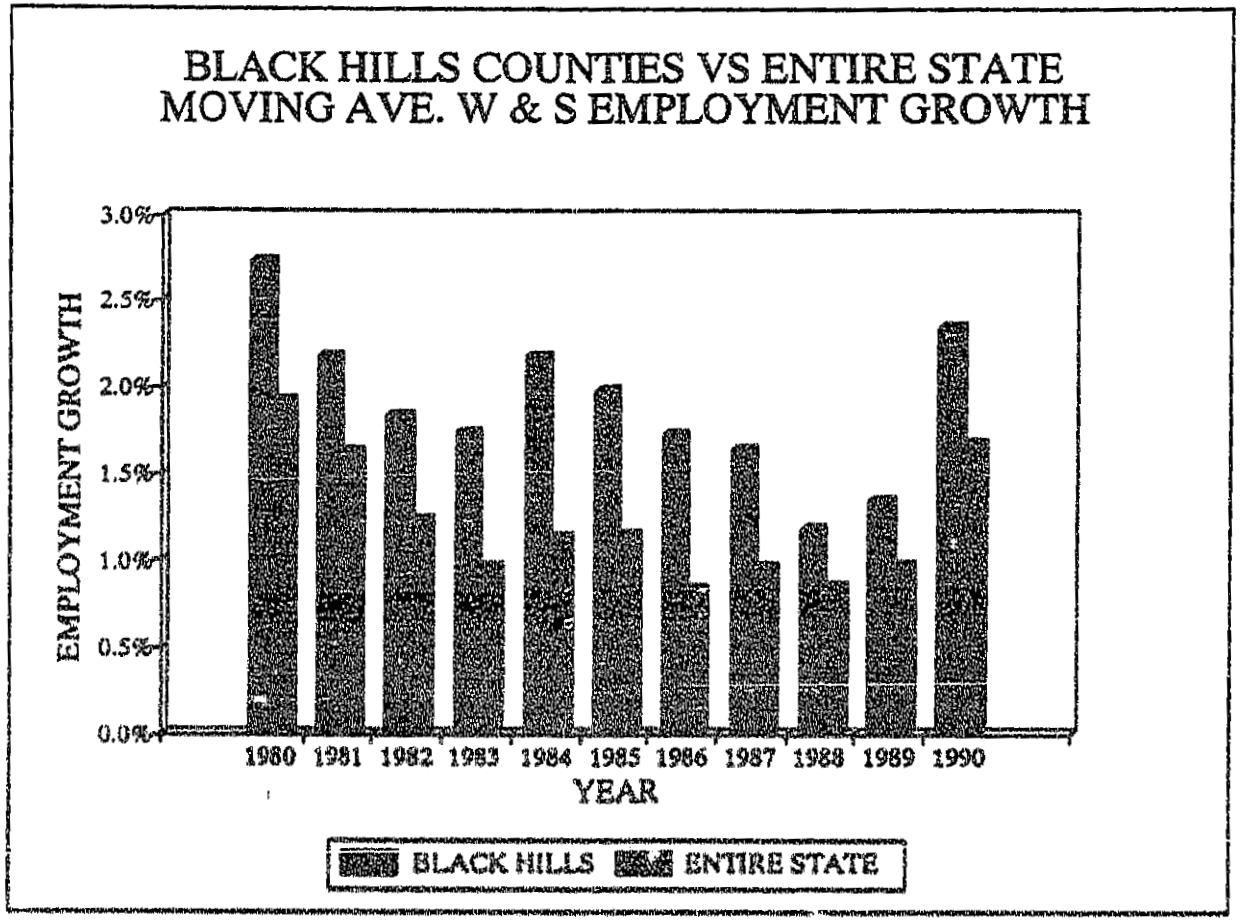
Generally it can be concluded that employment growth in the Black Hills region is about one percentage point higher than growth statewide.

The following graphics also illustrate that this trend does not appear to be transitory, but rather seems to exist for long periods of time.

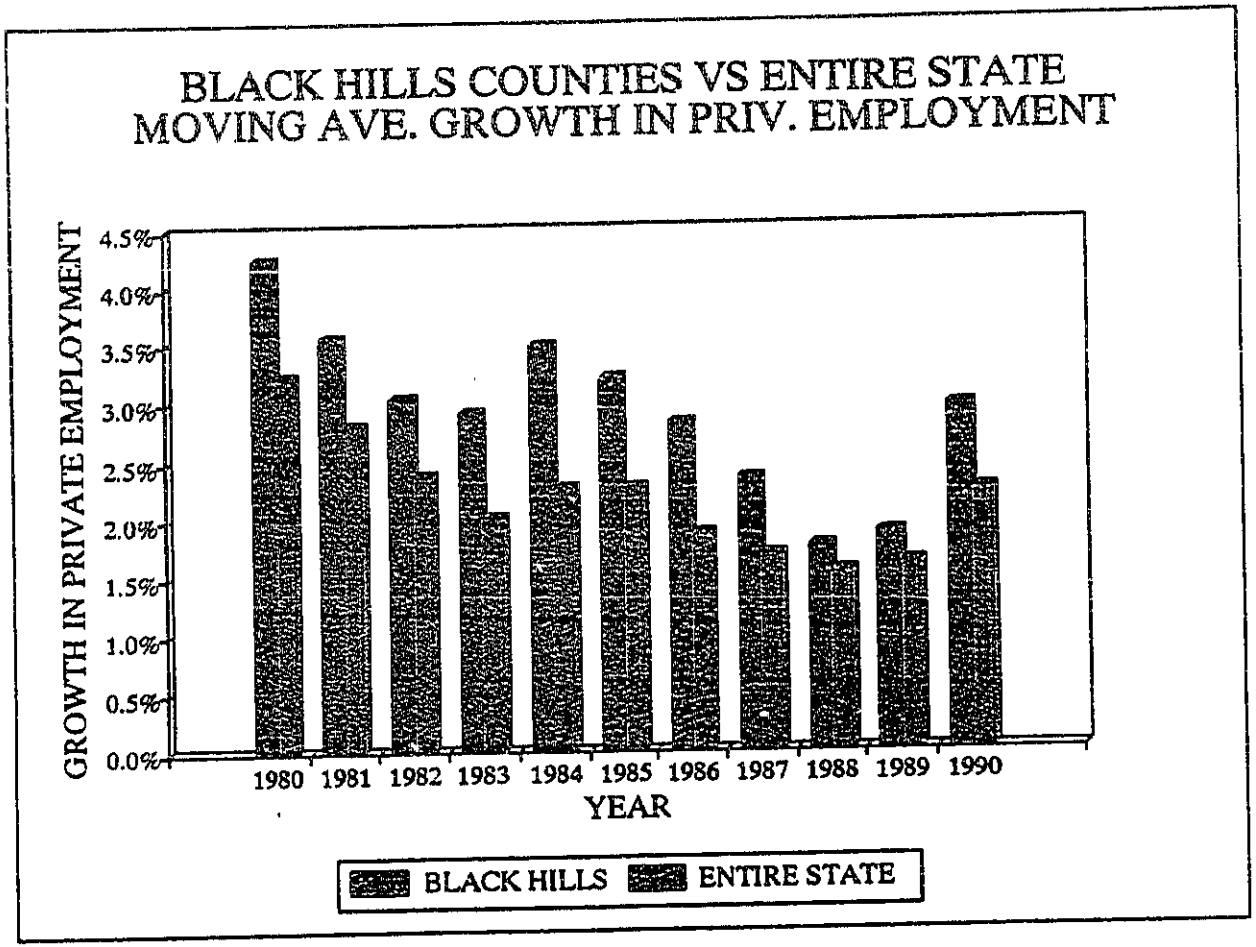
GRAPH 11


BLACK HILLS COUNTIES VS ENTIRE STATE
MOVING AVERAGE EMPLOYMENT GROWTH
EMPLOYMENT GROWTH
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
YEAR
BLACK HILLS
ENTIRE STATE

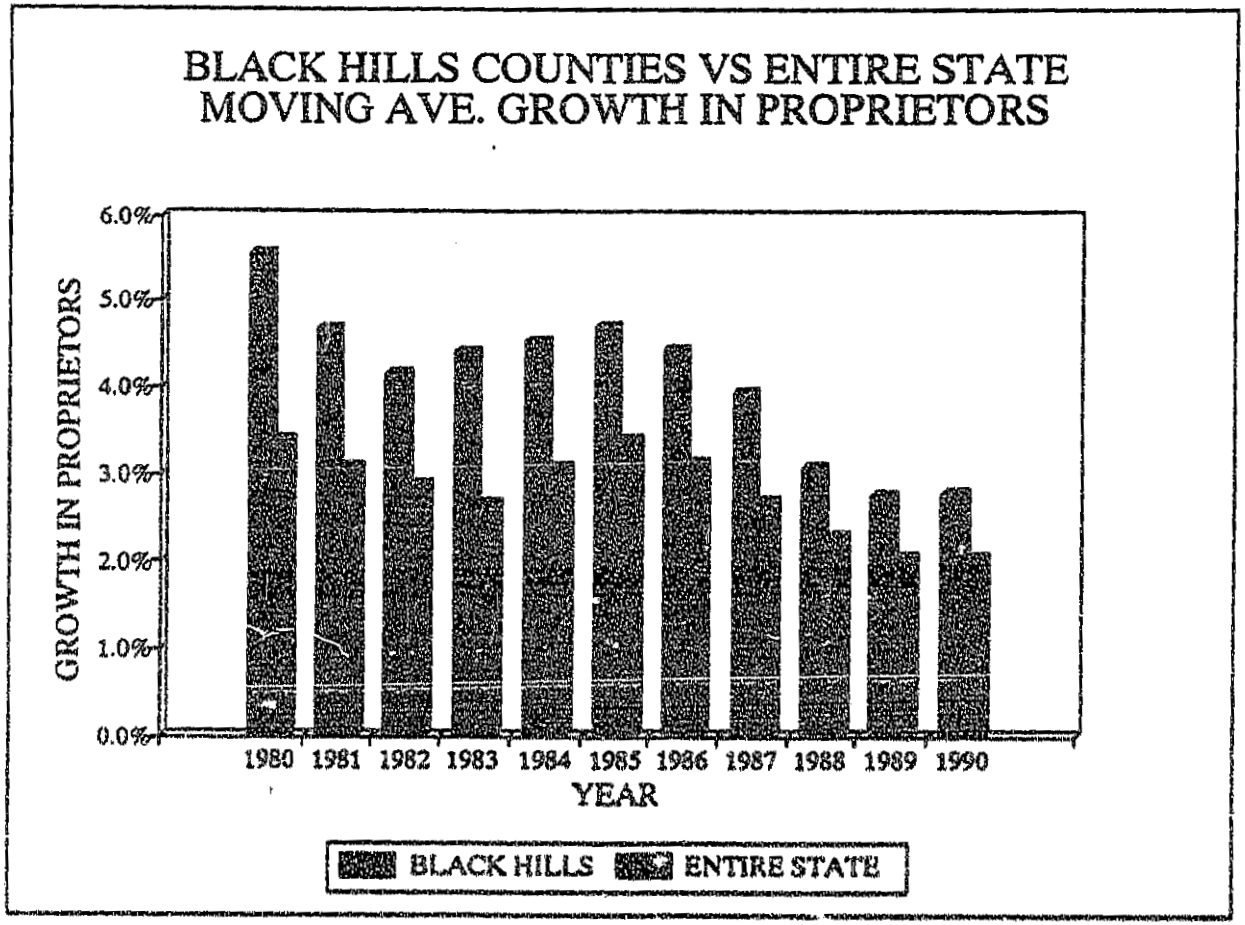
GRAPH 12


BLACK HILLS COUNTIES VS ENTIRE STATE
MOVING AVE. W & S EMPLOYMENT GROWTH
EMPLOYMENT GROWTH
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
YEAR
BLACK HILLS
ENTIRE STATE

GRAPH 13


BLACK HILLS COUNTIES VS ENTIRE STATE
MOVING AVE. GROWTH IN PRIV. EMPLOYMENT
GROWTH IN PRIVATE EMPLOYMENT
4.5%
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
YEAR
BLACK HILLS
ENTIRE STATE

GRAPH 14


BLACK HILLS COUNTIES VS ENTIRE STATE
MOVING AVE. GROWTH IN PROPRIETORS
GROWTH IN PROPRIETORS
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990
YEAR
BLACK HILLS
ENTIRE STATE

Geographical Characteristics

The six counties within the Black Hills Region vary significantly in employment levels. Butte, Custer and Fall River Counties each had between 3,300 and 3,700 employed residents in 1990. Meade County employment totaled about 6,600, Lawrence County 12,400 and Pennington 55,000.

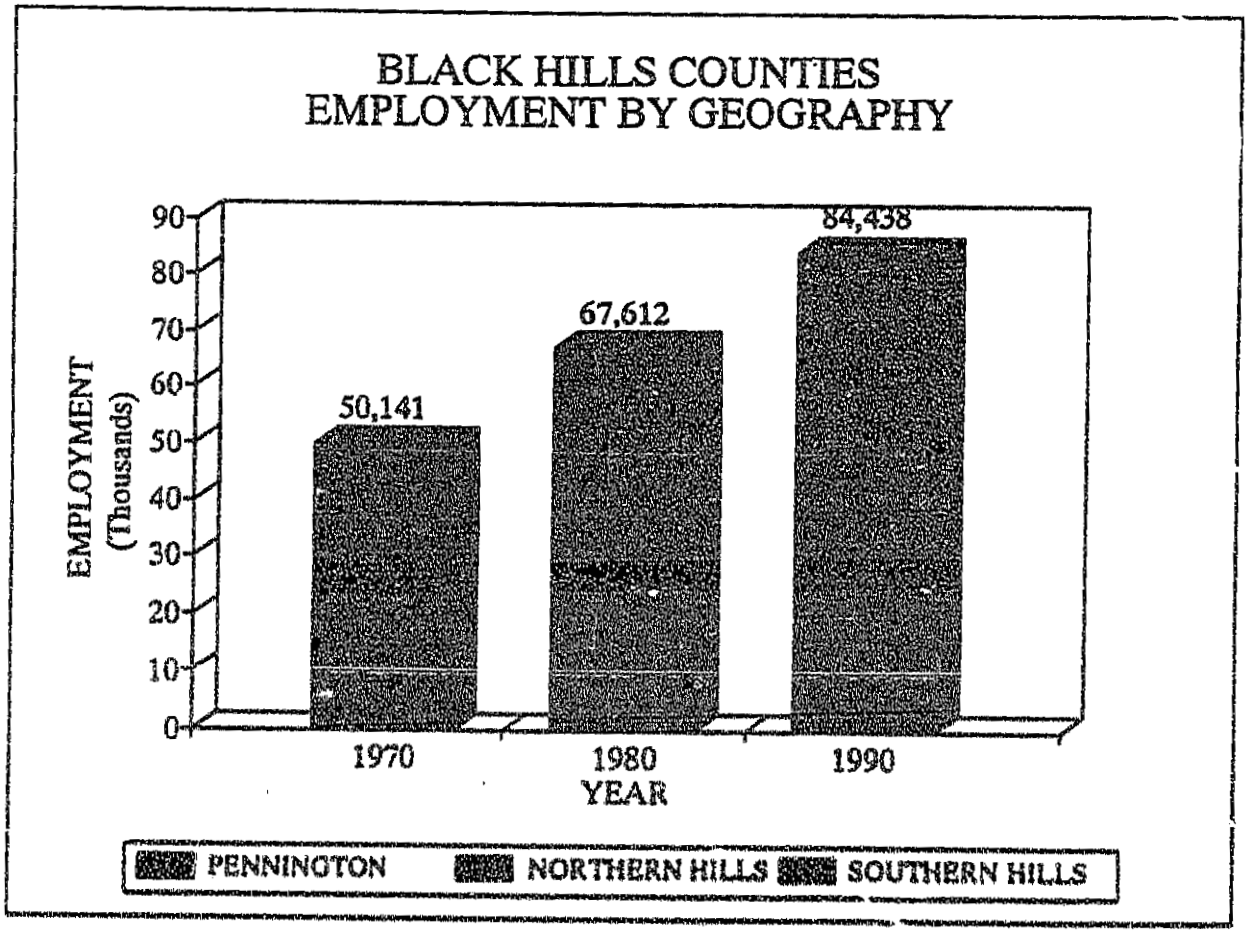
The employment trend in Fall River County is downward. In Butte County the trend has been virtually flat in the nineteen eighties. Custer County and all of the other larger counties have had significant positive trends in employment.

When employment in all of the counties are aggregated the positive growth in the larger counties has dominated the overall trend so that employment has grown in the manner documented above.

It is also useful to classify employment levels according to geographical location in the Black Hills. If one separates the region into the southern Black Hills (Custer and Fall River Counties), the northern Black Hills (Butte, Lawrence and Meade Counties) and Pennington County, the distributive shares of employment levels can be illustrated.

The following graph shows the employment levels which are associated with each of the three geographical areas in 1970, 1980 and 1990. The largest **relative** growth has occurred in the northern Black Hills and the largest **absolute** growth is traced to Pennington County.

TABLE 15


BLACK HILLS COUNTIES
EMPLOYMENT BY GEOGRAPHY
EMPLOYMENT
(Thousands)
90
80
70
60
50
40
30
20
10
0
50,141
67,612
84,438
1970
1980
1990
YEAR
PENNINGTON
NORTHERN HILLS
SOUTHERN HILLS

Employment Growth by Sector

The substantial employment growth experienced in the seventies and eighties varies significantly among sectors of the economy.

Manufacturing has witnessed the largest average annual growth during this twenty year period approximating 8%. Construction, wholesale employment and services each account for about 7% growth. The significant growth in service sector employment in the Black Hills is undoubtedly related to growth in the vacation travel industry.

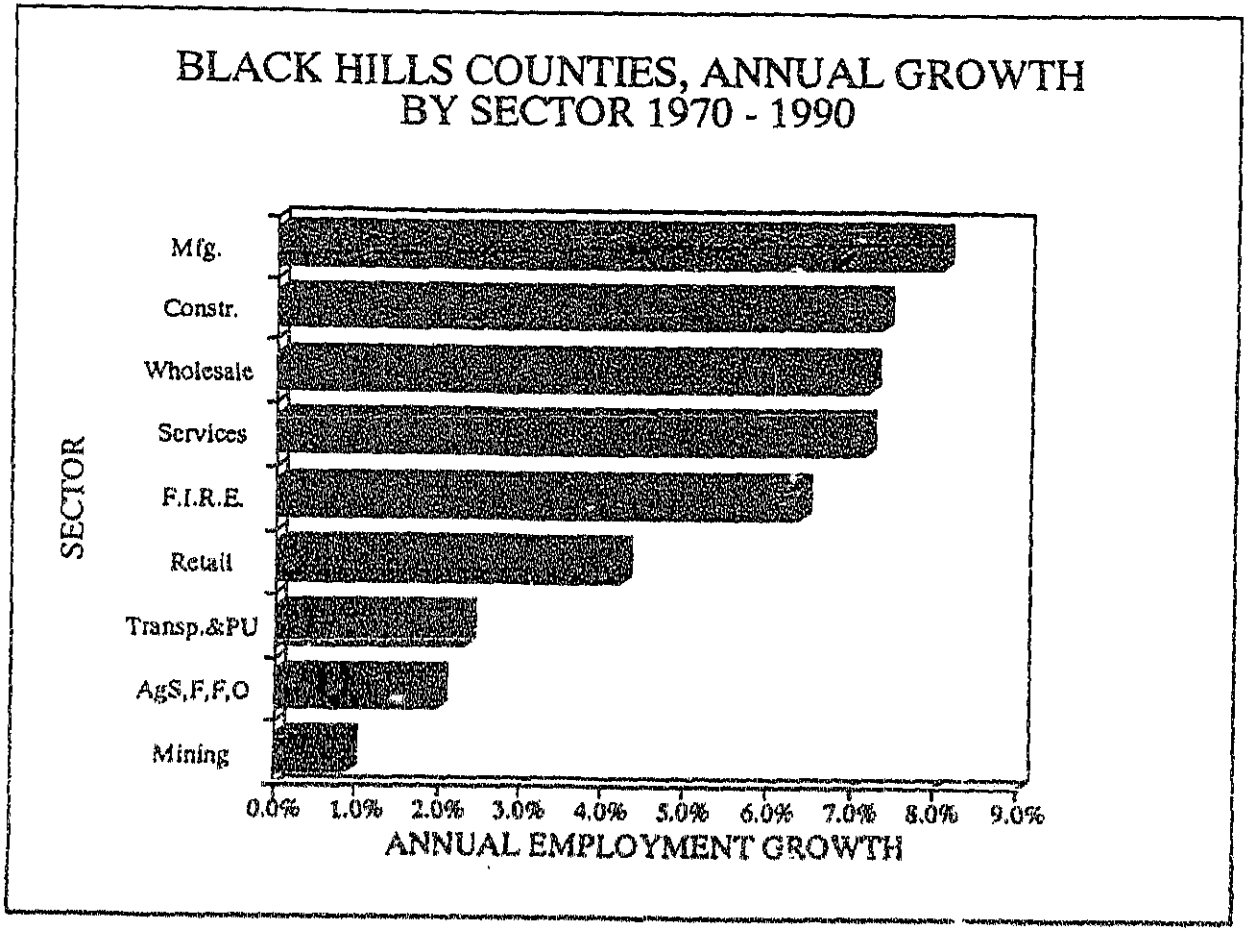
The lowest growth sectors include transportation and public utilties, agriculture, forestry and fisheries and mining. The mining sector has experienced the lowest growth rate among all sectors despite the development of several new surface mines during the period analyzed. The reduction in labor intensive underground mining has been nearly matched by increases in surface mine employment.

A certain amount of correlation in growth by sector exists when comparing Black Hills sector employment with the entire state. Generally, it can be said that sectors which performed best statewide also did so in the Black Hills Region. However, growth rates in these sectors is substantially higher in the Black Hills Region.

The only sector for which employment growth has been higher in the state than for the Black Hills is Finance, Insurance and Real Estate. This is explained by the establishment of a large credit card service facility in Sioux Falls.

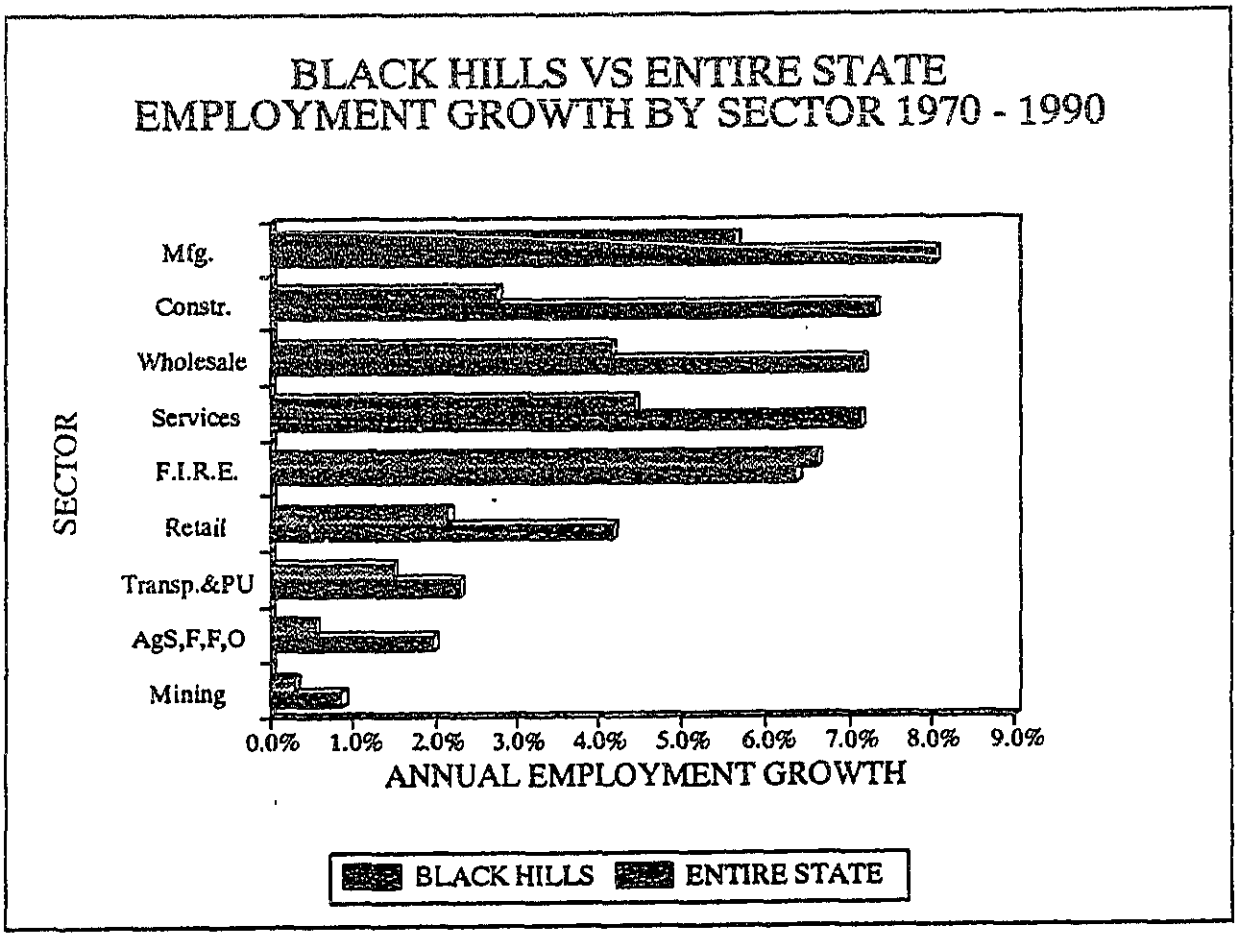
Graphical representations of these observations are found in the following two graphs.

GRAPH 16



*F.I.R.E = Finance, Insurance and Real Estate AgS,F,F,O = Agricultural Services, Forestry and Fisheries.

GRAPH 17



*F.I.R.E = Finance, Insurance and Real Estate AgS,F,F,O = Agricultural Services, Forestry and Fisheries.

Income and Employment Summary

The preceding discussion and graphical displays provide a description of the patterns of economic activity in the Black Hills Region. Employment growth has been substantial in the Black Hills. This growth has been remarkably stable during the twenty year period ending in 1990, the exception being in the early 1980's.

Even considering this downward business cycle, the overall arithmetic average annual increase in employment has been about 2% during the nineteen eighties.

It is also observed that there have been no sectors of the private economy which have experienced negative growth since 1970. Some sectors such as manufacturing and construction have witnessed growth in the range of seven to eight percent.

Employment growth has not been uniform among counties in the Black Hills, however. Some smaller counties have shown little or no growth while larger counties have grown significantly in employment numbers.

Real income has also grown for the region mirroring the growth in employment. However, the growth in income has in many years been lower than the growth in employment.

This has produced more moderate growth in per capita income. In this regard there have been two cycles since 1970 where percapita income dropped noticably before moving back on its upward trend.

An understanding of the patterns of basic time series' as described above is important in the development of forecasts. Evidence of positive and stable growth in past years suggests similar patterns in the future.

Information contained in this section will be utilized in following sections of this document.

SECTION III
POPULATION TRENDS

It is common to relate the economic vitality of a community or region to trends in population. This section will review population both from the standpoint of aggregate and county changes in population and also population by age distribution.

Future economic projections are related to population growth from a number of perspectives. First, a growing population requires the production of increasing amounts of goods and services thereby stimulating future growth. Second, a growing population gives indication that economic or social opportunities exist relative to other areas of the country which portends additional growth. Third, a growing population is necessary if labor resources are going to be sufficient to provide future economic expansion.

Communities dominated by older segments of the populace are symptomatic of declining future population through mortality and future growth is hindered by insufficient numbers of working age people. Very often low proportions of young age groups is due to lack of economic opportunity already present.

Bureau of Economic Analysis data on a county level is utilized in the analysis of population patterns. In each of the six counties included in this study it is expected that the dominance of the cities from the standpoint of population allows that many conclusions regarding city populations can be inferred from county data.

Because of the secular decline in rural population in South Dakota as well as the Black Hills, it is probably reasonable to assume that any increase in urban area population is probably more than that associated with county wide population statistics.

Census reports comparing 1980 with 1990 age distributions will also be considered in this section. Source material consists of US Bureau of the Census summary documents.

Long Run Trends

Actual population counts are performed each ten years by the US Bureau of the Census. Interim population estimates are also derived by the Bureau of Economic Analysis annually.

It is common that population estimates between census counts are subject to significant error, particularly for those years just prior to census years.

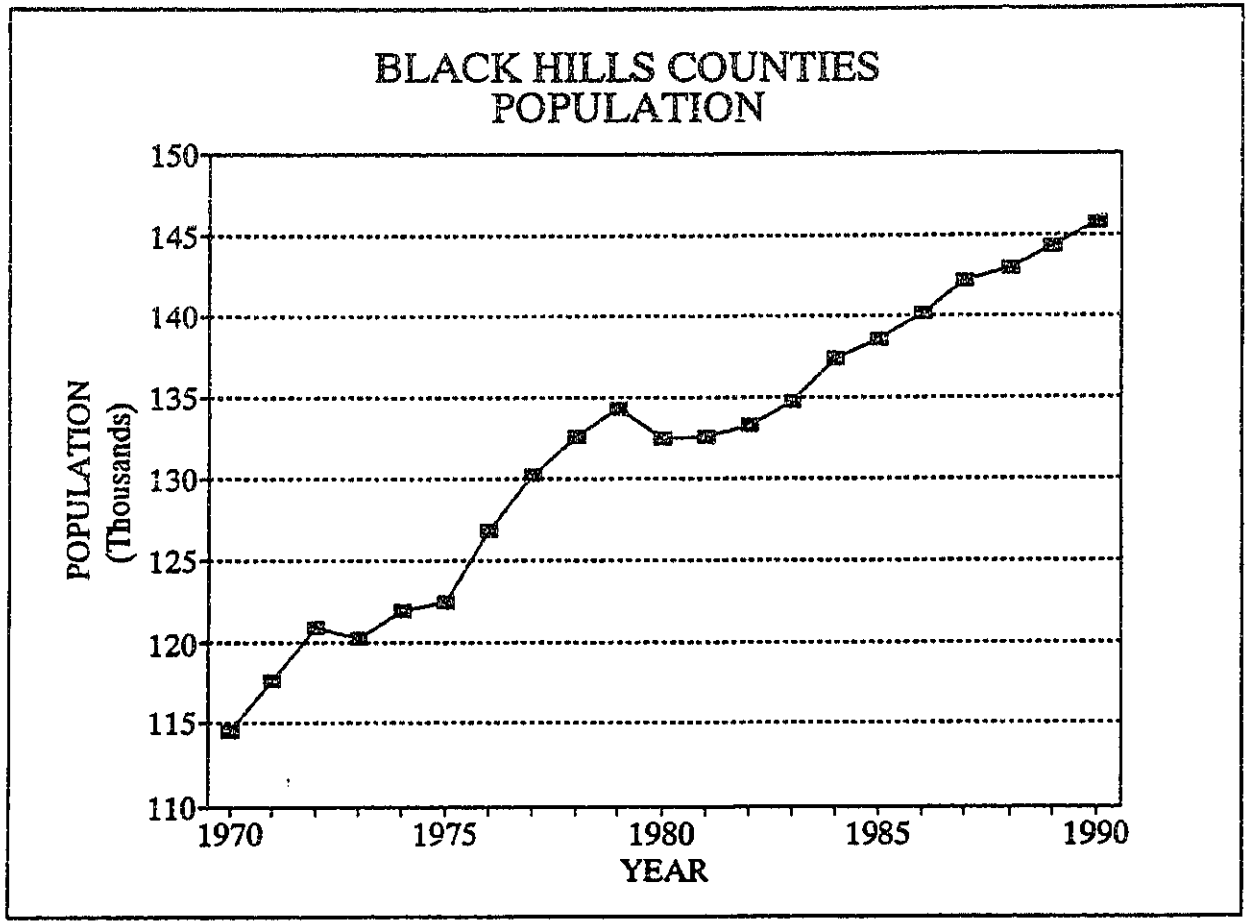
The following graph traces population changes for the six Black Hills Counties which are the subject of this research effort. Population increased from about 115,000 in 1970 to 146,000 in 1990.

There are only two years in which the estimated population dropped, 1973 and 1980. It is likely that the 1980 population reduction is statistical in nature and therefore reflects 1980 census information which pointed to higher than warranted estimates for preceding years.

One should discount the significance of the magnitude of the 1980 decrease for this reason. Through the twenty years ending in 1990, it can be seen that substantial growth rates have been experienced for the Black Hills Region. This growth is traced to four of the six counties. Fall River County has experienced population decreases and the population of Butte County has been flat. During this twenty year period the proportion of population living in or near cities and towns has significantly increased.

Average compounded growth in the Black Hills population has been about 1.4%. In contrast, the population of the entire state has grown .2% since 1970.

GRAPH 18


BLACK HILLS COUNTIES
POPULATION
POPULATION
(Thousands)
150
145
140
135
130
125
120
115
110
1970
1975
1980
1985
1990
YEAR

Population Distribution

Although population trends can provide considerable information regarding regional growth prospects, the **age distribution** defines the demographic nature of population growth. A population which grows, but does so with an aging of the general population does not grow in the long run by as much as one which has growth in the lower age classifications.

Increased proportions of population in the lower age groups gives an indication of basic economic opportunity for working age members of the region.

Graph 19 illustrates the marked uniformity among age groups in regard to population proportions. The reader is reminded that the 35-44 age group contains ten years rather than five.

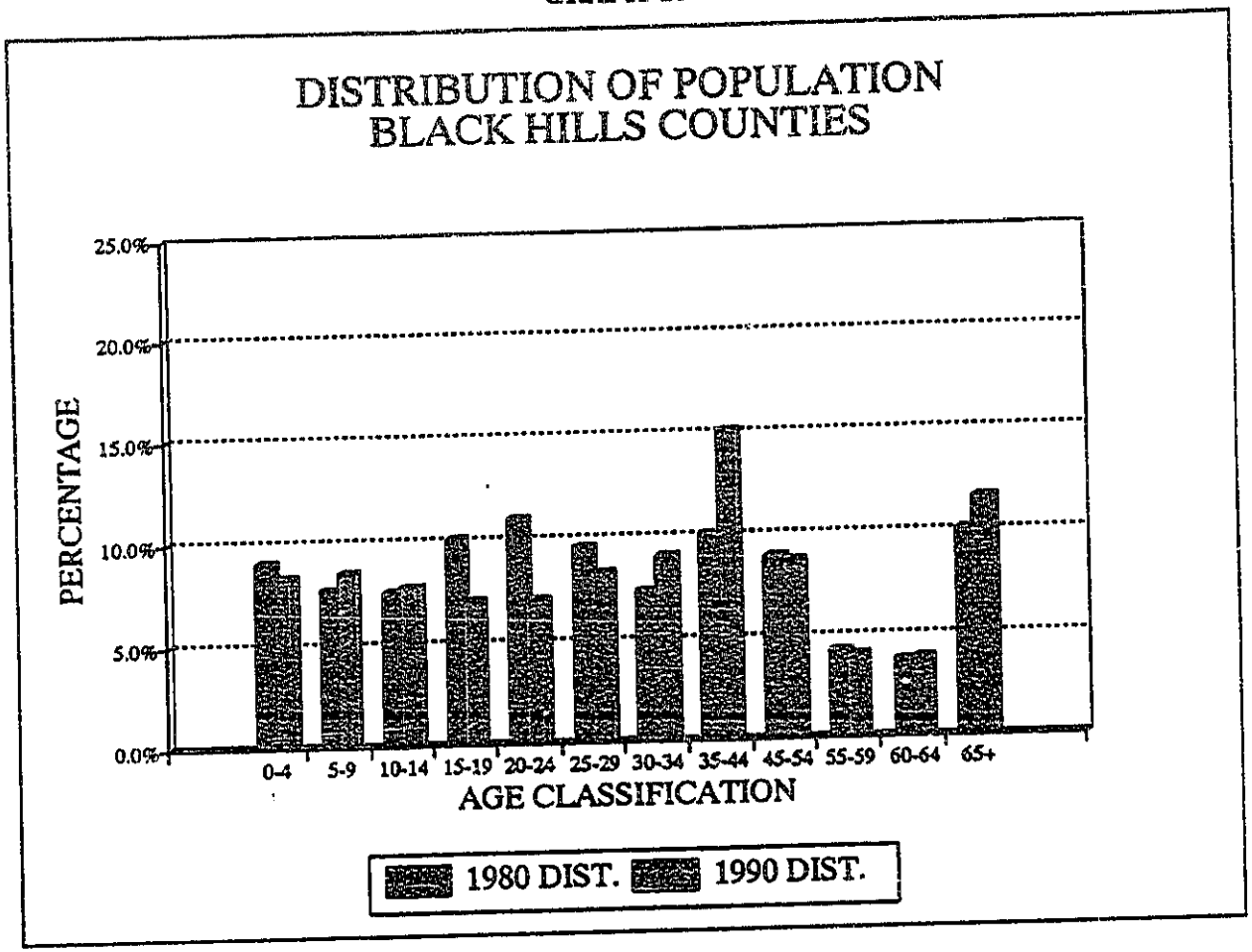
It is interesting to note the proportion of the population under age 15 is higher in 1990 than in 1980 for all age groups. This corresponds to the larger proportion of working age classifications between 30 and 45.

The growth in the proportion of the population younger than 15 is consistent with the crowding conditions which exist in many Black Hills school districts.

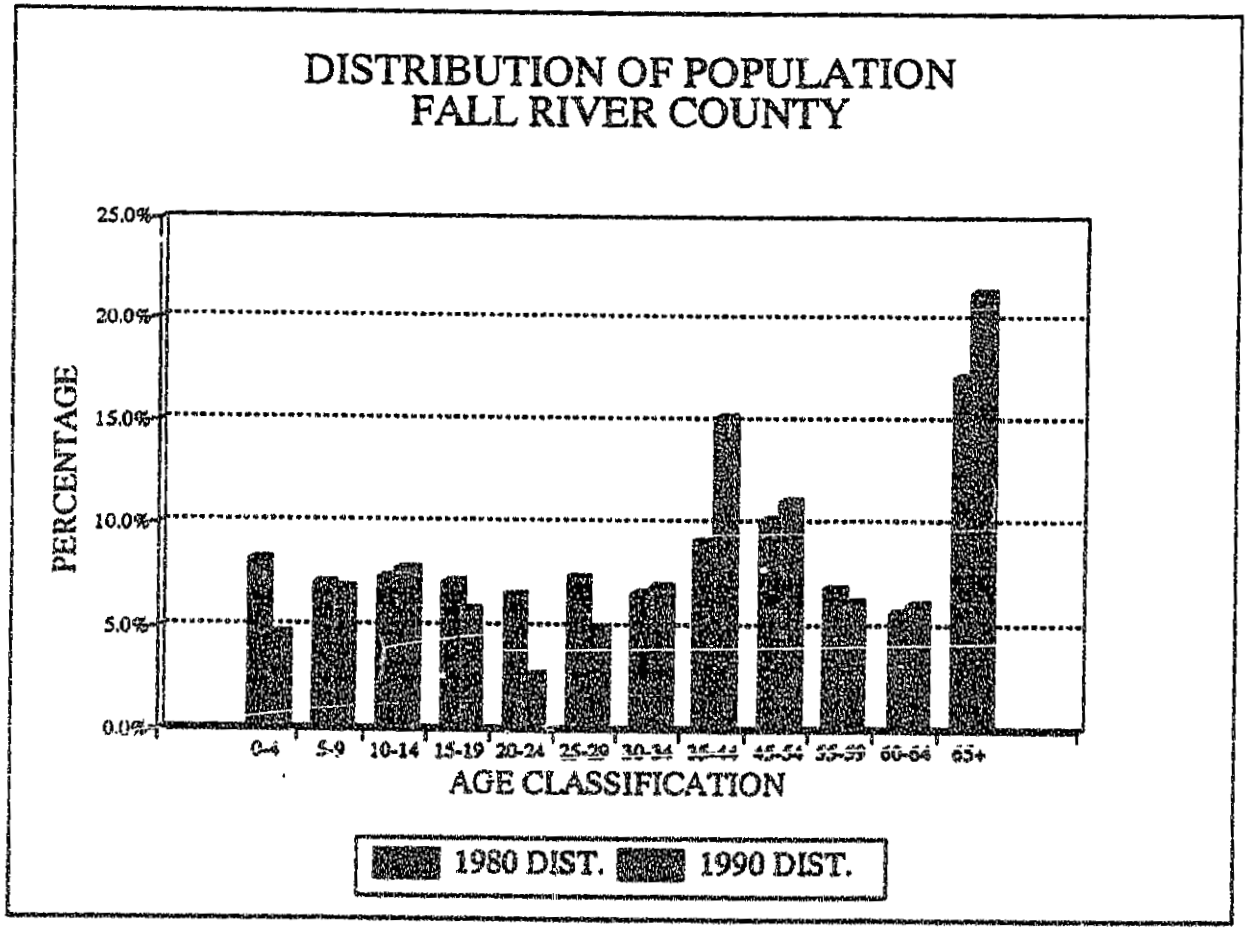
Graph 20 represents the age distribution of Fall River County and is presented only to provide the reader with a marked contrast to the more ideal Black Hills Regional distribution. This distribution is an excellent example of a population which is very likely to experience further population declines. Moreover, this graphic shows that population imbalances which existed in 1980 produced a more pronounced imbalance in 1990.

It is noted that nearly 30% of this county's population is over 60 years of age. An extremely small portion of the population consists of young adults aged 20 to 30. And there are very small proportions of children under age 5. All of these factors explain why populations have and are likely to continue to decline in the county.

GRAPH 19


DISTRIBUTION OF POPULATION
BLACK HILLS COUNTIES
PERCENTAGE
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-44
45-54
55-59
60-64
65+
AGE CLASSIFICATION
1980 DIST.
1990 DIST.

GRAPH 20


DISTRIBUTION OF POPULATION
FALL RIVER COUNTY
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
PERCENTAGE
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-44
45-54
55-59
60-64
65+
AGE CLASSIFICATION
1980 DIST.
1990 DIST.

Statewide Population Redistributions

The significant population growth in the Black Hills Region during the last twenty years is related to what has occurred to population densities in the state as a whole.

A significant population migration from rural areas to urban growth centers has taken place throughout the state. The magnitude of the migration is illustrated on the following map developed by the South Dakota State Data Center.

This map indicates that four of the seven counties west of the Missouri River which experienced increases in population from 1980 to 1990 are Black Hills Counties. The balance of Western South Dakota counties experienced population reductions.

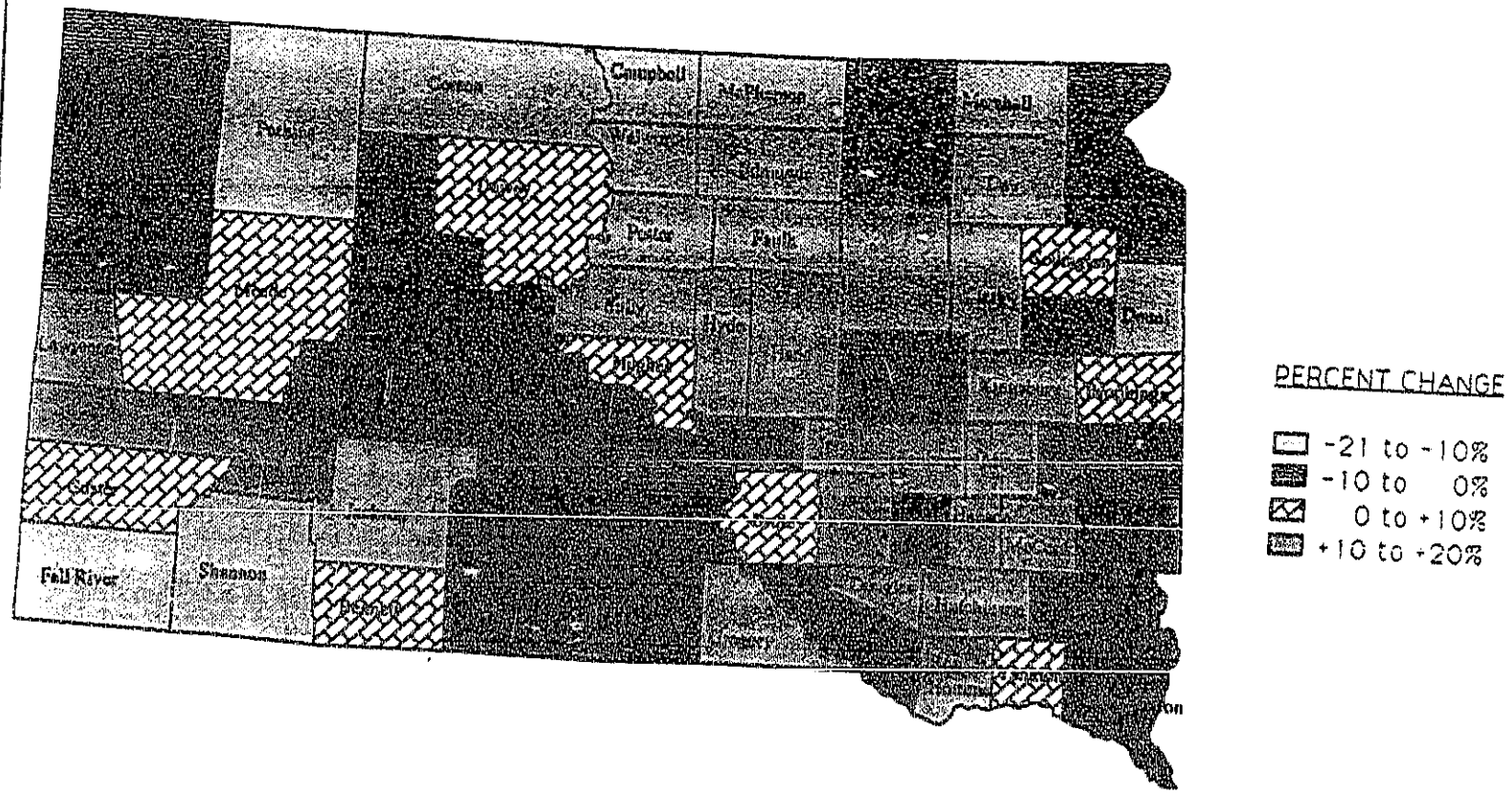
Only five counties in the entire state witnessed population growth greater than 10%, two of which are the Black Hills counties of Pennington and Lawrence.

Age distributions of counties which have experienced population declines suggest that this pattern will continue into the future.

Examining population migration patterns from a statewide basis provides an understanding of why growth in Black Hills Region employment, income and population growth has exceeded similar statewide trends and why it is likely to continue into the future.

MAP 1

PERCENT CHANGE IN SOUTH DAKOTA COUNTY POPULATIONS 1980 -- 1990



Map by State Data Center, 1990 Census

SECTION IV
POPULATION AND EMPLOYMENT PROJECTIONS

Forecasts pertaining to the Black Hills Region are not generally available from secondary sources. The methodology employed in this document involves extrapolative inferences. The use of historical trends in this manner is a common forecasting technique, particularly in applications where long term regularity is present in relevant data series'. Time series' involving Black Hills employment and population variables have exhibited exceptional regularity over the twenty one year period examined in this document.

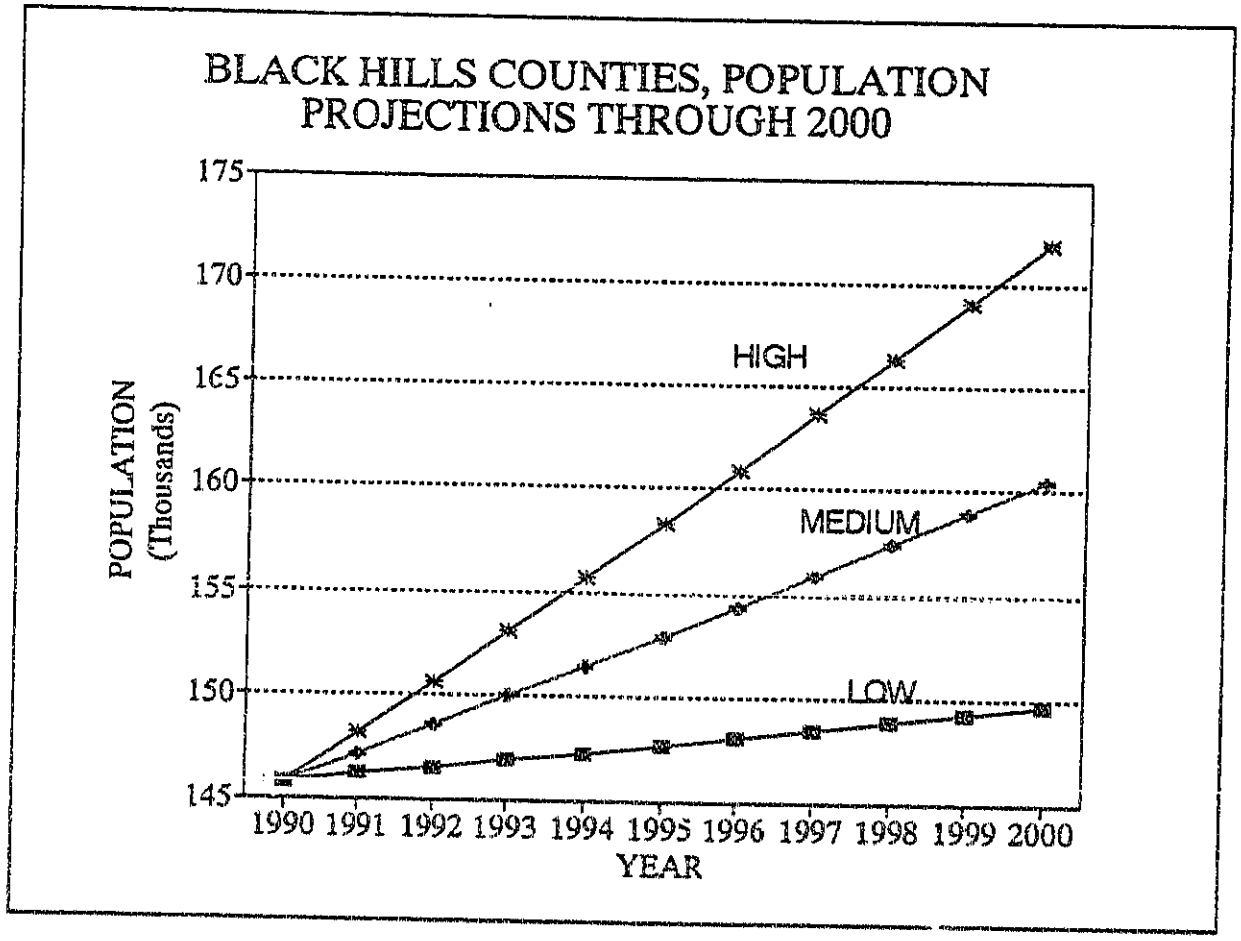
The specific procedure used in developing ranges of population and employment forecasts involves calculating five year moving averages for the years 1980 to 1990, averaging these percentage changes, and using the result as the expected percentage change for the future. A low range projection is developed by reducing the mean change by one standard deviation and a high projection is derived by adding one standard deviation to the mean change.

This process, yields a projection range for each year into the future which widens as the length of the projection increases. This increasing interval is consistent with the fact that forecasts are less precise for years further into the future.

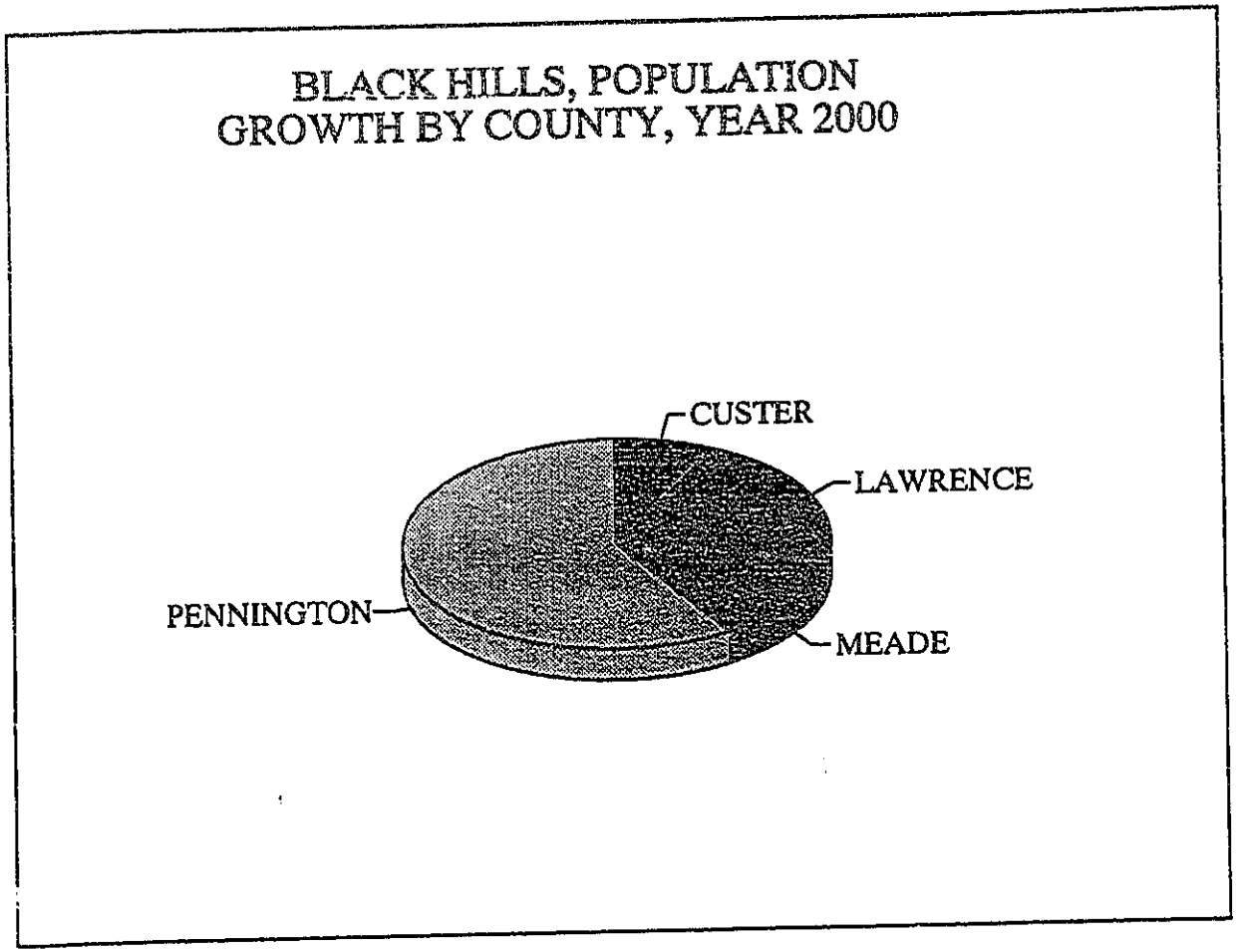
Generally speaking it can be said that if relative changes in population and employment occur similar to the 1975 - 1990 period, the predicted population for a given year would be that appearing on the line labeled 'medium'. If the average growth is one standard deviation smaller than what has occurred in the nineteen eighties, the low line would represent future population estimates. Finally if the growth rate is one standard deviation larger than has occurred in the recent past the high line would be appropriate.

The following graph represents annual population levels which would be projected based upon the methodology described.

GRAPH 21


BLACK HILLS COUNTIES, POPULATION PROJECTIONS THROUGH 2000
175
170
165
160
155
150
145
POPULATION (Thousands)
HIGH
MEDIUM
LOW
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
YEAR

GRAPH 22


BLACK HILLS, POPULATION
GROWTH BY COUNTY, YEAR 2000
CUSTER
LAWRENCE
PENNINGTON
MEADE

An example of the interpretation of Graph 21 is that in 1995, a low population forecast is about 148,000, a high forecast is 158,000 and a medium forecast is 153,000. This compares with a 1990 population of about 146,000.

Graph 22 depicts the distribution of population increases by county assuming each county grows in the same relative amount as they did in the nineteen eighties.

Since both Butte and Fall River Counties experienced no growth during the 1980 decade, they do not appear on the graph.

It is inferred, based on this analysis, that Pennington County will grow by the largest number of citizens and Lawrence County will grow by the second largest amount. These breakdowns should be viewed tentatively because population growth in a community can occur across county boundaries. For example some of the growth which is projected for Pennington County may spill into southern Meade County.

Average, low and high population growth rate projections used are expressed in the following table.

TABLE 2

LOW, MEDIUM AND HIGH POPULATION GROWTH RATES		
	Black Hills	State
LOW	.54%	0.0%
MED.	.92%	.13%
HIGH	1.31%	.23%

As alluded to earlier the low and high growth rates are established by subtracting and adding respectively the standard deviation from the medium growth rate.

Population growth rates for the State of South Dakota are included in the table for the reader's reference. During the last decade the growth rate for the Black Hills region is about .6% higher than for the state as a whole.

Employment Projections

The methodology used in forecasting future employment is identical to that used above for population. As the following graph shows total employment for the Black Hills is projected to grow from about 85,000 to 93,000 by 1995 and to more than 100,000 in the year 2000.

Average, low and high growth rates for employment are shown in Table 3. As indicated in this table,projected growth in employment is expected to approximate 1.81%. The low projection is one standard deviation below and equal to 1.09% and the high projection is 2.52%

For the state as a whole projected growth in employment is 1.0% per year. As in the case of population the growth rate of employment in the Black Hills is about .8% higher than the state as a whole.

The following pie chart shows the distribution of employment growth assuming relative county job growth rates continue in their recent fashion.

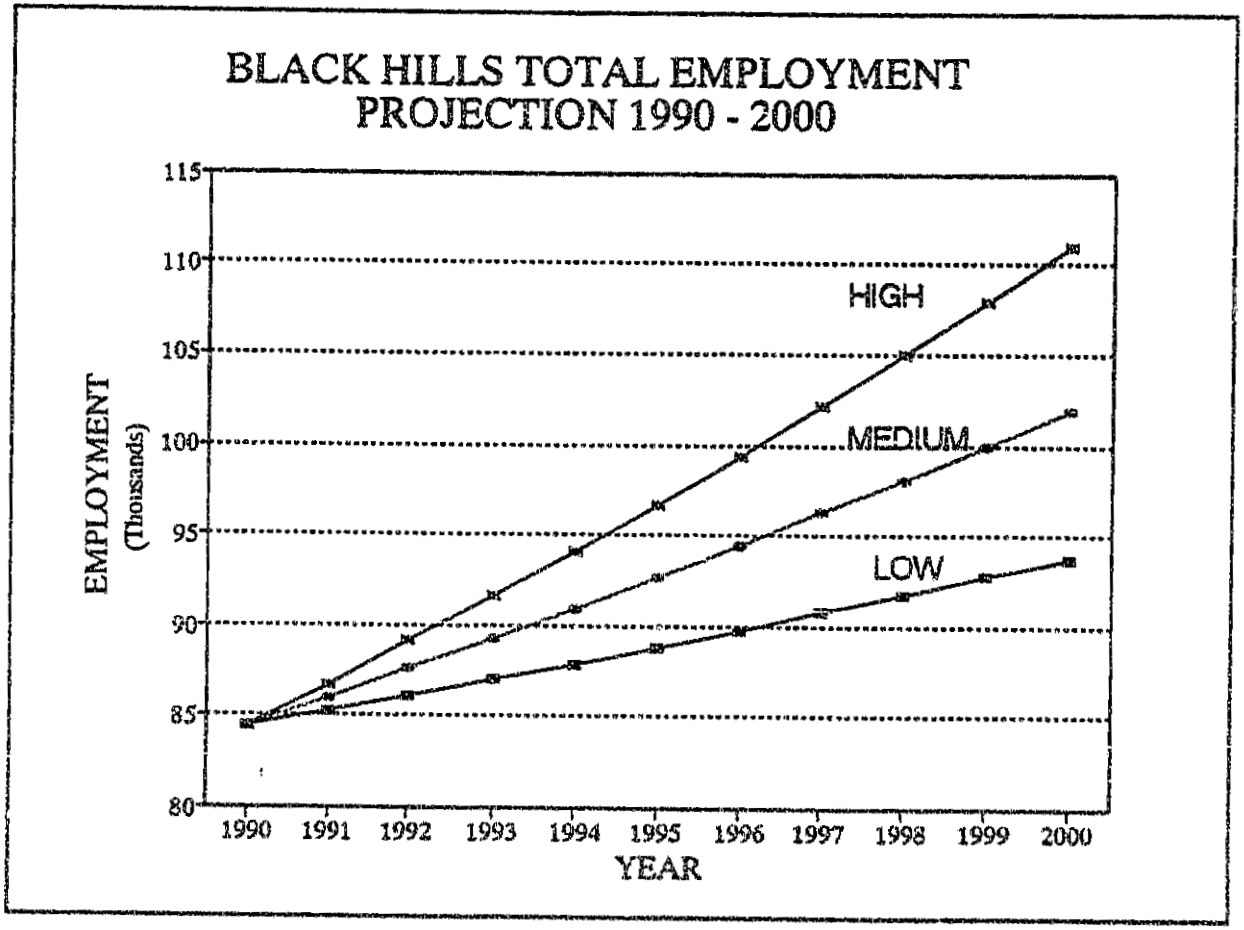
TABLE 3

LOW, MEDIUM AND HIGH EMPLOYMENT GROWTH RATES

	Black Hills	State
LOW	1.09%	0.23%
MED.	1.81%	1.01%
HIGH	2.52%	1.78%

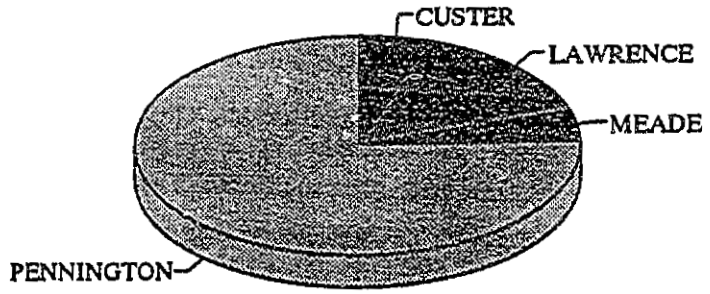
This graphic indicates that the bulk of job creation is to occur in Pennington County. Interpreting this graphic in conjunction with the employment pie chart indicates that much of the new Pennington County jobs will be filled by residents in nearby Custer and Meade Counties. Again the reader is reminded that County breakdowns should be viewed with discretion.

GRAPH 23


BLACK HILLS TOTAL EMPLOYMENT
PROJECTION 1990 - 2000
EMPLOYMENT
(Thousands)
115
110
105
100
95
90
85
80
HIGH
MEDIUM
LOW
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
YEAR

GRAPH 24

BLACK HILLS EMPLOYMENT DISTRIBUTION BY COUNTY, YEAR 2000



Ellsworth Force Reductions

The deactivation of the missile squadron at Ellsworth Air Force Base (Source: Final Environmental Impact Statement, Deactivation of the Minuteman II Missile Wing at Ellsworth Air Force Base, South Dakota, October 1991.) as well as a number of other personnel reduction moves is one set of factors which will have an impact on employment in the Black Hills Region. These reductions are distributed through the 1992 - 1995 time span.

It is, of course, possible in the future that some Air Force operations will move to Ellsworth as free space is made available from the deactivation and other reductions in current missions. There is no assurance, however, that new missions will locate at Ellsworth because of the down scaling of the military nation wide.

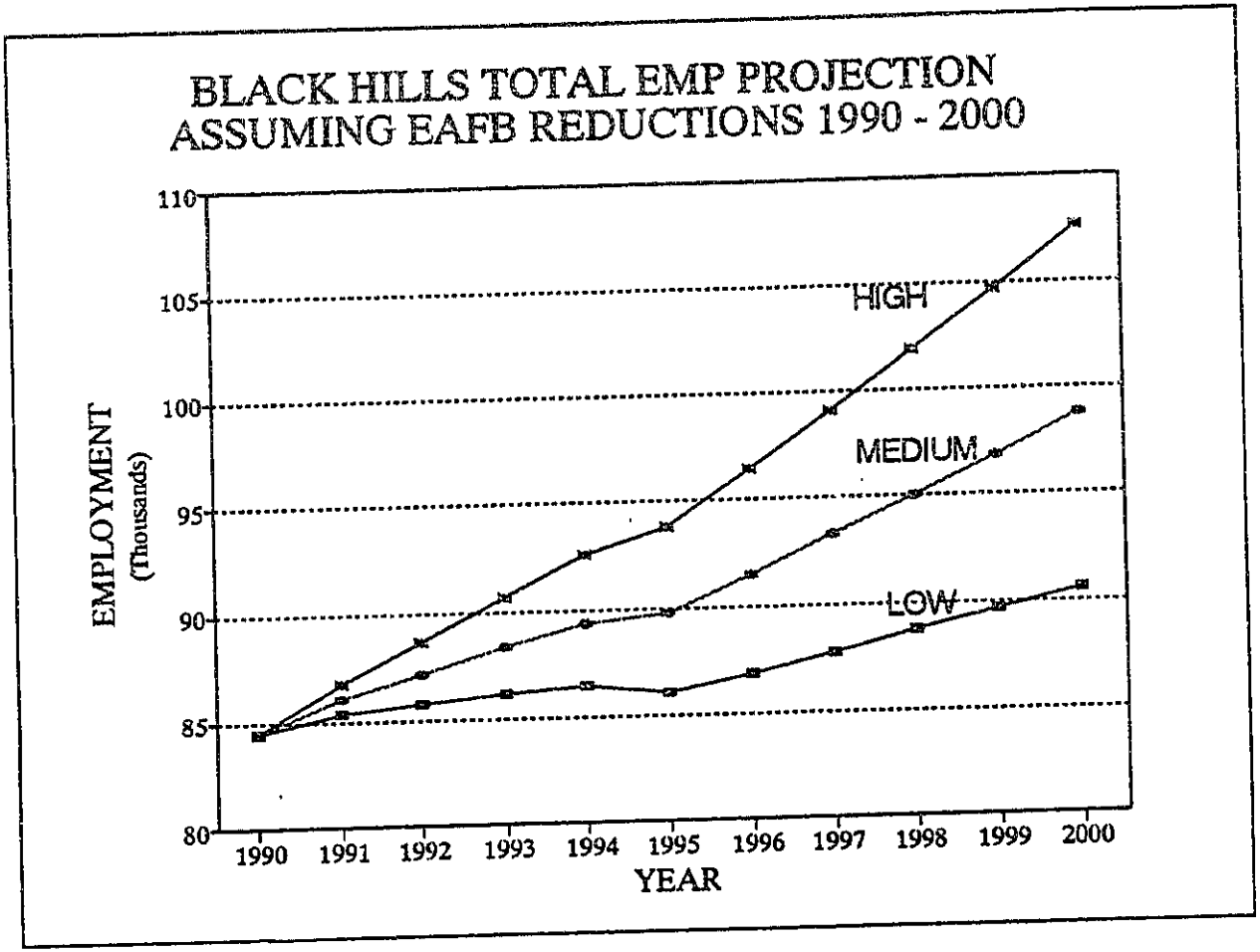
Because Ellsworth Air Force Base is not included within the Black Hills Power and Light service area, no direct effect is traceable to Air Force operations. The reductions in manpower will have an impact however, because many households in the service area are Ellsworth personnel.

The following graphic illustrates the affect that is projected to occur in the future assuming a reduction of about 2,900 direct and indirect Air Force jobs. These reductions are distributed through the years 1992 to 1995 according to Air Force projections.

As shown in the graphic, growth in Black Hills Regional employment is expected to move off trend during the mid nineteen nineties as military reductions take place. Beyond 1995 growth is projected to move back on trend as the impact of these reductions is exhausted.

By carefully comparing Graphs 23 and 25, one can judge the influence on Black Hills employment growth resulting from military personnel reductions. It is interesting to note that despite the significance of these reductions, the medium projection still results in some moderate job growth during this period.

GRAPH 25


BLACK HILLS TOTAL EMP PROJECTION
ASSUMING EAFB REDUCTIONS 1990 - 2000
EMPLOYMENT
(Thousands)
110
105
100
95
90
85
80
HIGH
MEDIUM
LOW
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
YEAR

Growth Sectors

The following table summarizes the sectors which have performed the best in terms of generating personal income in the Black Hills Region. All growth rates are in real terms.

Amusement services, eating and drinking establishments, hotels and a significant share of business services are all traceable to the travel industry which has grown substantially in the last ten years. Current indicators point to the fact that this industry has continued to grow beyond 1990 and is likely to continue this trend.

The health industry has also grown rapidly, primarily in Rapid City, but also in many other communities in the region.

Basic industries such as manufacturing and the lumber industry have also lead in the generation of higher employment in income levels

TABLE 4

SECTORS GENERATING HIGHEST INCOME GROWTH IN 1980'S, BLACK HILLS REGION

Sector	Growth Rate
Amusement Services	21.9%
Business Services	14.0%
Health Services	12.3%
Durable Mfg.	11.8%
All Services	10.7%
Personal Services	10.2%
Utilities	9.1%
Lumber	9.0%
All Manufacturing	6.8%
Eat & Drink	6.7%
Legal	6.4%
Hotels	5.9%
Heavy Const	5.8%

Integration With State Economic Forecast

The South Dakota Bureau of Finance and Management subscribes to Data Resources Forecasting Service (DRI) for the purpose of forecasting economic activity for the state as a whole. The basis of the DRI model is a multiple equation econometric system which depends upon lagged explanatory variables and other exogenous variables on a national level. In short the model integrates economic factors unique to the state with influences that the national economy bears upon South Dakota.

No effort is made by DRI to forecast economic variables for sub regions of the state. However, one can make general inferences about a region such as the Black Hills by the knowledge of how this region has performed relative to the state in past years.

For example during the nineteen eighties, South Dakota growth in employment averaged 1.01% while the Black Hills growth in employment was 1.81% or .8% higher than the state average. The employment growth rate in the Black Hills Region has uniformly exceeded similar statewide statistics over long periods of time.

The latest DRI forecast is based upon data inputs as of August of 1992 and extends to 1995. Economic variables which are included consist of various measures of employment and income. Employment sectors include mining, construction, manufacturing, transportation and public utilities, retail trade and services. Income measures include personal farm and nonfarm income, wage and salary income and manufacturing wages and salaries.

The latest DRI forecast appears on the following page and includes the years of 1991 through 1995. The average annual percentage changes for each of the variables appear in the rightmost column. For the state of South Dakota a 1.0% average annual increase in employment is projected by this model. Real Disposable income is forecast to be 1.2% through this period.

TABLE 5

SD BUREAU OF FINANCE AND MANAGEMENT DRI FORECAST						
	1991	1992	1993	1994	1995	%
TOTAL EMPLOYMENT	349,000	351,200	353,700	358,200	362,600	1.0%
NONFARM EMPLOYMENT	296,700	303,700	307,000	313,000	319,000	1.9%
MINING	2,600	2,700	2,700	2,800	2,800	1.9%
CONSTRUCTION	11,900	12,300	12,700	13,300	13,900	4.2%
MANUFACTURING	35,300	37,300	38,500	40,300	41,800	4.6%
TRANS. & PUB. UTILITIES	13,700	14,200	13,900	1,400	14,100	0.7%
TRADE	78,700	80,300	81,100	82,500	83,900	1.7%
FIN. INS. REAL ESTATE	16,600	16,900	17,200	17,800	18,300	2.6%
SERVICES	74,800	76,200	77,400	79,000	80,600	1.9%
PERSONAL INCOME	$11,500,000,000	$12,000,000,000	$12,500,000,000	$13,200,000,000	$13,800,000,000	5.0%
REAL DISPOSABLE INCOME	6,500,000,000	6,600,000,000	6,700,000,000	6,700,000,000	6,800,000,000	1.2%
NONFARM INCOME	10,300,000,000	10,800,000,000	11,400,000,000	11,900,000,000	12,500,000,000	5.3%
NONFARM PROPRIETOR	1,200,000,000	1,300,000,000	1,300,000,000	1,400,000,000	1,400,000,000	4.2%
WAGE AND SALARY INCOME	5,300,000,000	5,600,000,000	5,900,000,000	6,200,000,000	6,400,000,000	5.2%
NON MANUF. W&S INCOME	4,600,000,000	4,800,000,000	5,100,000,000	5,400,000,000	5,600,000,000	5.4%
MANUFACTURING W&S	700,000,000	700,000,000	800,000,000	800,000,000	900,000,000	7.1%
AVERAGE ANNUAL WAGES	$17,900	$18,400	$19,200	$19,800	$20,200	3.2%

Although the annual average increase in total employment is estimated to be 1% through 1995, the increase in non-farm employment is forecast at nearly double that rate at 1.9%. This is relevant to the Black Hills Region because of the limited role of agriculture.

The manufacturing and construction are forecast to be the leading growth sectors during the next few years. Manufacturing is also a sector which has performed substantially above average in the Black Hills Region.

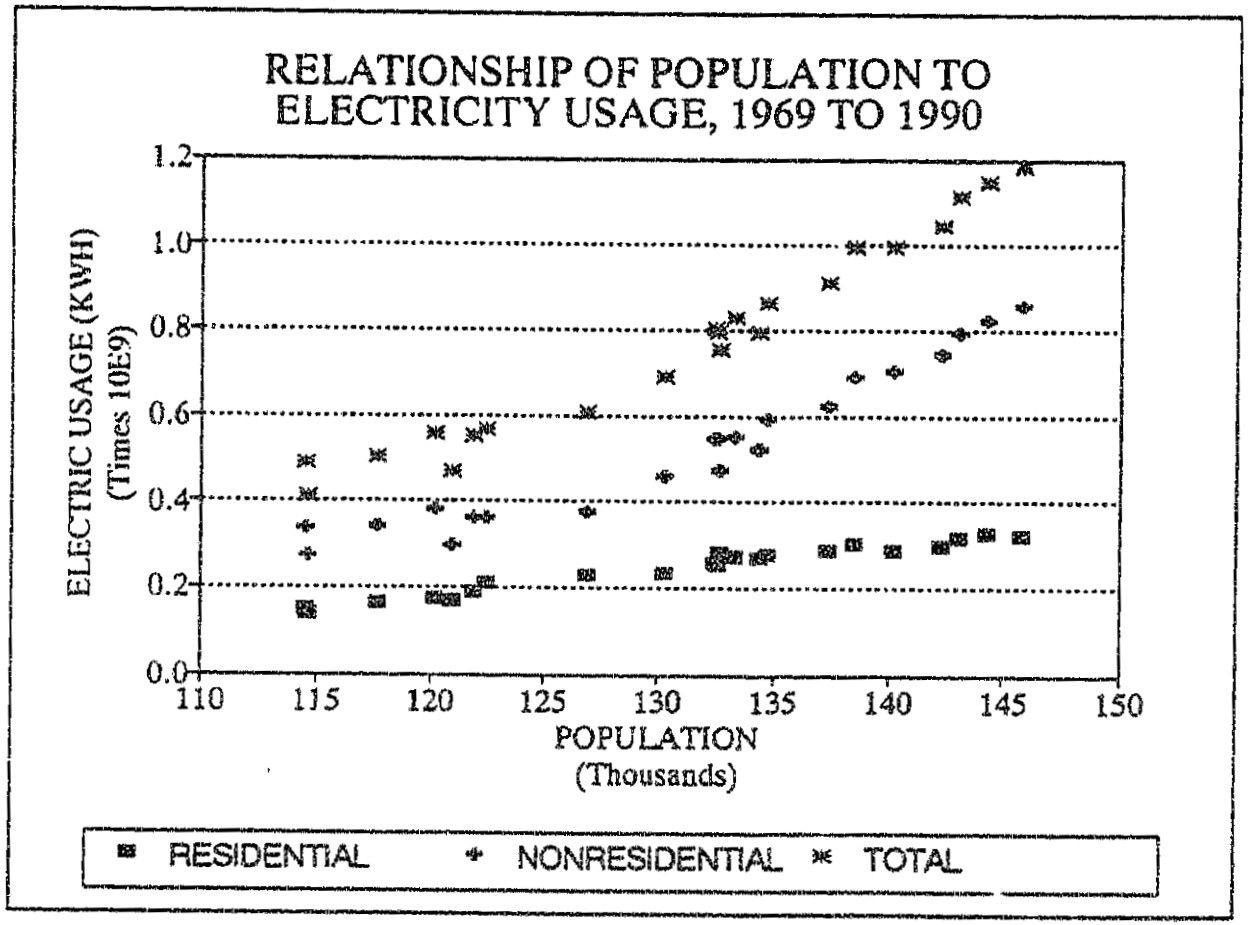
In synthesizing the earlier analysis of long run trends regarding the Black Hills Region with the DRI statewide forecast, one finds a great deal of consistency between the two approaches. Recent trends indicate that employment growth has in the past been about 1% statewide and about 1.8% in the Black Hills. The latest DRI forecast summarized above indicates projected statewide growth averaging 1% through 1995. Thus, it appears that if the growth rate in the Black Hills bears its historical relationship to growth in the entire state, there will be approximately a 1.8% growth rate in Black Hills Regional employment.

Growth and the Demand for Electrical Energy

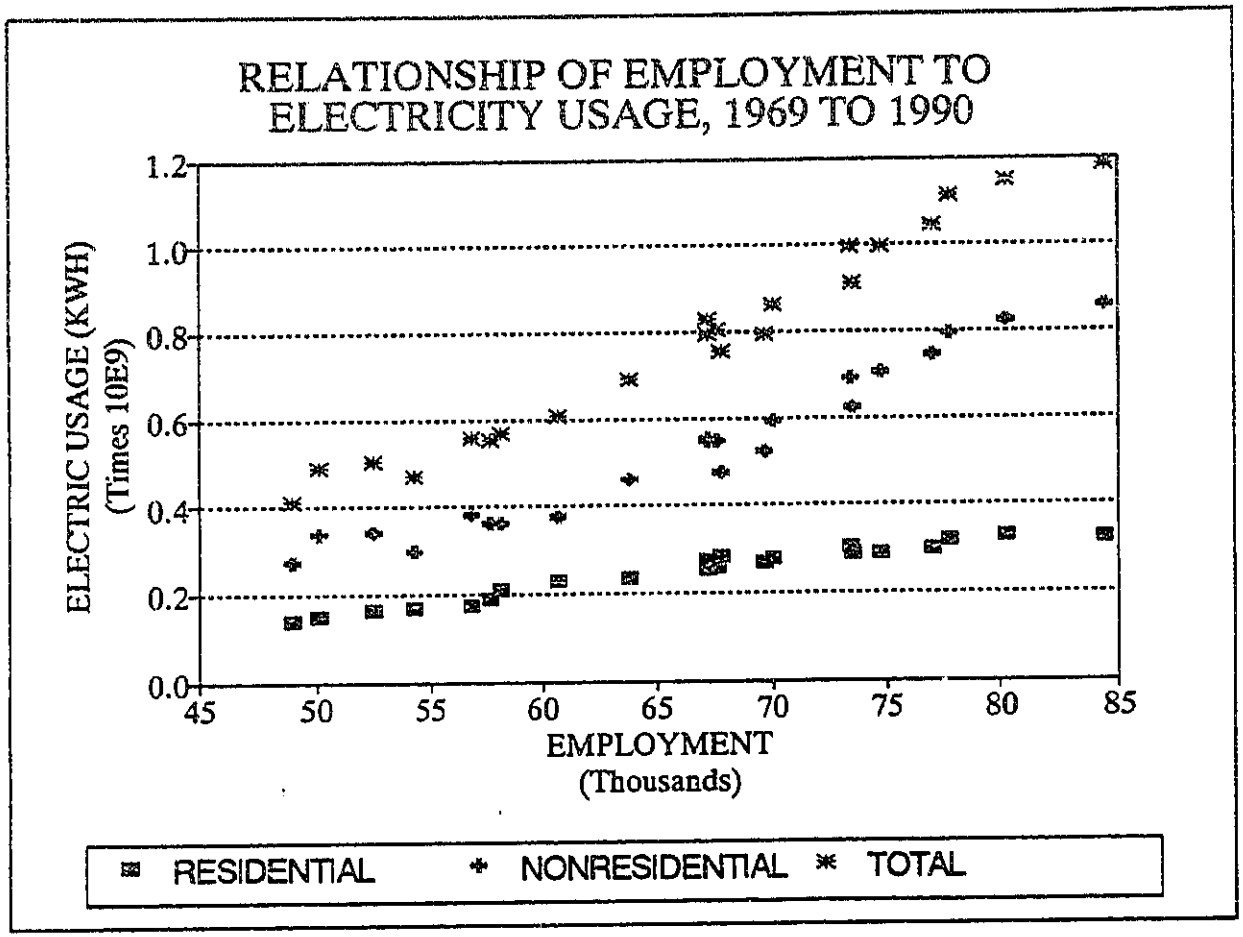
Measures of population growth and economic expansion as measured by employment both tend to correlate with the demand for electrical energy. The logic behind this conclusion is straightforward. Added employment in a region is associated with population expansion. The added population points to additional households. The new household units require electric energy. Employment itself also produces increased energy needs in connection with the tasks associated with the added employment.

Graph 26 illustrates the relationship which has existed from 1969 to 1990 between population and electricity demands of Black Hills Power and Light Company. Graph 27 traces the relationship between electric demand and employment.

GRAPH 26


RELATIONSHIP OF POPULATION TO
ELECTRICITY USAGE, 1969 TO 1990
ELECTRIC USAGE (KWH)
(Times 10E9)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
110
115
120
125
130
135
140
145
150
POPULATION
(Thousands)
RESIDENTIAL
NONRESIDENTIAL
TOTAL

GRAPH 27


RELATIONSHIP OF EMPLOYMENT TO
ELECTRICITY USAGE, 1969 TO 1990
ELECTRIC USAGE (KWH)
(Times 10E9)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
45
50
55
60
65
70
75
80
85
EMPLOYMENT
(Thousands)
RESIDENTIAL
NONRESIDENTIAL
TOTAL

In statistically analyzing these relationships it seems reasonable that population should logically correlate with residential electrical demand. Conversely, employment should correlate best with non residential demand.

Using this reasoning, regression equations of the following form were utilized in mathematically measuring these relationships.

- $RESUSE_t = A + B \times POP_t + e_t$

and:

- $NONRESUSE_t = A + B \times EMP_t + e_t$

RESUSE AND NONRESUSE represent residential and nonresidential use respectively. POP and EMP are explanatory variables, population and total employment.

Data intervals tested for both equations include the years 1969 to 1990. As a check on the stability of the models, the subperiod 1980 to 1990 was also estimated.

All variables are converted to logarithms in order to establish relative relationships between the dependent and independent variables.

The results, appearing on the following page, show a remarkable relationship between electrical use as defined and the explanatory variables even though no other variables such as temperature and price are included.

Except for the population variable during the 1980 decade all coefficients of determination (R squared) are .95 or more. The population variable was able to explain 83% of the squared deviations in residential use in the remaining run.

The most important result in the following regression results involve the stability of the relationship between total employment and non residential electric use. The

TABLE 6

REGRESSION OF RESIDENTIAL ELECTRIC DEMAND ON POPULATION	
Regression Results 1969 - 1990	
Constant	-20.92
Std Err of Y Est	0.06
R Squared	0.96
No. of Observations	22
Degrees of Freedom	20
Population Coefficient	3.41
Std Err of Coef.	0.16
Regression Results 1980 - 1990	
Constant	-7.12
Std Err of Y Est	0.04
R Squared	0.83
No. of Observations	10
Degrees of Freedom	8
Population Coefficient	2.25
Std Err of Coef.	0.35

TABLE 7

REGRESSION OF NON RESIDENTIAL ELECTRICAL DEMAND ON EMPLOYMENT	
Regression Results 1969 - 1990	
Constant	-4.09
Std Err of Y Est	0.08
R Squared	0.95
No. of Observations	22
Degrees of Freedom	20
Employment Coefficient	2.18
Std Err of Coef.	0.11
Regression Results 1980 - 1990	
Constant	-3.92
Std Err of Y Est	0.04
R Squared	0.95
No. of Observations	10
Degrees of Freedom	8
Employment Coefficient	2.16
Std Err of Coef.	0.18

regression coefficient is virtually the same in the case of data from 1969 to 1990 and 1980 to 1990. In other words the effect on electricity needs as a function of employment has been the same in the last decade as it has been since 1969.

The regression coefficient of 2.18 suggests that each one percent rise in employment has increased the demand for **non residential** electric needs by 2.18%. This can be referred to as the employment elasticity of non residential electric demand.

The impact on **residential** demand for electricity due to population increases appears to have changed, although the degree of regression fit remains quite high over both time intervals. For the entire time span considered the regression coefficient suggests that each one percent increase in population is associated with a 3.41% increase in residential electric demand. However, for the decade of the 1980's population elasticity of electric demand reduced to 2.25.

The preceding regression results demonstrate the statistical relationship which has existed between electrical energy demands and employment and population during the time period included in the regression. The inference is that if the relationship between these variables holds in a manner similar to the past, one can use this established correlation to predict the increased electrical energy needs in the future.

It was earlier established that population growth in the Black Hills Region has been about .92% during the last decade. Applying the population elasticity of 2.25 to this growth rate implies that **residential** electric demand is projected to grow at the rate of 2.07% per year in the Black Hill Region of South Dakota.

Similarly it has been determined that employment growth in the Black Hills has averaged 1.81% during the nineteen eighties. This suggests that non **residential** electric demand is projected to grow at a rate of 3.90% per year.

Taking into account that in 1990, residential electric demand accounted for 27.25% of total demand with the balance going to non residential users, the overall average yearly growth in electrical needs based upon this analysis is equal to about 3.4%.

Additional Issues

Other factors of an economic nature merit attention from the standpoint of future projections. It is important to note, however, that the Black Hills area economy is quite diversified for an economy of its size. The government plays an important role in terms of stable employment in income generation. Federal, state and local government agencies are all important in this regard. The travel, mining, forestry, health services and agricultural industries are all basic industries to the area. A number of communities in the Black Hills are retail and service centers to a population within a wide radius of the region. This level of diversification plays a large part in explaining the stable growth seen in the economy during the last two or three decades. Diversification causes negative impacts in some sectors of the economy to be offset by positive impacts in other sectors in the long run.

A number of individual factors are worthy of consideration in regard to the future growth of the region, however.

Ellsworth Air Force Base

The reduction in manpower at Ellsworth Air Force Base is currently estimated to be about 2,900. This issue was treated earlier in this document. This analysis shows that the contemplated reductions will cause a move off-trend in employment. The reduction will be felt in the 1993 - 1995 time period. The analysis suggests that the growth rate in total employment in the region will resume in 1996.

The Mining Industry

Currently there are five surface gold mines in the Black

Hills Region. In addition Homestake Mining Company operates an underground mine. According to the latest conditional use annual reports, two of the smaller surface mines have completed the mining of ore. However, gold recovery and reclamation is expected to take place for an additional one or two years. During the 1992 - 1994 period an expected reduction of 115 mining jobs will take place. In addition, recent reports indicate that Homestake Mining Company will cut about 100 mining jobs in connection with the underground mine.

The economic feasibility of future mine development depends heavily upon gold prices increasing above current rates.

The two operations which have nearly completed active mining use approximately 4.9 million KWH of electrical energy annually. This represents less than .4% of the total electrical demand from Black Hill Power and Light in 1991.

The Travel Industry

The advent of legalized gaming in Deadwood, South Dakota has had a dramatic impact on the vacation travel industry in the Black Hills. Visitor spending has more than tripled in Lawrence County since 1989 and significant growth has taken place in other Black Hills counties as well. Moreover, the distribution of travel spending has expanded into the shoulder seasons as well as the traditionally slow winter season.

The demand for electric energy has paralleled the development of the gaming industry in Deadwood. Since gaming began, electrical energy used in Deadwood has increased by about 9 million KWH annually. (Source: Black Hills Power and Light Company records.) This equals the amount of energy used by two of the smaller surface gold mines in the Black Hills.

Black Hills Power and Light Co. Service Area

The 3.4% increase in projected demand for electric energy is based upon the historical geographical commonality of growth in the economy and the service area of Black Hills Power and Light Company. Two of the primary growth communities, Spearfish and Rapid City, are positioned at the juncture of the Black Hills National Forest and ranch and farmland. The rural land around these communities is developed into urban uses as they grow. A portion of development in these communities lie within the service area of rural electric cooperatives.

This phenomena can result in some of the growth in these communities to not result in proportionate growth in electric demand from Black Hills Power and Light Company. This issue is clarified by examining the comprehensive plans for the cities of Spearfish and Rapid City.

The Spearfish comprehensive plan focuses on the decade of the nineties. Population growth for the community is projected to be about 800 more residents by 1995 and 1,200 more from 1995 to 2000. The comprehensive plan is relatively short term in nature and in this regard has identified a number of housing subdivisions which are programmed for complete development in the next eight years. Between five and six hundred single and multiple family housing units have been identified. Most development is concentrated east of the original town. When overlaying these subdivision developments, it appears that about 60% of these residences will fall within the Black Hill Power and Light service area with the remainder being served by the rural electric cooperative.

The major industrial area is also located east of the original town of Spearfish and is also served by Black Hills Power and Light Company as well as the rural electric cooperative. It appears that the proportion of industrial use to be served by Black Hills Power and Light Company is also about 60%.

The Rapid City Area Comprehensive Plan is more long run in nature, projecting land use needs until the year 2,015. Projected housing needs is equal to 17,750 by that year. Using a constant growth rate between 1990 and 2015 results in an estimated 3,500 to 4,000 new housing units by the year 2000. This estimate together with that for Spearfish is quite consistent with the population growth projections developed earlier in this document.

Overlaying the Comprehensive land Use and Comprehensive Plan map with the Black Hills Power and Light service area map suggests that about 75% of expected future residential development will fall within the company's service area. The case of industrial development is not analyzed completely in the Rapid City Plan, but past development suggests that more than 75% of future industrial and commercial development in and near Rapid City will be served by Black Hills Power and Light Company.

Most other Black Hills area communities are of lower population and most are projected to have lower growth rates than Spearfish and Rapid City. An inspection of service area maps suggest that the bulk and any urban growth in other communities will occur in the Black Hills Power and Light service area.

If one hypothetically assumes that virtually all growth will occur in Spearfish and Rapid City, and one further assumes the service area percentages developed above are reasonable, the projected annual growth in Black Hills Power and Light electricity demand would be about 2.5% as opposed to the 3.4% estimated earlier based on population and employment trends.

In reality, growth is likely to occur in a number of other communities, so the 2.5% should be regarded as a minimum growth rate.

Based upon the analysis developed in this document, a reasonable growth rate in the decade of the nineteen nineties is 2.5% to 3.4%.

EXHIBIT
BHPL
TMO-10, p. 1

SCREENING CURVES

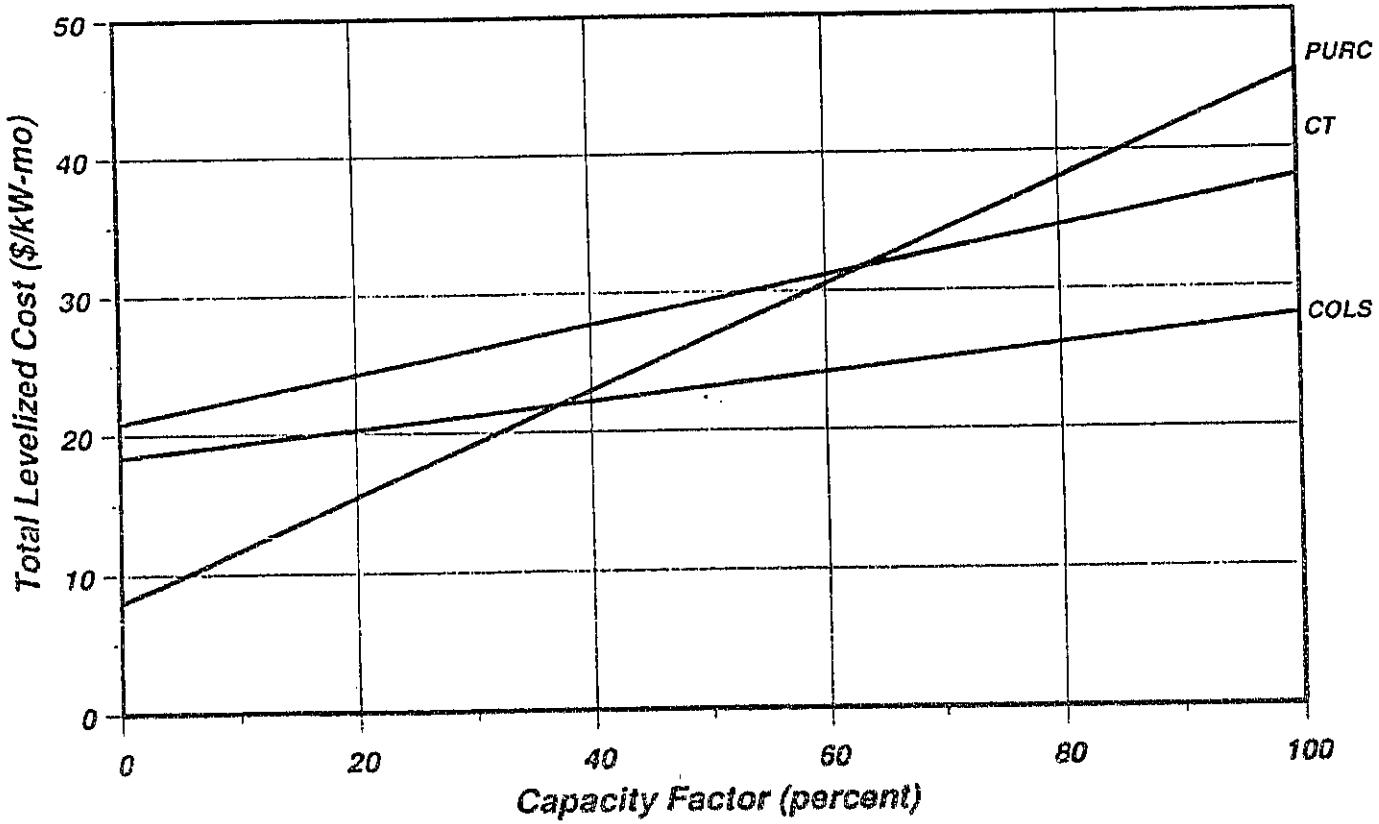


EXHIBIT
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TMO-10, P. 2

SCREENING CURVES

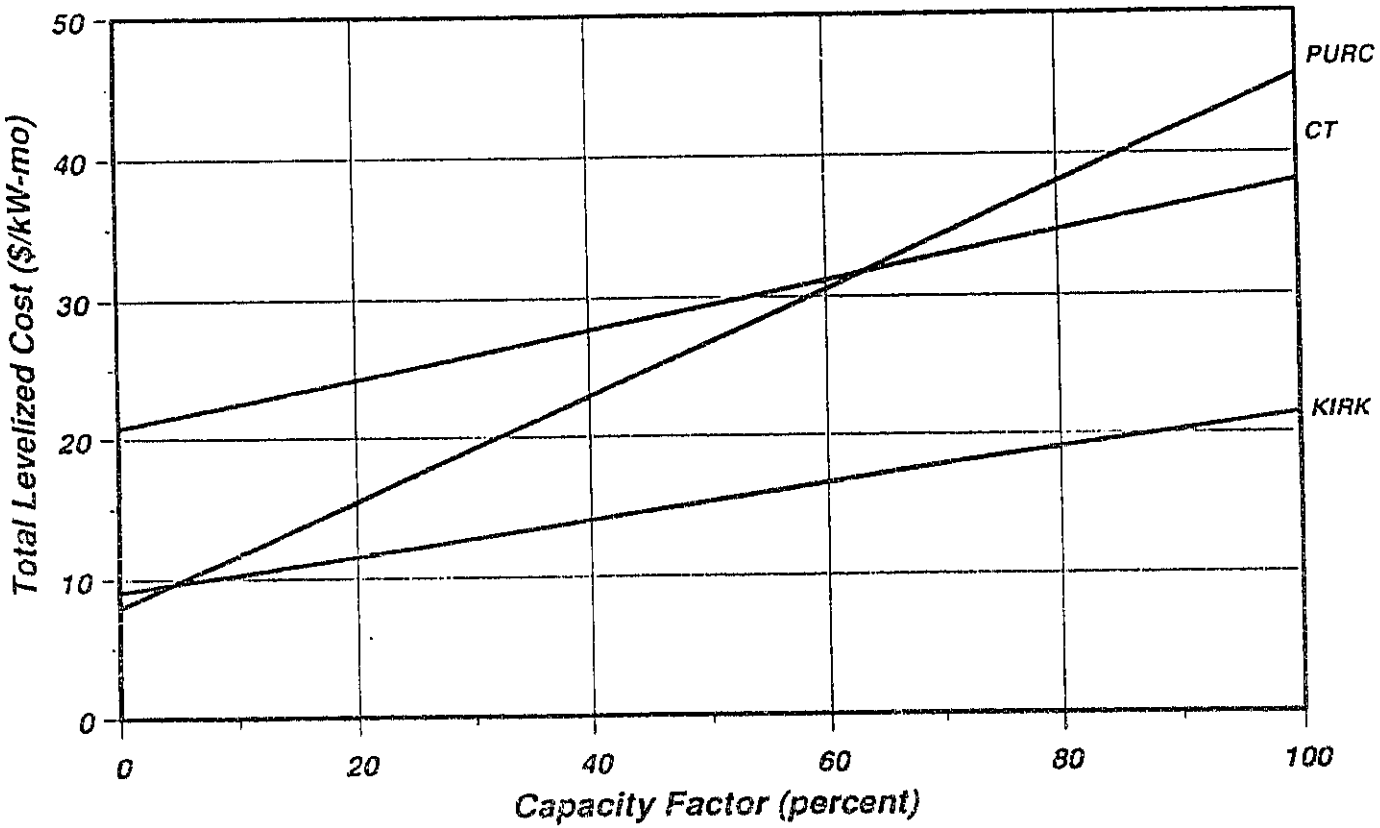


EXHIBIT
BHPL
TWO-10, p. 5

SCREENING CURVES

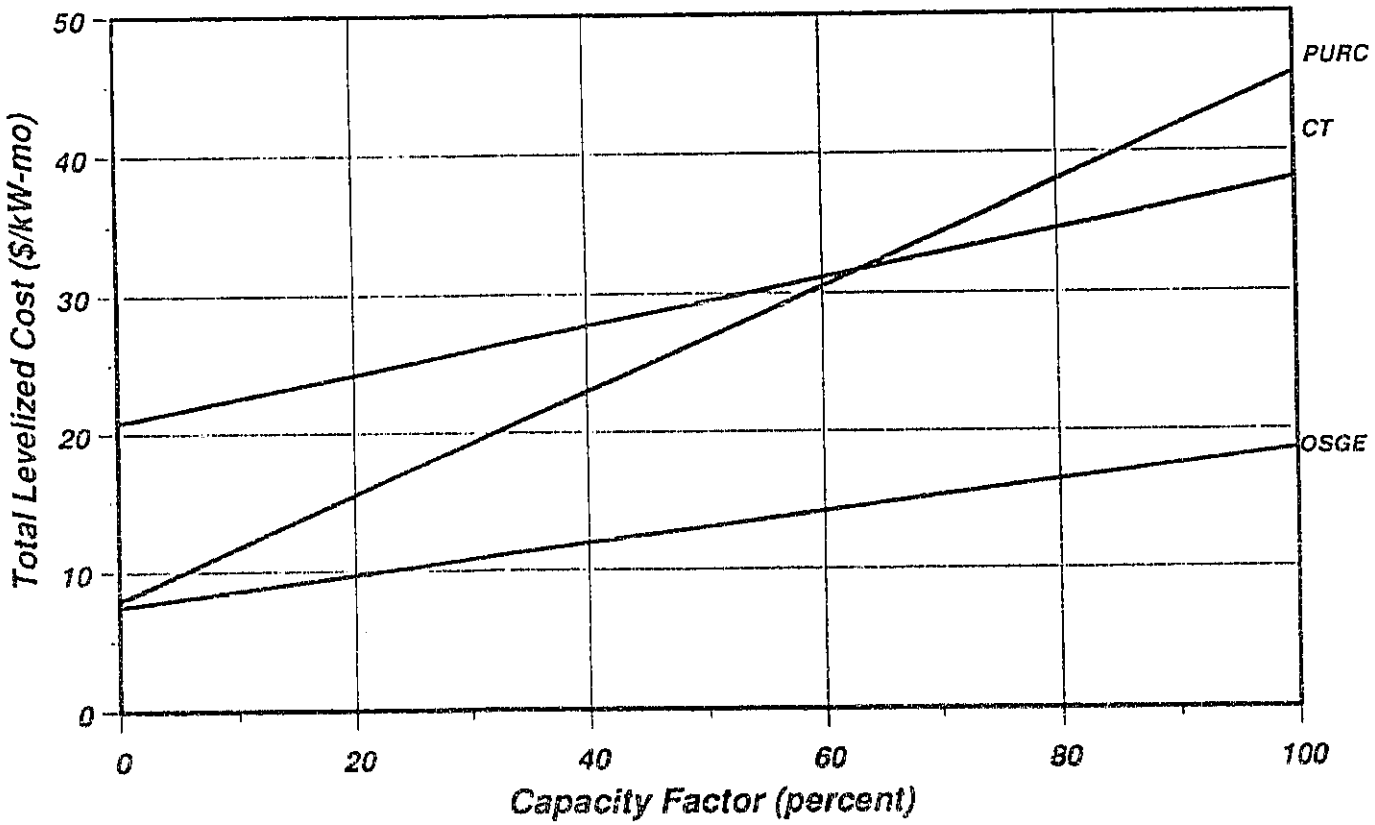


EXHIBIT
BIIPL
TMO-10, p. 4

SCREENING CURVES

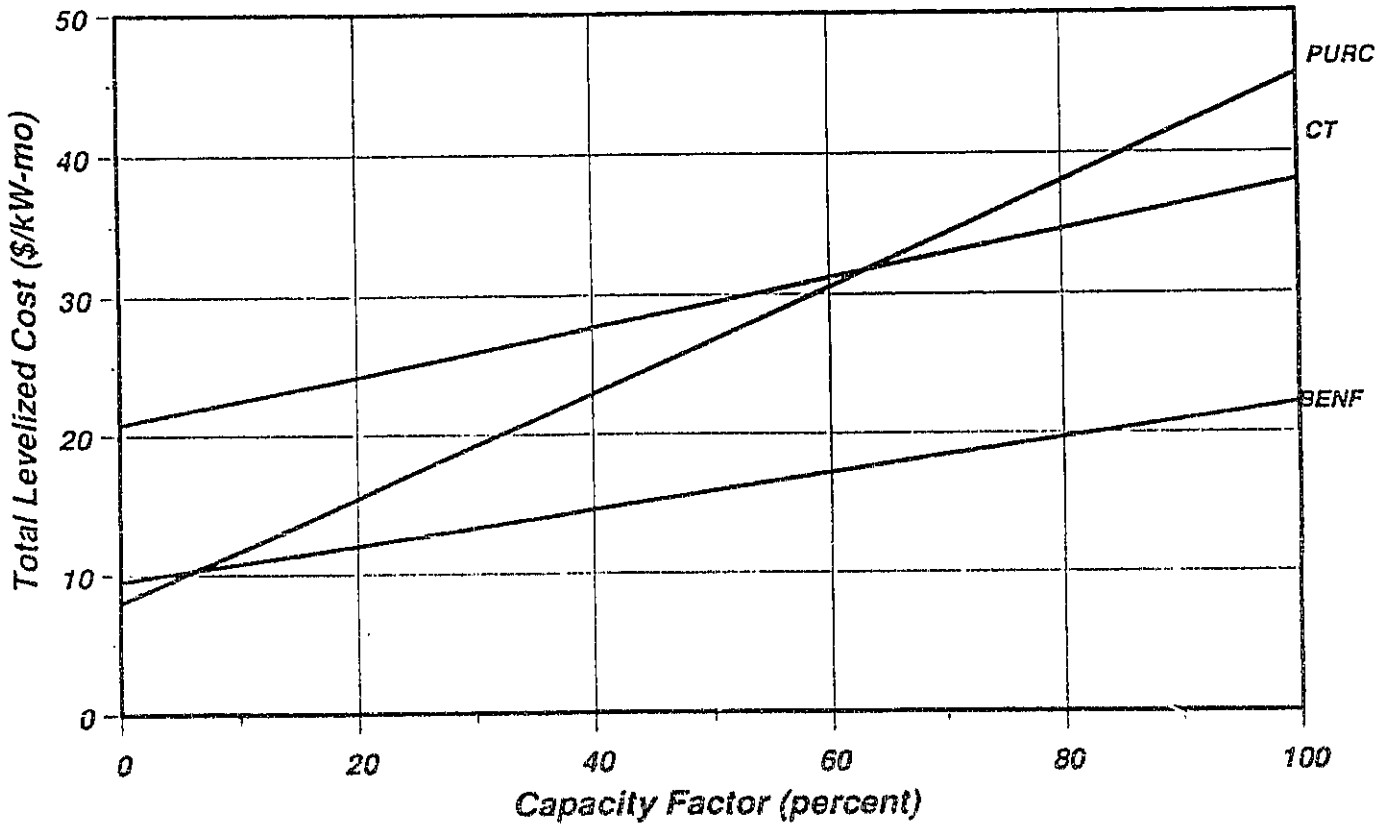


EXHIBIT
BHPL
TMO-10, p. 5

SCREENING CURVES

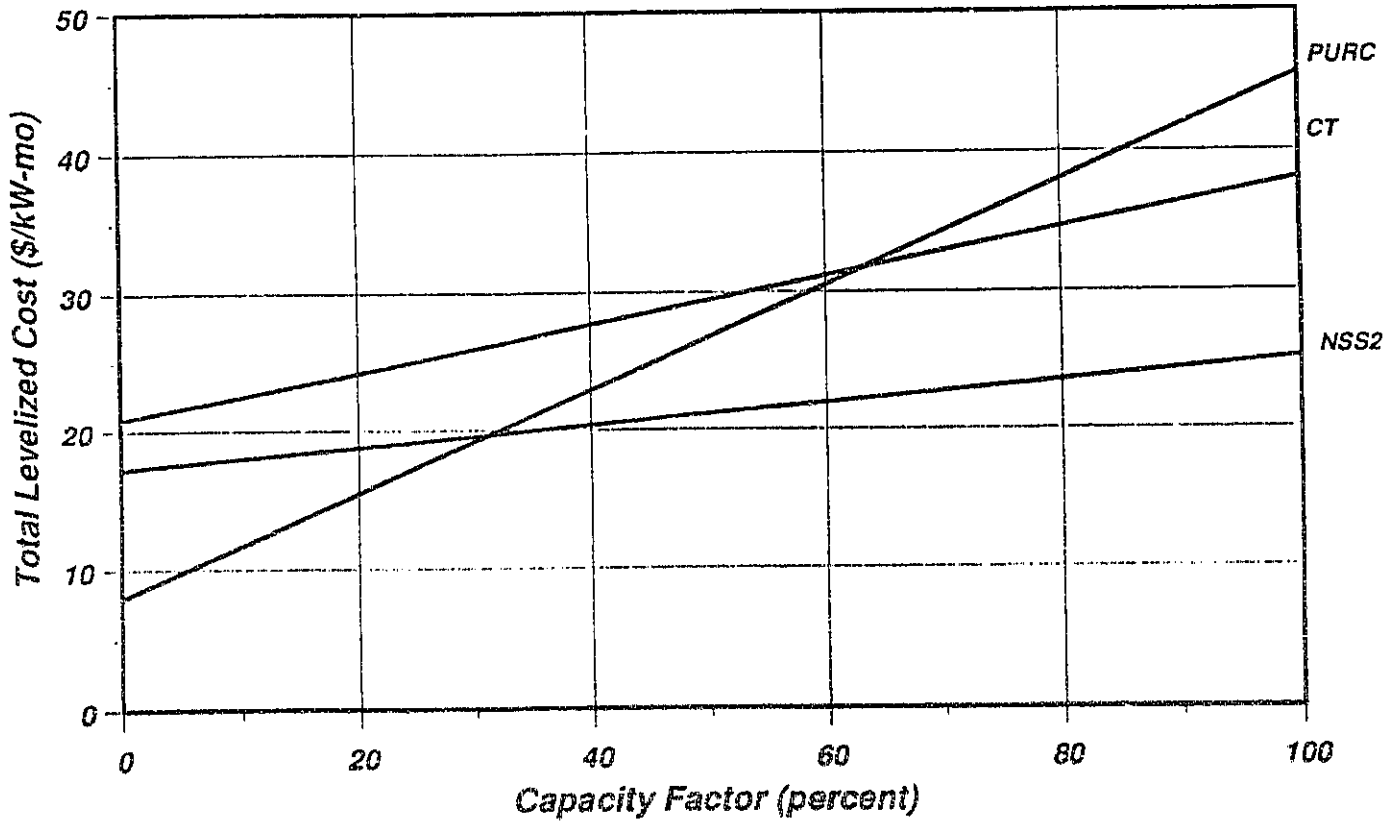


EXHIBIT
BHPL
TMO-11

1996 LDC (PROJECTED)

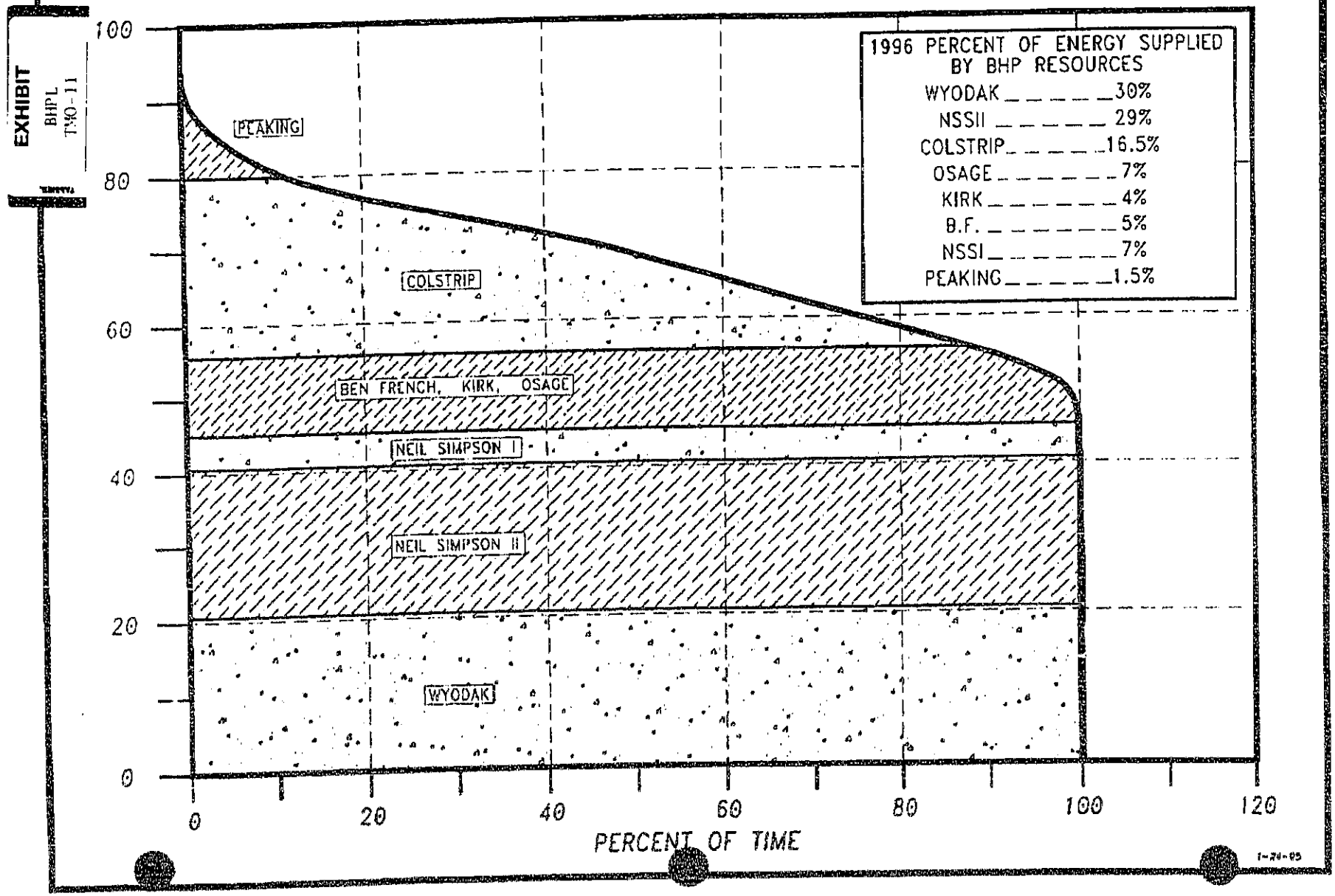
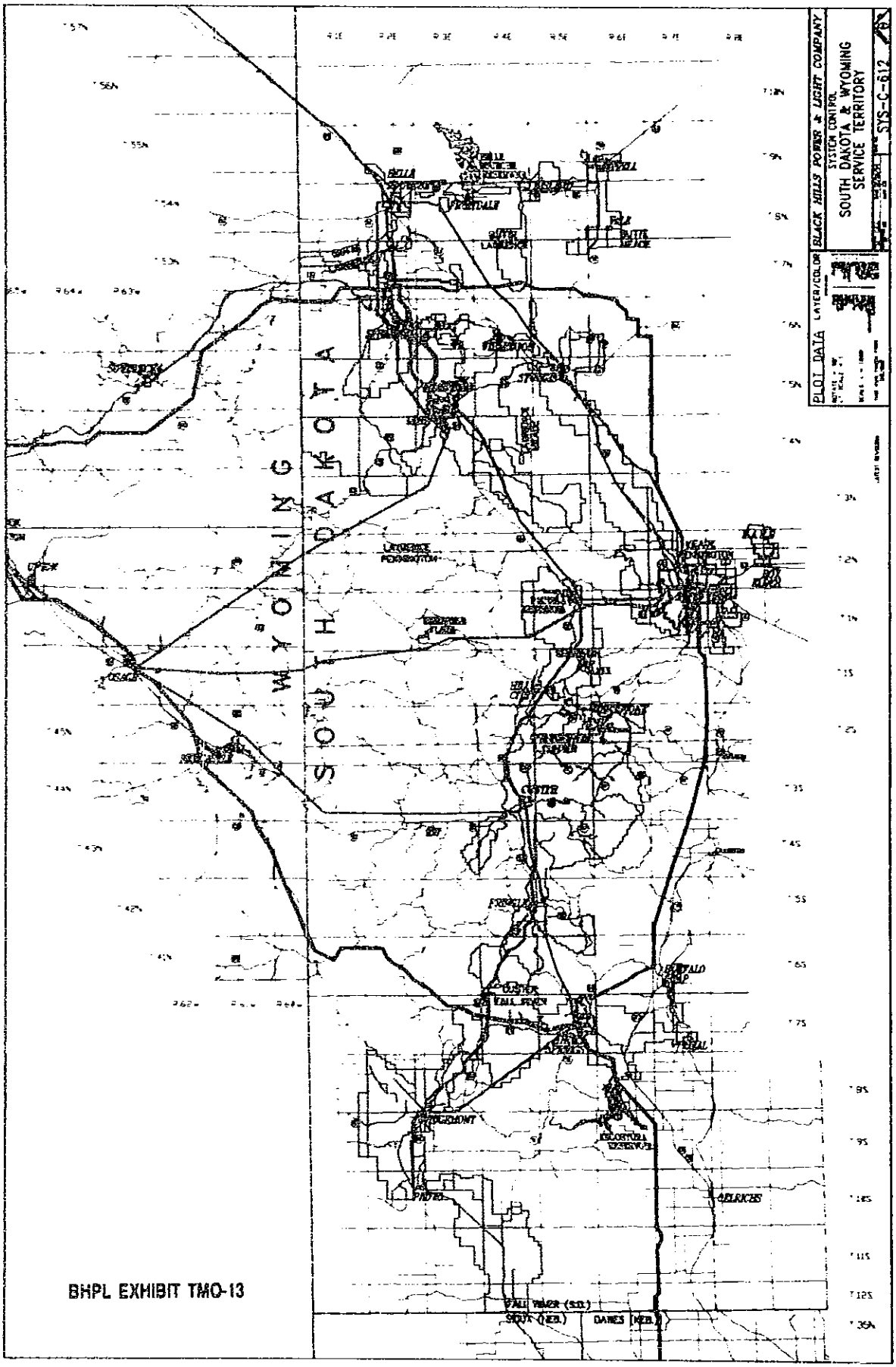


EXHIBIT
BHPL
TMO-12

Table 8-4 Capacity and Energy Prices Provided by Pacific Power and Light

	Capacity Price	Energy Price
Year	$/kW-mo	$/MWh
1993	17.51	15.18
1994	17.59	15.62
1995	17.68	16.19
1996	17.77	16.84
1997	17.86	17.54
1998	17.95	18.28
1999	18.04	19.07
2000	18.13	19.90
2001	18.22	20.82
2002	18.31	21.84
2003	18.40	22.95
2004	18.49	24.12
2005	18.59	25.41
2006	18.68	26.82
2007	18.77	28.34
2008	18.87	30.00
2009	18.96	31.74
2010	19.05	33.59
2011	19.15	35.54
2012	19.25	37.60



BHPL EXHIBIT TMO-13

EXHIBIT
BHPL
TMO-14

BEFORE THE WYOMING PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION OF BLACK HILLS CORPORATION D/B/A BLACK HILLS POWER AND LIGHT COMPANY FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO BUILD NEIL SIMPSON UNIT #2, AN 80 MW COAL-FIRED POWER PLANT AT WYODAK, WYOMING	)	DOCKET NO. 20002-EA-92-27

APPEARANCES

MR. DAVID MORRILL, Attorney at Law, Rapid City, South Dakota and MS. MRG SIMON, Attorney at Law, Rapid City, South Dakota, appearing for Applicant, Black Hills Power and Light Company

MR. WILLIS CHRANS, Chairman, Campbell County Board of Commissioners, Gillette, Wyoming, MR. ED WRIGHT, Associate Superintendent, Campbell County School District, Gillette, Wyoming; MR. GAYLORD ALLEN, The Wyoming Building and Construction Trades Council, Cheyenne, Wyoming, MR. FRANK LATTA, Gillette, Wyoming, MR. CHRISTOPHER HARD, The Campbell County Economic Development Corporation, Gillette, Wyoming.

MR. DAVID J. LUCERO, Attorney at Law, Cheyenne, Wyoming, appearing for Intervenor, Consumer Representative Staff of the Wyoming Public Service Commission

HEARD BEFORE

CHAIRMAN BIL TUCKER
DEPUTY CHAIRMAN JOHN R. SMYTH
COMMISSIONER STEVE ELLENBECKER
Chairman Tucker, presiding

FINDINGS, CONCLUSIONS AND ORDER APPROVING STIPULATION AND AGREEMENT

(Issued June 2, 1993)

This matter is before the Public Service Commission of Wyoming upon the Application of Black Hills Power and Light Company for a certificate of public convenience and necessity to construct the Neil Simpson Unit #2, an 80 megawatt, coal-fired power plant at Wyodak, Wyoming. This matter was heard

on January 26, 1993 in Gillette, Wyoming and on March 22, 1993 in Cheyenne, Wyoming.

PROCEDURAL FINDINGS

1. Black Hills Power and Light Company (hereinafter Black Hills) is a public utility as defined in W.S. § 37-1-101(a)(vi) and, as such, the Commission has jurisdiction pursuant to W.S. § 37-2-112. Black Hills serves the Wyoming communities of Newcastle, Osage, Upton and Wyodak with its principal offices in Rapid City, South Dakota.

2. A party to this matter, in addition to the Applicant, is the Consumer Representative Staff which provided analysis of the filing and presented an independent public interest position pursuant to W.S. § 16-3-111 of the Wyoming Administrative Procedure Act and the Commission's Rules, §§ 101, 103, 111 and 113. The Consumer Representative Staff was granted intervenor status on November 3, 1992. Other parties to the proceeding who were granted intervention are TAME T.I.C., a division of the Western States Pipe Trades, Hermes Consolidated, Inc., d/b/a Wyoming Refining Company, Wyoming Building and Construction Trades Council and the Campbell County Economic Development Corporation.

3. During the public hearing certain of the parties placed into the record, for the Commission's consideration and final action, the Stipulation and Agreement dated March 22, 1993, which was executed by Daniel P. Landguth, Chief Executive Officer, President and Chairman of the Board of the Applicant, Black Hills, and by David J. Lucero, counsel for the Consumer Representative Staff. Both signatory parties made statements and provided evidence at the hearing demonstrating that the Stipulation and Agreement complies with the requirements of Wyoming law and is in the best interest of the public. Both

parties testified that the elements of the Stipulation and Agreement were just and reasonable.

TESTIMONY OF PARTIES

4. Black Hills Corporation is a South Dakota corporation and operates its electric utility doing business as Black Hills Power and Light Company. Black Hills is engaged in the generation, purchase, transmission, distribution, and sale of electric energy in 11 counties, serving approximately 52,200 customers in a 9,300 square mile area of western South Dakota, northeastern Wyoming and southeastern Montana. As of January 1, 1993, Black Hills Power and Light had a year-end customer count of 52,534. That is made up of 43,822 residential customers, 8,602 general service commercial and similar customers, and 39 industrial customers. Approximately 80 percent of Black Hills' sales are to retail customers in South Dakota, 7.2 percent to retail customers in Wyoming, 1.3 percent to retail customers in Montana, and 10.5 percent to the City of Gillette municipal electric energy system, Black Hills Power and Light's only wholesale customer.

5. Black Hills' electric transmission system consists of 445 miles of 230 kV lines, 4 miles of 115 kV lines, and 540 miles of lower voltage lines, particularly, 532 miles of 69 kV and 8 miles of 47 kV. Black Hills owns generating plants consisting of the coal-fired Neil Simpson Unit #1 at Wyodak, Wyoming with the capacity of 18 megawatts; a 20 percent interest in the 330 megawatt coal-fired Wyodak plant at Wyodak, Wyoming, which yields Black Hills 64 megawatts of capacity; three coal-fired units at Osage, Wyoming, with a capacity of 30 megawatts; the coal-fired plant at Ben French Station at Rapid City, South Dakota, with a capacity of 22 megawatts, and the diesel units at the same location with a capacity of 10 megawatts; the coal-fired Unit No. 4 at the Kirk Station near Lead, South Dakota, with a capacity of 16 megawatts, and the

three low-pressure units at the same location with a capacity of 15 megawatts. Black Hills also owns four 25 megawatt combustion turbines located at Ben French Station in Rapid City, South Dakota. Two of the combustion turbines can now be fired on either natural gas or oil. The other two units can be fired only on oil, but can be converted to gas at a cost of approximately $1.2 million.

PURCHASED POWER

6. Black Hills purchases 75 megawatts of firm power from Pacific Power & Light Company under the terms of a power sales agreement dated December 31, 1983. The term of the contract commenced January 1, 1984, and ends December 31 in the year 2023. The contract provides for Black Hills purchasing, each month, energy at a minimum of 300 megawatt hours per megawatt of capacity. The maximum energy which Black Hills may take is limited to 75 megawatt hours per megawatt in any one hour and 134 megawatt hours per megawatt during any one week. While Pacific is obligated to deliver 75 megawatts of power from its system, and therefore, in effect, it is backed with reserves, Black Hills pays Pacific an annual fixed cost and variable costs based upon Pacific's cost of its 10 percent interest in the Colstrip Units No. 3 and No. 4 at Colstrip, Montana, hence the common reference by Black Hills to this agreement as the Colstrip Agreement. The purchase is not unit power from the Colstrip units. The obligation of Pacific continues even if the Colstrip Units No. 3 and No. 4 are no longer in operation. This power is delivered from Pacific's transmission system to Black Hills' transmission system at the PacifiCorp and Black Hills interconnection at the Wyodak plant.

7. In addition, Black Hills buys short-term firm capacity and energy. An agreement with Montana Power Company provides for 30 megawatts to be delivered from Pacific's system at Wyodak. The contract expires September 30, 1993, and will be replaced until the commercial operation of Neil Simpson Unit

#2. Black Hills has now entered into an agreement with Tri-State Generation and Transmission Association (Tri-State) for delivery of power at Black Hills' west interconnection with Western Area Power Administration (WAPA) at Stegall, Nebraska. The term of the Tri-State agreement commences October 1, 1993 and terminates December 31, 1997; however, by Black Hills giving Tri-State written notice on or before September 1, 1995, Black Hills may terminate the contract the last day of any month of December 1995 through November 1997, as specified by Black Hills. Black Hills' right to cancellation is based upon Black Hills' good faith belief that it anticipates the commencement of commercial operation of Neil Simpson Unit #2 prior to December 31, 1997. Tri-State's contract provides for 20 megawatts of firm capacity and associated energy. The contract provision provides that Black Hills has an option to buy an additional 20 megawatts of firm capacity and associated energy for any period during the term. The energy charge is the same for the optional capacity, and the charge for the optional capacity is $8.90 per kilowatt month if Tri-State is given one-year notice, and $9.40 a kilowatt month if the notice is six months. On a short-term cancelable basis, Black Hills obtains the use of 5 megawatts of summer seasonal capacity furnished by WAPA to the South Dakota State Cement Plant. This power is delivered at Stegall, Nebraska. This regulation contract allows Black Hills to balance its resource with load to within 10 megawatts, plus or minus 5. As a result of this contract, Black Hills is able to block load its units and regulate the system with purchased power contracts and its own generators. Without this contract, Black Hills' units would be required to respond to automatic generation control (AGC). This contract is renewable annually.

8. This has been a trial contract between Black Hills and WAPA. Both parties are receiving benefits, but WAPA has not been willing to offer

extended terms for this service. Black Hills will need additional resources between 1993 and 1996. The termination of the Montana contract of 30 megawatts and the beginning of the 20 megawatt Tri-State capacity will result in a net 10 megawatt reduction in capacity in 1993. Black Hills made some preliminary inquiries to determine if peaking contracts could be acquired to meet the resource requirement and will be negotiating a short-term peaking contract or increasing the Tri-State contract. If lower cost peaking contracts cannot be found, Black Hills can exercise its Tri-State option to buy more capacity.

9. A prepared exhibit which summarizes Black Hills' current generation resources is Black Hills Exhibit TMO-1. This exhibit shows all Black Hills' current generation resources totaling 395 megawatts. Also included is Table 10.2, Black Hills Exhibit TMO-2. This exhibit sets forth the estimated retirement date or contract expiration date of each of the resources. Included is the 100 megawatts of capacity acquired through the reserve integration agreement with PacifiCorp, but not including the four 25 megawatt combustion turbines at the Ben French Station. The reserve capacity integration agreement was signed by Pacific Power & Light and Black Hills as of May 5, 1987. The term of the agreement commenced July 1, 1987 and ends June 30 in the year 2012. This agreement was one of the results of the negotiations between PacifiCorp and Wyodak Resource and Development Corporation, Black Hills' coal subsidiary, settling a contract under which PacifiCorp was obligated to purchase 40,000,000 tons of coal from Wyodak Resources for Wyodak Unit No. 2. Since Wyodak Unit No. 2 was canceled, PacifiCorp did not have the use for the coal and, therefore, negotiated with Wyodak Resources to settle the obligation. Rather than PacifiCorp paying Wyodak Resources a cash sum, PacifiCorp offered Wyodak Resources and its parent corporation, Black Hills, a

variety of benefits, some for the benefit of the coal company and some for the benefit of Black Hills' electric utility. One of the benefits for the electric utility was the reserve capacity integration agreement. A copy of the agreement is Black Hills Exhibit TMO-3. The subject of the agreement is Black Hills' four 25 megawatt nameplate combustion turbines situated at Ben French Station at Rapid City, South Dakota. PacifiCorp undertook the obligation to pay most of the operation and maintenance costs as defined in the agreement of these turbines during the 25-year term and to pay Black Hills an additional $50,000 a month during the term. Pacific received the right to use the combustion turbines for its own purposes during the term subject, however, to Black Hills' right to use the turbines superior to that of PacifiCorp if Black Hills found it necessary because of transmission outages or low voltage conditions. The combustion turbines are capable of 100 megawatt output in the winter, but are capable of only 68 megawatts under typical summer conditions. In addition to other benefits received by Black Hills under this agreement, Pacific promised during the 25-year term that it would make available up to 100 megawatts of capacity from its system to meet Black Hills' reserve requirements. The reserve capacity available to Black Hills would only be at such times as consistent with prudent utility practice where Black Hills would have used the combustion turbines.

ENVIRONMENTAL CONTROL

10. Evidence regarding the scenic, historical, archeological and recreational locations, as well as the natural resources, plant and animal life surrounding the proposed plant site located in Section 27 of T50N, R71W, was presented by the Applicant's witness, Stevan Mueller.

11. The area around the proposed facility was examined in an archeological survey conducted by the Wyoming Recreation Commission in 1975 and by the Wyoming State Archeologist's Office in 1985. Both surveys

indicated that no cultural resources were located near or adjacent to the proposed facility. No adverse visual affect on the surrounding area is expected since the proposed facility will be similar to the existing power plants at the site. Moreover, terrestrial environmental impacts, if any, will be incremental only because of the use of this site for industrial purposes since as early as the late 1880's by the Burlington Northern Railroad. Wildlife habitat in the close vicinity of the proposed plant is generally lacking and no specific impact due to the construction of Neil Simpson Unit #2 is anticipated. There are no existing resource oriented recreational opportunities within the proposed project area.

12. Waste products that may be expended by the proposed plant can be anticipated to model the waste product currently generated by the two existing power plants. Three separate waste products are generated by Neil Simpson Unit #1 and the Wyodak Plant. The first, termed bottom ash, is a by-product from the combustion process which collects at the bottom of the boiler. The second waste by-product is termed fly ash, and is a by-product from the combustion process which collects in the precipitator. Fly ash is currently produced by Neil Simpson Unit #1. There is no fly ash produced by the Wyodak Plant. The third by-product is scrubber ash. The scrubber uses lime as a reagent to remove sulfur gases and results in additional waste material (calcium sulfate) which is mixed with the fly ash and disposed of as a unit, termed scrubber ash. Operation of Neil Simpson Unit #2 will produce both bottom ash and scrubber ash. The environmental control technology will result in bottom ash and scrubber ash waste products similar to those currently produced by Neil Simpson Unit #1 and the Wyodak Plant. The bottom ash will be slurried to the North Pit disposal pond; the scrubber ash will be hauled to either the South Pit or North Pit and disposed of in clay lined disposal cells. The disposal of the ash will be necessary in areas which will eventually become

saturated with ground water. To alleviate ground water contamination, studies have been conducted showing that certain overburdened, interburdened and underburdened clays, when properly placed and compacted, greatly restrict the flow of water through the ash. Ignoring the permeability of the ash itself, the amount of flow through the compacted liners would be insignificant when compared to the flow through surrounding soils. It was on this basis that the Wyoming Department of Environmental Quality/Solid Waste Management Program originally issued a disposal permit, and continues its authorization for the disposal of ash. All such waste products have been characterized and no barriers are foreseen to the amendment to the permit, inasmuch as there are no volume restrictions. The proposed plant is designed as a zero-discharge plant and no liquid waste will be discharged in a manner that would allow plant waste to mix with local aquifers.

FACILITIES

13. The testimony of Consumer Representative Staff Witness Robert L. Larsen addressed the Applicant's facilities and the following:

a) the need for additional electrical energy resources by the Company;

b) the need for voltage support for the Black Hills and northeast Wyoming area (Black Hills) transmission system which serves other utilities in the area as well as the Company; and

c) the expected life and load factor of Neil Simpson Unit #2.

14. The Company's forecast peak demand for the summer of 1996 is 337 MW, 61 MW higher than the present peak demand of 276 MW. It has 175 MW of internal generation resources and 220 MW of purchased power for a total of 395 MW. 15 MW of the internal generation resources, Kirk Units 1, 2, and 3 are in cold storage. Kirk Units 1,2, and 3 will be retired in 1996, reducing

its internal generation resources to 160 MW. Company witnesses testified that the 5 MW South Dakota state cement plant contract and the 10 MW regulation and control contract, both with WAPA are cancelable. If these were canceled, the Company's purchased power resources would decrease to 205 MW. If the cancellation should occur, the total resource capacity for the Company in 1996 would be 365 MW.

15. The Company needs a reserve capacity sufficient to meet its peak demand requirement in the event of loss of its largest resource. The amount of reserve requirement specified by the Western Systems Coordinating Council is 21 MW of additional resources now and 59 MW by 1996 to be in compliance with Western System Coordinating Council reserve margin requirements. (Exhibit LFF-2.)

16. A review of the load forecasts and present Company resources leads to a conclusion that additional load resources are needed in the time frames set forth by the Company.

17. At the request of the Consumer Representative Staff, the Company considered renewable energy resources and is presently studying demand side energy resources. Wind energy and photovoltaics were addressed in the Integrated Resource Plan in the testimony of Jill S. Baylor, Company Exhibit JSB-3 and in the testimony of Dr. Donald M. Hardy.

18. Although wind turbines might be a least cost alternative in the future, the Company will need to conduct further studies to verify usable site locations, transmission line access, and cost. Preliminary indications are that wind energy could be a good energy resource but wind energy, by itself, may not be available at times of peak demand.

19. Combustion turbines would meet the peak load requirements, but they are not suitable for base load operation. The Company's load duration

curves indicate a base load resource of 80 MW could be used by 1996. A base load resource in 1996 would benefit the system.

20. The replies from the Company to interrogatories included a "Report of Bulk Transmission Planning Study for the Black Hills and Northeastern Wyoming Area" in 1986, a second study in 1990 called the "Operating Conditions for the Black Hills and Northeastern Wyoming Area 230 kilovolt Transmission System 1991-1995 including the Spearfish to Kirk 230 kilovolt Line Addition", a third study in 1991 continuing into 1993, and a Black Hills Power and Light Company summary paper outlining the preliminary results of this last study.

21. The Company needs additional resources to support the Black Hills area transmission system by 1996 to avoid low voltages in northeast Wyoming in the event of an outage on the Dave Johnston to Yellowcake 230 kV line in the summer when Wyodak is off line. CRS Exhibit RAL-2 is a copy of the Company load flow summary for Case BA90F2DJYC for this outage. It shows that Hughes, Wyodak, Reno, Teckla, Antelope Mine, and Yellowcake buses, all of which are located in northeast Wyoming, will sustain per unit voltages well below the minimum 0.92 at a total system load of 441 MW. The system peak load forecast by Black & Veatch dated November 6, 1992, (Exhibit RAL-4) forecasts a 471.5 MW peak for the summer of 1993.

22. CRS Exhibit RAL-3 is base case study BB05F2DJYC as prepared by the Company. This study indicates low voltages for Hughes, Wyodak, Reno, Teckla, Antelope Mine and Yellowcake buses at a load level of 512 MW. The Black & Veatch load forecast, as set forth in CRS Exhibit RAL-4, indicates a 510 MW peak summer load in 1996, and 523.2 MW during the summer of 1997.

23. Company Exhibit TMO-28, Addendum's 5 and 6 are letters from Basin Electric Power Cooperative to Alex Eliopulos of the Wyoming Public

Service Commission, and Thomas Ohlmacher of the Company, respectively. Basin Electric Power Cooperative was a joint partner with the Company in the transmission system load flow studies. The joint studies referenced in the letter indicate the best solution to the increased area loads is either a back to back direct current (DC) tie at Rapid City or a 345 kV transmission injection line from Laramie River Station to Osage.

24. The letters also point out that if other utilities in the area need further capacity which require the construction of additional transmission lines, the agreement between those utilities and the Company will require the Company to share the cost of those additional transmission lines. The letter indicates additional transmission facilities may be needed prior to 2005.

25. The letters also expressed a concern regarding the stability of the transmission system when Neil Simpson Unit #2 is connected to the Wyodak Substation because studies by Western System Coordination Council show that certain fault situations at Wyodak would create unacceptable voltages in the Black Hills area.

26. There exists a potential low voltage problem at Moorcroft that will not be solved with the addition of any resource. Additional resources provide only a short term solution for potential low voltages at the Teckla Substation. The shared cost would be negotiated on the basis of load flow analyses and loads served.

27. Company Exhibit TMO-28, Addendum 6, a letter from Basin Electric to the Company, indicates a stability problem would occur for a single phase Wyodak 230 kilovolt fault with a stuck breaker, followed by the loss of both the Wyodak to Spearfish and Wyodak to Buffalo 230 kilovolt lines. PacifiCorp has scheduled remedial measures for the problem during its next scheduled maintenance outage starting September 13, 1993.

28. Based upon this testimony, the Commission finds that Neil Simpson Unit #2 is the preferable alternative for several reasons:

a) The Integrated Resource Plan submitted as supplementary application information by Jill S. Baylor of RCG/Hagler, Bailly, Company Exhibit JSB -3, supports the Company Integrated Resource Plan for the addition of Neil Simpson Unit #2 in 1996.

b) The 1993 load flow studies include a study of Neil Simpson Unit #2. The worst case scenario in the 1993 load flow studies was for Wyodak off in the summer and an outage on the Dave Johnston to Yellowcake 230 kV line. With the internal 230 kV line from Osage to Yellow Creek installed, load flow studies show that Neil Simpson Unit #2 will increase internal transmission system capacities as much as a 230 kV injection line from Dave Johnston Plant and an AC-DC-AC tie at Rapid City, and that a 345 kV line from Laramie River Station will increase the internal transmission system capacity only 5% more than Neil Simpson Unit #2.

29. With regard to the real expected life for generating plants, existing plants will require major capital improvements as long as such improvements are economical. Future technological improvements, may be more economically implemented on existing facilities than on new ones. Social and political indications are that new coal fired generating plants will be difficult to get approval to build. Therefore, it will be economical to make major repairs to modern coal fired generating plants for at least 50 years.

FINANCIAL ANALYSIS

30. Studies of the financial issues regarding this application for a Certificate of Public Convenience and Necessity for building Neil Simpson Unit #2, specifically the financial study conducted by Roxann Basham with

assumptions provided by Dale Clement, Thomas Ohlmacher, and Dan Landguth for Black Hills show the following:

a) Cost of capital assumptions under the conventional method with "allowance for funds used during construction";

Debt Ratio	52.0%
Common Equity	48.0%
Cost of Debt	9.0%
Cost of Equity	12.5%
Weighted Cost of Capital	10.68%

b) Capital costs of building the plant will not exceed $124,889,000 including "allowance for funds used during construction";

c) Fuel costs are based upon a guaranteed coal contract where Neil Simpson Unit #2 can have a maximum yearly coal consumption of 490,000 tons with an estimated cost of $3.143 per ton in 1996 declining to $0.000 cost per ton by 2001;

d) Fixed costs with an applied inflation factor of 4 percent per year;

e) A 50 year book depreciation life for Neil Simpson Unit #2 and a 20 year tax depreciation life;

f) A 34 percent current federal income tax rate and 34 percent deferred tax rate;

g) A 90% load factor for this plant;

h) Estimated annual levelized operating revenues of $23,647,539 and levelized operating expenses of $11,002,714;

i) A conservative load forecast requiring 59 megawatts of additional resources by 1996;

j) Plant cost of debt during construction computed at 9.5 percent and other construction such as plant repair at 10 percent;

k) Health care costs increased at 10 percent per year;

l) Financial Accounting Standard 106 expenses, Employer's Accounting for Post-retirement Benefits Other than Pensions, escalated at 12 percent;

m) Property taxes increased for net additions and escalated using 1990 rates;

n) Capital expenditures expressed in January 1992 dollars and escalated approximately 4 percent per year compounded annually; and

o) Market assumptions of common stock price under the conventional plan of $20 a share.

BLACK HILLS' CURRENT CAPITAL STRUCTURE

31. In the past four years, Black Hills' common equity has decreased while long-term debt has increased. From year-end 1987 to December 31, 1991, the debt ratio has increased from 37 percent to approximately 54 percent. During the same time period common equity has decreased from 59 percent to 46 percent.

32. As listed in VALUE-LINE Electric Companies Financial and Common Stock Information, the industry averages for capital structure are 55 percent debt and 45 percent equity. Black Hills is very near the industry averages and would continue at that level after building Neil Simpson Unit #2 under the conventional plan.

THE BLACK HILLS' COST OF LONG-TERM DEBT

33. The past five years' cost of debt for Black Hills Corporation shows that 8.98 percent is an appropriate cost of long-term debt. The actual interest rate charged to Black Hills Power and Light Company for 1992 long-term debt averages 8.9 percent. "Allowance for funds used during construction" of the new plant, including capitalization, long-term debt, and short-term debt is

computed at a short-term debt rate of 9.5 percent. Any other construction for Black Hills would have a long-term debt rate computed at 10 percent.

THE LEVELIZED FIXED CHARGE OF THE PROPOSED NEIL SIMPSON UNIT #2 PLANT

34. The estimated levelized fixed charge study performed by Roxann Basham of Black Hills used two plans. The conventional plan would allow for "funds used during construction" to be capitalized as part of the cost of the new plant, and the new plant would be put into rate base at the time of commercial operation. The rate stability plan does not include the capitalization of "allowance for funds used during construction" but assumes that rate increases would be phased-in during the construction period of the plant. The rate stability plan was originally proposed to the South Dakota Commission, but was withdrawn.

35. The estimated levelized fixed charge study determined what the levelized fixed charge of the plant would be over the life of the plant in cents per net kilowatt-hour and determined the estimated total amount of "allowance for funds used during construction", which is $11,546,000.

SENSITIVITY ANALYSES REGARDING THE ANNUAL LOAD FACTOR RELATED TO THE LEVELIZED FIXED COST

36. The Consumer Representative Staff requested Black Hills to provide 85% and 80% load factor scenarios along with the submitted 90% annual load factor scenario. A comparison shows an increase in the levelized fixed charge when the load factor is reduced, thus the 90% annual load factor has the lowest charge. If the annual load factor should drop to 80% or 85%, the Company's levelized fixed charge study still indicates that the plant is economic. As referenced by Consumer Representative Staff witness Robert Larsen, a 90% annual load factor is reasonable given the technology associated with the plant.

LOAD FACTOR	AFUDC	LEVELIZED FIXED CHARGE	DIFFERENCE
90%	Yes	3.906¢/Net Kwh	
85%	Yes	4.094¢/Net Kwh	0.188¢/Net Kwh
80%	Yes	4.306¢/Net Kwh	0.212¢/Net Kwh

THE BOOK DEPRECIATION LIFE

37. The plant life of some of Black Hills' existing plants have approached or exceeded 50 years. Based upon Black Hills' testimony it is believed that a new unit will be able to operate economically for fifty years. With improved engineering and design capabilities and technologies available today, and additional preventive and planned periodic maintenance practices in place for generation facilities, it is reasonable that a fifty year book life is achievable.

38. The Consumer Representative Staff also requested a scenario based upon a 35 year book life. The results, as would be expected, showed changing the life of the plant would also change the estimated annual operating revenues and expenses. The levelized operating revenues are the present worth of the discounted annual cost. On a levelized basis, the operating revenues are similar because the tax depreciation remains the same, as deferred income taxes normalize the difference. The 35 year life of the plant versus a 50 year life shows an increase to operating revenues of $44,108. The operating revenues on an annual basis would be higher for the first ten years. The levelized operating expense at 35 years also shows an increase of $614,157. The levelized fixed charge shows a difference of 0.007¢/Net Kwh.

LOAD FACTOR	YEARS	OPERATING REVENUES	DIFFERENCE
90%	35	$23,691,647	
90%	50	$23,647,539	$44,108

LOAD FACTOR	YEARS	OPERATING EXPENSES	DIFFERENCE
90%	35	$11,616,871	
90%	50	$11,002,714	$614,157

LOAD FACTOR	YEARS	AFUDC	LEVELIZED FIXED CHARGE	DIFFERENCE
90%	35	Yes	3.913¢/Net Kwh	
90%	50	Yes	3.906¢/Net Kwh	0.007¢/Net Kwh

THE COAL CONTRACT

39. Black Hills has entered into a Restated and Amended Coal Supply Agreement for Neil Simpson Unit #2 with Wyodak Resources that guarantees the coal supply for the life of the plant. Black Hills is not obligated to purchase any minimum amount of coal from Wyodak but estimates a maximum yearly coal consumption of 490,000 tons. The incremental cost of coal as determined by a coal pricing methodology, explained by Mr. Landguth, estimates the coal cost for Neil Simpson Unit #2 will be $3.14 per ton in 1996 to $0.00 per ton by 2001. These cost estimates are based on the investment/rate of return formula proposed by the company for the pricing of coal. Under this formula, most of the cost of coal is paid for under the existing coal contract for the other power plants including Wyodak. The result of this low coal cost only reinforces the benefit of building Neil Simpson Unit #2.

POSITION OF THE APPLICANT

40. The position of the Company that the Neil Simpson Unit #2 is the best overall choice was based on many criteria other than just costs. In determining the best solution, the Company identified the following criteria:

a) Maintenance scheduling. If a utility has the operating control of the generating resource, the resource can be scheduled off line for routine maintenance during off peak periods during the spring and fall. This is

not often the case with purchased power if the power is being supplied from a single unit and operated by others or the contract comes with minimum take-or-pay provisions. Wind and photovoltaic systems generate into the grid subject to the availability of wind or solar power which can't be used or relied upon in determining a maintenance schedule. The best ability to provide maintenance scheduling is either by building Neil Simpson Unit #2 or using combustion turbines.

b) System reliability. A resource located close to the loads it serves is the most reliable resource for Black Hills. A resource not dependent on fuel transportation disruptions at a mine mouth site hooked to a transmission system capable of delivering power to the load centers is also important to maintain reliability.

All other options would be less reliable because of their dependence on gas pipelines or long electric transmission additions or greater fuel reliability risks. Even if considerable transmission is built from Black Hills' service area to strong points of interconnection like Dave Johnston or Laramie River and system reliability is thereby improved, a resource close to the load and not dependent on long transmission lines is still the best solution because of its reliability.

c) Fuel Price stability. The greatest fuel price stability would be wind or solar. However, since Black Hills' needs are for a base load resource, wind or solar cannot be relied upon to meet those requirements. The most stable fuel price for a base load 50-year resource is the contract Wyodak Resources is willing to offer Black Hills for the 50-year life of Neil Simpson Unit #2.

d) Load following ability. In meeting electric loads it is imperative that there is generation that follows customer load requirements

since it is changing constantly. Neil Simpson Unit #2 will best meet these requirements because it will be on line in excess of 90% of the time. Purchased power is normally scheduled by the hour, day, or week when being supplied to meet partial requirements of an electric utility. Wind and solar flow into the grid only when they are available as a resource.

e) Possible future environmental costs. Wind and solar offer the least risk environmentally. Neil Simpson Unit #2 or combustion turbines are the next best option because Neil Simpson Unit #2 is being designed state-of-the-art to meet best available control technology, and the air emission allowances under the Clean Air Act are in hand by Black Hills. With purchased power all of the impositions of the Clean Air Act will be passed through in purchased power costs.

f) Transmission capital additions required. Neil Simpson Unit #2 is the best resource since all of the transmission facilities required to serve Black Hills' load centers are in place from the Neil Simpson Unit #2 site. Through the construction of Neil Simpson Unit #2 additional external transmission requirements of Black Hills are also eliminated. Combustion turbines will require additional pipeline costs. The best wind areas are remote from Black Hills' service territory, requiring extensive transmission investment.

g) Potential dumped energy sales. Because the delivered fuel costs for Neil Simpson Unit #2 will be the lowest cost for any coal-fired power plant in the area and possibly in the entire USA, the ability to sell off-peak energy or dumped power is only limited to the availability of the unit. No other options offer this potential. Currently off-peak energy is selling from 22 to 30 mills per KWH. The Applicant can't rely on wind or solar for dumped energy sales, and combustion turbine and purchased power are too highly priced to compete.

h) Fuel transportation cost escalation. There will be no transportation costs for Neil Simpson Unit #2 or wind or solar. Combustion turbines will require gas and oil transportation charges.

i) Proven technology. Neil Simpson Unit #2 is like the Applicant's other plants. Black Hills has had experience operating these plants with proven records in excess of 95% availability. The other options do not have the same proven technology record as Neil Simpson Unit #2.

j) Reduction of system losses. Any resource located close to the loads reduces system losses and the cost of operating an electric system. Neil Simpson Unit #2 and the combustion turbine resources offer this benefit. All other options located remote from the service area increase system losses.

k) Emergency system restoration Any resource that is located within the service area when ice storms or blizzards occur is more reliable in restoration of service. It is important to be able to isolate an electric system when regional transmission disturbances occur. Therefore, Neil Simpson Unit #2 or combustion turbines are the best option for emergency system restoration. The Applicant rated five separate resources: Neil Simpson Unit #2; purchased power plus transmission facilities; combustion turbine; wind; and a photovoltaic resource. The Applicant used a rating system of 1 to 4, 1 being the most favorable and 4 being the least favorable from the standpoint of the most reliable resource. The Applicant applied all of its collective judgments to each of the criteria and submitted the results of the study in BHPL Exhibit DPL-13.

THE STIPULATION FINDINGS

The parties agreed to the following:

41. It is the intention of the parties, in accordance with proper regulatory principles and appropriate approvals by jurisdictional regulatory

authorities, that all cost-effective demand-side management programs should be implemented by Black Hills.

42. In order to keep the Consumer Representative Staff informed of its demand side management plans, Black Hills agrees to provide the Commission and the Consumer Representative Staff with a copy of the final RCG/Hagler demand-side management report when it is finalized. Additionally, Black Hills will provide and discuss with the Consumer Representative Staff and other Commission staff members, demand-side management programs that it intends to implement in the near future, with the first discussion on this matter to take place no later than June 30, 1993. Black Hills and Consumer Representative Staff agree that ongoing periodic meetings, to be scheduled initially on a quarterly basis, shall be held for the purpose of continuing the dialogue regarding the implementation of cost-effective demand-side management programs.

43. Black Hills historically has not documented its integrated resource planning decisions in a manner that readily allows for regulators to review the decision-making process. In order to assist in the remedy of this situation and with the intent of reviewing and revising the integrated resource planning process on an ongoing basis, Black Hills agrees to establish and generally fund an Integrated Resource Planning Advisory Board. This Integrated Resource Planning Advisory Board would generally consist of Commission staff members from South Dakota and Wyoming, customer representatives, community leaders, and Black Hills representatives. The Board will meet periodically as needed, but no less than three times per year, with the first meeting to take place no later than September 1, 1993.

44. Black Hills' own studies show that Neil Simpson Unit #2 is the most cost effective and reliable way to meet the forecast needs of its service

area in the near future, but that additional economies may be achieved through the implementation of additional demand-side management programs and the addition of wind-powered resources to its system. In order to further investigate the economies that may be achieved through wind generation, Black Hills agrees to perform additional studies regarding the addition of wind-generation to its system. Additionally, Black Hills agrees to provide to the Consumer Representative Staff, no later than September 1, 1993, the steps and associated timetable it intends to use to study wind generation as an additional energy resource.

45. Black Hills commits to construct Neil Simpson Unit #2 as described in Black Hills' evidence and testimony submitted in this proceeding, subject to the following conditions, any one of which would release Black Hills from this commitment:

a. Not receiving all construction permits from Wyoming regulators authorizing the construction of Neil Simpson Unit #2 prior to July 1, 1993;

b. Receiving any rulings from the South Dakota Public Utilities Commission that would prohibit Black Hills from giving notices to proceed by July 1, 1993 to its vendors and contractors to design and construct Neil Simpson Unit #2, that would reasonably be interpreted as a finding that Black Hills would be found imprudent if it proceeded to build Neil Simpson Unit #2 or that would force Black Hills to enter into a rate stability plan that Black Hills believes to be unfair and inequitable; and

c. Not entering into voluntarily or not being forced to enter into any purchased power contracts from other power producers to buy power as an alternative to Neil Simpson Unit #2.

46. Guarantee of Capital Costs. Black Hills agrees never to include in its rate base, to determine rates for its Wyoming retail customers, any initial capital costs of constructing Neil Simpson Unit #2 which exceed $124,889,000 (including AFUDC), conditioned upon the following:

a. No conditions described in paragraph #45 (commitment to construct) have occurred so as to prevent Black Hills from giving notices to proceed by July 1, 1993 to its vendors and contractors to design and construct Neil Simpson Unit #2; and

b. The final prevention of significant deterioration air quality construction permit to be granted for Neil Simpson Unit #2 will not contain any modifications from the draft permit issued by the Wyoming Department of Environmental Quality dated January 25, 1993, which would require additional air quality control equipment, in which event the capital costs of providing the additional air quality control equipment will be added to the guaranteed price.

The total initial capital costs of constructing Neil Simpson Unit #2 include all costs to complete Neil Simpson Unit #2 as planned and necessary to bring it into commercial operation. The guaranteed capital costs do not include capital expenditures for replacements, improvements, or additions to Neil Simpson Unit #2 subsequent to its being brought into commercial operation. Black Hills represents that it has no plans to construct nor is it now aware of any additions or improvements required to bring Neil Simpson Unit #2 into commercial operation which are not included in the initial capital costs.

47. Black Hills represents that sufficient fuel supply for the life of Neil Simpson Unit #2 has been committed and is reserved and will be priced as provided by the Restated and Amended Coal Supply Agreement for Neil Simpson Unit #2, dated February 12, 1993 ("Coal Supply Agreement"), between Wyodak Resources Development Corp. ("Wyodak Resources") and

Black Hills. Conditioned upon none of the conditions described in the Commitment to Construct paragraph (paragraph #45) occurring which would prevent Black Hills from giving the notices to proceed to the vendors and contractors on or before July 1, 1993 to design and construct Neil Simpson Unit #2, the electric rates for Black Hills' Wyoming retail sales will reflect the coal pricing methodology under the Coal Supply Agreement for all coal sales from Wyodak Resources to Black Hills for Neil Simpson Unit #2 and Black Hills' other existing power plants and its twenty (20) percent interest in the Wyodak Plant.

48. Black Hills further agrees to offer to the Commission any further guarantees, commitments, or other incentives that it may subsequently offer the South Dakota Commission as part of any rate stability proceedings relating to Neil Simpson Unit #2.

49. The parties acknowledge that the construction of Neil Simpson Unit #2 may result in significant, future increases in Wyoming customer retail rates. Black Hills agrees that in an effort to mitigate future rate impacts as much as possible, it will pursue all reasonable cost containment measures in the construction and operation of Neil Simpson Unit #2, and the overall electric utility operations of Black Hills Power & Light.

50. Conditioned upon acceptance of the agreements as set forth in paragraphs numbers 41 through 49 hereinabove, and the Company's initial representation that under optimum conditions a resource package containing Neil Simpson Unit #2, demand-side, and wind resources is the least cost resource mix, the Consumer Representative Staff concurred that Black Hills has supported the need for additional base load capacity and supports Black Hills' application for a certificate of public convenience and necessity to construct Neil Simpson Unit #2.

51. Consumer Representative Staff's expressed support for Commission approval of the certificate application of Black Hills to construct Neil Simpson Unit #2 shall not be construed to constitute an approval or a prior determination as to any position that the Consumer Representative Staff may take in future appropriate ratemaking proceedings held before this Commission for the purpose of determining the recovery through rates of the costs associated with the construction of Neil Simpson Unit #2.

52. Black Hills and the Consumer Representative Staff agree that any certificate of public convenience and necessity that may be issued as a result of this proceeding shall be null and void if construction of Neil Simpson Unit #2 is not begun by December 31, 1993.

INTEGRATED RESOURCE PLANNING

53. The integrated resource planning process should take into account necessary features for system operation, such as diversity, reliability, dispatchability, and other factors of risk and the ability to verify energy savings achieved through energy conservation as well as efficiency and the projected durability of such savings measured over time. It should treat demand and supply resources on a consistent and integrated basis.

54. The terms "least cost planning" and "integrated resource planning", sometimes used synonymously in the utility industry, do not call for the evaluation of resources based solely on costs. They do call for the implementation of the lowest cost resources that are adequate and reliable.

55. Integrated resource planning is a tool to be used in the planning and selection process for new resources, such as Neil Simpson Unit #2, demand-side management, and renewable resources. The concepts of integrated resource planning are highly relevant in this case.

56. The Commission has historically directed utilities to provide the lowest cost reliable services but the analysis required to satisfy the requirements of the integrated resource planning is much more extensive than has been required in the past.

57. Black Hills' initial integrated resource plan was deficient in three areas: supply-side, demand-side, and sensitivity analysis. The Consumer Representative Staff sought more information on demand-side management, renewable resources and sensitivity studies adding to the knowledge it has about Neil Simpson Unit #2 as well as other resource options.

58. The Company then did further studies and hired additional consultants to address the issues raised by the Consumer Representative Staff. RCG/Hagler, Bailly, Inc. consultants addressed the issues of wind generation, demand-side management and performed sensitivity studies.

59. The additional studies show that wind may be a viable resource for Black Hills and should be given serious consideration in the future but that for now, inadequate site-specific information exists for the Company's commitment. Also, Black Hills is in need of base load resources, and the variable nature of wind generation technology as it exists today does not lend itself to base load needs.

60. The RCG/Hagler, Bailly consultants completed a study that determined the cost effective demand-side resources available in Black Hills' service area. Their report estimated how much demand-side management is technically feasible. Further study will then have to be done to determine what demand-side management is cost effective. The level of conservation that can be achieved cost effectively will undoubtedly be lower than the level that is technically feasible, but Black Hills' consultants have represented to the

Consumer Representative Staff that successful utilities have achieved on average a 10% peak reduction through conservation.

61. RCG/Hagler, Bailly also performed a sensitivity analysis which showed that under all scenarios, Neil Simpson Unit #2 should be included as part of Black Hills' resource portfolio, and it also revealed that wind generation and demand side management should receive consideration in the future to supplement the plant.

62. Neil Simpson Unit #2 is a sensible resource addition choice for Black Hills. A unique window of opportunity currently exists for Black Hills, for general reasons: no other utilities are building coal plants so vendors, design engineers and contractors are willing to cut costs; and Black Hills has negotiated a 50 year coal contract that provides very low cost coal for Neil Simpson Unit #2 for the first 5 years and free coal for the remaining 45 years of the contract. The coal contract, combined with the low demand for power plants and the low interest rates at this time all combine to make this an excellent opportunity for Black Hills. It is the finding of this Commission that Neil Simpson Unit #2 provides the least cost approach, consistent with adequate and reliable service, to the resource needs of Black Hills and its customers.

63. The Company has committed to a cap of costs that they will attempt to pass through to their customers. This cap is possible in large part because the Company already has firm "not to exceed" bids in hand for the majority of the plant.

64. There will be no immediate rate effect on Wyoming's rate payers as a result of Black Hills' construction of this plant. Black Hills is not asking to have Neil Simpson Unit #2 included in Wyoming rates at this time. When Black Hills files a rate case, the appropriateness of including Neil Simpson Unit #2 in rate base will be fully examined. The granting of a certificate of public

convenience and necessity to Black Hills Corporations d/b/a Black Hills Power and Light Company for the Neil Simpson Unit #2 is found to be in the public interest.

CONCLUSIONS OF LAW

1. The Public Service Commission has jurisdiction over this matter, pursuant to Wyoming law.

2. Neil Simpson Unit #2 provides the least cost approach to the resource needs of Black Hills and its customers.

3. Public notice was given in accordance with the Wyoming Administrative Procedure Act, W.S. § 37-2-201, W.S. § 37-2-202, and the Commission's Rules.

4. Public hearings were held and conducted pursuant to W.S. § 16-3-107, W.S. § 16-3-108, W.S. § 37-2-120, W.S. § 37-2-201, W.S. § 37-2-203 and the Commission's Rules.

5. The Stipulation and Agreement presented to the Commission is supported by substantial evidence and should be adopted.

6. The granting of a certificate of public convenience and necessity to Black Hills Corporation d/b/a Black Hills Power and Light Company for the Neil Simpson Unit #2 is in the public interest.

IT IS THEREFORE ORDERED THAT:

1. Black Hills Corporations d/b/a Black Hills Power and Light Company shall be, and is hereby, granted a Certificate of Public Convenience and Necessity to construct the Neil Simpson Unit #2, an 80 megawatt, coal-fired power plant at Wyodak, Wyoming. All other elements of the executed Stipulation and Agreement are hereby approved and incorporated herein, by this reference.

2. Nothing herein shall bind the Commission to any ratemaking policy, practice or procedure.

3. This Order is effective immediately.

MADE and ENTERED at Cheyenne, Wyoming, this 2nd day of June, 1993.

PUBLIC SERVICE COMMISSION OF WYOMING

BIL TUCKER, Chairman

JOHN R. SMYTH, Deputy Chairman

STEVE ELLENBECKER, Commissioner

PUBLIC SERVICE COMMISSION OFFICIAL SEAL (SEAL) OF WYOMING

ATTEST:

Douglas J. Moench, Assistant Secretary and Commission Counsel

EXHIBIT
BHPL
TMO-15

Neil Simpson II
Operation and Maintenance Budget

Payroll Direct and Overheads	$1,592,100
Operations Materials (excluding fuel)	
▪ Ash Disposal	$254,100
▪ Steam Expenses	$151,300
▪ Pollution Expenses	
Lime	$681,600
Water Treatment	$3,600
Emission Tax	$22,220
▪ Electric Expenses	$34,200
▪ Misc. Expenses	$49,700
Total	$1,196,720
Maintenance Supplies and Service Contracts	
▪ Facilities	$80,000
▪ Boiler	$112,500
▪ Fuel Prep	$32,000
▪ Pollution Equipment	$86,000
▪ Water Treatment	$19,000
▪ DCIS/Instrumentation	$25,000
▪ Ash Handling	$10,000
▪ Compressed Air	$10,000
▪ Turbine Generator	$100,000
▪ Substation Plant Elec	$50,000
▪ Air Cooled Condenser	$40,000
Total	$564,500
Total O&M Budget	$3,353,320

EXHIBIT
BHPL
TMO-16

BLACK HILLS POWER & LIGHT COMPANY

NEIL SIMPSON COMPLEX – BUDGETED POST START UP STAFFING

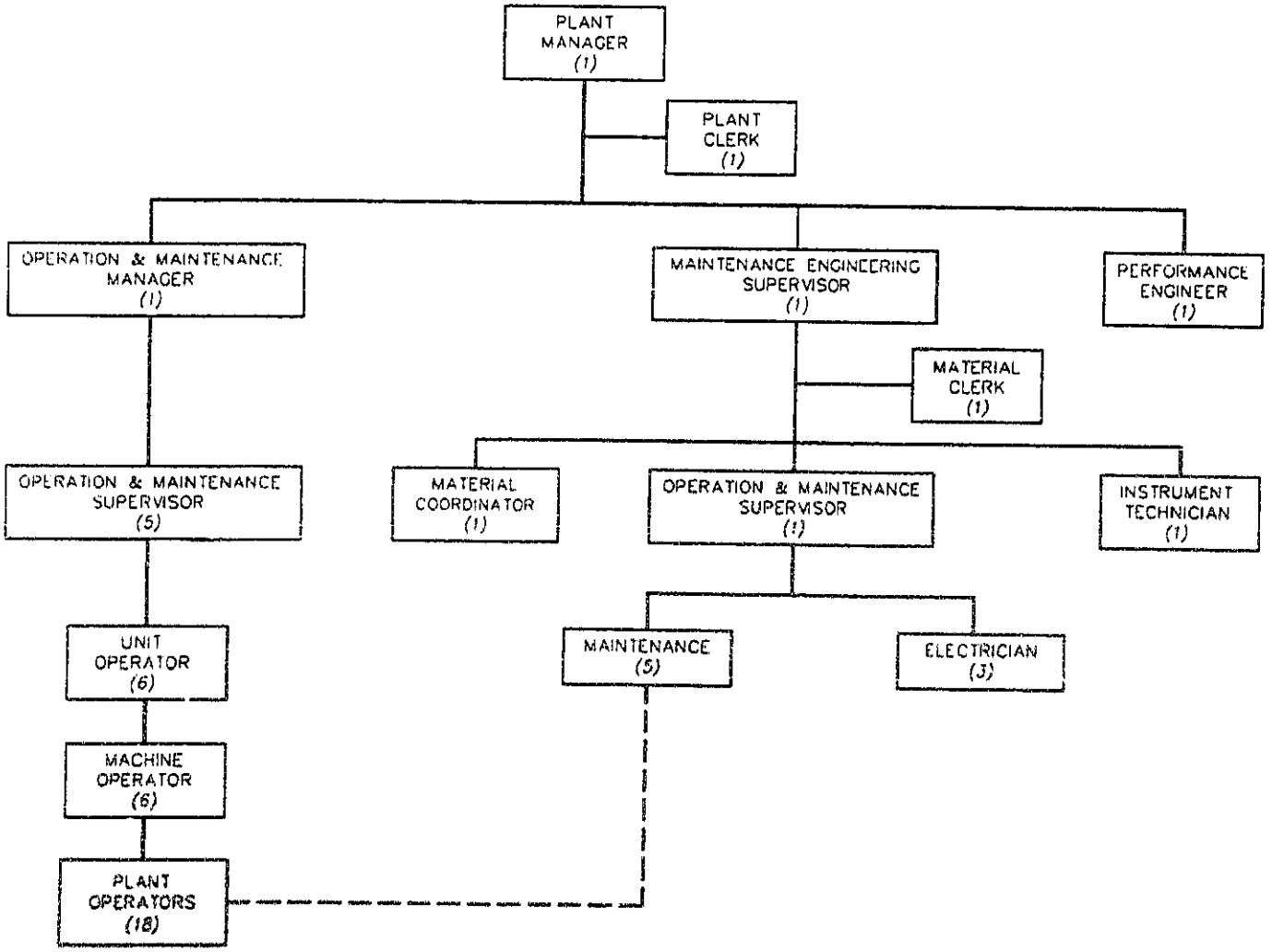


EXHIBIT
BHPL
TMO-17

NEIL SIMPSON COMPLEX STAFFING

	NSS1	NSS II	TOTAL
	SUPERVISORY	CHANGES	
MANAGER	1		1
O&M MANAGER	1		1
MTO SUPERVISOR	1		1
MATERIAL COORDINATOR	1		1
PERF. ENGR.		1	1
O&M SUPERVISOR		6	6
CLERK	1	1	2
INSTRUMENT TECH		1	1
SUBTOTAL	5	9	14
OPERATION AND MAINTENANCE			
UNIT OPER	4	2	6
MACH OP	4	2	6
PLANT OPERATOR	6	12	18
MTO FIREMAN	1	0	1
ELECT FIREMAN			
MECH	3	2	5
MECH/ELECTR	1	2	3
SUBTOTAL	24	29	53

0447-02-2010

EXHIBIT
BHPL
TMO-18

NSSII INVENTORY COMPARISON

Wyodak Generating Station - Gillette, Wyoming

Size: 332 MW

Inventory Value: $3,100,000.00

Critical Spares: Inventory has no break down

Inventory per MW: $9337.00

Hastings Power Station - Hastings, Nebraska

Size: 77 MW

Inventory Value: $1,500,000.00 *

* Estimated by Production Superintendent. Still in process of setting up all parts into Maintenance Management System. Almost completed.

Critical Spares: Inventory has no break down.

Inventory per MW: $19,480.00

Grand Island Utilities - Platte Generating Station - Grand Island, Nebraska

Size: 100 MW

Inventory Value: $1,000,000.00 plus *

* In the process of setting up parts in Maintenance Management System. Current value of inventory is $900,000.00 with 70% of parts entered.

Critical Spares: Inventory has no break down. Estimates at 50% or more of total value. Wants to bring in more critical spares.

Nucla Generating Station - Nucla Colorado

Size: 110 MW

Inventory Value: $750,000.00

Plans are to add more inventory. Won,t exceed 1 million.

Inventory per MW: $6818.00

Critical Spares: Inventory has no break down. Has no feel percentage wise.

DIRECT TESTIMONY OF MICHAEL J. FREDRICH
SOUTH DAKOTA PUBLIC UTILITIES COMMISSION
BLACK HILLS POWER AND LIGHT COMPANY
APPLICATION FOR AN INCREASE IN ELECTRIC RATES
DOCKET NO. EL95-003

Q: Please state your name and business address.

A: Michael J. Fredrich, Black Hills Power and Light Company, 409 Deadwood Avenue, P. O. Box 1400, Rapid City, South Dakota.

Q: What is your occupation?

A: I am an electrical engineer employed by Black Hills Power and Light Company and hold the title of Manager, Planning and Coordination.

Q: Please describe your education and training which qualifies you to give this testimony.

A: I graduated from the South Dakota School of Mines and Technology with a Bachelor of Science Degree in Electrical Engineering in December 1981. Since my employment with the Company, I have had the following responsibilities:

<u>1981-1986--Electrical Engineer in Power Resources Department</u>

- Responsible for the operation and maintenance of the generation and transmission system protective relaying systems.
- Provided project engineering on a number of projects associated with control and

protective relaying for the generating plants and the transmission system.

- Responsible for the electrical transmission system electrical data base used in short-circuit and power flow analysis studies.
- Participated in a joint transmission power flow study with Basin Electric.
- Participated in the Rocky Mountain Power Pool Voltage Study Group to review high voltage conditions during light load periods. These studies continued through 1991.

1987-1988 Substation Maintenance Supervisor for Electric Operations

- Responsible for the operation and maintenance of the bulk transmission system electrical equipment.
- Member of the BHPL load forecast committee.
- Member of the Colorado/Wyoming Area Off-Normal Frequency Task Force. This study group reviewed the area islanding and load shedding protection of the Rocky Mountain Power Pool region and recommended and installed a coordinated load shedding program within the region. This study continued until 1991.

- Conducted in-house power flow studies to identify the need and timing of the second 230/69 kV transformer addition at Spearfish and the timing of the Spearfish-to-Yellow Creek 230 kV line addition.

1989-1991 System Protection and Studies Engineer for System Engineering Department

- Perform system study work for operational and planning requirements.
- Participated in joint study with Basin Electric to review the timing of the Spearfish-to-Yellow Creek 230 kV line addition.
- Member of the BHPL load forecast committee.

1991 - Manager, Planning and Coordination

- Study the electrical system and develop operating and development plans.
- Establish operating parameters based on standards of WSCC and NERC.
- Coordinate intercompany and intracompany planning activities to assure adequate electrical facilities.
- Participate in joint transmission studies with Basin Electric to review short/long term need for and timing of system additions.

Q: What is your primary responsibility for Black Hills Power and Light Company?

A: As Manager of Planning and Coordination, my primary responsibility is to study, review and analyze the area transmission system to ensure an adequate system is maintained to meet the electrical needs of our customers today and in the future.

Q: Please explain the Western Systems Coordinating Council (WSCC) transmission region.

A: The WSCC transmission region is the largest of the nine operating regions that were created by the North American Electric Reliability Council to promote reliable transmission and generation service throughout the North American continent. The WSCC region covers all or portions of the western 14 states and extends into Canada. The generation resources makeup of the region includes hydroelectric resources in the Pacific Northwest, large coal-fired and nuclear resources in the Southwest region and coal-fired units in the Western region. The location of some of this generation and the geographical makeup of the region requires an extensive bulk transmission system to transport these resources to the

remotely populated areas. I have included a map of the WSCC region marked Black Hills Exhibit MJF-1.

Q: Where is Black Hills' service territory and transmission system located within the WSCC region?

A: Black Hills' generation and transmission system is located in the northeastern part of Wyoming, the western part of South Dakota (namely the Black Hills of South Dakota), and a portion of southeastern Montana. The Black Hills' area is interconnected to the remaining WSCC region through three long 230 kV transmission lines from Wyodak to Buffalo, Wyodak to Dave Johnston and Hot Springs to Stegall.

Q: Are there any unique features of the Black Hills' transmission system due to its location in the WSCC region as it relates to service to its customers?

A: Yes. Some of the unique features of the Black Hills' area being remotely located on the eastern edge of the WSCC region and not being intertwined within the WSCC transmission system are the following:

1. The long transmission lines that interconnect the Black Hills' area to the WSCC region are more voltage restricted than load restricted when importing power into the area,
2. The ability of the system to import purchased power from outside the area is limited, and
3. The generation located throughout the service territory provides local resources and voltage support to the loads and decreases the amount of power that needs to be imported to support that area.

I will provide additional detail on these items later in my testimony.

Q: Describe Black Hills' electric transmission system.

A: Black Hills' electric transmission system consists of 463 miles of 230 kV lines and 540 miles of lower-voltage lines, principally 69 kV and 47 kV. The 69 kV system consists of approximately 532 miles and the 47 kV system 8 miles. Black Hills is interconnected with the Western Area Power Administration's west 230 kV bus at Stegall, Nebraska (located near Scottsbluff, Nebraska) and with Pacific Power & Light Company at the Wyodak Plant (located near Gillette, Wyoming).

Q: What do you mean, Black Hills is connected to the west 230 kV bus at Stegall, Nebraska?

A: The Western Area Power Administration's Stegall 230 kV bus is located on the border of two separate transmission grids that maintain their own frequency control. They are frequently referred to as the eastern and western grids. These two grid systems cannot be electrically connected together except through the capacity of a high-cost converter station. These are commonly referred to as AC/DC/AC ties. The Stegall location does have an AC/DC/AC tie connection. Black Hills' transmission system is connected to the western 230 kV bus at Stegall via a 127-mile 230 kV line from Hot Springs, South Dakota.

Black Hills' transmission system in Rapid City is also located on the border of these two transmission grid systems. Black Hills' system which is normally connected to the western grid has access to the eastern grid through the Western Area Power Administration's Cambell Street Substation located on the east side of Rapid City. Since there is no AC/DC/AC tie connection at Cambell Street, this connection remains open except for those short periods of time when a

portion of Black Hills' system is connected to the eastern system or a portion of the WAPA system is connected to the western grid.

Q: What would be the occasions when Black Hills' system would be tied to the east or a portion of WAPA's system would be tied to the west?

A: Black Hills has maintained a connection with the Western Area Power Administration--Upper Missouri Region since the early 1950s when Black Hills' transmission system at that time was entirely connected to the eastern system at the Cambell substation location. Black Hills' transmission system was interconnected into the western transmission system with the addition of the Wyodak #1 unit, but Black Hills continues to maintain an emergency maintenance connection to the eastern system which has provided benefits to both Black Hills' and WAPA customers throughout the years. This connection has been utilized by BHPL when major system disturbances on the western grid system have caused the western system to collapse. During such a disturbance, a connection to the eastern system would then be established to provide start-up power for the Rapid City combustion turbines which would then allow Black

Hills to begin restoration of service to some of the area loads and generation. Once the western system had stabilized, Black Hills would transfer the loads being served from the eastern system back to the western system. This would restore Black Hills' transmission system to normal operating conditions.

During the time periods when Black Hills has utilized the eastern system, whether it was during a system disturbance or for a scheduled plant maintenance overhaul, the total amount of system load served was limited to the amount of resources available from the eastern system. Typically these resources have been supplied on a seasonal basis as they are available. These resources have not been available the last few years due to the lack of hydro power on the river system. Even though Black Hills has utilized this connection, it does cause some operational problems within the Rapid City service territory as portions of the Rapid City distribution system and load would be interconnected to the two different asynchronous transmission systems.

This connection has also provided benefits to WAPA eastern-connected loads located on the east

side of Rapid City. During March 11-12, 1998, Black Hills served 537 MWH of WAPA load at a peak demand of 24 MW, due to a winter snowstorm that disrupted their eastern transmission system.

Q: Generally describe what an AC/DC/AC tie is and its approximate cost per megawatt of capacity.

A: An AC/DC/AC tie is a converter station comprised of equipment that allows two unsynchronized transmission systems to be electrically connected together to allow for the transfer of power from one system to another. An estimated cost of an AC/DC/AC converter station installation at Rapid City would be approximately $50 million including AFUDC. This would be a tie with 100 MVA of capacity.

Q: Are the eastern transmission system and western transmission in the Rapid City area likely to be interconnected on a synchronized basis within the foreseeable future?

A: No.

Q: Why not?

A: Even though the addition of an AC/DC/AC tie provides the capability of interconnecting two unsynchronized transmission systems together to allow for the power transfer from one system to

another, the tie itself does not provide any resources to serve loads. The only source of resources can come from a generating plant. Since Black Hills does not have any generation located on the eastern grid, we would either have to build resources or purchase the resources from another party already located on the eastern system. In addition to the purchased resources, Black Hills would also have to purchase rights in the eastern transmission system to transport the power to the Black Hills' area.

Q: Have you prepared an exhibit showing a map of Black Hills' transmission system and the approximate geographical locations of the various lines?

A: Yes. I have prepared what has been marked Black Hills Exhibit MJF-2.

Q: Does this exhibit also show the location of electric generating stations from which Black Hills obtains power?

A: Yes.

Q: Does Black Hills share the use of its transmission system with others? If so, please explain.

A: Yes. Black Hills Corporation, Basin Electric Power Cooperative, Rushmore Electric Power

Cooperative, Inc., Tri-County Electric Association, Inc., Black Hills Electric Cooperative, Inc., and Butte Electric Cooperative, Inc. are parties to the Agreement for Transmission Service and the Common Use of Transmission Systems, dated January 1, 1986. Basin Electric is a generation and transmission rural electric cooperative. Rushmore Electric is also a generation and transmission cooperative, but does not own generation or transmission but serves as a contracting party for its member distribution cooperatives. Tri-County, Black Hills Electric and Butte Electric are rural electric distribution cooperatives who serve in and around Black Hills' electric service area. Generally, the contract describes the transmission area in which the parties have the rights under certain conditions to use each other's transmission system for the purpose of delivering electric power to their customers. The transmission area includes Black Hills' service area in South Dakota and Wyoming, Tri-County's service area in Wyoming and that part of Black Hills Electric's and Butte Electric's service area in South Dakota and located west of the east-west ties.

Q: Have you prepared a transmission map which shows this Transmission Area and the interconnections of this Transmission Area to other areas?

A: Yes. I have included with this testimony such a map marked Black Hills Exhibit MJF-3. This map shows an outline of the eastern portion of the WSCC region of Montana, Wyoming, Colorado, Nebraska, and South Dakota and includes major generation and transmission lines that comprise the western transmission system in this region. The large generation units in this area are located at Colstrip, Yellowtail, Jim Bridger, Laramie River, Dave Johnston and Wyodak. The extensive transmission system at the larger generation locations such as Colstrip, Jim Bridger and Laramie River is required to transport these large quantities of resources out of the area to serve loads in the more densely populated areas located on the west side of the WSCC region.

The "Agreement for Transmission Service and the Common Use of Transmission Systems" defines Black Hills' joint transmission system as an area located in the northeastern part of Wyoming and the western portion of South Dakota. This region is highlighted as the Joint Transmission Area on

Black Hills Exhibit MJF-3. In general, this transmission area is served from a 230 kV transmission loop from Wyodak to Hot Springs and a 230 kV line from Wyodak to the Converse County line which is just south of the Teckla substation in Wyoming. This joint transmission area is then interconnected to the WSCC region through 230 kV lines from Wyodak to Buffalo, Wyodak to Dave Johnston and Hot Springs to Stegall.

Q: Where is the delivery point of the electric power and energy delivered by the Western Area Power Administration and by Basin Electric to the Cooperatives in your area?

A: The Cooperatives receive their power contractually from WAPA western 230 kV bus at the Stegall Substation.

Q: Do you deliver power and energy for entities other than the rural electric cooperatives, and if so, please identify those entities.

A: Yes, under the Restated Electric Power and Energy Supply and Transmission Agreement between the City of Gillette, Wyoming and Black Hills Power and Light Company, dated December 21, 1987, during the term of the contract ending June 30, 2012, Black Hills has undertaken the obligation to maintain

capacity in its transmission system capable of delivering all of Gillette's requirements above that furnished by Black Hills to Gillette under the terms of the Agreement.

Under the terms of the Electric Power Service Agreement between Black Hills and the South Dakota State Cement Plant Commission, dated May 1, 1987, Black Hills serves all of the requirements of the Cement Plant, except during the term of the contract the Cement Plant Commission was given the right to purchase and make available to Black Hills a summer seasonal firm resource from the Western Area Power Administration of up to 6233 KVA. During the summer season, the Cement Plant is currently acquiring that resource which is contractually delivered to Black Hills by WAPA at the Stegall 230 kV western bus.

Q: What are the current highest peak deliveries of power over Black Hills' transmission system?

A: The highest coincidental peak load for the Black Hills area transmission system was 487 MW which occurred on January 17, 1994. Black Hills' load was 284 MW and the Cooperatives' load was 203 MW on January 17, 1994.

Black Hills' highest historical peak load was 293 MW which was reached December 20, 1990. The Cooperatives' peak load on that date was 177 MW. During that system peak, 5 MW of power was delivered to Gillette from WAPA and approximately 5 MW of power was delivered to Black Hills from WAPA for the State Cement Plant.

The maximum amount of power delivered to Gillette from WAPA has been 6 MW, 5 MW to Black Hills for the State Cement Plant, and 2 MW to the South Dakota School of Mines.

Q: Have you had occasion to study the transmission limitations of Black Hills' transmission system? If so, please explain.

A: Yes. My employment duties for Black Hills include the responsibility to continually be aware of the limitations of the transmission system in order to determine transmission improvements as they are needed to ensure good, reliable electric service. So my study of the transmission system is a constant process. This study process is formalized under the terms of the transmission agreement with the rural electric cooperatives. The agreement provides for a 69 kV Planning Committee to study the 69 kV system and a High

Voltage Planning Committee to study the 230 kV system or other higher-voltage transmission which may be needed in the future. I have been a member of that High Voltage Planning Committee for approximately eight years and have studied the system extensively with Basin Electric personnel.

Q: Have any of your studies with Basin Electric concerning high voltage been formalized?

A: Yes. Black Hills and Basin Electric initiated a joint transmission study in July 1986, and that study was completed in late 1989. That study was formalized in a report, entitled "Report of Bulk Transmission Study for the Black Hills and Northeastern Wyoming Area." I will make that report available upon request.

A second study was formalized in June 1990, entitled "Operating Conditions for the Black Hills and Northeastern Wyoming Area 230 kV Transmission System 1991-1995 Including the Spearfish 230 kV Line Addition." This report reviewed the operating conditions for the Black Hills area 230 kV transmission system and the reliability of the 69 kV transmission system in the Kirk area. This report identified the need and timing of the Spearfish-to-Yellow Creek (Kirk) 230 kV line

addition. This report is also available upon request.

Q: Did you personally participate in the studies?

A: Yes. I have participated in both studies.

Q: Would you please generally describe how Black Hills and Basin Electric went about conducting the studies?

A: A computer model of Black Hills' 230 and 69 kV transmission systems was incorporated into base case models obtained from the Western Systems Coordinating Council that represented the transmission system of the western United States for the time period to be studied. These models included detailed data for Black Hills' generation and updated peak load forecast data for both Black Hills and Basin Electric loads in the area. Additional base case models were constructed from the original case for each proposed system addition that was to be reviewed and analyzed. Various outage contingencies were run on all of the models to determine how the system performed under various additions and load levels.

Q: As an electrical engineer, are you able to opine on the studies and testify to their results?

A: Yes.

Q: Have you conducted some studies of the limitations of Black Hills' area transmission system since these two written Black Hills/Basin Electric reports? If so, please explain.

A: Yes. Black Hills, Basin Electric, Tri-County Electric and the South Dakota Cooperatives initiated a study in early 1991 to further identify existing and future operating problem areas with the 69 kV system, to review possible solutions to these problem areas, and to review how these solutions affect the operation of the bulk 230 kV transmission system. The study also determined at what load levels the Rapid City combustion turbines are required to be on line to provide support to the transmission system and to identify what the operating limits of the system are when these turbines are on line. This study work included the analysis of the addition of the 80 MW Neil Simpson Unit #2 generation to the area transmission system along with the need requirements of the Yellow Creek-to-Osage 230 kV transmission line.

This most recent study analysis has just been finalized and printed under the title, "Operating Conditions for the Black Hills and Northeast

Wyoming Area 1995-2000 Including the Osage to Yellow Creek 230 kV Line Addition." A copy of the report is included as Black Hills Exhibit MJF-4.

Q: How do you determine the capacity of a transmission system?

A: The capacity of a transmission system is determined by performing computer studies on an electrical model of the system which includes all generation and transmission in the area to identify what system outage conditions prevent the system from adequately supporting the loads in the area. The transmission system should be able to survive a specific contingency outage without causing equipment overloading or voltage levels that do not meet acceptable defined limits.

Q: How do electric generation and its location affect the capacity of a transmission system?

A: The more generation you have located in the proximity of the load being served decreases the amount of power that has to be imported into the area from an outside source through the interconnected transmission system. This in turn unloads the transmission system, which also decreases the amount of losses on the system, and as the loads in the area again increase, the

transmission system has the capacity to import more power into the area. This internal generation also provides a dynamic source of reactive support to the area being served that cannot be obtained from a transmission line or from the utility that the transmission line is interconnected to. Our contracts with WAPA state that they shall have no obligation to supply reactive power.

Q: How does the location of Black Hills' generating resources within its transmission area affect the capacity of the transmission area?

A: The location of Black Hills' generation within its transmission system allows for a limited amount of resources to be imported into the system from outside the area. This internal location of resources increases the capacity of the transmission system to support additional load.

This can be seen from the results of the most recent study work. For the winter season case with the Wyodak Plant machine off-line, the Rapid City combustion turbines off-line, and an outage of Dave Johnston-to-Yellowcake, the transmission system is only capable to support an area load of 400 MW. The same case conditions with the Rapid

City combustion turbines on-line, representative of additional internal generation, the area is capable of supporting 518 MW of load. This is an additional 118 MW of load being supported in the area due to the addition of internal generation.

The addition of the Neil Simpson Unit #2 resource internal to Black Hills' area will also increase the capacity of the transmission area. Black Hills will meet its requirements for transmission and generation by constructing generation internal to its service territory.

Q: What outage contingencies have been identified in the study work that cause Black Hills' transmission system to reach an operating limit?

A: The studies indicated that the reliability of the bulk transmission system in the Black Hills area is strongly affected by outages of the Wyodak machine, as it is the largest unit in the area and is the primary source of voltage control for the area. When the Wyodak machine outage is combined with an outage of one of the three 230 kV injection lines--Dave Johnston-to-Yellowcake, Wyodak-to-Buffalo, Hot Springs-to-Stegall--that connect the area to the rest of the interconnected

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western system, the bulk transmission performance is further degraded.

Q: Why did Basin Electric and Black Hills choose these contingencies?

A: The only large generation unit within the Black Hills area is the 330 MW Wyodak machine which is operated by Pacific Power. The Wyodak unit as with any coal-fired steam generating unit has had forced and scheduled outages in the past. The Wyodak machine has been off-line twice in the past eight years during a Black Hills area peak condition. The summer of 1986 it was off-line for annual maintenance when the Black Hills area had a summer peak on August 19, 1986. It was off-line again from May to September 1989 for an extended overhaul due to machine damage. During that time period the Black Hills area had a summer peak on July 7, 1989. The reliability of the transmission system in the Black Hills and northeast Wyoming area is strongly affected by an outage of the Wyodak unit. Therefore, it is prudent to consider a transmission line outage contingency when Wyodak is off-line.

Q: Is there some national electric reliability standard which was applied to determine that the

capacity of the system is to be studied by certain contingencies?

A: The Western Systems Coordinating Council Reliability Criteria for System Design establishes criteria guidelines to be used by members' systems in operating and planning of their transmission systems to provide reliable service. This criteria defines acceptable performance limits for various outage contingencies. These outage contingencies include loss of transmission lines, loss of a generation unit with or without the additional loss of a transmission line.

Q: Explain what transmission operating limits are.

A: Transmission operating limits can be defined as what operating conditions a transmission system can tolerate and still provide reliable service to its customers without affecting the neighboring utility's system. These limits or criteria are typically defined in the analysis of the computer studies as:

1. The maximum transformer and transmission line loadings must not exceed 100 percent of their equipment design rating,
2. The system bus voltages during a system intact condition must be maintained between

95 percent and 105 percent of nominal system voltage, and

3. The system bus voltages during a contingency condition must correct to 90 percent to 110 percent of nominal system voltage.

Q: Under what transmission outage condition, does Black Hills' transmission system reach an operating limit?

A: The most recent study analysis indicates that there are two types of Bulk System transmission limitations reached in the 1995 to 2000 time period. The loss of one of the two 230 kV lines into the Rapid City and Northern Hills area prior to the Osage-to-Yellow Creek 230 kV addition is a critical outage for the Rapid City and Northern Hills area.

The second limitation is the loss of a major injection line, specifically either the Dave Johnston-to-Yellowcake or Hot Springs-to-Stegall 230 kV line, with the Wyodak unit off is a severe outage for the entire Black Hills and Northeast Wyoming area.

The present study analysis indicates that the existing transmission system configuration with the Wyodak unit off can support a summer total

area load of 357 MW and a winter area load of 400 MW. The support of the Rapid City combustion turbines allows the existing transmission system to support a summer area load of 500 MW and a winter area load of 518 MW. Based on the most recent published combined load forecast, these loads will occur in the summer of 1995 and 1994/95 winter season.

Q: Based on a winter season area load limit with the Wyodak Plant not operating and the Dave Johnston-to-Yellowcake 230 kV line opened, what is the present ability of Black Hills' 230 kV transmission system to deliver power from an external resource into Black Hills' transmission area?

A: The present transmission system configuration as studied indicated that during the winter season with the Wyodak machine off-line, the Black Hills area can support 400 MW for limiting outages of the Dave Johnston-to-Yellowcake or Hot Springs-to-Rapid City or Hot Springs-to-Stegall 230 kV line outages. If the four 25 MW Rapid City combustion turbines are on-line, Black Hills' transmission system can support an area load of 518 MW. The use of the combustion turbines provides internal

generation to the system, provides support for the Hot Springs-to-Rapid City 230 kV line outage, and allows the interconnected transmission system to support an additional 118 MW of load before the Dave Johnston-to-Yellowcake 230 kV line outage causes an operating limit.

Q: Under that winter season peak condition, what would be the typical quantity of power being injected into Black Hills' transmission system?

A: The amount of power being supplied from outside Black Hills' transmission system from the Wyodak-to-Buffalo and Hot Springs-to-Stegall 230 kV lines was approximately 347 MW. The area load representation for that case showed Black Hills' load at 302 MW, Cooperative loads at 188 MW, Gillette WAPA-wheeled load of 18 MW and PPL 14 MW. Black Hills' requirements to receive power from external sources would have been approximately 114 MW, Cooperatives 188 MW, Gillette 18 MW, and PPL 14 MW.

Q: What does the load forecast project for a 1995/1996 area winter load within the Black Hills' transmission system?

A: The projected area load for the 1995/96 winter is 534 MW. This is comprised of 306 MW of BHPL load,

198 MW of Cooperative load, 16 MW of Gillette WAPA load, and 14.3 MW of PPL load. These projected loads are based on the most recent combined publication of area loads based on the 1992 BHPL Load Forecast and the 1992 Power Requirements Study for the Cooperatives' loads.

Since then, BHPL has updated its area load forecasts with a 1994 BHPL Load Forecast. The 1994 forecast projects a 1995/96 winter BHPL load of 303 MW.

Q: From these studies have you reached a conclusion whether or not it would be prudent for Black Hills to rely upon additional firm power purchases from sources external to its transmission system?

A: In my opinion, the study analysis completed to date on the area transmission system clearly shows the present transmission will not meet study criteria through the 1995 time period. Therefore, it would not have been prudent for Black Hills to enter into any agreement to purchase firm long-term purchased power from sources external to Black Hills' transmission system unless major transmission additions were to have been constructed into the area. The Neil Simpson Unit #2 generator addition not only will provide the

necessary resources required to meet the load requirements of Black Hills' customers, but this internal resources addition to the area transmission system will allow the system to meet the area customers' needs through the 2000 time period.

Q: What transmission facilities could be constructed which would increase the capacity of Black Hills' transmission system?

A: The addition of a 230 kV line from Yellow Creek (Kirk) substation to Osage, Wyoming with the addition of an injection line into Osage, Wyoming from an external bus would increase the capacity of the system. This injection line into Osage could be either a 230 kV transmission line to the Dave Johnston Plant or a major transmission line from the Laramie River Station. If the Laramie River Station to Osage, Wyoming line is constructed, Basin Electric has indicated in their ten-year planning that the line be constructed at 345 kV to fit in their long-range transmission plans.

Q: What is your estimated cost of these lines?

A: Based on estimated line miles and construction estimates, I would estimate the cost of a 230 kV

line from Osage to Dave Johnston would be approximately $22,000,000. The estimated cost of a 345 kV line from Osage to Laramie River Station would be approximately $50,000,000.

Q: How much do either of these improvements increase the capacity of Black Hills' transmission system to receive power from external sources?

A: Based on the analysis contained in the first study report, "Report of Bulk Transmission Study for the Black Hills and Northeastern Wyoming Area," conducted by Black Hills and Basin Electric, a 345 kV transmission line from Laramie River to Osage would increase the capacity of the transmission system by 95 MW from 497 MW to 592 MW. The addition of the 345 kV with the completion of the Osage-to-Spearfish 230 kV line would increase the capacity of the system to at least 616 MW. These limits are based on the 330 MW Wyodak Plant off-line, the Rapid City combustion turbines on-line and an outage of the Dave Johnston-to-Yellowcake 230 kV line.

Q: In that building either of these transmission lines would increase the capacity of Black Hills' transmission system, does that solve Black Hills' needs for additional resources?

A: No. The building of these transmission lines does not create resources. If either one of these transmission lines were built, Black Hills would still have to either build generation or contract for purchased power from others and would likely have to pay an additional transmission charge to get the power to the area transmission system.

Q: Does the addition of the Neil Simpson Unit #2 added internally to Black Hills' system increase the capacity of Black Hills' transmission system to import electric power?

A: Yes. All of the study analysis completed to date indicates that the existing Black Hills' area transmission system which includes the most recent addition of the Tri-County Electric Hughes substation in 1993 will not have the capacity to support the area loads beyond the 1995 time period. These studies indicate the addition of Neil Simpson Unit #2 in September 1995 and the future addition of the Osage-to-Yellow Creek 230 kV line in 1996 will provide support for an area load level of 593 MW. This area load limit is based on a winter case with the Wyodak machine off-line, Dave Johnston-to-Yellowcake 230 kV line

outage, and the Rapid City combustion turbines on line.

Based on the most recent combined load forecast information, the above system configuration will meet the load requirements of the area into the year 2000. These additions not only provide support to the area, but they delay the need to build transmission into the area as well as provide a local energy resource to meet the needs of Black Hills' customers.

Q: Does Black Hills have additional plans to meet their additional load requirements.

A: Yes. Black Hills' present resource plans indicate additional resources will be required by the year 2000. This additional resource is planned to be the installation of a combustion turbine located in Rapid City.

Q: I note that except for the 330 MW Wyodak Plant, Black Hills has always been largely dependent on relative small electric generators and again is building a relatively small 80 MW generator. Are there advantages to Black Hills' depending upon these small generators.

A: As the loads in Black Hills' area increase, so will the need for voltage control and support.

The inherent location of Black Hills' area requires that either long high-voltage transmission lines be constructed into the area from other highly stable busses or that generation be constructed internally to the area to support these loads. The problem with the long transmission lines is that as more power is transferred over these lines, the more losses there are and the greater the voltage drop at the end of the line. That is the present limiting factor on Black Hills' existing bulk 230 kV transmission system in that the lines are not overload limited but are voltage limited. The addition of generation internal to the area provides a dynamic source of voltage control and support. This has been one advantage that Black Hills has obtained by having a number of smaller generating units located throughout its service territory. The resources and dynamic reactive support from this generation is utilized to supply the loads and provide voltage support in the immediate area which decreases the amount of power and reactive support that must be transferred through the bulk transmission system. This in turn also decreases the amount of losses that are

seen on the bulk transmission system as the load is served and supported by local generation.

This internal generation located near the loads provides greater reliability for our customers. During periods when disturbances on the western transmission system have caused the transmission system to become unstable, Black Hills has been able to isolate each of its generation sites with critical loads, such as underground mining loads served by Homestake Mining Company, community hospitals and other critical services. This has not only allowed service to be maintained to some of our customers during certain outage conditions, but it also has allowed us the capability to restore service to all of the remaining customers in the area in a shorter time period.

Q: Has this ever occurred?

A: Yes. Over the past ten years there have been three such occurrences when this has occurred in the Black Hills area.

Q: What additional studies have been run to incorporate the new plant generation into the system?

A: Black Hills has conducted additional power flow and stability study work to review the performance of the Neil Simpson Unit #2 generation addition to the Black Hills area and the WSCC system. The results of this study showed that Neil Simpson Unit #2 can be integrated into the area transmission system. This information has been presented to and reviewed by the other utilities in the area.

Q: In summary, how does the Neil Simpson Unit #2 generator addition affect the area transmission system?

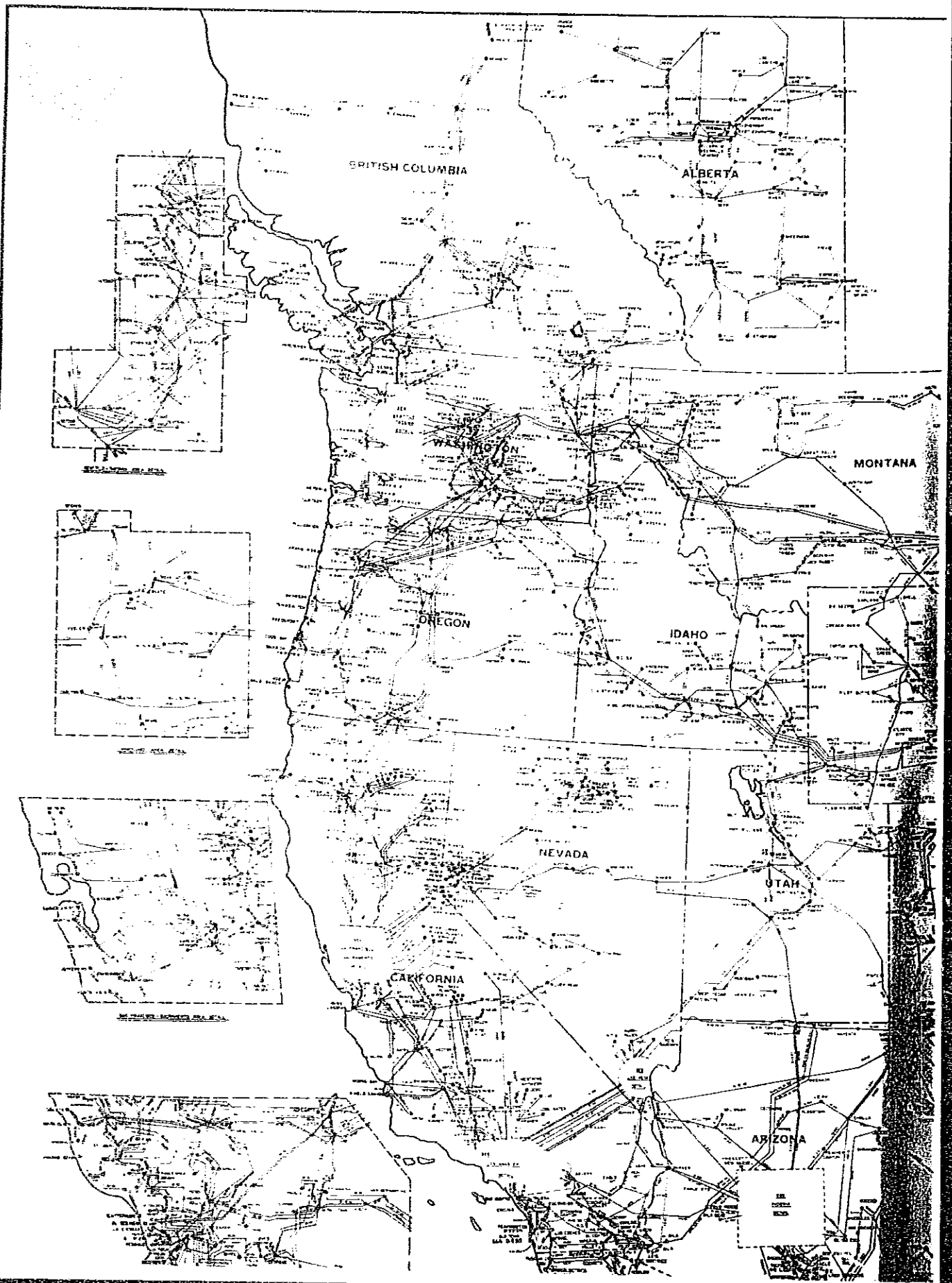
A: It provides a resource internal to the transmission system for serving the area loads and is a dynamic source of reactive voltage support.

It will add generation internal to the system which in turn unloads the bulk 230 kV transmission and decreases the amount of losses to the system due to the transmission of power from outside the area.

It provides locally controlled and operated internal resources to meet the load requirements of Black Hills' customers and delays the need for additional injection lines to be built into the area.

Q: Does that conclude your testimony?

A: Yes.

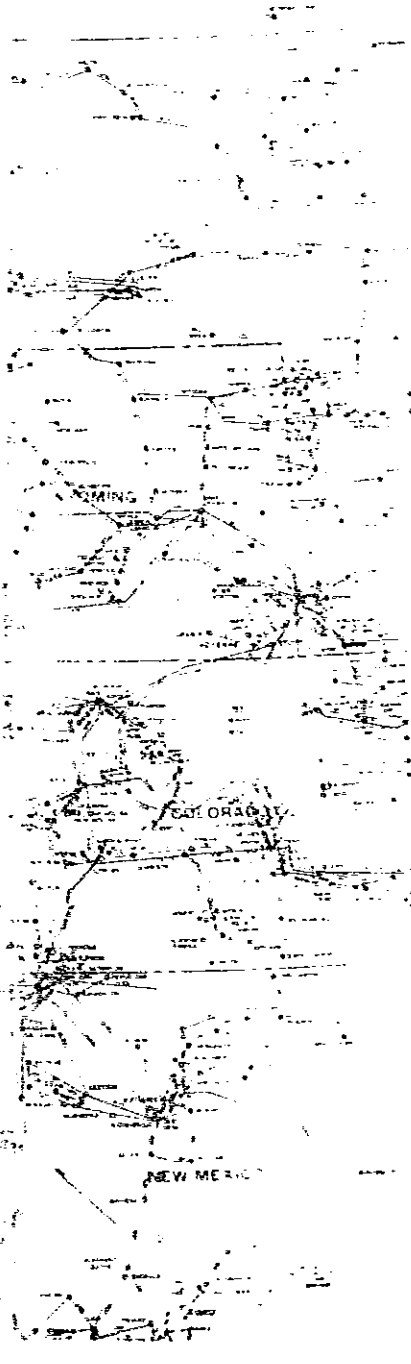

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WESTERN SYSTEMS COORDINATING COUNCIL
MAP OF PRINCIPAL TRANSMISSION LINES

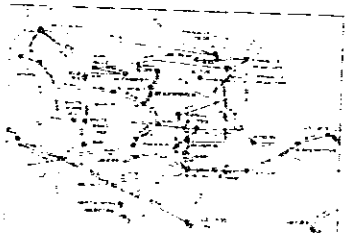
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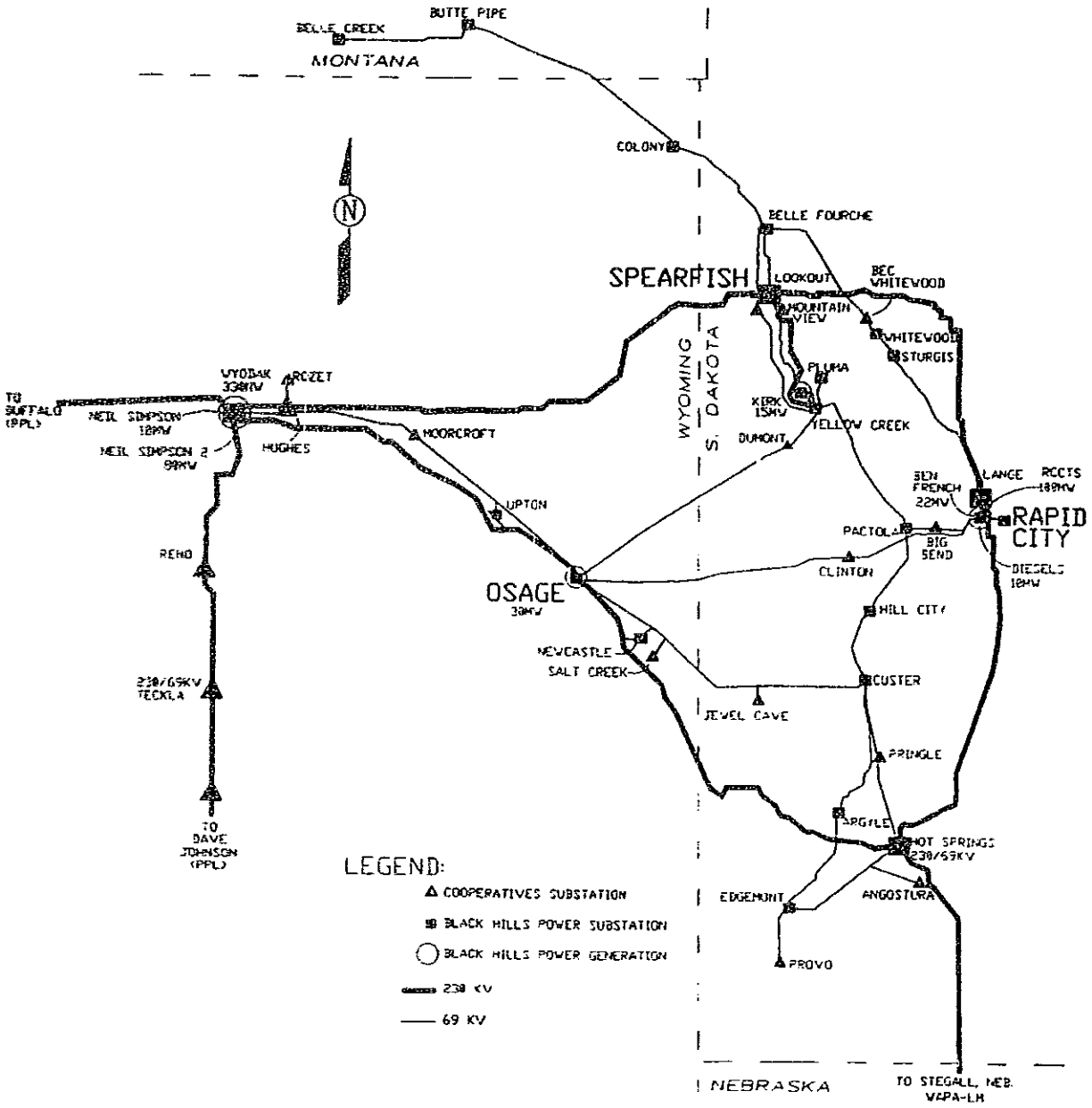




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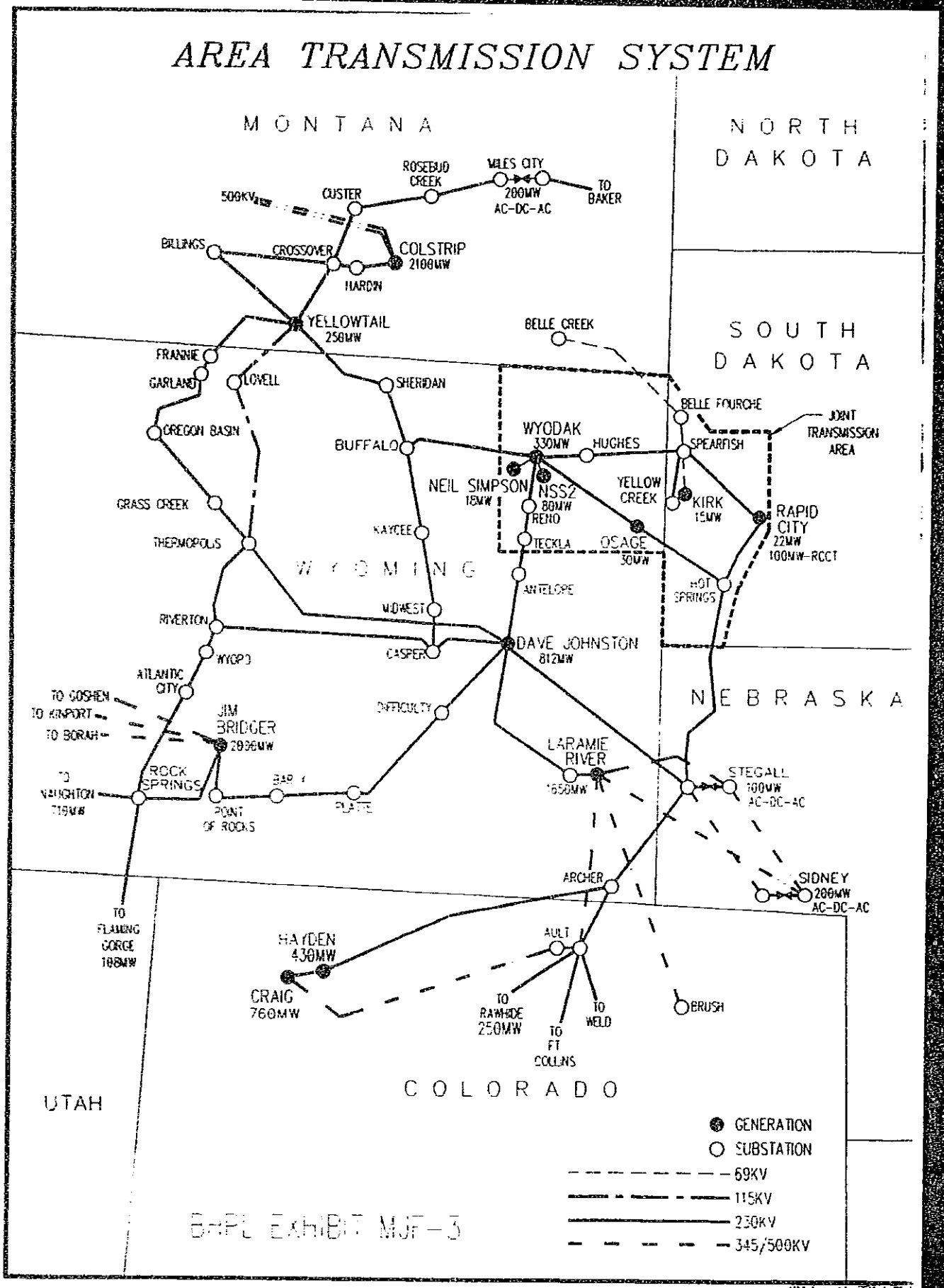


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AREA TRANSMISSION SYSTEM



B&PL EXHIBIT MJF-3

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OPERATING CONDITIONS

FOR THE

BLACK HILLS AND NORTHEAST WYOMING AREA

1995-2000

INCLUDING THE

OSAGE TO YELLOW CREEK 230 KV LINE ADDITION

VOLUME 1

PREPARED JOINTLY BY STAFF OF:

BASIN ELECTRIC POWER COOPERATIVE

BLACK HILLS POWER AND LIGHT

JANUARY 1995

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1.0 Executive Summary

The purpose of this study analysis was to determine acceptable operating conditions for the Black Hills area of South Dakota and the Northeastern Wyoming area 230 kV bulk transmission system during the 1995-2000 time period and to review the requirements of the Yellow Creek to Osage 230 kV transmission line addition. The study analysis and results are presented in terms of the Black Hills and Northeast Wyoming area forecasted load levels which can be supported during the 1995 through 2000 summer and winter seasons. The analysis performed jointly by Basin Electric Power Cooperative and Black Hills Power & Light focused on the reliability of the 230 kV bulk transmission system.

The Spearfish to Yellow Creek 230 kV line and Yellow Creek 230/69 kV transformer placed into service in February 1993 and the Hughes 230/69 kV transformer at Rozet energized December 1993 are included in this study analysis.

The 80 MW Neil Simpson Unit 2 generation addition presently under construction is scheduled to be in service in November 1995. Scenarios with this unit on line were studied.

Black Hills Power & Light's projected resource plans indicate the need for an additional 40 MWs in the latter 1990s after the addition of the Neil Simpson Unit 2. One option reviewed as part of this study analysis was the addition of a 40 MW combustion turbine located in the Rapid City area.

The reliability of the 230 kV Bulk Transmission System in the Black Hills and Northeast Wyoming area is strongly affected by an outage of the Wyodak unit. The performance of the 230 kV Bulk Transmission System is further limited when the Wyodak unit outage is combined with an outage of one of the 230 kV injection lines: Dave Johnston to Yellowcake, Wyodak to Buffalo, or Hot Springs to Stegall.

Previous study work performed jointly by Basin Electric Power Cooperative and Black Hills Power & Light identified the need for the Spearfish to Yellow Creek to Osage 230 kV line. Local area voltage problems in the Rapid City and Northern Hills area occur

when the loads are served from long radial 230 kV transmission lines for outages of the Spearfish to Hughes and Rapid City to Hot Springs 230 kV lines. The addition of the Osage to Yellow Creek 230 kV line section along with the existing Spearfish to Yellow Creek 230 kV line section will provide the required support to the Rapid City and Northern Hills area loads by intersecting the Wyodak to Osage to Hot Springs line at Osage. The Osage to Yellow Creek to Spearfish 230 kV line will eliminate the long radial line service during the limiting outage conditions of the Spearfish to Hughes and Rapid City to Hot Springs 230 kV lines. The addition of the Osage to Yellow Creek 230 kV line segment will provide backup service to the Kirk area (Deadwood/Lead) for outage of the Spearfish to Yellow Creek 230 kV line.

Voltage instability and power flow outage analyses were performed on the transmission system. Steady state voltage instability in electric power networks is characterized by a progressive decline of voltage, which can occur because of the inability of the network to meet increasing demand for reactive power. In the limiting systems investigated the Wyodak unit is the primary source of voltage control and reactive support in the area. The additional loss of major injection line sections with the Wyodak unit off line results in heavier line loadings, increased reactive power losses, and reduced var support (line charging) from the remaining lines. The effect is loss of voltage support to serve the area load possibly resulting in area black outs.

Acceptable operating conditions for the 230 kV Bulk Transmission System are achieved in the study analysis through the use of Rapid City combustion turbines, capacitor additions, or additional transmission. It is Black Hills Power & Light's operating procedure to bring the Rapid City combustion turbines on line when necessary to support the local and bulk transmission systems. The combustion turbines will need to be operated during heavy load periods in anticipation of a severe contingency.

Rapid City combustion turbine operational guides were determined for many system scenarios with the Wyodak unit on or off. System limits were determined with the Wyodak unit off with support from all Rapid City combustion turbines.

There are two types of Bulk System transmission limitations reached in the 1995 to 2000 time period. The loss of a major injection line with the Wyodak unit off is a severe outage for the entire Black Hills and Northeast Wyoming area. The loss of one of the two 230 kV lines into the Rapid City and Northern Hills area prior to the Osage to Yellow Creek 230 kV addition is a critical outage for the Rapid City and Northern Hills area. This second limitation is less dependent on the Wyodak unit status than the first limitation.

The existing system with the Wyodak unit off and prior to the addition of Neil Simpson unit 2 is expected to meet criteria through the 1995 summer season and the 1993/94 winter season. The 1994/95 winter season with the Wyodak unit off would not meet criteria assuming the NSS unit 2 comes on line as scheduled in November of 1995, but the 1994/95 winter peak is only 1 MW higher than this system's winter Total Area Load limit. Criteria could be met through the planned addition of the NSS unit 2 if the Wyodak unit is on line.

The post NSS 2 system with the Osage to Dumont 69 kV line retired prior to addition of the Osage to Yellow Creek 230 kV line with the Wyodak unit off is expected to meet criteria through the 1997 summer season and the 1998/1999 winter season. The Osage to Yellow Creek 230 kV line addition is required prior to the 1998 summer season. The results indicate the timing requirements for the Osage to Yellow Creek 230 kV line are essentially the same if the Wyodak unit is on line. The results also indicate the addition of capacitors at Rapid City could delay the Osage to Yellow Creek 230 kV line by one year based on the summer limitation. This is not a recommended solution due to the short duration of the support provided by capacitors.

The post NSS 2 post Osage to Yellow Creek 230 kV line system with the Wyodak unit off is expected to meet criteria through the 2000 summer and 1998/99 winter season. The 1999/2000 winter season with the Wyodak unit off would not meet criteria, but the 1999/2000 winter peak is only 1 MW higher than this system's winter Total Area Load limit. This system could meet criteria well beyond the 2000 time period if the Wyodak unit is assumed on line during peak load conditions.

The post NSS 2, post Osage to Yellow Creek 230 kV line, and post 40 MW Rapid City combustion turbine system with the Wyodak unit off is expected to meet criteria beyond the 2002 summer season and through the 2000/2001 winter season. Based on these results other Bulk Transmission System additions should not be required until around 2002.

2.0 Introduction

This report presents the study results performed to determine acceptable operating conditions for the 230 kV electrical transmission system in the Black Hills and Northeast Wyoming area (referred to in the remainder of this report as the Bulk System) during the 1995 to 2000 time period. The analysis performed included system intact and post adjustment post outage power flow analysis as well as voltage instability analysis.

The parties to the contract titled *Agreement for Transmission Service and the Common Use of Transmission Systems* are required to periodically jointly study the transmission system. Several facilities have been added to the transmission system since the last joint study completed in 1990, titled *Operating Conditions for the Black Hills and Northeastern Wyoming Area 230 kV Transmission System 1991-1995 including the Spearfish-Kirk 230 kV Line Addition*. The two major additions are listed below and are included as part of the existing system in all the case work performed in this study analysis.

1. The Spearfish to Yellow Creek (Kirk) 230 kV line and Yellow Creek 230/69 kV transformer and the associated rerouting of 69 kV lines between the Kirk 69 kV substation and the Yellow Creek 230/69 kV substation.
2. The Hughes 230/69 kV substation on the Wyodak to Spearfish 230 kV line and interconnection to the 69 kV system near the Rozet 69 kV substation.

Black Hills Power & Light is presently constructing an 80 MW Neil Simpson Unit 2 (NSS 2) near the existing Wyodak unit in Northeastern Wyoming. It is presently scheduled to be in service in November 1995. This addition was incorporated into the study work and results are presented within the report.

The need for the Osage to Yellow Creek to Spearfish 230 kV line has been identified in previous joint study work. The Spearfish to Yellow Creek 230 kV line section was placed into service in 1993. The Osage to Yellow Creek 230 kV line addition was incorporated into the study analysis and the results and timing requirements are presented in the report. The addition of 230 kV capacitors at Rapid City was investigated as a means to delay this 230 kV line addition.

Black Hills Power & Light's projected resource plans indicate a 40 MW combustion turbine may be required in the latter 1990s. A 40 MW unit located in the Rapid City area was briefly investigated and the results are presented.

A geographical map of the 230 and 69 kV transmission system in the area and the additions that were studied is included as Figure 1.

Major existing elements affecting reliability of the Bulk System are:

- The Wyodak 320 MW steam coal-fired generating unit located near Gillette, Wyoming.
- The 230 kV transmission grid within the Black Hills and Northeastern Wyoming area.
- The three 230 kV transmission lines (Dave Johnston to Yellowcake, Wyodak to Buffalo, and Hot Springs to Stegall) that connect the area to the rest of the interconnected western system. These three lines will be referred to throughout this report as injection lines.
- The 69 kV subtransmission and distribution system with the associated 230/69 kV load tap changing (LTC) transformers. This system will be referred to in the remainder of this report as the subtransmission system.
- The approximate 100 MW of Rapid City combustion turbine generation. These combustion turbines will be referred to in the remainder of this report as RCCTs.
- The approximate 85 MW of Black Hills Power & Light coal-fired generation dispersed throughout the Black Hills and Northeast Wyoming area.

3.0 Study Objectives

The reliability of the entire Black Hills and Northeast Wyoming area is dependent on the reliability of the Bulk System. The reliability of the Bulk System is affected by the status of the internal generation. The largest single unit is the Wyodak unit. The objectives of this study were to:

- Determine acceptable operating conditions for the Black Hills and Northeast Wyoming Area transmission system in the 1995 to 2000 time period.
- Determine limitations of the Bulk System in the 1995 to 2000 time period.
- Determine the timing of the Osage to Yellow Creek 230 kV addition within the 1995 to 2000 time period.

Study results are presented in terms of total Black Hills and Northeast Wyoming Area load (Total Area Load). Where timing considerations are of concern (i.e. Osage to Yellow Creek 230 kV line), the Total Area Load is referenced to a year based on the most recent load forecasts. Base systems with the Wyodak unit off were utilized to determine the limitations of the Bulk System and the timing of the Osage to Yellow Creek 230 kV line because of the possibility of this unit being off line during peak periods.

4.0 Study Procedure

The cases run to meet the study objectives were performed on Basin Electric Power Cooperative's SUN workstation facilities using the PTI PSS/E power system simulation software package.

4.1 Study Models

Peak load base cases were developed from the following WSCC data cases. Updates to the WSCC data cases supplied with the WSCC data cases were incorporated.

- 1995 Summer - from WSCC 1995 HS1 base case - NW/SW intertie schedule - 3080 MW AC / 1410 MW DC
- 1995/96 Winter - from WSCC 1995/96 HW2 base case - NW/SW intertie schedule - 2500 MW AC / 1142 MW DC

The following changes were made to these models to more accurately represent the power system in the study area.

1. Miles City, Sidney, and Stegall DC ties were modeled in detail. The Miles City DC tie was scheduled as in the corresponding original WSCC data case, 100 MW east to west in the winter and 22 MW east to west in the summer. The Sidney and Stegall DC ties were scheduled at 100 MW west to east to represent a worst case scenario.
2. The Black Hills and Northeast Wyoming area subtransmission system was added in detail. The Bulk Transmission System is connected to the subtransmission system with 230/69 kV transformers at Spearfish, Rapid City, Hot Springs, Yellow Creek, Wyodak, and Hughes. There is approximately 85 MW of coal fired steam generation dispersed throughout the 69 kV system. Some radial 69 kV lines and loads were not modeled in detail, but these loads were represented on the bus serving the radial line. The new 69 kV routing in the Yellow Creek/Kirk area associated with the addition of the Spearfish to Yellow Creek 230 kV line and the Yellow Creek 230/69 kV substation was incorporated. The 69 kV line rerouting presently being done around Neil Simpson was incorporated into the post NSS 2 cases.
3. The Black Hills Power & Light internal coal fired generation was represented in

detail.

4. Wyodak net generation was represented as 322 MW in the summer and winter cases.
5. Area loads were represented as described in Section 4.1.1.
6. Any changes to the local area detail for generation and load representation from the WSCC base case were accounted for at the Laramie River Station.
7. Impedance and modeling updates were made to the subtransmission system in the study area.

4.1.1 Loads Used in the Study

Electrical loads in the Black Hills and Northeast Wyoming area were obtained from the 1990 Black Hills Power & Light / Black and Veatch ten-year planning forecast for Black Hills Power & Light loads and from the 1990 Power Requirements Study (PRS) for cooperative loads. These loads were then modeled for Tri-County Electric Association, Black Hills Power & Light, Black Hills Electric Cooperative, and Butte Electric Cooperative and are listed in Table 2 for the two base case study seasons. Tables 3 and 4 list electrical peak load distribution by bus for the 1995 summer and 1995/96 winter seasons, respectively.

The study cases were constructed and run utilizing the 1990 forecasted loads. During the study work, the 1992 Black Hills Power & Light / Black and Veatch ten-year planning forecast and the 1992 Power Requirements Study became available. Table 1 lists the estimated electrical peak loads in the Black Hills and Northeast Wyoming area by utility for the two base case study seasons based on these 1992 forecasts. The study results are presented in terms of Total Area Load and are referenced to a year based on the 1992 load forecasts.

Table 5 lists the Black Hills Power & Light Rapid City/Northern Hills area loads as well as Black Hills Power & Light and Cooperative Total Area Loads for the 1995 Summer and 1995/96 Winter peaks based on the 1990 and 1992 load forecasts. In general, the 1992 forecasts are higher than the 1990 forecasts. The higher forecasted loads in 1992 over those projected in 1990 in the Rapid City and Northern Hills area indicate the timing of the Osage to Yellow Creek 230 kV line addition will be required earlier to provide support to the area.

4.1.2 System Additions

The system additions considered and analyzed in the time frame of this study work were:

- Neil Simpson Unit 2
- Osage to Yellow Creek 230 kV line
- Rapid City 230 kV Capacitors
- 40 MW Rapid City Combustion Turbine

Neil Simpson Unit 2 (NSS 2) is an 80 MW net coal-fired generating unit presently under construction by Black Hills Power & Light and scheduled to be in service in November 1995. It was modeled in this study work interconnected to the 69 kV system at the Wyodak and Neil Simpson Unit 1 69 kV busses. The power flow modeling data used in the study work is listed in Table 6.

The Osage to Yellow Creek 230 kV line addition is approximately 43 miles long and will use the existing Osage to Dumont 69 kV line right-of-way. The Osage to Dumont 69 kV line will be retired and is therefore modeled out of service in the study cases that include the Osage to Yellow Creek 230 kV line. In determining the timing of the Osage to Yellow Creek 230 kV line, cases were run with the Osage to Dumont 69 kV line out of service prior to addition of the Osage to Yellow Creek 230 kV line because during construction of the Osage to Yellow Creek 230 kV line there will be a period of time when neither is in service. It is important that reliability is not jeopardized during this construction period. The power flow modeling data for the Osage to Yellow Creek 230 kV line is listed in Table 7.

Several cases were run with capacitors represented at Rapid City as an alternative to the Osage to Yellow Creek 230 kV line addition. As many as 50 MVARs were modeled at the Rapid City 230 kV bus in 10 MVAR banks.

Black Hills Power & Light's present resource plans indicate a need for additional generation in the latter 1990s. A 40 MW combustion turbine modeled at the Rapid City North 69 kV bus was investigated as part of this study analysis. Several cases were run with this addition with the NSS 2 and Osage to Yellow Creek 230 kV additions in service. The power flow modeling data for this addition is listed in Table 8.

4.2 Study Criteria

Case results were analyzed to check conformance with the criteria for system intact and single element outage conditions.

The only large generation unit within the Black Hills and Northeast Wyoming area is the Wyodak machine which is operated by Pacific Power and Light. The Wyodak unit as with any coal fired steam generating unit has had forced and scheduled outages in the past. The Wyodak machine has been off line during a Black Hills area peak condition twice in the past eight years, either from scheduled maintenance or extended forced outages. Therefore it is prudent to consider a transmission line contingency with the Wyodak unit off line.

In addition, the North American Electric Reliability Council (NERC) Generating Unit Statistics for 1988-1992 indicate the Availability Factor for coal fired generating units in the 300 to 400 MW range is approximately 82%, while the 1993 Mid-Continent Area Power Pool (MAPP) Bulk Transmission System Outage Report indicates the MAPP availability for sustained outages for 230 kV lines for 1987-1992 was approximately 97%.

For these reasons, system "limits" were determined with the Wyodak unit off as a base condition. Operating guides (i.e. Rapid City combustion turbine guides) were developed for both Wyodak on and Wyodak off conditions.

4.2.1 Power Flow Criteria

System Intact

- Voltages of 0.95 p.u. to 1.05 p.u. on the Bulk System were considered acceptable.
- Maximum transformer and transmission line loadings of 100% were considered acceptable.

Single Element Outages

- Voltages of 0.90 p.u. to 1.10 p.u. on the Bulk System were considered acceptable.
- Maximum transformer and transmission line loadings of 100% were considered acceptable.

4.2.2 Voltage Instability Criteria

The voltage instability analysis was performed using the following techniques and criteria to analyze the system.

QV Curves

A discussion of QV curve application for voltage instability analysis can be found in a document assembled by the Voltage Instability Task Force of the Western Systems Coordinating Council (WSCC) titled *Voltage Instability Analysis*. Appendix 3 of that document is included in Appendix J. QV curves were created for a select set of severe single element outages using the following criteria.

- The critical voltage was required to be below 0.95 p.u. and preferably below 0.90 p.u. In instances where the critical voltage was between 0.90 p.u. and 0.94 p.u., case results were considered acceptable provided there was at least 0.05 p.u. margin between the critical voltage and the operating point on the QV curve (the point where the curve crosses the 0 MVAR axis).
- A 30 MVAR margin was required for outages that affect the entire area (i.e. Wyodak unit, Dave Johnston to Yellowcake, etc.).
- A 20 MVAR margin was required for outages that affect the local Rapid City/Spearfish/Northern Hills area (i.e. Hughes to Spearfish 230 kV outage prior to the Osage to Yellow Creek 230 kV addition).

PV Curves

Several PV curves were run to compare PV curve results to QV curve results with regards to the timing requirements for the Osage to Yellow Creek 230 kV line addition. The PV results were not used as a limiting criteria but rather as a verification tool. A general description of PV curve application for voltage instability analysis is included as Appendix K. The criteria utilized was as follows.

- The lowest acceptable operating point (the highest acceptable Total Area Load) on the PV curve is where the curve crosses the 0.90 p.u. voltage line.
- A 10% margin in Total Area Load from the nose of the PV curve was required. Using this criteria the limit is calculated as 0.90 x Pcrit.

4.3 Study Assumptions

The following assumptions were made in creating the base cases and running the outage cases.

- The winter and summer base cases were created as previously stated in Section 4.1.
- Only area loads were updated from the WSCC case. The generation was added in the study area as stated in Section 4.1.
- Load changes in the study were accounted for at the Missouri Basin Power Project (MBPP) Laramie River Station's (LRS) two west side units.
- Generation was increased at the Coulee unit in the Pacific Northwest to account for the Wyodak unit off line as a base condition. This is consistent with the procedure used in joint studies in the past.
- When generation other than Wyodak is off line as a base condition it is accounted for at LRS.
- The swing bus is allowed to account for the loss of the Wyodak unit. The swing bus in both the summer and winter cases is bus 12217 PTS7SWNG in Pacific Gas and Electric's (PG&E) area 12.
- The system "limit" by case studies is the maximum Total Area Load (in 5% increments) that meets QV and post adjustment outage power flow study criteria with all four RCCTs on line.
- Linear interpolation was performed to refine the system "limit" within the 5% load increments.
- RCCT generation increases were accounted for at LRS.
- Each of the four RCCTs modeled was assumed capable of 25.3 MW output with +14, -5 MVAR limits in the winter and 16.9 MW output with +11, -8 MVAR limits in the summer. This is a very important assumption since the RCCTs are relied on during severe system contingencies. The real and reactive power output from the RCCTs is beneficial under outage conditions. The reactive power output provides VARs directly to the system and the real power output, internal to the area, decreases line loadings and frees up VARs for the rest of the system.
- The modeling of the real power output and reactive power limits for the other Black Hills Power & Light internal generation is an important assumption and was modeled as follows:

	SUMMER			WINTER		
	MW	MVAR		MW	MVAR	
Neil Simpson	14.6	+15	-10	18.6	+13	-9
Osage 1	10.1	+5	-2	10.1	+5	-2
Osage 2	10.1	+5	-2	10.1	+5	-2
Osage 3	10.1	+5	-2	10.1	+5	-2
Kirk 4	16.1	+8	-5	16.1	+8	-5
Ben French	21.6	+12	-8	21.6	+12	-8
Total	82.6			86.6		

- Single contingencies were run.
- The fictitious synchronous condenser for QV analysis was applied at either the Rapid City or Wyodak 230 kV bus depending on the system conditions and outage studied.
- The QV curves are run with LTC taps and shunts locked in the pre contingency setting and represent the post contingency pre adjustment time frame. Loads were modeled as constant MVA.
- The bus monitored in the PV analysis was the Rapid City or Wyodak 230 kV bus depending on the system conditions and outage studied.
- The outage power flows and PV curves are run with LTC taps and switched shunts enabled to adjust and represent the post contingency post adjustment time frame.
- RCCT operating guides were determined for Wyodak on and Wyodak off summer and winter conditions. System "limits" were determined with Wyodak off, except for the timing of the Osage to Yellow Creek 230 kV line addition which was determined with Wyodak off and then checked with Wyodak on.
- The RCCTs impose no starting load on the system and are assumed capable of starting if the system voltage is 69 kV plus 10% or minus 13% and the system frequency is 60 hertz plus or minus 0.25 hertz. They have a seven to ten minute start time.
- The RCCTs were required to be on prior to the outage because of the uncertainty of being able to start them should low voltages occur.

4.4 Study Method

This section briefly describes the study methodology used and the manner in which the study results are presented. The planned future additions with combinations of Wyodak unit status were studied to meet the study objectives for the summer and winter base

cases. The study systems were:

- Existing system, Wyodak on
- Existing system, Wyodak off
- Wyodak off, NSS 2 in, Osage to Dumont 69 retired
- Wyodak on, NSS 2 in, Osage to Dumont 69 retired
- Wyodak off, NSS 2 in, Osage to Dumont 69 retired, Caps at Rapid City
- Wyodak on, NSS 2 in, Osage-Yellow Creek 230 in
- Wyodak off, NSS 2 in, Osage-Yellow Creek 230 in
- Wyodak off, NSS 2 in, Osage-Yellow Creek 230 in, 40 MW Rapid City CT in
- Wyodak on, NSS 2 off, Osage-Yellow Creek 230 in

RCCT Operating Guidelines were determined for a given study system by determining the maximum Total Area Load, scaled in 5% increments, that could be served with support from the RCCTs and still meet study criteria for a single element outage. RCCTs are assumed on line in anticipation of the disturbance because voltage collapse can occur in such a time frame that there is no guarantee an operator could respond in time. Even if an operator could respond in time, there is no guarantee the RCCT starting criteria assumption in Section 4.3 could be met under a severe contingency

situation. RCCT operating guides were determined for Wyodak on and Wyodak off conditions.

System "limits" for a given study system were determined with the Wyodak unit off as a base condition and with all four RCCTs on line by determining the maximum Total Area Load, scaled in 5% increments, that could be served and still meet study criteria for a single element outage.

4.4.1 Case Name Convention

The case name convention utilized in this study is a string of alpha numeric character codes indicating the conditions in the case. The first eight characters describe base conditions in the predisturbance power flow. The last four characters are an outage code. Figure 2 illustrates the case name convention in more detail.

4.4.2 Method Of Presenting Results

Acceptable cases were first determined by voltage instability analysis and then verified with post contingency power flow cases.

An example of the QV curve results are presented in Figure 3. In the table for a given case listed from left to right are the case name, Total Area Load, and QV curve results for the various outages run. The outages are listed by their code name. A list is included at the bottom of Figure 3.

The code name is a two part code separated by a period (.). The first part is a four letter code indicating the contingency. The second part is a two letter code indicating the 230 kV bus location where the QV curve analysis was performed (i.e. location of the fictitious VAR source).

The results presented for each curve are two and sometimes three numbers separated by a slash. First is the critical voltage (voltage instability point) in p.u. Second is the reactive power margin in MVARs between the critical voltage and the operating point. If the critical voltage is between 0.90 p.u. and 0.94 p.u. and the reactive power margin meets criteria, the third number is the operating point (point where the curve crosses the 0 MVAR line).

An example of the PV curve results are presented in Figure 4. In the table from left to right are the case name, Total Area Load, contingency, and the Total Area Load limits based on the PV criteria. In most instances the power flow doesn't solve as the knee is approached, so the knee was determined to be the last solved case or the first unsolved case. The outage codes are defined at the bottom of the figure.

Power flow results are presented on a "results grid" sheet. Figure 5 is an example of a "results grid".

A series of cases within a "results grid" are based on outages of different facilities. On a particular "results grid" a change in horizontal position indicates that a different facility outage was examined. A particular sheet summarizes the Bulk System outages run on a particular base case condition at various load levels.

A rectangular box was drawn at the appropriate location on the grid sheet indicating that case was run. Facts about the case results can be determined from the type and amount of information contained within each small rectangular box. Each rectangular box can have up to four lines of information.

- Line one will contain either nothing, a U or a NS. If line one is blank, the case meets Bulk System criteria and is therefore acceptable. If line one contains a U, the case does not meet Bulk System criteria and is unacceptable. If line one contains a NS, that particular power flow could not reach solution.

- Line two lists the lowest 230 kV voltage if it is lower than 0.95 p.u. It lists the highest 230 kV voltage if higher than 1.05 p.u. This is not the study criteria but is included as a flag that study criteria is being approached.

- Line three contains overload codes and LTC information. A definition of these codes is included as Figure 6.

- Line four lists the lowest voltage on the subtransmission system if it is lower than 0.95 p.u. It lists the highest voltage on the subtransmission system if higher than 1.05 p.u. This is not the study criteria but is included as a flag that study criteria is being approached.

Appendices A through I contain the QV results tables, PV results tables, and the power flow results grids for the base systems studied. Volume 2 of the report contains power flow plots and QV and PV curves of select cases, also organized into base systems.

5.0 Results

The results of the voltage instability analysis and power flow case analysis for each base system studied are included in this section.

In general loss of the Wyodak to Hughes 230 kV line resulted in heavy loading and sometimes overloading of the Wyodak 230/69 kV transformers and the Wyodak to Rozet 69 kV line. This outage also resulted in power flow from the 69 to the 230 kV system on the Hughes 230/69 kV transformer. The most viable solution in resolving the reverse power flow and overloading conditions was to trip the Hughes 230/69 kV transformer during reverse power flow through the transformer. A reverse power flow relay has been installed at the Hughes transformer to perform this function. Cases with and without tripping the Hughes transformer on reverse power flow for this outage are included for most of the systems studied.

Overload of the Osage Unit 2 step up transformer (OL03) occurred in some of the outage cases run, but was not considered a system limitation. Also, it has been rewound at a higher MVA rating, although not as a result of this study work.

5.1 Existing system, Wyodak on (Appendix A)

The existing system with the Wyodak unit on was studied primarily to determine RCCT operating guides for this system prior to the NSS 2 addition.

Summer

The QV results in Table QV-A indicate the existing system with the Wyodak unit on can support a summer Total Area Load of 429 MW with no RCCT operation. This system can support a summer Total Area Load of 524 MW with all four RCCTs on line. Case results are included in Table QV-A that determine the required RCCT operation between these two Total Area Load values. The limiting contingency is loss of the Spearfish to Hughes 230 kV line (SFHN) which leaves only one 230 kV line to serve the Rapid City/Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition.

The power flow results grid sheet shows the entire cross section of Bulk System outage cases meet study criteria at a summer Total Area Load of 476 MW with two RCCTs on as determined in the QV analysis. This corresponds to the 1995 summer season peak based on the 1990 load forecasts. The 1992 load forecast indicates a summer Total Area Load of 470 MW occurring in 1993 and 484 MW in 1994.

The entire cross section of outages was run on this system because the NSS 2 is scheduled to be on line in November 1995. The most critical Bulk System outages meet power flow study criteria at the Total Area Load of 524 MW with all four RCCTs on line. This corresponds to the 1997 summer peak based on the 1992 load forecasts. The actual Total Area Load limit with four RCCTs on was not determined because it is well beyond the period when NSS 2 will come on line.

The power flow results grid sheet indicates that the lowest voltages on the system for a Bulk System contingency occur for the Spearfish to Hughes 230 kV line outage (SF-HN). As in the QV analysis for this system, this is the most severe Bulk System outage because it leaves only one 230 kV line to serve the Rapid City/Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition.

The RCCT operation guides based on the results in Table QV-A and the power flow grid sheet are included as Table 9. Results indicate the existing system with the Wyodak unit on and four RCCTs on can serve a summer peak load of 524 MW (1997 summer peak based on 1992 forecasts) for loss of the Spearfish to Hughes 230 kV line.

Winter

The QV results in Table QV-A indicate the existing system with the Wyodak unit on can support a winter Total Area Load of 480 MW with no RCCT operation. This system can support a winter Total Area Load of 586 MW with two RCCTs on line. This was the highest winter Total Area Load studied for the existing system. Case results are included in Table QV-A that determine the required RCCT operation between these two Total Area Load values. The limiting contingency is loss of the Spearfish to Hughes 230 kV line (SFHN) which leaves only one 230 kV line to serve the Rapid City/Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition. Of note also is that the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is approximately 0.91 p.u. This meets the study criteria because the operating voltage from the QV curve is greater than 1.00 p.u.

The power flow results grid sheet shows the entire cross section of outage cases, other than the Wyodak to Hughes 230 kV outage (WYHN), meets study criteria at a winter Total Area Load of 533 MW with one RCCT on. This corresponds to the 1995/96 winter season peak based on the 1990 load forecasts. The 1992 load forecasts indicate a winter Total Area Load of 519 MW occurring in 1994/95 and 534 MW in 1995/96.

The entire cross section of outages was run on this system because BHPL's NSS 2 is scheduled to be on line in November 1995. The worst outages meet power flow study criteria at the Total Area Load of 586 MW with two RCCTs on line. This is through the 1998/99 winter peak based on the 1992 load forecasts. The actual Total Area Load limit with four RCCTs on was not determined because it is well beyond the period when NSS 2 will come on line.

The power flow results in the grid sheet indicate that the lowest voltages on the system for a Bulk System contingency occur for the Spearfish to Hughes 230 kV line outage (SFHN). As in the QV analysis for this system, this is the most severe Bulk System outage because this leaves only one 230 kV line to serve the Rapid City/Spearfish/ Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition. Tripping the Hughes transformer on reverse power flow (WHN6) for loss of the Wyodak to Hughes 230 kV line (WYHN) alleviates the overloading of the Wyodak transformers and meets criteria.

The RCCT operating guides based on the results in Table QV-A and the power flow grid sheet are included as Table 9. Results indicate the existing system with the Wyodak unit on and two RCCTs on can serve a winter peak load of 586 MW (through 1998/99 winter peak based on 1992 forecasts) for loss of the Spearfish to Hughes 230 kV line.

5.2 Existing system, Wyodak off (Appendix B)

The existing system with the Wyodak unit off was studied for two reasons. The first to determine RCCT operating guides for this system prior to NSS 2. The second to determine when this system no longer meets study criteria and compare it to the timing of the NSS 2 unit.

Unless otherwise noted, the control voltages for NSS 1, Ben French, and the RCCTs in the existing system, Wyodak off cases were reduced from 1.02 p.u. to 1.00 p.u. to prevent high voltages on the Bulk System (especially in the Rapid City/Northern Hills area) in the system intact cases and some outage cases.

Summer

The QV results in Table QV-B indicate the existing system with the Wyodak unit off can support a summer Total Area Load of 357 MW with no RCCT operation. This system can support a summer Total Area Load of 500 MW with all four RCCTs on line. Case results are included in Table QV-B that determine the required RCCT operation between these two Total Area Load values. The limiting contingency is loss of the Hot Springs to Rapid City 230 kV line (HSRC).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 476 MW with three RCCTs on and 500 MW with four RCCTs on. These Total Area Loads correspond to the 1995 summer peak and through the 1997 summer peak based on the 1990 load forecasts. The 1992 load forecasts indicate a summer Total Area Load of 496 MW occurring in 1995 and 511 MW in 1996.

The power flow results in the grid sheet indicate that the lowest voltages on the system for a Bulk System contingency are in the 0.90 p.u. to 0.92 p.u. range for a number of Bulk System 230 kV line outages, including Dave Johnston to Yellowcake (DJYC), Hot Springs to Rapid City (HSRC), Hot Springs to Stegall (HSST), Spearfish to Hughes (SFHN), and Wyodak to Hughes (WYHN).

The RCCT operating guides based on the results in Table QV-B and the power flow grid sheet are included as Table 10. These results indicate the existing system with the Wyodak unit off and all four RCCTs on can serve a summer peak load of 500 MW (through 1995 summer peak based on 1992 forecasts) for several severe Bulk System outages.

Winter

The QV results in Table QV-B indicate the existing system with the Wyodak unit off can support a winter Total Area Load of 400 MW with no RCCT operation. This system can support a winter Total Area Load of 506 MW with all four RCCTs on line. Case results are included in Table QV-B that determine the required RCCT operation between these two Total Area Load values. The limiting contingency is loss of the Dave Johnston to Yellowcake 230 kV line (DJYC).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 506 MW with all four RCCTs on, except

outage of the Dave Johnston to Yellowcake 230 kV line (DJYC), which results in the lowest Bulk System voltage of 0.89 p.u. A case with NSS 1, Ben French, and the RCCT control voltages raised from 1.00 p.u. to 1.02 p.u. for this outage (nd4aae95.djyc) resulted in the lowest Bulk System voltages being 0.93 p.u. It was therefore assumed cases meet criteria at a winter Total Area Load of 506 MW since the QV results were acceptable and the one post adjustment power flow case that violates criteria meets criteria with the area unit control voltages increased from 1.00 p.u. to 1.02 p.u. A winter Total Area Load of 506 MW is through the 1992/93 winter season peak based on the 1990 load forecasts. The 1992 load forecasts indicate a winter Total Area Load of 505 MW occurring in 1993/94 and 519 MW occurring in 1994/95. The power flow results in the grid sheet also indicate that the lowest voltages on the system for a Bulk System contingency occur for the Dave Johnston to Yellowcake 230 kV line outage (DJYC).

The RCCT operating guides based on the results in Table QV-B and the power flow grid sheet are included as Table 10. These results indicate the existing system with the Wyodak unit off and all four RCCTs on can serve a winter peak load of 506 MW (through 1993/94 winter peak based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake 230 kV line.

5.3 Wyodak off, NSS 2 in, Osage to Dumont 69 retired (Appendix C)

The post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit off was studied to determine the timing requirements of the Osage to Yellow Creek 230 kV line. The Osage to Dumont 69 kV line is considered retired in this analysis because its right-of-way will be utilized for the Osage to Yellow Creek 230 kV line. There will be a period of time during construction of the 230 kV line when neither the 230 or the 69 kV line will be in service.

Summer

The QV results in Table QV-C in Appendix C indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit off can support a summer Total Area Load of 524 MW with all four RCCTs on line. The limiting contingency in terms of meeting the VAR margin criteria is loss of the Hot Springs to Rapid City 230 kV line (HSRC) or loss of the Spearfish to Hughes 230 kV line (SFHN). Either of these outages leaves only one 230 kV line to serve the Rapid City/Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition. Of note also is the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is

in the 0.90 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is greater than 1.00 p.u.

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 524 MW with all four RCCTs on. The 1990 load forecasts indicate a summer Total Area load of 517 MW occurring in 1999 and 529 MW in 2000. The 1992 load forecasts indicate a summer Total Area Load of 524 MW occurring in 1997.

The power flow results in the grid sheet indicate that the lowest Bulk System voltages for a Bulk System contingency are 0.91 p.u. for the Spearfish to Hughes 230 kV line outage (SFHN). As in the QV analysis for this system, this is the most severe Bulk System outage because this leaves only one 230 kV line to serve the Rapid City/ Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition. The Hot Springs to Rapid City (HSRC) and Wyodak to Hughes (WYHN) 230 kV line outages result in Bulk System voltages as low as 0.93 p.u.

The results indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit off, and all four RCCTs on, can serve a summer peak Total Area Load of 524 MW (1997 summer peak based on 1992 forecasts) for loss of the Spearfish to Yellow Creek or Hot Springs to Rapid City 230 kV lines.

PV curves were run on the limiting case for several of the severe contingencies to verify the power flow outage and QV curve results because the limits of this system determine the timing of the Osage to Yellow Creek 230 kV line. PV curve results are summarized in Table PV-C. The summer Total Area Load limit for this system based on PV curve results is 509 MW for the Hot Springs to Rapid City or the Spearfish to Hughes 230 kV line outages to meet the 10% MW margin from the knee criteria. The PV curve results are more restrictive than the QV curve results for this system and if used as a criteria rather than a verification tool would require the Osage to Yellow Creek 230 kV line sooner.

Winter

The QV results in Table QV-C indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit off can support a winter Total Area Load of 586 MW with all four RCCTs on line. The limiting contingency in terms of meeting the VAR margin criteria is loss of the Dave Johnston to Yellowcake 230 kV line (DJYC). Of note also is the critical voltage from the QV curve for the Hot Springs to

Stegall 230 kV line outage (HSST) is in the 0.90 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is approximately 1.00 p.u.

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 586 MW with all four RCCTs on, except outage of the Dave Johnston to Yellowcake 230 kV line which results in the lowest Bulk System voltages of 0.89 p.u. The lowest Bulk System voltages below 0.95 p.u. are in the 0.93-0.94 p.u. range for the rest of the Bulk System contingencies. Therefore, in terms of absolutely meeting the criteria, the power flow results indicate this system can support a winter Total Area Load of 560 MW. A winter Total Area Load of 554 MW occurs in 1997/98 and 565 MW in 1998/99 based on the 1990 load forecasts. The 1992 load forecasts indicate a winter Total Area Load of 549 MW occurring in 1996/97 and 564 MW in 1997/98.

The results indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit off, and all four RCCTs on, can serve a winter peak load of 560 MW (through 1996/97 winter peak based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake 230 kV line.

5.4 Wyodak on, NSS 2 in, Osage to Dumont 69 retired (Appendix D)

The post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit on was studied to determine the timing of the Osage to Yellow Creek 230 kV line with Wyodak on in comparison to Wyodak off results. The Osage to Dumont 69 kV line is considered retired because its right-of-way will be utilized for the Osage to Yellow Creek 230 kV line and there will therefore be a period of time during construction of the 230 kV line where neither the 230 or 69 kV line will be in service.

Summer

The QV results in Table QV-D indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit on with all four RCCTs on can support a summer Total Area Load of 524 MW. The limiting contingency is loss of the Spearfish to Hughes 230 kV line (SFHN).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 524 MW with all four RCCTs on. The 1990 load forecasts indicate a summer Total Area load of 517 MW occurring in 1999

and 529 MW occurring in 2000. The 1992 load forecasts indicate a summer Total Area Load of 524 MW occurring in 1997. The power flow results in the grid sheet indicate that the lowest Bulk System voltages for a Bulk System contingency are 0.91 p.u. for the Spearfish to Hughes 230 kV line outage (SFHN).

The results indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit on, and all four RCCTs on, can serve a summer peak load of 524 MW (1997 summer peak based on 1992 forecasts) for loss of the Spearfish to Yellow Creek 230 kV line. This is basically the same result as with the Wyodak unit off except there are not as many limiting contingencies with the Wyodak unit on. Therefore, based on this summer analysis the timing requirements of the Osage to Yellow Creek 230 kV line are basically the same with the Wyodak unit off or on.

Winter

The QV results in Table QV-D indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit on can support a winter Total Area Load of 613 MW with all four RCCTs on line.

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 613 MW with all four RCCTs on. The 1990 load forecasts indicate a winter Total Area load of 613 MW is not reached until beyond the 2000/2001 winter season. The 1992 load forecasts indicate a winter Total Area Load of 610 MW occurring in 2000/2001 and 625 MW occurring in 2001/2002. The power flow results in the grid sheet indicate that the lowest Bulk System voltages for a Bulk System contingency are 0.92 p.u. for the Spearfish to Hughes 230 kV line outage (SFHN).

The results indicate the post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit on, and all four RCCTs on, can serve a winter peak load of 613 MW (through 2000/2001 winter peak based on 1992 forecasts) for loss of the Spearfish to Yellow Creek 230 kV line. The actual limit was not determined because these results are better than the corresponding winter season results with Wyodak off with regards to timing of the Osage to Yellow Creek 230 kV line. The summer season results therefore determine the timing requirements of the Osage to Yellow Creek 230 kV line for this system with Wyodak on.

5.5 Wydk off, NSS 2 in, Os to Dum 69 retired, Caps at Rapid City (Appendix E)

The post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit off, and capacitors at Rapid City, was studied to investigate the effect of capacitor additions on the timing requirements of the Osage to Yellow Creek 230 kV line. Capacitors were modeled at the Rapid City 230 kV bus in 10 MVAR banks. The Rapid City area generator control voltages (RCCTs and Ben French) were decreased from 1.02 p.u. to 1.01 p.u. in cases where Rapid City capacitors were added to prevent high voltage conditions, especially on the Bulk System, for many of the outages.

Summer

The QV results in Table QV-E indicate capacitor additions of 30 MVARs at Rapid City for the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit off can support a summer Total Area Load of 548 MW with all four RCCTs on line. This is an increase from 524 MW for the system without capacitors at Rapid City. The limiting contingency in terms of meeting the VAR margin criteria is loss of the Hot Springs to Rapid City 230 kV line (HSRC) or loss of the Spearfish to Hughes 230 kV line (SFHN). Either of these outages leaves only one 230 kV line to serve the Rapid City/Spearfish/Northern Hills area prior to the Osage to Yellow Creek 230 kV line addition. Of note also is that the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is in the 0.92 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is greater than 1.00 p.u. Note however that the critical voltage is 0.91 p.u. for the Hot Springs to Stegall 230 kV line outage (HSST), 0.91 p.u. for the Spearfish to Hughes 230 kV line outage (SFHN), and 0.89 p.u. for the Dave Johnson to Yellowcake 230 kV line outage (DJYC). These outages also meet criteria because their operating voltages are all in the neighborhood of 1.00 p.u. With the addition of capacitors at Rapid City, this is a significant increase in the number of outages where the critical voltage is above 0.90 p.u.

At a summer Total Area Load of 572 MW with 40 MVAR of capacitors at Rapid City the Hot Springs to Rapid City (HSRC) and Spearfish to Hughes (SFHN) 230 kV line outages do not meet the VAR margin criteria. At a summer Total Area Load of 572 MW with 50 MVAR of capacitors only the Spearfish to Hughes 230 kV line outage does not meet VAR margin criteria. However, critical voltages for several outages do not meet criteria, namely 0.95 p.u. for the Hot Springs to Rapid City (HSRC) 230 kV line outage and 0.96 p.u. for the Hot Springs to Stegall (HSST) 230 kV line outage.

Also, the critical voltage is 0.94 p.u. for the Spearfish to Hughes (SFHN) 230 kV line outage.

Post adjustment post fault outage power flow cases were not run. Assuming post fault power flow cases would be acceptable, this system could support a summer Total Area Load limit of 548 MW, or through the 1998 summer peak season. The 1992 load forecasts indicate 538 MW occurring in 1998 and 553 MW occurring in 1999. Without capacitor additions this system could support a summer Total Area Load of 524 MW or through the 1997 summer peak based on the 1992 forecasts. Therefore, based on these summer results capacitor additions delay the summer system limit by only one year and therefore are not recommended.

Winter

The QV results in Table QV-E indicate capacitor additions at Rapid City for the post NSS 2 system with the Osage to Dumont 69 kV line retired, the Wyodak unit off, and all four RCCTs on line, cannot support additional winter Total Area Load above the limit of 586 MW found in Appendix C without capacitor additions at Rapid City. At a winter Total Area Load of 613 MW the case with 30 MVARs of capacitors at Rapid City does not meet the VAR margin criteria for loss of the Dave Johnston to Yellowcake 230 kV line (DJYC). At a winter Total Area Load of 613 MW the case with 40 MVARs of capacitors at Rapid City does not meet criteria because the critical voltage is 0.95 p.u. for loss of the Hot Springs to Stegall 230 kV line outage (HSST). The critical voltage is 0.93 p.u. and 0.92 p.u. for the Hot Springs to Rapid City 230 kV line (HSRC) and the Spearfish to Hughes 230 kV line (SFHN) outages respectively.

The addition of capacitors at Rapid City does not result in an increase in the winter Total Area Load limit of 594 MW for the post NSS 2 system with the Osage to Dumont 69 kV line retired and the Wyodak unit off and all four RCCTs on line based on the critical voltage for the Hot Springs to Stegall 230 kV line outage (HSST). The critical voltages for the Hot Springs to Rapid City (HSRC) and the Spearfish to Hughes (SFHN) 230 kV line outages are also of concern.

5.6 Wyodak on, NSS 2 in, Osage-Yellow Creek 230 in (Appendix F)

The post NSS 2 post Osage to Yellow Creek 230 kV System with the Wyodak unit on was studied to determine RCCT operating guides for this system through the 2000 time frame.

Summer

The QV results in Table QV-F indicate the post NSS 2 post Osage to Yellow Creek 230 kV system with the Wyodak unit on can support a summer Total Area Load of 548 MW with no RCCT operation. This system can support a summer Total Area Load of 572 MW with one RCCT on line. The limiting contingency is loss of the Wyodak unit (WYDK).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 572 MW with one RCCT on. This is beyond the 2000 time frame based on the 1990 load forecasts. This is through the 2000 time frame based on the 1992 load forecasts which project the 2000 Total Area Load summer peak at 567 MW and the 2001 summer peak at 581 MW. The actual Total Area Load limit with four RCCTs on was not determined because it is well beyond the 2000 time period. The power flow results in the grid sheet also indicate the lowest Bulk System voltages are in the 0.92-0.94 p.u. range for the Bulk System contingencies run.

The guides for necessary RCCT operation based on the results in Table QV-F and the power flow grid sheet are included as Table 11. These results indicate the post NSS 2 post Osage to Yellow Creek 230 kV system with the Wyodak unit on and one RCCT on can serve a summer peak load of 572 MW (through the 2000 time frame based on 1992 forecasts) for loss of the Wyodak Unit.

Winter

The QV results in Table QV-F indicate the post NSS 2 post Osage to Yellow Creek 230 kV system with the Wyodak unit on can support a winter Total Area Load of 586 MW with no RCCT operation. This system can support a winter Total Area Load of 613 MW with one RCCT on line. The limiting contingency is loss of the Wyodak unit (WYDK).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 613 MW with one RCCT on. This is beyond the 2000 time frame based on the 1990 load forecasts. This is also beyond the 2000 winter peak based on the 1992 load forecasts which project the 2000/2001 Total Area Load winter peak at 610 MW and the 2001/2002 winter peak at 625 MW. The actual Total Area Load limit with four RCCTs on was not determined because it is well beyond the 2000 time period. The power flow results in the grid sheet also indicate 230 kV voltages are 0.94 p.u. or above for all of the Bulk System contingencies run.

The guides for necessary RCCT operation based on the results in Table QV-F and the power flow grid sheet are included as Table 11. These results indicate the existing system with the Wyodak unit on and one RCCT on can serve a winter peak load of 613 MW (through the 2000 time frame based on 1992 forecasts) for loss of the Wyodak Unit.

5.7 Wyodak off, NSS 2 in, Osage-Yellow Creek 230 in (Appendix G)

The post NSS 2 post Osage to Yellow Creek 230 kV system with the Wyodak unit off was studied to determine RCCT operating guides for this system through the 2000 time frame and to determine if this system meets study criteria through the 2000 time frame.

Summer

The QV results in Table QV-G indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit off can support a summer Total Area Load of 452 MW with no RCCT operation. This system can support a summer Total Area Load of 548 MW with all four RCCTs on line. Case results are also included in Table QV-G that determine the required RCCT operation between these two Total Area Load values. The limiting contingencies in terms of meeting the VAR margin criteria are loss of the Dave Johnston to Yellowcake (DJYC) or the Hot Springs to Stegall (HSST) 230 kV lines. Of note also is that the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is in the 0.90 p.u. to 0.92 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is in the 0.99 p.u. to 1.00 p.u. range.

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 548 MW with all four RCCTs on. This is beyond the 2000 summer peak based on the 1990 load forecasts. The 1992 load forecasts indicate a Total Area Load of 538 MW occurring in 1998 and 553 MW in 1999. The power flow results in the grid sheet indicate that the Bulk System voltages are 0.95 p.u. or above for the Bulk System contingencies run.

The guides for necessary RCCT operation, based on the results in Table QV-G and the power flow grid sheet, are included as Table 12. These results indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit off and all four RCCTs on can serve a summer peak load of 548 MW (through 1998 summer peak based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake or Hot Springs to Stegall 230 kV lines.

Winter

The QV results in Table QV-G indicate the existing system with the Wyodak unit off can support a winter Total Area Load of 480 MW with no RCCT operation. This system can support a winter Total Area Load of 586 MW with all four RCCTs on line. Case results are also included in Table QV-G that determine the required RCCT operation between these two Total Area Load values. The limiting contingency is loss of the Dave Johnston to Yellowcake 230 kV line (DJYC).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 586 MW with all four RCCTs on. This is through the 1999/2000 winter season based on the 1990 load forecasts. The 1992 load forecasts indicate a winter Total Area Load of 578 MW occurring in 1998/99 and 594 MW in 1999/2000. The power flow results in the grid sheet indicate the lowest Bulk System voltages are 0.91 p.u. for loss of the Dave Johnston to Yellowcake 230 kV line (DJYC).

The guides for necessary RCCT operation based on the results in Table QV-G and the power flow grid sheet are included as Table 12. These results indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit off and all four RCCTs on can serve a winter peak load of 586 MW (through 1998/1999 winter based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake 230 kV line.

5.8 Wydk off, NSS 2 in, Os-Ylw Crk 230 in, 40 MW RC CT in (Appendix H)

The post NSS 2 post Osage-Yellow Creek post 40 MW Rapid City CT system with the Wyodak unit off was studied to determine how long this system would meet study criteria.

Summer

The QV results in Table QV-H indicate the post NSS 2 post Osage to Yellow Creek post 40 MW Rapid City CT system with the Wyodak unit off can support a summer Total Area Load of 595 MW with all four RCCTs on line. The limiting contingency in terms of VAR margin criteria is loss of the Dave Johnston to Yellowcake 230 kV line (DJYC). Of note also is that the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is in the 0.91 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is in the 0.99 p.u. range.

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 595 MW with all four RCCTs on. This is beyond the 2000 summer peak based on the 1990 load forecasts. The 1992 load forecasts indicate a summer Total Area Load of 581 MW occurring in 2001 and 597 MW in 2002. The power flow results in the grid sheet indicate the lowest Bulk System voltages are 0.92 p.u. and 0.94 p.u. for the Dave Johnston to Yellowcake (DJYC) and the Hot Springs to Stegall (HSST) 230 kV line outages, respectively.

These results indicate the post NSS 2 post Osage to Yellow Creek post 40 MW Rapid City CT system with the Wyodak unit off and all four RCCTs on can serve a summer peak load of 595 MW (through the 2001 summer season based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake 230 kV line.

Winter

The QV results in Table QV-H indicate the post NSS 2 post Osage to Yellow Creek post 40 MW Rapid CT system with the Wyodak unit off can support a winter Total Area Load of 613 MW with all four RCCTs on line. The limiting contingency is loss of the Dave Johnston to Yellowcake 230 kV line (DJYC).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a winter Total Area Load of 613 MW with all four RCCTs on. This is beyond the 2000 time frame based on the 1990 load forecasts. The 1992 load forecasts indicate a winter Total Area Load of 610 MW occurring in 2000/2001 and 625 MW in 2001/2002. The power flow results in the grid sheet indicate the lowest Bulk System voltages are 0.90 p.u. for loss of the Dave Johnston to Yellowcake 230 kV line (DJYC).

These results indicate the post NSS 2 post Osage to Yellow Creek post 40 MW Rapid City CT system with the Wyodak unit off and all four RCCTs on can serve a winter peak load of 613 MW (through the 2000/2001 winter season based on 1992 forecasts) for loss of the Dave Johnston to Yellowcake 230 kV line.

5.9 Wyodak on, NSS 2 off, Osage-Yellow Creek 230 in (Appendix I)

The post NSS 2 post Osage to Yellow Creek system with the Wyodak unit on and the NSS 2 unit off was studied to determine RCCT operating guides for this system through the 2000 time frame.

Summer

The QV results in Table QV-I indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit on and the NSS 2 unit off can support a summer Total Area Load of 500 MW with no RCCT operation. This system can support a summer Total Area Load of 572 MW with two RCCTs on line. The limiting contingency is loss of the Wyodak unit (WYDK).

The power flow results grid sheet shows the entire cross section of outage cases meet study criteria at a summer Total Area Load of 572 MW with two RCCTs on. This is beyond the 2000 summer peak based on the 1990 load forecasts. The 1992 load forecasts indicate a summer Total Area Load of 567 MW occurring in 2000 and 581 MW in 2001. The actual Total Area Load limit with four RCCTs on was not determined because it is beyond the 2000 time period. The power flow results in the grid sheet indicate that the lowest Bulk System voltages are 0.94 p.u. for loss of the Wyodak unit (WYDK).

The guides for necessary RCCT operation based on the results in Table QV-I and the power flow grid sheet are included as Table 13. These results indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit on, the NSS 2 unit off, and two RCCTs on, can serve a summer peak load of 572 MW (through 2000 summer peak based on 1992 forecasts) for loss of the Wyodak unit.

Winter

The QV results in Table QV-I indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit on and the NSS 2 unit off can support a winter Total Area Load of 533 MW with no RCCT operation. This system can support a winter Total Area Load of 613 MW with two RCCTs on line. The limiting contingency in terms of meeting the VAR margin criteria is loss of the Wyodak unit (WYDK). Of note also is that the critical voltage from the QV curve for the Hot Springs to Stegall 230 kV line outage (HSST) is in the 0.90 p.u. to 0.91 p.u. range. The results for this outage meet the study criteria because the operating voltage from the QV curve is equal to or greater than 1.00 p.u.

The power flow results grid sheet shows the entire cross section of outage cases, other than the Wyodak to Hughes 230 kV outage (WYHN), meet study criteria at a winter Total Area Load of 613 MW with two RCCTs on. This is beyond the 2000 time frame

based on the 1990 load forecasts. This is also beyond the 2000 winter peak based on the 1992 load forecasts which project the 2000/2001 Total Area Load winter peak at 610 MW. The actual Total Area Load limit with four RCCTs on was not determined because it is well beyond the 2000 time period. The power flow results in the grid sheet also indicate the lowest Bulk System voltages are 0.91 p.u. for loss of the Wyodak unit (WYDK). Tripping the Hughes transformer on reverse power flow (WHN6) for loss of the Wyodak to Hughes 230 kV line (WYHN) alleviates the heavy loading on the Wyodak transformers and Wyodak to Rozet 69 kV line and meets criteria.

The guides for necessary RCCT operation based on the results in Table QV-I and the power flow grid sheet are included as Table 13. These results indicate the post NSS 2 post Osage to Yellow Creek system with the Wyodak unit on, the NSS 1 unit off, and two RCCTs on, can serve a winter peak load of 613 MW (through the 2000/2001 winter season based on 1992 forecasts) for loss of the Wyodak Unit.

6.0 System Limits

This section summarizes the system limit results presented in the previous section in terms of Total Area Load and projected year to occur, based on the 1992 load forecasts. The Wyodak unit is off and all 4 RCCTs on-line as a base condition in all of these systems. Table 14 summarizes the limits to be discussed here. Because the case work was run in 5% increments of Total Area Load, the system limits were refined using linear interpolation between the last acceptable case and the first unacceptable case in order to maximize the limit. The limits based on linear interpolation are included in Table 14 and discussed below.

There are two limitations reached in the 1995 to 2000 time period. The loss of the Dave Johnston to Yellowcake 230 kV injection line with the Wyodak unit off is a severe outage for the entire Black Hills and Northeast Wyoming area. This limitation is approached in the mid 1990s and is deferred with the addition of the planned NSS 2 unit. This limitation is again approached in the late 1990s and is deferred into the early 2000s with the addition of a 40 MW Rapid City combustion turbine in the late 1990s.

The second limitation encountered is loss of one of the two 230 kV lines into the Rapid City/Spearfish/Northern Hills area prior to addition of the Osage to Yellow Creek 230 kV line. The loss of the Spearfish to Hughes 230 kV line is the most severe. This is reached in the mid 1990s and is not as dependent on the Wyodak unit status as is loss of the injection line. The Osage to Yellow Creek 230 kV line addition defers this limitation past the 2000 time frame.

6.1 Existing System

The summer Total Area Load limit is 500 MW which is through the 1995 summer season based on the 1992 load forecasts. Interpolation of power flow outage results shows the summer Total Area Load limit is still 500 MW which is through the 1995 summer season.

The winter Total Area Load limit is 506 MW which is through the 1993/1994 winter season based on the 1992 load forecasts. Interpolation of power flow outage results

shows the winter Total Area Load limit is 518 MW which is through the 1993/94 winter season. The 1994/95 winter peak is 519 MW.

This system is expected to meet criteria through the 1995 summer season and the 1993/94 winter season based on 1992 load forecasts. The 1994/95 winter season would be the only season where criteria is not being met assuming the NSS 2 unit comes on line as scheduled in November of 1995, but the 1994/95 winter peak is only 1 MW higher than this system's winter Total Area Load limit of 518 MW.

If the Wyodak unit is on line, criteria would be met through the planned addition of the NSS 2 unit.

6.2 Post NSS 2, Osage to Dumont 69 kV line retired

The summer Total Area Load limit is 524 MW which is through the 1997 summer season based on the 1992 load forecasts. Interpolation of QV results shows the summer Total Area Load limit is 526 MW which is through the 1997 summer season.

The winter Total Area Load limit is 560 MW which is through the 1996/1997 winter season based on the 1992 load forecasts. Interpolation of power flow outage results shows the winter Total Area Load limit is 581 MW which is through the 1998/1999 winter season.

This system is expected to meet criteria through the 1997 summer season and the 1998/1999 winter season based on 1992 load forecasts. The Osage to Yellow Creek 230 kV line addition is required prior to the 1998 summer season.

The results show the timing requirements for the Osage to Yellow Creek 230 kV line are essentially the same if the Wyodak unit is on line. The results indicate the addition of capacitors at Rapid City could delay the Osage to Yellow Creek 230 kV line by only one year based on the summer limitation.

6.3 Post NSS 2, Post Osage to Yellow Creek 230

The summer Total Area Load limit is 548 MW which is through the 1998 summer season based on the 1992 load forecasts. Interpolation of QV results shows the summer Total Area Load limit is 567 MW which is through the 2000 summer season.

The winter Total Area Load limit is 586 MW which is through the 1998/1999 winter season based on the 1992 load forecasts. Interpolation of power flow outage results shows the winter Total Area Load limit is 593 MW which is through the 1998/99 winter season. The 1999/2000 winter peak is 594 MW.

This system is expected to meet criteria through the 2000 summer season and the 1998/99 winter season based on 1992 load forecasts. The 1999/2000 winter season would be the only season through the 2000 time frame where criteria is not being met, but the 1999/2000 winter peak is only 1 MW higher than this system's winter Total Area Load limit of 593 MW.

If the Wyodak unit is on line, this system does not reach its limit until well beyond the 2000 time frame.

6.4 Post NSS 2, Post Osage to Ylw Crk 230, Post 40 MW Rapid City CT

This system's limitations are reached beyond the 2000 study time period. However, this system limit was determined to get an indication of when the next addition may be required.

The summer Total Area Load limit is 595 MW which is through the 2001 summer season based on the 1992 load forecasts. Interpolation of QV results shows the summer Total Area Load limit is 610 MW. This is beyond the 2002 summer season which is the end of the 1992 load forecast data.

The winter Total Area Load limit is 613 MW which is through the 2000/2001 winter season based on the 1992 load forecasts. Interpolation of the power flow outage results shows the winter Total Area Load limit is 613 MW which is through the 2001/2002 winter season.

This system is expected to meet criteria beyond the 2002 summer season and through the 2000/2001 winter season based on 1992 load forecasts. Based on these results, if the NSS unit 2, the Osage to Yellow Creek 230 kV line, and the 40 MW Rapid City combustion turbine are added, other Bulk System transmission additions should not be required until around 2002.

7.0 Conclusions

The purpose of this study analysis was to determine acceptable operating conditions for the Black Hills area of South Dakota and the Northeastern Wyoming area 230 kV bulk transmission system during the 1995 through 2000 time period and to review the requirements of the Yellow Creek to Osage 230 kV transmission line addition.

The Spearfish to Yellow Creek 230 kV line section was placed into service in February 1993. The Hughes 230/69 kV transformer at Rozet was energized December 1993.

The 80 MW Neil Simpson Unit 2 generation addition presently under construction is scheduled to be in service in November 1995. Scenarios with this unit on line were studied. Black Hills Power & Light's resource plans indicate a 40 MW addition is expected in the latter 1990s which could be a 40 MW combustion turbine in the Rapid City area.

The reliability of the 230 kV Bulk Transmission System in the Black Hills and Northeast Wyoming area is strongly affected by the availability of the Wyodak unit. The performance of the 230 kV Bulk Transmission System is further limited when the Wyodak unit outage is combined with an outage of one of the 230 kV injection lines: Dave Johnston to Yellowcake, Wyodak to Buffalo, or Hot Springs to Stegall.

Previous study work performed jointly by Basin Electric Power Cooperative and Black Hills Power & Light identified the need for the Spearfish to Yellow Creek to Osage 230 kV line. Local area voltage problems in the Rapid City and Northern Hills area occur when the loads are served from long radial 230 kV transmission lines for 230 kV line outages into this area. The addition of the Osage to Yellow Creek 230 kV line section along with the existing Spearfish to Yellow Creek 230 kV line section will provide the required support to the Rapid City and Northern Hills area loads. The addition of the Osage to Yellow Creek 230 kV line segment will provide backup service to the Kirk area (Deadwood/Lead) for outage of the Spearfish to Yellow Creek 230 kV line.

Voltage instability and power flow outage analyses were performed on the transmission systems investigated. In the limiting systems investigated here, the Wyodak unit is the

primary source of voltage control in the area and it is off line as a base condition. The additional loss of major injection line sections results in heavier line loadings, increased reactive power losses, and reduced var support (line charging) from the remaining lines. The effect is loss of voltage support to serve the area load possibly resulting in area black outs.

Acceptable operating conditions for the 230 kV Bulk Transmission System are achieved in the study analysis through the use of Rapid City combustion turbines, capacitor additions, or additional transmission. The combustion turbines will need to be operated during heavy load periods in anticipation of a severe contingency. System limits are defined when all the turbines are being utilized.

Rapid City combustion turbine operational guides were determined for many system scenarios with the Wyodak unit on or off. System limits were determined with the Wyodak unit off.

Two types of Bulk System transmission limitations are reached in the 1995 to 2000 time period. First, loss of a major injection line with the Wyodak unit off is a severe outage for the entire Black Hills and Northeast Wyoming area. Second, loss of one of the two 230 kV lines into the Rapid City and Northern Hills area prior to the Osage to Yellow Creek 230 kV addition is a critical outage for the Rapid City and Northern Hills area. This second limitation is less dependent on the Wyodak unit status than the first limitation is.

Linear interpolation was performed to refine the system load limit between the 5% load scaling increments actually studied. The Total Area Load limits were referenced to a year based on the 1992 load forecasts.

The existing system prior to the addition of Neil Simpson unit 2 with the Wyodak unit off is expected to meet criteria through the 1995 summer season and the 1993/94 winter season. The 1994/95 winter season with the Wyodak unit off would not meet criteria assuming the NSS unit 2 comes on line as scheduled in November of 1995, but the 1994/95 winter peak is only 1 MW higher than this system's winter Total Area Load limit. Criteria could be met through the planned addition of the NSS unit 2 if the Wyodak unit is on line.

The post NSS 2 system with the Wyodak unit off and the Osage to Dumont 69 kV line retired prior to addition of the Osage to Yellow Creek 230 kV line is expected to meet criteria through the 1997 summer season and the 1998/1999 winter season. The Osage

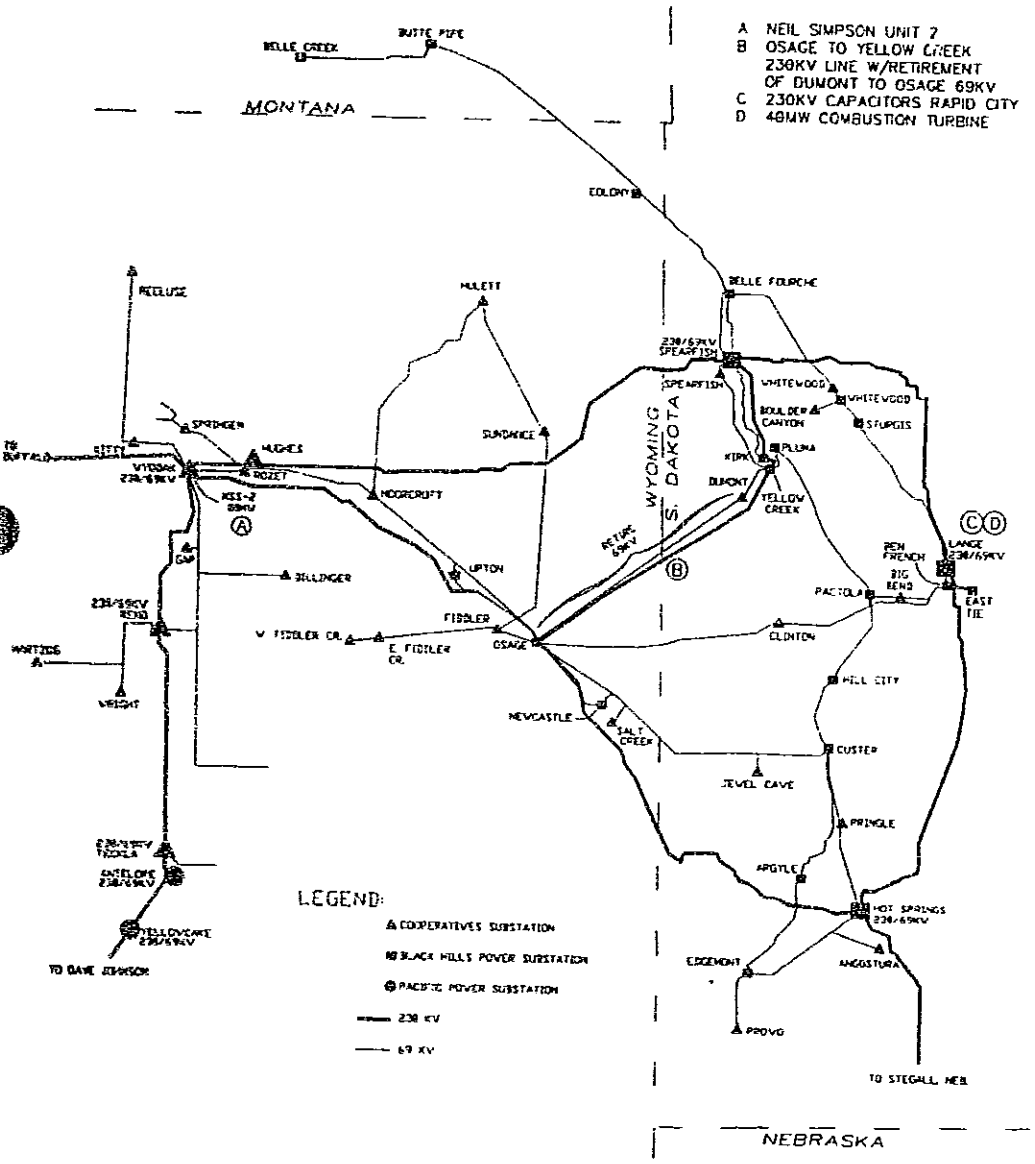
to Yellow Creek 230 kV line addition is required prior to the 1998 summer season. The results indicate the timing requirements for the Osage to Yellow Creek 230 kV line are essentially the same if the Wyodak unit is on line. The addition of capacitors at Rapid City could delay the Osage to Yellow Creek 230 kV line by one year based on the summer limitation, bus this is not a recommended solution due to the short duration of the support provided by capacitors.

The post NSS 2 Post Osage to Yellow Creek 230 kV line system with the Wyodak unit off is expected to meet criteria through the 2000 summer and 1998/1999 winter season. The 1999/2000 winter season with the Wyodak unit off would not meet criteria, but the 1999/2000 winter peak is only 1 MW higher than this system's winter Total Area Load limit This system could meet criteria well beyond the 2000 time period if the Wyodak unit is assumed on line during peak load conditions.

The post NSS 2, post Osage to Yellow Creek 230 kV line, and post 40 MW Rapid City combustion turbine system with the Wyodak unit off is expected to meet criteria beyond the 2002 summer season and through the 2000/2001 winter season. Based on these results other Bulk Transmission System additions should not be required until around 2002.

Figure 1

TRANSMISSION SYSTEM
230 KV & 69 KV



M77 REV 0

Figure 2
Case Name Convention

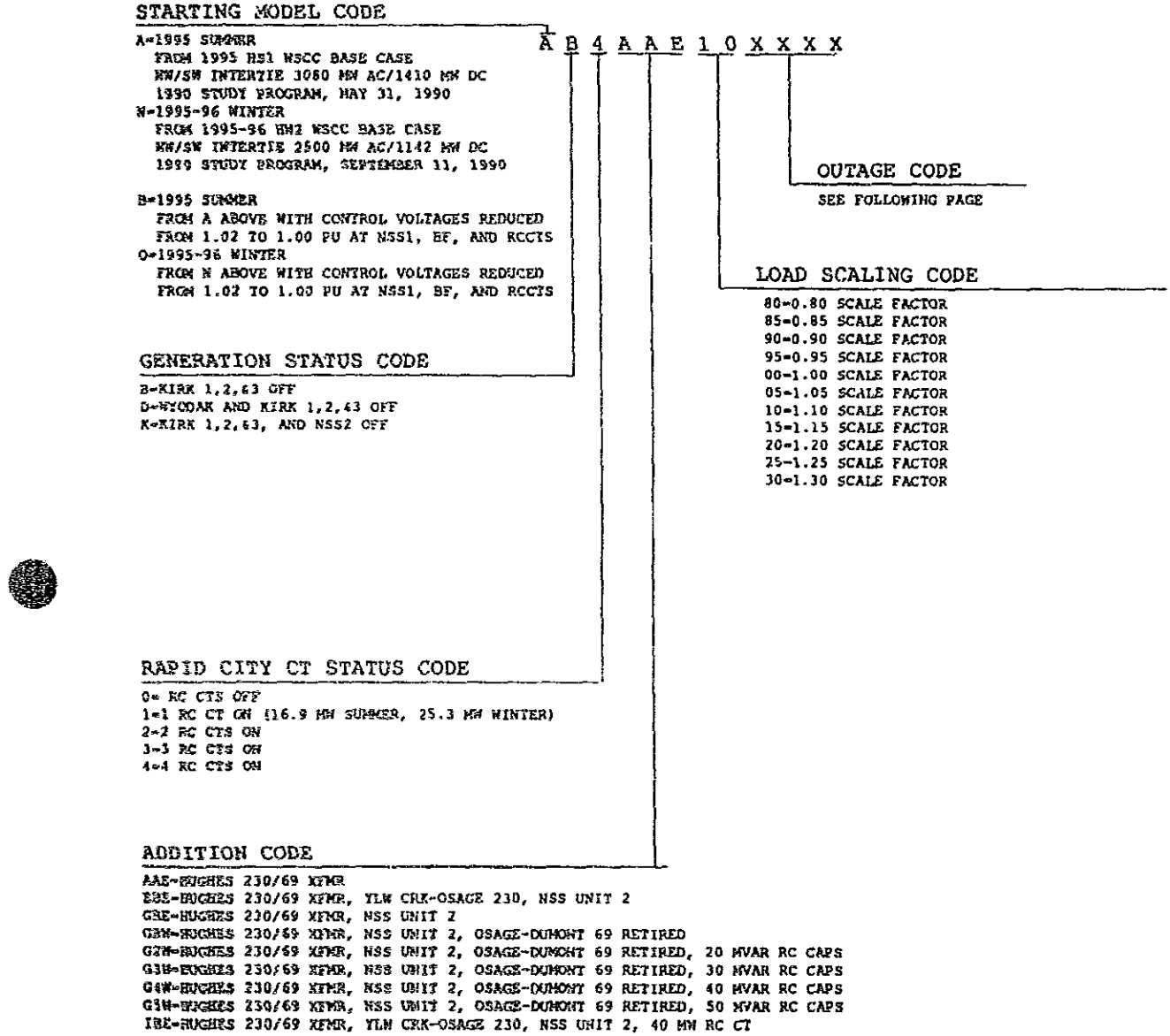


Figure 2 cont.
Case Name Convention

OUTAGE CODE

= SYSTEM INTACT
DJYC = DAVE JOHNSTON-YELLOWCAKE 230
HSOS = HOT SPRINGS-OSAGE 230
HSRC = HOT SPRINGS-RAPID CITY 230
HSST = HOT SPRINGS-STEGALL 230
HSWY = HOT SPRINGS-WYODAK 230
OSYL = OSAGE-YELLOW CREEK 230
RCSF = RAPID CITY-SPEARFISH 230
SFHN = SPEARFISH-HUGHES 230
SFYL = SPEARFISH-YELLOW CREEK 230
SFY2 = SPEARFISH-YELLOW CREEK 230 & YELLOW CREEK 230/69
WYBU = WYODAK-BUFFALO 230
WYHN = WYODAK-HUGHES 230
WYOS = WYODAK-OSAGE 230
WYRE = WYODAK-RENO 230
WHN9 = WYODAK-HUGHES 230 & WYODAK-ROZET 69
WHN6 = WYODAK-HUGHES 230 & HUGHES 230/69
WYDK = WYODAK GEN UNIT
KRG4 = KIRK GEN UNIT 4
NSS2 = NEIL SIMPSON GEN UNIT 2
RT40 = RAPID CITY 40 MW CT

Figure 3

QV Curve Results
Wyodak Off, NSS 2 in, Osage-Dumont 69 Retired

	total area load		hsrc.rc	hsst.rc	sfhn.rc	djyc.wy	wybu.wy
summer							
ad4gbw10	524		.88/-21.4	.90/-41.3/ >1.00	.87/-21.3	.87/-62.1	.83/-92.6
ad4gbw15	548		.89/-5.1		.89/-4.0	.89/-36.6	
winter							
nd4gbw05	560		.84/-53.0	.87/-59.0	.85/-59.9	.84/-57.9	.80/-114.3
nd4gbw10	586		.86/-39.7	.90/-41.0/ .997	.86/-45.4	.86/-31.4	.81/-92.0
nd4gbw15	613		.88/-24.3	.91/-20.5/ .968	.87/-28.8	.88/-1.8	

contingency code

hsrc - Hot Springs to Rapid City 230
hsst - Hot Springs to Stegall 230
sfhn - Spearfish to Hughes 230
djyc - Dave Johnston to Yellowcake 230
wybu - Wyodak to Buffalo 230
wydk - Wyodak unit

code for location of var source

rc - Rapid City 230
wy - Wyodak 230

Figure 4

PV Curve Results
Wyodak Off, NSS 2 In, Osage-Dumont 69 Retired

case name	total area load	contingency*	mw limit if criteria is 0.90 pu minimum Rapid City 230 voltage	mw limit if criteria is 0.90 x Pcrit	
				if Pcrit is last solved case	if Pcrit is first unsolved case
summer					
ad4gbw10	524	hsrc	551	504	509
		sfhn	554	504	509
		hsst	570	519	523

* contingency code

hsrc - Hot Springs to Rapid City 230
sfhn - Spearfish to Hughes 230
hsst - Hot Springs to Stegall 230

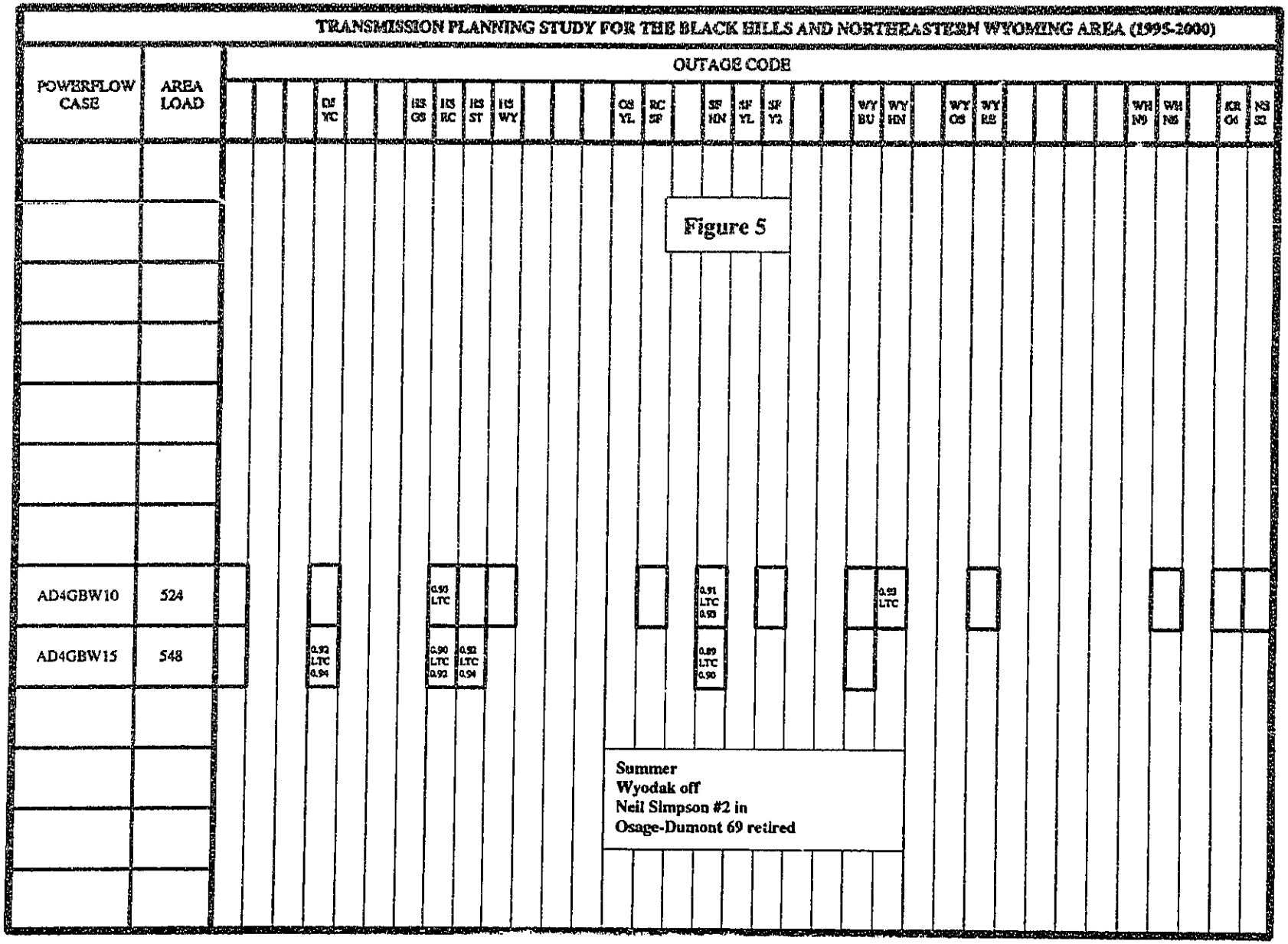

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DE YC
HS GS
HS RC
HS ST
HS WY
OS YL
RC SF
SF HN
SF YL
SF YS
WY BU
WY HN
WY OS
WY RS
WH NO
WH NS
KR OS
NS SU
AD4GBW10
524
AD4GBW15
548
0.93 LTC
0.91 LTC 0.93
0.93 LTC
0.92 LTC 0.94
0.90 LTC 0.92
0.92 LTC 0.94
0.89 LTC 0.90
Summer
Wyodak off
Neil Simpson #2 in
Osage-Dumont 69 retired

Figure 5

0132-26-291

Figure 6

LTC and Overload
Code Definitions

LTC	One or more LTCs at limit
OL01	Overload of Wyodak #1 230/69 transformer
OL03	Overload of Osage unit #2 step up transformer
OL05	Overload of Wyodak #1 and #2 230/69 transformers
OL15	Overload of Wyodak #1 and #2 transformers and Osage unit #2 step up transformer
LO01	LTC and OL01
LO03	LTC and OL03
etc	

Table 1
Black Hills and Northeast Wyoming
Area Loads
1992 Projections

Summer Peak	BHPL(1)	REPC(2)	TCE(2)	Gillette WAPA(1)	PPL(3)	Total Area Load
1993	311.0	13.4	124.4	9.4	11.8	470.0
1994	320.0	13.5	128.1	10.3	11.8	483.7
1995	328.0	13.7	131.7	11.1	11.8	496.3
1996	337.0	14.0	136.2	11.6	11.8	510.6
1997	346.0	14.2	140.3	11.8	11.8	524.1
1998	355.0	14.4	144.8	12.2	11.8	538.2
1999	365.0	14.5	149.2	12.4	11.8	552.9
2000	374.0	14.6	153.8	12.7	11.8	566.9
2001	383.0	14.7	158.5	13.0	11.8	581.0
2002	393.0	14.9	163.8	13.2	11.8	596.7

Winter Peak	BHPL(1)	REPC(2)	TCE(2)	Gillette WAPA(1)	PPL(3)	Total Area Load
1992-93	282.0	17.9	163.7	13.3	14.3	491.2
1993-94	290.0	18.1	168.5	14.2	14.3	505.1
1994-95	298.1	18.3	173.3	15.2	14.3	519.2
1995-96	306.1	18.8	179.2	15.8	14.3	534.2
1996-97	315.0	19.1	184.6	16.1	14.3	549.1
1997-98	323.0	19.4	190.5	16.6	14.3	563.8
1998-99	331.0	19.6	196.4	17.0	14.3	578.3
1999-2000	340.0	19.7	202.4	17.3	14.3	593.7
2000-01	349.0	19.9	208.6	17.7	14.3	609.5
2001-02	357.0	20.2	215.5	18.1	14.3	625.1

(1) Black Hills 1992 B&V load forecast
(2) 1992 Power Requirements Study
(3) PacifiCorp loads for Antelope and Yellowcake are based on 1995 study data and are assumed constant during the forecasted time period

Table 2
Black Hills and Northeast Wyoming
Area Loads
1990 Projections

Summer Peak	BHPL(1)	REPC(2)	TCE(2)	Gillette WAPA(1)	PPL(3)	Total Area Load
1990	275.3		115.4			
1991	285.5	12.6	116.8	8.0	11.8	434.7
1992	291.8	13.2	123.3	8.0	11.8	448.1
1993	298.1	14.0	125.3	8.0	11.8	457.2
1994	304.4	14.2	128.4	8.0	11.8	466.8
1995	310.7	14.7	131.3	8.0	11.8	476.5
1996	316.9	14.8	134.8	8.0	11.8	486.3
1997	323.2	15.2	138.4	8.0	11.8	496.6
1998	330.3	15.3	141.9	8.0	11.8	507.3
1999	336.5	15.5	145.5	8.0	11.8	517.3
2000	343.6	16.0	149.3	8.0	11.8	528.7
Winter Peak	BHPL(1)	REPC(2)	TCE(2)	Gillette WAPA(1)	PPL(3)	Total Area Load
1991-92	277.9	17.9	162.2	19.0	14.3	491.3
1992-93	284.4	18.8	164.8	19.0	14.3	501.3
1993-94	289.7	19.3	168.9	19.0	14.3	511.2
1994-95	295.9	19.6	172.8	19.0	14.3	521.6
1995-96	302.1	20.1	177.3	19.0	14.3	532.8
1996-97	307.4	20.4	182.1	19.0	14.3	543.2
1997-98	313.6	20.8	186.7	19.0	14.3	554.4
1998-99	319.7	21.1	191.4	19.0	14.3	565.5
1999-2000	325.9	21.3	196.4	19.0	14.3	576.9
2000-01	332.9	21.8	201.9	19.0	14.3	589.9

(1) Black Hills 1990 B&V load forecast
(2) 1990 Power Requirements Study
(3) PacifiCorp loads for Antelope and Yellowcake are based on 1995 study data and are assumed constant during the forecasted time period

4-93-82-0132

Table 3
Black Hills and Northeastern Wyoming Area Study
1990 Projections

Bus#	Study Bus Name - kV	Zone	Delivery Point	1995 Summer (MW)	(MVAR)	Power Factor
2409	ALZDABHP 69	411	Alzada	4.2	1.40	95%
2330	ARGYLBHP 69	412	Argyle	0.6	0.20	95%
			Belle Fourche	6.3	2.10	95%
			Belle Fourche Tx	6.2	2.00	95%
2331	BELLFBHP 69	411	SUBTOTAL	12.5	4.10	
2409	BLCRKBHP 69	411	Belle Creek	4.2	1.40	95%
			Custer	4.0	1.30	95%
			Custer Load	3.8	1.20	95%
2335	CUSTRBHP 69	412		7.8	2.60	
			Edgemont 47	2.1	0.70	95%
			Edgemont 69	0.0	0.00	95%
2337	EDGMTBHP 69	412	SUBTOTAL	2.1	0.70	
2339	HCITYBHP 69	410	Hill City	7.1	2.30	95%
			Hot Springs 12	5.6	1.80	95%
			Hot Springs 69	4.8	1.60	95%
2340	HSPGSBHP 69	412	SUBTOTAL	10.4	3.40	
			HMC 12	10.4	3.40	95%
			Kirk 12	0.0	0.00	95%
2341	KIRK1BHP 12	411	SUBTOTAL	10.4	3.40	
2342	KIRK2BHP 2.4	411	HMC 2.4	4.7	1.50	95%
2344	YLWCKBHP 69	411	HMC 69	15.1	5.00	95%
2348	NCUSTBHP 69	412	North Custer	0.0	0.00	95%
2349	NLOOPBHP 69	410	Rapid City North Loop	32.5	10.70	95%
2350	NSS5 BHP 69	413	Neil Simpson Station	0.4	0.10	95%
2351	NWCL BHP 69	413	Newcastle	10.2	3.40	95%
			Osage	5.2	1.70	95%
			Upton	0.0	0.00	95%
2353	OSAGEBHP 69	413	SUBTOTAL	5.2	1.70	
2354	OSGEGBHP 69	413	Osage generation	0.0	0.00	95%
2355	PACT BHP 69	410	Pactola	0.1	0.00	95%
2356	PLUMABHP 69	411	Pluma	10.4	3.40	95%
			Ben French 24.9	13.2	4.30	95%
			Ben French 69	22.0	7.20	95%
			RC West	10.9	3.60	95%
2358	RCBF BHP 69	410	SUBTOTAL	46.1	15.20	
2359	RCBF1BHP 69	410	Rapid City BF #1	0.0	0.00	95%
2381	RCCT1BHP 69	410	Rapid City CT #1	0.0	0.00	95%
2382	RCCT2BHP 69	410	Rapid City CT #2	0.0	0.00	95%
2383	RCCT3BHP 69	410	Rapid City CT #3	0.0	0.00	95%
2384	RCCT4BHP 69	410	Rapid City CT #4	0.0	0.00	95%
2360	RC E BHP 69	410	Rapid City East	8.3	2.70	95%
2361	RC N BHP 69	410	Rapid City North	5.6	1.80	95%
2363	SLOOPBHP 69	410	Rapid City South Loop	54.1	17.80	95%
2346	SPFHTBHP 69	411	Spearfish	15.4	5.10	95%
2403	WWOODBHP 69	411	Whitewood 24.9	5.9	1.90	95%
2369	STGS2BHP 69	411	Sturgis 69	9.8	3.20	95%
2372	WFLATBHP 69	411	W Flat	0.4	0.10	95%
2375	WYDK BHP 69	413		0.0	0.00	95%
2410	GLLETBHP 69	413	Gillette 69	24.0	7.90	95%
2345	TROJNBHP 69	411	Trojan	3.1	1.00	95%
	TOTALS		Black Hills P & L	310.6	102.0	

Table 3 cont.
Black Hills and Northeastern Wyoming Area Study
1990 Projections

Bus#	Study Bus Name	kV	Zone	Delivery Point	1995 Summer (MW)	(MVAR)	Power Factor
2347	MCFT TCE	69	401	Moorcroft	16.7	4.90	96%
2370	NWCL TCE	69	401	Newcastle	2.5	0.80	95%
2401	OSAGETCE	69	401	Osage	7.5	1.50	98%
21076	RENO TCE	230	401	Reno	28.4	9.30	95%
2362	ROZETTCE	69	401	Rozet	13.4	1.90	99%
21077	TCKLATCE	230	401	Teckla	20.9	6.90	95%
2407	NSS TCE	69	401	Wyodak North & South	20.9	5.20	97%
2405	WYDK TCE	69	401	Wyodak Carter	20.9	4.20	98%
				Tri-County Electric	131.2	34.7	
2332	BIGB BHC	69	402	Big Bend	2.2	0.70	95%
2334	CLNTNBHC	69	402	Clinton	0.4	0.10	95%
2336	DUMNTBHC	69	402	Dumont	0.3	0.10	95%
2400	EDGMTBHC	69	402	Provo	0.1	0.00	95%
2402	NWCL BHC	69	402	Jewel Cave	0.8	0.30	95%
2352	ORAL BHC	69	402	Angostura	2.0	0.70	95%
2357	PRNGLBHC	69	402	Pringle	0.8	0.30	95%
				Black Hills Coop	6.6	2.2	
2404	BCNYNBUC	69	403	Boulder Canyon	0.7	0.20	95%
2366	SPFH BUC	69	403	Spearfish	4.9	1.60	95%
2373	BELLFBUC	69	403	Whitewood	2.5	0.80	95%
				Butte Electric Coop	8.1	2.6	
2406	GLLETWAP	69	404	Gillette's WAPA alloc.	8.0	2.60	95%
				Total	464.5	144.1	

Table 4
Black Hills and Northeastern Wyoming Area Study
1990 Projections

Bus#	Study Bus Name -	kV	Zone	Delivery Point	1995/1996 Winter (MW)	(MVAR)	Power Factor
2408	ALZDABHP	69	411	Alzada	4.5	1.50	95%
2330	ARGYLBHP	69	412	Argyle	0.6	0.20	95%
				Belle Fourche	6.9	2.30	95%
				Belle Fourche Tx	5.1	1.70	95%
2331	BELLFBHP	69	411	SUBTOTAL	12.0	4.00	
2409	BLCRKBHP	69	411	Belle Creek	4.4	1.40	95%
				Custer	3.7	1.20	95%
				Custer Load	4.6	1.50	95%
2335	CUSTRBHP	69	412		8.3	2.70	
				Edgemont 47	0.5	0.20	95%
				Edgemont 69	2.5	0.80	95%
2337	EDGMTBHP	69	412	SUBTOTAL	3.0	1.00	
2339	HCITYBHP	69	410	Hill City	5.6	1.80	95%
				Hot Springs 12	6.9	2.30	95%
				Hot Springs 69	4.4	1.40	95%
2340	HSPGSBHP	69	412	SUBTOTAL	11.3	3.70	
				HMC 12	10.4	3.40	95%
				Kirk 12	0.0	0.00	95%
2341	KIRK1BHP	12	411	SUBTOTAL	10.4	3.40	
2342	KIRK2BHP	2.4	411	HMC 2.4	4.8	1.60	95%
2344	YLWCKBHP	69	411	HMC 69	15.1	5.00	95%
2348	NCUSTBHP	69	412	North Custer	0.0	0.00	95%
2349	NLOOPBHP	69	410	Rapid City North Loop	24.1	7.90	95%
2350	NSS5 BHP	69	413	Neil Simpson Station	2.8	0.90	95%
2351	NWCL BHP	69	413	Newcastle	10.6	3.50	95%
				Osage	5.7	1.90	95%
				Upton	0.0	0.00	95%
2353	OSAGEBHP	69	413	SUBTOTAL	5.7	1.90	
2354	OSGEGBHP	69	413	Osage generation	0.0	0.00	95%
2355	PACT BHP	69	410	Pactola	0.4	0.10	95%
2356	PLUMABHP	69	411	Pluma	12.0	3.90	95%
				Ben French 24.9	11.5	3.80	95%
				Ben French 69	19.7	6.50	95%
				RC West	10.3	3.40	95%
2358	RCBF BHP	69	410	SUBTOTAL	41.5	13.60	
2359	RCBF1BHP	69	410	Rapid City BF #1	0.0	0.00	95%
2381	RCCT1BHP	69	410	Rapid City CT #1	0.0	0.00	95%
2382	RCCT2BHP	69	410	Rapid City CT #2	0.0	0.00	95%
2383	RCCT3BHP	69	410	Rapid City CT #3	0.0	0.00	95%
2384	RCCT4BHP	69	410	Rapid City CT #4	0.0	0.00	95%
2360	RC E BHP	69	410	Rapid City East	6.0	2.00	95%
2361	RC N BHP	69	410	Rapid City North	10.3	3.40	95%
2363	SLOOPBHP	69	410	Rapid City South Loop	47.0	15.40	95%
2346	SPFH7BHP	69	411	Spearfish	14.0	4.60	95%
2403	WWOODBHP	69	411	Whitewood 24.9	11.1	3.60	95%
2369	STGS2BHP	69	411	Sturgis 69	8.5	2.80	95%
2372	WFLATBHP	69	411	W Flat	0.8	0.30	95%
2375	WYDK BHP	69	413		0.0	0.00	95%
2410	GLLETBHP	69	413	Gillette 69	24.0	7.90	95%
2345	TROJNBHP	69	411	Trojan	3.3	1.10	95%
	TOTALS			Black Hills P & L	302.1	99.2	

Table 4 cont.
Black Hills and Northeastern Wyoming Area Study
1990 Projections

Bus#	Study Bus Name - kV	Zone	Delivery Point	1995/1996 Winter (MW)	(MVAR)	Power Factor
2347	MCFT TCE 69	401	Moorcroft	23.1	6.70	96%
2370	NWCL TCE 69	401	Newcastle	3.7	1.20	95%
2401	OSAGETCE 69	401	Osage	10.2	2.10	98%
21076	RENO TCE 230	401	Reno	38.8	12.80	95%
2362	ROZETTCE 69	401	Rozet	18.5	2.60	99%
21077	TCKLATCE 230	401	Teckla	27.7	9.10	95%
2407	NSS TCE 69	401	Wyodak North & South	27.7	6.90	97%
2405	WYDK TCE 69	401	Wyodak Carter	27.7	5.60	98%
			Tri-County Electric	177.4	47.0	
2332	BIGB BHC 69	402	Big Bend	4.7	1.50	95%
2334	CLNTNBHC 69	402	Clinton	0.7	0.20	95%
2336	DUMETBHC 69	402	Dumont	0.5	0.20	95%
2400	EDGMTBHC 69	402	Provo	0.2	0.10	95%
2402	NWCL BHC 69	402	Jewel Cave	1.2	0.40	95%
2352	ORAL BHC 69	402	Angostura	2.3	0.80	95%
2357	PRNGLBHC 69	402	Pringle	0.9	0.30	95%
			Black Hills Coop	10.5	3.5	
2404	BCNYNBDC 69	403	Boulder Canyon	1.3	0.40	95%
2366	SPFH BDC 69	403	Spearfish	5.9	1.90	95%
2373	BELLFBDC 69	403	Whitewood	2.4	0.80	95%
			Butte Electric Coop	9.6	3.1	
2406	GLLETWAP 69	404	Gillette's WAPA alloc.	19.0	6.20	95%
			Total	518.6	159.0	

Table 5
Black Hills Power & Light Rapid City and Northern Hills Area Loads
and
Black Hills Power & Light and Cooperative Total Area Loads
1992 vs 1990 Projections

	1995 Summer Peak		1995/96 Winter Peak	
	1992 Projections	1990 Projections	1992 Projections	1990 Projections
BHPL Rapid City Area*	161.3	153.8	140.3	134.9
BHPL North System*	99.6	96.1	99.2	100.9
BHPL Rapid City and North System Total*	260.9	249.9	239.5	235.8
BHPL and Coop Total Area**	496.3	476.5	534.2	532.8

* BHPL loads only. Coop loads by bus were not available for the 1992 PRS.

** BHPL and Coop loads included.

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Table 6
Neil Simpson Unit 2
Power Flow Modeling Data

DATA FOR BUS 21989 [NSS 2 22.0] RESIDING IN AREA 21 AND ZONE 413:

CODE	PLOAD	QLOAD	G-SHUNT	B-SHUNT	VOLTAGE	ANGLE
2	8.0	4.5	0.0	0.0		

PLNT	PGEN	QGEN	QMAX	QMIN	VSCHED	X- REMOTE BUS	VOLTAGE	Q PCT-X
	88.0		25.0	-25.0	1.00000			100.00

IO	ST	PGEN	QGEN	QMAX	QMIN	MBASE	Z	S	O	R	C	E	X	T	R	A	N	GENTAP	PMAX	PMIN
2	1	88.0		25.0	-25.0	100.0	0.0000		1.0000		0.0000		0.0000		1.0000				88.0	-9999.0

X-------TO-------X	CKT	LINE R	LINE X	CHARGING	ST	MET	RATE-A	RATE-B	RATE-C
2421 NSS2 BHP69.0	1	0.00000	0.07000	0.00000	1	T	100.0	0.0	0.0

TO	CKT	TP	RATIO	ANGLE	RG	CONT	RMAX	RMIN	VMAX	VMIN	TSTP	TAB	NOMINAL R,X
2421	1	F	1.00000	0.00	1		1.50000	0.51000	1.50000	0.51000	0.00625		

DATA FOR BUS 2421 [NSS2 BHP69.0] RESIDING IN AREA 21 AND ZONE 413:

CODE	PLOAD	QLOAD	G-SHUNT	B-SHUNT	VOLTAGE	ANGLE
1	0.0	0.0	0.0	0.0		

X-------TO-------X	CKT	LINE R	LINE X	CHARGING	ST	MET	RATE-A	RATE-B	RATE-C
2359 NSS5 BHP69.0	1	0.00140	0.01310	0.00000	1	T	100.0	0.0	0.0
2405 WYDK TCE69.0	1	0.00130	0.01170	0.00000	1	T	100.0	0.0	0.0
2431 WY N TCE69.0	1	0.00000	0.00080	0.00000	1	F	100.0	0.0	0.0
21988 NSS 2 22.0	1	0.00000	0.07000	0.00000	1	F	100.0	0.0	0.0

TO	CKT	TP	RATIO	ANGLE	RG	CONT	RMAX	RMIN	VMAX	VMIN	TSTP	TAB	NOMINAL R,X
21988	1	T	1.00000	0.00	1		1.50000	0.51000	1.50000	0.51000	0.00625		

Table 7
Osage to Yellow Creek 230 kV Line
Power Flow Modeling Data

DATA FOR BUS 21069 (OSAGE 230) RESIDING IN AREA 21 AND ZONE 212:

CODE	PLOAD	QLOAD	G-SHUNT	B-SHUNT	VOLTAGE	ANGLE
1	0.0	0.0	0.0	0.0		

X-------TO-------X	CKT	LINE R	LINE X	CHARGING	ST	MET	RATE-A	RATE-B	RATE-C
21046 HOTSPRGS 230	1	0.01030	0.09500	0.19900	1	F	430.3	0.0	0.0
21088 YLWCREEK 230	1	0.00660	0.06070	0.12730	1	F	402.0	0.0	0.0
21106 WYODAKLM 230	1	0.00950	0.08650	0.17024	1	T	402.0	0.0	0.0

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Table 8
Rapid City 40 MW Combustion Turbine
Power Flow Modeling Data

DATA FOR BUS 21990 [RC CT 13.8] RESIDING IN AREA 21 AND ZONE 410:

CODE	PLOAD	QLOAD	G-SHUNT	B-SHUNT	VOLTAGE	ANGLE
2	0.0	0.0	0.0	0.0		

PLNT	PGEN	QGEN	QMAX	QMIN	VSCHED	X-	REMOTE BUS	VOLTAGE	Q PCT-X
	40.0		12.5	-12.5	1.01000				100.00

ID	ST	PGEN	QGEN	QMAX	QMIN	MBASE	Z	S	O	R	C	E	X	T	R	A	N	GENTAP	PMAX	PMIN
1	1	40.0		12.5	-12.5	100.0	0.0000	1.0000					0.0000					1.0000	40.0	-9999.0

X-------TO-------X	CKT	LINE R	LINE X	CHARGING	ST	MET	RATE-A	RATE-B	RATE-C
2361 RC N BHP69.0	1	0.00000	0.15000	0.00000	1	F	50.0	0.0	0.0

TO	CKT	TP	RATIO	ANGLE	RG	CONT	RMAX	RMIN	VMAX	VMIN	TSTP	TAB	NOMINAL R,X
2361	1	F	1.00000	0.00	I		1.50000	0.51000	1.50000	0.51000	0.00625		

Table 9
Rapid City Combustion Turbine
Operation Guides
by Total Area Load

Summer, Wyodak On
Existing System

Area Load	# RCCTs	Case Name	Contingency
429	0	ab0aae90	
452	1	ab1aae95	Hughes-Spearfish 230
476	2	ab2aae00	Hughes-Spearfish 230
500	3	ab3aae05	Hughes-Spearfish 230
524	4	ab4aae10	Hughes-Spearfish 230

Winter, Wyodak On
Existing System

Area Load	# RCCTs	Case Name	Contingency
480	0	nb0aae90	
533	1	nb1aae00	Hughes-Spearfish 230
586	2	nb2aae10	Hughes-Spearfish 230

Each RCCT rating is 16.9 MW Summer and 25.3 MW Winter

Table 10
Rapid City Combustion Turbine
Operation Guides
by Total Area Load

Summer, Wyodak Off
Existing System

Area Load	# RCCTs	Case Name	Contingency
357	0	bd0aae75	
405	1	bd1aae85	Hot Springs-Rapid City 230
429	2	bd2aae90	Hot Springs-Rapid City 230
476	3	bd3aae00	Ht Spg-RC, DJ-Ylwck, & Ht Spg-Steg 230
500	4	bd4aae05	Ht Spg-RC, DJ-Ylwck, & Ht Spg-Steg 230

Winter, Wyodak Off
Existing System

Area Load	# RCCTs	Case Name	Contingency
400	0	od0aae75	
426	1	od1aae80	Ht Spg-RC, DJ-Ylwck, & Ht Spg-Steg 230
453	2	od2aae85	Dave John-Yellowcake 230
480	3	od3aae90	Dave John-Yellowcake 230
506	4	od4aae95	Dave John-Yellowcake 230

Each RCCT rating is 16.9 MW Summer and 25.3 MW Winter

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Table 11
Rapid City Combustion Turbine
Operation Guides
by Total Area Load

Summer, Wyodak On
NSS 2 In, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
548	0	ab0ebe15	
572	1	ab1ebe20	Wyodak Unit

Winter, Wyodak On
NSS 2 In, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
586	0	nb0ebe10	
613	1	nb1ebe15	Wyodak Unit

Each RCCT rating is 16.9 MW Summer and 25.3 MW Winter

Table 12
Rapid City Combustion Turbine
Operation Guides
by Total Area Load

Summer, Wyodak Off
NSS 2 In, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
452	0	ad0ebe95	
476	1	ad1ebe00	DJ-Ylwck & Ht Spg-Steg 230
500	2	ad2ebe05	DJ-Ylwck & Ht Spg-Steg 230
524	3	ad3ebe10	Hot Springs-Stegall 230
548	4	ad4ebe15	DJ-Ylwck & Ht Spg-Steg 230

Winter, Wyodak Off
NSS 2 In, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
480	0	nd0ebe90	
506	1	nd1ebe95	Dave John-Yellowcake 230
533	2	nd2ebe00	Dave John-Yellowcake 230
560	3	nd3ebe05	Dave John-Yellowcake 230
586	4	nd4ebe10	Dave John-Yellowcake 230

Each RCCT rating is 16.9 MW Summer and 25.3 MW Winter

Table 13
Rapid City Combustion Turbine
Operation Guides
by Total Area Load

Summer, Wyodak On
NSS 2 Off, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
500	0	ak0ebe05	
524	1	ak1ebe10	Wyodak Unit
572	2	ak2ebe20	Wyodak Unit

Winter, Wyodak On
NSS 2 Off, Osage-Yellow Creek 230 kV line In

Area Load	# RCCTs	Case Name	Contingency
533	0	nk0ebe00	
560	1	nk1ebe05	Wyodak Unit
613	2	nk2ebe15	Wyodak Unit

Each RCCT rating is 16.9 MW Summer and 25.3 MW Winter

Table 14
Bulk (230 kV) System Acceptable Through Load Level/Year
(Wyodak off, Kirk 4 on, 4 RCCTs on)
(1992 Load Projections)

Existing System

		Summer		Summer Interpolated*		Winter		Winter Interpolated*	
Case Name	Outage**	Area Load	Year	Area Load	Year	Area Load	Year	Area Load	Year
bd4aae05	djyc pf	500	1995	500	1995				
nd4aae95	djyc pf					506	1993/94	518	1993/94

NSS 2 In, Osage-Dumont 69 Retired

		Summer		Summer Interpolated*		Winter		Winter Interpolated*	
Case Name	Outage**	Area Load	Year	Area Load	Year	Area Load	Year	Area Load	Year
sd4gbw10	sfhn qv	524	1997	526	1997				
nd4gbw05	djyc pf					560	1996/97	581	1998/99

NSS 2 In, Osage-Yellow Creek 230 In

		Summer		Summer Interpolated*		Winter		Winter Interpolated*	
Case Name	Outage**	Area Load	Year	Area Load	Year	Area Load	Year	Area Load	Year
ad4ebe15	hsst qv	548	1998	567	2000				
nd4ebe10	djyc pf					586	1998/99	593	1998/99

NSS 2 In, Osage-Yellow Creek 230 In, 40 MW Rapid City CT In

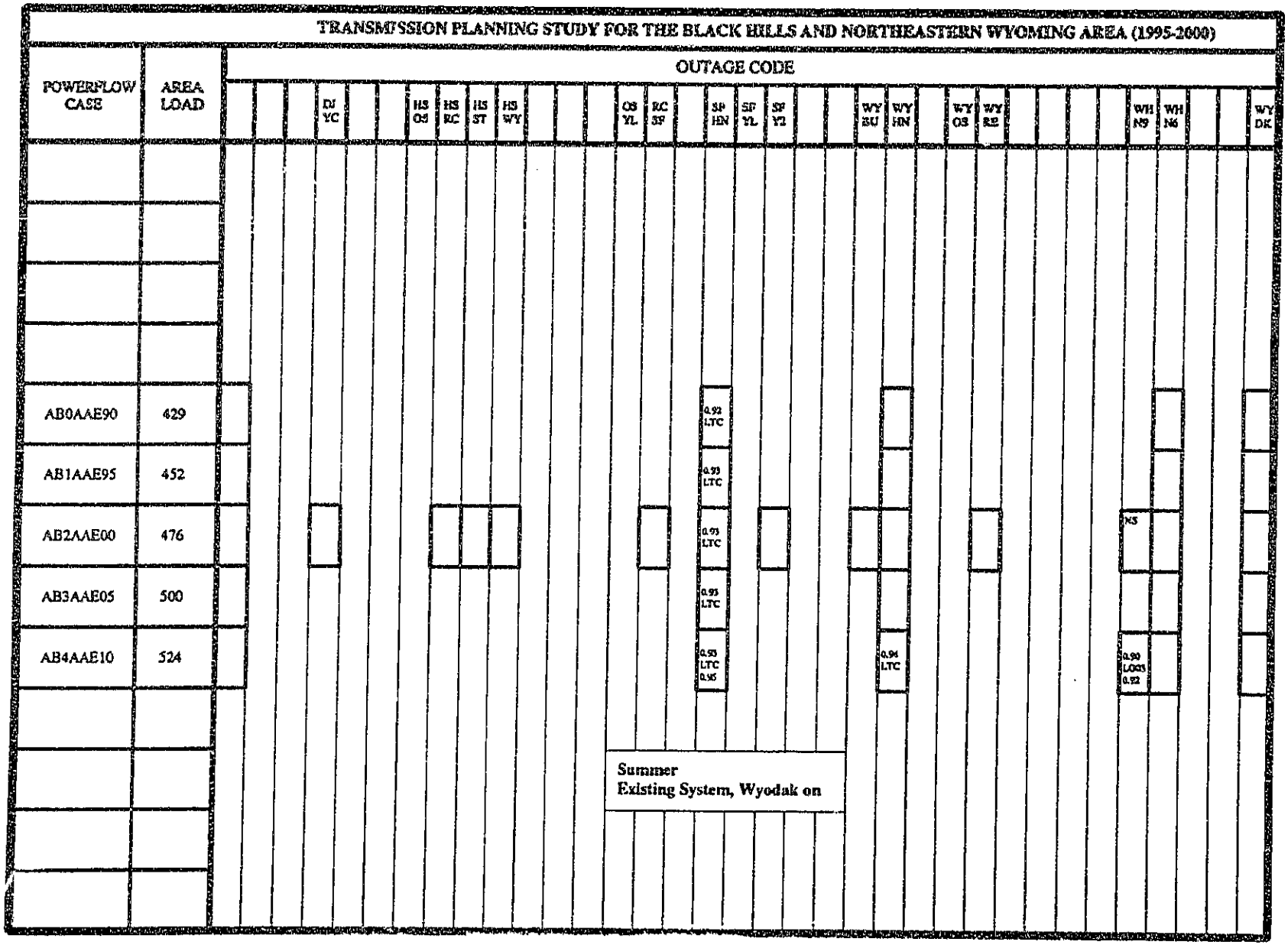
		Summer		Summer Interpolated*		Winter		Winter Interpolated*	
Case Name	Outage**	Area Load	Year	Area Load	Year	Area Load	Year	Area Load	Year
ad4ibe25	djyc qv	595	2001	610	>2002				
nd4ibe15	djyc pf					613	2000/01	613	2000/01

* Area Load that can be supported if linear interpolation is performed between last acceptable case and first unacceptable case.

** Outage codes
- djyc - Dave Johnston-Yellowcake 230
- sfhn - Spearfish-Hughes 230
- hsst - Hot Springs-Stegall 230
- qv - limited by voltage instability analysis (qv curve)
- pf - limited by power flow analysis

Table QV-A
QV Curve Results
Existing System, Wyodak On

	total area load	diyc.rc	hsrc.rc	hssl.rc	sfhn.rc	wybu.rc	wydk.wy
summer							
ab0aae90	429	.79/-166.4	.74/-42.9	.81/-121	.80/-23	.81/-158.7	.79/-147
ab1aae95	452	.80/-171.3	.74/-50.8	.81/-125.2	.80/-28.5	.81/-163.2	.79/-150.1
ab1aae00	476				.81/-10.1		.81/-115.4
ab2aae00		.80/-175.2	.74/-58.5	.82/-130.7	.80/-34	.82/-168.3	.78/-152.8
ab2aae05	500				.82/-15.7		.81/-118.3
ab3aae05		.81/-178.4	.74/-64.7	.82/-133.7	.81/-37.9	.82/-171.4	.78/-152.6
ab3aae10	524				.83/-19.8		.81/-118.5
ab4aae10		.82/-180.9	.74/-70.7	.83/-137.4	.82/-41.5	.83/-174.6	.78/-151.9
winter							
nb0aae90	480	.86/-140.3	.80/-46.1	.87/-98.1	.80/-32.2	.83/-139.7	.78/-108.1
nb0aae95	506				.80/-14.4		.81/-70.4
nb1aae95		.85/-147.9	.80/-59	.88/-107.6	.79/-44.5	.84/-148.1	.78/-118.5
nb1aae00	533	.88/-131.2	.82/-44.5	.89/-91.7	.81/-27.1	.85/-133.6	.80/-82.1
nb1aae05	560				.82/-9.3		.83/-43.5
nb2aae05		.87/-137.4	.82/-56.1	.89/-99.8	.81/-38.1	.86/-140.8	.79/-90.2
nb2aae10	586	.89/-119.8	.85/-41.2	.91/-83.3/ >1.00	.83/-21	.87/-125.4	.82/-53.4


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SP HN
SF YL
SF YT
WY SU
WY HN
WY OS
WY RE
WH N9
WH N6
WY DK
AB0AAE90 429
AB1AAE95 452
AB2AAE00 476
AB3AAE05 500
AB4AAE10 524
0.92 LTC
0.93 LTC
0.93 LTC
0.93 LTC
0.93 LTC 0.95
0.94 LTC
N5
2.90 L003 0.92
Summer
Existing System, Wyodak on

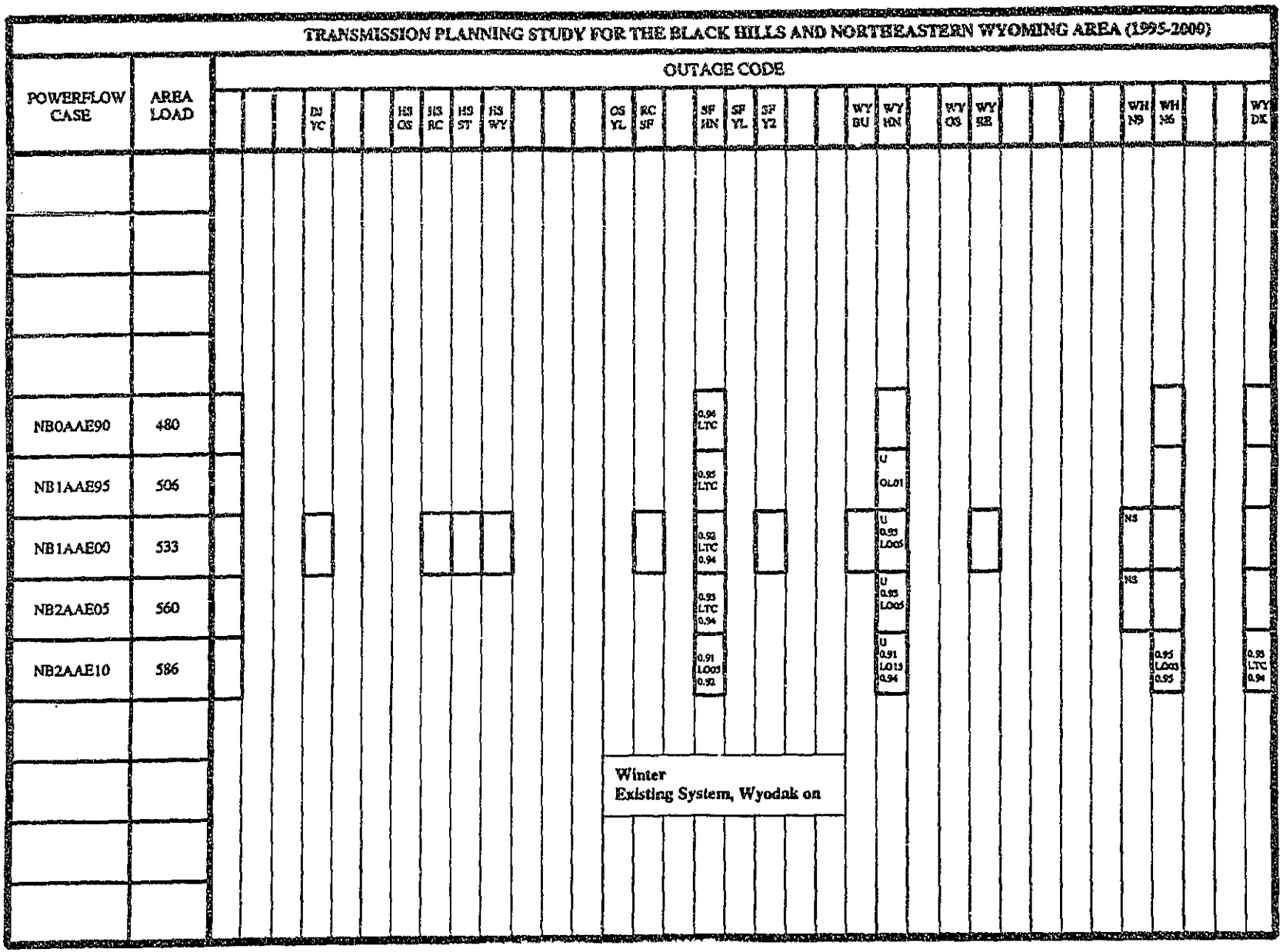
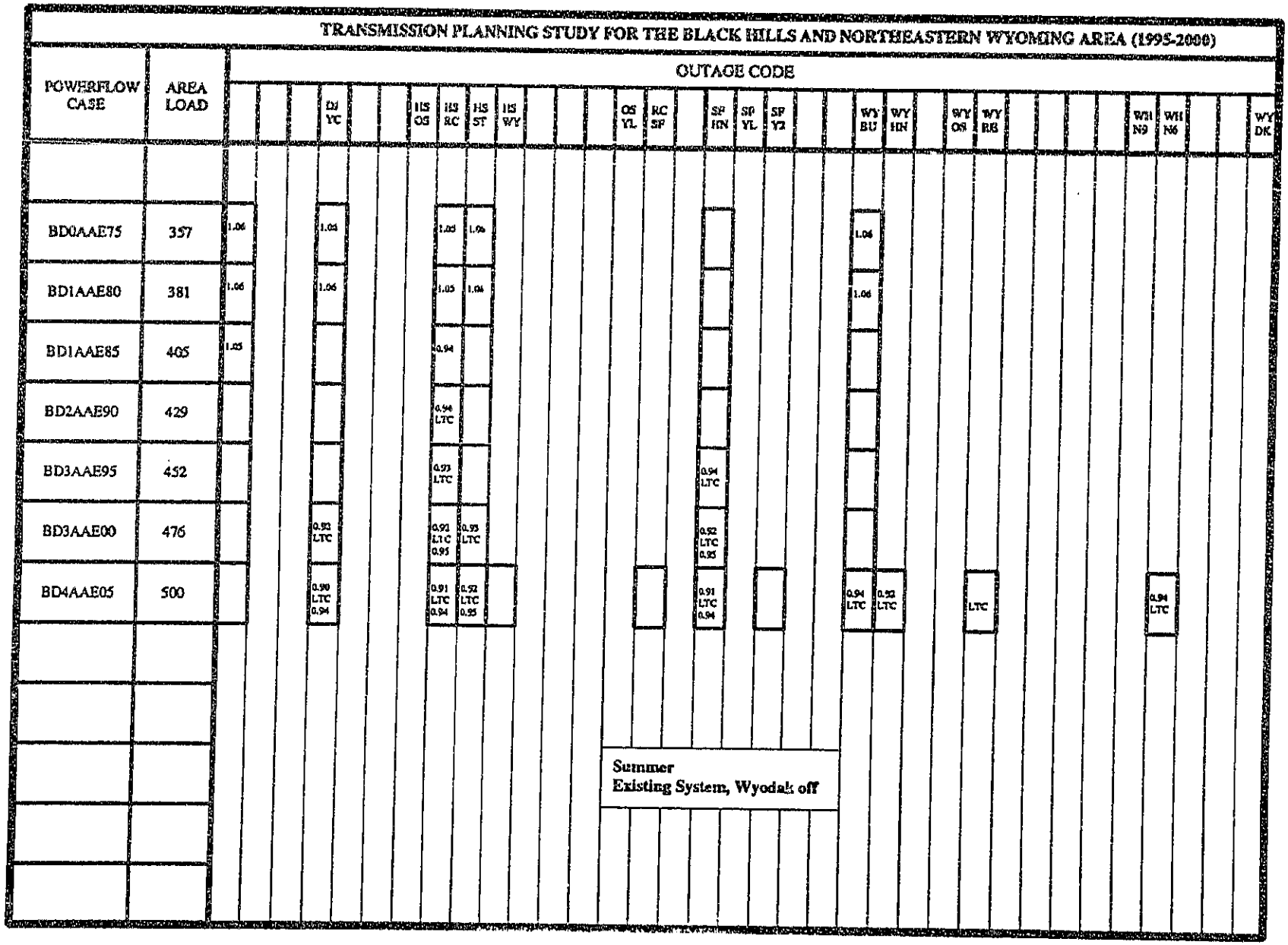

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SF HN
SF YL
SF YZ
WY BU
WY HN
WY OS
WY RB
WH N9
WH N6
WY DK
NB0AAE90
480
NB1AAE95
506
NB1AAE00
533
NB2AAE05
560
NB2AAE10
586
0.94 LTC
0.95 LTC
0.92 LTC 0.94
0.93 LTC 0.94
0.91 LOO3 0.92
U OL01
U 0.93 LOO5
U 0.93 LOO5
U 0.91 LO13 0.94
N5
N5
0.95 LOO3 0.95
0.93 LTC 0.94
Winter
Existing System, Wyodak on

Table QV-B
QV Curve Results
Existing System, Wyodak Off

	total area load		hsrc.rc	hsst.rc	sfhn.rc	diyc.wy	wybu.wy
summer							
bd0aae75	357		.82/-34.8	.83/-60.2	.80/-57.9	.81/-93.4	.78/-116.7
bd0aae80	381		.83/-17.0		.82/-38.9	.83/-64.8	
bd1aae80			.81/-39.9	.83/-62.6	.80/-61.4	.81/-91.0	.78/-116.7
bd0aae85	405		.84/-0.2		.84/-21.6	.86/-37.3	
bd1aae85			.84/-24.2	.85/-44.1	.82/-44.9	.83/-64.9	.80/-92.5
bd1aae90	429		.85/-7.4	.88/-24.3	.83/-27.5	.86/-37.3	
bd2aae90			.83/-30.6	.86/-47.5	.82/-49.9	.83/-63.6	.80/-93.4
bd2aae95	452		.85/-14.6	.88/-28.4	.84/-33.3	.85/-37.1	
bd3aae95			.84/-36.3	.86/-50.5	.83/-54.3	.84/-61.6	.80/-93.7
bd3aae00	476		.84/-20.7	.88/-31.4	.84/-37.9	.86/-35.2	.82/-69.3
bd4aae00			.83/-43.1	.86/-54.4	.82/-59.9	.84/-60.6	.80/-95.1
bd4aae05	500		.86/-26.0	.89/-33.5	.84/-42.0	.86/-32.4	.82/-69.0
bd4aae10	524		.87/-9.4	.90/-13.0	.86/-24.5	.88/-4.7	.87/-43.7
winter							
od0aae75	400		.81/-28.1	.83/-38.3	.79/-55.8	.82/-45.3	.79/-93.4
od0aae80	426		.82/-10.8	.85/-16.4	.81/-38.3	.84/-14.1	
od1aae80			.80/-40.6	.83/-47.7	.79/-66.7	.82/-48.6	.78/-99.7
od1aae85	453		.81/-24.5	.86/-26.4	.81/-50.0	.84/-18.3	
od2aae85			.79/-51.2	.84/-55.4	.80/-75.5	.83/-50.0	.78/-103.7
od2aae90	480		.82/-36.3	.85/-35.2	.82/-60.3	.84/-20.8	
od3aae90			.80/-61.2	.85/-62.8	.81/-84.3	.83/-50.9	.78/-107.3
od3aae95	506		.81/-46.9	.87/-42.8	.82/-69.1	.85/-21.9	
od4aae95			.81/-70.1	.86/-69.5	.81/-92.4	.83/-51.3	.78/-110.2
od4aae00	533		.82/-55.8	.88/-49.0	.83/-76.4	.84/-21.3	.80/-85.0


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SP HN
SP YL
SP Y2
WY BU
WY HN
WY OS
WY RB
WH N9
WH N6
WY DK
BD0AAE75 357
BD1AAE80 381
BD1AAE85 405
BD2AAE90 429
BD3AAE95 452
BD3AAE00 476
BD4AAE05 500
1.06
1.05
1.06
1.05
1.06
1.05
1.06
1.05
1.06
1.05
0.94
0.94 LTC
0.93 LTC
0.92 LTC 0.95
0.95 LTC
0.90 LTC 0.94
0.91 LTC 0.94
0.92 LTC 0.95
0.94 LTC
0.91 LTC 0.94
0.94 LTC
0.92 LTC
LTC
0.94 LTC
Summer
Existing System, Wyodak off

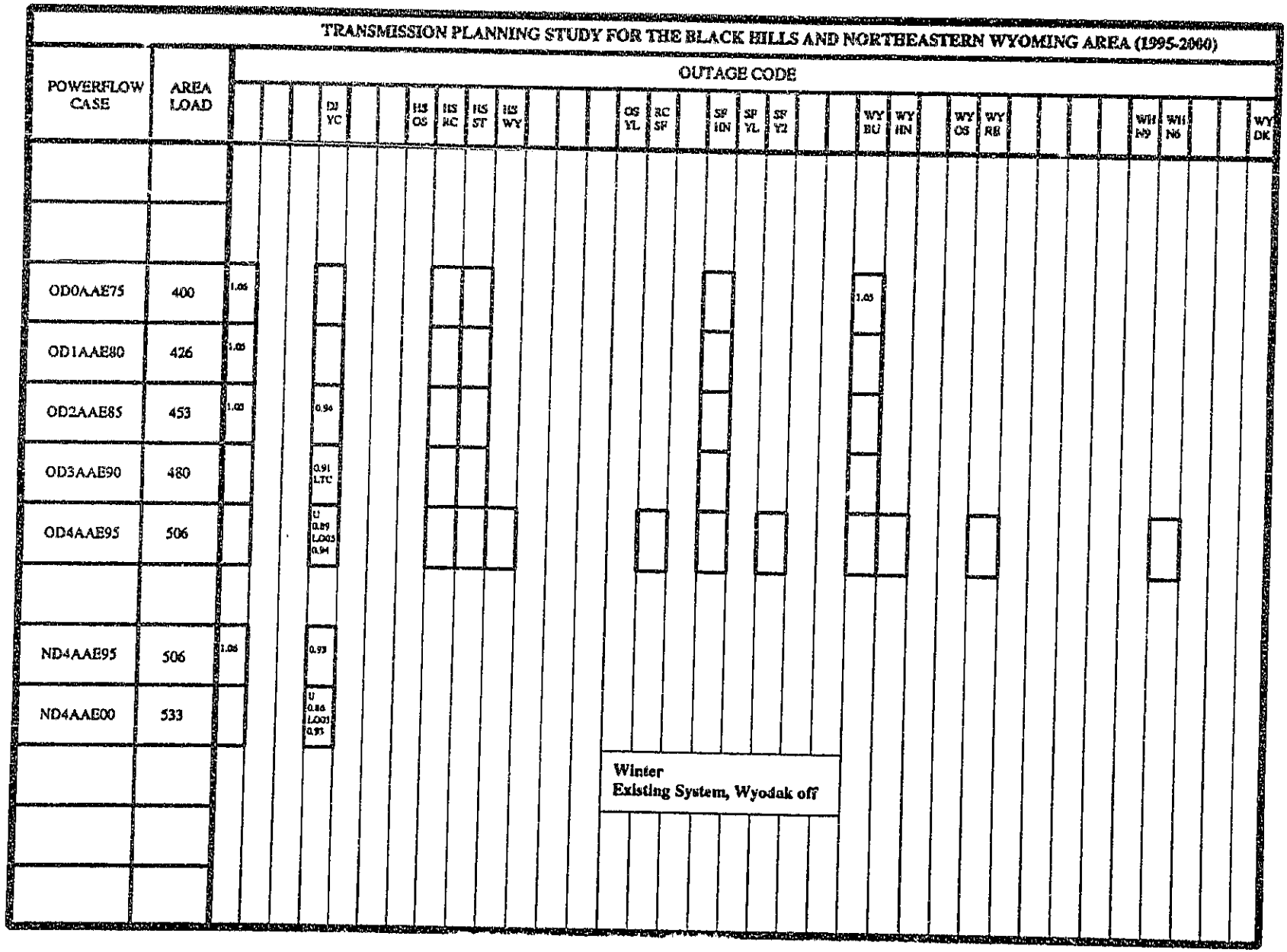
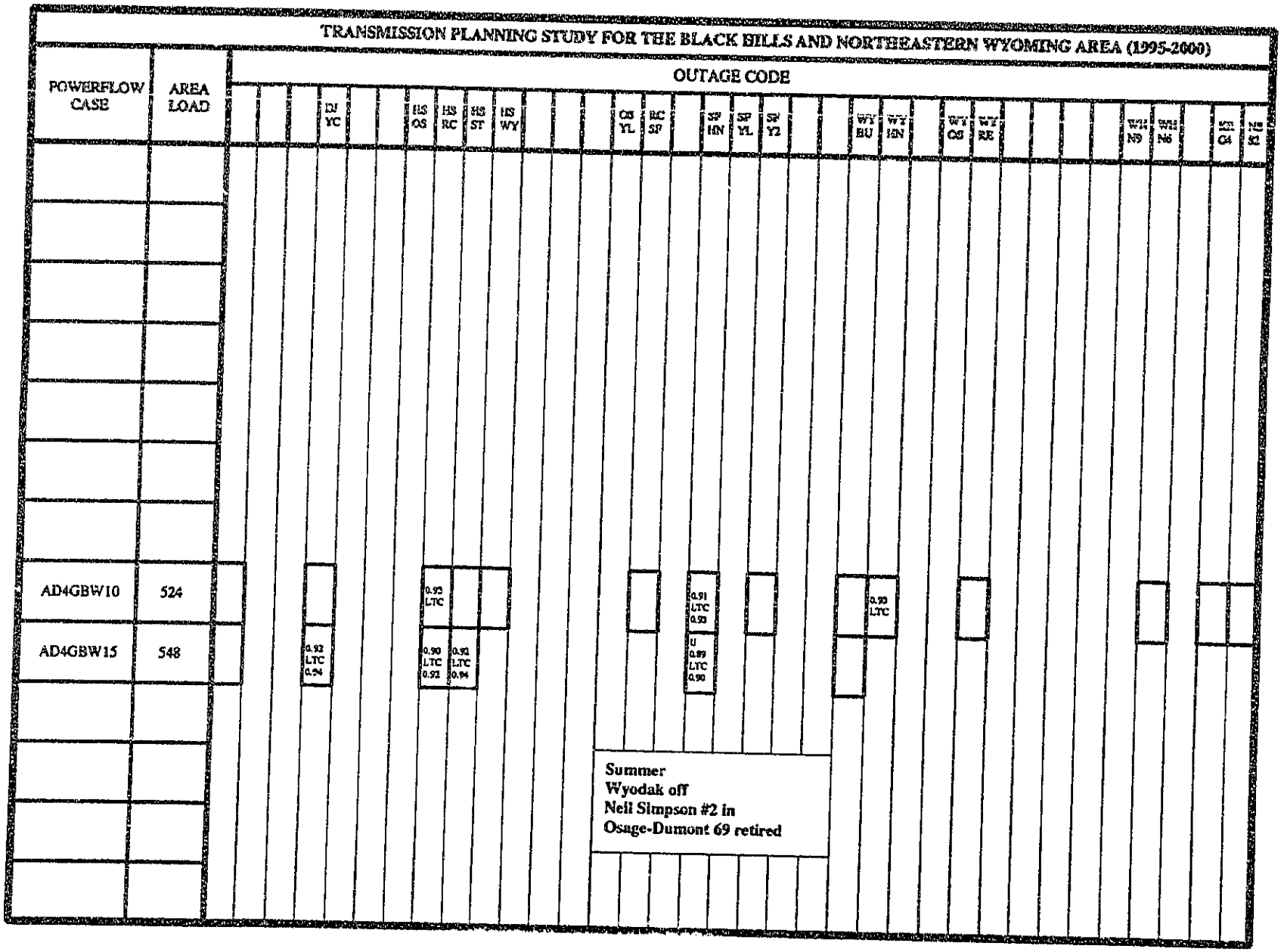

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SP HN
SP YL
SF Y2
WY BU
WY HN
WY OS
WY RB
WH N9
WH N6
WY DK
OD0AAE75 400
OD1AAE80 426
OD2AAE85 453
OD3AAE90 480
OD4AAE95 506
ND4AAE95 506
ND4AAE00 533
1.05
1.03
1.03
1.06
0.94
0.91 LTC
U 0.89 LO03 0.94
0.93
U 0.86 LO03 0.93
1.05
Winter
Existing System, Wyodak off

Table QV-C
QV Curve Results
Wyodak Off, NSS 2 In, Osage-Dumont 69 Retired

	total area load		hsrc.rc	hsst.rc	sfhn.rc	djyc.wy	wybu.wy
summer							
ad4gbw10	524		.88/-21.4	.90/-41.3/ >1.00	.87/-21.3	.87/-62.1	.83/-92.6
ad4gbw15	548		.89/-5.1		.89/-4.0	.89/-36.6	
winter							
nd4gbw05	560		.84/-53.0	.87/-59.0	.85/-59.9	.84/-57.9	.80/-114.3
nd4gbw10	586		.86/-39.7	.90/-41.0/ .997	.86/-45.4	.86/-31.4	.81/-92.6
[illegible]4gbw15	613		.88/-24.3	.91/-20.5/ .968	.87/-28.8	.88/-1.8	


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
EJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SP
SP HN
SP YL
SP Y2
WY BU
WY HN
WY OS
WY RE
WY N9
WY N6
AD4GBW10
524
AD4GBW15
548
0.92 LTC
0.92 LTC 0.94
0.92 LTC
0.90 LTC 0.92
0.92 LTC 0.94
0.91 LTC 0.93
U 0.89 LTC 0.90
0.93 LTC
Summer
Wyodak off
Neil Simpson #2 in
Osage-Dumont 69 retired

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)

| POWERFLOW CASE | AREA LOAD | OUTAGE CODE | | |

Table PV-C
PV Curve Results
Wyodak Off, NSS 2 In, Osage-Dumont 69 Retired

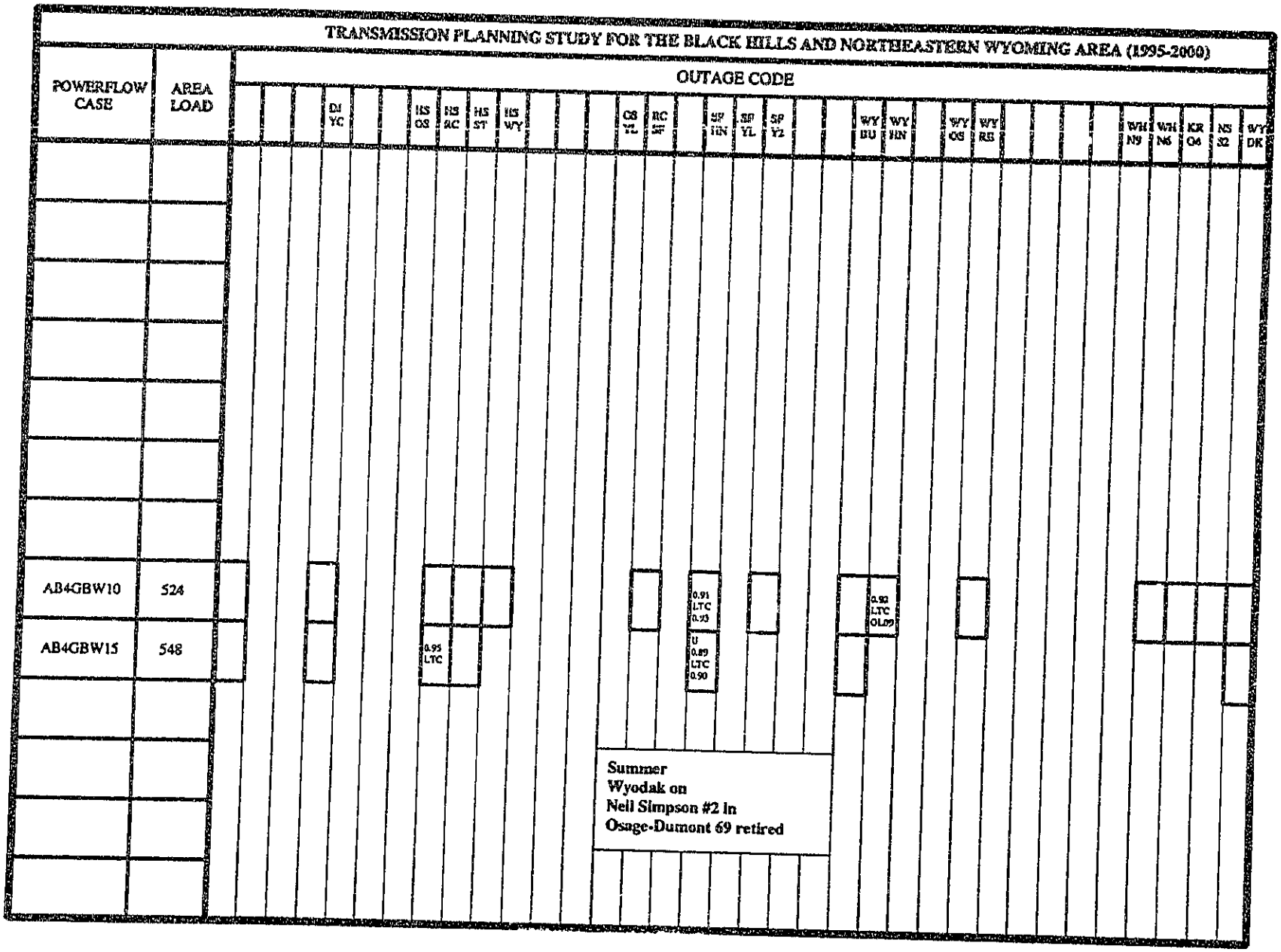
case name	total area load	contingency*	mw limit if criteria is 0.90 pu minimum Rapid City 230 voltage	mw limit if criteria is 0.90 x Pcrit	
				Pcrit is last solved case	Pcrit is first unsolved case
summer					
acl4gbw10	524	hsrc	551	504	509
		sfhn	554	504	509
		hsst	570	519	523

* contingency code

hsrc - Hot Springs to Rapid City 230
sfhn - Spearfish to Hughes 230
hsst - Hot Springs to Stegall 230

Table QV-D
QV Curve Results
Wyodak On, NSS 2 In, Osage-Dumont 69 Retired

	total area load	divc.rc	hsrc.rc	hssl.rc	sfhn.rc	wybu.rc	wydk.wy
summer							
ab4gbw10	524	.76/-185.4	.74/-70.3	.81/-142.2	.82/-29.8	.78/-178.2	.78/-200.0
ab4gbw15	548	.78/-172.1	.74/-57.2	.82/-128.1	.84/-12.5	.78/-166.0	.80/-169.8
winter							
nb4gbw15	613	.83/-166.5	.81/-79.7	.83/-127.1	.83/-46.1	.83/-166.4	.78/-161.0


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SP HN
SP YL
SP YS
WY BU
WY HN
WY OS
WY RS
WH N9
WH N6
KR O4
NS S2
WY DK
AB4GBW10
524
AB4GBW15
548
0.95 LTC
0.91 LTC 0.93
U 0.89 LTC 0.90
0.93 LTC OL09
Summer
Wyodak on
Neil Simpson #2 In
Osage-Dumont 69 retired

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)

POWERFLOW CASE	AREA LOAD	OUTAGE CODE
NB4GBW15	613	DJ YC; HS OS; HS RC; HS ST; HS WY; OS YL; RC SF; SP HN; SF YL; SP Y2; WY BU; WY HN; WY OS; WY RB; WH W9; WH N6; KR C4; NS S2; WY DK

0.92 LTC 0.93

0.93 LTC 0.94

OL03

Winter
Wyodak on
Neil Simpson #2 in
Osage-Dumont 69 retired

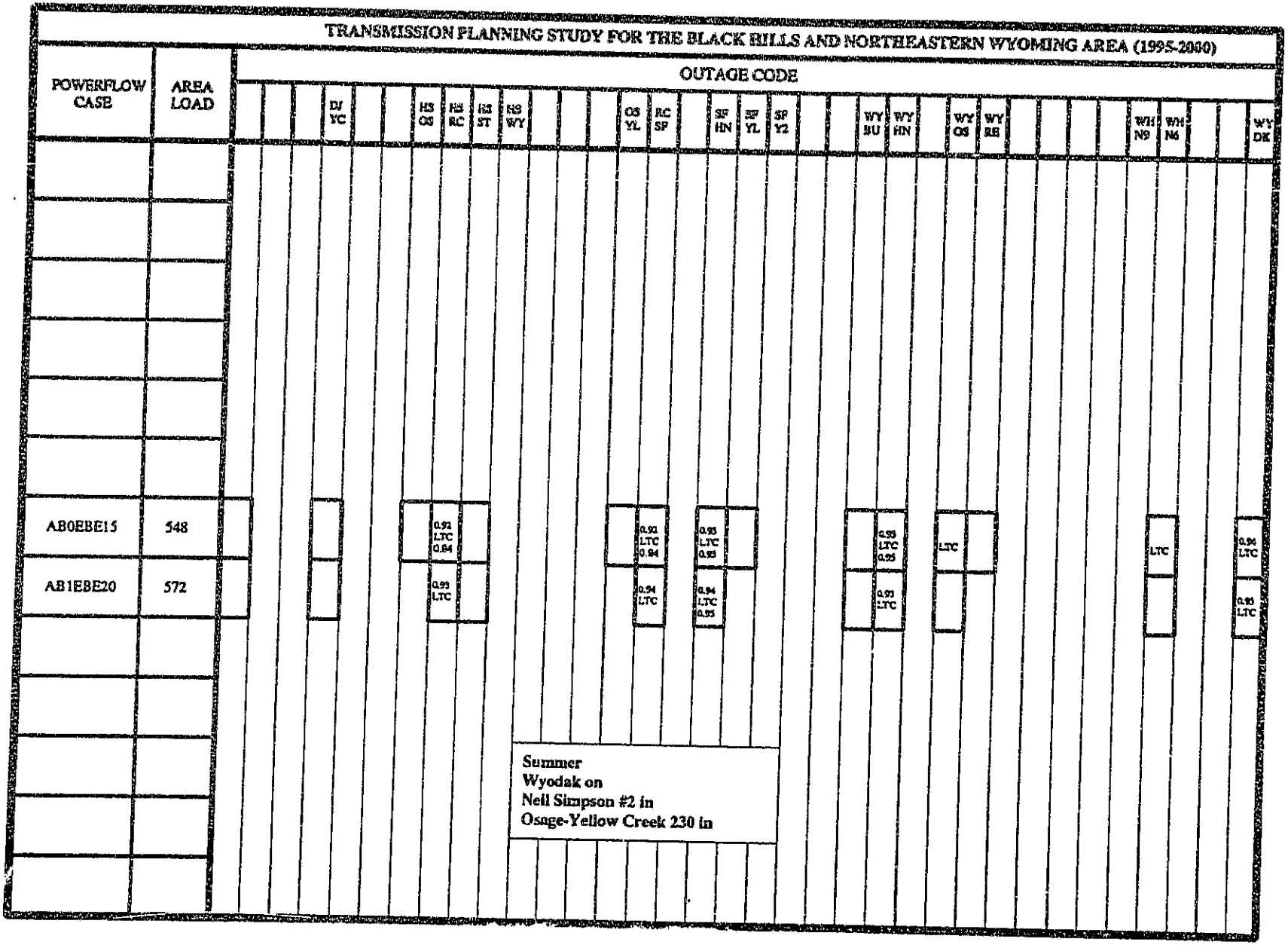
Table QV-E
QV Curve Results
Wyodak Off, NSS 2 In, Osage-Dumont 69 Retired, Capacitors at Rapid City 230

	total area load		hsrc.rc	hsst.rc	sfhn.rc	divc.wy	wybu.wy
summer							
20 mvars							
ad4g2w15	548		.90/-19.6/ .982	.91/-37.3/ >1.00	.90/-18.6/ .974	.89/-52.7/	.86/-84.6/
30 mvars							
ad4g3w15	548		.91/-26.5/ >1.00	.92/-44.3/ >1.00	.91/-24.9/ .993	.89/-59.9/	.86/-91.6/
40 mvars							
ad4g4w20	572		.94/-15.2/ .994	.94/-30.4/ >1.00	.92/-12.7/ .983	.91/-40.1/ .980	.89/-73.3
50 mvars							
ad4g5w20	572		.95/-22.3/ >1.00	.96/-37.4/ >1.00	.94/-18.8/ >1.00	.91/-46.7/ .997	.90/-79.6/ >1.00
winter							
30 mvars							
nd4g3w15	613		.92/-44.0/ >1.00	.94/-41.9/ >1.00	.91/-48.0/ >1.00	.88/-24.3	.86/-87.7
40 mvars							
nd4g4w15	613		.93/-51.1/ >1.00	.95/-49.2/ >1.00	.92/-54.4/ >1.00	.88/-31.5	.85/-94.6

Table QV-F
QV Curve Results
Wyodak On, NSS 2 In, Osage-Yellow Creek 230 In

	total area load	divc.rc	hsrc.rc	hsst.rc	sfhn.rc	wybu.rc	wydk.wy
summer							
ab0ebe15	548	.81/-119	.78/-43.6	.85/-65.2	.78/-38.3	.80/-114	.88/-49.2
ab0ebe20	572						
ab1ebe20		.80/-124.6	.79/-51.6	.85/-70.6	.80/-20.1		.90/-11.5
					.79/-45.1	.81/-119.7	.87/-55.0
winter							
nb0ebe10	586	.84/-111.6	.79/-53.9	.85/-61.1	.80/-55.6	.84/-114.6	.85/-48.3
nb0ebe15	613				.80/-38.3		.87/-9.4
nb1ebe15		.85/-121.6	.79/-68.0	.85/-73.1	.79/-69.0	.84/-124.9	.83/-63.4
nb1ebe20	639				.81/-51.7		.85/-25.4

0132268202


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HE RC
HS ST
NS WY
OS YL
RC SP
SF HN
SF YL
SP Y2
WY BU
WY HN
WY OS
WY RB
WH N9
WH N6
WY DK
AB0EBE15
548
AB1EBE20
572
0.92 LTC 0.94
0.93 LTC
0.92 LTC 0.94
0.94 LTC
0.93 LTC 0.95
0.94 LTC 0.95
0.93 LTC 0.95
0.93 LTC
LTC
LTC
0.96 LTC
0.95 LTC
Summer
Wyodak on
Neil Simpson #2 in
Osage-Yellow Creek 230 in

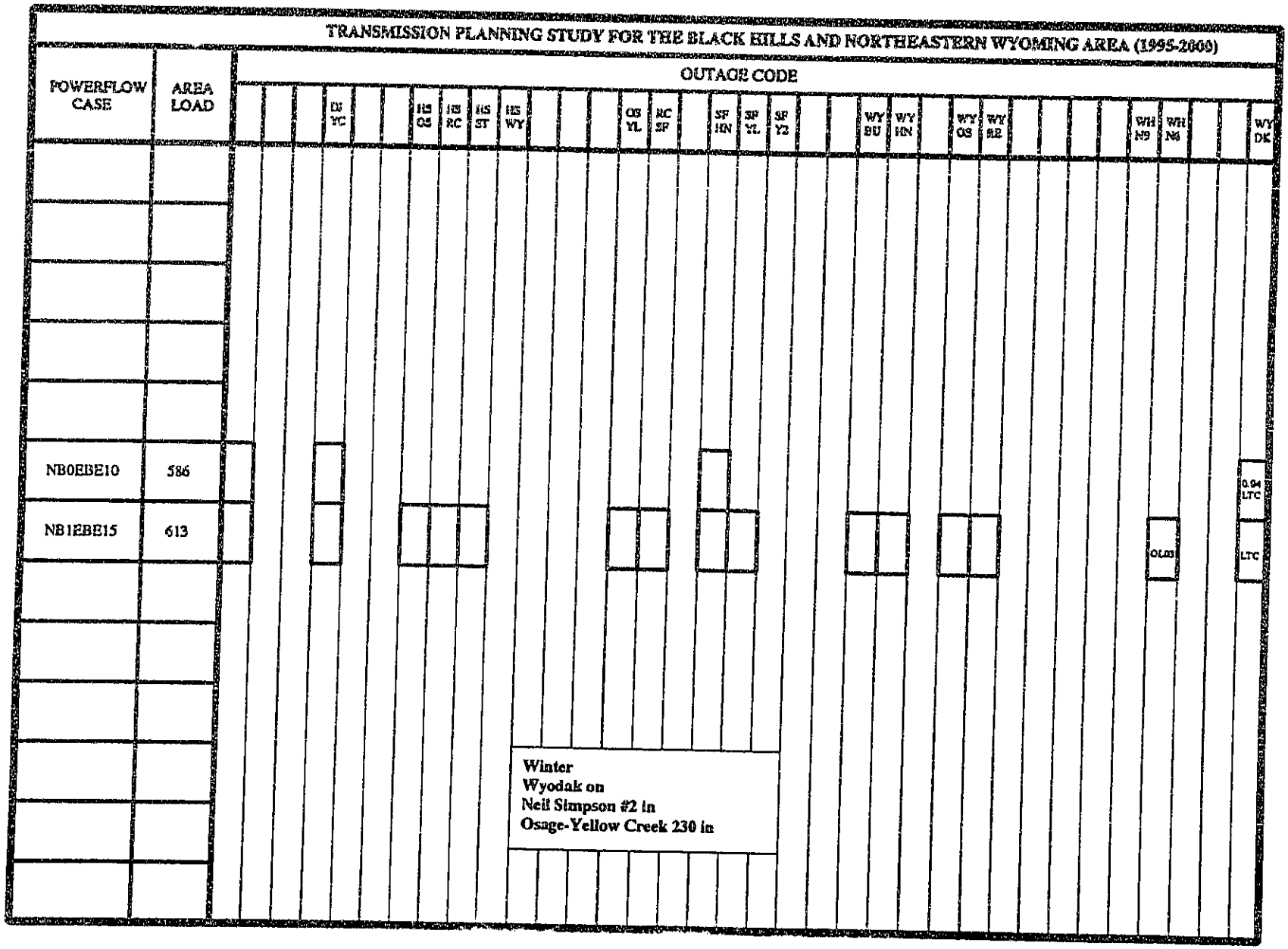
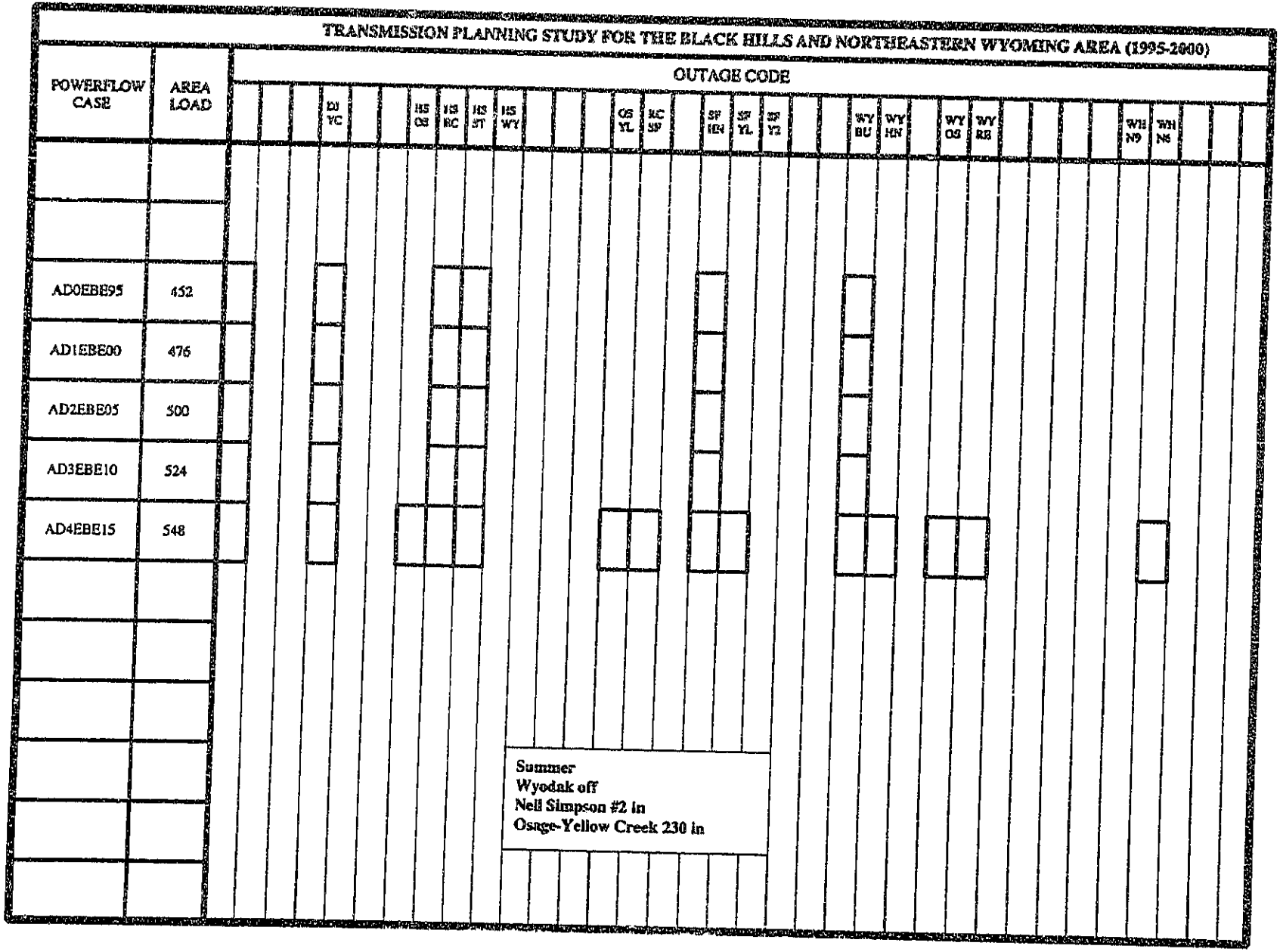

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SP
SF HN
SP YL
SP Y2
WY BU
WY HN
WY OS
WY SE
WH N9
WH N6
WY DK
NB0EBE10
586
NB12BE15
613
0.94 LTC
OL03
LTC
Winter
Wyodak on
Neil Simpson #2 in
Osage-Yellow Creek 230 in

Table QV-G
QV Curve Results
Wyodak Off, NSS 2 In, Osage-Yellow Creek 230 In

	total area load		hsrc.rc	hsst.rc	sfhn.rc	divc.wy	wybu.wy
summer							
ad0ebe95	452		.80/-35.9	.91/-24.3/ >1.00	.79/-57.3	.87/-57.1	.85/-81.3
ad1ebe95			.78/-56.6	.88/-46.0	.78/-78.2	.85/-81.9	.81/-106.8
ad0ebe00	476			.92/-2.0	.81/-37.6	.90/-27.3	
ad1ebe00			.79/-42.6	.90/-28.4/ >1.00	.79/-62.9	.87/-57.8	.84/-84.4
ad2ebe00			.78/-62.8	.88/-49.8	.78/-83.2	.86/-81.8	.82/-109.0
ad1ebe05	500			.91/-6.6	.80/-43.9	.90/-29.0	
ad2ebe05			.79/-48.3	.90/-31.3/ >1.00	.79/-67.3	.87/-56.9	.84/-86.1
ad1ebe10	524				.82/-26.3	.92/-1.4	
ad2ebe10			.81/-32.2	.91/-11.0	.81/-50.2	.90/-30.1/ .991	.86/-61.2
ad3ebe10			.80/-51.9	.91/-32.6/ >1.00	.79/-69.8	.88/-53.8	.84/-85.1
ad3ebe15	548			.92/-13.4	.81/-53.8	.90/-28.6	
ad4ebe15			.79/-58.3	.91/-36.3/ >1.00	.79/-74.9	.88/-53.6	.84/-87.4
ad4ebe20	572			.92/-16.1	.81/-57.9	.90/-27.1	
winter							
nd0ebe90	480		.77/-46.4	.88/-20.5	.76/-71.6	.85/-35.4	.82/-85.1
nd0ebe95	506				.79/-54.4	.88/-5.5	
nd1ebe95			.77/-58.4	.88/-30.7	.77/-82.1	.85/-40.3	.81/-93.2
nd1ebe00	533				.79/-65.1	.88/-10.4	
nd2ebe00			.76/-68.3	.88/-39.0	.77/-90.6	.85/-42.8	.81/-98.6
nd2ebe05	560				.79/-74.1	.87/-13.7	
nd3ebe05			.77/-76.0	.89/-45.6	.78/-96.9	.86/-43.3	.80/-101.9
nd3ebe10	586				.79/-81.9	.88/-15.5	
nd4ebe10			.78/-83.9	.89/-52.7	.78/-103.7	.86/-44.2	.81/-105.5
nd4ebe15	613				.79/-88.3	.87/-16.1	

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)



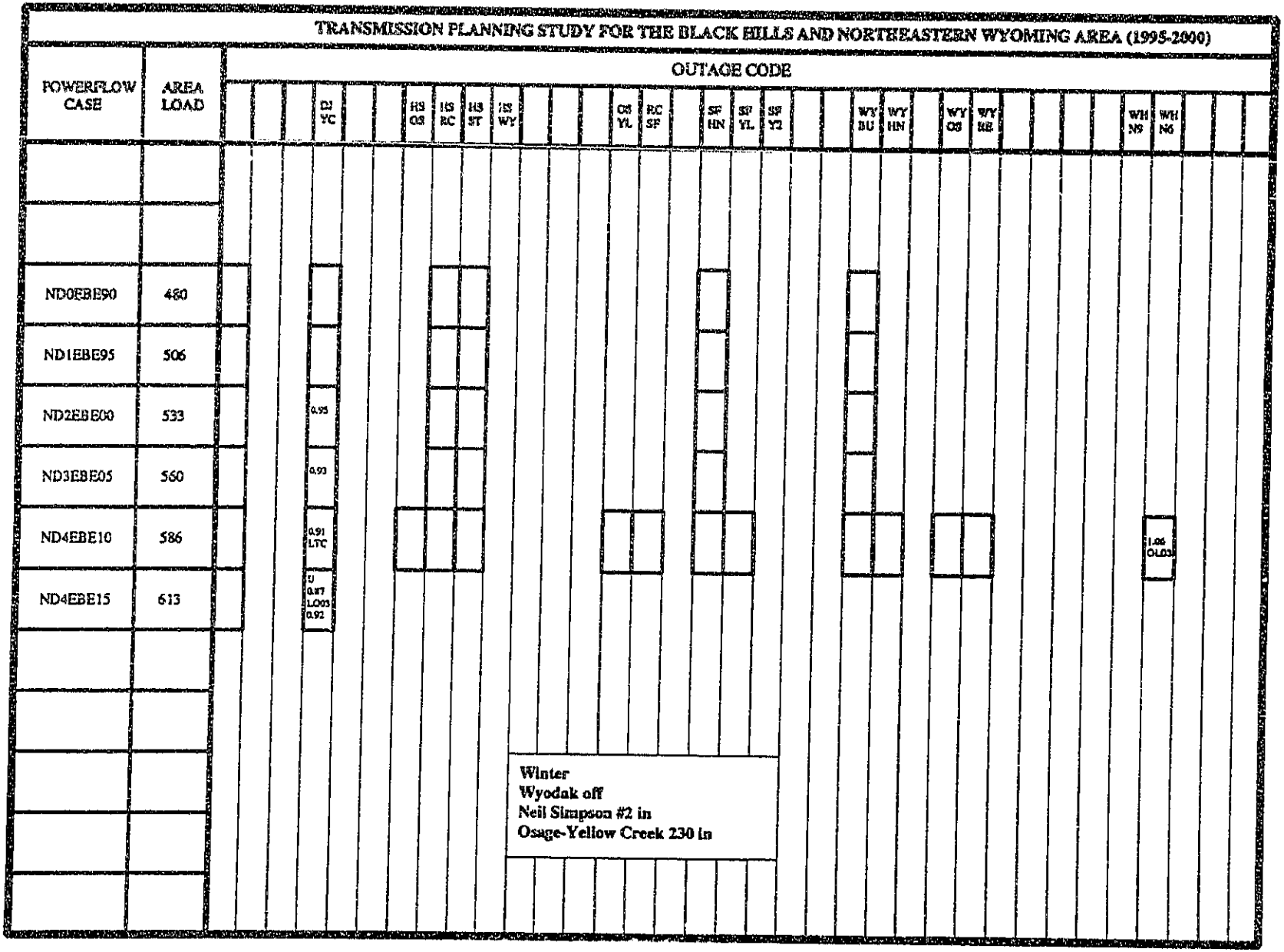
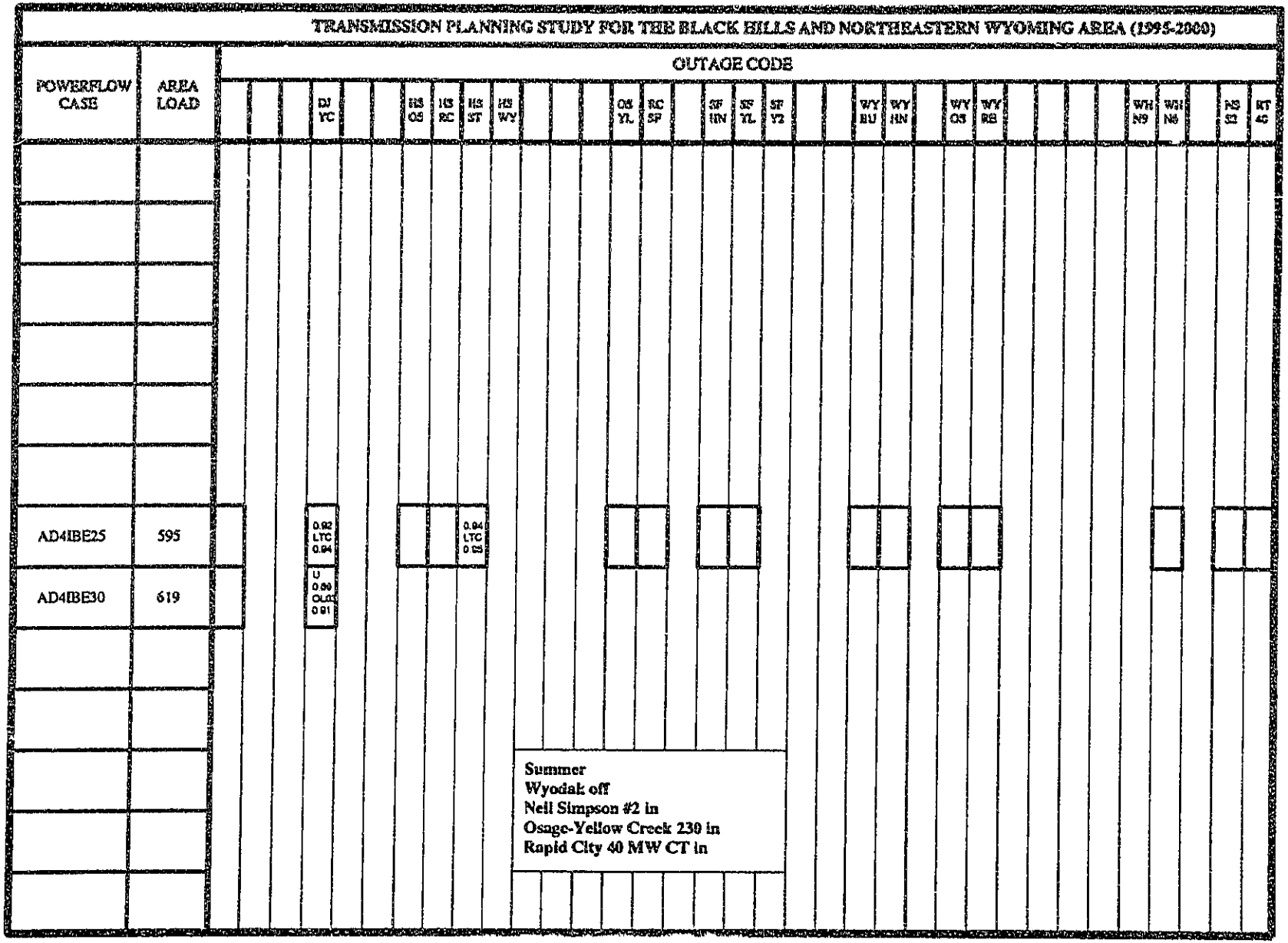

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
DJ YC
HS OS
HS RC
HS ST
HS WY
OS YL
RC SF
SF HN
SF YL
SF YZ
WY BU
WY HN
WY OS
WY RE
WH N9
WH N6
ND0EBE90
480
ND1EBE95
506
ND2EBE00
533
ND3EBE05
560
ND4EBE10
586
ND4EBE15
613
0.95
0.93
0.91 LTC
U 0.87 LO03 0.92
1.06 OL03
Winter
Wyodak off
Neil Simpson #2 in
Osage-Yellow Creek 230 in

Table QV-H
QV Curve Results
Wyodak Off, NSS 2 In, Osage-Yellow Creek 230 In, 40 MW Rapid City CT In

	total area load		hsrc.rc	hsst.rc	sfhn.rc	diyc.wy	wybu.wy
summer							
ad4ibe25	595		.80/-63.6	.91/-38.2/ .989	.80/-77.5	.88/-46.9	.84/-84.5
ad4ibe30	619				.82/-60.1	.89/-19.7	
winter							
nd4ibe15	613		.77/-97.1	.88/-68.3	.78/-116.5	.85/-55.1	.81/-117.7
nd4ibe20	639				.79/-102.1	.88/-27.9	


TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)
POWERFLOW CASE
AREA LOAD
OUTAGE CODE
BJ YC
BS OS
BS RC
BS ST
BS WY
OS YL
RC SP
SF HN
SF YL
SF YZ
WY BU
WY HN
WY OS
WY RB
WH N9
WH N6
NS S2
RT 45
AD4IBE25
595
0.92 LTC 0.94
0.94 LTC 0.95
AD4IBE30
619
U 0.89 O.L. 0.91
Summer
Wyodak off
Neil Simpson #2 in
Osage-Yellow Creek 230 in
Rapid City 40 MW CT in

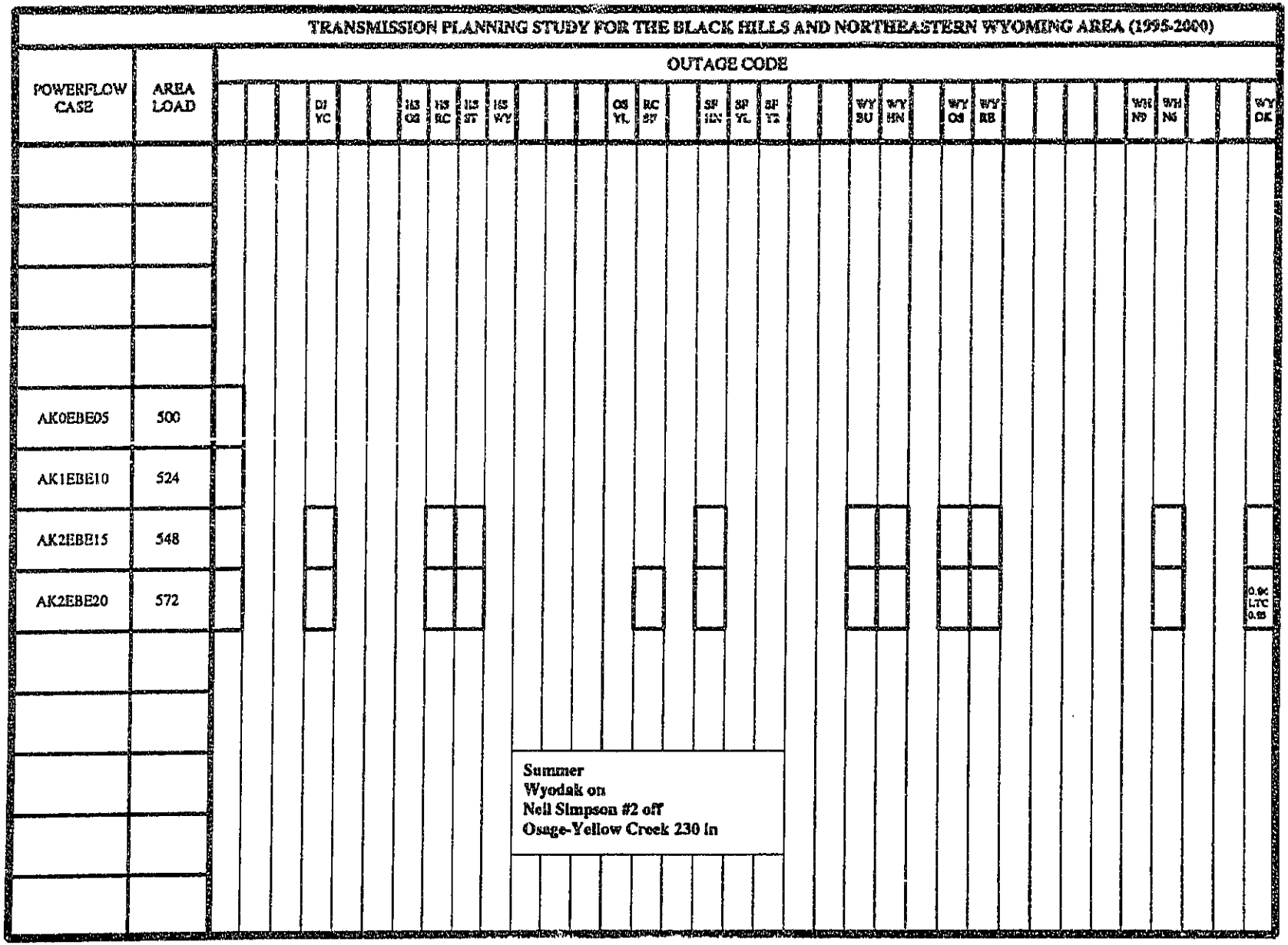
TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)

| POWERFLOW CASE | AREA LOAD | OUTAGE CODE | | |

Table QV-I
QV Curve Results
Wyodak On, NSS 2 Off, Osage-Yellow Creek 230 In

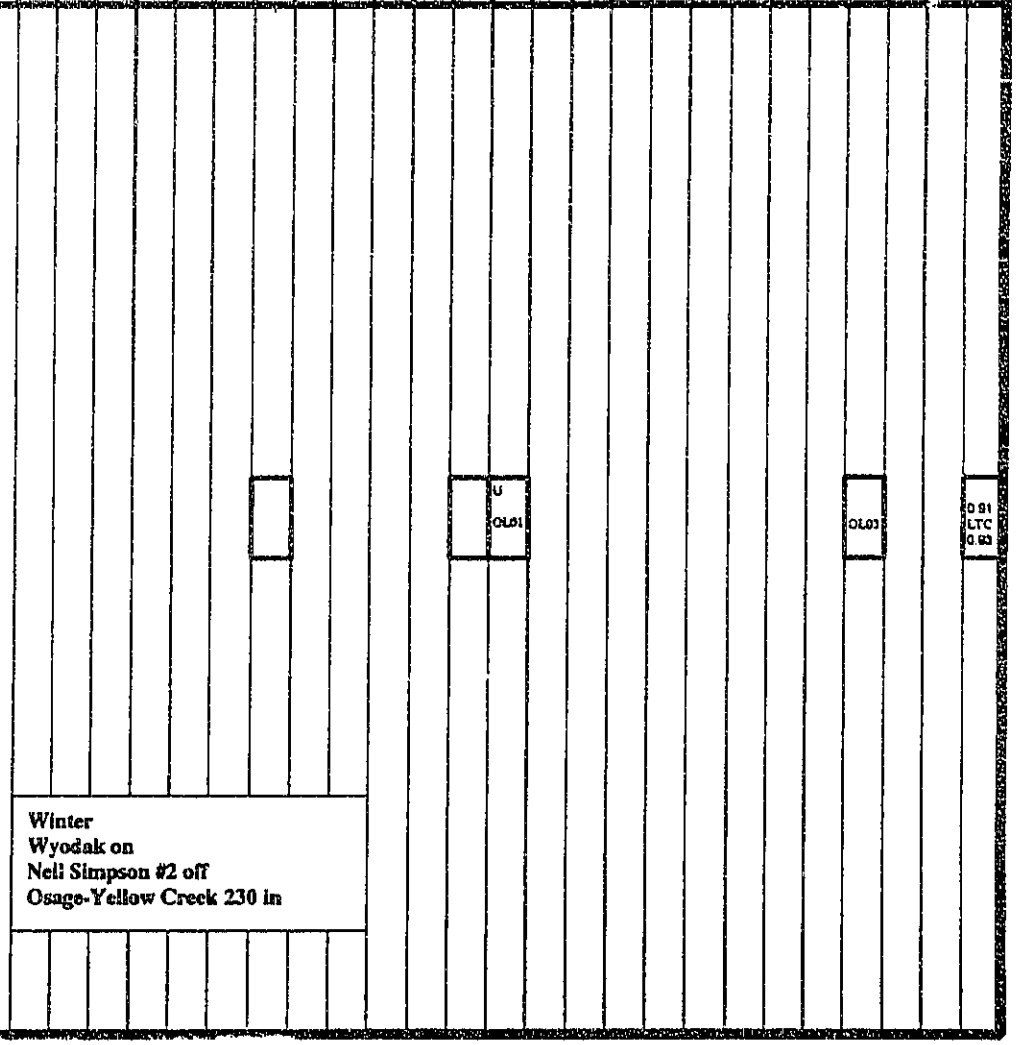
	total area load	olvc.rc	hsrc.rc	hsst.rc	sfhn.rc	wybu.rc	wydk.wy
summer							
ak0ebe05	500	.83/-140.9	.78/-69.4	.85/-89.3	.77/-74.6	.84/-135.3	.84/-61.7
ak0ebe10	524	.84/-123.8	.80/-53.6	.86/-71.4	.79/-56.8	.85/-119.4	**.86/-23.2**
ak1ebe10		.84/-146.0	.79/-77.1	.85/-94.1	.78/-81.5	.85/-140.8	.83/-66.6
ak1ebe15	548	.85/-127.8	.80/-61.0	.87/-75.5	.79/-63.2	.86/-123.9	**.86/-27.5**
ak2ebe15		.84/-149.5	.79/-83.9	.86/-99.3	.78/-87.7	.85/-145.3	.83/-70.2
ak2ebe20	572	.85/-131.5	.81/-68.5	.87/-81.5	.80/-69.9	.86/-129.0	.85/-32.2
winter							
nk0ebe00	533	.88/-122.3	.81/-71.7	.89/-77.4	.81/-83.7	.85/-126.8	.81/-53.0
nk0ebe05	560	.88/-102.9	.83/-56.0	.90/-58.6/ >1.00	.82/-66.2	.87/-109.7	**.83/-13.8**
nk1ebe05		.88/-129.6	.81/-83.6	.90/-87.2/ >1.00	.80/-94.8	.85/-135.4	.80/-63.6
nk1ebe10	586	.89/-110.2	.83/-68.3	.91/-68.8/ >1.00	.82/-77.6	.86/-118.7	**.82/-25.7**
nk2ebe10		.88/-135.6	.80/-93.9	.90/-95.7/ >1.00	.80/-104.4	.86/-142.8	.79/-71.2
nk1ebe15	613	.90/-89.3/ >1.00	.84/-51.7	.92/-48.8/ 1.00	.83/-59.2	.88/-100.6	**.85/+14.5**
nk2ebe15		.89/-117.2	.81/-79.7	.91/-78.2/ >1.00	.82/-88.4	.87/-127.0	**.81/-35.5**

TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)



TRANSMISSION PLANNING STUDY FOR THE BLACK HILLS AND NORTHEASTERN WYOMING AREA (1995-2000)

POWERFLOW CASE	AREA LOAD	OUTAGE CODE
NK0EBE00	533	
NK1EBE05	560	
NK2EBE10	586	
NK2EBE15	613	



Appendix 3

Voltage Instability Criteria and Planning/Operating Margins

Although recommendations for voltage instability reliability criteria and planning/operating margins are outside the Task Force scope, we will provide some information. Individual WSCC member utilities are still developing criteria.

CIGRE [A1] suggests that *n*-2 criteria be used for voltage instability. The idea is that the probability of a disturbance threatening voltage stability should be similar to the probability of a disturbance threatening transient stability. The probability of a *n*-1 three-phase fault at a critical location with line loss may be lower than, say, a *n*-2 double line or two line outage. For voltage instability analysis, an appropriate *n*-2 outage might be outage of a main circuit element plus outage of reactive equipment.

Appropriate planning/operating margins require a great deal of engineering judgement. Margins could be based on real power import (for example, stability required for loading 5% above rating), post-disturbance voltage profile, reactive reserve at critical locations, etc.

Voltage stability is often studied by means of *Q-V* curves as shown in Figure A3-1. The curves are generated from post-disturbance power flow simulations by applying a fictitious synchronous condenser at a critical bus and varying the condenser voltage schedule (the critical bus may change with the disturbance). The *Q* axis represents the capacitance required for a particular post-disturbance operating point. Stable operation is on the right side of the curve. The point where the curve crosses $Q = 0$ is the operating point if no capacitors are added.

Criteria and margins available from *Q-V* plots are shown on Figure A3-1. One criterion is that the critical voltage (voltage instability point) be below some value such as 0.95 pu. If the critical voltage is in the normal operating range, as possible with high shunt compensation and limited spinning reactive reserve, monitoring of voltage profile is meaningless. A related criterion is the voltage margin between critical voltage and post-disturbance operating point (voltage distance C on Figure A3-1). Another possible criterion is an acceptable *Q-V* curve slope at the operating point; this insures that small reactive changes do not cause large voltage changes and/or hunting of voltage controlled capacitors.

With high levels of shunt compensation, several WSCC member utilities are having difficulties designing so that the critical voltage is below the normal operating range. Another criterion (perhaps more appropriate) is the reactive power margin between the critical voltage and the operating point (MVAr distance A on Figure A3-1; note that the voltage distance C and the MVAr distance A are for different shunt capacitor values).

If shunt capacitors (rather than static compensators or synchronous condensers) are applied, the actual critical point is not the bottom of the curve, but instead where the capacitor characteristic is tangent to the *Q-V* curve.

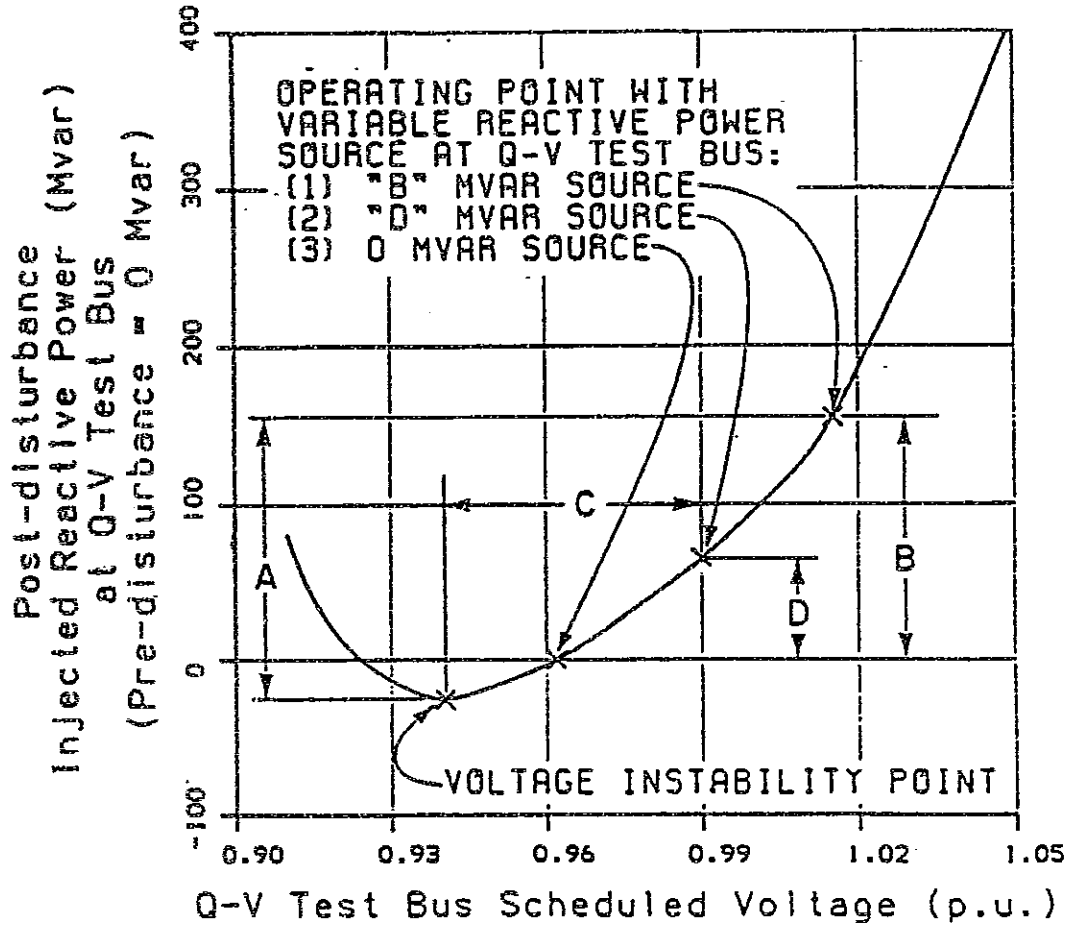


Fig. A3-1. *Q-V curve showing candidates for voltage instability margin; source: B.C. Hydro [AI2].*

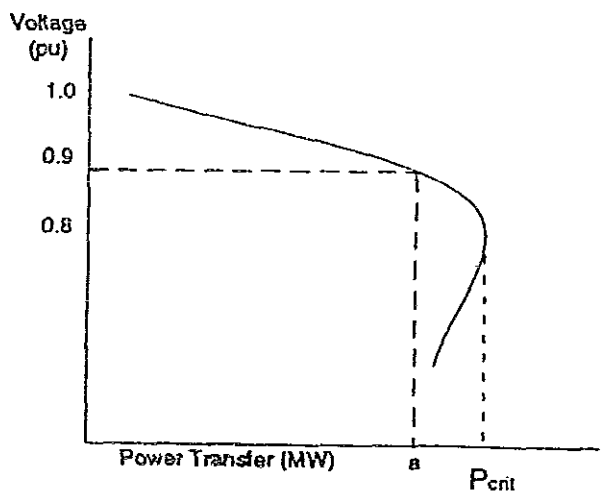
PV Analysis

PV curves (example below) can be generated by increasing total load in an area or power transfer across an interface and plotting this P versus the voltage (V) at a critical or representative bus. A family of curves can be generated for different system conditions and line outages. The results of these curves can be used by operators to limit transfers or adjust local generation so that operation will not fall below the knee of the curve (nose of the PV curve) for any credible outage.

A disadvantage of PV analysis is that the power flow simulation will diverge near the nose or maximum power point on the curve. Another disadvantage is that generation must be realistically rescheduled as the area load or transfer is increased.

In order to maintain some amount of margin, the limit can be defined from the PV curve results as the lesser of several criteria. Several possible criteria are listed below.

- (0.90 x Pcrit) where Pcrit is defined as the maximum power transfer (i.e. the nose of the PV curve)
- the maximum power transfer before a bus voltage falls below 0.90 p.u. (shown below as point "a")
- the maximum power transfer which results in any other specified voltage violation



DIRECT TESTIMONY OF L. W. LOOS
SOUTH DAKOTA PUBLIC UTILITIES COMMISSION
BLACK HILLS POWER AND LIGHT COMPANY
APPLICATION FOR AN INCREASE IN ELECTRIC RATES
DOCKET NO. EL95-003

Q: Q. Please state your name and business address.

A. L. W. Loos, 8400 Ward Parkway, Kansas City, Missouri 64114.

Q. What is your occupation?

A. I am a Partner in the firm of Black & Veatch. I currently serve in the firm's Management Consulting Division as Partner-in-Charge of Energy Services.

Q. How long have you been associated with the firm of Black & Veatch?

A. I have been with the firm continuously since 1971.

Q. What is your educational background?

A. I am a graduate of the University of Missouri at Columbia, with a Bachelor of Science Degree in Mechanical Engineering and a Masters Degree in Business Administration.

Q. Are you a registered Professional Engineer?

A. Yes, I am a registered Professional Engineer in the states of Colorado, Indiana, Iowa, Kansas, Louisiana, Missouri, Ohio, Nebraska, and New Mexico.

Q. Do you belong to any professional societies?

A. Yes, I do. I am a member of the American Society of Mechanical Engineers, the National Society of Professional Engineers, the Missouri Society of Professional Engineers, and the Association of Energy Services Professionals.

Q. What is your professional experience?

A. As a Partner and a Project Manager in the Management Consulting Division of Black & Veatch, I have been responsible for numerous engagements involving electric, gas and other utility services. Clients served include both investor-owned and publicly-owned utilities, customers of such utilities, and regulatory agencies. During the course of these engagements, I have been responsible for the preparation and presentation of studies involving cost of service, allocation, rate design, financial feasibility, cost of capital, and other engineering, economic and management areas.

Q. Have you previously appeared as an expert witness?

A. Yes, I have. I have presented expert witness testimony before the Federal Energy Regulatory Commission, as well as regulatory bodies in the states of Colorado, Illinois, Iowa, Kansas,

Minnesota, Missouri, New York, North Carolina, Pennsylvania, South Carolina, Texas, Utah, Vermont, and Wyoming. In addition, I have presented expert witness testimony before District Courts in the states of Colorado, Iowa and Nebraska; and before Courts of Condemnation in the states of Iowa and Nebraska. I have also served as a special advisor to the Connecticut Department of Public Utility Control.

Q. Please describe something of the nature of the firm of Black & Veatch.

A. The firm of Black & Veatch has provided comprehensive engineering and management services to utility, industrial, and governmental clients since 1915. The firm specializes in engineering connected with utility services, including primarily electric, gas, water, sewerage, telephone, and waste disposal. Service engagements consist primarily of investigations and reports, design and observation of construction, feasibility analyses, rate and financial reports, appraisals, reports on operations, and general consulting services. Present engagements include work throughout the United States, District of Columbia and various

foreign countries. The firm, including subsidiary companies, has a staff of over 4,000 people.

Q. For whom are you testifying in this proceeding?

A. I am testifying on behalf of Black Hills Power and Light Company.

Q. What is the nature of your work in this engagement?

A. I was asked by the Company to present to the Commission, the results of the 1992 and 1994 system load forecasts which were prepared under my supervision and direction. The Company also asked that I generally address the need for and role of integrated resource planning.

Load Forecasting

Q. What is the nature of your work in this engagement with regard to load forecasting?

A. I was asked by the Company to sponsor the System Load Forecast which was prepared under my supervision and direction in October, 1994. A copy of the report setting forth my forecast is contained in BHPL Exhibit ___ (LWL-1). In addition, since the 1994 System Load Forecast was prepared after the Company committed to proceed with the construction of Neil Simpson Unit No. 2

the Company asked that I present the results of the 1992 System Load Forecast. The 1992 Forecast was also prepared under my supervision and direction and was available at the time the decision to proceed with Neil Simpson 2 was made. A copy of the 1992 System Load Forecast is contained in BHPL Exhibit ___ (LWL-2).

Q. What forecasts do you make in the System Load Forecast contained in BHPL Exhibit ___ (LWL-1)?

A. The System Load Forecast (both 1992 and 1994) contains two sets of forecasts - short-term and long-term. The short-term forecast (1994) includes monthly sales by customer (rate) class and jurisdiction through 2000 and annually through 2006. Long-term forecasts of system sales, energy requirements and peak demand are provided monthly through 2006 and annually through 2016. In addition to the load forecasts (sales, energy requirements and peak demand) the System Load Forecast report also contains a short-term forecast of average annual number of customers by customer (rate) class and jurisdiction.

Q. What are the principal uses for these forecasts contained in BHPL Exhibits ___ (LWL-1) and ___ (LWL-2)?

A. The short-term forecasts are primarily intended to be used by the Company for budgeting purposes. The long-term forecasts are intended to be used as an input in long-term capacity planning decisions.

Q. What are the principal assumptions upon which these forecasts are based?

A. The principal assumption underlying these forecasts is that trends during the recent historical past, as adjusted to reflect anticipated conditions not reflected in historical trends, will continue into the future. In most cases, I found no indication from available information that significant changes are occurring in trends from that evidenced in the recent past. However, there are some instances where the historical trends were modified in developing the forecasts.

Q. Please give an example where you departed from historical trends in forecasting future sales.

A. There are two significant departures from historical trends discussed in Chapter 4 of the 1994 report. First, the forecast for Gillette, Wyoming takes into consideration continuation of historical trends as well as anticipated changes in the amount of the City's capacity and energy

requirements which will be met from sources other than Black Hills.

Second, the forecast takes into consideration responses to a survey of large general service and industrial customers conducted by the Company. Based on this survey, the South Dakota Contract Industrial class sales forecast directly reflects the capacity and energy requirements reported by the three customers served in this class.

A third, much less significant departure, is with regard to the Montana jurisdiction sales forecast. Extrapolation of the historical trend indicates that sales in this jurisdiction will approach zero sometime near the end of the decade. I believe that it is more realistic to assume that at some point, sales in this jurisdiction will flatten out. In the sales forecast, I have assumed that sales are equal to 500 MWh per month throughout the forecast period. This assumption is not intended to imply that sales will be the same every month. There will be up and down years as well as seasonal differences over the period forecasted. In the forecast, these ups and downs

are forecast to average out to little or no growth. Rather than attempt to guess when a turnaround would occur, I chose to assume that during the forecast period sales will average somewhat less than current levels.

Q. Are there any other assumptions which you believe should be noted?

A. Yes, there are three. The load forecast makes no direct adjustments to reflect additional demand side management program impacts. As discussed in Chapter 4, the load forecast assumes that the measures currently in place and already reflected in the historical data and historical trends will continue.

Second, the load forecast assumes that any future rate increases will be phased-in over a long enough period of time to minimize disruption and therefore have a minimal short and long-term effect on sales, and the Company's ability to attract and retain commercial and industrial load. If rates are increased substantially in one large increment, the assumption that there will be no negative sales impacts will need to be revisited, especially with respect to short-term forecasts.

Negative sales impacts associated with implementing a substantial rate increase does not generally have implications over the long-term so long as rate levels remain generally competitive in the long-term.

Third, the load forecast makes no adjustments to reflect any loss of load which might occur due to retail wheeling. Due to the speculative nature of retail wheeling, no adjustment has been made on its potential impact on Black Hills. As noted in BHPL Exhibit ___ (LWL-1), there are several factors which when considered suggest that the impact of retail wheeling on Black Hills may be less than on other systems, especially systems located in more densely populated areas.

Q. Generally, how did you prepare each of these forecasts?

A. The methodology used in developing these forecasts is described in detail in Chapters 3 through 5 of BHPL Exhibit ___ (LWL-1). The following is an abbreviated description.

The short-term sales forecasts by customer rate class and jurisdiction are generally developed

using multiple linear regression, simple linear regression, and/or time series methods. For customer classes whose usage is weather dependent, the sales forecasts are based on multiple linear regression analysis of use per customer versus heating and/or cooling degree-days and time The use per customer is then forecasted using the regression coefficients. Number of customers is forecasted using time series analysis. Combining the use per customer and customer forecasts produces the sales forecast for the weather sensitive classes. For some classes, linear regression of sales versus time and/or hours of darkness (lighting classes) is used. For classes which exhibit strong seasonal patterns not directly attributable to changes in temperature or hours of darkness, time series analysis is used. For classes which do not exhibit identifiable trends, average of representative historical periods are used as a basis for the sales forecasts. Table 3-1 in the report lists the type of analysis used to forecast sales for each class.

Q. How did you develop your long-term forecast?

A. The long-term forecasts of system energy requirements and peak demand are developed from

the sales forecast. Monthly system energy requirements are developed from the sales forecast by applying monthly energy to sales ratios. These ratios are developed from historical relationships. These ratios represent the difference between monthly sales and system energy input which arise from the effects of cycle billing, company use and unaccounted for energy. Monthly system peak demands are determined by dividing forecast system energy requirements by forecast monthly load factor. Forecast monthly load factors are developed based on recent historical experience with consideration given to changes which are anticipated to occur during the forecast period.

For each forecast, upper and lower bandwidths are developed. These bandwidths approximate plus and minus one standard deviation. Therefore, it is expected that values actually experienced will be outside of these bandwidths approximately 1/3 of the time. The intent of these bandwidths is not to define the potential maximum and minimum values. The purpose of these bandwidths is to define the expected range under normal weather

conditions. During periods of significantly abnormal weather conditions, it is expected that these bandwidths will be exceeded.

Q. Please summarize the results of the System Load Forecast.

A. Total Company sales are projected to increase on average about 2.0 percent per year through 2004. Total Company sales during 1993 equalled 1,594 GWh. Sales are forecasted to increase to 2,017 GWh by the year 2004. Approximately 90 percent of the projected sales increase occurs in the South Dakota Jurisdiction with the remainder of the increase attributable to sales to the City of Gillette, and the Wyoming jurisdiction. Sales in the Montana jurisdiction are projected to remain constant at level somewhat below current levels.

Q. What methodological differences exist in the 1994 load forecast compared to the 1992 load forecast?

A. There are three significant changes in methodology in the 1994 load forecast. The first change is the introduction of weather data and the direct integration of the sales and customer forecast for the weather sensitive customer classes. The sales forecast for weather sensitive classes is based upon normal heating or cooling degree-days.

The upper and lower bandwidth forecasts for these classes is based on heating and cooling degree-days one standard deviation above and below normal. While this change did not change the results significantly, it does make it possible to quantify the effects of changes in temperature on sales to the weather sensitive classes. The results forecast in 1994 did not change much from prior forecasts. This similarity in results is due to the fact that in prior forecasts (including 1992) the time periods used in the analysis experienced conditions which averaged near normal.

The second significant change is with regard to how the sales forecast for Gillette, Wyoming is determined. In prior forecasts, I assumed that Black Hills' sales to Gillette equalled Black Hills' energy requirements for Gillette. Due to terms of the Company's contract with Gillette, the amount of sales billed to Gillette are not necessarily equal to energy requirements. As discussed more fully in Chapter 4 of the report, Gillette does not receive credit for 100 percent of the WAPA energy delivered into the Black Hills's system when the load met by Black Hills

declines below 60 percent of Gillette's current historical peak. The net effect is that sales to Gillette are currently about 10,000 MWh greater than the energy requirements from Black Hills sources. This difference is forecast to diminish over time as Gillette's load increases. This difference is forecast to be about 6,500 MWh at the end of the forecast period.

The third significant change relates to how the sales forecast is determined for the South Dakota Contract Industrial class. As discussed in greater detail in Chapter 4 of the report, the sales forecast is based directly on information provided by the three customers served in this class. The resultant forecast is less than that which would result based on the historical trend. The forecast exhibits an irregular shape primarily due to anticipated changes at Homestake Mining and Dacotah Cement.

In addition to the changes identified above, an additional analysis is contained in the 1994 Load Forecast. Chapter 7 contains an analysis of summer and winter peak demands independent of the

detailed "bottoms up" approach that forms the basis for the interdependent sales, energy, and peak forecast in the report. The system peak analysis focuses on daily peak load and independent variables which effect daily peak load. The intent of this analysis is to test the reasonableness of the forecast using the bottoms up approach. The regression models developed for summer and winter peaks in Chapter 7 produce forecasts which do not differ significantly from the forecasts produced using the more detailed bottoms up approach.

Q. What differences exist between the 1994 load forecast and the 1992 load forecast?

A. In general, the sales, energy, and peak forecasts in the 1994 load forecast are less than in the 1992 load forecast. For the calendar year 1999, the 1992 Forecast forecasts sales of 1,886 GWh (-2.9%); the 1994 Forecast forecasts 1,832 GWh. Energy requirements for the year 1999 were forecast to equal 1,960 GWh in the 1992 Forecast and 1,905 GWh in the 1994 Forecast (-2.8%). The December 1999 peak demand is forecast to equal 323 MW in the 1992 Forecast and 308 MW in the 1994 Forecast (-4.6%). The July 1999 peak demand is

forecast to equal 347 MW in the 1992 Forecast and 319 MW in the 1994 Forecast (-9.1%).

The 1992 Forecast forecasts sales of 2,119 GWh in the year 2004; the 1994 Forecast forecasts sales of 2,017 GWh in the year 2004 (-4.8%). Energy requirements for the year 2004 were forecast to equal 2,201 GWh in the 1992 Forecast and 2,101 GWh in the 1994 Forecast (-4.5%). The December 2004 peak demand is forecast to equal 365 MW in the 1992 Forecast and 345 MW in the 1994 Forecast (-5.5%). The July 2004 peak demand is forecast to equal 391 MW in the 1992 Forecast and 352 MW in the 1994 Forecast (-10.0%).

Q. What are the principal causes for these differences between the two forecasts?

A. The principal differences between the sales forecasts (approximately 110 GWh or 5 percent by the year 2004) relate to the following (the figures in parentheses indicate the amount by which the 1994 sales forecast differs from the 1992 forecast):

1. South Dakota Industrial class (-61 GWh)
2. South Dakota Contract Industrial class (-60 GWh)

3. Wyoming Industrial class (+40 GWh)

4. Montana jurisdiction (-15 GWh)

5. Gillette, Wyoming (-25 GWh)

6. Other classes (+10 GWh)

Of these six items, the first three constitute the bulk of the difference. The difference in the South Dakota Industrial class sales forecast is due to two factors. The first, the underlying rate of growth has slowed. Second, the modifications made in the 1992 forecast to reflect the large customer survey increased sales above the underlying rate of growth. The decline in the South Dakota Contract Industrial class sales forecast is primarily attributable to incorporation of input from the three customers served under this rate. In aggregate this input results in a forecast less than that indicated by the historical rate of growth. The increase in the Wyoming Industrial class sales forecast is primarily attributable to a significant increase in sales to this class which the Company has recently experienced.

Due to the methodology employed, the energy forecast declines (100 GWh) by about the same

amount as the sales forecast. The energy forecast declines by a lesser amount than the sales forecast due primarily to the adjustment made to the Gillette sales forecast discussed earlier in my testimony.

The decline in expected peaks is relatively greater than the decline in expected energy requirements due to the use of slightly higher load factors in the 1994 report. The expected summer peaks have declined more than expected winter peaks primarily due to the fact that the sales impacts identified above are relatively greater during the summer months than the winter months.

Q. Are there any corrections which need to be made to the 1992 System Load Forecast contained in BHPL Exhibit ___ (LWL-2)?

A. Yes. Subsequent to completing the 1992 forecast, I discovered a discrepancy between 1991 General Service average number of customers contained in Table 6-11 of BHPL Exhibit ___ (LWL-2) and the Company's 1991 operating report. The figure used in the load forecast for 1991 was taken from a different source of information which understated

the average number of General Service customers by 250 customers. As a result, the forecast values for 1992 through 1998 shown on Page 2 of Table 6-1 should be 7010, 7097, 7186, 7276, 7367, 7459, and 7552, respectively.

This correction to the average number of customers has no impact on the sales, energy, and load forecasts because the customer forecast was performed independent of these other forecasts in the 1992 System Load Forecast.

Q. Does this conclude your prepared direct testimony with regard to the System Load Forecast?

A. Yes, it does.

Integrated Resource Planning

Q. What is the purpose of an integrated resource plan?

A. An integrated resource plan (IRP) serves two primary purposes. First, it serves to identify future resource needs. Second, it analyzes alternative resources to determine what resources should be added to most economically meet those needs.

Q. Is the concept of IRP new?

A. No, it is not. Utilities have been doing IRP since their inception. However, the complexity of today's operating environment and the relative cost levels of alternatives has dictated that the process become more rigorous and structured. The increase in the number of services demanded of electric utilities and in the resources (including demand side management) available to meet these demands, necessitates a more rigorous analysis than may have been used in the past.

Q. Is there a foundation upon which IRP rests?

A. Yes there is, and from all appearances that foundation is weakening. IRP firmly rests on the concept that the supplier (i.e., electric utility) has an obligation to serve and that the supplier faces no competition for the service provided. For the purpose of the balance of my testimony, I assume that IRP is in connection with vertically integrated electric utility suppliers who do not face competition for the services they provide.

Q. How does an integrated resource plan identify future needs?

A. An integrated resource plan begins by comparing future requirements with existing resources taking

into consideration the ability of existing resources to meet requirements. The ability of existing resources to meet requirements is dependent on the available capacity from each resource including limitations of available capacity due to the expected retirement (or expiration date of purchase contract), forced outage rates, maintenance requirements and other factors associated with the capability of each resource. Future requirements include expected customer demands and energy needs as well as reserve requirements. When requirements exceed existing resources, additional resources are required.

Q. How are resource alternatives evaluated in an integrated resource plan?

A. Comparison of existing resources with forecast requirements identifies, in a very general way, the timing and size of additional resource requirements. The specific size of resource additions, the type of resource, and timing of the resource availability is determined through analyzing alternative resource plans. The "best" resource plan is the one that provides the most

economical service consistent with prudent utility operation.

Q. Does an integrated resource plan alone determine future resource requirements?

A. No, it does not. An integrated resource plan is simply a tool. An integrated resource plan is based on numerous assumptions regarding load, growth, resources, availability, reliability, costs, taxes, and regulation, to name a few. Each assumption has varying degrees of uncertainty, risk, and impact. There are many other intangible factors such as the perceived current and future regulatory climate, cost of capital, technological change, and availability of purchased power which have significant impacts on the economics of resource additions. Many of these other factors are beyond the control of the Company. As such, informed judgment plays a significant role in assessing the implications of these other factors, especially when alternatives exhibit similar economics.

Q. Does this conclude your prepared direct testimony?

A. Yes, it does.

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BHPL EXHIBIT LWL-1

1994 LOAD FORECAST

BLACK & VEATCH

8400 Ward Parkway, P.O. Box No. 8405, Kansas City, Missouri 64114, (913) 339-2000

October 26, 1994

Mr. Tom Ohlmacher
Vice President, Power Supply
Black Hills Power and Light Company
399 Deadwood Avenue
Rapid City, South Dakota 57702

Dear Mr. Ohlmacher:

We are submitting herewith our report on the Black Hills Power and Light Company System Load Forecast. We will submit under a separate cover a set of computer disks containing a System Forecasting Model based on Lotus 1-2-3 spreadsheet software. This model will be supplied in order to permit revision and updating of the forecasts to reflect the most current information. Instructions for use of the model will be included.

Two sets of forecasts are presented in this report - short term and long term. The short term forecasts are intended to be used in the Black Hills Power and Light Company budgeting process and provide forecasts of energy sales by customer rate class and jurisdiction monthly through December 2000 and annually through 2006. Long term forecasts of peak demand and system energy requirements are provided monthly through 2006 and annually through 2016. These forecasts are intended as an aid for long term generation planning.

We appreciate the opportunity to work with you on this matter and look forward to working with you in the future. If you have any questions concerning the enclosed, please do not hesitate to contact either Tom Sullivan or me.

Very truly yours,

BLACK & VEATCH

L. W. Loos

lmc
Enclosure

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Chapter 1 - Executive Summary

This report presents the results of an analysis and forecast of Black Hills Power and Light Company (Black Hills or BHPL) demand and energy requirements. Two sets of forecasts are presented - short term and long term. The short term forecasts include monthly energy sales forecasts by customer rate class and jurisdiction monthly through December 2000 and annually through 2006. These detailed individual forecasts are very sensitive to changing economic and weather conditions. Since their primary use is in the preparation of short term budgets, they should be frequently revised and updated. Extrapolation of these short term forecasts beyond the period presented is discouraged, since the accuracy of the forecasting method used decreases rapidly after the first two to three years. It is recommended that the short term forecasts contained herein be updated every two years in order to maintain an acceptable level of reliability.

Long term forecasts of system energy requirements and peak demand are presented monthly through 2006 and annually through 2016. The long term energy forecasts are developed directly from the total sales forecast through the application of energy to sales ratios. Total energy to sales ratios for each month are developed from analyses of historical relationships. This ratio represents the difference between sales and energy due to the effects of cycle billing, company use and unaccounted for energy. The long term peak forecasts are calculated directly from the energy forecast based on monthly (through 2006) and annual (2007 through 2016) load factors. Monthly load factors for 1994 are generally based on the averages experienced from 1987 through 1994. A small declining annual trend is applied to load factors used in future years to recognize that future growth rates for the higher load factor industrial customers have been adjusted downward to reflect the results of the Company's large customer survey.

The short range monthly forecasts by rate class and jurisdiction exhibit strong seasonal behavior and are not amenable to generalization. The long range trends, however, have been remarkably stable for several years over a wide range of economic and weather conditions and are expected to continue to be valid for intermediate term projections. It is recommended that the long term forecasts be updated coincidentally with short term forecast updates.

The results of the sales and peak forecasts are briefly summarized below in Table 1-1 and Table 1-2. Total Company sales are forecasted to increase from actual sales of 1,594 GWh in 1993 to 1,684 GWh in 1995 and 2,017 GWh in 2004. The equivalent annual compound rate of growth over the ten year period ended 2004 is 2.0 percent.

Table 1-1
Total Company Sales and Peak Forecast

	1995	1996	1997	2000	2004
Sales - GWh	1,684	1,738	1,774	1,842	2,017
Summer Peak - MW	293	303	309	320	352
Winter Peak - MW	280	289	296	312	345

Table 1-2
Equivalent Annual Compound Growth Rates[1]

	1995-96	1996-97	1995-2000	1995-2004
Sales	3.2%	2.0%	1.8%	2.0%
Summer Peak	3.5%	1.9%	1.8%	2.1%
Winter Peak	3.2%	2.6%	2.2%	2.4%

[1]Applicable only to the specific time periods shown.

As shown in Table 1-1, the Total Company peak is forecasted to occur during the summer. Total Company peak is forecasted to increase from an actual peak of 279 MW in 1994 to 293 MW in 1995 and 352 MW in 2004. The equivalent annual compound rate of growth over the ten year period ended 2004 is 2.1 percent. The winter peak is forecasted to grow at an equivalent 2.4 percent annual compound rate.

The chapters that follow discuss the load forecast in more detail. Chapter 2 contains a brief discussion of Black Hills and its service territory. Chapter 3 discusses the statistical methods used to develop the forecasts in this report. Chapter 4 discusses the other significant considerations which have an impact on the load forecast. Chapter 5 discusses the sales, energy, and peak forecasts in detail. Chapter 6 discusses the forecast for average number of customers by rate and jurisdiction. Finally, Chapter 7 contains a discussion of the historical winter and summer peak demands and a comparison between the peak demand forecast based on the bottom's up approach used in this report and direct statistical analysis of peak loads.

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Chapter 2 - Regional Overview

The Black Hills Corporation is a diversified company consisting of three principle businesses: electric service, coal mining, and oil and gas operations. The electric operations of the Black Hills Corporation are conducted by its public utility division under the name of Black Hills Power and Light Company. Black Hills Power and Light Company provides electric utility services in 11 counties in western South Dakota, northeastern Wyoming, and southeastern Montana. The Company serves a total of about 53,000 customers, 95 percent of which are in South Dakota. Most of the remaining customers are located in Wyoming. Only a few residential and general service customers and three industrial customers are served in Montana. The bulk of the energy sales in Montana are accounted for by the three industrial customers.

The Wyoming jurisdiction contains a mix of residential, commercial, and industrial customers and the Company's only wholesale customer - the City of Gillette. The City of Gillette at the present time accounts for approximately 10 percent of the Company's total energy sales.

The South Dakota jurisdiction, with 95 percent of the Company's customers and 82 percent of the Company's energy sales, has experienced a long period of relatively stable growth, without the "boom and bust" cycles experienced in the other two jurisdictions. This relatively stable growth pattern is attributed to the larger population base and greater diversity of economic activity in the South Dakota jurisdiction, where a decline in one sector of the economy can be offset by growth in another.

The Montana and Wyoming jurisdictions, however, have been severely impacted by declines in oil and gas prices and the resultant cutbacks in the oil and gas sectors of the economy. This impact has been especially noticeable in Montana where the loss of jobs and industrial activity has resulted in a sharp decrease in the number of Black Hills Power and Light customers and energy sales. In Wyoming, the economy of the City of Gillette has been significantly affected by the decline in oil and gas production and exploration activity. This is demonstrated by the total annual electric energy sales to the City, which over the 10 year period from 1975 to 1985, exhibited growth at an average annual rate of over 13 percent. This trend reversed in 1986, stabilized during 1987 through 1989 and has resumed a more modest rate of growth through 1993. It is expected that Gillette will continue to show a smaller positive growth in the future. It is considered doubtful that the explosive rate of the 1975-1985 period will be repeated unless oil prices drastically increase.

Even though the South Dakota jurisdiction has exhibited a much more stable economy than the Wyoming and Montana jurisdictions, economic dislocations can still have a strong effect on demand and energy forecasts in this area. Short term forecasts need to be adjusted

regularly to accommodate the most recent changes and trends in economic activity. The Black Hills Power and Light Company is in a unique position to evaluate trends and activities in the local economy due to its involvement, through the other divisions of the Black Hills Corporation, in the major industries of the area - oil and gas production and mining. The forecasts developed in this study reflect inputs and evaluations from Black Hills Power and Light personnel. The computer model provided is designed to allow modification of the forecasts by Black Hills Power and Light as conditions change.

Chapter 3 - Discussion of Forecasting Methodologies

General

Forecasting techniques fall into two major categories:

1. Quantitative
2. Qualitative or technological

This study is concerned only with quantitative forecasting, since numerical estimates of energy sales and system demand are needed for budgeting and long-term planning purposes. Application of any of the quantitative forecasting methods requires that three conditions be met:

1. Information about the past is available.
2. This information can be quantified in the form of numerical data.
3. At least some aspects or patterns of past conditions are expected to continue into the future.

This last condition, known as the assumption of continuity, is an underlying premise of all quantitative forecasting methods. Even the most exhaustive and detailed econometric models assume that relationships or patterns determined on the basis of historical data will continue to remain valid for the future.

There are two major types of quantitative forecasting models: time series and causal (regression) models. In time series models, prediction of the future is based on determining the pattern in the historical data series and extrapolating that pattern into the future. Causal models, on the other hand, assume that the factor to be forecasted exhibits a cause and effect relationship with one or more independent variables. The purpose of the causal model is to discover the form of that relationship and use it to forecast future values of the dependent variable based on forecast values of the independent variable(s). Both time series and causal models can have advantages in certain situations.

If the main concern is to project what will happen without knowing why, time series models are frequently easier to use and generally produce more accurate short and medium term forecasts. This is especially true in situations with very complex systems involving multiple independent variables and non-linear relationships between variables.

Regression-based modeling techniques, on the other hand, are very popular as a forecasting means, especially in academic circles, since they may aid in providing insights into the underlying principles and interactions of economic and social systems. Regression methods are easy to understand and can generate statistical measures which may seem to provide a mathematical proof that the methodology is correct. One of these measures, the coefficient of determination or R^2, should be used with considerable caution in evaluating regression models for forecasting. The R^2 factor does not indicate how well the regression

equation fits the data, but only how well the shape of the regression line corresponds to the shape of the data line. Confidence intervals, which are frequently computed for regression models, should also be used with caution, as they apply only to that portion of the regression line which lies within the historical range of values of the independent variables and do not apply to extrapolations beyond this range. Attempts to use the regression model beyond the historical data range may not yield usable projections. In order to develop a valid regression model for forecasting, several conditions should exist including:

1. A long series of historical data for both dependent and independent variable(s).
2. The values of the independent and dependent variable(s) should show significant change during the historical period so that the relationship(s) between the independent and dependent variable(s) can be determined.
3. The relationship(s) between the independent and dependent variable(s) must remain stable over the historical and forecast period.

If the model is to be used as a forecasting tool, an additional condition must be met.

4. The independent variable(s) must be either determined or projected to a greater degree of accuracy than that desired in the dependent variable.

If all these conditions are met, regression based models can provide excellent forecasting tools. The forecasts prepared in the course of this study employed both time series and regression forecasting methods. The following presents a description of the methodologies used in this report.

Time Series Techniques

The time series forecasting techniques employed in this study were simple linear regression, log regression, and the ratio-to-moving-averages method or the Census method I. The basic approach of the Census method I is to first remove the seasonal and error variance by calculating moving averages whose number of terms equals the periodicity. In our analysis, periodicity equals 12 corresponding to each month of a year. Seasonality of the data is removed by averaging the high and low points for each season. The averaging also reduces the unsystematic error throughout the series. The result of this procedure is the trend-cycle component. The ratio of the original series to this series of moving averages (the trend-cycle component) is then computed. The result is a seasonal-plus-error component, which can be broken down further by computing monthly averages to eliminate the error.

The seasonal decomposition method used in this study requires at least four complete seasons of data or 48 observations of monthly data. The Census method I should not be used with highly volatile data or data that contains negative numbers or zeros. In order to avoid

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volatility problems, we analyzed the data very closely and adjusted the data as necessary to eliminate the effect of obvious billing corrections, errors, and missing data points.

The Seasonal Decomposition procedure used in this study creates four new series for each selected variable. The new series are:

1. Seasonal adjustment factors, representing seasonal variation,
2. Seasonally adjusted series, representing the original series with seasonal variation removed,
3. Smoothed trend-cycle component, a smoothed version of the seasonally adjusted series which show both trend and cyclic components, and
4. The residual component of the series for a particular observation.

Linear regression is then applied to the smoothed trend-cycle component in order to generate a forecast of the component trend. This trend forecast is then multiplied by the appropriate monthly seasonal factor to generate the forecast. The irregular factors are not used in the final forecast since they represent random disturbances which by definition cannot be forecast. These factors, however, will give some indication of the goodness of fit of the predicted values to the original data, in a manner analogous to the R^2 values for a regression analysis.

Regression Techniques

The three regression based techniques used in this study are simple linear regression, log regression, and multiple regression. Simple linear regression is used to examine the relationship between two variables. This two variable method is known as linear regression because it yields an equation in the form $y = ax + b$ where

- y is the dependent variable
- x is the independent variable
- b is a constant
- a is the slope of the regression line

This method can also be used in many cases where the relationship between the two variables is non-linear if the relationship can be transformed into a linear relationship through application of mathematical transformations such as log regression. Log regression transforms the data such that the regression curve of y on x is exponential. The data approaches a limit of zero rather than actually ever equalling zero or falling below zero.

If the transform is successful in producing a nearly linear relationship, the method of least squares (minimizing the sum of the squared deviation of the actual data points from the regression line) can be used to determine the coefficients of the regression equation. This equation can then be used to forecast values for the dependent variable, given an assumed value of the independent variable. It should be noted, however, that assuming values for the

independent variable which lie outside the range of the historical data used in deriving the equation may not yield valid forecasts, especially for those cases where the apparent relationship between the dependent and independent variables is not strong.

The third regression technique utilized is multiple regression, which is an extension of simple regression. It examines the relationship between the dependent variable and two or more explanatory variables. Multiple regression is used to:

1. Predict the value of a dependent variable using some or all of the dependent variables. The aim here is generally to explain the dependent variable accurately with as few independent variables as possible.
2. Examine the influence and relative importance of each independent variable on the dependent variable. This involves looking at the magnitude and size of the standardized regression coefficients as well as the significance of the individual regression coefficients. Multiple regression yields an equation of the form:

$$Y = B + A_1X_1 + A_2X_2 + \ldots + A_KX_K$$

where

Y	is the dependent variable
$X_1 \ldots X_K$	are the independent variables
B	is the intercept
$A_1 \ldots A_K$	are the coefficients

This analysis is considerably more difficult than simple regression. Even multiple regression equations which exhibit high R^2 values may have variable coefficients which fly in the face of logic, such as a negative coefficient for the number of customers in a peak load analysis. This would indicate that peak loads decrease as the number of customers increased and cast considerable doubt on the validity of the equation.

Another caution to be observed in multiple regression analysis is that the number of independent variables should not become too large if the equation is to be used for forecasting purposes rather than as an explanation of the determinants of the dependent variable. For use as a forecasting tool for the dependent variable, all of the independent variables must be forecasted. This requirement severely limits the practicality of elaborate regression models as forecasting tools.

There are other time series and regression modeling techniques which could be used to provide demand and energy forecasts for the Black Hills Power and Light Company. Some of them, such as the Box-Jenkins method for time series analysis, may provide some improved accuracy but only at the expense of greatly increased computational and analysis time. Other forms of analysis were screened during the preparation of this report but were discarded as offering less accuracy than those selected.

Monthly Energy Sales by Jurisdiction and Rate Class Forecast

These forecasts utilize various approaches including multiple linear regression, simple linear regression, and time series methods. These forecasts are computed for a twelve year period but, due to the nature of the data and the methodology, reliability will diminish considerably after the first two years. Table 3-1 summarizes the analyses used for each customer class.

For customer classes whose usage is weather dependent, the sales forecasts are based on regression analysis of use per customer versus heating and/or cooling degree-days and time (to take into account changes in usage characteristics over time). The use per customer is then forecasted using the regression coefficients. Number of customers is forecasted using time series analysis. Combining the use per customer and number of customer forecasts produces the sales forecast for the weather sensitive customer classes.

The simple linear regression approaches include regression of sales versus time and hours of darkness. For classes which exhibit strong seasonal patterns not attributable directly to changes in temperature or hours of darkness, time series analysis is used. For classes which do not exhibit identifiable trends, averages of representative historical periods are used as a basis for the forecasts.

System Energy Requirements Forecast

This forecast is developed directly from the total sales forecast by using an energy to sales ratio based on historical relationship experienced by Black Hills.

System Load Forecast

This forecast is developed from the system energy forecast using historical monthly load factors. A slight negative annual trend is introduced into forecast monthly load factors to recognize the lower load factors associated with the customer loads contributing to growth.

Number of Customers by Rate Class and By Jurisdiction

These forecasts are generally based on time series analysis. As indicated above, the number of customers forecast for the weather sensitive classes is integrated with the sales forecast. For the non-weather sensitive classes, the number of customers forecast considers past trends as well as the underlying sales forecast annual growth rate.

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Table 3-1

Summary of Statistical Analysis of Sales Forecast

Jurisdiction	Customer Classification	Type of Analysis	R-Squared (1)	Dependent Variable (2)	Independent Variable 1	Independent Variable 2	Independent Variable 3	Independent Variable 4	Independent Variable 5	Independent Variable 6
South Dakota	Residential	Mult. Regress.	83%	kWh/cust	Current HDD	Previous HDD	January	Current CDD	Previous CDD	Trend
	Residential All Electric	Mult. Regress.	96%	kWh/cust	Current HDD	Previous HDD	January			
	Residential Others	Mult. Regress.	94%	kWh/cust	Current HDD	Previous HDD				
	General Service	Mult. Regress.	72%	kWh/cust	May	October	January	Current CDD	Previous CDD	Trend
	Large General Service	Seasonal/Trend	93%	kWh	Trend					
	General Service All Electric	Mult. Regress.	77%	kWh/cust	Current HDD	Previous HDD	January	Current CDD	Previous CDD	
	Area Lighting	Seasonal/Trend	27%	kWh	Trend					
	General Service Irrigation	Average of 88-94	NA							
	General Service Others	Seasonal/Trend	67%	kWh	Trend					
	Industrial	Trend	58%	kWh	Trend					
	Contract Industrial	(3)	NA							
	Street Lighting	Regression	94%	kWh/cust	Hrs of Dark					
	Municipal Pumping	Seasonal/Trend	0%	kWh	Trend					
Wyoming	Residential	Mult. Regress.	80%	kWh/cust	Current HDD	Previous HDD	January	Current CDD		
	Residential All Electric	Mult. Regress.	95%	kWh/cust	Current HDD	Previous HDD	January			
	Residential Others	Mult. Regress.	93%	kWh/cust	Current HDD	Previous HDD				
	General Service	Seasonal/Trend	4%	kWh	Trend					
	Large General Service	Seasonal/Trend	41%	kWh	Trend					
	General Service All Electric	Mult. Regress.	92%	kWh/cust	Current HDD	Previous HDD	January	Current CDD	Previous CDD	Trend
	Area Lighting	Seasonal/Trend	50%	kWh	Trend					
	Industrial (4)	Seasonal/Trend	52%	kWh	Trend					
	Street Lighting	Average of 92-94	NA							
	Municipal Pumping	Repeat 93-94	NA							
Montana	Total	Assume no growth Use 500,000 kwh	NA							
Gillette	Total	Mult. Regress.	91%	kWh	Current HDD	January	Current CDD	Trend		

(1) R-squared for seasonal/trend analysis is based on fitting trend line to seasonally adjusted data. Typically the r-squared is low when the trend is not significantly different from 0.

(2) For classes where kWh per customer is dependent variable, number of customers is forecasted using seasonal/trend analysis.

(3) Based on information provided by customers.

(4) Insufficient data to statistically determine seasonal factors. Winter (November - March) factor based on 1993 - 94. Summer (April - October) factor based on most recent year.

Chapter 4 - Other Considerations

In addition to the statistical analyses discussed in the prior chapter, other non-statistical considerations have an impact on the forecasts. The most significant non-statistical considerations include the following: Gillette, Wyoming forecast, large customer survey, demand side load management programs, and rate impacts.

Gillette, Wyoming Forecast

Gillette, Wyoming is Black Hills' sole wholesale customer and accounted for approximately 10 percent of the Company's sales in 1993. Prior to mid-1989, Black Hills provided virtually 100 percent of Gillette's capacity requirements and almost all of Gillette's energy requirements. In 1989, Gillette began taking approximately 27-28 MWh per year of energy and 4 MW of capacity from the Western Area Power Administration (WAPA). Currently, Black Hills is providing firm power to the City of Gillette under a long term power supply agreement which generally requires Black Hills to serve up to 60 percent of Gillette's historical peak and associated energy above that supplied by WAPA. Prior to early 1991, Black Hills provided the capacity and energy requirements above the WAPA and firm power supply agreement to Gillette under a seasonal non-firm power sales agreement. Black Hills has exercised an option to cancel this non-firm agreement and the City of Gillette is currently obtaining peaking capacity and energy from another source.

In the load forecast, it assumed that Black Hills provides capacity to Gillette equal to 60 percent of Gillette's historical peak. Gillette's current historical peak of 38.8 MW occurred in December 1990. Sixty percent of the current historical peak amounts to 23.3 MW. This 23.3 MW level increases in the future as Gillette's total noncoincident peak is forecasted to increase above 38.8 MW. Black Hills is assumed to provide energy to Gillette corresponding to the firm capacity provided by Black Hills. This amount is equal to Gillette's total requirements, less energy supplied by WAPA, minus peaking energy requirements above WAPA's 4 MW and BHPL's 60 percent of historical peak. This results in a projection for Black Hills providing about 83 percent of Gillette's energy requirements through the period analyzed.

The Gillette sales forecast is determined by adjusting the energy forecast to reflect that Gillette does not receive credit for 100 percent of the WAPA energy entering the BHPL system. Whenever the contractual BHPL share of Gillette's load is less than 60 percent of the current historical peak, Gillette receives credit for 50 percent of the excess WAPA energy entering the BHPL system. For example, if Gillette's load in a given hour is 26.3 megawatts and the WAPA power entering the system is 4 megawatts, BHPL's share of Gillette's load is 23.3 megawatts and there is 1 megawatt of excess WAPA power. Gillette receives credit

for only 0.5 megawatt-hours of that excess megawatt for that hour. Therefore, for that hour, BHP&L sales to Gillette are 22.8 megawatt-hours.

As discussed above, this load forecast assumes that Gillette will obtain all of their energy requirements above Black Hills' 60 percent of historical peak plus WAPA capacity from sources other than Black Hills. It should be noted that Gillette has a contractual option that if exercised could require Black Hills to serve additional capacity and energy above the 60 percent level assumed in this forecast. The Company believes that Gillette's statements and actions indicate that this option will not be exercised. In the event that this option is exercised, the load forecast will need to be modified to reflect any additional capacity and energy to be provided by Black Hills.

The portions of Gillette's sales, energy, and peak requirements met by Black Hills are forecasted independent of the other jurisdictions' retail sales, energy and peak requirements met by Black Hills. The energy to sales ratios and load factors used to determine energy and peak requirements of the other jurisdictions are developed excluding Gillette. This approach makes it easy to isolate the portion of BHPL's total sales, energy and peak attributable to Gillette and makes adjustments to the forecast relatively simple should Black Hills' commitments to Gillette change.

Customer Survey

During 1994, Black Hills conducted a survey of large general service and industrial customers. The intent of this survey was to obtain input from customers with regard to their expected levels of energy demand in the future.

Customer surveys can provide very important information which cannot be obtained from purely statistical analysis. Statistical analysis of historical data can provide insight into seasonal usage patterns and the past growth or decline in sales and a foundation to extrapolate such information into the future. The key assumption of such an analysis of historical data is that the recent past is the best indication of the near future. But for customer classes which contain a relatively few large customers and which add customers either infrequently or in small increments, statistical analysis of historical data alone may not provide the best results. Further, usage changes for these classes tend to follow irregular patterns. Usage changes usually occur from one of two sources: 1) addition or loss of customer and 2) changes in usage characteristics of existing customers. Frequently, these changes can be rather abrupt. On the other hand, customer classes which contain a large number of small customers such as a residential class, changes in usage characteristics occur infrequently and generally over long periods of time and customer additions occur on a fairly consistent and regular basis.

Surveys of existing large customers are helpful in identifying the potential loss of a customer and projected changes in usage characteristics. Further, the survey can also identify new customers. For example, a customer survey may discover that an existing grocery store chain intends to add another store. Information regarding new large customers may be known in advance by utility personnel either through their involvement in the community or because the utility has been contacted by a potential large commercial or industrial customer researching building sites. Such information is invaluable to generating a more accurate forecast for large customer classes.

In general, the Company has concluded that the load forecast reasonably reflects expected changes in load as indicated by the large customer survey with the exception of the South Dakota Contract Industrial class. The Contract Industrial class consists of three customers: Homestake Mining, Dakotah Cement, and Merillat. The load forecast has been modified to reflect anticipated load changes by Homestake Mining and Dakotah Cement. The Merillat forecast, while done separately, is generally based upon the long term growth rate of approximately 1.5 percent per year.

With regard to Homestake Mining, Homestake expects their energy requirements to peak in 1997 at 193.7 million kilowatt-hours and then decline through the year 2000 to 156.0 million kilowatt-hours as their open cut operation is completed. After the year 2000, Homestake expects their energy requirements to increase due to more energy intensive operations with lower grade ore and more difficult mining conditions.

With regard to Dakotah Cement, two factors affect their expected energy requirements. Based on forecast demand for cement, Dakotah Cement expects their energy requirements to peak in 1996 at 133.8 million kilowatt-hours and then decline throughout the next decade to a level of 102.9 million kilowatt-hours. In addition, Dakotah Cement plans on upgrading their kiln capacity and installing variable speed motors this winter. These two changes have the result of increasing peak energy requirements (generally during the summer and fall) through 1996 and reduce off-peak energy requirements (during the winter).

As discussed in Chapter 3, a negative annual trend is introduced into the forecast of monthly system load factors. The declines in load to the Company's two largest retail customers (Homestake Mining and Dakotah Cement) are a significant factor in this assumption. These customers have higher load factors than the overall system and to the extent that their requirements as a percent of total Company requirements decline, then system load factor will decline, all other factors being equal. Further, after the year 2000, the load factors for these two customers actually begin to decline, adding further to an anticipated decline in total system load factor.

Demand Side Management

The Company encourages the efficient use of electricity through its rate offerings, rate design, and payment of energy efficiency incentives. The majority of these offerings have been in place for many years and have received steady customer participation.

The forecast is for Black Hills to maintain its relatively high load factor and nearly equal summer and winter peaks. The Company's programs have been and will be targeted toward the maintenance of these beneficial system conditions. Therefore, because the load management programs currently in place, in the form of rates and energy efficiency incentives, have existed in the historical data used as a basis for the load forecast developed in this report, the impact of such load management programs are reflected in the forecast of future sales. At such time, as the Company substantially changes its load management approach through new forms of pricing, significant changes to energy efficiency incentives, or through direct attempts to control load, the load forecast may need to be modified based on the expected impacts of the specific rates or programs.

Rate Impacts

The statistical analyses in the Gillette load forecast generally use historical data from the last five years. This time frame can be characterized as a period with relatively constant rates. The Company has not filed for base rate changes since the early 1980's and phase-in of the 1983 Power Sales Agreement with Pacific Power and Light Company was completed in 1988.

It is anticipated that rates will be increased in the future due to increased investment by Black Hills in generation and transmission facilities. Rate increases have the potential to exert negative impacts on electricity usage. Such impacts are dependent upon the size of the increases and the overall resultant level of rates. Small rate increases over a relatively long period of time which do not significantly exceed the overall rate of inflation generally can be expected to have a negligible impact on sales. Large one time increases can be expected to have significant short term negative impact on sales. If the large one time increase results in rates significantly above the average of locations with which the utility competes for large commercial and industrial customers, the negative impact can be not only significant in the short term but also in the longer term.

In this report, it is assumed that any future rate increases will be phased in over a long enough period of time to minimize disruption and therefore have a minimal long term impact on sales and the Company's ability to attract and retain commercial and industrial load. However, in the event that there are large rate increases over relatively short time frames in the future, the load forecast should be adjusted downward. The negative impact of large rate increases would likely manifest itself in two ways. First, the growth rates in sales to most

customer classes would likely be less especially in the years immediately following the rate increases. Second, industrial and large commercial load growth may decline or some industrial and commercial customers may be lost all together depending upon such factors as the economics of the customer's industry and the cost of alternative energy supplies.

Retail Wheeling

At some point in the future, the possibility that electric systems may be opened up to retail wheeling in a manner similar to that which currently exists with regard to transportation on gas systems cannot be dismissed. The timing of this change and its impact on Black Hills is impossible to determine with any certainty at this time. However, there are several factors which suggest that the impact of this trend will not have a significant adverse impact on Black Hills, especially in the near term. Some of the principal factors include:

1. The Wyoming and South Dakota jurisdictions have not addressed this issue and we are unaware of any plans to do so. Changes in state law would likely be required before implementation of retail wheeling in its purest sense is possible.
2. The relative isolation of the Black Hills system will likely make it costly for retail customers to wheel power from other providers.
3. Black Hills' production costs are relatively low.
4. Black Hills' two largest customers, Gillette and Homestake Mining, are currently served under long-term contracts.

No adjustments have been made to the load forecast to reflect any loss of load which might occur due to retail wheeling. If at some time in the future any adverse impacts can be quantified with some degree of certainty, the load forecast should be adjusted accordingly.

Chapter 5 - Sales, Energy, and Peak Forecasts

The sales, energy and peak forecasts are developed to meet two needs of Black Hills. The first is to provide Black Hills with monthly sales forecasts by rate class by jurisdiction through 2000 so that five year budgets for 1995 through 1999 and 1996 through 2000 can be prepared. (The monthly sales forecasts by rate class by jurisdiction are prepared through 2006 because they are needed in preparing total company sales, energy and peak by month through 2006.) The second purpose is to provide Black Hills with total company sales, energy and peak forecasts monthly through 2006 and annually through 2016 with upper and lower bandwidths to assist in the short and long term planning of system operations.

As discussed in Chapter 4, sales, energy and peak are forecasted separately for Gillette and the retail jurisdictions. The Gillette forecast is performed in two steps. Total Gillette energy and peak requirements are forecasted and then the BHPL share of Gillette energy and peak requirements are determined based on the criteria discussed in Chapter 4. The retail forecast and the forecast of BHPL's share of Gillette are added together to arrive at the sales, energy and peak forecast for the total company.

At the time this study was initially prepared, actual sales, energy, and peak demand through June 1994 were available (some data was available through August 1994). Monthly sales forecasts are developed for each rate class in each retail jurisdiction, excluding Montana, through 2006. Monthly sales forecasts for the Montana jurisdiction are developed as a total through 2006. The monthly sales forecasts are developed to recognize seasonal variations and the underlying trend or growth rate. The basic forecasts do not consider the random influences that cause sales to vary from the forecasted values (abnormal weather, for example). Upper and lower bandwidths have been calculated for each rate class based on the standard errors of the regression analysis performed for each class and the standard deviation of annual heating and cooling degree-days, as applicable. These bandwidths are equal to plus and minus one standard error and plus and minus one standard deviation in heating and cooling degree-days. Between the individual classes there is a wide range of resulting bandwidths. Generally, the large bandwidths are associated with classes with few customers and/or that exhibit extreme growth rates or extreme seasonal variation. The larger classes (residential, general service and industrial) generally have bandwidths in the area of plus and minus 5 percent. The upper and lower bandwidths for each class are not presented in this report but are carried through to the upper and lower bandwidths for the total sales within each jurisdiction. The upper and lower bandwidths for each jurisdiction are equal to the sum of the upper and lower bandwidths for each class within the jurisdiction.

The sales forecasts contained in this report reflect the other considerations discussed in Chapter 4. The direct impact of these considerations is reflected in the determination of

the sales, energy and peak forecasts for Gillette and in the sales forecasts for the retail rate classes. Appendix A contains tables summarizing the approximate underlying average annual growth rates. In addition, Appendix A contains, for comparison purposes, the growth rates in the 1988, 1990, and 1992 reports. The growth rates shown in Appendix A are the approximate average annual exponential growth rates. Because not all of the trend forecasts for each class are based on the application of an equal annual exponential growth rate, the growth rates shown in Appendix A should be considered only to approximate the actual growth forecasted. The growth rates shown in Appendix A are calculated assuming an equal annual exponential growth rate in order to provide a meaningful way to compare the forecasts of each class and jurisdiction.

If any significant economic changes occur in the areas served by Black Hills, the level of sales could vary significantly from the basic forecasts. Forecasting the factors that could cause such significant changes is not possible due to the inability to predict the national and international events which can affect the economic conditions in the Black Hills service area. Some of the significant factors which could impact the accuracy of the forecast or necessitate revisions to the forecast are discussed in Chapter 4.

The sales, energy and peak forecasts for the South Dakota, Wyoming and Montana jurisdictions are developed in three steps: 1) development of sales forecast by rate class by jurisdiction, 2) development of monthly energy to sales ratios (excluding Gillette) and 3) development of monthly load factors (excluding Gillette). For Gillette, total sales and energy requirements are assumed to be equal; therefore, there is no determination of energy to sales ratios for Gillette.

Monthly energy to sales ratios (excluding Gillette) are developed to produce the retail energy forecast directly from the retail sales forecast. The main reason for using this approach was to insure consistency between the sales and energy forecasts and to use a mechanism that allows changes made to the sales forecast to be reflected in the energy forecast. Appendix C summarizes the monthly sales to energy ratios used to develop the energy forecast from the sales forecast. Appendix C was developed based on the historical energy to sales ratios experienced in each month with consideration given to the expected relationships between months. In general, the energy to sales ratio recognizes the three basic differences between the sales and energy levels recorded by Black Hills for each month: timing differences due to cycle billing of sales, company use and unaccounted for. For Gillette, total sales and energy requirements are assumed to be equal. The BHPL share of Gillette's sales, energy, and peak reflect the portion of Gillette's total requirements which are met by WAPA and other sources as discussed in Chapter 4. The total company sales and energy forecasts are developed by adding the retail and BHPL share of Gillette forecasts.

Monthly load factors are developed separately for the retail jurisdictions and Gillette to produce the peak demand forecasts directly from the respective energy forecasts. Appendix D summarizes the monthly load factors used. For 1994, the monthly load factors used are equal to the average of the period 1987 through 1994 adjusted to remove outliers (load factors significantly different from the average). For years beyond 1994, a slight negative trend is introduced into the monthly load factors for the retail jurisdictions, recognizing that the future growth rates for the higher load factor industrial customers have been adjusted downward based on the Company's large customer survey. Load factors for Gillette are assumed to be constant throughout the forecast period. The total company peak is developed by adding the retail jurisdiction peak to BHPL's share of the Gillette peak.

The following sections discuss the sales forecasts for each jurisdiction and the sales, energy and peak forecasts for Gillette and Total Company (excluding and including Gillette).

South Dakota Sales Forecast

The South Dakota jurisdiction is divided into 13 rate classes: Residential plus Residential Water Heating, Residential All Electric, Residential Others, General Service, Large General Service, General Service All Electric, Area Lighting, General Service Irrigation, General Service Others, Industrial, Contract Industrial, Street Lighting and Municipal Pumping. South Dakota sales accounted for approximately 82 percent of Total Company sales in 1993. Contract Industrial, Residential and General Service sales combined account for about two-thirds of the sales in South Dakota. South Dakota sales have experienced consistent growth since 1980, averaging approximately 5 percent annually in the earlier years of the period and approximately 3 percent annually over the last six years. South Dakota sales generally experience a peak during the summer months.

Table 5-1 summarizes the South Dakota jurisdiction sales forecast. Total jurisdiction sales are forecasted to grow at about 2.8 percent per year from about 1.30 million megawatt-hours in 1993 to 1.34 million megawatt-hours in 1994 and 1.52 million megawatt-hours in 2000. The approximate individual class annual growth rates are summarized on Page 1 of Appendix A. The 1992 System Load Forecast forecasted South Dakota sales of 1.32 million megawatt-hours in 1993 and 1.61 million megawatt-hours in 2000. Minor differences in the individual rate classes between the two forecasts seem to balance out, resulting in a small decline in the forecast total South Dakota sales. Figure 5-1 graphically depicts actual (1987-1994) and forecasted sales (1994-2000) for the South Dakota jurisdiction. The graphs for the individual rate classes are contained in Appendix B.

Wyoming Sales Forecast

The Wyoming jurisdiction is divided into 10 rate classes: Residential, Residential All Electric, Residential Others, General Service, Large General Service, General Service All Electric, Area Lighting, Industrial, Street Lighting and Municipal Pumping. Wyoming sales accounted for about 7 percent of Total Company sales in 1993. Industrial sales account for about 70 percent of total Wyoming sales. Total Wyoming sales have been essentially flat over the past several years but have recently begun to increase. Wyoming sales exhibit a fairly strong winter peak.

Table 5-2 summarizes the Wyoming jurisdiction sales forecast. Sales are forecasted to increase slightly above the 117,000 megawatt-hours experienced in 1993 at about a 2,500 megawatt-hour per year rate. The approximate individual class annual growth rates are summarized on Page 2 of Appendix A. The 1992 Report forecasted a relatively constant level of sales for 1991-1996 of about 110,000 megawatt-hours per year. The resumed growth in the Wyoming jurisdiction is due to the increased energy demands of the industrial customers. Figure 5-2 graphically depicts actual (1987-1994) and forecasted (1994-2000) sales for Wyoming. The graphs for the individual rate classes are contained in Appendix B.

Montana Sales Forecast

The Montana jurisdiction consists of four rate classes: Residential, General Service, Industrial and Area Lighting. The Montana jurisdiction accounted for less than 1 percent of Total Company sales in 1993. Industrial class sales account for more than 95 percent of Montana sales. Total Montana sales have experienced a significant decline in sales from about 60,000 megawatt-hours in 1983 to about 13,000 megawatt-hours in 1993. Sales in the Montana jurisdiction have a slight winter peak. The Montana sales forecast is done on a jurisdictional basis rather than by classes. Sales to all but the industrial class are so insignificant that separate detailed analysis is deemed unnecessary.

Table 5-3 summarizes the Montana jurisdiction sales forecast. Sales are forecasted to level off to 500 MWH per month in 1995 and remain constant. The 1992 Report forecasted a constant level of sales for the 1994-1998 period at about 21,000 megawatt-hours per year. The prior forecasts have been optimistic in projecting the level at which sales will ultimately bottom in the Montana jurisdiction. Figure 5-3 graphically depicts actual (1987-1991) and forecasted (1992-2000) sales for Montana. The graphs for the Montana jurisdiction is contained in Appendix B.

Total Excluding Gillette

In Tables 5-6 through 5-8, sales, energy and peak forecasts are developed independent of the forecasts for Gillette, Wyoming. In this report, the total company forecast excluding

Gillette is also referred to as the retail jurisdiction forecast. Table 5-6 shows expected sales, energy and peak on a monthly basis through 2006 and an annual basis through 2016. Tables 5-7 and 5-8 are the upper and lower bandwidth forecasts, respectively. Total sales excluding Gillette have increased on average about 2.3 percent per year over the last five years. In the future, this increase is to be about 2.0 percent per year over the 1994 through 2006 period. The recent historical growth (especially the last three years) has been slowed by abnormally mild summers. We assume normal weather conditions exist during the forecast period.

Monthly Total Sales excluding Gillette is the sum of the sales forecast for each of the jurisdictions discussed above. Total Sales excluding Gillette are forecast to increase from actual sales of 1,431 GWh in 1993 to 1,836 GWh in 2004. Monthly Total Energy excluding Gillette is equal to Monthly Total Sales excluding Gillette times a monthly energy to sales ratio. The monthly energy to sales ratios exclude Gillette and are developed in Appendix C. Because energy requirements are calculated directly from sales using sales to energy ratios, which are assumed to be constant over time, the energy forecast has the same trend as the sales forecast (approximately 2.0 percent per year).

Monthly Peak excluding Gillette is equal to the Monthly Total Energy excluding Gillette times a monthly load factor. The monthly load factors exclude Gillette and are developed in Appendix D.

Gillette, Wyoming Sales Forecast

Black Hills' share of total Gillette, Wyoming sales accounted for about 10 percent of Total Company sales in 1993. Historically, Gillette has been the fastest growing portion of Total Company sales. But declining growth in Gillette combined with an increasing amount of Gillette's requirements being met by sources other than Black Hills are resulting in Gillette's declining share of Total Company Sales. Approximately 16 percent of Gillette's requirements in 1993 were met by sources other than Black Hills. This level is forecasted to increase gradually to be about 17 percent by 2006. This factor combined with the lower forecasted rate of growth for Gillette versus the South Dakota jurisdictions will reduce Gillette's share of Total Company Sales to about 8.5 percent.

During 1993, over 20 percent of Gillette's peak demand was met by sources other than Black Hills. In the forecasted period, 40 percent of Gillette's peak demand is met by sources other than Black Hills as discussed in more detail in Chapter 4. Gillette experiences a very pronounced winter peak. With Black Hills providing less of Gillette's peak requirements, the impact on the total company peak forecast has been to reduce Black Hills winter peak relative to summer peak. This is a major contributing factor in the peak forecast showing Black Hills summer peak exceeding its winter peak in the future.

Table 5-4 summarizes the calculation of total Gillette sales, energy and peak, and the portions met through WAPA, other sources, and Black Hills' purchases. Total Gillette expected energy requirements are forecasted to grow at about 1.2 percent per year from 180,400 megawatt-hours in 1993 to 214,500 megawatt-hours in 2006. Energy provided by WAPA is forecasted at a constant 27,000 megawatt-hours per year. As discussed in Chapter 4, the Company's contractual arrangement with Gillette results in Gillette not receiving credit for 100 percent of this energy. Other energy purchases by Gillette are forecasted to increase from 1,544 megawatt-hours in 1993 to 8,700 megawatt-hours in 2006. The remainder of Gillette's energy requirements are met by purchases from Black Hills. As discussed in Chapter 4, the Company's contractual arrangement with Gillette results in Gillette receiving credit for about 65 percent of the WAPA power early in the forecast period, increasing to about 80 percent at the end of the forecast period. As a result, sales by BHPL to Gillette exceed the indicated energy requirements provided by Black Hills. Gillette's expected coincident peak is forecasted to grow from 33 MW in 1993 to 38 MW in 2006. Gillette's monthly peaks are about 95 percent coincident with Black Hill's peaks; therefore, the 38 MW coincident peak in 2006 corresponds to a 40 MW noncoincident peak. As discussed in Chapter 4, it is assumed that Black Hills provides 60 percent of Gillette's peak requirements. BHPL's share of Gillette's expected coincident peak is assumed to increase from the current level of 23 MW to 24 MW in 2006.

The 1992 Report forecasted total requirements of 198,600 megawatt-hours in 1994. This figure compares to a current forecast of 184,800 megawatt-hours for 1994. The changes which have occurred in Gillette's supply mix over the last few years make it difficult to compare the previous and current forecasts with regard to the portion of Gillette's requirements being met by Black Hills. As discussed in Chapter 4, the assumption regarding how much of Gillette's energy and peak requirements are met by Black Hills is very specific and detailed. If circumstances change such that the assumptions made are no longer valid, the forecast for Gillette contained in this report must be modified accordingly.

Actual and forecasted total Gillette requirements are graphically depicted in Figure 5-4.

Total Company Sales, Energy, and Peak Forecasts

Table 5-5 summarizes monthly expected, upper bandwidth and lower bandwidth sales, energy and peak forecasts for the period 1994 through 2006. Tables 5-6 through 5-8 show the detailed calculations of the figures summarized in Table 5-5. The calculations in Tables 5-6 through 5-8 are discussed at the beginning of this chapter.

Total Company sales (summarized on Page 1 of Table 5-5) represent the sum of the sales in South Dakota, Wyoming, and Montana plus sales made by Black Hills to Gillette,

Wyoming. Sales are forecasted to increase from the actual sales of 1,594 GWh in 1993 to 1,641 GWh in 1994 and 2,017 GWh in 2004. The equivalent annual compound rate of sales growth over the ten year period ended 2004 is approximately 2.0 percent.

The Total Company energy figures (summarized on Page 2 of Table 5-5) represent the sum of the Total Company energy figures excluding Gillette plus the portion of Gillette's energy requirements supplied by Black Hills. Total Company energy requirements are forecasted to increase from the actual level of 1,651 GWh in 1993 to 1,702 GWh in 1994 and 2,101 GWh in 2004. The equivalent annual compound rate of energy growth over the ten year period ended 2004 is approximately 2.0 percent.

The Total Company peak figures (summarized on Page 3 of Table 5-5) represent the sum of the Total Company peak figures excluding Gillette plus the portion of Gillette's peak requirements supplied by Black Hills. Annual peaks are forecasted to occur during the summer (July). Total Company peak is forecasted to increase from 279 MW in 1994 to 352 MW in 2004. The winter peak is forecasted to increase from 278 MW in 1994 to 345 MW in 2004. The equivalent annual compound rates of growth over the ten year period ended 2004 for both the summer and winter peaks are approximately 2.1 and 2.4 percent, respectively.

Several factors discussed in this report are contributing to the trend towards higher summer than winter peaks. First, sales in the South Dakota jurisdiction during the peak summer and winter months are approximately equal. But, the much higher load factor that the Company experiences in the winter results in the South Dakota jurisdiction having a summer peak. Second, the General Service and Large General Service classes are very strong summer peaking classes and these classes are forecasted to grow faster than the Residential class. The Residential class has sales during the peak summer month which are about 15 percent less than the peak winter month. But taking into consideration the higher winter load factor, the Residential class' summer and winter peak are virtually equal. Third, sales in Wyoming (which has a winter peak) as a percentage of total sales have been declining. During the forecast period, this trend is forecasted to stabilize with Wyoming requirements growing at about the same rate as the overall system. Fourth, sales to Gillette (which also has a winter peak) as a percentage of total sales are forecasted to decline. Fifth, as discussed in Chapter 4, changes at Dakotah Cement are expected to reduce their winter requirements. Finally, the higher winter peaks Black Hills experienced in 1989 and 1990 are not comparable to the "expected" peaks forecasted in this report. The 1989 and 1990 peaks included Gillette at almost full requirements whereas in future years, Black Hills' share of Gillette's winter peak is assumed not to exceed 60 percent of Gillette's historical winter peak. Further, the conditions that existed in February 1989 and December 1990 were typical of design conditions rather than expected or normal conditions. It should be noted that Black Hills'

service territory has not experienced any summer conditions over the last five years which would be considered design conditions. A more detailed discussion of Black Hill's summer and winter peaks is contained in Chapter 7.

Figures 5-5, 5-6, 5-7, and 5-8 graphically depict the annual sales, energy, summer peak, and winter peak demand forecasts, respectively, showing actual (1988-1993) and forecasted (1994-2016) for the Total Company.

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Table 5-1
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Year	Month	Residential + Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	*General Service Irrigation*	*General Service Others*	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
1993	January	23,361	13,689	4,992	21,291	13,465	3,660	449	37	490	10,810	27,616	711	1,061	121,632
	February	19,97[illegible]	11,064	4,243	20,078	13,062	3,329	363	34	186	8,992	25,050	631	1,037	108,041
	March	20,072	11,120	4,157	20,578	13,196	3,247	329	36	261	9,787	27,452	592	1,090	111,926
	April	18,954	8,678	3,320	20,419	13,570	2,674	301	44	99	9,073	27,182	549	1,112	105,975
	May	15,420	5,625	2,208	17,632	11,895	2,280	262	63	110	9,630	27,525	478	1,124	94,255
	June	16,679	5,110	1,975	19,783	13,402	2,491	242	90	149	9,621	30,411	451	1,413	101,805
	July	16,550	4,382	1,689	21,253	13,673	2,642	261	84	202	9,623	32,660	477	1,389	104,886
	August	*17,667*	*4,280*	*1,704*	*22,487*	*14,575*	*2,839*	*296*	*105*	*233*	*9,522*	*32,416*	*531*	*1,542*	*108,197*
	September	17,576	4,654	1,866	22,537	15,187	2,812	320	95	215	9,872	32,899	574	1,497	109,909
	October	16,501	5,503	2,225	19,567	14,134	2,424	353	68	177	9,958	34,735	635	1,212	107,491
	November	17,749	7,796	3,275	18,635	12,488	2,563	379	48	170	9,060	30,734	678	1,147	104,721
	December	23,450	11,507	4,874	22,819	14,893	3,248	404	37	818	10,845	27,074	737	1,277	121,982
	Total	*223,950*	93,409	36,526	247,075	163,538	34,017	3,969	731	3,112	116,797	365,754	7,042	14,900	1,300,820
1994	January (1)	21,750	11,270	4,775	22,206	13,124	3,139	443	36	596	9,638	28,372	726	1,143	117,217
	February (1)	20,202	11,313	4,908	19,726	13,082	3,052	358	7	168	9,132	24,142	640	1,080	107,812
	March (1)	20,193	9,834	4,260	21,191	14,068	3,021	335	13	149	10,231	26,870	621	1,157	111,953
	April (1)	18,392	7,831	3,386	19,795	13,679	2,639	297	*24*	*154*	*10,278*	*29,693*	569	1,162	107,900
	May (1)	15,928	5,591	2,511	17,761	13,214	2,244	261	54	176	11,270	30,851	500	1,171	101,532
	June (1)	15,851	3,974	1,606	20,953	13,432	2,308	240	94	232	9,696	28,182	465	1,465	98,079
	July (1)	21,565	4,802	2,210	27,275	17,433	2,921	260	133	454	10,244	33,737	511	2,074	123,619
	August (1)	19,541	4,194	1,958	25,383	15,354	2,824	297	113	423	9,655	32,996	554	1,898	115,390
	September	18,469	4,548	2,069	24,991	16,290	2,530	320	130	249	10,182	36,137	594	1,413	117,940
	October	17,573	5,850	2,723	20,702	*14,176*	*2,444*	353	73	193	10,225	37,041	670	1,206	113,229
	November	18,772	7,883	3,752	21,358	13,355	2,664	380	33	141	10,268	31,103	707	1,065	111,480
	December	20,403	9,920	4,824	21,204	13,985	3,015	405	23	1,259	10,311	24,145	755	998	111,248
	Total	228,659	87,009	39,182	262,545	171,193	32,800	3,950	732	4,196	120,530	363,258	7,314	15,831	1,337,197
1995	*January*	*23,937*	*12,599*	5,544	23,290	14,558	3,614	426	26	826	10,353	24,061	743	1,074	121,050
	February	21,026	10,894	5,447	21,146	13,311	3,261	353	18	441	10,396	23,077	662	1,007	111,041
	March	20,277	9,855	4,947	21,264	13,945	3,056	336	22	407	10,439	27,963	641	1,019	114,172
	April	19,016	8,481	4,295	21,537	13,980	2,910	297	37	153	10,482	30,687	567	1,045	113,488
	May	17,506	6,474	3,276	19,866	12,877	2,628	260	61	169	10,525	31,078	529	1,135	106,383
	June	17,723	5,048	2,530	23,004	14,899	2,493	240	89	*192*	*10,567*	*32,686*	492	*1,394*	*121,359*
	July	19,938	4,285	2,126	25,291	16,431	2,717	260	137	262	10,610	33,511	518	1,616	117,705
	August	20,684	4,072	2,022	27,336	16,428	2,839	295	147	273	10,653	35,202	566	1,645	122,161
	September	18,854	4,548	2,286	25,954	16,984	2,582	319	130	289	10,696	34,632	612	1,414	119,299
	October	17,927	5,850	3,007	21,560	14,778	2,494	351	73	223	10,739	36,687	690	1,207	115,587
	November	19,140	7,883	4,140	22,227	13,920	2,719	379	33	163	10,781	31,734	728	1,065	114,912
	December	20,791	9,920	5,318	22,067	14,575	3,077	404	23	*1,453*	*10,824*	*23,777*	778	998	114,005
	Total	236,820	89,910	48,937	274,543	176,688	34,390	3,919	796	4,852	127,066	365,095	7,526	14,618	1,381,163
1996	January	24,367	12,599	6,107	24,199	15,170	3,688	424	26	951	10,867	28,611	765	1,075	128,849
	February	21,421	10,894	5,995	22,004	13,871	3,328	352	18	507	10,910	25,102	682	1,007	116,091
	March	*20,663*	*9,855*	*5,441*	*22,125*	*14,527*	*3,119*	334	22	467	10,953	29,087	660	1,019	118,273
	April	19,386	8,481	4,721	22,408	14,562	2,970	296	37	176	10,995	28,528	584	1,045	114,189
	May	17,859	6,474	3,598	20,704	13,410	2,682	259	61	194	11,038	29,324	545	1,135	107,282
	June	18,079	5,048	2,777	23,919	15,514	2,543	239	89	219	11,081	32,117	507	1,395	113,528
	July	20,320	4,285	2,332	26,259	17,107	2,773	259	137	299	11,124	35,094	533	1,617	122,139
	August	21,074	4,072	2,215	28,351	17,101	2,896	294	147	312	11,167	37,384	582	1,645	127,241
	September	19,223	4,548	2,503	26,935	17,679	2,634	318	130	329	11,209	36,917	630	1,414	124,469
	October	18,285	5,850	3,291	22,436	15,380	2,545	350	73	254	11,252	39,053	711	1,207	120,696
	November	19,512	7,883	4,528	23,113	14,485	2,773	378	33	185	11,295	33,631	750	1,065	119,631
	December	21,182	9,920	5,812	22,947	15,164	3,139	402	23	1,647	11,338	24,635	801	998	118,009
	Total	241,371	89,910	49,319	285,401	183,971	35,090	3,908	796	5,540	133,229	379,492	7,749	14,622	1,430,396

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Year	Month	Residential + Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	General Service Irrigation	General Service Others	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
1997	January	24,800	12,599	8,670	25,125	15,781	3,762	423	26	1,077	11,381	28,509	788	1,075	132,015
	February	21,819	10,894	6,544	22,878	14,428	3,395	351	18	574	11,423	25,094	684	1,007	119,110
	March	21,052	9,855	5,536	23,003	15,109	3,181	333	22	527	11,466	28,090	679	1,019	121,174
	April	19,761	8,481	5,146	23,295	15,143	3,029	295	37	198	11,509	28,362	601	1,046	116,903
	May	18,215	6,474	3,920	21,560	13,944	2,735	258	61	218	11,552	29,101	561	1,335	109,733
	June	18,438	5,048	3,024	24,852	15,130	2,594	220	89	240	11,595	31,735	521	1,295	115,905
	July	20,705	4,285	2,537	27,243	17,783	2,828	259	137	336	11,637	34,597	549	1,617	124,515
	August	21,468	4,072	2,409	29,384	17,775	2,954	293	147	350	11,680	36,806	599	1,645	129,583
	September	19,595	4,548	2,721	27,934	16,373	2,687	317	130	369	11,723	36,244	648	1,414	126,701
	October	18,640	5,850	3,574	23,329	15,982	2,595	349	73	284	11,766	38,383	731	1,207	122,769
	November	19,887	7,883	4,915	24,016	15,050	2,828	376	33	207	11,808	33,164	771	1,066	122,005
	December	21,577	9,920	6,306	23,844	15,754	3,201	401	23	1,841	11,851	24,711	824	999	121,252
		245,963	89,910	53,701	296,463	191,253	35,790	3,893	796	6,228	139,391	375,696	7,954	14,626	1,461,664
1998	January	25,236	12,599	7,233	26,068	16,393	3,836	421	26	1,203	11,894	27,754	810	1,075	134,548
	February	22,221	10,894	7,092	23,769	14,985	3,462	350	18	640	11,937	24,392	703	1,007	121,471
	March	21,445	9,855	6,430	23,898	15,691	3,246	332	22	588	11,980	28,223	598	1,019	123,424
	April	20,138	8,481	5,572	24,200	15,774	3,089	294	37	221	12,022	27,657	618	1,046	119,099
	May	18,575	6,474	4,242	22,433	14,477	2,789	257	61	243	12,065	28,406	577	1,136	111,734
	June	18,800	5,048	3,270	25,802	16,745	2,645	238	89	274	12,108	31,026	536	1,396	117,976
	July	21,094	4,285	2,743	28,246	18,459	2,883	258	137	373	12,151	33,832	564	1,618	126,643
	August	21,866	4,072	2,603	30,434	18,449	3,011	292	147	388	12,194	36,027	616	1,646	131,743
	September	19,971	4,548	2,938	28,949	19,067	2,739	316	130	409	12,236	35,519	666	1,415	128,902
	October	19,010	5,850	3,858	24,239	16,586	2,646	348	73	316	12,279	37,615	751	1,208	124,776
	November	20,266	7,883	5,303	24,936	15,616	2,883	375	33	229	12,322	32,420	792	1,066	124,124
	December	21,975	9,920	6,800	24,758	16,344	3,263	400	23	2,035	12,365	23,968	847	999	123,696
	Total	250,595	89,910	58,083	307,731	198,535	36,490	3,880	796	6,917	145,553	366,839	8,177	14,629	1,488,136
1999	January	25,676	12,599	7,796	27,027	17,005	3,910	420	26	1,328	12,408	26,726	832	1,075	136,829
	February	22,626	10,894	7,641	24,677	15,543	3,529	349	18	706	12,450	23,436	722	1,008	123,600
	March	21,841	9,855	6,924	24,809	16,273	3,306	331	22	648	12,493	27,179	717	1,020	125,419
	April	20,519	8,481	5,997	25,121	16,306	3,148	293	37	243	12,536	26,698	635	1,046	121,061
	May	18,938	6,474	4,564	23,323	15,011	2,843	256	61	267	12,579	27,459	592	1,136	113,502
	June	19,165	5,048	3,517	26,769	17,360	2,696	237	89	301	12,622	30,061	551	1,396	119,811
	July	21,485	4,285	2,948	29,266	19,136	2,938	257	137	411	12,664	32,793	579	1,618	128,518
	August	22,266	4,072	2,797	31,501	19,123	3,069	291	147	426	12,707	34,966	633	1,646	133,644
	September	20,350	4,548	3,156	29,983	19,761	2,791	315	130	449	12,750	34,534	684	1,415	130,864
	October	19,378	5,850	4,142	25,166	17,186	2,696	347	73	345	12,793	36,570	772	1,208	126,526
	November	20,648	7,883	5,691	25,873	16,181	2,938	374	33	251	12,836	31,412	814	1,066	125,998
	December	22,376	9,920	7,294	25,689	16,934	3,325	398	23	2,229	12,878	22,960	869	999	125,894
	Total	255,268	89,910	62,465	319,204	205,817	37,189	3,867	796	7,605	151,716	354,796	8,400	14,633	1,511,666
2000	January	26,119	12,599	8,359	28,004	17,617	3,985	418	26	1,454	12,921	24,633	855	1,076	138,065
	February	23,034	10,894	8,190	25,602	16,100	3,595	347	18	772	12,964	21,665	761	1,008	124,952
	March	22,240	9,855	7,418	25,737	16,855	3,369	330	22	708	13,007	25,070	737	1,020	126,369
	April	20,903	8,481	6,422	26,060	16,887	3,207	292	37	266	13,050	24,604	652	1,046	121,907
	May	19,304	6,474	4,885	24,230	15,545	2,896	255	61	292	13,092	25,277	608	1,136	114,056
	June	19,634	5,048	3,763	27,754	17,975	2,746	236	89	329	13,135	27,555	565	1,396	120,127
	July	21,881	4,285	3,154	30,303	19,812	2,994	256	137	448	13,178	29,963	595	1,618	128,622
	August	22,671	4,072	2,991	32,586	19,796	3,127	290	147	464	13,221	31,929	649	1,647	133,580
	September	20,732	4,548	3,373	31,033	20,456	2,844	314	130	488	13,263	31,458	702	1,415	130,756
	October	19,749	5,850	4,426	26,110	17,788	2,746	346	73	376	13,306	33,360	792	1,208	126,130
	November	21,033	7,883	6,078	26,827	16,746	2,993	373	33	273	13,349	28,691	835	1,066	126,180
	December	22,781	9,920	7,788	26,636	17,523	3,387	397	23	2,423	13,392	21,259	892	999	127,421
	Total	259,582	89,910	66,847	330,883	213,099	37,889	3,854	796	8,293	157,870	325,465	8,641	14,637	1,518,174

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Year	Month	Residential + Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	General Service Irrigation	General Service Others	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
2001	Total	264,737	89,910	71,229	342,766	220,182	38,569	3,841	796	8,981	164,040	330,567	8,665	14,640	1,559,303
2002	Total	269,533	89,910	75,611	354,855	227,654	39,289	3,827	796	9,665	170,203	328,107	9,067	14,644	1,583,175
2003	Total	274,370	89,910	79,993	367,149	234,946	39,988	3,814	796	10,357	176,365	333,415	9,290	14,648	1,635,042
2004	Total	279,247	89,910	84,375	379,549	242,228	40,688	3,801	796	11,045	182,527	338,938	9,534	14,651	1,677,290
2005	Total	279,707	89,910	84,938	380,709	242,840	40,752	3,800	796	11,171	183,041	339,409	9,555	14,652	1,681,291
2006	Total	280,133	89,910	85,456	381,717	243,397	40,829	3,799	796	11,237	183,554	339,847	9,554	14,652	1,684,912

(1) Actual.
(2) Total may differ slightly from sum of individual rates because of rounding.

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Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
1993	January	1,267	612	64	878	399	139	36	7,690	53	17	11,175
	February	1,059	486	52	843	390	110	23	6,780	50	16	9,841
	March	1,182	514	54	909	433	124	22	7,571	47	18	10,873
	April	987	352	34	758	404	80	20	6,244	46	15	8,939
	May	846	241	24	828	363	73	17	6,624	37	13	8,566
	June	943	222	21	765	406	67	16	6,918	33	14	9,405
	July	877	193	16	778	402	61	17	6,203	36	12	8,597
	August	934	194	17	847	425	70	19	6,815	40	11	9,373
	September	880	193	17	781	416	63	21	6,819	43	9	9,243
	October	876	242	21	809	398	64	23	6,626	47	11	9,118
	November	982	356	35	867	389	84	25	7,526	50	8	10,312
	December	1,298	539	56	1,048	449	117	27	8,153	55	10	11,751
	Total	12,183	4,145	413	9,902	4,872	1,053	266	83,970	536	152	117,492
1994	January (1)	1,165	477	50	844	384	107	30	8,062	53	12	11,184
	February (1)	1,115	504	62	850	384	117	30	8,367	48	16	11,492
	March (1)	1,133	443	48	868	409	102	22	8,761	45	20	11,851
	April (1)	1,020	340	39	767	399	74	20	6,133	40	19	8,852
	May (1)	847	233	26	898	403	59	17	8,657	36	14	9,191
	June (1)	838	166	19	916	427	59	15	9,721	33	14	12,210
	July (1)	1,033	206	24	1,243	499	72	17	7,625	36	29	10,784
	August (1)	982	197	24	1,149	481	63	19	8,080	40	93	11,128
	September	857	202	20	857	458	55	21	7,173	43	9	9,694
	October	900	262	28	831	440	59	23	7,188	47	11	9,789
	November	989	359	41	818	422	75	25	8,541	50	8	11,328
	December	1,078	455	54	956	435	95	27	8,559	54	10	11,723
	Total	11,957	3,844	434	10,998	5,142	937	264	94,870	526	256	129,228
1995	January	1,263	594	62	910	421	126	30	8,577	55	12	12,047
	February	1,106	510	59	860	414	109	23	8,596	49	16	11,742
	March	1,064	450	53	871	419	98	22	8,614	46	20	11,656
	April	997	382	44	813	444	87	20	7,280	43	19	10,128
	May	911	288	31	728	403	68	17	7,296	37	14	9,792
	June	888	221	22	808	458	57	15	7,311	33	14	9,829
	July	913	189	17	852	475	58	17	7,326	37	12	9,897
	August	896	177	16	898	497	58	19	7,342	40	11	9,953
	September	857	202	20	868	474	54	20	7,357	43	9	9,904
	October	900	262	28	842	455	58	22	7,372	47	11	9,997
	November	989	359	41	828	437	74	24	8,759	50	8	11,570
	December	1,078	455	54	968	450	94	26	8,777	54	10	11,967
	Total	11,862	4,088	445	10,246	5,347	940	255	94,609	535	155	128,483
1996	January	1,263	594	62	922	435	124	29	8,796	55	12	12,290
	February	1,106	510	59	871	428	108	23	8,814	49	16	11,984
	March	1,064	450	53	882	434	96	22	8,832	46	20	11,898
	April	997	382	44	823	459	86	19	7,464	43	19	10,336
	May	911	288	31	738	416	66	16	7,480	37	14	9,998
	June	888	221	22	819	473	56	15	7,495	33	14	10,037
	July	913	189	17	863	491	57	16	7,510	37	12	10,106
	August	896	177	16	909	513	57	19	7,526	40	11	10,164
	September	857	202	20	879	490	52	20	7,541	43	9	10,113
	October	900	262	28	853	470	56	22	7,556	47	11	10,206
	November	989	359	41	839	451	73	24	8,977	50	8	11,812
	December	1,078	455	54	981	465	93	26	8,996	54	10	12,210
	Total	11,862	4,088	445	10,379	5,526	923	251	96,988	535	156	131,154

Black Hills Power & Light Company
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Wyoming Jurisdiction
Megawatt-Hours
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Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
1997	January	1,263	594	62	934	449	123	20	9,014	55	12	12,533
	February	1,106	510	59	882	442	106	22	9,032	49	16	12,228
	March	1,064	450	53	894	448	95	21	9,050	46	20	12,140
	April	997	382	44	836	474	84	19	7,649	43	19	10,546
	May	911	288	31	747	430	65	16	7,664	37	14	10,203
	June	888	221	22	829	489	55	15	7,679	33	14	10,246
	July	913	189	17	874	507	55	16	7,695	37	12	10,316
	August	896	177	16	921	530	55	18	7,710	40	11	10,375
	September	857	202	20	891	506	51	20	7,725	43	9	10,323
	October	900	262	28	864	485	55	22	7,741	47	11	10,414
	November	989	359	41	850	465	71	24	9,196	50	8	12,053
	December	1,078	455	54	993	480	91	25	9,214	54	10	12,454
	Total	11,862	4,088	445	10,513	5,705	907	248	99,367	535	156	133,825
1998	January	1,263	594	62	946	464	121	28	9,232	55	12	12,775
	February	1,106	510	59	893	457	105	22	9,250	49	16	12,467
	March	1,064	450	53	905	462	94	21	9,268	46	20	12,383
	April	997	382	44	844	489	83	19	7,833	43	19	10,752
	May	911	288	31	757	444	63	16	7,848	37	14	10,408
	June	888	221	22	840	504	53	15	7,863	33	14	10,454
	July	913	189	17	885	523	54	16	7,879	37	12	10,525
	August	896	177	16	933	547	54	18	7,894	40	11	10,585
	September	857	202	20	902	521	49	19	7,909	43	9	10,532
	October	900	262	28	875	500	54	22	7,925	47	11	10,623
	November	989	359	41	861	480	70	23	9,414	50	8	12,295
	December	1,078	455	54	1,006	495	90	25	9,432	54	10	12,698
	Total	11,862	4,088	445	10,646	5,884	890	244	101,746	535	156	136,497
1999	January	1,263	594	62	957	478	120	28	9,450	55	12	13,018
	February	1,106	510	59	905	471	104	22	9,468	49	16	12,709
	March	1,064	450	53	916	476	92	21	9,487	46	20	12,625
	April	997	382	44	855	503	81	18	8,017	43	19	10,960
	May	911	288	31	766	457	62	16	8,032	37	14	10,614
	June	888	221	22	850	520	52	15	8,047	33	14	10,662
	July	913	189	17	896	539	53	16	8,063	37	12	10,734
	August	896	177	16	944	563	53	18	8,078	40	11	10,796
	September	857	202	20	913	537	48	19	8,093	43	9	10,741
	October	900	262	28	886	515	52	21	8,109	47	11	10,831
	November	989	359	41	871	494	69	23	9,632	50	8	12,536
	December	1,078	455	54	1,018	510	89	25	9,650	54	10	12,942
	Total	11,862	4,088	445	10,780	6,063	874	240	104,126	535	156	139,168
2000	January	1,263	594	62	969	492	119	27	9,668	55	12	13,261
	February	1,106	510	59	916	485	102	21	9,687	49	16	12,951
	March	1,064	450	53	928	490	91	20	9,705	46	20	12,867
	April	997	382	44	866	518	80	18	8,201	43	19	11,168
	May	911	288	31	776	471	61	15	8,216	37	14	10,819
	June	888	221	22	861	535	50	14	8,231	33	14	10,871
	July	913	189	17	907	555	51	15	8,247	37	12	10,944
	August	896	177	16	956	580	51	17	8,262	40	11	11,007
	September	857	202	20	925	553	47	19	8,277	43	9	10,951
	October	900	262	28	897	530	51	21	8,293	47	11	11,039
	November	989	359	41	882	509	67	23	9,850	50	8	12,778
	December	1,078	455	54	1,031	525	87	24	9,868	54	10	13,186
	Total	11,862	4,088	445	10,913	6,242	857	236	106,505	535	156	141,840

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Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
2001	Total	11,862	4,088	445	11,046	6,422	841	233	108,884	535	156	144,511
2002	Total	11,862	4,088	445	11,180	6,601	828	220	111,263	535	156	147,183
2003	Total	11,862	4,088	445	11,313	6,780	808	225	113,642	535	156	149,854
2004	Total	11,862	4,088	445	11,446	6,959	791	221	116,021	535	156	152,526
2005	Total	11,862	4,088	445	11,580	7,139	774	218	118,401	535	156	155,197
2006	Total	11,862	4,088	445	11,713	7,318	758	214	120,780	535	156	157,869

(1) Actual.
(2) Total may differ slightly from sum of individual rates because of rounding.

Black Hills Power & Light Company
Monthly Sales Forecast
Montana Jurisdiction
Megawatt-Hours
16-Oct-94

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Year	Month	Total Montana
1993	January	1,180
	February	1,001
	March	1,052
	April	872
	May	899
	June	1,133
	July	1,112
	August	1,208
	September	1,091
	October	992
	November	1,043
	December	1,280
	Total	12,863
1994	January (1)	1,230
	February (1)	775
	March (1)	784
	April (1)	676
	May (1)	526
	June (1)	547
	July (1)	743
	August (1)	670
	September	500
	October	500
	November	500
	December	500
	Total	7,957
1995	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000
1996	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000

Black Hills Power & Light Company
Monthly Sales Forecast
Montana Jurisdiction
Megawatt-Hours
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Year	Month	Total Montana
1997	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000
1998	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000
1999	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000
2000	January	500
	February	500
	March	500
	April	500
	May	500
	June	500
	July	500
	August	500
	September	500
	October	500
	November	500
	December	500
	Total	6,000
2001		6,000
2002		6,000
2003		6,000
2004		6,000
2005		6,000
2006		6,000

(1) Actual.
(2) Total may differ slightly from sum of individual rates because of rounding.

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
16-Nov-94

Table S-4
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Year	Month	Total Gillette, Wyoming: Sales and Energy	Load Factor	Coincident Peak	WAPA: Energy	WAPA: Sales Adjustment	WAPA: Sales	WAPA: Peak	60 Percent of Gillette Noncoinc. Pe	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total MCP	Energy - Other Sources: Percent of Total	Energy - Other Sources: Sales and Energy	BHPL Share: Energy	BHPL Share: Sales	BHPL Share: Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW (4)
1993 (1)	January	18,937		32.0	2,294	292	2,002	4						651	15,992	16,184	27.0
	February	16,296		32.0	1,820	487	1,333	4						490	13,978	14,665	24.0
	March	16,045		29.0	1,384	725	1,259	4						21	14,045	14,785	25.0
	April	14,144		25.0	2,068	991	1,077	4						0	12,076	13,067	23.0
	May	13,356		23.0	2,169	1,089	1,080	4						0	11,187	12,276	19.0
	June	12,937		25.0	2,490	1,243	1,247	5						0	10,447	11,690	20.0
	July	13,644		30.0	3,007	1,443	1,564	5						0	10,637	12,080	25.0
	August	14,138		26.0	2,480	1,160	1,320	4						12	11,826	12,746	22.0
	September	12,938		23.0	1,828	910	918	3						0	11,110	12,020	20.0
	October	14,294		28.0	2,171	1,049	1,122	3						6	12,117	13,166	25.0
	November	16,430		33.0	2,160	704	1,456	4						201	14,069	14,773	27.0
	December	17,395		30.0	2,356	660	1,696	4						183	14,850	15,916	26.0
	Total	180,406	0.624	33.0	26,827	10,753	16,074							1,544	152,015	162,788	27.0
1994 (1)	January (1)	17,629		33.0	2,294	586	1,708	4						474	14,861	15,447	25.0
	February (1)	16,414		33.0	1,820	391	1,429	4						348	14,246	14,637	28.0
	March (1)	15,538		27.0	1,984	777	1,207	4						0	13,554	14,331	23.0
	April (1)	14,020		24.0	2,068	975	1,093	3						0	11,952	12,927	21.0
	May (1)	13,628		24.0	2,169	1,084	1,085	3						0	11,459	12,543	21.0
	June (1)	13,959		28.0	2,490	1,121	1,369	4						10	11,433	12,554	23.0
	July (1)	15,285		29.0	3,007	1,248	1,759	5						54	12,224	13,472	23.0
	August (1)	16,167		30.0	2,480	836	1,644	4						131	13,556	14,392	23.0
	September	13,990	0.711	27.3	1,828	777	1,051	4	17.3	23.3	27.3	95%	0.1%	19	12,142	12,919	23.3
	October	14,612	0.734	26.7	2,171	1,033	1,138	4	16.9	23.3	27.3	97%	0.0%	6	12,435	13,466	22.7
	November	16,175	0.713	31.5	2,160	721	1,439	4	19.9	23.3	27.3	82%	2.5%	397	13,619	14,340	23.3
	December	17,358	0.725	32.2	2,356	810	1,546	4	20.3	23.3	27.3	81%	2.5%	426	14,577	15,187	23.3
	Total	184,775	0.639	33.0	26,827	10,359	16,468						1.0%	1,860	156,098	166,417	28.0
1995	January	18,828	0.752	33.6	2,294	476	1,818	4	21.2	23.3	27.3	77%	4.6%	860	15,665	16,141	23.3
	February	16,951	0.750	33.6	1,820	312	1,508	4	21.2	23.3	27.3	77%	4.6%	782	14,340	14,661	23.3
	March	16,629	0.754	29.6	1,984	664	1,320	4	18.7	23.3	27.3	88%	0.5%	90	14,555	15,219	23.3
	April	15,136	0.763	27.5	2,068	825	1,243	4	17.4	23.3	27.3	94%	0.1%	21	13,047	13,872	23.3
	May	14,008	0.754	25.0	2,169	1,068	1,101	4	15.8	23.3	27.3	104%	0.0%	0	11,839	12,906	21.0
	June	14,187	0.694	28.4	2,490	1,060	1,430	4	17.9	23.3	27.3	91%	0.3%	44	11,653	12,713	23.3
	July	15,278	0.674	30.5	3,007	1,249	1,758	4	19.2	23.3	27.3	85%	1.0%	157	12,114	13,363	23.3
	August	14,992	0.705	28.6	2,480	1,055	1,425	4	18.0	23.3	27.3	91%	0.3%	47	12,465	13,521	23.3
	September	14,183	0.711	27.7	1,828	762	1,066	4	17.5	23.3	27.3	94%	0.1%	19	12,136	13,098	23.3
	October	14,806	0.734	27.1	2,171	1,026	1,145	4	17.1	23.3	27.3	96%	0.0%	6	12,629	13,655	23.1
	November	16,369	0.713	31.9	2,160	693	1,467	4	20.1	23.3	27.3	81%	2.5%	401	13,808	14,501	23.3
	December	17,552	0.725	32.5	2,356	627	1,729	4	20.5	23.3	27.3	80%	3.6%	624	14,572	15,199	23.3
	Total	188,919	0.641	33.6	26,827	9,818	17,009						1.6%	3,061	159,031	168,849	23.3
1996	January	19,021	0.752	34.0	2,294	476	1,818	4	21.5	23.3	27.3	76%	4.6%	878	15,850	16,325	23.3
	February	17,145	0.750	32.8	1,820	410	1,410	4	20.7	23.3	27.3	79%	3.6%	610	14,715	15,126	23.3
	March	16,823	0.754	30.0	1,984	628	1,356	4	18.9	23.3	27.3	87%	1.0%	173	14,666	15,294	23.3
	April	15,330	0.763	27.9	2,068	822	1,246	4	17.6	23.3	27.3	93%	0.1%	21	13,241	14,063	23.3
	May	14,202	0.754	25.3	2,169	1,059	1,110	4	16.0	23.3	27.3	102%	0.0%	0	12,033	13,092	21.3
	June	14,381	0.694	28.8	2,490	1,045	1,445	4	18.2	23.3	27.3	90%	0.3%	45	11,846	12,891	23.3
	July	15,472	0.674	30.8	3,007	1,204	1,803	4	19.5	23.3	27.3	84%	1.7%	261	12,204	13,408	23.3
	August	15,186	0.705	28.9	2,480	1,040	1,440	4	18.3	23.3	27.3	90%	0.5%	82	12,624	13,664	23.3
	September	14,377	0.711	28.1	1,828	723	1,105	4	17.7	23.3	27.3	92%	0.3%	45	12,504	13,227	23.3
	October	15,000	0.734	27.5	2,171	998	1,173	4	17.3	23.3	27.3	94%	0.1%	21	12,808	13,606	23.3
	November	16,563	0.713	32.3	2,160	640	1,520	4	20.4	23.3	27.3	80%	2.5%	400	13,997	14,638	23.3
	December	17,746	0.725	32.9	2,356	627	1,729	4	20.8	23.3	27.3	79%	3.6%	631	14,759	15,386	23.3
	Total	191,246	0.642	34.0	26,827	9,673	17,154						1.7%	3,172	161,247	170,920	23.3

Black Hills Power & Light Company
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Gillette, Wyoming Requirements - Expected
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Year	Month	Total Gillette, Wyoming			WAPA				90 Percent of Gillette Noncoinc. Pe	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total NCP	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Coincident Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW (4)
1997	January	19,215	0.752	34.3	2,294	448	1,846	4	21.7	23.3	27.3	76%	4.6%	887	16,034	16,482	23.3
	February	17,339	0.750	34.4	1,820	266	1,554	4	21.7	23.3	27.3	75%	4.6%	800	14,719	14,986	23.3
	March	17,017	0.756	30.3	1,984	571	1,413	4	19.2	23.3	27.3	86%	1.0%	175	14,858	15,429	23.3
	April	15,524	0.763	28.3	2,068	797	1,271	4	17.8	23.3	27.3	92%	0.3%	49	13,407	14,204	23.3
	May	14,395	0.754	25.7	2,169	1,033	1,136	4	16.2	23.3	27.3	101%	0.0%	0	12,226	13,260	21.7
	June	16,575	0.694	29.2	2,490	994	1,496	4	18.4	23.3	27.3	89%	0.5%	79	12,006	13,001	23.3
	July	15,666	0.674	31.2	3,007	1,185	1,822	4	19.7	23.3	27.3	83%	1.7%	264	12,395	13,580	23.3
	August	15,320	0.705	29.3	2,480	1,016	1,464	4	18.5	23.3	27.3	88%	0.5%	83	12,017	13,833	23.3
	September	14,571	0.711	28.5	1,828	705	1,123	4	18.0	23.3	27.3	91%	0.3%	46	12,698	13,402	23.3
	October	15,194	0.734	27.8	2,171	979	1,192	4	17.6	23.3	27.3	93%	0.1%	21	13,002	13,981	23.3
	November	16,757	0.719	32.7	2,160	618	1,542	4	20.6	23.3	27.3	79%	3.6%	596	14,001	14,619	23.3
	December	17,940	0.725	33.2	2,356	587	1,769	4	21.0	23.3	27.3	78%	3.6%	638	14,946	15,533	23.3
	Total	193,573	0.643	34.4	26,827	9,200	17,627						1.9%	3,637	163,109	172,310	23.3
1998	January	19,409	0.752	34.7	2,294	364	1,930	4	21.9	23.3	27.3	75%	6.4%	1,251	15,865	16,228	23.3
	February	17,533	0.750	34.8	1,820	239	1,581	4	22.0	23.3	27.3	75%	6.4%	1,130	14,584	14,822	23.3
	March	17,211	0.754	30.7	1,984	538	1,446	4	19.4	23.3	27.3	85%	1.7%	290	14,937	15,474	23.3
	April	15,718	0.763	28.8	2,068	726	1,342	4	18.1	23.3	27.3	91%	0.3%	49	13,600	14,326	23.3
	May	14,589	0.754	26.0	2,169	1,029	1,140	4	16.4	23.3	27.3	100%	0.0%	4	12,417	13,446	22.0
	June	16,769	0.694	29.6	2,490	976	1,514	4	18.7	23.3	27.3	88%	0.5%	80	12,199	13,175	23.3
	July	15,860	0.674	31.6	3,007	1,159	1,848	4	20.0	23.3	27.3	82%	2.5%	389	12,464	13,623	23.3
	August	15,574	0.705	29.7	2,480	984	1,496	4	18.7	23.3	27.3	87%	1.0%	160	12,934	13,918	23.3
	September	14,765	0.711	28.9	1,828	631	1,197	4	18.2	23.3	27.3	90%	0.5%	80	12,857	13,488	23.3
	October	15,388	0.734	28.2	2,171	956	1,215	4	17.8	23.3	27.3	92%	0.3%	48	13,188	14,128	23.3
	November	16,951	0.719	33.0	2,160	432	1,728	4	20.9	23.3	27.3	79%	3.6%	603	14,188	14,620	23.3
	December	18,134	0.725	33.6	2,356	521	1,835	4	21.2	23.3	27.3	77%	4.6%	837	14,941	15,462	23.3
	Total	196,900	0.643	34.8	26,827	8,553	18,274						2.5%	4,919	164,153	172,707	23.3
1999	January	19,603	0.752	35.0	2,294	364	1,930	4	22.1	23.3	27.3	74%	6.4%	1,263	16,046	16,410	23.3
	February	17,727	0.750	35.2	1,820	239	1,581	4	22.2	23.3	27.3	74%	6.4%	1,142	14,765	15,004	23.3
	March	17,404	0.754	31.0	1,984	486	1,498	4	19.6	23.3	27.3	84%	1.7%	293	15,127	15,613	23.3
	April	15,911	0.763	29.0	2,068	683	1,385	4	18.3	23.3	27.3	90%	0.5%	86	13,757	14,440	23.3
	May	14,783	0.754	26.4	2,169	1,020	1,149	4	16.7	23.3	27.3	98%	0.0%	4	12,611	13,631	22.4
	June	16,963	0.694	29.9	2,490	944	1,546	4	18.9	23.3	27.3	87%	1.0%	154	12,319	13,264	23.3
	July	16,054	0.674	32.0	3,007	1,119	1,888	4	20.2	23.3	27.3	81%	2.5%	394	12,653	13,772	23.3
	August	15,768	0.705	30.1	2,480	951	1,529	4	19.0	23.3	27.3	86%	1.0%	162	13,126	14,077	23.3
	September	14,959	0.711	29.2	1,828	611	1,217	4	18.5	23.3	27.3	89%	0.5%	81	13,050	13,661	23.3
	October	15,582	0.734	28.5	2,171	931	1,240	4	18.0	23.3	27.3	91%	0.3%	49	13,362	14,293	23.3
	November	17,145	0.713	33.4	2,160	541	1,619	4	21.1	23.3	27.3	78%	3.6%	610	14,375	14,916	23.3
	December	18,328	0.725	34.0	2,356	521	1,835	4	21.5	23.3	27.3	76%	4.6%	846	15,126	15,647	23.3
	Total	198,226	0.644	35.2	26,827	8,410	18,417						2.6%	5,082	156,317	174,727	23.3
2000	January	19,797	0.752	35.4	2,294	364	1,930	4	22.3	23.3	27.3	73%	6.4%	1,276	16,227	16,591	23.3
	February	17,921	0.750	35.5	1,820	220	1,600	4	22.4	23.3	27.3	73%	6.4%	1,155	14,946	15,166	23.3
	March	17,598	0.754	31.4	1,984	458	1,526	4	19.8	23.3	27.3	83%	1.7%	296	15,318	15,776	23.3
	April	16,105	0.763	29.3	2,068	675	1,393	4	18.5	23.3	27.3	88%	0.5%	87	13,950	14,625	23.3
	May	14,977	0.754	26.7	2,169	952	1,217	4	16.9	23.3	27.3	97%	0.0%	6	12,802	13,754	22.7
	June	15,157	0.694	30.3	2,490	909	1,581	4	19.2	23.3	27.3	86%	1.0%	156	12,511	13,420	23.3
	July	16,247	0.674	32.4	3,007	1,076	1,931	4	20.5	23.3	27.3	80%	2.5%	398	12,842	13,918	23.3
	August	15,962	0.705	30.4	2,480	927	1,553	4	19.2	23.3	27.3	85%	1.0%	164	13,318	14,245	23.3
	September	15,153	0.711	29.6	1,828	593	1,235	4	18.7	23.3	27.3	88%	0.5%	82	13,243	13,836	23.3
	October	15,770	0.734	28.9	2,171	881	1,290	4	18.2	23.3	27.3	90%	0.5%	85	13,519	14,400	23.3
	November	17,339	0.713	33.8	2,160	523	1,637	4	21.3	23.3	27.3	77%	4.6%	800	14,379	14,901	23.3
	December	18,521	0.725	34.3	2,356	496	1,860	4	21.7	23.3	27.3	76%	4.6%	855	15,311	15,806	23.3
	Total	200,553	0.644	35.5	26,827	8,072	18,755						2.7%	5,360	168,366	176,438	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
15-Nov-94

Year	Month	Total Gillette, Wyoming: Sales and Energy	Total Gillette, Wyoming: Load Factor	Total Gillette, Wyoming: Coincident Peak	WAPA: Energy	WAPA: Sales Adjustment	WAPA: Sales	WAPA: Peak	60 Percent of Gillette Noncoinc. Pe	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total MCP	Energy - Other Sources: Percent of Total	Energy - Other Sources: Sales and Energy	BHPL Share: Energy	BHPL Share: Sales	BHPL Share: Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW (4)
2001	January	19,591	0.752	35.7	2,294	289	2,005	4	22.6	23.3	27.3	73%	6.4%	1,288	16,409	16,698	23.3
	February	18,115	0.750	35.9	1,820	192	1,628	4	22.7	23.3	27.3	72%	7.9%	1,438	14,857	15,049	23.3
	March	17,792	0.754	31.7	1,984	429	1,555	4	20.0	23.3	27.3	82%	2.5%	436	15,372	15,801	23.3
	April	16,299	0.783	29.7	2,068	603	1,465	4	18.7	23.3	27.3	87%	1.0%	167	14,064	14,667	23.3
	May	15,171	0.754	27.1	2,169	949	1,220	4	17.1	23.3	27.3	96%	0.0%	6	12,996	13,945	23.1
	June	15,351	0.694	30.7	2,490	890	1,600	4	19.4	23.3	27.3	84%	1.7%	259	12,602	13,492	23.3
	July	16,441	0.674	32.8	3,007	1,049	1,958	4	20.7	23.3	27.3	79%	3.6%	585	12,850	13,899	23.3
	August	16,156	0.705	30.8	2,480	882	1,598	4	19.4	23.3	27.3	86%	1.7%	272	13,403	14,285	23.3
	September	15,347	0.711	30.0	1,828	560	1,268	4	18.9	23.3	27.3	86%	1.0%	158	13,361	13,921	23.3
	October	15,969	0.734	29.2	2,171	865	1,306	4	18.5	23.3	27.3	89%	0.5%	86	13,712	14,577	23.3
	November	17,533	0.713	34.7	2,160	523	1,637	4	21.6	23.3	27.3	76%	4.6%	809	14,563	15,086	23.3
	December	18,715	0.725	34.7	2,356	423	1,933	4	21.9	23.3	27.3	75%	6.4%	1,206	15,153	15,577	23.3
	Total	202,880	0.645	35.9	26,827	7,654	19,173						3.3%	6,710	169,343	176,997	23.3
2002	January	20,185	0.752	36.1	2,294	276	2,018	4	22.8	23.3	27.3	72%	7.9%	1,602	16,289	16,565	23.3
	February	18,309	0.750	36.3	1,820	192	1,628	4	22.9	23.3	27.3	71%	7.9%	1,453	15,026	15,227	23.3
	March	17,986	0.754	32.1	1,984	373	1,611	4	20.2	23.3	27.3	81%	2.5%	441	15,561	15,934	23.3
	April	16,493	0.763	30.0	2,068	584	1,484	4	19.0	23.3	27.3	86%	1.0%	169	14,256	14,840	23.3
	May	15,365	0.754	27.4	2,169	932	1,237	4	17.3	23.3	27.3	95%	0.1%	21	13,175	14,107	23.3
	June	15,544	0.694	31.1	2,490	850	1,640	4	19.6	23.3	27.3	83%	1.7%	262	12,793	13,643	23.3
	July	16,635	0.674	33.2	3,007	1,005	2,002	4	20.9	23.3	27.3	78%	3.6%	591	13,037	14,042	23.3
	August	16,350	0.705	31.2	2,480	857	1,623	4	19.7	23.3	27.3	83%	1.7%	275	13,594	14,451	23.3
	September	15,541	0.711	30.4	1,828	497	1,331	4	19.2	23.3	27.3	85%	1.0%	159	13,553	14,050	23.3
	October	16,163	0.734	29.6	2,171	840	1,331	4	18.7	23.3	27.3	88%	0.5%	87	13,905	14,745	23.3
	November	17,727	0.713	34.5	2,160	455	1,705	4	21.8	23.3	27.3	75%	4.6%	818	14,748	15,204	23.3
	December	18,909	0.725	35.0	2,356	423	1,933	4	22.1	23.3	27.3	74%	6.4%	1,218	15,335	15,758	23.3
	Total	205,207	0.645	36.3	26,827	7,283	19,544						3.5%	7,099	171,281	178,564	23.3
2003	January	20,379	0.752	36.4	2,294	276	2,018	4	23.0	23.3	27.3	71%	7.9%	1,618	16,467	16,744	23.3
	February	18,503	0.750	36.7	1,820	192	1,628	4	23.2	23.3	27.3	71%	7.9%	1,469	15,214	15,406	23.3
	March	18,180	0.754	32.4	1,984	351	1,633	4	20.5	23.3	27.3	80%	2.5%	446	15,750	16,101	23.3
	April	16,687	0.763	30.4	2,068	536	1,532	4	19.2	23.3	27.3	85%	1.0%	171	14,448	14,983	23.3
	May	15,569	0.754	27.8	2,169	889	1,280	4	17.5	23.3	27.3	93%	0.1%	21	13,368	14,257	23.3
	June	15,738	0.694	31.5	2,490	815	1,675	4	19.9	23.3	27.3	82%	2.5%	386	12,862	13,677	23.3
	July	16,829	0.674	33.5	3,007	962	2,045	4	21.2	23.3	27.3	77%	4.6%	777	13,045	14,007	23.3
	August	16,543	0.705	31.5	2,480	825	1,655	4	19.9	23.3	27.3	82%	2.5%	406	13,658	14,483	23.3
	September	15,735	0.711	30.8	1,828	479	1,349	4	19.4	23.3	27.3	84%	1.7%	265	13,641	14,120	23.3
	October	16,357	0.734	29.9	2,171	796	1,375	4	18.9	23.3	27.3	87%	1.0%	168	14,018	14,814	23.3
	November	17,920	0.713	34.9	2,160	421	1,739	4	22.1	23.3	27.3	74%	6.4%	1,155	14,606	15,027	23.3
	December	19,103	0.725	35.4	2,356	423	1,933	4	22.4	23.3	27.3	73%	6.4%	1,231	15,516	15,939	23.3
	Total	207,533	0.646	36.7	26,827	6,964	19,863						3.9%	8,111	172,595	179,560	23.3
2004	January	20,573	0.752	36.8	2,294	276	2,018	4	23.2	23.3	27.3	71%	7.9%	1,633	16,646	16,922	23.3
	February	18,697	0.750	37.1	1,820	173	1,647	4	23.4	23.4	27.4	70%	7.9%	1,484	15,393	15,566	23.4
	March	18,374	0.754	32.7	1,984	329	1,655	4	20.7	23.4	27.4	80%	3.6%	653	15,737	16,065	23.4
	April	16,881	0.763	30.7	2,068	497	1,571	4	19.4	23.4	27.4	85%	1.7%	284	14,528	15,025	23.4
	May	15,753	0.754	28.1	2,169	915	1,254	4	17.7	23.4	27.4	93%	0.1%	22	13,562	14,477	23.4
	June	15,932	0.694	31.9	2,490	815	1,675	4	20.1	23.4	27.4	82%	2.5%	391	13,052	13,866	23.4
	July	17,023	0.674	33.9	3,007	973	2,034	4	21.4	23.4	27.4	77%	4.6%	786	13,230	14,203	23.4
	August	16,737	0.705	31.9	2,480	825	1,655	4	20.1	23.4	27.4	82%	2.5%	410	13,847	14,672	23.4
	September	15,928	0.711	31.1	1,828	461	1,367	4	19.7	23.4	27.4	84%	1.7%	268	13,832	14,293	23.4
	October	16,551	0.734	30.3	2,171	764	1,407	4	19.1	23.4	27.4	86%	1.0%	170	14,210	14,974	23.4
	November	18,114	0.713	35.3	2,160	421	1,739	4	22.3	23.4	27.4	74%	6.4%	1,167	14,787	15,208	23.4
	December	19,297	0.725	35.8	2,356	390	1,967	4	22.6	23.4	27.4	73%	6.4%	1,243	15,608	16,097	23.4
	Total	209,860	0.646	37.1	26,827	6,848	19,979						4.1%	8,511	174,522	181,370	23.4

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
16-Nov-94

Table 5-4
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Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Noncoinc. Pe	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total RCP	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Coincident Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW (4)
2005	January	20,766	0.752	37.1	2,294	276	2,018	4	23.4	23.6	27.4	70%	7.9%	1,648	16,824	17,101	23.4
	February	18,890	0.750	37.5	1,820	174	1,646	4	23.7	23.7	27.7	70%	7.9%	1,499	15,571	15,745	23.7
	March	18,568	0.754	33.1	1,984	329	1,655	4	20.9	23.7	27.7	79%	3.6%	660	15,924	16,252	23.7
	April	17,075	0.763	31.1	2,068	497	1,571	4	19.6	23.7	27.7	85%	1.7%	298	14,719	15,216	23.7
	May	15,947	0.754	28.4	2,169	827	1,342	4	18.0	23.7	27.7	92%	0.3%	50	13,728	14,555	23.7
	June	16,126	0.694	32.3	2,490	815	1,675	4	20.4	23.7	27.7	81%	2.5%	395	13,241	14,055	23.7
	July	17,717	0.674	34.3	3,007	950	2,057	4	21.7	23.7	27.7	77%	4.6%	796	13,416	14,385	23.7
	August	16,931	0.705	32.3	2,480	825	1,655	4	20.4	23.7	27.7	81%	2.5%	415	14,036	14,861	23.7
	September	16,122	0.711	31.5	1,828	443	1,385	4	19.9	23.7	27.7	83%	1.7%	272	14,023	14,488	23.7
	October	16,745	0.734	30.7	2,171	764	1,407	4	19.4	23.7	27.7	85%	1.0%	172	14,402	15,166	23.7
	November	18,308	0.713	35.7	2,160	421	1,739	4	22.5	23.7	27.7	74%	6.4%	1,180	14,969	15,389	23.7
	December	19,491	0.725	36.1	2,356	374	1,982	4	22.8	23.7	27.7	73%	6.4%	1,256	15,879	16,253	23.7
	Total	212,187	0.647	37.5	26,827	6,695	20,132						4.1%	8,629	176,730	183,425	23.7
2006	January	20,960	0.752	37.4	2,294	276	2,018	4	23.7	23.7	27.7	70%	7.9%	1,664	17,003	17,279	23.7
	February	19,084	0.750	37.8	1,820	174	1,646	4	23.5	23.9	27.9	70%	7.9%	1,515	15,750	15,924	23.9
	March	18,762	0.754	33.4	1,984	329	1,655	4	21.1	23.9	27.9	79%	3.6%	667	16,111	16,439	23.9
	April	17,269	0.763	31.4	2,068	497	1,571	4	19.8	23.9	27.9	84%	1.7%	291	14,910	15,407	23.9
	May	16,140	0.754	28.8	2,169	827	1,342	4	18.2	23.9	27.9	92%	0.3%	51	13,921	14,748	23.9
	June	16,320	0.694	32.7	2,490	791	1,699	4	20.6	23.9	27.9	81%	2.5%	400	13,430	14,221	23.9
	July	17,911	0.674	34.7	3,007	950	2,057	4	21.9	23.9	27.9	76%	4.6%	804	13,600	14,550	23.9
	August	17,125	0.705	32.6	2,480	811	1,669	4	20.6	23.9	27.9	81%	2.5%	420	14,225	15,037	23.9
	September	16,316	0.711	31.9	1,828	443	1,385	4	20.1	23.9	27.9	83%	1.7%	275	14,213	14,667	23.9
	October	16,939	0.734	31.0	2,171	748	1,423	4	19.6	23.9	27.9	85%	1.0%	174	14,594	15,342	23.9
	November	18,502	0.713	36.1	2,160	421	1,739	4	22.8	23.9	27.9	74%	6.4%	1,192	15,150	15,571	23.9
	December	19,685	0.725	36.5	2,356	362	1,994	4	23.0	23.9	27.9	73%	6.4%	1,268	16,061	16,423	23.9
	Total	214,514	0.647	37.8	26,827	6,631	20,196						4.1%	8,720	178,967	185,597	23.9

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.
(4) BHPL sales for 1993 and January through August of 1994 are actual values.

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Upper Bandwidth
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Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources	BHPL Share		
		Sales and Energy	Load Factor	Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
1993 (1)	January	18,837		32.0	2,294	292	2,002	4						651	15,892	16,184	27.0
	February	16,248		32.0	1,820	487	1,333	4						450	13,978	14,465	24.0
	March	16,045		29.0	1,984	725	1,259	4						21	14,040	14,786	25.0
	April	14,144		25.0	2,068	991	1,077	4						0	12,076	13,067	21.0
	May	13,756		23.0	2,169	1,089	1,080	4						0	11,187	12,276	19.0
	June	12,917		25.0	2,490	1,243	1,247	5						0	10,447	11,690	20.0
	July	13,644		30.0	3,007	1,443	1,564	5						0	10,637	12,080	24.0
	August	14,138		26.0	2,480	1,160	1,320	4						32	11,626	12,786	20.0
	September	12,938		23.0	1,828	910	918	3						0	11,110	12,020	20.0
	October	14,294		28.0	2,171	1,049	1,122	3						6	12,117	13,166	25.0
	November	16,430		33.0	2,160	704	1,456	4						201	14,069	14,773	27.0
	December	17,395		30.0	2,356	660	1,696	4						183	14,956	15,516	26.0
	Total	180,406	0.624	33.0	26,827	10,753	16,074							1,544	152,035	162,788	27.0
1994	January (1)	17,629		33.0	2,294	586	1,708	4						474	14,861	15,447	25.0
	February (1)	16,414		33.0	1,820	391	1,429	4						348	14,246	14,637	28.0
	March (1)	15,538		27.0	1,984	777	1,207	4						0	13,554	14,331	23.0
	April (1)	14,020		24.0	2,068	975	1,093	3						0	11,952	12,927	21.0
	May (1)	13,628		24.0	2,169	1,084	1,085	3						0	11,459	12,543	21.0
	June (1)	13,959		28.0	2,490	1,121	1,369	4						36	11,433	12,554	23.0
	July (1)	15,285		29.0	3,007	1,248	1,759	5						54	12,224	13,472	23.0
	August (1)	16,167		30.0	2,480	836	1,644	4						131	13,556	14,392	23.0
	September	14,702	0.711	28.7	1,828	690	1,138	4	18.1	23.3	27.3	90%	0.3%	46	12,828	13,518	23.3
	October	15,273	0.734	28.0	2,175	979	1,196	4	17.7	23.3	27.3	93%	0.1%	21	13,077	14,056	23.3
	November	16,931	0.713	33.0	2,175	611	1,564	4	20.8	23.3	27.3	79%	3.6%	602	14,154	14,765	23.3
	December	18,195	0.725	33.7	2,381	521	1,860	4	21.3	23.3	27.3	77%	4.6%	840	14,975	15,498	23.3
	Total	187,741	0.636	33.7	26,871	9,819	17,052						1.4%	2,552	158,318	168,138	28.0
1995	January	19,709	0.752	35.2	2,316	364	1,952	4	22.2	23.3	27.3	74%	6.4%	1,270	16,123	16,487	23.3
	February	17,758	0.750	35.2	1,828	238	1,590	4	22.2	23.3	27.3	74%	6.4%	1,144	14,786	15,024	23.3
	March	17,412	0.754	31.0	1,995	486	1,509	4	19.6	23.3	27.3	84%	1.7%	293	15,123	15,609	23.3
	April	15,813	0.763	28.8	2,069	726	1,343	4	18.2	23.3	27.3	90%	0.3%	50	13,694	14,420	23.3
	May	14,616	0.754	26.1	2,169	1,029	1,140	4	16.5	23.3	27.3	99%	0.0%	4	12,444	13,473	22.1
	June	14,973	0.694	30.0	2,494	944	1,550	4	18.9	23.3	27.3	87%	1.0%	154	12,326	13,270	23.3
	July	16,388	0.674	32.7	3,118	1,049	2,069	4	20.6	23.3	27.3	79%	3.6%	583	12,687	13,737	23.3
	August	16,025	0.705	30.5	2,494	908	1,586	4	19.3	23.3	27.3	85%	1.7%	270	13,261	14,169	23.3
	September	14,896	0.711	29.1	1,828	631	1,197	4	18.4	23.3	27.3	89%	0.5%	81	12,988	13,618	23.3
	October	15,467	0.734	28.3	2,175	931	1,244	4	17.9	23.3	27.3	92%	0.3%	48	13,243	14,174	23.3
	November	17,125	0.713	33.4	2,175	549	1,626	4	21.1	23.3	27.3	78%	3.6%	609	14,341	14,890	23.3
	December	18,389	0.725	34.1	2,381	521	1,860	4	21.5	23.3	27.3	76%	4.6%	849	15,159	15,681	23.3
	Total	198,571	0.644	35.2	27,042	8,377	18,665						2.7%	5,353	166,176	174,552	23.3
1996	January	19,903	0.752	35.6	2,316	343	1,973	4	22.5	23.3	27.3	73%	6.4%	1,282	16,305	16,648	23.3
	February	17,952	0.750	34.4	1,828	261	1,567	4	21.7	23.3	27.3	75%	6.4%	829	15,295	15,556	23.3
	March	17,606	0.754	31.4	1,995	458	1,537	4	19.8	23.3	27.3	83%	1.7%	297	15,314	15,772	23.3
	April	16,007	0.763	29.1	2,069	683	1,386	4	18.4	23.3	27.3	89%	0.5%	87	13,851	14,534	23.3
	May	14,810	0.754	26.4	2,169	978	1,191	4	16.7	23.3	27.3	98%	0.0%	4	12,638	13,615	22.4
	June	15,167	0.694	30.4	2,494	909	1,585	4	19.2	23.3	27.3	85%	1.0%	156	12,517	13,426	23.3
	July	16,582	0.674	33.1	3,118	1,032	2,086	4	20.9	23.3	27.3	78%	3.6%	590	12,874	13,908	23.3
	August	16,219	0.705	30.9	2,494	882	1,612	4	19.5	23.3	27.3	84%	1.7%	273	13,452	14,333	23.3
	September	15,090	0.711	29.5	1,828	593	1,235	4	18.6	23.3	27.3	88%	0.5%	82	13,180	13,773	23.3
	October	15,661	0.734	28.7	2,175	914	1,261	4	18.1	23.3	27.3	90%	0.3%	49	13,436	14,351	23.3
	November	17,319	0.713	33.7	2,175	531	1,644	4	21.3	23.3	27.3	77%	4.6%	799	14,344	14,875	23.3
	December	18,583	0.725	34.4	2,381	469	1,912	4	21.7	23.3	27.3	75%	4.6%	858	15,344	15,813	23.3
	Total	200,898	0.645	35.6	27,042	8,052	18,990						2.6%	5,304	168,552	176,604	23.3

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Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
1997	January	20,097	0.752	35.9	2,316	276	2,040	4	22.7	23.3	27.3	72%	7.9%	1,595	16,186	16,462	23.3
	February	18,146	0.750	36.0	1,828	174	1,654	4	22.7	23.3	27.3	72%	7.9%	1,440	14,878	15,051	23.3
	March	17,799	0.754	32.7	1,995	429	1,566	4	20.0	23.3	27.3	82%	2.5%	436	15,368	15,797	23.3
	April	16,201	0.763	29.5	2,069	636	1,433	4	18.6	23.3	27.3	86%	0.5%	88	14,044	14,680	23.3
	May	15,004	0.754	26.8	2,169	952	1,217	4	16.9	23.3	27.3	97%	0.0%	6	12,829	13,781	22.8
	June	15,361	0.694	30.7	2,494	885	1,609	4	19.4	23.3	27.3	84%	1.7%	259	12,908	13,494	23.3
	July	16,776	0.674	33.4	3,118	981	2,137	4	21.1	23.3	27.3	78%	3.6%	596	13,061	14,042	23.3
	August	16,413	0.705	31.3	2,494	849	1,645	4	19.8	23.3	27.3	83%	1.7%	277	13,643	14,491	23.3
	September	15,284	0.711	29.9	1,828	560	1,268	4	18.9	23.3	27.3	87%	1.0%	157	13,299	13,859	23.3
	October	15,854	0.734	29.0	2,175	881	1,294	4	18.3	23.3	27.3	89%	0.5%	86	13,594	14,474	23.3
	November	17,513	0.713	34.1	2,175	531	1,644	4	21.6	23.3	27.3	76%	4.6%	808	14,529	15,060	23.3
	December	18,777	0.725	34.8	2,381	423	1,958	4	22.0	23.3	27.3	75%	6.4%	1,210	15,186	15,809	23.3
	Total	203,224	0.645	36.0	27,042	7,576	19,466						3.4%	6,958	169,224	176,801	23.3
1998	January	20,291	0.752	36.3	2,316	276	2,040	4	22.9	23.3	27.3	72%	7.9%	1,611	16,364	16,641	23.3
	February	18,340	0.750	36.4	1,828	174	1,654	4	23.0	23.3	27.3	71%	7.9%	1,456	15,056	15,230	23.3
	March	17,983	0.754	32.1	1,995	373	1,622	4	20.3	23.3	27.3	81%	2.5%	441	15,557	15,930	23.3
	April	16,395	0.763	29.8	2,069	584	1,485	4	18.8	23.3	27.3	87%	1.0%	168	14,157	14,741	23.3
	May	15,198	0.754	27.1	2,169	949	1,220	4	17.1	23.3	27.3	96%	0.0%	6	13,023	13,972	23.1
	June	15,555	0.694	31.1	2,494	850	1,644	4	19.7	23.3	27.3	83%	1.7%	262	12,799	13,649	23.3
	July	16,970	0.674	33.8	3,118	950	2,168	4	21.4	23.3	27.3	77%	4.6%	783	13,069	14,019	23.3
	August	16,607	0.705	31.7	2,494	825	1,669	4	20.0	23.3	27.3	82%	2.5%	407	13,705	14,531	23.3
	September	15,478	0.711	30.3	1,828	517	1,311	4	19.1	23.3	27.3	86%	1.0%	159	13,491	14,007	23.3
	October	16,048	0.734	29.4	2,175	865	1,310	4	18.6	23.3	27.3	88%	0.5%	87	13,786	14,652	23.3
	November	17,707	0.713	34.5	2,175	455	1,720	4	21.8	23.3	27.3	75%	4.6%	817	14,714	15,170	23.3
	December	18,971	0.725	35.2	2,381	423	1,958	4	22.2	23.3	27.3	74%	6.4%	1,222	15,368	15,791	23.3
	Total	205,551	0.645	36.4	27,042	7,241	19,801						3.6%	7,419	171,090	178,331	23.3
1999	January	20,685	0.752	36.6	2,316	276	2,040	4	23.1	23.3	27.3	71%	7.9%	1,626	16,543	16,819	23.3
	February	18,534	0.750	36.8	1,828	174	1,654	4	23.2	23.3	27.3	71%	7.9%	1,471	15,235	15,408	23.3
	March	18,187	0.754	32.4	1,995	351	1,644	4	20.5	23 3	27.3	80%	2.5%	446	15,746	16,098	23.3
	April	16,589	0.763	30.2	2,069	544	1,525	4	19.1	23.3	27.3	86%	1.0%	170	14,349	14,893	23.3
	May	15,392	0.754	27.5	2,169	932	1,237	4	17.3	23.3	27.3	94%	0.1%	21	13,202	14,134	23.3
	June	15,749	0.694	31.5	2,494	815	1,679	4	19.9	23.3	27.3	82%	2.5%	386	12,869	13,683	23.3
	July	17,164	0.674	34.2	3,118	929	2,189	4	21.6	23.3	27.3	76%	4.6%	792	13,254	14,182	23.3
	August	16,800	0.705	32.0	2,494	610	1,884	4	20.2	23.3	27.3	81%	2.5%	412	13,895	14,505	23.3
	September	15,672	0.711	30.6	1,828	479	1,349	4	19.3	23.3	27.3	85%	1.7%	264	13,580	14,058	23.3
	October	16,242	0.734	29.7	2,175	823	1,352	4	18.8	23.3	27.3	87%	1.0%	167	13,901	14,724	23.3
	November	17,900	0.713	34.9	2,175	421	1,754	4	22.0	23.3	27.3	76%	6.4%	1,153	14,572	14,993	23.3
	December	19,165	0.725	35.5	2,381	423	1,958	4	22.4	23.3	27.3	73%	6.4%	1,235	15,549	15,972	23.3
	Total	207,678	0.646	36.8	27,042	6,776	20,266						3.9%	8,143	172,693	179,469	23.3
2000	January	20,678	0.752	36.9	2,316	213	2,103	4	23.3	23.3	27.3	70%	7.9%	1,641	16,721	16,935	23.3
	February	18,727	0.750	37.1	1,828	174	1,654	4	23.5	23.5	27.5	70%	7.9%	1,486	15,413	15,587	23.5
	March	18,381	0.754	32.8	1,995	329	1,666	4	20.7	23.5	27.5	80%	3.6%	653	15,733	16,061	23.5
	April	16,782	0.763	30.5	2,069	536	1,533	4	19.3	23.5	27.5	85%	1.0%	172	14,541	15,077	23.5
	May	15,586	0.754	27.8	2,169	889	1,280	4	17.6	23.5	27.5	94%	0.1%	21	13,395	14,284	23.5
	June	16,943	0.694	31.9	2,494	815	1,679	4	20.2	23.5	27.5	82%	2.5%	391	13,058	13,872	23.5
	July	17,358	0.674	34.6	3,118	911	2,207	4	21.9	23.5	27.5	75%	4.6%	801	13,438	14,350	23.5
	August	16,994	0.705	32.4	2,494	584	1,910	4	20.5	23.5	27.5	81%	2.5%	417	14,084	14,667	23.5
	September	15,866	0.711	31.0	1,828	461	1,367	4	19.6	23.5	27.5	84%	1.7%	267	13,770	14,231	23.5
	October	16,436	0.734	30.1	2,175	796	1,379	4	19.0	23.5	27.5	87%	1.0%	169	14,092	14,888	23.5
	November	18,094	0.713	35.3	2,175	421	1,754	4	22.3	23.5	27.5	74%	6.4%	1,166	14,754	15,174	23.5
	December	19,359	0.725	35.9	2,381	362	2,019	4	22.7	23.5	27.5	73%	6.4%	1,247	15,730	16,093	23.5
	Total	210,205	0.646	37.1	27,042	6,490	20,552						4.0%	8,433	174,730	181,220	23.5

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Year	Month	Total Gillette, Wyoming Sales and Energy	Load Factor	Peak	WAPA Energy	WAPA Sales Adjustment	WAPA Sales	WAPA Peak	60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources Percent of Total	Energy - Other Sources Sales and Energy	BHPL Share Energy	BHPL Share Sales	BHPL Share Peak
		MWh		MW	MWh	MWh	MWh	MW	MW .60 CP/0.95	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
2001	January	20,872	0.752	37.3	2,316	276	2,040	4	23.6	23.6	27.6	70%	7.9%	1,657	16,900	17,176	23.6
	February	18,921	0.750	37.5	1,828	174	1,654	4	23.7	23.7	27.7	70%	7.9%	1,502	15,592	15,765	23.7
	March	18,975	0.754	33.1	1,995	247	1,748	4	20.9	23.7	27.7	79%	3.6%	660	15,920	16,167	23.7
	April	16,970	0.763	30.9	2,069	536	1,533	4	19.5	23.7	27.7	85%	1.7%	174	14,733	15,269	23.7
	May	15,780	0.754	28.1	2,169	889	1,280	4	17.8	23.7	27.7	93%	0.1%	22	13,589	14,478	23.7
	June	16,137	0.694	32.3	2,494	815	1,679	4	20.4	23.7	27.7	81%	2.5%	396	13,247	14,062	23.7
	July	17,551	0.674	35.0	3,118	911	2,207	4	22.1	23.7	27.7	75%	4.6%	810	13,623	14,535	23.7
	August	17,188	0.705	32.8	2,494	558	1,936	4	20.7	23.7	27.7	80%	2.5%	421	14,273	14,831	23.7
	September	16,059	0.711	31.4	1,828	461	1,367	4	19.6	23.7	27.7	84%	1.7%	271	13,961	14,422	23.7
	October	16,630	0.734	30.4	2,175	796	1,379	4	19.2	23.7	27.7	86%	1.0%	171	14,284	15,080	23.7
	November	18,288	0.713	35.6	2,175	414	1,761	4	22.5	23.7	27.7	74%	6.4%	1,173	14,935	15,349	23.7
	December	19,553	0.725	36.2	2,381	362	2,019	4	22.9	23.7	27.7	73%	6.4%	1,260	15,912	16,274	23.7
	Total	212,531	0.647	37.5	27,042	6,439	20,603						4.0%	8,521	176,968	183,407	23.7
2002	January	21,066	0.752	37.6	2,316	276	2,040	4	23.8	23.8	27.8	70%	7.9%	1,672	17,078	17,355	23.8
	February	19,115	0.750	37.9	1,828	174	1,654	4	23.9	23.9	27.9	70%	7.9%	1,517	15,770	15,944	23.9
	March	18,769	0.754	33.5	1,995	247	1,748	4	21.1	23.9	27.9	79%	3.6%	667	16,107	16,264	23.9
	April	17,170	0.763	31.2	2,069	497	1,572	4	19.7	23.9	27.9	85%	1.7%	289	14,812	15,309	23.9
	May	15,974	0.754	28.5	2,169	663	1,506	4	18.0	23.9	27.9	93%	0.1%	22	13,783	14,646	23.9
	June	16,330	0.694	32.7	2,494	791	1,703	4	20.6	23.9	27.9	81%	2.5%	400	13,436	14,227	23.9
	July	17,745	0.674	35.4	3,118	884	2,234	4	22.3	23.9	27.9	75%	4.6%	819	13,808	14,693	23.9
	August	17,382	0.705	33.1	2,494	558	1,936	4	20.9	23.9	27.9	80%	2.5%	426	14,462	15,020	23.9
	September	16,253	0.711	31.8	1,828	461	1,367	4	20.1	23.9	27.9	84%	1.7%	274	14,152	14,613	23.9
	October	16,824	0.734	30.8	2,175	796	1,379	4	19.5	23.9	27.9	86%	1.0%	173	14,476	15,272	23.9
	November	18,482	0.713	36.0	2,175	414	1,761	4	22.7	23.9	27.9	74%	6.4%	1,191	15,116	15,530	23.9
	December	19,746	0.725	36.6	2,381	335	2,046	4	23.1	23.9	27.9	73%	6.4%	1 272	16,093	16,429	23.9
	Total	214,858	0.647	37.9	27,042	6,297	20,745						4.1%	8,723	179,093	185,390	23.9
2003	January	21,260	0.752	38.0	2,316	276	2,040	4	24.0	24.0	28.0	70%	7.9%	1,688	17,267	17,533	24.0
	February	19,309	0.750	38.3	1,828	108	1,720	4	24.2	24.2	28.2	70%	9.7%	1,875	15,606	15,715	24.2
	March	18,963	0.754	33.8	1,995	247	1,748	4	21.3	24.2	28.2	79%	3.6%	674	16,294	16,541	24.2
	April	17,364	0.763	31.6	2,069	497	1,572	4	20.0	24.2	28.2	85%	1.7%	293	15,003	15,499	24.2
	May	16,167	0.754	28.8	2,169	863	1,306	4	18.2	24.2	28.2	93%	0.1%	22	13,976	14,840	24.2
	June	16,524	0.694	33.1	2,494	791	1,703	4	20.9	24.2	28.2	81%	2.5%	405	13,625	14,416	24.2
	July	17,939	0.674	35.8	3,118	860	2,258	4	22.6	24.2	28.2	75%	6.4%	1,156	13,665	14,525	24.2
	August	17,576	0.705	33.5	2,494	551	1,943	4	21.2	24.2	28.2	80%	3.6%	625	14,457	15,008	24.2
	September	16,447	0.711	32.1	1,828	443	1,385	4	20.3	24.2	28.2	83%	1.7%	277	14,342	14,786	24.2
	October	17,018	0.734	31.2	2,175	764	1,411	4	19.7	24.2	28.2	86%	1.0%	175	14,668	15,432	24.2
	November	18,676	0.713	36.4	2,175	414	1,761	4	23.0	24.2	28.2	74%	6.4%	1,203	15,298	15,712	24.2
	December	19,940	0.725	37.0	2,381	335	2,046	4	23.3	24.2	28.2	72%	7.9%	1,583	15,977	16,312	24.2
	Total	217,185	0.647	38.3	27,042	6,150	20,892						4.6%	9,975	180,168	186,319	24.2
2004	January	21,454	0.752	38.3	2,316	209	2,107	4	24.2	24.2	28.2	70%	9.7%	2,083	17,055	17,264	24.2
	February	19,503	0.750	38.7	1,828	108	1,720	4	24.4	24.4	28.4	70%	9.7%	1,894	15,781	15,890	24.4
	March	19,157	0.754	34.1	1,995	247	1,748	4	21.6	24.4	28.4	79%	3.6%	681	16,481	16,728	24.4
	April	17,558	0.763	32.0	2,069	497	1,572	4	20.2	24.4	28.4	85%	1.7%	296	15,193	15,690	24.4
	May	16,361	0.754	29.2	2,169	863	1,306	4	18.4	24.4	28.4	93%	0.1%	22	14,170	15,033	24.4
	June	16,718	0.694	33.5	2,494	791	1,703	4	21.1	24.4	28.4	81%	2.5%	410	13,814	14,606	24.4
	July	18,133	0.674	36.1	3,118	860	2,258	4	22.8	24.4	28.4	75%	6.4%	1,168	13,847	14,707	24.4
	August	17,770	0.705	33.9	2,494	551	1,943	4	21.4	24.4	28.4	80%	3.6%	632	14,644	15,195	24.4
	September	16,641	0.711	32.5	1,828	443	1,385	4	20.5	24.4	28.4	83%	1.7%	280	14,533	14,976	24.4
	October	17,212	0.734	31.5	2,175	764	1,411	4	19.9	24.4	28.4	86%	1.0%	177	14,860	15,624	24.4
	November	18,870	0.713	36.8	2,175	414	1,761	4	23.2	24.4	28.4	73%	6.4%	1,216	15,479	15,893	24.4
	December	20,134	0.725	37.3	2,381	335	2,046	4	23.6	24.4	28.4	72%	7.9%	1,598	16,155	16,491	24.4
	Total	219,512	0.648	38.7	27,042	6,083	20,959						4.8%	10,457	182,013	188,095	24.4

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Year	Month	Total Gillette, Wyoming Sales and Energy	Total Gillette, Wyoming Load Factor	Total Gillette, Wyoming Peak	WAPA Energy	WAPA Sales Adjustment	WAPA Sales	WAPA Peak	60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources Percent of Total	Energy - Other Sources Sales and Energy	BHPL Share Energy	BHPL Share Sales	BHPL Share Peak
		MWh		MW	MWh	MWh	MWh	MW	MW (2)	MW (2)	MW (2)	%	% (3)	MWh	MWh	MWh	MW
2005	January	21,648	0.752	38.7	2,316	209	2,107	4	24.4	24.6	28.4	70%	9.7%	2,102	17,230	17,439	24.4
	February	19,697	0.760	39.1	1,828	108	1,720	4	24.7	24.7	28.7	70%	9.7%	1,912	15,957	18,065	24.7
	March	19,351	0.754	38.5	1,995	247	1,748	4	21.8	24.7	28.7	79%	3.6%	688	16,668	16,915	24.7
	April	17,752	0.753	32.3	2,069	497	1,572	4	20.4	24.7	28.7	84%	1.7%	299	15,384	15,881	24.7
	May	16,555	0.754	29.5	2,169	861	1,308	4	16.7	24.7	28.7	92%	0.3%	52	14,334	15,195	24.7
	June	16,912	0.694	33.8	2,494	767	1,727	4	21.4	24.7	28.7	80%	2.5%	415	14,004	14,771	24.7
	July	18,327	0.674	36.5	3,118	860	2,258	4	23.1	24.7	28.7	75%	6.4%	1,181	14,028	14,888	24.7
	August	17,964	0.705	34.2	2,494	551	1,943	4	21.6	24.7	28.7	80%	3.6%	639	14,831	15,382	24.7
	September	16,835	0.711	32.9	1,828	400	1,428	4	20.5	24.7	28.7	83%	1.7%	284	14,723	15,123	24.7
	October	17,406	0.734	31.9	2,175	764	1,411	4	20.1	24.7	28.7	85%	1.0%	179	15,052	15,816	24.7
	November	19,064	0.713	37.1	2,175	414	1,761	4	23.5	24.7	28.7	73%	6.4%	1,228	15,661	18,074	24.7
	December	20,328	0.725	37.7	2,381	335	2,046	4	23.8	24.7	28.7	72%	7.9%	1,614	16,334	16,669	24.7
	Total	221,838	0.648	39.1	27,042	6,012	21,030						4.8%	10,591	184,205	190,217	24.7
2006	January	21,842	0.752	39.0	2,316	209	2,107	4	24.6	24.7	28.7	70%	9.7%	2,121	17,405	17,614	24.7
	February	19,891	0.750	39.4	1,828	108	1,720	4	24.9	24.9	28.9	70%	9.7%	1,931	16,132	16,240	24.9
	March	19,548	0.754	38.8	1,995	247	1,748	4	22.0	24.9	28.9	79%	3.6%	695	16,855	17,102	24.9
	April	17,946	0.763	32.7	2,069	497	1,572	4	20.6	24.9	28.9	84%	1.7%	302	15,575	16,071	24.9
	May	16,749	0.754	29.9	2,169	827	1,342	4	18.9	24.9	28.9	92%	0.5%	81	14,528	15,355	24.9
	June	17,106	0.694	34.2	2,494	756	1,738	4	21.6	24.9	28.9	80%	2.5%	419	14,193	14,949	24.9
	July	18,521	0.674	36.9	3,118	860	2,258	4	23.3	24.9	28.9	74%	6.4%	1,193	14,210	15,069	24.9
	August	18,158	0.705	34.6	2,494	551	1,943	4	21.9	24.9	28.9	79%	3.6%	646	15,018	15,569	24.9
	September	17,029	0.711	33.3	1,828	400	1,428	4	21.0	24.9	28.9	83%	1.7%	287	14,914	15,314	24.9
	October	17,599	0.734	32.2	2,175	748	1,427	4	20.3	24.9	28.9	85%	1.0%	181	15,244	15,992	24.9
	November	19,258	0.713	37.5	2,175	414	1,761	4	23.7	24.9	28.9	73%	6.4%	1,241	15,842	16,256	24.9
	December	20,522	0.725	38.0	2,381	335	2,046	4	24.0	24.9	28.9	72%	7.9%	1,629	16,512	16,848	24.9
	Total	224,165	0.649	39.4	27,042	5,952	21,090						4.8%	10,697	185,426	192,378	24.9

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.

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Year	Month	Total Gillette, Wyoming: Sales and Energy	Total Gillette, Wyoming: Load Factor	Total Gillette, Wyoming: Peak	WAPA: Energy	WAPA: Sales Adjustment	WAPA: Sales	WAPA: Peak	60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources: Percent of Total	BHPL Share: Sales and Energy	BHPL Share: Energy	BHPL Share: Sales	BHPL Share: Peak
		MWh		MW	MWh	MWh	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
1993 (1)	January	16,837		32.0	2,294	293	2,002	4						651	15,892	16,184	27.0
	February	16,248		32.0	1,820	487	1,333	4						450	13,978	14,465	24.0
	March	16,045		29.0	1,984	725	1,259	4						21	14,040	14,765	25.0
	April	14,184		25.0	2,068	991	1,077	4						0	12,076	13,067	21.0
	May	13,356		23.0	2,169	1,089	1,080	4						0	11,187	12,276	19.0
	June	12,937		25.0	2,490	1,243	1,247	5						0	10,447	11,690	20.0
	July	13,044		30.0	3,007	1,443	1,564	5						0	10,637	12,080	25.0
	August	14,138		26.0	2,480	1,160	1,320	4						32	11,626	12,786	20.0
	September	12,938		23.0	1,828	910	918	3						0	11,110	12,028	20.0
	October	14,294		28.0	2,171	1,049	1,122	3						6	12,117	13,166	25.0
	November	16,430		33.0	2,160	704	1,456	4						201	14,069	14,773	27.0
	December	17,395		30.0	2,356	660	1,696	4						183	14,856	15,516	26.0
	Total	180,406	0.624	33.0	26,827	10,753	16,074							1,544	152,035	167,786	27.0
1994	January (1)	17,629		33.0	2,294	586	1,708	4						474	14,861	15,447	25.0
	February (1)	16,414		33.0	1,820	391	1,429	4						348	14,246	14,637	28.0
	March (1)	15,538		27.0	1,984	777	1,207	4						0	13,554	14,331	23.0
	April (1)	14,020		24.0	2,068	975	1,093	3						0	11,952	12,927	21.0
	May (1)	13,628		24.0	2,169	1,084	1,085	3						0	11,459	12,543	21.0
	June (1)	13,959		28.0	2,490	1,121	1,369	4						36	11,433	12,554	23.0
	July (1)	15,285		29.0	3,007	1,248	1,759	5						54	12,224	13,472	23.0
	August (1)	16,167		30.0	2,480	836	1,644	4						131	13,556	14,392	23.0
	September	13,277	0.711	25.9	1,828	858	970	4	16.4	23.3	27.3	100%	0.0%	3	11,446	12,304	21.9
	October	13,952	0.734	25.5	2,175	1,066	1,109	4	16.1	23.3	27.3	102%	0.0%	0	11,777	12,842	21.5
	November	15,420	0.713	30.0	2,175	848	1,327	4	19.0	23.3	27.3	86%	1.0%	158	13,087	13,934	23.3
	December	16,521	0.725	30.6	2,381	852	1,529	4	19.3	23.3	27.3	85%	1.7%	278	13,861	14,713	23.3
	Total	181,809	0.629	33.0	26,871	10,642	16,229						0.8%	1,483	153,455	164,097	28.0
1995	January	17,946	0.752	32.1	2,316	623	1,693	4	20.3	23.3	27.3	81%	2.5%	440	15,190	15,813	23.3
	February	16,145	0.750	32.0	1,828	487	1,341	4	20.2	23.3	27.3	81%	2.5%	396	13,921	14,408	23.3
	March	15,846	0.754	28.2	1,995	809	1,186	4	17.8	23.3	27.3	92%	0.3%	50	13,801	14,611	23.3
	April	14,459	0.763	26.3	2,069	959	1,110	4	16.6	23.3	27.3	99%	0.0%	3	12,386	13,345	22.3
	May	13,399	0.754	23.9	2,169	1,083	1,086	4	15.1	23.3	27.3	109%	0.0%	0	11,230	12,313	19.9
	June	13,401	0.694	26.8	2,494	1,168	1,326	4	16.9	23.3	27.3	97%	0.0%	6	10,902	12,070	22.8
	July	14,168	0.674	28.2	3,118	1,383	1,735	4	17.8	23.3	27.3	92%	0.3%	44	11,005	12,389	23.3
	August	13,960	0.705	26.6	2,494	1,181	1,313	4	16.8	23.3	27.3	97%	0.0%	6	11,460	12,641	22.6
	September	13,471	0.711	25.3	1,828	842	986	4	16.6	23.3	27.3	99%	0.0%	3	12,639	12,481	22.3
	October	14,145	0.734	25.9	2,175	1,064	1,111	4	16.4	23.3	27.3	100%	0.0%	0	11,970	13,034	21.9
	November	15,614	0.713	30.4	2,175	829	1,346	4	19.2	23.3	27.3	85%	1.0%	160	13,278	14,108	23.3
	December	16,715	0.725	31.0	2,381	819	1,562	4	19.6	23.3	27.3	84%	1.7%	282	14,052	14,871	23.3
	Total	179,268	0.638	32.1	27,042	11,247	15,795						0.8%	1,390	150,836	162,083	23.3
1996	January	18,140	0.752	32.4	2,316	601	1,715	4	20.5	23.3	27.3	80%	2.5%	445	15,379	15,980	23.3
	February	16,339	0.750	31.3	1,828	531	1,297	4	19.8	23.3	27.3	83%	1.7%	275	14,236	14,766	23.3
	March	16,040	0.754	28.6	1,995	761	1,234	4	18.1	23.3	27.3	91%	0.3%	50	13,995	14,756	23.3
	April	14,653	0.763	26.7	2,069	926	1,143	4	16.8	23.3	27.3	97%	0.0%	6	12,578	13,504	22.7
	May	13,593	0.754	24.2	2,169	1,081	1,088	4	15.3	23.3	27.3	107%	0.0%	0	11,424	12,505	20.2
	June	13,595	0.694	27.2	2,494	1,136	1,358	4	17.2	23.3	27.3	95%	0.0%	6	11,095	12,232	23.2
	July	14,362	0.674	28.6	3,118	1,358	1,760	4	18.1	23.3	27.3	91%	0.3%	45	11,199	12,557	23.3
	August	14,154	0.705	27.0	2,494	1,173	1,321	4	17.0	23.3	27.3	96%	0.0%	6	11,654	12,827	23.0
	September	13,665	0.711	26.7	1,828	811	1,017	4	16.9	23.3	27.3	97%	0.0%	6	11,831	12,642	22.7
	October	14,339	0.734	26.2	2,175	1,055	1,120	4	16.6	23.3	27.3	99%	0.0%	3	12,161	13,216	22.2
	November	15,808	0.713	30.8	2,175	780	1,395	4	19.5	23.3	27.3	84%	1.7%	266	13,366	14,146	23.3
	December	16,909	0.725	31.3	2,381	755	1,626	4	19.8	23.3	27.3	83%	1.7%	285	14,243	14,998	23.3
	Total	181,595	0.640	32.4	27,042	10,970	16,072						0.8%	1,393	153,160	164,129	23.3

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Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
1997	January	18,334	0.752	32.8	2,316	582	1,734	4	20.7	23.3	27.3	79%	3.6%	652	15,366	15,948	23.3
	February	16,533	0.750	32.8	1,828	410	1,418	4	20.7	23.3	27.3	79%	3.8%	588	14,117	14,527	23.3
	March	16,234	0.754	28.9	1,995	727	1,268	4	18.3	23.3	27.3	90%	0.5%	88	14,151	14,878	23.3
	April	14,848	0.763	27.0	2,069	907	1,162	4	17.1	23.3	27.3	96%	0.0%	6	12,721	13,678	21.0
	May	13,717	0.754	26.6	2,169	1,072	1,097	4	15.5	23.3	27.3	105%	0.0%	0	11,618	12,690	20.6
	June	13,789	0.694	27.6	2,494	1,114	1,380	4	17.4	23.3	27.3	94%	0.1%	19	11,276	12,390	23.3
	July	14,556	0.674	29.0	3,118	1,336	1,782	4	18.1	23.3	27.3	89%	0.5%	79	11,359	12,695	23.3
	August	14,347	0.705	27.3	2,494	1,141	1,353	4	17.3	23.3	27.3	95%	0.1%	20	11,634	12,975	23.1
	September	13,859	0.711	27.1	1,828	808	1,020	4	17.1	23.3	27.3	96%	0.0%	6	12,025	12,832	23.1
	October	14,513	0.734	26.6	2,175	1,035	1,140	4	16.8	23.3	27.3	97%	0.0%	6	12,352	13,387	22.6
	November	16,001	0.713	31.2	2,175	762	1,413	4	19.7	23.3	27.3	83%	1.7%	270	13,557	14,318	23.3
	December	17,103	0.725	31.7	2,381	737	1,644	4	20.0	23.3	27.3	82%	2.5%	419	14,302	15,039	23.3
	Total	183,921	0.640	32.8	27,042	10,630	16,412						1.2%	2,151	154,728	165,358	23.3
1998	January	18,528	0.752	33.1	2,316	556	1,760	4	20.9	23.3	27.3	78%	3.6%	659	15,563	16,109	23.3
	February	16,727	0.750	33.2	1,828	366	1,462	4	20.9	23.3	27.3	78%	3.6%	595	14,104	14,670	23.3
	March	16,428	0.754	29.3	1,995	698	1,297	4	18.5	23.3	27.3	89%	0.5%	89	14,144	15,041	23.3
	April	15,040	0.763	27.4	2,069	889	1,180	4	17.3	23.3	27.3	95%	0.1%	21	12,951	13,840	23.3
	May	13,981	0.754	24.9	2,169	1,072	1,097	4	15.6	23.3	27.3	104%	0.0%	0	11,812	12,884	20.9
	June	13,983	0.694	28.0	2,494	1,097	1,397	4	17.7	23.3	27.3	93%	0.1%	19	11,420	12,566	23.3
	July	14,750	0.674	29.4	3,118	1,306	1,812	4	18.6	23.3	27.3	88%	0.5%	80	11,552	12,857	23.3
	August	14,541	0.705	27.7	2,494	1,128	1,366	4	17.5	23.3	27.3	94%	0.1%	20	12,027	13,156	23.3
	September	14,052	0.711	27.5	1,828	777	1,051	4	17.3	23.3	27.3	94%	0.1%	19	12,205	12,982	23.3
	October	14,727	0.734	27.0	2,175	1,033	1,142	4	17.0	23.3	27.3	96%	0.0%	6	12,546	13,579	23.0
	November	16,195	0.713	31.6	2,175	721	1,454	4	19.9	23.3	27.3	82%	2.5%	397	13,623	14,344	23.3
	December	17,296	0.725	32.1	2,381	691	1,690	4	20.2	23.3	27.3	81%	2.5%	424	14,491	15,182	23.3
	Total	186,240	0.641	33.2	27,042	10,332	16,710						1.3%	2,328	156,878	167,210	23.3
1999	January	18,722	0.752	33.4	2,316	498	1,818	4	21.1	23.3	27.3	78%	3.6%	668	15,740	16,238	23.3
	February	16,921	0.750	33.6	1,828	312	1,516	4	21.2	23.3	27.3	77%	4.6%	781	14,312	14,624	23.3
	March	16,622	0.754	29.6	1,995	664	1,331	4	18.7	23.3	27.3	88%	0.5%	90	14,537	15,201	23.3
	April	15,234	0.763	27.7	2,069	825	1,244	4	17.5	23.3	27.3	94%	0.1%	21	13,144	13,970	23.3
	May	14,175	0.754	25.3	2,169	1,068	1,101	4	16.0	23.3	27.3	103%	0.0%	0	12,006	13,073	21.3
	June	14,177	0.694	28.4	2,494	1,060	1,434	4	17.9	23.3	27.3	91%	0.3%	44	11,638	12,698	23.3
	July	14,943	0.674	29.8	3,118	1,299	1,819	4	18.8	23.3	27.3	87%	1.0%	153	11,672	12,971	23.3
	August	14,735	0.705	28.1	2,494	1,088	1,406	4	17.7	23.3	27.3	92%	0.3%	46	12,195	13,283	23.3
	September	14,246	0.711	27.8	1,828	747	1,081	4	17.6	23.3	27.3	93%	0.1%	20	12,399	13,145	23.3
	October	14,921	0.734	27.3	2,175	998	1,177	4	17.3	23.3	27.3	95%	0.1%	20	12,726	13,723	23.3
	November	16,389	0.713	31.9	2,175	693	1,482	4	20.2	23.3	27.3	81%	2.5%	402	13,812	14,506	23.3
	December	17,490	0.725	32.4	2,381	657	1,724	4	20.5	23.3	27.3	80%	2.5%	429	14,681	15,338	23.3
	Total	188,575	0.642	33.6	27,042	9,908	17,134						1.4%	2,672	158,861	168,769	23.3
2000	January	18,916	0.752	33.8	2,316	476	1,840	4	21.3	23.3	27.3	77%	4.6%	873	15,727	16,202	23.3
	February	17,114	0.750	33.9	1,828	312	1,516	4	21.4	23.3	27.3	76%	4.6%	790	14,497	14,809	23.3
	March	16,816	0.754	30.0	1,995	628	1,367	4	18.9	23.3	27.3	87%	1.0%	173	14,648	15,276	23.3
	April	15,428	0.763	28.1	2,069	797	1,272	4	17.7	23.3	27.3	92%	0.3%	48	13,311	14,108	23.3
	May	14,368	0.754	25.6	2,169	1,059	1,110	4	16.2	23.3	27.3	101%	0.0%	0	12,199	13,259	21.6
	June	14,371	0.694	28.8	2,494	1,045	1,449	4	18.2	23.3	27.3	90%	0.3%	45	11,832	12,877	23.3
	July	15,137	0.674	30.2	3,118	1,257	1,861	4	19.1	23.3	27.3	86%	1.0%	155	11,864	13,121	23.3
	August	14,929	0.705	28.5	2,494	1,069	1,425	4	18.0	23.3	27.3	91%	0.3%	47	12,388	13,457	23.3
	September	14,440	0.711	28.2	1,828	723	1,105	4	17.8	23.3	27.3	92%	0.3%	45	12,567	13,290	23.3
	October	15,115	0.734	27.7	2,175	981	1,194	4	17.5	23.3	27.3	94%	0.1%	21	12,919	13,900	23.3
	November	16,583	0.713	32.3	2,175	640	1,535	4	20.4	23.3	27.3	80%	2.5%	407	14,002	14,642	23.3
	December	17,684	0.725	32.8	2,381	627	1,754	4	20.7	23.3	27.3	79%	3.6%	629	14,674	15,302	23.3
	Total	190,902	0.642	33.9	27,042	9,615	17,427						1.7%	3,232	160,627	170,242	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bow-Arvada
10-Nov-94

Table 5-4
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Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
2001	January	19,109	0.752	34.1	2,316	470	1,860	4	21.6	23.3	27.3	76%	4.6%	882	15,911	16,387	23.3
	February	17,308	0.750	34.3	1,828	396	1,432	4	21.7	23.3	27.3	76%	4.6%	799	14,681	15,078	23.3
	March	17,009	0.754	30.3	1,995	571	1,424	4	19.1	23.3	27.3	88%	1.0%	175	14,840	15,411	23.3
	April	15,622	0.763	28.4	2,069	758	1,311	4	18.0	23.3	27.3	91%	0.3%	49	13,504	14,262	23.3
	May	14,562	0.754	26.0	2,169	1,031	1,138	4	16.4	23.3	27.3	100%	0.0%	4	12,990	13,421	22.0
	June	14,554	0.694	29.1	2,494	994	1,500	4	18.4	23.3	27.3	89%	0.5%	79	11,992	12,986	23.3
	July	15,331	0.674	30.6	3,118	1,235	1,883	4	19.3	23.3	27.3	85%	1.7%	258	11,955	13,190	23.3
	August	15,123	0.705	28.8	2,494	1,047	1,447	4	18.2	23.3	27.3	90%	0.5%	82	12,547	13,595	23.3
	September	14,634	0.711	28.6	1,828	690	1,138	4	18.1	23.3	27.3	91%	0.3%	46	12,760	13,450	23.3
	October	15,309	0.734	28.0	2,175	963	1,212	4	17.7	23.3	27.3	93%	0.1%	21	13,113	14,076	23.3
	November	16,777	0.713	32.7	2,175	618	1,557	4	20.6	23.3	27.3	79%	3.6%	596	14,006	14,624	23.3
	December	17,878	0.725	33.1	2,381	600	1,781	4	20.9	23.3	27.3	78%	3.6%	636	14,861	15,462	23.3
	Total	193,228	0.643	34.3	27,042	9,382	17,660						1.9%	3,626	162,561	171,943	23.3
2002	January	19,303	0.752	34.5	2,316	398	1,918	4	21.8	23.3	27.3	75%	4.6%	891	16,096	16,495	23.3
	February	17,502	0.750	34.7	1,828	238	1,590	4	21.9	23.3	27.3	75%	6.4%	1,128	14,547	14,785	23.3
	March	17,203	0.754	30.7	1,995	538	1,457	4	19.4	23.3	27.3	85%	1.7%	290	14,918	15,456	23.3
	April	15,816	0.763	28.8	2,069	726	1,343	4	18.2	23.3	27.3	90%	0.3%	50	13,697	14,423	23.3
	May	14,756	0.754	26.3	2,169	1,020	1,149	4	16.6	23.3	27.3	99%	0.0%	4	12,584	13,604	22.3
	June	14,758	0.694	29.5	2,494	976	1,518	4	18.7	23.3	27.3	88%	0.5%	80	12,185	13,160	23.3
	July	15,525	0.674	30.9	3,118	1,204	1,914	4	19.5	23.3	27.3	84%	1.7%	262	12,146	13,350	23.3
	August	15,317	0.705	29.2	2,494	1,016	1,478	4	18.4	23.3	27.3	89%	0.5%	83	12,740	13,756	23.3
	September	14,828	0.711	29.0	1,828	631	1,197	4	18.3	23.3	27.3	89%	0.5%	80	12,920	13,551	23.3
	October	15,503	0.734	28.4	2,175	931	1,244	4	17.9	23.3	27.3	91%	0.3%	49	13,279	14,210	23.3
	November	16,971	0.713	33.1	2,175	603	1,572	4	20.9	23.3	27.3	78%	3.6%	603	14,193	14,796	23.3
	December	18,072	0.725	33.5	2,381	521	1,860	4	21.2	23.3	27.3	77%	4.6%	834	14,857	15,378	23.3
	Total	195,555	0.643	34.7	27,042	8,803	18,239						2.2%	4,352	164,161	172,964	23.3
2003	January	19,497	0.752	34.8	2,316	364	1,952	4	22.0	23.3	27.3	74%	6.4%	1,256	15,925	16,289	23.3
	February	17,696	0.750	35.1	1,828	238	1,590	4	22.2	23.3	27.3	74%	6.4%	1,140	14,728	14,966	23.3
	March	17,397	0.754	31.0	1,995	508	1,487	4	19.6	23.3	27.3	84%	1.7%	293	15,109	15,617	23.3
	April	16,010	0.763	29.1	2,069	675	1,394	4	18.4	23.3	27.3	89%	0.5%	87	13,854	14,529	23.3
	May	14,950	0.754	26.7	2,169	978	1,191	4	16.8	23.3	27.3	97%	0.0%	6	12,775	13,752	22.7
	June	14,952	0.694	29.9	2,494	944	1,550	4	18.9	23.3	27.3	87%	1.0%	153	12,305	13,249	23.3
	July	15,719	0.674	31.3	3,118	1,168	1,950	4	19.8	23.3	27.3	83%	1.7%	265	12,336	13,504	23.3
	August	15,511	0.705	29.6	2,494	997	1,497	4	18.7	23.3	27.3	88%	0.5%	84	12,933	13,930	23.3
	September	15,022	0.711	29.4	1,828	611	1,217	4	18.5	23.3	27.3	88%	0.5%	81	13,113	13,723	23.3
	October	15,697	0.734	28.7	2,175	914	1,261	4	18.1	23.3	27.3	90%	0.3%	49	13,472	14,387	23.3
	November	17,165	0.713	33.4	2,175	541	1,634	4	21.1	23.3	27.3	78%	3.6%	610	14,380	14,920	23.3
	December	18,266	0.725	33.8	2,381	521	1,860	4	21.4	23.3	27.3	77%	4.6%	843	15,042	15,563	23.3
	Total	197,882	0.644	35.1	27,042	8,458	18,584						2.5%	4,868	165,972	174,430	23.3
2004	January	19,691	0.752	35.2	2,316	364	1,952	4	22.2	23.3	27.3	74%	6.4%	1,269	16,106	16,470	23.3
	February	17,890	0.750	35.5	1,828	238	1,590	4	22.4	23.3	27.3	73%	6.4%	1,153	14,909	15,148	23.3
	March	17,591	0.754	31.4	1,995	458	1,537	4	19.8	23.3	27.3	83%	1.7%	296	15,300	15,758	23.3
	April	16,204	0.763	29.5	2,069	636	1,433	4	18.6	23.3	27.3	88%	0.5%	88	14,047	14,683	23.3
	May	15,144	0.754	27.0	2,169	949	1,220	4	17.1	23.3	27.3	96%	0.0%	6	12,969	13,918	23.0
	June	15,146	0.694	30.3	2,494	909	1,585	4	19.1	23.3	27.3	86%	1.0%	155	12,497	13,406	23.3
	July	15,913	0.674	31.7	3,118	1,146	1,972	4	20.0	23.3	27.3	82%	2.5%	390	12,405	13,551	23.3
	August	15,705	0.705	29.9	2,494	959	1,535	4	18.9	23.3	27.3	87%	1.0%	161	13,050	14,008	23.3
	September	15,216	0.711	29.7	1,828	578	1,250	4	18.8	23.3	27.3	87%	1.0%	156	13,232	13,809	23.3
	October	15,891	0.734	29.1	2,175	881	1,294	4	18.4	23.3	27.3	89%	0.5%	86	13,630	14,510	23.3
	November	17,359	0.713	33.8	2,175	523	1,652	4	21.4	23.3	27.3	77%	4.6%	801	14,383	14,905	23.3
	December	18,460	0.725	34.2	2,381	496	1,885	4	21.6	23.3	27.3	76%	4.6%	852	15,227	15,723	23.3
	Total	200,209	0.644	35.5	27,042	8,136	18,906						2.7%	5,414	167,753	175,888	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bandwidth
16-Nov-94

Year	Month	Total Gillette, Wyoming			WAPA				60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share		
		Sales and Energy	Load Factor	Peak	Energy	Sales Adjustment	Sales	Peak					Percent of Total	Sales and Energy	Energy	Sales	Peak
		MWh		MW	MWh	MWh	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MWh	MW
2005	January	19,885	0.752	35.5	2,116	343	1,973	4	22.4	23.3	27.3	73%	6.4%	1,281	16,788	16,691	23.3
	February	18,004	0.750	35.9	1,829	174	1,654	4	22.6	23.3	27.3	72%	7.9%	1,435	14,821	14,994	23.3
	March	17,785	0.754	31.7	1,995	429	1,566	4	20.0	23.3	27.3	82%	2.5%	436	15,354	15,783	23.3
	April	16,398	0.763	29.8	2,069	584	1,485	4	18.8	23.3	27.3	87%	1.0%	168	14,160	14,744	23.3
	May	15,336	0.754	27.4	2,169	932	1,237	4	17.3	23.3	27.3	95%	0.1%	21	13,148	14,080	23.3
	June	15,340	0.694	30.7	2,494	890	1,604	4	19.4	23.3	27.3	84%	1.7%	258	12,588	13,478	23.3
	July	16,107	0.674	32.1	3,118	1,095	2,023	4	20.3	23.3	27.3	81%	2.5%	395	12,594	13,688	23.3
	August	15,899	0.705	30.3	2,494	927	1,567	4	19.1	23.3	27.3	86%	1.0%	163	13,241	14,169	23.3
	September	15,410	0.711	30.1	1,828	517	1,311	4	19.0	23.3	27.3	88%	1.0%	158	13,424	13,940	23.3
	October	16,084	0.738	29.4	2,175	840	1,335	4	18.6	23.3	27.3	88%	0.5%	87	13,822	14,662	23.3
	November	17,553	0.713	34.2	2,175	498	1,677	4	21.6	23.3	27.3	76%	4.0%	810	14,568	15,066	23.3
	December	18,654	0.725	34.6	2,381	461	1,920	4	21.8	23.3	27.3	75%	4.6%	861	15,412	15,872	23.3
	Total	202,535	0.645	35.9	27,042	7,689	19,353						3.0%	6,075	169,419	177,107	23.3
2006	January	20,079	0.752	35.9	2,316	276	2,040	4	22.7	23.3	27.3	72%	7.9%	1,594	16,160	16,446	23.3
	February	18,278	0.750	36.2	1,828	174	1,654	4	22.9	23.3	27.3	72%	7.9%	1,451	14,999	15,173	23.3
	March	17,979	0.754	32.0	1,995	403	1,592	4	20.2	23.3	27.3	81%	2.5%	441	15,543	15,946	23.3
	April	16,592	0.763	30.2	2,069	544	1,525	4	19.1	23.3	27.3	86%	1.0%	170	14,352	14,896	23.3
	May	15,532	0.754	27.7	2,169	889	1,280	4	17.5	23.3	27.3	94%	0.1%	21	13,341	14,230	23.3
	June	15,534	0.694	31.1	2,494	850	1,644	4	19.6	23.3	27.3	83%	1.7%	262	12,778	13,628	23.3
	July	16,301	0.674	32.5	3,118	1,058	2,060	4	20.5	23.3	27.3	80%	3.6%	580	12,603	13,661	23.3
	August	16,093	0.705	30.7	2,494	908	1,586	4	19.4	23.3	27.3	85%	1.7%	271	13,327	14,236	23.3
	September	15,604	0.711	30.5	1,828	497	1,331	4	19.3	23.3	27.3	85%	1.0%	160	13,615	14,112	23.3
	October	16,278	0.734	29.8	2,175	796	1,379	4	18.8	23.3	27.3	87%	1.0%	167	13,936	14,732	23.3
	November	17,747	0.713	34.6	2,175	421	1,754	4	21.6	23.3	27.3	75%	6.4%	1,143	14,428	14,849	23.3
	December	18,848	0.725	34.9	2,381	423	1,958	4	22.1	23.3	27.3	74%	6.4%	1,214	15,252	15,675	23.3
	Total	204,862	0.645	36.2	27,042	7,239	19,803						3.6%	7,474	170,346	177,585	23.3

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.

Black Hills Power and Light Company
Monthly Sales Forecast
Total Company
16-Nov-94

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Month	Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
January (1)	Upper Bandwidth - MWh	145,078	157,761	166,281	169,610	172,637	175,399	176,999	181,397	185,314	189,710	193,697	198,151	202,626
	Expected - MWh	145,078	149,738	157,964	161,530	164,051	166,756	168,416	172,547	176,041	180,304	184,605	188,927	193,271
	Lower Bandwidth - MWh	145,078	141,754	149,825	152,895	155,758	158,351	159,788	163,865	167,487	171,232	175,401	179,571	183,417
February (1)	Upper Bandwidth - MWh	134,717	146,847	154,881	156,746	157,901	160,212	162,005	166,062	169,826	173,556	177,746	181,915	186,127
	Expected - MWh	134,717	137,944	145,700	148,820	149,260	151,813	153,569	157,200	160,853	164,858	168,902	172,944	177,028
	Lower Bandwidth - MWh	134,717	130,151	138,590	138,503	141,174	143,438	145,198	149,084	152,152	156,029	159,963	163,542	167,494
March (1)	Upper Bandwidth - MWh	138,919	149,544	154,310	157,478	160,170	162,627	163,781	167,775	171,417	175,553	179,729	183,926	188,144
	Expected - MWh	138,919	141,547	145,965	149,243	151,781	154,157	155,511	159,298	162,781	166,770	170,593	174,662	178,752
	Lower Bandwidth - MWh	138,919	133,332	137,660	140,825	143,415	145,759	147,026	150,798	154,086	157,941	161,813	165,591	169,528
April (1)	Upper Bandwidth - MWh	130,355	146,045	147,058	150,717	152,746	155,118	156,351	160,244	163,506	167,457	171,647	175,459	179,492
	Expected - MWh	130,355	137,968	139,060	142,151	144,677	146,900	148,200	151,824	155,123	158,907	162,627	166,518	170,430
	Lower Bandwidth - MWh	130,355	129,952	131,029	134,035	136,537	138,785	139,984	143,601	146,792	150,418	154,129	157,769	161,521
May (1)	Upper Bandwidth - MWh	123,792	135,727	136,940	139,804	142,220	144,361	145,216	148,855	151,934	155,634	159,372	163,099	166,847
	Expected - MWh	123,792	129,581	130,871	133,696	136,088	138,247	139,129	142,692	145,718	149,300	152,989	156,557	160,262
	Lower Bandwidth - MWh	123,792	120,106	121,363	124,087	126,393	128,475	129,401	132,786	135,711	139,141	142,624	146,126	149,638
June (1)	Upper Bandwidth - MWh	123,390	142,575	145,173	147,900	150,392	152,515	153,196	156,962	160,009	163,836	167,703	171,567	175,466
	Expected - MWh	123,390	134,401	136,957	139,652	142,105	144,237	144,918	148,454	151,406	154,964	158,715	162,488	166,259
	Lower Bandwidth - MWh	123,390	126,141	128,616	131,286	133,684	135,815	136,550	140,009	142,905	146,403	150,008	153,546	157,187
July (1)	Upper Bandwidth - MWh	148,623	150,722	155,725	158,534	160,921	163,229	163,681	167,598	170,662	174,288	178,303	182,341	186,400
	Expected - MWh	148,623	141,464	146,153	148,910	151,291	153,524	153,984	157,563	160,519	164,143	168,037	171,920	175,847
	Lower Bandwidth - MWh	148,623	131,607	136,228	138,864	141,290	143,427	143,922	147,455	150,334	154,013	157,622	161,345	164,924
August (1)	Upper Bandwidth - MWh	141,380	156,451	162,140	164,946	167,443	169,601	169,892	173,863	176,938	180,796	184,894	189,014	193,156
	Expected - MWh	141,380	146,135	151,569	154,291	156,747	159,018	159,341	163,041	165,990	169,744	173,695	177,667	181,648
	Lower Bandwidth - MWh	141,380	135,589	140,831	143,635	145,901	148,067	148,424	152,074	154,916	158,563	162,354	166,149	169,872
September	Upper Bandwidth - MWh	150,334	152,038	157,797	160,402	163,036	165,320	165,551	169,485	172,428	176,405	180,439	184,451	188,529
	Expected - MWh	141,054	142,801	148,309	150,926	153,422	155,766	156,042	159,740	162,536	166,279	170,161	174,066	178,010
	Lower Bandwidth - MWh	131,758	132,457	138,782	141,336	143,822	146,095	146,383	150,023	152,709	156,421	160,083	163,812	167,604
October	Upper Bandwidth - MWh	145,319	148,081	153,788	156,253	158,701	160,774	160,686	164,484	167,257	171,084	174,984	178,906	182,834
	Expected - MWh	136,907	139,740	145,208	147,664	150,023	152,149	152,069	155,735	158,417	162,036	165,785	169,588	173,397
	Lower Bandwidth - MWh	128,616	131,298	136,583	138,975	141,325	143,385	143,441	146,989	149,570	153,178	156,772	160,416	164,000
November	Upper Bandwidth - MWh	145,514	149,640	154,577	157,451	159,981	161,965	162,531	166,405	169,500	173,441	177,422	181,423	185,446
	Expected - MWh	137,648	141,483	146,580	149,178	151,539	153,950	154,359	158,126	161,078	164,542	168,403	172,285	176,189
	Lower Bandwidth - MWh	129,803	133,522	138,329	141,044	143,371	145,601	146,201	149,847	152,575	156,222	159,767	163,509	166,895
December	Upper Bandwidth - MWh	146,384	149,657	154,185	157,576	160,513	163,192	165,103	169,319	173,273	177,251	181,564	185,898	190,253
	Expected - MWh	138,857	141,671	146,106	149,739	152,356	154,983	156,913	160,593	164,459	168,609	172,773	176,956	181,175
	Lower Bandwidth - MWh	130,765	133,838	138,065	141,484	144,247	146,791	148,505	152,449	155,936	159,963	164,001	168,051	171,775
Total	Upper Bandwidth - MWh	1,673,803	1,783,866	1,839,756	1,874,917	1,906,362	1,934,313	1,944,992	1,992,448	2,032,067	2,079,013	2,127,300	2,176,150	2,225,321
	Expected - MWh	1,640,799	1,684,494	1,738,470	1,773,799	1,803,339	1,831,561	1,842,452	1,886,812	1,924,921	1,970,455	2,017,285	2,064,578	2,112,268
	Lower Bandwidth - MWh	1,607,196	1,580,759	1,632,700	1,666,769	1,696,918	1,723,990	1,734,821	1,778,778	1,815,175	1,859,624	1,904,537	1,949,428	1,993,855
Expected Percent Increase			2.66%	3.20%	2.03%	1.67%	1.57%	0.59%	2.41%	2.02%	2.37%	2.38%	2.34%	2.31%

(1) 1994 figures are actuals.

Black Hills Power and Light Company
Monthly Energy Forecast
Total Company
16-Nov-94

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Month	Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
January (1)	Upper Bandwidth - MWh	155,000	162,091	170,932	174,645	177,557	180,416	182,128	186,602	190,643	195,180	199,377	203,973	208,592
	Expected - MWh	155,000	150,721	158,216	165,923	168,621	171,411	173,120	177,460	181,087	185,486	189,925	194,385	198,868
	Lower Bandwidth - MWh	155,000	145,335	153,464	156,864	159,853	162,507	164,104	168,311	172,128	176,039	180,342	184,866	188,713
February (1)	Upper Bandwidth - MWh	138,600	147,772	153,875	156,882	159,782	162,433	164,253	168,373	172,200	176,058	180,314	184,550	188,828
	Expected - MWh	138,600	139,671	145,417	148,736	151,245	153,836	155,638	159,359	163,070	167,137	171,264	175,370	179,518
	Lower Bandwidth - MWh	138,600	131,579	137,059	140,149	142,901	145,256	147,040	150,904	154,185	158,124	162,120	165,825	169,840
March (1)	Upper Bandwidth - MWh	136,300	154,310	159,181	162,605	165,453	168,022	169,245	173,471	177,250	181,541	185,873	190,228	194,604
	Expected - MWh	136,300	145,836	150,461	153,919	156,588	159,104	160,532	164,486	168,166	172,326	176,324	180,545	184,788
	Lower Bandwidth - MWh	136,300	137,178	141,718	145,037	147,751	150,214	151,565	155,534	158,985	163,014	167,082	171,036	175,148
April (1)	Upper Bandwidth - MWh	129,500	146,492	147,557	150,789	153,392	155,824	157,074	161,000	164,330	168,315	172,339	176,385	180,452
	Expected - MWh	129,500	138,269	139,380	142,494	145,113	147,459	148,716	152,443	155,789	159,654	163,446	167,369	171,315
	Lower Bandwidth - MWh	129,500	130,033	131,150	134,201	136,741	139,072	140,309	143,995	147,246	150,955	154,736	158,460	162,284
May (1)	Upper Bandwidth - MWh	131,300	144,024	145,370	148,460	151,054	153,363	154,314	158,216	161,544	165,510	169,519	173,521	177,576
	Expected - MWh	131,300	137,413	138,797	141,850	144,414	146,732	147,741	151,564	154,826	158,712	162,639	166,561	170,535
	Lower Bandwidth - MWh	131,300	127,246	128,586	131,513	133,979	136,211	137,201	140,850	144,005	147,728	151,493	155,206	159,078
June (1)	Upper Bandwidth - MWh	137,100	150,309	153,107	156,036	158,720	161,018	161,733	165,739	169,003	173,074	177,187	181,324	185,484
	Expected - MWh	137,100	141,509	144,239	147,158	149,783	152,084	152,835	156,622	159,803	163,633	167,623	171,636	175,673
	Lower Bandwidth - MWh	137,100	132,630	135,292	138,153	140,717	143,018	143,806	147,541	150,638	154,397	158,266	162,058	165,973
July (1)	Upper Bandwidth - MWh	143,100	159,448	164,814	167,864	170,455	172,937	173,427	177,610	180,908	184,830	189,118	193,430	197,766
	Expected - MWh	143,100	149,357	154,422	157,382	159,956	162,378	162,904	166,766	169,967	173,896	178,043	182,213	186,407
	Lower Bandwidth - MWh	143,100	138,732	143,695	146,531	149,150	151,439	151,999	155,801	158,906	162,872	166,758	170,787	174,660
August (1)	Upper Bandwidth - MWh	152,800	154,489	170,552	173,568	176,233	178,743	179,069	183,305	186,562	190,670	195,014	199,381	203,772
	Expected - MWh	152,800	153,419	159,201	162,106	164,744	167,180	167,537	171,513	174,662	178,682	182,869	187,079	191,313
	Lower Bandwidth - MWh	152,800	142,139	147,707	150,497	153,120	155,455	155,842	159,734	162,777	166,767	170,723	174,778	178,750
September	Upper Bandwidth - MWh	146,357	148,082	153,744	156,321	158,939	161,207	161,454	165,298	168,175	172,078	176,020	179,983	183,968
	Expected - MWh	137,198	138,923	144,360	146,917	149,429	151,741	152,033	155,676	158,472	162,144	165,955	169,788	173,642
	Lower Bandwidth - MWh	128,029	129,719	134,940	137,441	139,901	142,154	142,463	145,952	148,735	152,381	155,991	159,695	163,420
October	Upper Bandwidth - MWh	154,800	157,820	163,985	166,671	169,316	171,590	171,509	175,594	178,572	182,724	186,920	191,139	195,381
	Expected - MWh	145,797	148,761	154,681	157,338	159,896	162,204	162,159	166,119	169,026	172,972	177,039	181,130	185,244
	Lower Bandwidth - MWh	136,777	139,658	145,359	147,948	150,472	152,720	152,783	156,617	159,426	163,324	167,228	171,191	175,099
November	Upper Bandwidth - MWh	163,642	157,885	163,385	166,439	169,205	171,369	171,960	176,089	179,379	183,571	187,805	192,062	196,342
	Expected - MWh	145,170	149,279	154,759	157,554	160,260	162,703	163,158	167,166	170,374	174,116	178,223	182,353	186,505
	Lower Bandwidth - MWh	136,701	140,675	145,850	148,754	151,275	153,671	154,354	158,054	161,181	165,127	168,928	172,934	176,638
December	Upper Bandwidth - MWh	158,390	161,958	166,960	170,741	173,941	176,859	179,002	183,605	187,948	192,319	197,027	201,759	206,514
	Expected - MWh	149,864	153,148	157,989	161,996	164,936	167,798	169,923	174,049	178,268	182,797	187,369	191,963	196,581
	Lower Bandwidth - MWh	141,021	144,405	149,088	152,849	155,909	158,714	160,627	164,959	168,868	173,262	177,697	182,155	186,292
Total	Upper Bandwidth - MWh	1,736,889	1,854,681	1,913,460	1,950,816	1,984,057	2,013,781	2,025,168	2,074,903	2,116,514	2,165,672	2,216,514	2,267,735	2,319,280
	Expected - MWh	1,701,729	1,749,306	1,805,902	1,843,374	1,874,986	1,904,630	1,916,296	1,963,231	2,003,510	2,051,556	2,100,719	2,150,393	2,200,390
	Lower Bandwidth - MWh	1,666,227	1,639,328	1,693,926	1,729,950	1,761,780	1,790,522	1,802,092	1,848,363	1,887,079	1,933,990	1,981,364	2,028,851	2,075,894
Expected Percent Increase			2.80%	3.24%	2.07%	1.71%	1.58%	0.61%	2.45%	2.05%	2.40%	2.40%	2.36%	2.33%

(1) 1994 Figures are actuals.

Black Hills Power and Light Company
Monthly Peak Demand Forecast
Total Company
16-Nov-94

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Month	Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
January (1)	Upper Bandwidth - MW	278	283	299	305	311	316	319	328	335	344	352	361	370
	Expected - MW	278	269	284	291	296	301	304	312	319	327	335	343	352
	Lower Bandwidth - MW	278	255	269	276	281	286	289	296	303	311	319	327	335
February (1)	Upper Bandwidth - MW	271	292	303	310	316	321	325	334	342	351	360	369	378
	Expected - MW	271	276	287	294	300	305	309	317	324	333	341	350	359
	Lower Bandwidth - MW	271	260	271	278	283	288	292	300	307	315	323	332	340
March (1)	Upper Bandwidth - MW	238	270	278	285	290	294	297	305	312	320	328	336	344
	Expected - MW	238	256	264	270	275	280	282	290	296	304	311	319	327
	Lower Bandwidth - MW	238	242	250	256	261	265	267	275	281	288	295	303	310
April (1)	Upper Bandwidth - MW	233	271	273	279	284	289	292	299	306	314	322	330	338
	Expected - MW	233	257	259	265	270	274	277	284	290	298	305	313	321
	Lower Bandwidth - MW	233	242	244	250	256	260	262	269	275	282	289	297	304
May (1)	Upper Bandwidth - MW	231	256	258	264	269	274	275	283	289	296	304	311	319
	Expected - MW	231	244	247	253	257	262	264	271	277	284	291	299	306
	Lower Bandwidth - MW	231	226	229	234	239	243	245	252	258	265	272	279	286
June (1)	Upper Bandwidth - MW	256	299	305	311	317	322	323	332	339	347	356	365	373
	Expected - MW	256	283	289	295	300	305	306	314	321	329	337	345	354
	Lower Bandwidth - MW	256	266	272	278	283	288	289	297	303	311	319	327	335
July (1)	Upper Bandwidth - MW	278	312	322	328	334	339	340	349	356	365	373	382	392
	Expected - MW	278	293	303	309	314	319	320	328	335	343	352	360	369
	Lower Bandwidth - MW	278	274	284	290	295	300	301	308	315	323	331	339	347
August (1)	Upper Bandwidth - MW	279	311	323	328	334	339	339	348	355	363	372	381	390
	Expected - MW	279	291	303	308	313	318	318	327	333	341	349	358	366
	Lower Bandwidth - MW	279	271	282	288	293	297	298	306	312	319	327	335	343
September	Upper Bandwidth - MW	275	278	289	294	299	304	304	312	318	325	333	341	349
	Expected - MW	259	262	272	277	282	287	287	294	300	307	314	322	330
	Lower Bandwidth - MW	242	245	255	260	265	270	270	277	282	289	296	303	310
October	Upper Bandwidth - MW	273	278	289	294	299	303	303	310	316	324	331	339	347
	Expected - MW	257	263	274	278	283	287	287	294	299	306	314	321	329
	Lower Bandwidth - MW	242	247	257	262	267	271	271	278	283	290	297	304	312
November	Upper Bandwidth - MW	280	288	298	304	309	314	315	323	330	338	346	354	363
	Expected - MW	265	273	283	289	294	298	299	307	313	320	328	336	344
	Lower Bandwidth - MW	251	258	268	273	278	282	284	291	297	304	312	319	327
December	Upper Bandwidth - MW	288	295	304	312	318	324	326	337	345	354	364	373	382
	Expected - MW	273	280	289	296	302	308	312	320	328	337	345	354	363
	Lower Bandwidth - MW	258	265	273	281	286	292	295	304	311	320	328	336	345
Maximum	Upper Bandwidth - MW	288	312	323	328	334	339	340	349	356	365	373	382	392
	Expected - MW	279	293	303	309	314	319	320	328	335	343	352	360	369
	Lower Bandwidth - MW	279	274	284	290	295	300	301	308	315	323	331	339	347
Expected Percent Increase			4.99%	3.48%	1.94%	1.74%	1.54%	0.35%	2.53%	1.96%	2.47%	2.47%	2.47%	2.43%

(1) 1994 Figures are actuals.

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
19-Nov-94

Table 5-6
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Year	Month	Excluding Gillette, Wyoming							BHPL Share of Gillette			Including Gillette, Wyoming		
		South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1993 (1)	January	121,632	11,175	1,380	133,987		137,108		245	15,892	16,184	27.0	150,171	153,000	272
	February	108,041	9,841	1,001	118,883		121,122		238	13,976	14,465	24.0	133,345	137,100	262
	March	111,926	10,073	1,052	123,851		124,360		219	14,040	14,765	25.0	138,816	138,800	244
	April	105,975	8,939	872	115,786		114,526		210	12,076	13,067	21.0	128,853	126,600	231
	May	94,255	8,835	809	104,020		103,213		195	11,187	12,276	18.0	116,206	124,400	214
	June	101,805	9,405	1,133	112,343		117,553		223	10,447	11,490	20.0	124,033	128,000	243
	July	104,866	8,507	1,112	114,595		124,963		242	10,637	12,080	25.0	126,675	135,600	267
	August	108,197	9,373	1,208	118,778		126,074		246	11,626	12,788	20.0	131,564	140,600	266
	September	109,909	9,243	1,091	120,242		119,000		212	11,110	12,020	20.0	132,262	130,200	232
	October	107,491	9,118	992	117,601		118,983		220	12,117	13,166	25.0	130,767	141,100	245
	November	104,721	10,312	1,043	116,076		132,631		250	14,069	14,773	27.0	130,849	146,700	277
	December	121,982	11,751	1,280	135,013		134,144		229	14,856	15,516	26.0	150,529	149,000	255
	Total	1,300,820	117,492	12,863	1,431,176	1.047	1,498,665	0.684	250	152,035	162,788	27.0	1,593,964	1,650,700	277
1994	January (1)	117,217	11,184	1,230	129,631		140,139		253	14,861	15,447	25.0	145,078	155,000	278
	February (1)	107,812	11,492	776	120,080		124,354		243	14,246	14,637	28.0	134,717	138,600	271
	March (1)	117,953	11,851	784	124,588		122,746		215	13,554	14,331	23.0	138,919	136,300	238
	April (1)	107,900	8,852	676	117,428		117,548		212	11,952	12,927	21.0	130,355	129,500	233
	May (1)	101,532	9,191	526	111,249		118,641		210	11,459	12,543	21.0	123,792	131,300	231
	June (1)	98,079	12,210	547	110,836		125,667		233	11,433	12,554	23.0	123,390	137,100	256
	July (1)	123,619	10,784	748	135,151		130,876		255	12,224	13,472	23.0	148,623	143,100	278
	August (1)	115,190	11,128	670	126,988		139,244		256	13,556	14,392	23.0	141,380	152,800	279
	September	117,940	9,694	500	128,135	0.976	125,056	0.737	236	12,142	12,919	23.3	141,054	137,198	259
	October	113,229	9,789	500	123,519	1.080	133,362	0.764	235	12,435	13,468	22.7	136,987	145,797	257
	November	111,480	11,328	500	123,308	1.067	131,551	0.755	242	13,619	14,340	23.3	137,648	145,170	265
	December	111,248	11,723	500	123,470	1.096	135,287	0.727	250	14,577	15,387	23.3	138,857	149,864	273
	Total	1,337,197	129,228	7,957	1,474,382	1.048	1,545,671	0.689	256	156,058	166,417	28.0	1,640,799	1,701,729	279
1995	January	121,050	12,047	500	133,598	1.033	138,056	0.756	245	15,665	16,141	23.3	149,738	153,721	269
	February	111,041	11,742	500	123,283	1.017	125,322	0.739	252	14,349	14,861	23.3	137,964	139,671	276
	March	114,172	11,656	500	126,328	1.039	131,282	0.759	233	14,555	15,219	23.3	141,547	145,836	256
	April	113,488	10,128	500	124,116	1.009	125,222	0.743	234	13,047	13,672	23.3	137,988	138,269	257
	May	106,383	9,792	500	116,675	1.076	125,575	0.757	223	11,839	12,906	21.0	129,581	137,413	244
	June	111,359	9,829	500	121,688	1.067	129,856	0.694	260	11,653	12,713	23.3	134,401	141,509	283
	July	117,705	9,897	500	128,102	1.071	137,243	0.684	270	12,114	13,363	23.3	141,464	149,357	293
	August	122,161	9,953	500	132,615	1.063	140,953	0.706	268	12,455	13,521	23.3	146,135	153,619	291
	September	119,259	9,904	500	129,703	0.976	126,587	0.736	239	12,336	13,098	23.3	142,801	138,923	262
	October	115,587	9,997	500	126,085	1.080	136,132	0.763	240	12,629	13,655	23.1	139,740	148,761	263
	November	114,912	11,570	500	126,982	1.067	135,471	0.754	250	13,808	14,501	23.3	141,483	149,279	273
	December	114,605	11,967	500	126,472	1.096	138,576	0.726	257	14,572	15,199	23.3	141,671	153,148	280
	Total	1,381,163	128,483	6,000	1,515,645	1.049	1,590,275	0.673	270	159,031	168,849	23.3	1,684,494	1,749,306	293
1996	January	128,849	12,290	500	141,639	1.033	146,366	0.755	261	15,850	16,325	23.3	157,964	162,216	284
	February	116,091	11,984	500	128,574	1.017	130,701	0.738	264	14,716	15,126	23.3	143,700	145,417	287
	March	118,273	11,898	500	130,671	1.039	135,795	0.758	241	14,666	15,294	23.3	145,965	150,461	264
	April	114,189	10,336	500	125,025	1.009	126,139	0.742	236	13,241	14,063	23.3	139,088	139,380	259
	May	107,282	9,998	500	117,780	1.076	126,764	0.756	225	12,033	13,092	21.3	130,371	138,797	247
	June	113,528	10,037	500	124,066	1.067	132,393	0.693	265	11,846	12,891	23.3	136,957	144,239	289
	July	122,139	10,106	500	132,745	1.071	142,218	0.683	280	12,204	13,408	23.3	146,153	154,422	303
	August	127,241	10,164	500	137,905	1.063	146,577	0.705	279	12,624	13,664	23.3	151,569	159,201	303
	September	124,469	10,113	500	135,082	0.976	131,836	0.735	249	12,504	13,027	23.3	148,309	144,340	272
	October	120,696	10,206	500	131,402	1.080	141,873	0.762	250	12,808	13,036	23.3	145,208	154,681	274
	November	119,631	11,812	500	131,942	1.067	140,762	0.753	260	13,997	14,638	23.3	146,580	154,759	283
	December	118,009	12,210	500	130,720	1.096	143,230	0.725	266	14,759	15,380	23.3	145,106	157,989	289
	Total	1,430,396	131,154	6,000	1,567,550	1.049	1,644,654	0.671	280	161,247	170,920	23.3	1,738,470	1,805,902	303

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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Energy	Sales	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1997	January	132,015	12,533	500	145,048	1.033	149,889	0.754	267	16,034	16,482	23.3	161,530	165,923	291
	February	119,110	12,226	500	131,835	1.017	134,015	0.737	271	14,719	14,985	23.3	146,820	148,734	284
	March	121,174	12,140	500	133,814	1.039	139,061	0.757	247	14,858	15,429	23.3	148,243	153,919	270
	April	116,903	10,544	500	127,947	1.009	129,087	0.741	242	13,407	14,204	23.3	142,151	142,494	265
	May	109,733	10,203	500	120,436	1.076	129,623	0.755	231	12,226	13,260	21.7	133,696	141,850	253
	June	115,905	10,246	500	126,651	1.067	135,152	0.692	271	12,006	13,001	23.3	139,652	147,158	295
	July	124,515	10,316	500	135,330	1.071	144,988	0.682	286	12,395	13,580	23.3	148,910	157,382	309
	August	129,583	10,375	500	140,458	1.063	149,290	0.704	285	12,817	13,833	23.3	154,291	162,106	308
	September	126,701	10,323	500	137,523	0.976	134,219	0.734	254	12,698	13,402	23.3	150,926	146,917	277
	October	122,769	10,414	500	133,683	1.080	144,336	0.761	255	13,002	13,981	23.3	147,664	157,338	278
	November	122,005	12,053	500	134,558	1.067	143,553	0.752	265	14,001	14,619	23.3	149,178	157,554	289
	December	121,252	12,454	500	134,206	1.096	147,051	0.724	273	14,946	15,533	23.3	149,739	161,996	296
	Total	1,461,664	133,825	6,000	1,601,490	1.049	1,680,264	0.671	286	163,109	172,310	23.3	1,773,799	1,843,374	309
1998	January	134,548	12,775	500	147,823	1.033	152,757	0.753	273	15,865	16,228	23.3	164,051	168,621	296
	February	121,471	12,467	500	134,438	1.017	136,662	0.736	276	14,584	14,822	23.3	149,260	151,245	300
	March	123,424	12,383	500	136,307	1.039	141,652	0.756	252	14,937	15,474	23.3	151,781	156,588	275
	April	119,099	10,752	500	130,351	1.009	131,513	0.740	247	13,600	14,326	23.3	144,677	145,113	270
	May	111,734	10,408	500	122,642	1.076	131,997	0.754	235	12,417	13,446	22.0	136,088	144,414	257
	June	117,976	10,454	500	128,930	1.067	137,584	0.691	277	12,199	13,175	23.3	142,105	149,783	300
	July	126,643	10,525	500	137,668	1.071	147,492	0.681	291	12,464	13,623	23.3	151,291	159,956	314
	August	131,743	10,585	500	142,829	1.063	151,810	0.703	290	12,934	13,938	23.3	156,747	164,744	313
	September	128,902	10,532	500	139,934	0.976	136,572	0.733	259	12,857	13,488	23.3	153,422	149,429	282
	October	124,776	10,623	500	135,898	1.080	146,728	0.760	260	13,168	14,125	23.3	150,023	159,896	283
	November	124,124	12,295	500	136,919	1.067	146,071	0.751	270	14,188	14,620	23.3	151,539	160,260	294
	December	123,696	12,698	500	136,894	1.096	149,996	0.723	279	14,941	15,462	23.3	152,356	164,936	302
	Total	1,488,136	136,497	6,000	1,630,632	1.049	1,710,833	0.671	291	164,153	172,707	23.3	1,803,339	1,874,986	314
1999	January	136,829	13,018	500	150,347	1.033	155,365	0.752	278	16,046	16,410	23.3	166,756	171,411	301
	February	123,600	12,709	500	136,809	1.017	139,071	0.735	282	14,765	15,004	23.3	151,813	153,836	305
	March	125,419	12,625	500	138,544	1.039	143,976	0.755	256	15,127	15,613	23.3	154,157	159,104	280
	April	121,061	10,960	500	132,520	1.009	133,701	0.739	251	13,757	14,440	23.3	146,960	147,459	274
	May	113,502	10,614	500	124,616	1.076	134,122	0.753	239	12,611	13,631	22.4	138,247	146,732	262
	June	119,811	10,662	500	130,974	1.067	139,765	0.690	281	12,319	13,264	23.3	144,237	152,084	305
	July	126,518	10,734	500	139,752	1.071	149,725	0.680	296	12,653	13,772	23.3	153,524	162,378	319
	August	133,644	10,796	500	144,940	1.063	154,054	0.702	295	13,126	14,077	23.3	159,018	167,180	318
	September	130,864	10,741	500	142,105	0.976	138,691	0.732	263	13,050	13,661	23.3	155,766	151,741	287
	October	126,526	10,831	500	137,856	1.080	148,842	0.759	264	13,362	14,293	23.3	152,149	162,204	287
	November	125,998	12,536	500	139,034	1.067	148,328	0.750	275	14,375	14,916	23.3	153,950	162,703	298
	December	125,894	12,942	500	139,336	1.096	152,672	0.722	284	15,126	15,647	23.3	154,983	167,798	308
	Total	1,511,666	139,168	6,000	1,656,834	1.049	1,738,313	0.671	296	166,317	174,727	23.3	1,831,561	1,904,630	319
2000	January	138,065	13,261	500	151,825	1.033	156,892	0.751	281	16,227	16,591	23.3	168,416	173,120	304
	February	124,952	12,951	500	138,403	1.017	140,692	0.734	285	14,946	15,166	23.3	153,569	155,638	309
	March	126,369	12,867	500	139,735	1.039	145,215	0.754	259	15,318	15,776	23.3	155,511	160,532	282
	April	121,907	11,168	500	133,575	1.009	134,765	0.738	254	13,950	14,625	23.3	148,200	148,716	277
	May	114,056	10,819	500	125,375	1.076	134,939	0.752	241	12,802	13,754	22.7	139,129	147,741	264
	June	120,127	10,871	500	131,498	1.067	140,325	0.689	283	12,511	13,420	23.3	144,918	152,836	306
	July	128,622	10,944	500	140,066	1.071	150,062	0.679	297	12,842	13,918	23.3	153,984	162,904	320
	August	133,589	11,007	500	145,096	1.063	154,219	0.702	295	13,318	14,245	23.3	159,341	167,537	318
	September	130,756	10,951	500	142,207	0.976	138,790	0.731	264	13,243	13,836	23.3	156,042	152,033	287
	October	126,130	11,039	500	137,669	1.080	148,640	0.758	264	13,519	14,400	23.3	152,069	162,159	287
	November	126,180	12,778	500	139,458	1.067	148,780	0.749	276	14,379	14,901	23.3	154,359	163,158	299
	December	127,421	13,186	500	141,107	1.096	154,612	0.721	288	15,311	15,806	23.3	156,913	169,923	312
	Total	1,518,174	141,840	6,000	1,666,014	1.049	1,747,930	0.672	297	168,366	176,438	23.3	1,842,452	1,916,296	320

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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	68% Share of Gillette: Energy	Sales	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2001	January	141,845	13,503	500	155,849	1.033	161,051	0.750	289	16,409	16,648	23.3	172,547	177,460	312
	February	128,458	13,199	360	142,151	1.017	144,502	0.733	293	14,857	15,049	23.3	157,200	159,359	317
	March	129,888	13,109	500	143,497	1.019	146,123	0.753	266	15,372	15,801	23.3	158,298	161,924	290
	April	125,281	11,376	500	137,157	1.009	138,379	0.737	261	14,064	14,067	23.3	151,826	152,440	284
	May	117,222	11,029	500	128,747	1.076	138,568	0.751	248	12,996	13,945	23.1	142,592	151,564	271
	June	123,365	11,079	500	134,962	1.067	144,021	0.688	291	12,602	13,492	23.3	148,454	156,622	314
	July	132,011	11,153	500	143,664	1.073	153,916	0.678	305	12,850	13,899	23.3	157,563	168,756	328
	August	127,038	11,217	500	138,755	1.063	158,109	0.700	303	13,403	14,285	23.3	162,041	171,513	327
	September	134,158	11,180	500	145,818	0.976	142,315	0.730	271	13,361	13,921	23.3	159,740	155,676	294
	October	129,613	11,248	500	141,158	1.080	152,407	0.756	271	13,712	14,577	23.3	155,736	166,119	294
	November	129,520	13,020	500	143,040	1.067	152,601	0.748	284	14,563	15,086	23.3	158,126	167,165	307
	December	131,967	13,429	500	145,896	1.096	159,895	0.720	297	15,153	15,577	23.3	160,593	174,049	320
	Total	1,559,303	164,511	6,000	1,709,814	1.049	1,793,888	0.671	305	169,343	176,997	23.3	1,886,812	1,963,231	328
2002	January	145,230	13,746	500	159,476	1.033	164,799	0.749	296	16,289	16,565	23.3	176,041	181,087	319
	February	131,891	13,434	500	145,826	1.017	148,034	0.732	301	15,036	15,227	23.3	160,853	163,070	324
	March	132,996	13,351	500	146,847	1.039	152,605	0.752	273	15,561	15,934	23.3	162,781	168,166	296
	April	128,199	11,583	500	140,283	1.009	141,533	0.736	267	14,256	14,840	23.3	155,123	155,789	290
	May	119,881	11,230	500	131,611	1.076	141,651	0.750	254	13,175	14,107	23.3	145,718	154,826	277
	June	125,976	11,267	500	137,743	1.067	147,010	0.687	297	12,793	13,643	23.3	151,406	159,803	321
	July	134,615	11,363	500	146,477	1.071	156,930	0.677	312	13,037	14,042	23.3	160,519	169,967	335
	August	139,611	11,428	500	151,539	1.063	161,068	0.699	310	13,594	14,451	23.3	165,990	174,662	333
	September	136,617	11,370	500	148,487	0.976	144,919	0.722	276	13,553	14,050	23.3	162,536	158,472	300
	October	131,716	11,456	500	143,672	1.080	155,121	0.755	276	13,905	14,745	23.3	158,417	169,026	299
	November	132,113	13,261	500	145,874	1.067	155,626	0.747	290	14,748	15,204	23.3	161,078	170,374	313
	December	134,528	13,673	500	148,701	1.096	162,933	0.719	305	15,335	15,758	23.3	164,459	178,268	328
	Total	1,593,175	147,183	6,000	1,746,357	1.049	1,832,229	0.671	312	171,281	178,564	23.3	1,924,921	2,003,510	335
2003	January	149,072	13,988	500	163,560	1.033	169,019	0.748	304	16,467	16,744	23.3	180,304	185,486	327
	February	135,276	13,676	500	149,452	1.017	151,923	0.731	309	15,214	15,406	23.3	164,858	167,127	333
	March	136,575	13,593	500	150,668	1.039	156,576	0.751	280	15,750	16,101	23.3	166,770	172,326	304
	April	131,632	11,791	500	143,924	1.009	145,207	0.735	274	14,448	14,983	23.3	158,907	159,654	298
	May	123,107	11,435	500	135,043	1.076	145,344	0.749	261	13,368	14,257	23.3	149,300	158,712	284
	June	129,291	11,496	500	141,287	1.067	150,770	0.686	305	12,862	13,677	23.3	154,964	163,633	329
	July	138,064	11,572	500	150,136	1.071	160,850	0.676	320	13,045	14,007	23.3	164,143	173,896	343
	August	143,122	11,638	500	155,261	1.063	165,024	0.698	318	13,658	14,483	23.3	169,744	178,682	341
	September	140,079	11,579	500	152,158	0.976	148,503	0.728	283	13,641	14,120	23.3	166,279	162,144	307
	October	135,058	11,664	500	147,222	1.080	158,954	0.754	283	14,018	14,814	23.3	162,036	172,972	306
	November	135,513	13,503	500	149,516	1.067	159,510	0.746	297	14,606	15,027	23.3	164,542	174,116	320
	December	138,252	13,917	500	152,669	1.096	167,281	0.718	313	15,516	15,939	23.3	168,609	182,797	337
	Total	1,635,042	149,854	6,000	1,790,896	1.049	1,878,961	0.671	320	172,595	179,560	23.3	1,970,455	2,051,556	343
2004	January	152,952	14,231	500	167,683	1.033	173,279	0.747	312	16,646	16,922	23.3	184,605	189,925	335
	February	138,918	13,918	500	153,336	1.017	155,872	0.730	318	15,393	15,566	23.4	168,902	171,264	341
	March	140,193	13,835	500	154,528	1.039	160,588	0.750	288	15,737	16,065	23.4	170,593	176,324	311
	April	135,103	11,999	500	147,602	1.009	148,918	0.734	282	14,528	15,025	23.4	162,627	163,446	305
	May	126,370	11,641	500	138,511	1.076	149,077	0.748	268	13,562	14,477	23.4	152,989	162,639	291
	June	132,645	11,704	500	144,849	1.067	154,571	0.685	314	13,052	13,866	23.4	158,715	167,623	337
	July	141,553	11,781	500	153,834	1.071	164,812	0.675	328	13,230	14,203	23.4	168,037	178,043	352
	August	146,673	11,849	500	159,022	1.063	169,022	0.697	326	13,847	14,672	23.4	173,695	182,869	349
	September	143,580	11,788	500	155,868	0.976	152,123	0.727	291	13,832	14,293	23.4	170,161	165,955	314
	October	138,438	11,873	500	150,811	1.080	162,829	0.753	290	14,210	14,974	23.4	165,785	177,039	314
	November	138,951	13,745	500	153,195	1.067	163,436	0.745	305	14,787	15,208	23.4	168,403	178,223	328
	December	142,015	14,161	500	156,676	1.096	171,871	0.717	322	15,698	16,097	23.4	172,773	187,369	345
	Total	1,677,390	152,526	6,000	1,835,915	1.049	1,926,197	0.670	328	174,522	181,370	23.4	2,017,285	2,100,719	352

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
16-Nov-96

Table 5-6
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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Energy	Sales	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2005	January	156,853	14,474	500	171,826	1.033	177,561	0.746	320	16,824	17,101	23.4	188,927	194,385	343
	February	142,539	14,160	500	157,199	1.017	159,799	0.729	326	15,571	15,745	23.7	172,944	175,370	350
	March	143,833	14,077	500	158,410	1.039	164,621	0.749	298	15,924	16,252	23.7	174,662	180,345	319
	April	138,594	12,207	500	151,302	1.009	152,658	0.733	289	14,719	15,216	23.7	166,518	167,369	313
	May	129,655	11,947	500	142,002	1.076	152,836	0.747	275	13,728	14,555	23.7	155,557	166,561	299
	June	136,020	11,912	500	148,432	1.067	158,395	0.684	322	13,241	14,055	23.7	162,488	171,836	345
	July	145,064	11,991	500	157,554	1.071	168,798	0.674	337	13,415	14,365	23.7	171,920	182,213	360
	August	150,246	12,060	500	162,806	1.063	173,043	0.696	334	14,038	14,861	23.7	177,667	187,079	358
	September	147,102	11,998	500	159,600	0.978	156,765	0.726	298	14,023	14,466	23.7	174,663	159,798	322
	October	141,841	12,081	500	154,422	1.080	166,728	0.752	298	14,402	15,166	23.7	169,588	181,130	321
	November	142,410	13,986	500	156,896	1.067	167,384	0.743	313	14,969	15,389	23.7	172,285	182,353	336
	December	145,799	14,405	500	160,703	1.096	176,084	0.716	331	15,879	16,253	23.7	176,956	191,963	354
	Total	1,719,955	155,197	6,000	1,881,152	1.049	1,973,663	0.669	337	176,730	183,425	23.7	2,064,578	2,150,393	360
2006	January	160,775	14,716	500	175,992	1.033	181,865	0.745	328	17,003	17,279	23.7	193,271	198,868	352
	February	146,203	14,402	500	161,104	1.017	163,769	0.728	335	15,750	15,924	23.9	177,028	179,518	359
	March	147,493	14,319	500	162,312	1.039	168,677	0.748	303	16,111	16,439	23.9	178,752	184,788	327
	April	142,108	12,415	500	155,023	1.009	156,405	0.732	297	14,910	15,407	23.9	170,430	171,315	321
	May	132,962	12,052	500	145,514	1.076	156,614	0.746	282	13,921	14,748	23.9	160,262	170,535	306
	June	139,417	12,121	500	152,038	1.067	162,243	0.683	330	13,430	14,221	23.9	166,259	175,073	354
	July	148,596	12,200	500	161,297	1.071	172,807	0.673	345	13,600	14,550	23.9	175,847	186,407	369
	August	153,841	12,270	500	166,611	1.063	177,088	0.695	342	14,225	15,037	23.9	181,648	191,313	366
	September	150,646	12,207	500	163,354	0.976	159,429	0.725	306	14,213	14,657	23.9	178,010	173,642	330
	October	145,265	12,289	500	158,055	1.080	170,650	0.751	305	14,594	15,342	23.9	173,397	185,244	329
	November	145,893	14,228	500	160,618	1.067	171,355	0.742	321	15,150	15,571	23.9	176,189	186,505	344
	December	149,604	14,649	500	164,752	1.096	180,521	0.715	340	16,061	16,423	23.9	181,175	196,581	362
	Total	1,762,802	157,869	6,000	1,926,671	1.049	2,021,423	0.669	345	178,967	185,597	23.9	2,112,268	2,200,390	369
2007	Total	1,806,717	160,586	6,000	1,973,303	1.049	2,070,348	0.668	354	181,232	187,795	24	2,161,098	2,251,579	378
2008	Total	1,851,725	163,350	6,000	2,021,075	1.049	2,120,470	0.667	363	183,525	190,019	24	2,211,094	2,303,995	387
2009	Total	1,897,855	166,162	6,000	2,070,017	1.049	2,171,818	0.666	372	185,846	192,270	25	2,262,286	2,357,666	397
2010	Total	1,945,133	169,022	6,000	2,120,155	1.049	2,224,423	0.666	381	188,199	194,547	25	2,314,702	2,412,622	406
2011	Total	1,993,590	171,932	6,000	2,171,521	1.049	2,278,315	0.665	391	190,581	196,850	25	2,368,372	2,468,896	416
2012	Total	2,043,253	174,891	6,000	2,224,145	1.049	2,333,526	0.664	401	192,993	199,182	25	2,423,326	2,526,519	426
2013	Total	2,094,154	177,902	6,000	2,278,056	1.049	2,390,089	0.664	411	195,435	201,540	26	2,479,590	2,585,524	437
2014	Total	2,146,323	180,964	6,000	2,333,287	1.049	2,448,036	0.663	422	197,908	203,927	26	2,537,214	2,645,944	448
2015	Total	2,199,792	184,079	6,000	2,389,871	1.049	2,507,402	0.662	432	200,413	206,342	26	2,596,213	2,707,815	458
2016	Total	2,254,592	187,247	6,000	2,447,840	1.049	2,568,222	0.661	443	202,949	208,786	26	2,656,625	2,771,171	470

(1) Actual.

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Upper Bandwidth
Total Company
Megawatt-Hours
18-Nov-94

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Energy	Sales	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1993 (1)	January	121,632	11,175	1,180	133,987		137,108		265	15,892	16,184	27.0	150,171	153,000	272
	February	108,041	9,841	1,001	118,883		123,122		238	13,978	14,465	24.0	133,348	137,100	262
	March	111,926	10,873	1,052	123,851		124,360		219	14,040	14,765	25.0	138,616	139,400	244
	April	105,975	8,939	872	115,786		114,524		210	12,076	13,067	21.0	128,853	126,600	231
	May	94,255	8,866	899	104,020		113,213		195	11,187	12,276	19.0	116,296	124,400	214
	June	101,805	9,405	1,133	112,343		117,553		223	10,447	11,690	20.0	124,033	128,000	243
	July	104,886	8,597	1,112	114,595		124,963		242	10,637	12,080	25.0	126,675	135,600	267
	August	108,197	9,373	1,208	118,778		126,974		245	11,626	12,786	20.0	131,564	140,600	268
	September	109,909	9,243	1,091	120,242		119,090		212	11,110	12,020	20.0	132,222	130,200	232
	October	107,491	9,118	992	117,601		128,983		220	12,117	13,166	25.0	130,767	141,100	245
	November	104,721	10,312	1,043	116,076		132,631		250	14,069	14,773	27.0	130,869	146,700	277
	December	121,982	11,751	1,280	135,013		134,144		229	14,856	15,516	26.0	150,529	149,000	255
	Total	1,300,820	117,492	12,863	1,431,176	1.047	1,498,665	0.684	250	152,035	162,788	27.0	1,593,964	1,650,700	277
1994	January (1)	117,217	11,184	1,230	129,631		140,139		253	14,861	15,447	25.0	145,078	155,000	278
	February (1)	107,812	11,492	776	120,080		124,354		243	14,245	14,537	28.0	134,717	138,600	271
	March (1)	111,953	11,851	784	124,588		122,746		215	13,554	14,331	23.0	138,919	136,300	238
	April (1)	107,900	8,852	676	117,428		117,548		212	11,952	12,927	21.0	130,355	129,500	233
	May (1)	101,532	9,191	526	111,249		119,841		210	11,459	12,543	21.0	123,792	131,300	231
	June (1)	98,079	12,210	547	110,836		125,667		233	11,433	12,554	23.0	123,390	137,100	256
	July (1)	123,619	10,784	748	135,151		130,876		255	12,224	13,472	23.0	148,623	143,100	278
	August (1)	115,190	11,128	670	126,988		139,244		256	13,556	14,392	23.0	141,380	152,800	279
	September	128,026	10,264	525	136,816	0.976	133,529	0.737	252	12,820	13,518	23.3	150,334	146,357	275
	October	120,376	10,362	525	131,263	1.080	141,724	0.764	249	13,077	14,056	23.3	145,319	154,800	273
	November	118,308	11,915	525	130,748	1.067	139,488	0.755	257	14,154	14,765	23.3	145,514	153,642	280
	December	118,038	12,325	525	130,888	1.096	143,415	0.727	265	14,975	15,496	23.3	146,384	158,390	288
	Total	1,366,049	131,559	8,057	1,505,665	1.048	1,578,571	0.680	265	158,318	168,138	28.0	1,673,803	1,736,889	288
1995	January	128,069	12,660	525	141,254	1.033	145,968	0.756	260	16,123	16,487	23.3	157,741	162,091	283
	February	117,946	12,352	525	130,823	1.017	132,986	0.739	268	14,786	15,024	23.3	145,847	147,772	291
	March	121,152	12,257	525	133,934	1.039	139,186	0.759	247	15,123	15,609	23.3	149,544	154,310	270
	April	120,382	10,718	525	131,625	1.009	132,798	0.743	248	13,694	14,420	23.3	146,045	146,492	271
	May	111,363	10,367	525	122,255	1.076	131,580	0.757	234	12,444	13,473	22.1	135,727	144,024	256
	June	118,375	10,404	525	129,305	1.067	137,984	0.694	276	12,326	13,270	23.3	142,575	150,309	299
	July	125,975	10,484	525	136,985	1.071	146,760	0.684	288	12,687	13,737	23.3	150,722	159,448	312
	August	131,219	10,537	525	142,281	1.063	151,228	0.706	288	13,261	14,169	23.3	156,451	164,489	311
	September	127,421	10,474	525	138,420	0.976	135,094	0.736	255	12,988	13,618	23.3	152,038	148,082	278
	October	122,811	10,570	525	133,906	1.080	144,577	0.763	255	13,243	14,174	23.3	148,081	157,820	278
	November	121,868	12,157	525	134,550	1.067	143,544	0.754	265	14,341	14,890	23.3	149,440	157,885	288
	December	120,882	12,569	525	133,976	1.096	146,799	0.726	272	15,159	15,681	23.3	149,657	161,958	295
	Total	1,467,465	135,549	6,300	1,609,314	1.049	1,688,506	0.669	288	166,176	174,552	23.3	1,783,866	1,854,681	312
1996	January	136,206	12,902	525	149,633	1.033	154,627	0.755	275	16,305	16,648	23.3	166,281	170,932	299
	February	123,206	12,594	525	136,325	1.017	138,579	0.738	279	15,295	15,556	23.3	151,881	153,875	303
	March	125,414	12,499	525	138,438	1.039	143,867	0.758	255	15,314	15,772	23.3	154,210	159,181	278
	April	121,074	10,926	525	132,524	1.009	133,705	0.742	250	13,851	14,534	23.3	147,058	147,557	273
	May	112,228	10,573	525	123,325	1.076	132,732	0.756	236	12,638	13,615	22.4	136,940	145,370	258
	June	120,609	10,613	525	131,747	1.067	140,590	0.693	282	12,517	13,426	23.3	145,173	153,107	305
	July	130,600	10,694	525	141,819	1.071	151,939	0.683	299	12,874	13,908	23.3	155,725	164,814	322
	August	136,534	10,748	525	147,806	1.063	157,100	0.705	299	13,452	14,333	23.3	162,140	170,552	323
	September	132,816	10,683	525	144,024	0.976	140,564	0.735	266	13,180	13,773	23.3	157,797	153,744	289
	October	128,133	10,779	525	139,437	1.080	150,548	0.762	266	13,436	14,351	23.3	153,788	163,985	289
	November	126,779	12,398	525	139,702	1.067	149,041	0.753	275	14,344	14,875	23.3	154,577	163,385	298
	December	125,034	12,812	525	138,372	1.096	151,615	0.725	281	15,344	15,813	23.3	154,185	166,960	304
	Total	1,510,632	138,220	6,300	1,663,152	1.049	1,744,908	0.665	299	168,552	176,604	23.3	1,839,756	1,913,460	323

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Upper Sandstick
Total Company
Megawatt-Hours
16-Nov-94

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming					BHPL Share of Gillette			Including Gillette, Wyoming		
					Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1997	January	139,478	13,145	525	153,148	1.031	158,260	0.754	282	16,186	16,462	23.3	169,610	174,445	305
	February	128,234	12,835	528	139,696	1.017	142,085	0.737	287	15,878	15,951	23.3	154,745	158,882	310
	March	128,415	12,741	525	141,681	1.039	147,237	0.757	261	15,368	15,797	23.3	157,478	162,603	285
	April	123,878	11,134	525	135,537	1.009	136,745	0.741	256	14,044	14,680	23.3	150,217	150,789	279
	May	114,721	10,778	525	126,024	1.076	135,637	0.755	242	12,829	13,781	22.8	139,804	148,466	264
	June	121,060	10,821	525	134,406	1.067	143,428	0.692	288	12,608	13,494	23.3	147,900	156,636	311
	July	132,062	10,903	525	144,491	1.071	154,803	0.682	305	13,561	14,542	23.3	158,534	167,864	328
	August	138,972	10,958	525	150,455	1.063	159,916	0.704	305	13,642	14,491	23.3	164,946	173,558	328
	September	135,125	10,893	525	146,543	0.976	143,022	0.734	271	13,299	13,859	23.3	160,402	156,321	294
	October	130,267	10,987	525	141,779	1.080	153,077	0.761	271	13,594	14,474	23.3	156,253	166,671	294
	November	129,226	12,540	525	142,291	1.067	151,909	0.752	281	14,529	15,060	23.3	157,451	166,439	304
	December	128,386	13,056	525	141,967	1.096	155,554	0.724	289	15,186	15,609	23.3	157,576	170,741	312
	Total	1,560,925	140,892	6,300	1,698,117	1.049	1,781,592	0.666	305	169,224	176,801	23.3	1,874,917	1,950,816	328
1998	January	142,084	13,388	525	155,997	1.033	161,203	0.753	286	16,364	16,641	23.3	172,837	177,567	311
	February	128,770	13,077	525	142,372	1.017	144,728	0.736	293	15,056	15,230	23.3	157,601	159,782	316
	March	130,732	12,984	525	144,240	1.039	149,898	0.756	267	15,557	15,930	23.3	160,170	165,453	290
	April	126,138	11,342	525	138,005	1.009	139,235	0.740	261	14,157	14,741	23.3	152,746	153,392	284
	May	116,740	10,983	525	128,248	1.076	138,031	0.754	246	13,023	13,972	23.1	142,220	151,054	269
	June	129,189	11,029	525	136,743	1.067	145,921	0.691	293	12,799	13,549	23.3	150,392	158,720	317
	July	135,265	11,113	525	146,903	1.071	157,386	0.681	311	13,069	14,019	23.3	160,921	170,455	334
	August	141,218	11,169	525	152,912	1.063	162,527	0.703	311	13,705	14,531	23.3	167,443	176,233	334
	September	137,401	11,102	525	149,028	0.976	145,448	0.733	270	13,491	14,007	23.3	163,036	158,939	299
	October	132,330	11,195	525	144,050	1.080	155,529	0.760	275	13,780	14,652	23.3	158,701	169,316	299
	November	131,406	12,882	525	144,811	1.067	154,491	0.751	286	14,714	15,170	23.3	159,981	169,205	309
	December	130,697	13,300	525	144,723	1.096	158,574	0.723	295	15,368	15,791	23.3	160,513	173,941	318
	Total	1,578,168	143,563	6,300	1,728,031	1.049	1,812,967	0.666	311	171,090	178,331	23.3	1,906,362	1,984,057	334
1999	January	144,424	13,630	525	158,580	1.033	163,872	0.752	293	16,543	16,819	23.3	175,399	180,416	316
	February	130,960	13,319	525	144,804	1.017	147,199	0.735	298	15,235	15,408	23.3	160,212	162,433	321
	March	132,779	13,226	525	146,530	1.039	152,275	0.755	271	15,748	16,098	23.3	162,627	168,022	294
	April	128,150	11,550	525	140,225	1.009	141,475	0.739	266	14,349	14,893	23.3	155,118	155,824	289
	May	118,514	11,189	525	130,228	1.076	140,162	0.753	250	13,202	14,134	23.3	144,361	153,363	274
	June	127,068	11,238	525	138,831	1.067	148,150	0.690	298	12,869	13,683	23.3	152,515	161,018	322
	July	137,200	11,322	525	149,047	1.071	159,683	0.680	316	13,254	14,162	23.3	163,229	172,937	339
	August	143,191	11,300	525	155,096	1.063	164,849	0.702	316	13,895	14,505	23.3	169,601	178,743	339
	September	139,425	11,311	525	151,261	0.976	147,627	0.732	280	13,580	14,058	23.3	165,320	161,207	304
	October	134,122	11,404	525	146,051	1.080	157,689	0.759	279	13,901	14,724	23.3	160,774	171,590	303
	November	133,324	13,123	525	146,973	1.067	156,797	0.750	291	14,572	14,993	23.3	161,965	171,369	314
	December	133,151	13,544	525	147,220	1.096	161,310	0.722	300	15,549	15,972	23.3	163,192	176,859	324
	Total	1,602,310	146,235	6,300	1,754,845	1.049	1,841,088	0.666	316	172,693	179,469	23.3	1,934,313	2,013,781	339
2000	January	145,666	13,873	525	160,064	1.033	165,406	0.751	296	16,721	16,935	23.3	176,999	182,128	319
	February	132,333	13,561	525	146,418	1.017	148,840	0.734	302	15,413	15,587	23.5	162,005	164,253	325
	March	133,728	13,468	525	147,720	1.039	153,513	0.754	274	15,733	16,061	23.5	163,781	169,245	297
	April	128,991	11,757	525	141,274	1.009	142,533	0.738	268	14,541	15,077	23.5	156,351	157,074	292
	May	119,012	11,394	525	130,931	1.076	140,919	0.752	252	13,395	14,284	23.5	145,216	154,314	275
	June	127,352	11,446	525	139,323	1.067	148,675	0.689	300	13,058	13,572	23.5	153,196	161,733	323
	July	137,275	11,531	525	149,332	1.071	159,988	0.679	317	13,438	14,350	23.5	163,681	173,427	340
	August	143,109	11,590	525	155,225	1.063	164,985	0.702	316	14,084	14,667	23.5	169,892	179,069	339
	September	139,274	11,521	525	151,320	0.976	147,684	0.731	281	13,770	14,231	23.5	165,551	161,454	304
	October	133,661	11,612	525	145,798	1.080	157,416	0.758	279	14,092	14,888	23.5	160,686	171,509	303
	November	133,467	13,365	525	147,357	1.067	157,207	0.749	292	14,754	15,174	23.5	162,531	171,960	315
	December	134,698	13,788	525	149,010	1.096	163,272	0.721	304	15,730	16,093	23.5	165,303	179,002	326
	Total	1,608,566	148,906	6,300	1,763,772	1.049	1,850,438	0.667	317	174,730	181,220	23.5	1,944,992	2,025,168	340

Black Hills Power and Light Company
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Year	Month	Excluding Gillette, Wyoming							BHPL Share of Gillette			Including Gillette, Wyoming		
		South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2001	January	149,581	14,116	525	164,221	1.033	169,702	0.750	304	16,900	17,176	23.8	181,397	186,602	328
	February	135,869	13,832	525	150,496	1.017	152,782	0.733	310	15,992	15,766	23.7	166,082	168,373	334
	March	137,373	13,710	525	151,608	1.039	157,553	0.753	281	15,920	16,187	23.7	167,775	173,473	305
	April	132,484	11,965	525	144,975	1.009	146,267	0.737	276	14,733	15,269	23.7	160,244	161,000	299
	May	122,252	11,600	525	134,377	1.076	144,627	0.751	259	13,589	14,478	23.7	148,855	158,216	283
	June	130,721	11,654	525	142,900	1.067	152,492	0.688	308	13,247	14,062	23.7	156,962	165,739	332
	July	140,797	11,741	525	153,063	1.071	163,986	0.678	325	13,623	14,535	23.7	167,598	177,520	349
	August	146,708	11,801	525	159,032	1.063	169,032	0.700	324	14,273	14,931	23.7	173,063	183,305	348
	September	142,008	11,730	525	155,063	0.976	151,337	0.730	288	13,961	14,422	23.7	169,485	165,298	312
	October	137,058	11,820	525	149,403	1.080	161,309	0.756	287	14,284	15,080	23.7	164,484	175,504	310
	November	136,924	13,607	525	151,056	1.067	161,154	0.748	299	14,935	15,349	23.7	166,405	176,089	323
	December	138,489	14,032	525	153,045	1.096	167,693	0.720	313	15,932	16,274	23.7	169,319	183,605	337
	Total	1,651,163	151,578	6,300	1,809,041	1.049	1,897,935	0.666	325	176,960	183,407	23.7	1,992,448	2,074,903	349
2002	January	153,076	14,358	525	167,960	1.033	173,565	0.749	312	17,078	17,356	23.8	185,314	190,643	335
	February	139,316	14,044	525	153,885	1.017	156,430	0.732	318	15,770	15,944	23.9	169,828	172,200	342
	March	140,587	13,952	525	155,063	1.039	161,144	0.752	288	16,107	16,354	23.9	171,417	177,250	312
	April	135,498	12,173	525	148,197	1.009	149,518	0.736	282	14,812	15,309	23.9	163,506	164,330	306
	May	124,958	11,805	525	137,289	1.076	147,761	0.750	265	13,783	14,646	23.9	151,934	161,544	289
	June	133,394	11,863	525	145,782	1.067	155,567	0.687	315	13,436	14,227	23.9	160,009	169,003	339
	July	143,494	11,950	525	155,970	1.071	167,100	0.677	332	13,808	14,693	23.9	170,662	180,908	356
	August	149,382	12,011	525	161,918	1.063	172,100	0.699	331	14,462	15,020	23.9	176,938	186,562	355
	September	145,351	11,940	525	157,815	0.976	154,023	0.729	294	14,152	14,613	23.9	172,428	168,176	318
	October	139,431	12,029	525	151,985	1.080	164,096	0.755	292	14,476	15,272	23.9	167,257	178,572	316
	November	139,597	13,848	525	153,970	1.067	164,262	0.747	306	15,116	15,530	23.9	169,500	179,379	330
	December	142,043	14,275	525	156,844	1.096	171,855	0.719	321	16,093	16,429	23.9	173,273	187,948	345
	Total	1,686,127	154,249	6,300	1,846,676	1.049	1,937,421	0.667	332	179,093	185,390	23.9	2,032,067	2,116,514	356
2003	January	157,051	14,601	525	172,177	1.033	177,923	0.748	320	17,257	17,533	24.0	189,710	195,180	344
	February	143,030	14,286	525	157,841	1.017	160,451	0.731	327	15,606	15,715	24.2	173,556	176,058	351
	March	144,294	14,194	525	159,012	1.039	165,248	0.751	296	16,294	16,541	24.2	175,553	181,541	320
	April	139,052	12,381	525	151,958	1.009	153,312	0.735	290	15,003	15,499	24.2	167,457	168,315	314
	May	128,259	12,011	525	140,794	1.076	151,534	0.749	272	13,976	14,840	24.2	155,634	165,510	296
	June	136,824	12,071	525	149,420	1.067	159,449	0.686	323	13,625	14,416	24.2	163,836	173,074	347
	July	147,079	12,160	525	159,763	1.071	171,164	0.676	340	13,665	14,525	24.2	174,288	184,830	365
	August	153,041	12,222	525	165,788	1.063	176,213	0.698	339	14,457	15,008	24.2	180,796	190,670	363
	September	148,945	12,149	525	161,619	0.976	157,736	0.728	301	14,342	14,786	24.2	176,405	172,078	325
	October	142,890	12,237	525	155,652	1.080	168,056	0.754	299	14,668	15,432	24.2	171,084	182,724	324
	November	143,115	14,090	525	157,730	1.067	168,274	0.746	313	15,298	15,712	24.2	173,441	183,571	338
	December	145,895	14,519	525	160,939	1.096	176,342	0.718	330	15,977	16,312	24.2	177,251	192,319	354
	Total	1,729,474	156,921	6,300	1,892,694	1.049	1,985,704	0.666	340	180,168	186,319	24.2	2,079,013	2,165,872	365
2004	January	161,065	14,843	525	176,434	1.033	182,322	0.747	328	17,055	17,264	24.2	193,697	199,377	352
	February	146,803	14,528	525	161,856	1.017	164,533	0.730	335	15,781	15,890	24.4	177,746	180,314	360
	March	148,040	14,436	525	163,001	1.039	169,393	0.750	304	16,481	16,728	24.4	179,729	185,873	328
	April	142,643	12,589	525	155,757	1.009	157,146	0.734	297	15,193	15,690	24.4	171,447	172,339	322
	May	131,597	12,216	525	144,339	1.076	155,349	0.748	279	14,170	15,033	24.4	159,372	169,519	304
	June	140,293	12,279	525	153,097	1.067	163,373	0.685	331	13,814	14,606	24.4	167,703	177,187	356
	July	150,703	12,369	525	163,597	1.071	175,271	0.675	349	13,847	14,707	24.4	178,303	189,118	373
	August	156,741	12,433	525	169,699	1.063	180,370	0.697	348	14,644	15,195	24.4	184,894	195,014	372
	September	152,579	12,358	525	165,463	0.976	161,487	0.727	309	14,533	14,976	24.4	180,439	176,020	333
	October	146,390	12,445	525	159,360	1.080	172,060	0.753	307	14,860	15,824	24.4	174,984	188,920	331
	November	146,672	14,331	525	161,529	1.067	172,326	0.745	321	15,479	15,893	24.4	177,422	187,805	346
	December	149,785	14,763	525	165,073	1.096	180,872	0.717	339	16,155	16,491	24.4	181,564	197,027	364
	Total	1,773,312	159,592	6,300	1,939,204	1.049	2,034,502	0.665	349	182,013	188,095	24.4	2,127,300	2,216,514	373

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Year	Month	Excluding Gillette, Wyoming								RMPL Share of Gillette			Including Gillette, Wyoming		
		South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2005	January	165,101	15,086	525	180,712	1.033	186,743	0.746	337	17,230	17,439	24.4	198,151	203,973	361
	February	150,456	14,770	525	165,850	1.017	168,693	0.729	344	15,957	15,965	24.7	181,915	184,550	369
	March	152,788	14,670	525	167,911	1.030	173,560	0.748	312	16,668	16,915	24.7	183,926	190,228	336
	April	145,256	12,797	525	159,579	1.009	161,001	0.733	305	15,384	15,881	24.7	175,459	176,365	320
	May	134,956	12,422	525	147,905	1.076	159,187	0.747	287	14,334	15,195	24.7	163,099	173,521	311
	June	143,783	12,488	525	156,796	1.067	167,320	0.684	340	14,004	14,771	24.7	171,567	181,324	365
	July	154,349	12,578	525	167,452	1.071	179,402	0.674	358	14,028	14,688	24.7	182,341	193,430	382
	August	160,464	12,643	525	173,632	1.063	184,550	0.696	356	14,831	15,382	24.7	189,014	199,301	381
	September	156,235	12,568	525	169,328	0.976	165,260	0.726	316	14,723	15,123	24.7	184,451	179,983	341
	October	149,911	12,654	525	163,090	1.060	176,087	0.752	315	15,052	15,816	24.7	178,906	191,139	339
	November	150,251	14,573	525	165,349	1.067	176,402	0.743	330	15,661	16,074	24.7	181,423	192,062	354
	December	153,697	15,007	525	169,228	1.096	185,425	0.716	349	16,334	16,669	24.7	185,898	201,759	373
	Total	1,817,389	162,261	6,300	1,985,933	1.049	2,083,530	0.655	358	184,205	190,217	24.7	2,176,150	2,267,735	382
2006	January	169,158	15,329	525	185,012	1.035	191,187	0.745	345	17,405	17,614	24.7	202,626	208,592	370
	February	154,351	15,011	525	169,887	1.017	172,696	0.728	353	16,132	16,240	24.9	186,127	188,828	378
	March	155,597	14,920	525	171,043	1.039	177,750	0.748	320	16,855	17,102	24.9	188,144	194,804	344
	April	149,891	13,005	525	163,421	1.009	164,878	0.732	313	15,575	16,071	24.9	179,492	180,452	338
	May	138,340	12,627	525	151,493	1.076	163,049	0.746	294	14,528	15,355	24.9	166,847	177,576	319
	June	147,296	12,696	525	160,517	1.067	171,292	0.683	349	14,193	14,949	24.9	175,466	185,484	373
	July	158,017	12,708	525	171,330	1.071	183,557	0.673	367	14,210	15,069	24.9	186,400	197,766	392
	August	164,208	12,854	525	177,587	1.063	188,754	0.696	365	15,018	15,569	24.9	193,156	203,772	390
	September	159,913	12,777	525	173,215	0.976	169,054	0.725	324	14,914	15,314	24.9	188,539	183,968	349
	October	153,455	12,862	525	166,842	1.080	180,137	0.751	322	15,244	15,992	24.9	182,834	195,381	347
	November	153,851	14,815	525	169,190	1.067	180,500	0.742	338	15,842	16,256	24.9	185,446	196,342	363
	December	157,630	15,251	525	173,405	1.096	190,002	0.715	357	16,512	16,848	24.9	190,253	206,514	382
	Total	1,861,708	164,935	6,300	2,032,943	1.049	2,132,854	0.664	367	186,426	192,378	24.9	2,225,321	2,319,280	392
2007	Total	1,907,128	167,650	6,300	2,081,079	1.049	2,183,356	0.663	376	188,674	194,563	25	2,275,842	2,372,029	401
2008	Total	1,953,657	170,411	6,300	2,130,367	1.049	2,235,067	0.663	385	190,949	196,773	25	2,327,141	2,426,015	410
2009	Total	2,001,321	173,216	6,300	2,180,837	1.049	2,288,016	0.662	395	193,251	199,009	26	2,379,845	2,481,267	420
2010	Total	2,050,147	176,068	6,300	2,232,515	1.049	2,342,235	0.661	404	195,581	201,269	26	2,433,785	2,537,816	430
2011	Total	2,100,165	178,967	6,300	2,285,432	1.049	2,397,752	0.661	414	197,939	203,556	26	2,488,987	2,595,691	440
2012	Total	2,151,403	181,913	6,300	2,339,617	1.049	2,454,599	0.660	425	200,326	205,868	26	2,545,484	2,654,925	451
2013	Total	2,203,892	184,908	6,300	2,395,100	1.049	2,512,809	0.659	435	202,741	208,206	27	2,603,306	2,715,551	462
2014	Total	2,257,661	187,952	6,300	2,451,913	1.049	2,572,415	0.659	446	205,186	210,571	27	2,662,484	2,777,601	473
2015	Total	2,312,741	191,047	6,300	2,510,088	1.049	2,633,449	0.658	457	207,660	212,963	27	2,723,051	2,841,109	484
2016	Total	2,369,166	194,192	6,300	2,569,658	1.049	2,695,946	0.657	468	210,164	215,383	27	2,785,040	2,906,110	496

(1) Actual.

Black Hills Power and Light Company
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					Excluding Gillette, Wyoming					BHPL Share of Gillette			Including Gillette, Wyoming		
Year	Month	South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1993 (1)	January	121,632	11,175	1,180	133,987		137,108		245	15,892	15,184	27.0	150,171	153,000	272
	February	108,541	9,641	1,001	118,883		123,122		238	13,978	14,465	24.0	133,348	137,100	262
	March	111,926	10,873	1,052	123,851		126,380		219	14,040	14,765	25.0	138,818	136,400	244
	April	105,975	8,939	872	115,786		114,524		210	12,076	13,067	21.0	128,853	125,600	231
	May	94,255	8,266	899	104,020		113,213		195	11,187	12,276	19.0	116,206	124,400	214
	June	101,805	9,405	1,133	112,343		117,563		223	10,447	11,690	20.0	124,033	128,000	243
	July	104,888	8,997	1,112	114,595		124,963		242	10,637	12,080	25.0	126,675	135,600	267
	August	108,197	9,373	1,208	118,778		128,974		246	11,626	12,786	20.0	131,564	140,600	266
	September	109,909	9,243	1,091	120,242		119,090		212	11,110	12,020	20.0	132,262	130,200	232
	October	107,491	9,118	992	117,601		128,983		220	12,117	13,166	25.0	130,767	141,100	245
	November	104,721	10,312	1,043	116,076		132,631		250	14,069	14,773	27.0	130,849	146,700	277
	December	121,982	11,751	1,280	135,013		134,144		229	14,856	15,516	28.0	150,529	149,000	255
	Total	1,300,820	117,492	12,862	1,431,176	1.047	1,498,665	0.684	250	152,035	162,788	27.0	1,593,964	1,650,700	277
1994	January (1)	117,217	11,184	1,230	129,631		140,139		253	14,861	15,447	25.0	145,078	155,000	278
	February (1)	107,812	11,492	776	120,080		124,354		243	14,248	14,537	28.0	134,717	138,600	271
	March (1)	111,953	11,851	784	124,588		122,745		215	13,554	14,331	23.0	138,919	136,300	238
	April (1)	107,900	8,852	676	117,428		117,540		212	11,952	12,927	21.0	130,355	129,500	233
	May (1)	101,532	9,191	526	111,249		119,841		210	11,459	12,543	21.0	123,792	131,300	231
	June (1)	98,079	12,210	567	110,836		128,667		233	11,433	12,554	23.0	123,390	137,100	256
	July (1)	123,619	10,784	748	135,151		130,876		255	12,224	13,472	23.0	148,623	143,100	278
	August (1)	115,190	11,128	670	126,988		139,244		256	13,556	14,392	23.0	141,380	152,800	279
	September	109,854	9,124	475	119,454	0.976	116,584	0.737	220	11,446	12,304	21.9	131,758	128,029	242
	October	106,083	9,218	475	115,774	1.080	125,000	0.764	220	11,777	12,842	21.5	128,616	136,772	242
	November	104,652	10,741	475	115,869	1.067	123,614	0.755	227	13,087	13,934	23.3	129,803	136,701	251
	December	104,457	11,121	475	116,052	1.096	127,159	0.727	235	13,661	14,713	23.3	130,765	141,021	258
	Total	1,308,346	126,896	7,857	1,443,098	1.048	1,512,772	0.675	256	153,455	164,097	28.0	1,607,196	1,666,227	279
1995	January	114,031	11,435	475	125,941	1.033	130,145	0.756	231	15,190	15,813	23.3	141,754	145,335	255
	February	104,136	11,132	475	115,743	1.017	117,657	0.739	237	13,921	14,408	23.3	130,151	131,579	260
	March	107,191	11,055	475	118,722	1.039	123,377	0.759	219	13,801	14,611	23.3	133,332	137,178	242
	April	106,594	9,538	475	116,607	1.009	117,646	0.743	220	12,386	13,345	22.3	129,952	130,033	242
	May	98,102	9,217	475	107,794	1.076	116,016	0.757	206	11,230	12,313	19.9	120,106	127,246	226
	June	104,343	9,254	475	114,071	1.067	121,728	0.694	244	10,902	12,070	22.8	126,141	132,630	266
	July	109,434	9,309	475	119,219	1.071	127,726	0.684	251	11,005	12,389	23.3	131,607	138,732	274
	August	113,103	9,370	475	122,948	1.063	130,679	0.706	249	11,460	12,641	22.6	135,589	142,139	271
	September	111,177	9,334	475	120,986	0.976	118,079	0.736	223	11,639	12,481	22.3	133,457	129,719	245
	October	108,363	9,425	475	118,263	1.080	127,688	0.763	225	11,970	13,034	21.9	131,298	139,858	247
	November	107,956	10,983	475	119,414	1.067	127,397	0.754	235	13,278	14,108	23.3	133,522	140,675	258
	December	107,128	11,364	475	118,967	1.096	130,353	0.726	241	14,052	14,871	23.3	133,830	144,405	265
	Total	1,291,560	121,416	5,700	1,418,676	1.049	1,488,492	0.677	251	150,836	162,083	23.3	1,580,759	1,639,328	274
1996	January	121,492	11,678	475	133,644	1.033	138,105	0.755	246	15,379	15,980	23.3	149,625	153,484	269
	February	108,975	11,374	475	120,824	1.017	122,822	0.738	248	14,236	14,766	23.3	135,590	137,058	271
	March	111,131	11,297	475	122,904	1.039	127,723	0.758	227	13,995	14,756	23.3	137,660	141,718	250
	April	107,304	9,746	475	117,525	1.009	118,572	0.742	222	12,578	13,504	22.7	131,029	131,150	244
	May	98,961	9,422	475	108,858	1.076	117,162	0.756	208	11,424	12,505	20.2	121,363	126,586	229
	June	106,447	9,462	475	116,384	1.067	124,196	0.693	249	11,095	12,232	23.2	128,616	135,292	272
	July	113,677	9,518	475	123,671	1.071	132,496	0.683	261	11,199	12,557	23.3	136,228	143,695	284
	August	117,949	9,580	475	128,004	1.063	136,053	0.705	259	11,054	12,827	23.0	140,831	147,707	282
	September	116,121	9,543	475	126,140	0.976	123,100	0.735	233	11,831	12,642	22.7	138,782	134,940	255
	October	113,259	9,633	475	123,367	1.080	133,198	0.762	235	12,161	13,216	22.2	136,583	145,359	257
	November	112,433	11,225	475	124,183	1.067	132,484	0.753	244	13,366	14,146	23.3	138,329	146,850	268
	December	110,984	11,608	475	123,067	1.096	134,846	0.725	250	14,243	14,998	23.3	138,065	149,088	273
	Total	1,338,783	124,080	5,700	1,468,571	1.049	1,540,766	0.675	261	153,160	164,129	23.3	1,632,700	1,693,926	284

Black Hills Power and Light Company
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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Energy	Sales	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
1997	January	124,552	11,920	475	136,947	1.033	141,518	0.754	252	15,366	15,948	23.3	152,895	156,884	276
	February	111,885	11,618	475	123,978	1.017	126,029	0.737	254	14,117	14,527	23.3	138,503	140,143	278
	March	113,933	11,540	475	125,947	1.039	130,886	0.757	232	14,151	14,878	23.3	140,825	145,037	256
	April	109,926	9,956	475	120,356	1.009	121,429	0.741	227	12,771	13,678	23.0	134,035	134,201	250
	May	101,294	9,620	475	111,397	1.076	119,895	0.755	213	11,618	12,690	20.6	124,087	131,513	234
	June	108,751	9,670	475	118,896	1.067	126,877	0.692	255	11,276	12,390	23.3	131,286	138,153	278
	July	115,366	9,728	475	126,169	1.071	135,173	0.682	266	11,359	12,895	23.3	136,864	148,531	290
	August	120,194	9,791	475	130,460	1.063	138,664	0.704	265	11,834	12,975	23.3	142,435	150,497	288
	September	118,276	9,753	475	128,504	0.976	125,416	0.734	237	12,025	12,832	23.1	141,336	137,441	260
	October	115,271	9,841	475	125,588	1.080	135,596	0.761	240	12,352	13,387	22.6	138,975	147,948	262
	November	114,784	11,486	475	126,726	1.067	135,197	0.752	250	13,557	14,318	23.3	141,044	148,754	273
	December	114,118	11,852	475	126,445	1.096	138,547	0.724	257	14,302	15,039	23.3	141,484	152,849	281
	Total	1,368,952	126,759	5,700	1,501,411	1.049	1,575,222	0.675	266	154,728	165,358	23.3	1,666,769	1,729,950	290
1998	January	127,012	12,163	475	139,650	1.033	144,310	0.755	258	15,553	16,109	23.3	155,758	159,863	281
	February	114,172	11,858	475	126,505	1.017	128,597	0.736	260	14,304	14,670	23.3	141,174	142,901	283
	March	116,117	11,782	475	128,374	1.039	133,408	0.756	237	14,344	15,041	23.3	143,415	147,751	261
	April	112,060	10,162	475	122,697	1.009	123,791	0.740	232	12,951	13,840	23.3	136,537	136,741	256
	May	103,201	9,833	475	113,509	1.076	122,168	0.754	218	11,812	12,884	20.9	126,393	133,979	239
	June	110,764	9,679	475	121,118	1.067	129,247	0.691	260	11,470	12,566	23.3	133,684	140,717	283
	July	118,020	9,937	475	128,433	1.071	137,598	0.681	272	11,552	12,857	23.3	141,290	149,150	295
	August	122,269	10,002	475	132,745	1.063	141,092	0.703	270	12,027	13,156	23.3	145,901	153,120	293
	September	120,403	9,962	475	130,840	0.976	127,696	0.733	242	12,205	12,982	23.3	143,822	139,901	265
	October	117,221	10,050	475	127,746	1.080	137,926	0.760	244	12,546	13,579	23.0	141,325	150,472	267
	November	116,844	11,708	475	129,027	1.067	137,652	0.751	255	13,623	14,344	23.3	143,371	151,275	278
	December	116,494	12,096	475	129,065	1.096	141,417	0.723	263	14,491	15,182	23.3	144,247	155,909	286
	Total	1,394,577	129,430	5,700	1,529,707	1.049	1,604,902	0.675	272	156,878	167,210	23.3	1,696,918	1,761,780	295
1999	January	129,233	12,406	475	142,114	1.033	146,857	0.752	263	15,740	16,238	23.3	158,351	162,597	286
	February	116,240	12,099	475	128,814	1.017	130,944	0.735	265	14,312	14,624	23.3	143,438	145,256	288
	March	118,059	12,024	475	130,558	1.039	135,678	0.755	242	14,537	15,201	23.3	145,759	150,214	265
	April	113,971	10,370	475	124,816	1.009	125,928	0.739	237	13,144	13,970	23.3	138,785	139,072	260
	May	104,888	10,039	475	115,402	1.076	124,205	0.753	222	12,006	13,073	21.3	128,475	136,211	243
	June	112,554	10,087	475	123,116	1.067	131,380	0.690	265	11,638	12,698	23.3	135,815	143,018	289
	July	119,835	10,147	475	130,457	1.071	139,767	0.680	276	11,672	12,971	23.3	143,427	151,439	300
	August	124,098	10,212	475	134,785	1.063	143,260	0.702	274	12,195	13,283	23.3	148,067	155,455	297
	September	122,303	10,172	475	132,949	0.976	129,755	0.732	246	12,399	13,145	23.3	146,095	142,154	270
	October	118,929	10,258	475	129,662	1.080	139,995	0.759	248	12,726	13,723	23.3	143,385	152,720	271
	November	118,671	11,950	475	131,096	1.067	139,859	0.750	259	13,812	14,506	23.3	145,601	153,671	282
	December	118,638	12,340	475	131,453	1.096	144,034	0.722	268	14,681	15,338	23.3	146,791	158,714	292
	Total	1,417,420	132,102	5,700	1,555,222	1.049	1,631,661	0.674	276	158,861	168,769	23.3	1,723,990	1,790,522	300
2000	January	130,463	12,648	475	143,586	1.033	148,378	0.751	266	15,727	16,202	23.3	159,788	164,104	289
	February	117,571	12,341	475	130,387	1.017	132,543	0.734	269	14,497	14,809	23.3	145,196	147,040	292
	March	119,010	12,266	475	131,750	1.039	136,917	0.754	244	14,648	15,276	23.3	147,026	151,565	267
	April	114,823	10,578	475	125,876	1.009	126,998	0.738	239	13,311	14,108	23.3	139,984	140,309	262
	May	105,423	10,244	475	116,142	1.076	125,002	0.752	224	12,199	13,259	21.6	129,401	137,201	245
	June	112,903	10,295	475	123,673	1.067	131,974	0.689	266	11,832	12,877	23.3	136,550	143,806	289
	July	119,970	10,356	475	130,801	1.071	140,135	0.679	277	11,864	13,121	23.3	143,922	151,999	301
	August	124,069	10,423	475	134,967	1.063	143,454	0.702	275	12,388	13,457	23.3	148,424	155,842	298
	September	122,237	10,381	475	133,093	0.976	129,896	0.731	247	12,567	13,290	23.3	146,383	142,463	270
	October	118,599	10,466	475	129,541	1.080	139,864	0.758	248	12,919	13,900	23.3	143,441	152,783	271
	November	118,892	12,191	475	131,559	1.067	140,353	0.749	260	14,002	14,642	23.3	146,201	154,354	284
	December	120,145	12,583	475	133,204	1.096	145,952	0.721	272	14,674	15,302	23.3	148,505	160,627	295
	Total	1,424,105	134,773	5,700	1,564,578	1.049	1,641,465	0.676	277	160,627	170,242	23.3	1,734,821	1,802,092	301

Black Hills Power and Light Company
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					Excluding Gillette, Wyoming					BHPL Share of Gillette			Including Gillette, Wyoming		
Year	Month	South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2001	January	134,112	12,891	475	147,478	1.033	152,400	0.750	273	15,911	16,387	23.3	163,865	168,311	296
	February	129,948	12,583	475	134,006	1.017	136,222	0.733	277	14,681	15,078	23.3	149,084	150,304	300
	March	122,402	12,508	475	135,381	1.039	140,694	0.753	251	14,840	15,411	23.3	150,796	156,534	275
	April	118,078	10,786	475	129,338	1.009	130,491	0.737	246	13,504	14,262	23.3	143,601	143,995	269
	May	108,440	10,450	475	119,365	1.076	128,470	0.751	230	12,390	13,421	22.0	132,786	140,850	252
	June	116,044	10,502	475	127,023	1.067	135,549	0.686	274	11,992	12,966	23.3	140,609	147,541	297
	July	123,224	10,565	475	134,265	1.071	143,848	0.678	265	11,965	13,190	23.3	147,455	155,803	308
	August	127,371	10,634	475	138,479	1.063	147,187	0.700	283	12,547	13,595	23.3	152,074	159,734	306
	September	125,508	10,590	475	136,573	0.976	133,292	0.730	254	12,780	13,450	23.3	150,023	146,052	277
	October	121,763	10,675	475	132,913	1.080	143,504	0.756	255	13,113	14,076	23.3	146,989	156,617	278
	November	122,115	12,433	475	135,023	1.067	144,049	0.748	288	14,006	14,624	23.3	149,647	158,054	291
	December	123,684	12,827	475	136,987	1.096	150,098	0.720	280	14,861	15,462	23.3	152,449	164,959	304
	Total	1,463,690	137,445	5,700	1,606,835	1.049	1,685,802	0.675	285	162,561	171,943	23.3	1,778,778	1,848,363	308
2002	January	137,384	13,133	475	150,993	1.033	156,032	0.749	280	16,096	16,495	23.3	167,487	172,128	303
	February	124,067	12,825	475	137,367	1.017	139,639	0.732	284	14,547	14,785	23.3	152,152	154,185	307
	March	125,405	12,750	475	138,630	1.039	144,066	0.752	258	14,918	15,456	23.3	154,086	158,985	281
	April	120,900	10,994	475	132,369	1.009	133,549	0.738	252	13,897	14,423	23.3	146,792	147,246	275
	May	110,977	10,655	475	122,107	1.076	131,421	0.750	236	12,584	13,604	22.3	135,711	144,005	258
	June	118,568	10,712	475	129,745	1.067	138,456	0.687	280	12,185	13,160	23.3	142,905	150,638	303
	July	125,735	10,775	475	136,985	1.071	146,760	0.677	291	12,146	13,350	23.3	150,334	158,906	315
	August	129,841	10,844	475	141,160	1.063	150,037	0.699	288	12,740	13,756	23.3	154,916	162,777	312
	September	127,884	10,800	475	139,158	0.976	135,815	0.720	259	12,920	13,551	23.3	152,709	148,735	282
	October	124,901	10,883	475	136,360	1.080	146,146	0.755	260	13,279	14,210	23.3	149,570	159,426	283
	November	124,629	12,675	475	137,779	1.067	146,989	0.747	273	14,193	14,796	23.3	152,575	161,181	297
	December	127,012	13,071	475	140,558	1.096	154,011	0.719	288	14,857	15,378	23.3	155,936	168,868	311
	Total	1,496,395	140,116	5,700	1,642,211	1.049	1,722,918	0.675	291	164,161	172,964	23.3	1,815,175	1,887,079	315
2003	January	141,092	13,376	475	154,943	1.033	160,114	0.748	288	15,925	16,289	23.3	171,232	176,039	311
	February	127,521	13,066	475	141,063	1.017	143,396	0.731	292	14,728	14,966	23.3	156,029	158,124	315
	March	128,857	12,992	475	142,324	1.039	147,905	0.751	265	15,109	15,617	23.3	157,941	163,014	288
	April	124,213	11,202	475	135,889	1.009	137,101	0.735	259	13,854	14,529	23.3	150,418	150,955	282
	May	114,052	10,861	475	125,388	1.076	134,953	0.749	242	12,775	13,752	22.7	139,141	147,728	265
	June	121,759	10,920	475	133,154	1.067	142,092	0.686	288	12,305	13,249	23.3	146,403	154,397	311
	July	129,050	10,984	475	140,509	1.071	150,536	0.676	299	12,336	13,504	23.3	154,013	162,872	323
	August	133,204	11,055	475	144,734	1.063	153,834	0.698	296	12,933	13,930	23.3	158,663	166,767	319
	September	131,213	11,009	475	142,697	0.976	139,269	0.728	266	13,113	13,723	23.3	156,421	152,381	289
	October	127,225	11,091	475	138,792	1.080	149,852	0.754	267	13,472	14,367	23.3	153,178	163,324	290
	November	127,911	12,916	475	141,302	1.067	150,747	0.746	281	14,360	14,920	23.3	156,222	165,127	304
	December	130,610	13,315	475	144,400	1.096	158,220	0.718	296	15,042	15,563	23.3	159,963	173,262	320
	Total	1,536,707	142,788	5,700	1,685,194	1.049	1,768,018	0.674	299	165,972	174,430	23.3	1,859,624	1,933,990	323
2004	January	144,838	13,619	475	158,931	1.033	164,236	0.747	296	16,106	16,470	23.3	175,401	180,342	319
	February	131,032	13,308	475	144,816	1.017	147,211	0.730	300	14,909	15,148	23.3	159,963	162,120	323
	March	132,346	13,234	475	146,055	1.039	151,783	0.750	272	15,300	15,758	23.3	161,813	167,082	295
	April	127,562	11,409	475	139,447	1.009	140,689	0.734	266	14,047	14,683	23.3	154,129	154,736	289
	May	117,165	11,066	475	128,706	1.076	138,524	0.748	249	12,969	13,918	23.0	142,624	151,493	272
	June	124,997	11,129	475	136,600	1.067	145,769	0.685	296	12,497	13,406	23.3	150,008	158,266	319
	July	132,403	11,194	475	144,072	1.071	154,353	0.675	307	12,405	13,551	23.3	157,622	166,758	331
	August	136,605	11,265	475	148,346	1.063	157,674	0.697	304	13,050	14,008	23.3	162,354	170,723	327
	September	134,580	11,219	475	146,274	0.976	142,759	0.727	273	13,232	13,609	23.3	160,083	155,991	296
	October	130,487	11,300	475	142,262	1.080	153,599	0.753	274	13,630	14,510	23.3	156,772	167,228	297
	November	131,229	13,158	475	144,862	1.067	154,545	0.745	288	14,383	14,905	23.3	159,767	168,928	312
	December	134,245	13,559	475	148,278	1.096	162,470	0.717	305	15,227	15,723	23.3	164,001	177,697	328
	Total	1,577,489	145,459	5,700	1,728,648	1.049	1,813,611	0.674	307	167,753	175,888	23.3	1,904,537	1,981,364	331

Black Hills Power and Light Company
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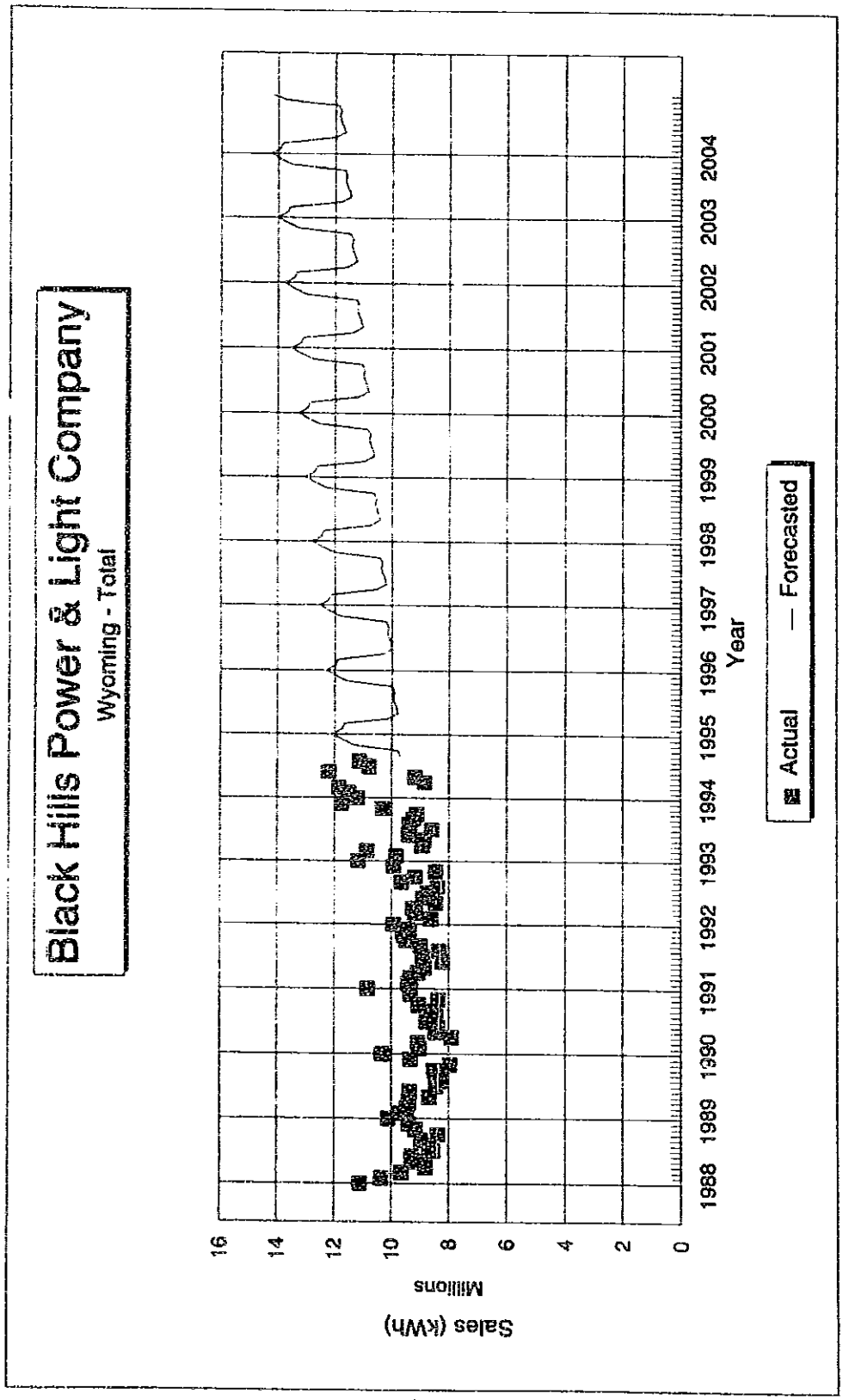
Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming					BHPL Share of Gillette			Including Gillette, Wyoming		
					Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Energy	Sales	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MWh	MW	MWh	MWh	MW
2005	January	148,604	13,861	475	162,941	1.033	168,375	0.746	303	16,286	16,631	23.3	179,571	184,666	327
	February	134,522	13,550	475	148,547	1.017	151,004	0.729	306	14,921	14,994	23.3	163,542	165,825	332
	March	135,857	13,475	475	149,808	1.039	155,682	0.749	279	15,354	15,783	23.3	165,591	171,036	303
	April	130,933	11,617	475	143,025	1.009	144,300	0.733	273	14,160	14,744	23.3	157,769	158,460	297
	May	120,299	11,272	475	132,046	1.076	142,118	0.747	256	13,148	14,080	23.3	146,126	155,266	279
	June	128,257	11,337	475	140,069	1.067	149,470	0.684	304	12,585	13,478	23.3	153,546	162,058	327
	July	135,778	11,403	475	147,656	1.071	158,193	0.674	316	12,594	13,608	23.3	161,345	170,787	339
	August	140,029	11,476	475	151,980	1.063	161,538	0.696	312	13,241	14,169	23.3	166,149	174,778	335
	September	137,969	11,428	475	149,872	0.976	146,271	0.726	280	13,424	13,940	23.3	163,812	159,695	303
	October	133,771	11,508	475	145,754	1.080	157,389	0.752	281	13,822	14,662	23.3	160,416	171,191	304
	November	134,569	13,399	475	148,443	1.067	158,366	0.743	296	14,568	15,066	23.3	163,509	172,934	319
	December	137,901	13,803	475	152,178	1.096	166,743	0.716	313	15,412	15,872	23.3	168,051	182,155	336
	Total	1,518,488	148,131	5,700	1,772,319	1.049	1,859,433	0.673	316	169,419	177,107	23.3	1,949,426	2,028,851	339
2006	January	152,392	14,104	475	166,971	1.033	172,564	0.745	311	16,169	16,446	23.3	183,417	188,713	335
	February	138,055	13,792	475	152,322	1.017	154,841	0.728	317	14,999	15,173	23.3	167,494	169,040	340
	March	139,389	13,718	475	153,582	1.039	159,605	0.748	287	15,543	15,946	23.3	169,528	175,148	310
	April	134,325	11,825	475	146,625	1.009	147,932	0.732	281	14,352	14,896	23.3	161,521	162,284	304
	May	123,455	11,477	475	135,407	1.076	145,736	0.746	263	13,341	14,230	23.3	149,638	159,078	286
	June	131,539	11,545	475	143,559	1.067	153,195	0.683	312	12,778	13,628	23.3	157,187	165,973	335
	July	139,175	11,612	475	151,264	1.071	162,057	0.673	324	12,603	13,661	23.3	164,924	174,660	347
	August	143,474	11,687	475	155,636	1.063	165,422	0.695	320	13,327	14,236	23.3	169,872	178,750	343
	September	141,380	11,637	475	153,492	0.976	149,804	0.725	287	13,615	14,112	23.3	167,604	163,420	310
	October	137,078	11,716	475	149,268	1.080	161,163	0.751	288	13,936	14,732	23.3	164,000	175,099	312
	November	137,930	13,641	475	152,046	1.067	162,210	0.742	303	14,428	14,849	23.3	166,895	176,638	327
	December	141,578	14,046	475	156,100	1.096	171,040	0.715	322	15,252	15,675	23.3	171,775	186,292	345
	Total	1,659,768	150,802	5,700	1,816,271	1.049	1,905,548	0.672	324	170,346	177,585	23.3	1,993,855	2,075,894	347
2007	Total	1,702,101	153,522	5,700	1,861,323	1.049	1,952,815	0.671	332	171,278	178,063	23	2,039,386	2,124,093	355
2008	Total	1,745,514	156,290	5,700	1,907,504	1.049	2,001,266	0.670	341	172,215	178,543	23	2,086,068	2,173,482	364
2009	Total	1,790,034	159,109	5,700	1,954,843	1.049	2,050,932	0.670	350	173,158	179,025	23	2,133,867	2,224,089	373
2010	Total	1,835,689	161,979	5,700	2,003,367	1.049	2,101,842	0.669	359	174,105	179,507	23	2,182,875	2,275,947	382
2011	Total	1,882,508	164,900	5,700	2,053,108	1.049	2,154,027	0.668	368	175,058	179,991	23	2,232,099	2,329,086	391
2012	Total	1,930,522	167,874	5,700	2,104,096	1.049	2,207,521	0.667	378	176,016	180,476	23	2,284,572	2,383,538	401
2013	Total	1,979,761	170,901	5,700	2,156,362	1.049	2,262,356	0.667	387	176,980	180,963	23	2,337,325	2,439,336	411
2014	Total	2,030,255	173,983	5,700	2,209,938	1.049	2,318,566	0.666	397	177,948	181,451	23	2,391,389	2,496,514	421
2015	Total	2,082,037	177,121	5,700	2,264,858	1.049	2,376,186	0.665	408	178,922	181,940	23	2,446,798	2,555,108	431
2016	Total	2,135,140	180,315	5,700	2,321,155	1.049	2,435,250	0.664	418	179,901	182,430	23	2,503,585	2,615,151	442

(1) Actual.

Black Hills Power & Light Company
South Dakota - Total
Sales (kWh)
Millions
175
150
125
100
75
50
25
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

Figure 5-1

Figure 5-2


Black Hills Power & Light Company
Wyoming - Total
Sales (kWh)
Millions
16
14
12
10
8
6
4
2
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

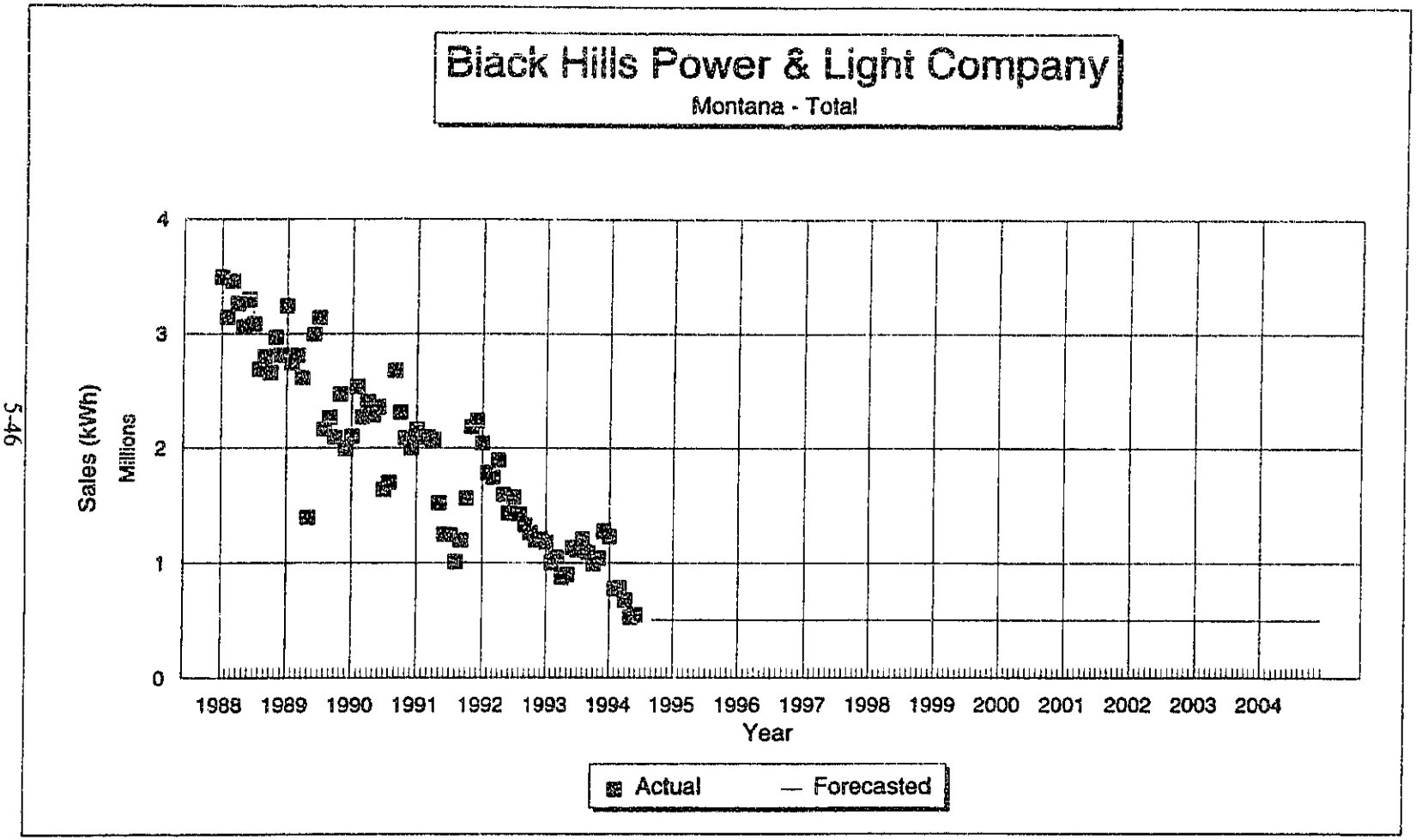

Black Hills Power & Light Company
Montana - Total
Sales (kWh)
Millions
4
3
2
1
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

Figure 5-3

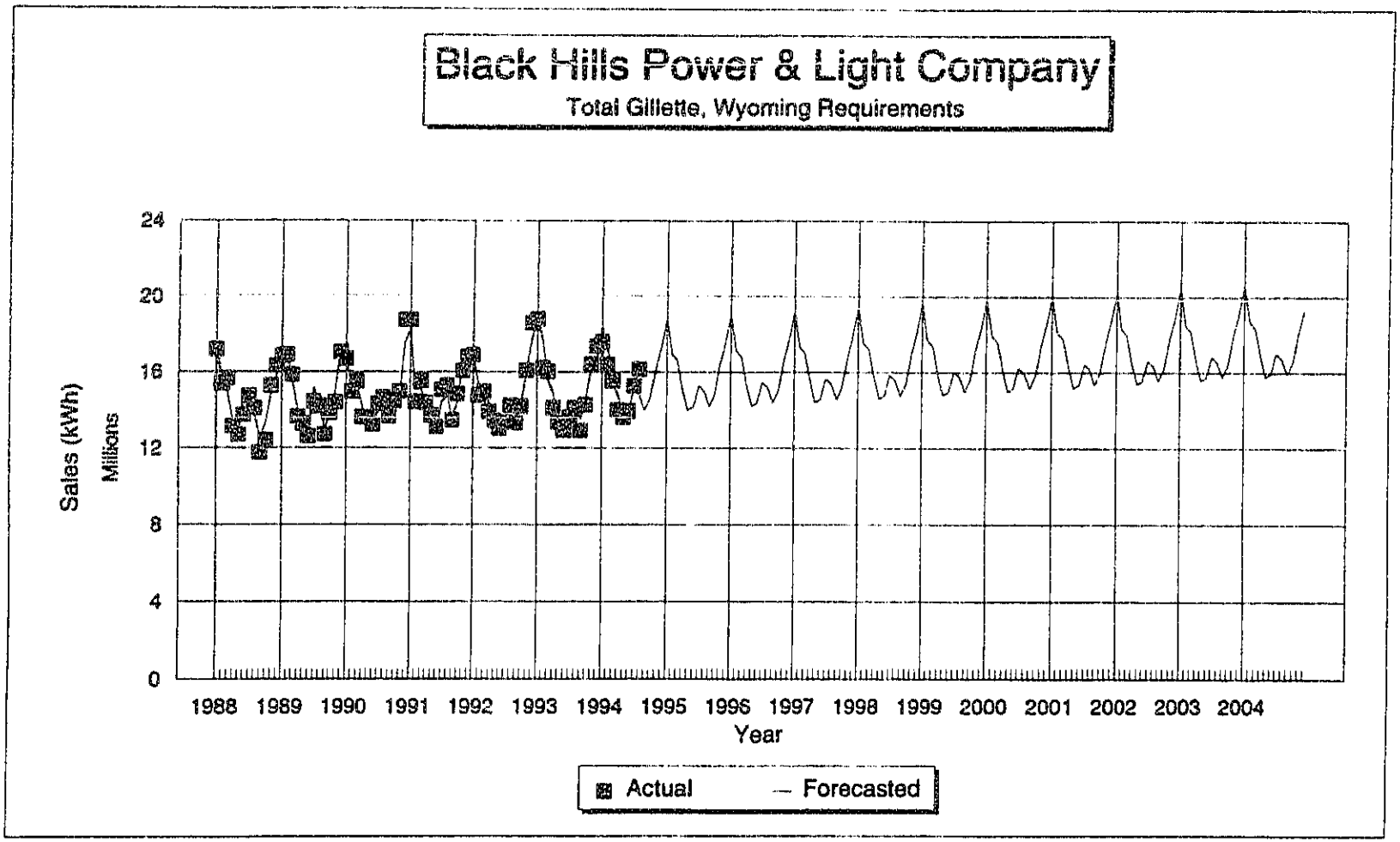

Black Hills Power & Light Company
Total Gillette, Wyoming Requirements
Sales (kWh)
Millions
24
20
16
12
8
4
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

Figure 5-4

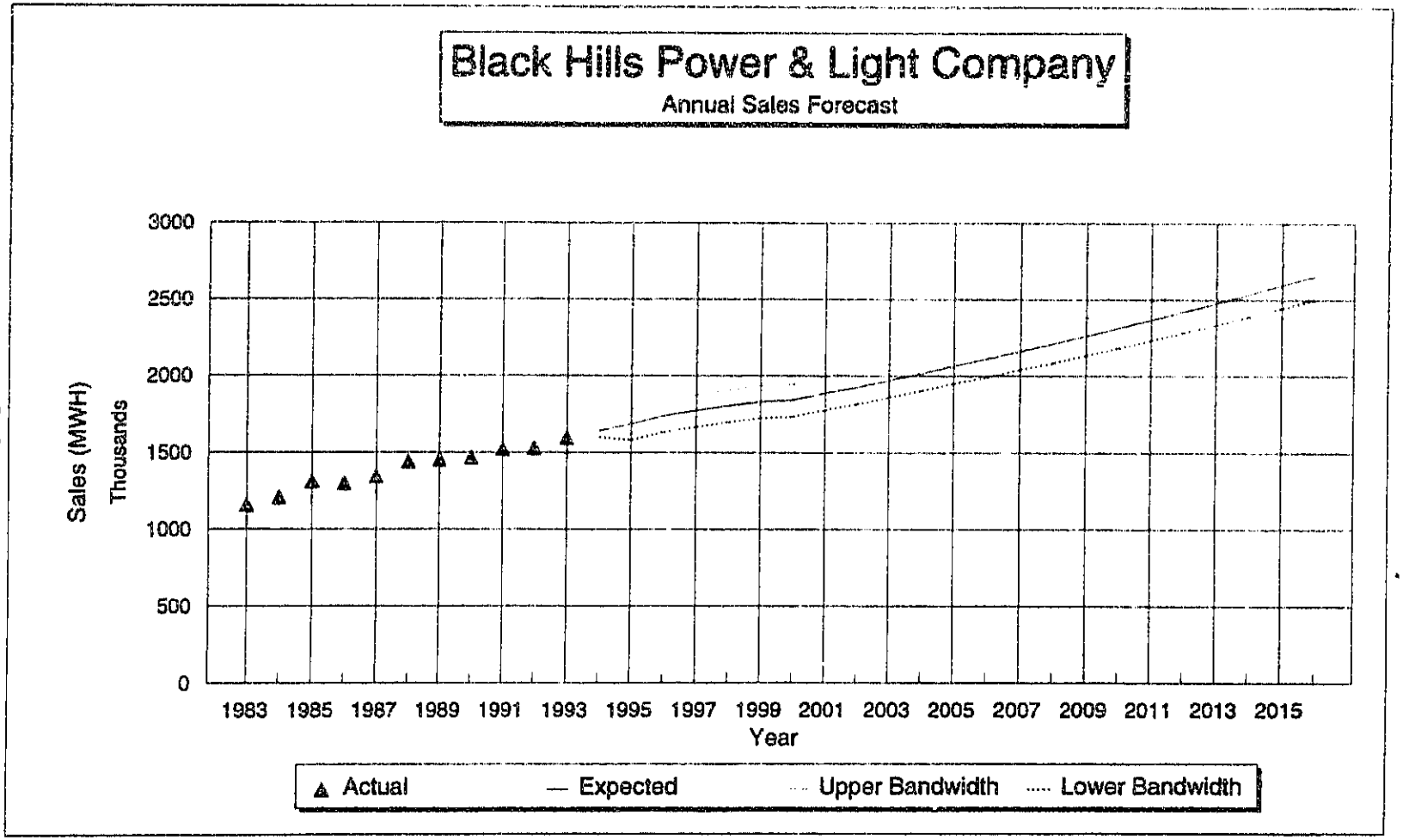

Black Hills Power & Light Company
Annual Sales Forecast
Sales (MWH)
Thousands
3000
2500
2000
1500
1000
500
0
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-5

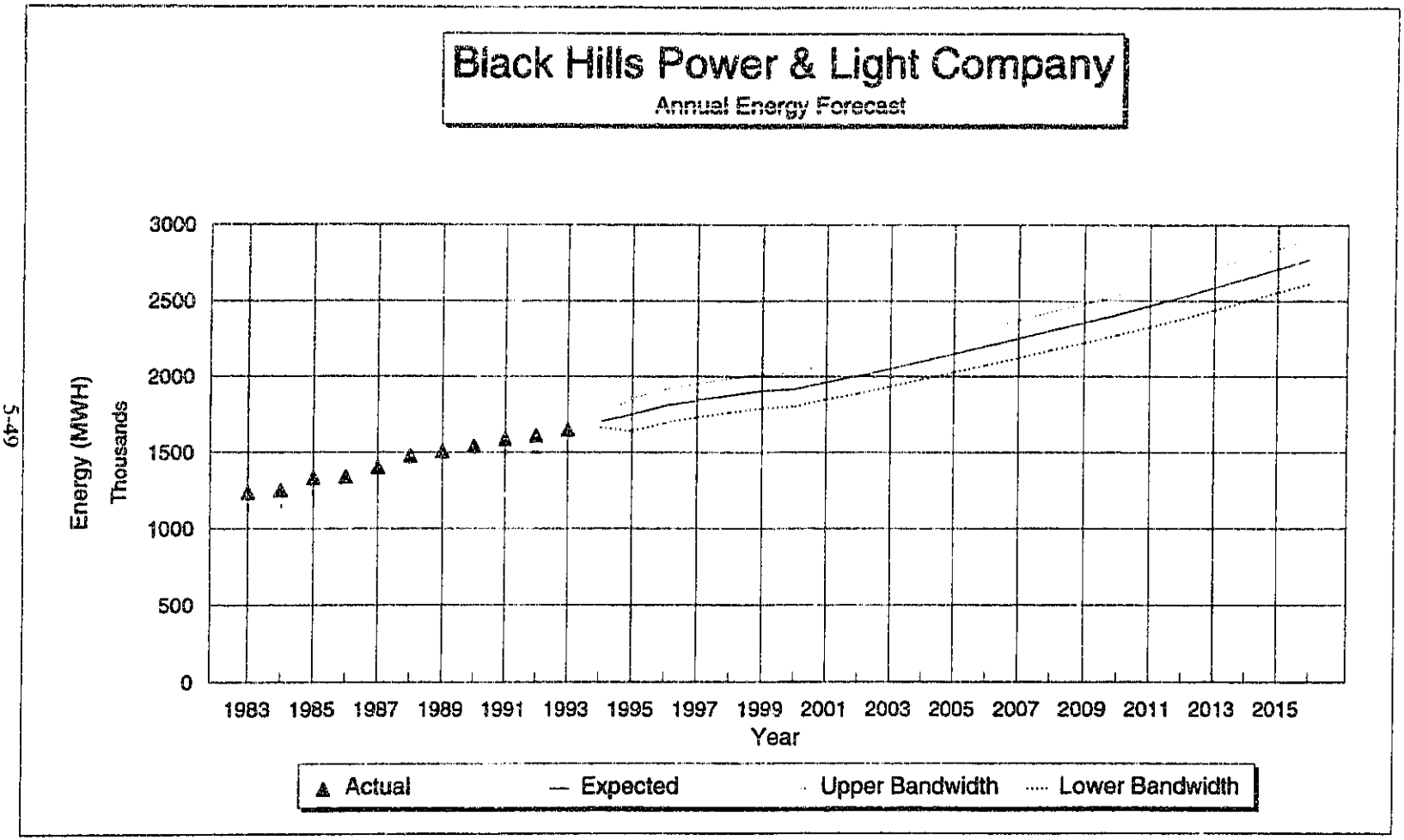

Black Hills Power & Light Company
Annual Energy Forecast
Energy (MWH)
Thousands
3000
2500
2000
1500
1000
500
0
1983 1985 1987 1989 1991 1993 1995 1997 1999 2001 2003 2005 2007 2009 2011 2013 2015
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-6

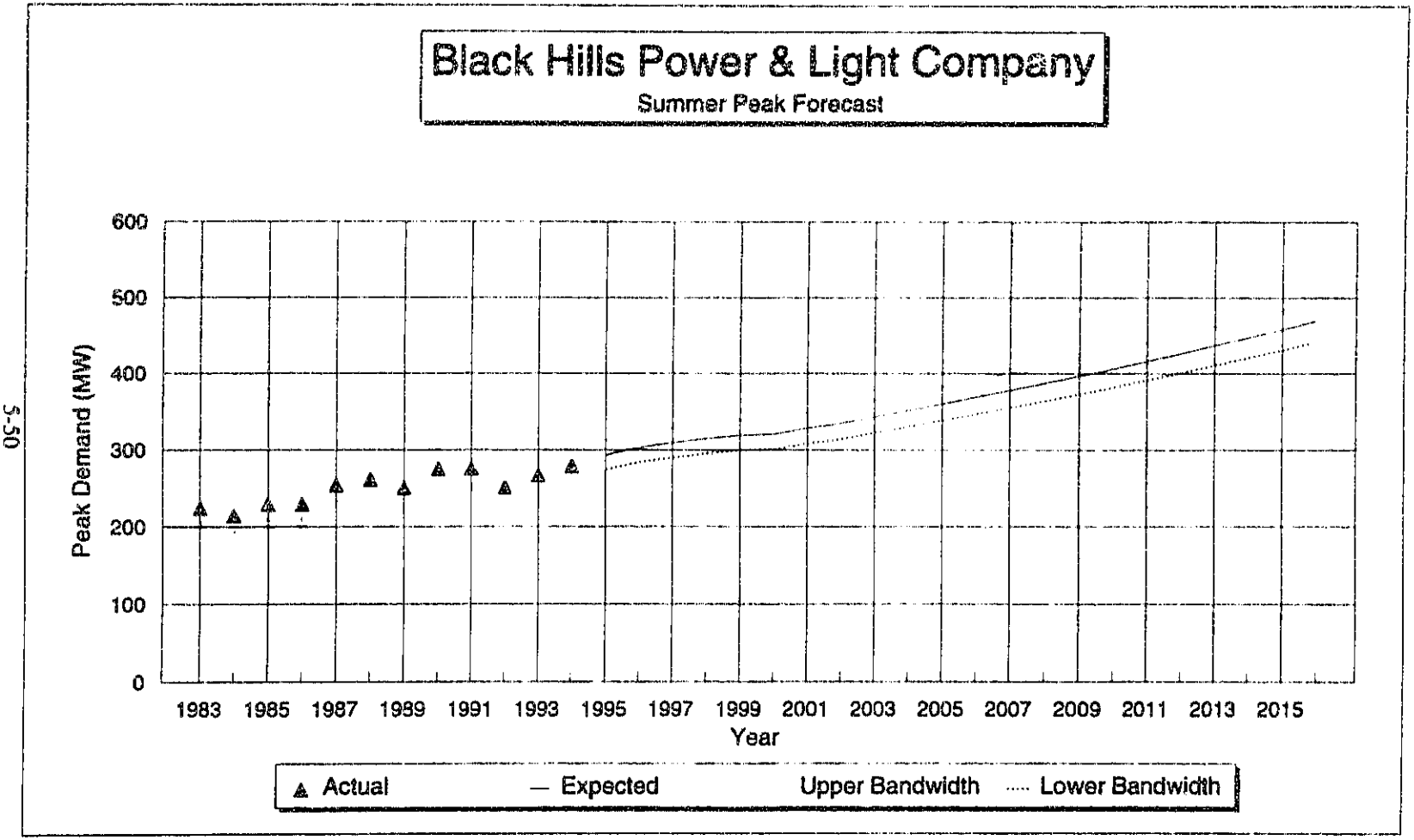

Black Hills Power & Light Company
Summer Peak Forecast
Peak Demand (MW)
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-7

Black Hills Power & Light Company
Winter Peak Forecast
Peak Demand (MW)
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-8

Chapter 6 - Customer Forecast

The annual average number of customers is forecasted for the South Dakota, Wyoming, and Montana jurisdictions for the years 1994 through 2000. Tables 6-1 through 6-4 summarize the historical annual average number of customers for the years 1980 through 1993, forecasts set forth in the 1988, 1990, and 1992 Reports, as well as the current forecasts for the period 1994 through 2000. The average number of customers forecast is made through 2000 so that five year budgets for 1995 through 1999 and 1996 through 2000 can be prepared. The growth rates used in the current forecast are derived from historical trends in customer growth as well as consideration of sales projections.

Historical number of customers in each jurisdiction are set forth on Page 1 of each of Tables 6-1 through 6-4. The South Dakota customer base has shown a somewhat steady increase since 1980 from 42,941 customers to a 1993 average of 50,661 customers. This upward trend is expected to continue. The Wyoming and Montana jurisdictions have experienced decreases in the average number of customers. The Wyoming jurisdiction experienced moderate growth from a 1980 level of 2,575 customers to a 1982 level of 2,706. However, a steady decline has occurred since then, principally attributable to a decline in residential customers, to a 1993 level of 2,346 customers. The Montana jurisdiction has experienced a decline, as well, from a 1980 average of 107 customers to a 1993 level of 52 customers. Although the downward trends in these jurisdictions appear to be leveling, the decline itself is not seen as significant when the relative size of the customer base in these jurisdictions is compared to that of the Total Company.

The Total Company customer base shown in Table 6-4, Page 1 is the sum of the three jurisdictions and shows consistent overall annual growth rate of approximately 1.17 percent for the period 1980 through 1993. This overall rate is principally affected by the growth experienced in the South Dakota jurisdiction. The annual average of total customers grew from a 1980 level of 45,623 to 53,059 in 1993.

The projections of the Black Hills customer base by jurisdiction and rate class for the period 1994 through 2000 (1994 Report) are shown on Page 2 of each of Tables 6-1 through 6-4. The projections for 1988 through 1992 set forth in the 1988 Report, the period 1990 through 1996 in the 1990 Report and the period 1992 through 1998 in the 1992 Report are summarized on Page 3 of each of Tables 6-1 through 6-4. Projections for the South Dakota jurisdiction (Table 6-1) are based on historical trends in customer growth as well as consideration of sales projections. The most significant growth in this jurisdiction is expected to occur in the Residential-Demand rate class, nine percent annually. This growth rate is partially attributable to customers migrating to this rate class from other classes. The current projection for the South Dakota jurisdiction average number of customers is slightly higher

than prior projections. Prior projections have slightly understated the actual South Dakota customer growth.

The customer base for the Wyoming and Montana jurisdictions is projected to remain constant through 2000. In these jurisdictions, the historical long term decline appears to be leveling. The current projections are only slightly less than prior forecasts.

Total Company average number of customers is the sum of the average number of customers in each of the three jurisdictions. The equivalent annual compound growth rate in total Company average number of customers is forecasted to be approximately 1.4 percent. Total Company average number of customers is forecasted to increase from 53,059 in 1993 to 58,576 in 2000.

Actual historical data, 1990 Forecasts, and 1992 Forecasts are graphically illustrated for total customers by jurisdiction and for the Total Company in Appendix E.

Black Hills Power & Light Company
Average Number of Customers Forecast
18-Nov-94

Table 6-1
Page 1 of 4

Class	Actual													
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
South Dakota														
Residential Service	25,462	25,461	29,001	31,694	32,034	32,318	32,575	32,902	33,043	33,340	34,073	34,398	34,733	35,157
Residential - Water Heating (1)	6,281	6,161	2,539	0	0	0	0	0	0	0	0	0	0	0
Residential - All Electric	4,671	4,947	5,098	5,232	5,406	5,542	5,670	5,816	5,864	5,985	5,802	5,844	5,900	5,882
Residential - Demand	0	0	0	33	125	226	317	424	600	759	917	1,099	1,287	1,459
Residential - Energy Storage	0	0	0	1	1	0	0	1	0	0	1	1	0	0
Residential - Utility Controlled	0	0	0	1	1	1	1	1	0	0	2	6	8	8
Total Residential	36,414	36,579	36,638	36,961	37,566	38,187	38,772	39,344	39,707	40,088	40,902	41,347	41,928	42,514
General Service	5,964	6,009	6,023	6,146	6,212	6,287	6,297	6,390	6,461	6,514	6,760	6,923	7,122	7,290
General Service - Large	69	72	75	77	80	84	95	93	95	93	93	98	107	112
General Service - All Electric	344	351	356	362	358	392	431	452	478	512	526	525	533	550
General Service - Utility Controlled	0	0	0	0	1	4	7	10	13	13	16	18	24	28
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	0	0	0	0	2	1	1	1	0	0	1	0	0	0
Irrigation Pumping	16	16	15	15	16	15	15	14	14	15	23	24	23	23
Industrial	25	25	24	24	25	22	24	23	23	24	29	29	26	24
Industrial - Contract	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Industrial - Curtailable	0	0	0	0	0	0	0	0	0	0	0	1	0	2
Total Commercial & Industrial Sales	6,420	6,475	6,495	6,626	6,696	6,807	6,872	6,985	7,087	7,174	7,451	7,621	7,838	8,032
Street Lighting	23	23	24	22	23	23	23	23	28	24	26	26	25	32
Customer-Owned Street Lighting	5	5	7	7	7	7	7	7	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	28	28	31	29	30	30	30	30	28	24	26	26	25	32
Municipal Pumping	79	77	76	75	73	76	76	74	71	74	78	80	83	83
Total Customers	42,941	43,159	43,240	43,691	44,365	45,100	45,750	46,433	46,893	47,360	48,457	49,074	49,874	50,661

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-1
Page 2 of 4

Class	Forecasted (1994 Report) 1994	1995	1996	1997	1998	1999	2000	Basis of Forecast
South Dakota								
Residential Service	35,391	36,048	36,473	36,900	37,327	37,754	38,182	Seasonal/Trend Analysis
Residential - Water Heating (1)								
Residential - All Electric	5,815	5,809	5,809	5,809	5,809	5,809	5,809	Seasonal/Trend Analysis
Residential - Demand	1,648	1,821	1,998	2,175	2,352	2,528	2,705	Regression
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	43,054	43,678	44,280	44,884	45,488	46,092	46,696	
General Service	7,485	7,668	7,819	7,993	8,166	8,340	8,514	Seasonal/Trend Analysis
General Service - Large	114	117	121	125	129	133	137	Seasonal/Trend Analysis
General Service - All Electric	557	573	584	596	608	619	631	Seasonal/Trend Analysis
General Service - Utility Controlled	30	32	34	36	38	40	42	Two customers per year.
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping	22	22	22	22	22	22	22	No growth.
Industrial	23	23	23	23	23	23	23	No growth.
Industrial - Contract	3	3	3	3	3	3	3	No growth.
Industrial - Curtailable								
Total Commercial & Industrial Sales	8,235	8,415	8,606	8,798	8,989	9,180	9,371	
Street Lighting	17	17	17	17	17	17	17	No growth.
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	17	17	17	17	17	17	17	
Municipal Pumping	85	88	89	91	93	95	97	Two percent growth rate.
Total Customers	51,391	52,196	52,993	53,790	54,587	55,384	56,181	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
18-Nov-94

Table 6-1
Page 3 of 4

Class	Forecasted (1988 Report)					Forecasted (1990 Report)							Forecasted (1992 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1997	1998
South Dakota																			
Residential Service	33,481	34,070	34,670	35,280	35,901	33,673	34,010	34,350	34,694	35,041	35,391	35,745	34,928	35,263	35,704	36,150	36,602	37,060	37,523
Residential - Water Heating (1)																			
Residential - All Electric	6,125	6,238	6,352	6,466	6,585	5,989	5,989	5,989	5,989	5,989	5,989	5,989	5,844	5,844	5,844	5,844	5,844	5,844	5,844
Residential - Demand	483	550	625	713	812	835	919	1,011	1,112	1,223	1,345	1,480	1,187	1,282	1,385	1,496	1,616	1,745	1,885
Residential - Energy Storage	1	1	1	1	1	0	0	0	0	0	0	0							
Residential - Utility Controlled	1	1	1	1	1	0	0	0	0	0	0	0							
Total Residential	40,092	40,860	41,650	42,463	43,301	40,497	40,918	41,350	41,795	42,253	42,725	43,214	41,859	42,389	42,933	43,490	44,062	44,649	45,252
General Service	6,486	6,583	6,682	6,782	6,884	6,579	6,645	6,711	6,778	6,846	6,914	6,983	6,756	6,840	6,926	7,013	7,101	7,190	7,280
General Service - Large	95	97	99	101	104	93	93	93	93	93	93	93	102	106	110	114	119	124	129
General Service - All Electric	488	485	503	521	540	522	532	543	554	565	576	588	536	547	558	569	580	592	604
General Service - Utility Controlled	10	10	10	10	10	13	13	13	13	13	13	13	20	22	24	26	29	32	35
General Service - Curtailable																			
Area Lighting (2)																			
Energy Storage Service	1	1	1	1	1	0	0	0	0	0	0	0							
Irrigation Pumping	14	14	14	14	14	15	15	15	15	15	15	15	25	26	27	28	29	30	31
Industrial	23	23	23	23	23	24	24	24	24	24	24	24	30	31	32	33	34	35	36
Industrial - Contract	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Industrial - Curtailable																			
Total Commercial & Industrial Sales	7,099	7,215	7,334	7,454	7,578	7,249	7,325	7,402	7,480	7,559	7,638	7,719	7,472	7,575	7,680	7,786	7,895	8,006	8,118
Street Lighting	23	23	23	23	23	24	24	24	24	24	24	24	27	28	29	30	31	32	33
Customer-Owned Street Lighting	7	7	7	7	7	0	0	0	0	0	0	0							
Traffic Signals (3)																			
Total Public Street Lighting Sales	30	30	30	30	30	24	24	24	24	24	24	24	27	28	29	30	31	32	33
Municipal Pumping	74	74	74	74	74	74	74	74	74	74	74	74	82	84	86	88	90	92	94
Total Customers	47,295	48,179	49,088	50,021	50,983	47,844	48,341	48,850	49,373	49,910	50,461	51,031	49,440	50,076	50,728	51,394	52,078	52,779	53,497

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-1
Page 4 of 4

Class	Historical Growth Rates								
	1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991	1991-1992	1992-1993
South Dakota									
Residential Service	0.80%	1.06%	1.10%	1.12%	1.35%	1.67%	0.95%	0.97%	1.22%
Residential - Water Heating (1)									
Residential - All Electric	2.07%	0.93%	-0.12%	-0.72%	-1.22%	-1.22%	-1.10%	0.96%	-0.17%
Residential - Demand	43.44%	32.33%	28.23%	26.88%	22.35%	20.33%	19.85%	17.11%	13.36%
Residential - Energy Storage									
Residential - Utility Controlled									
Total Residential	1.31%	1.38%	1.29%	1.25%	1.36%	1.56%	1.09%	1.41%	1.40%
General Service	0.95%	1.46%	1.91%	2.02%	2.33%	3.06%	2.41%	2.87%	2.36%
General Service - Large	3.66%	2.06%	0.82%	1.32%	1.04%	2.65%	5.38%	9.18%	4.67%
General Service - All Electric	7.42%	6.06%	4.02%	3.81%	3.19%	1.26%	-0.19%	1.52%	3.19%
General Service - Utility Controlled	67.03%	31.95%	20.79%	15.83%	11.46%	17.67%	12.50%	33.33%	16.67%
General Service - Curtailable									
Area Lighting (2)									
Energy Storage Service									
Irrigation Pumping	-1.28%	8.92%	9.86%	14.42%	19.68%	26.49%	4.35%	-4.17%	0.00%
Industrial	-0.81%	5.68%	3.86%	5.97%	8.03%	9.92%	0.00%	-10.34%	-7.69%
Industrial - Contract	8.45%	8.45%	8.45%	10.67%	0.00%	0.00%	0.00%	0.00%	0.00%
Industrial - Curtailable									
Total Commercial & Industrial Sales	1.39%	1.82%	2.09%	2.20%	2.46%	3.07%	2.28%	2.85%	2.48%
Street Lighting	0.85%	2.48%	2.48%	3.11%	-2.44%	4.08%	0.00%	-3.85%	28.00%
Customer-Owned Street Lighting									
Traffic Signals (3)									
Total Public Street Lighting Sales	-4.36%	-2.82%	-2.82%	-3.51%	-2.44%	4.08%	0.00%	-3.85%	28.00%
Municipal Pumping	0.27%	0.52%	1.03%	1.97%	4.06%	3.98%	2.56%	3.75%	0.00%
Total Customers	1.32%	1.45%	1.41%	1.39%	1.53%	1.79%	1.27%	1.63%	1.58%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-2
Page 1 of 4

Class	Actual 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Wyoming														
Residential Service	1,108	1,159	1,968	1,942	1,908	1,865	1,795	1,741	1,687	1,651	1,633	1,626	1,598	1,582
Residential - Water Heating (1)	793	796	0	0	0	0	0	0	0	0	0	0	0	0
Residential - All Electric	190	217	257	277	285	298	289	277	274	275	275	271	265	267
Residential - Demand	0	0	0	0	1	5	9	12	16	16	16	18	17	17
Residential - Energy Storage	0	0	0	0	1	1	1	1	0	0	0	0	0	0
Residential - Utility Controlled	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Residential	2,091	2,172	2,225	2,219	2,195	2,169	2,094	2,031	1,977	1,943	1,924	1,915	1,880	1,866
General Service	437	440	432	435	439	433	426	427	429	434	439	434	431	432
General Service - Large	3	3	3	3	3	3	4	4	4	5	5	6	6	6
General Service - All Electric	24	28	29	29	31	33	33	30	29	27	26	25	25	25
General Service - Utility Controlled	0	0	0	0	0	0	0	0	0	0	1	1	1	1
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	10	9	8	8	8	6	6	6	7	7	7	7	6	7
Industrial - Contract	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial - Curtailable	0	0	0	0	0	2	2	2	0	0	0	0	1	1
Total Commercial & Industrial Sales	474	480	472	475	481	477	471	469	469	473	478	473	470	472
Street Lighting	4	3	3	3	3	3	3	3	5	5	5	5	5	5
Customer-Owned Street Lighting	3	3	3	3	3	3	3	3	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	7	6	6	6	6	6	6	6	5	5	5	5	5	5
Municipal Pumping	3	3	3	5	5	5	4	4	4	3	3	3	3	3
Total Customers	2,575	2,661	2,706	2,705	2,687	2,657	2,575	2,510	2,455	2,424	2,410	2,396	2,358	2,346

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-2
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Class	Forecasted (1994 Report) 1994	1995	1996	1997	1998	1999	2000	Basis of Forecast
Wyoming								No growth for entire state.
Residential Service	1,581	1,581	1,581	1,581	1,581	1,581	1,581	
Residential - Water Heating (1)								
Residential - All Electric	266	266	266	266	266	266	266	
Residential - Demand	19	19	19	19	19	19	19	
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	1,866	1,866	1,866	1,866	1,866	1,866	1,866	
General Service	433	432	432	432	432	432	432	
General Service - Large	6	6	6	6	6	6	6	
General Service - All Electric	24	24	24	24	24	24	24	
General Service - Utility Controlled	1	1	1	1	1	1	1	
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping								
Industrial	7	7	7	7	7	7	7	
Industrial - Contract								
Industrial - Curtailable								
Total Commercial & Industrial Sales	471	470	470	470	470	470	470	
Street Lighting	5	5	5	5	5	5	5	
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	5	5	5	5	5	5	5	
Municipal Pumping	3	3	3	3	3	3	3	
Total Customers	2,344	2,344	2,344	2,344	2,344	2,344	2,344	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
18-Nov-94

Table 6-2
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Class	Forecasted (1988 Report)					Forecasted (1990 Report)							Forecasted (1992 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1997	1998
Wyoming																			
Residential Service	1,763	1,785	1,807	1,830	1,853	1,651	1,651	1,651	1,651	1,651	1,651	1,651	1,626	1,626	1,626	1,626	1,626	1,626	1,626
Residential - Water Heating (1)																			
Residential - All Electric	288	299	310	322	334	276	276	276	276	276	276	276	271	271	271	271	271	271	271
Residential - Demand	15	18	22	27	33	16	16	18	16	16	16	16	18	18	18	18	18	18	18
Residential - Energy Storage	1	1	1	1	1	0	0	0	0	0	0	0							
Residential - Utility Controlled																			
Total Residential	2,067	2,103	2,140	2,180	2,221	1,943	1,943	1,943	1,943	1,943	1,943	1,943	1,915	1,915	1,915	1,915	1,915	1,915	1,915
General Service	427	427	427	427	427	434	434	434	434	434	434	434	434	434	434	434	434	434	434
General Service - Large	4	4	4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6
General Service - All Electric	30	30	30	30	30	27	27	27	27	27	27	27	25	25	25	25	25	25	25
General Service - Utility Controlled													1	1	1	1	1	1	1
General Service - Curtailable																			
Area Lighting (2)																			
Energy Storage Service																			
Irrigation Pumping																			
Industrial	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Industrial - Contract																			
Industrial - Curtailable	2	2	2	2	2	0	0	0	0	0	0	0							
Total Commercial & Industrial Sales	469	469	469	469	469	473	473	473	473	473	473	473	473	473	473	473	473	473	473
Street Lighting	3	3	3	3	3	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Customer-Owned Street Lighting	3	3	3	3	3	0	0	0	0	0	0	0							
Traffic Signals (3)																			
Total Public Street Lighting Sales	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Municipal Pumping	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Total Customers	2,546	2,582	2,619	2,659	2,700	2,424	2,424	2,424	2,424	2,424	2,424	2,424	2,396	2,396	2,396	2,396	2,396	2,396	2,396

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
10-Nov-94

Table 6-2
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Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991	1991-1992	1992-1993
Wyoming									
Residential Service	-2.85%	-2.62%	-1.96%	-1.69%	-1.22%	-0.76%	-0.43%	-1.72%	-1.00%
Residential - Water Heating (1)									
Residential - All Electric	-0.64%	-1.59%	-1.28%	-0.55%	-0.37%	-0.91%	-1.45%	-2.21%	0.75%
Residential - Demand	74.11%	26.19%	14.87%	10.67%	4.00%	6.07%	12.50%	-5.56%	0.00%
Residential - Energy Storage									
Residential - Utility Controlled									
Total Residential	-2.41%	-2.37%	-1.77%	-1.46%	-1.06%	-0.72%	-0.47%	-1.83%	-0.74%
General Service	-0.23%	0.28%	0.37%	0.41%	0.39%	0.00%	-1.16%	-0.65%	0.23%
General Service - Large	10.76%	10.76%	8.45%	10.67%	14.47%	9.54%	20.00%	0.00%	0.00%
General Service - All Electric	-2.73%	-4.66%	-5.40%	-4.46%	-4.83%	-3.77%	-3.85%	0.00%	0.00%
General Service - Utility Controlled									
General Service - Curtailable									
Area Lighting (2)									
Energy Storage Service									
Irrigation Pumping									
Industrial	-2.64%	3.13%	3.13%	3.93%	0.00%	0.00%	0.00%	-14.29%	16.67%
Industrial - Contract									
Industrial - Curtailable									
Total Commercial & Industrial Sales	-0.33%	0.04%	0.08%	0.21%	0.28%	0.00%	-1.05%	-0.63%	0.43%
Street Lighting	10.76%	10.76%	10.76%	13.62%	0.00%	0.00%	0.00%	0.00%	0.00%
Customer-Owned Street Lighting									
Traffic Signals (3)									
Total Public Street Lighting Sales	-3.58%	-3.58%	-3.58%	-4.46%	0.00%	0.00%	0.00%	0.00%	0.00%
Municipal Pumping	-9.71%	-9.71%	-5.59%	-6.94%	-9.14%	0.00%	0.00%	0.00%	0.00%
Total Customers	-2.04%	-1.93%	-1.43%	-1.16%	-0.81%	-0.58%	-0.58%	-1.59%	-0.51%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
18-Nov-94

Table 6-3
Page 1 of 4

Class	Actual													
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Montana														
Residential Service	56	51	49	51	49	46	40	32	27	27	23	20	17	15
Residential - Water Heating (1)	6	5	0	0	0	2	0	1	1	0	0	0	0	0
Residential - All Electric	1	2	3	3	2	0	1	0	0	0	0	0	0	0
Residential - Demand	0	0	3	0	0	0	0	0	0	0	0	0	0	0
Residential - Energy Storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential - Utility Controlled	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Residential	63	58	55	54	51	48	41	33	28	27	23	20	17	15
General Service	33	40	39	40	41	40	41	37	35	35	35	34	34	32
General Service - Large	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General Service - All Electric	1	1	1	1	1	1	1	1	2	2	2	2	2	2
General Service - Utility Controlled	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	10	6	6	6	6	6	5	3	3	3	3	3	3	3
Industrial - Contract	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Commercial & Industrial Sales	44	47	46	47	48	47	47	41	40	40	40	39	39	37
Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Customer-Owned Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Municipal Pumping	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Customers	107	105	101	101	99	95	88	74	68	67	63	59	56	52

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-96

Table 6-3
Page 2 of 4

Class	Forecasted (1994 Report) 1994	1995	1996	1997	1998	1999	2000	Basis of Forecast
Montana								No growth for entire state.
Residential Service	15	15	15	15	15	15	15	
Residential - Water Heating (1)								
Residential - All Electric								
Residential - Demand								
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	15	15	15	15	15	15	15	
General Service	31	31	31	31	31	31	31	
General Service - Large								
General Service - All Electric	2	2	2	2	2	2	2	
General Service - Utility Controlled								
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping								
Industrial	3	3	3	3	3	3	3	
Industrial - Contract								
Industrial - Curtailable								
Total Commercial & Industrial Sales	36	36	36	36	36	36	36	
Street Lighting								
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	0	0	0	0	0	0	0	
Municipal Pumping								
Total Customers	51	51	51	51	51	51	51	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
18-Nov-94

Table 6-3
Page 3 of 4

Class	Forecasted (1988 Report)					Forecasted (1990 Report)							Forecasted (1992 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1997	1998
Montana																			
Residential Service	33	33	33	33	33	27	27	27	27	27	27	27	20	20	20	20	20	20	20
Residential - Water Heating (1)																			
Residential - All Electric																			
Residential - Demand																			
Residential - Energy Storage																			
Residential - Utility Controlled																			
Total Residential	33	33	33	33	33	27	27	27	27	27	27	27	20	20	20	20	20	20	20
General Service	37	37	37	37	37	35	35	35	35	35	35	35	34	34	34	34	34	34	34
General Service - Large																			
General Service - All Electric	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
General Service - Utility Controlled																			
General Service - Curtailable																			
Area Lighting (2)																			
Energy Storage Service																			
Irrigation Pumping																			
Industrial	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Industrial - Contract																			
Industrial - Curtailable																			
Total Commercial & Industrial Sales	41	41	41	41	41	40	40	40	40	40	40	40	39	39	39	39	39	39	39
Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0							
Customer-Owned Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0							
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0							
Total Public Street Lighting Sales	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Municipal Pumping	0	0	0	0	0	0	0	0	0	0	0	0							
Total Customers	74	74	74	74	74	67	67	67	67	67	67	67	59	59	59	59	59	59	59

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-3
Page 4 of 4

Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991	1991-1992	1992-1993
Montana									
Residential Service	-11.24%	-12.94%	-12.04%	-11.09%	-9.62%	-13.93%	-13.04%	-15.00%	-11.76%
Residential - Water Heating (1)									
Residential - All Electric									
Residential - Demand									
Residential - Energy Storage									
Residential - Utility Controlled									
Total Residential	-11.94%	-13.68%	-13.37%	-11.77%	-10.61%	-13.93%	-13.04%	-15.00%	-11.76%
General Service	-3.11%	-2.64%	-3.68%	-2.09%	-0.96%	-1.44%	-2.86%	0.00%	-5.88%
General Service - Large									
General Service - All Electric	14.87%	14.87%	14.87%	18.92%	0.00%	0.00%	0.00%	0.00%	0.00%
General Service - Utility Controlled									
General Service - Curtailable									
Area Lighting (2)									
Energy Storage Service									
Irrigation Pumping									
Industrial	-12.94%	-12.94%	-9.71%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Industrial - Contract									
Industrial - Curtailable									
Total Commercial & Industrial Sales	-3.58%	-3.17%	-3.66%	-1.24%	-0.84%	-1.26%	-2.50%	0.00%	-5.13%
Street Lighting									
Customer-Owned Street Lighting									
Traffic Signals (3)									
Total Public Street Lighting Sales									
Municipal Pumping									
Total Customers	-7.51%	-7.89%	-7.68%	-5.51%	-4.62%	-6.16%	-6.35%	-5.00%	-7.14%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
15-Nov-94

Table 6-4
Page 1 of 4

Class	Actual													
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Total Company														
Residential Service	26,626	28,671	31,018	33,687	33,991	34,229	34,410	34,675	34,757	35,018	35,729	36,044	36,348	36,754
Residential - Water Heating (1)	7,080	6,962	2,939	0	0	2	0	1	1	0	0	0	0	0
Residential - All Electric	4,852	5,176	5,358	5,512	5,692	5,940	6,169	6,293	6,338	6,265	6,184	6,115	6,185	6,157
Residential - Demand	0	0	3	33	126	231	326	436	616	775	933	1,117	1,304	1,476
Residential - Energy Storage	0	0	0	1	2	1	1	2	0	0	1	1	0	0
Residential - Utility Controlled	0	0	0	1	1	1	1	1	0	0	2	5	8	8
Total Residential	38,568	38,809	38,918	39,234	39,812	40,404	40,907	41,408	41,712	42,058	42,849	43,282	43,825	44,395
General Service	6,434	6,489	6,494	6,621	6,692	6,760	6,764	6,854	6,925	6,983	7,234	7,391	7,587	7,754
General Service - Large	72	75	78	80	83	87	99	97	99	98	98	104	113	110
General Service - All Electric	369	380	386	392	390	426	465	483	509	541	554	552	560	577
General Service - Utility Controlled	0	0	0	0	1	4	7	10	13	13	17	19	25	29
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	0	0	0	0	2	1	1	1	0	0	1	0	0	0
Irrigation Pumping	16	16	15	15	16	15	15	14	14	15	23	24	23	23
Industrial	45	40	38	38	39	34	35	32	33	34	39	39	35	34
Industrial - Contract	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Industrial - Curtailable	0	0	0	0	0	2	2	2	0	0	0	1	1	3
Total Commercial & Industrial Sales	6,938	7,002	7,013	7,148	7,225	7,331	7,390	7,495	7,596	7,687	7,969	8,133	8,347	8,541
Street Lighting	27	26	27	25	26	26	26	26	33	29	31	31	30	37
Customer-Owned Street Lighting	8	8	10	10	10	10	10	10	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	35	34	37	35	36	36	36	36	33	29	31	31	30	37
Municipal Pumping	82	80	79	80	78	81	80	78	75	77	81	83	86	86
Total Customers	45,623	45,925	46,047	46,497	47,151	47,852	48,413	49,017	49,416	49,851	50,930	51,529	52,288	53,059

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
15-Nov-94

Table 6-4
Page 2 of 4

Class	Forecasted (1994 Report) 1994	1995	1996	1997	1998	1999	2000	Basis of Forecast
Total Company								
Residential Service	37,186	37,641	38,069	38,496	38,923	39,350	39,778	
Residential - Water Heating (1)	0	0	0	0	0	0	0	
Residential - All Electric	6,081	6,075	6,075	6,075	6,075	6,075	6,075	
Residential - Demand	1,667	1,840	2,017	2,194	2,371	2,547	2,724	
Residential - Energy Storage	0	0	0	0	0	0	0	
Residential - Utility Controlled	0	0	0	0	0	0	0	
Total Residential	44,934	45,557	46,161	46,765	47,369	47,973	48,577	
General Service	7,950	8,108	8,282	8,456	8,629	8,803	8,977	
General Service - Large	120	123	127	131	135	139	143	
General Service - All Electric	583	599	610	622	634	645	657	
General Service - Utility Controlled	31	33	35	37	39	41	43	
General Service - Curtailable	0	0	0	0	0	0	0	
Area Lighting (2)	0	0	0	0	0	0	0	
Energy Storage Service	0	0	0	0	0	0	0	
Irrigation Pumping	22	22	22	22	22	22	22	
Industrial	33	33	33	33	33	33	33	
Industrial - Contract	3	3	3	3	3	3	3	
Industrial - Curtailable	0	0	0	0	0	0	0	
Total Commercial & Industrial Sales	8,742	8,921	9,113	9,304	9,495	9,686	9,877	
Street Lighting	22	22	22	22	22	22	22	
Customer-Owned Street Lighting	0	0	0	0	0	0	0	
Traffic Signals (3)	0	0	0	0	0	0	0	
Total Public Street Lighting Sales	22	22	22	22	22	22	22	
Municipal Pumping	88	91	92	94	96	98	100	
Total Customers	53,787	54,590	55,388	56,185	56,982	57,779	58,576	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Table 6-4
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Class	Forecasted (1988 Report)					Forecasted (1990 Report)							Forecasted (1992 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996	1997	1998
Total Company																			
Residential Service	35,277	35,888	36,510	37,143	37,787	35,351	35,688	36,028	36,372	36,719	37,069	37,423	36,474	36,909	37,350	37,796	38,248	38,706	39,169
Residential - Water Heating (1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential - All Electric	6,414	6,537	6,662	6,790	6,920	6,265	6,265	6,265	6,265	6,265	6,265	6,265	6,115	6,115	6,115	6,115	6,115	6,115	6,115
Residential - Demand	498	568	646	740	845	851	935	1,027	1,128	1,239	1,361	1,496	1,205	1,300	1,403	1,514	1,634	1,763	1,903
Residential - Energy Storage	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Residential - Utility Controlled	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Residential	42,192	42,996	43,821	44,676	45,555	42,467	42,888	43,320	43,765	44,223	44,695	45,184	43,794	44,324	44,868	45,425	45,997	46,584	47,187
General Service	6,950	7,047	7,146	7,246	7,348	7,048	7,114	7,180	7,247	7,315	7,383	7,452	7,224	7,308	7,394	7,481	7,569	7,658	7,748
General Service - Large	99	101	103	105	108	98	98	98	98	98	98	98	108	112	116	120	125	130	135
General Service - All Electric	499	516	534	552	571	551	561	572	583	594	606	617	563	574	585	596	607	619	631
General Service - Utility Controlled	10	10	10	10	10	13	13	13	13	13	13	13	21	23	25	27	30	33	36
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Irrigation Pumping	14	14	14	14	14	15	15	15	15	15	15	15	25	26	27	28	29	30	31
Industrial	32	32	32	32	32	34	34	34	34	34	34	34	40	41	42	43	44	45	46
Industrial - Contract	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Industrial - Curtailable	2	2	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Commercial & Industrial Sales	7,609	7,725	7,844	7,964	8,086	7,762	7,838	7,915	7,993	8,072	8,151	8,232	7,984	8,087	8,192	8,298	8,407	8,518	8,630
Street Lighting	26	26	26	26	26	29	29	29	29	29	29	29	32	33	34	35	36	37	38
Customer-Owned Street Lighting	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	36	36	36	36	36	29	29	29	29	29	29	29	32	33	34	35	36	37	38
Municipal Pumping	78	78	78	78	78	77	77	77	77	77	77	77	85	87	89	91	93	95	97
Total Customers	49,915	50,835	51,781	52,754	53,757	50,336	50,832	51,341	51,864	52,401	52,952	53,522	51,895	52,531	53,183	53,849	54,533	55,234	55,952

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
16-Nov-94

Class	Historical Growth Rates								
	1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991	1991-1992	1992-1993
Total Company									
Residential Service	0.60%	0.86%	0.93%	0.97%	1.22%	1.45%	0.88%	0.84%	1.12%
Residential - Water Heating (1)									
Residential - All Electric	1.94%	0.81%	-0.18%	-0.71%	-1.19%	-1.20%	-1.12%	0.82%	-0.13%
Residential - Demand	43.81%	32.21%	27.93%	26.51%	21.94%	20.05%	19.72%	16.74%	13.19%
Residential - Energy Storage									
Residential - Utility Controlled									
Total Residential	1.10%	1.18%	1.14%	1.11%	1.24%	1.44%	1.01%	1.25%	1.30%
General Service	0.85%	1.36%	1.79%	1.90%	2.19%	2.88%	2.17%	2.65%	2.20%
General Service - Large	3.38%	2.41%	0.99%	1.76%	1.66%	3.02%	6.12%	8.65%	4.42%
General Service - All Electric	6.76%	5.60%	3.49%	3.39%	2.74%	1.01%	-0.36%	1.45%	3.04%
General Service - Utility Controlled	67.03%	33.56%	22.10%	17.41%	13.48%	20.89%	11.76%	31.58%	16.00%
General Service - Curtailable									
Area Lighting (2)									
Energy Storage Service									
Irrigation Pumping	-1.28%	8.92%	9.86%	14.42%	19.68%	26.49%	4.35%	-4.17%	0.00%
Industrial	-2.71%	2.78%	2.19%	5.07%	5.73%	7.10%	0.00%	-10.26%	-2.86%
Industrial - Contract	8.45%	8.45%	8.45%	10.67%	0.00%	0.00%	0.00%	0.00%	0.00%
Industrial - Curtailable									
Total Commercial & Industrial Sales	1.25%	1.68%	1.93%	2.06%	2.30%	2.86%	2.06%	2.63%	2.32%
Street Lighting	2.21%	3.58%	3.58%	4.50%	-2.06%	3.39%	0.00%	-3.23%	23.33%
Customer-Owned Street Lighting									
Traffic Signals (3)									
Total Public Street Lighting Sales	-4.23%	-2.95%	-2.95%	-3.67%	-2.06%	3.39%	0.00%	-3.23%	23.33%
Municipal Pumping	-0.26%	0.00%	0.74%	1.57%	3.44%	3.82%	2.47%	3.61%	0.00%
Total Customers	1.12%	1.25%	1.26%	1.26%	1.41%	1.67%	1.18%	1.47%	1.47%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Chapter 7 - System Peak

The monthly system peak discussed in Chapter 5 is developed using a "bottom's up" approach. First, monthly sales are forecasted for each customer classification in each jurisdiction. Next, monthly energy is calculated by applying monthly sales to energy ratios to the total sales forecast. Finally, the monthly peak is determined by applying a monthly load factor (average energy requirements divided by peak energy requirements) to the energy forecast. The peak forecast is dependent upon each component of the sales and energy forecasts.

An alternate method of forecasting system peak requirements is to forecast the system peaks directly. There are two significant benefits that are derived from this exercise. First, such a forecast can be used as a check on the reasonableness of the bottom's up approach. Second, the impact of variables which directly affect the system peak can be quantified and then used to predict the peak under varying circumstances without forecasting numerous components in a bottom's up approach.

In this chapter, separate regression models are developed for summer and winter period system peak requirements. It is generally easier to analyze the summer and winter separately because the effect of temperature on the two seasons is the opposite; temperature and summer peaks are positively correlated, and temperature and winter peaks are negatively correlated. In other words the summer peak generally increases as temperature increases and the winter peak generally increases as the temperature decreases. Further, the relationship between peak load and temperature is not the same during the summer and winter. Each degree in temperature change during the summer has a more significant impact on load than each degree in temperature change during the winter. These differences result from the differences between how heating and cooling equipment are designed and used and on the saturation of cooling and space heating equipment in Black Hills service territory.

Historical Perspective

Prior to about 1990, Black Hills generally experienced leap frogging peaks where a new system peak was set with each new winter or summer season. Table 7-1 and 7-2 summarize statistics regarding the winter and summer peaks, respectively, since the 1982-83 winter season. The last couple of years has seen exception to the general trend. The system peaks have not increased appreciably since 1991. During the 1990-91 winter season, the all-time winter peak of 293 megawatts was set, and this year's all time summer peak of 279 megawatts barely surpassed the summer 1991 peak of 276 megawatts. There are two principal reasons why the historical trend has not continued into 1992 through 1994. The

first reason is due to recent weather and the second is with regard to changes in the Company's service to Gillette, Wyoming.

The last three summers have been abnormally mild. The summers of 1992 and 1993 were the coolest in the available database (going back to 1969) and the summer of 1994 was the fifth coolest (out of 26 years). Further, as shown in Table 7-2, the "hot" stretches during 1992 through 1994 were significantly cooler than prior experience. The maximum temperatures on the day of the system peaks during 1992 through 1994 were around 95 degrees compared with temperatures in the low 100's in prior years. More importantly, the temperatures on the days preceding the system peaks during 1992 through 1994 were extremely mild. The average maximum temperatures during the five day period ending with the day of system peak were in the low 80's during 1992 through 1994. In prior years the average was 15 to 20 degrees higher. Historically, sustained periods of hot weather have preceded system peaks.

With regard to the winter periods, the 1991-92 winter was the second warmest in the last 30 years, the 1992-93 was the second coldest in the last 30 years, the 1993-94 was relatively close to normal. Even though the 1992-93 winter was cold overall, it did not experience the extreme cold periods experienced during the 1987-88 through 1990-91 winter periods. The 1991-92 and 1993-94 winters experienced no appreciable cold spell.

In summary, recent weather conditions have been extremely mild compared to historical standards. Historically, summer peaks have occurred during sustained periods of hot weather and winter peaks have occurred during very cold spikes. Neither of these conditions have existed during the last three years. Therefore, the peaks set during the last three years should not be indicative of the level of latent peak demand which currently exists.

The second contributing factor to the recent exception to the long term trend is that in July 1989 Black Hills ceased providing 100 percent of Gillette, Wyoming's requirements. During the last couple of years, approximately 5 to 10 megawatts of Gillette's coincident peak load has been met by sources other than Black Hills. Initially, this reduction in load contributes to a decline in the system peak, all other things being equal. Over time, as Gillette's load grows the initial decline is eliminated.

With these historical observations in mind, the next sections summarize the development of models analyzing the Company's summer and winter peaks.

Winter Peak

The regression model developed for the winter period relies upon daily peak load and temperature data for the period January 1983 through March 1994. For purposes of the analysis, the winter period is defined as November through March. Even though cold weather occurs during October and April, the purpose of the analysis is to determine the winter peak.

and under normal circumstances, a winter peak is not going to occur during these months. No winter peaks have been set in March, but March is a winter month and eliminating it from the analysis has no appreciable effect on the statistical analysis performed.

Several independent variables were analyzed using multiple linear regression to explain the variation in daily peak load, but four were found to have the highest correlation- the current day's heating degree-days, trend (time), whether the day was a holiday or on a weekend, and the change in service to Gillette. The resulting equation, statistics, and a comparison of the peaks using this regression model to the bottom's up approach are shown in Table 7-3.

As expected, most of the variation in daily peak load is explained by the change in the current day's heating degree-days. The current day's heating degree-days exhibits a stronger correlation than the current day's minimum temperature. Temperatures on prior days did not have a significant impact on the analysis. If the day was a holiday or on a weekend, the regression analysis indicates that the load is approximately 26 megawatts less than a weekday. It makes intuitive sense that demand would be lower on weekends and holidays because of the reduction in commercial and industrial activity. The trend analysis indicates that winter load is growing at about six megawatts per year. The change in service to Gillette reduced winter peak load by about 6.5 megawatts. This is consistent with recent experience.

As shown in Table 7-3 the winter peak predicted by the regression model is very close to the winter peaks predicted using the bottom's up approach used for the 1994 Load Forecast. The regression model predicts a winter peak for 1994-95 of 288 megawatts at 80 heating degree-days. This compares to figures of 276 megawatts in the 1994 Forecast and 284 megawatts in the 1992 Forecast. In 2000-2001 the regression model predicts a peak of 326 megawatts at 80 heating degree-days compared to the 1994 Forecast of 317 megawatts.

Summer Peak

The regression model developed for the summer period relies upon daily peak load and temperature data for the period June 1983 through August 1994. For purposes of the analysis, the summer period is defined as June through September. Even though no summer peaks have been set in September, it is a summer month and eliminating it from the analysis has no appreciable effect on the statistical analysis performed.

Several independent variables were analyzed using multiple linear regression to explain the variation in daily peak load, but five were found to have the highest correlation- the current day's cooling degree-days, trend (time), whether the day was a holiday or on a weekend, the average maximum temperature over the last five days, and the change in service to Gillette. The resulting equation, statistics, and a comparison of the peaks using this regression model to the bottom's up approach are shown in Table 7-4.

As expected, most of the variation in daily peak load is explained by the change in the current day's cooling degree-days. The current day's maximum temperature did not exhibit as strong a correlation as the current day's cooling degree-days. If the day was a holiday or on a weekend, the regression analysis indicates that the load is approximately 32 megawatts less than a weekday. The trend analysis indicates that summer load is growing at about six megawatts per year. The change in service to Gillette reduced summer peak load by about two megawatts. This is consistent with recent experience.

As shown in Table 7-4 the summer peak predicted by the regression model is close to the summer peaks predicted using the bottom's up approach used for the 1994 Load Forecast. The regression model predicts a summer peak for 1995 of 303 megawatts at 25 cooling degree-days and a five day average maximum temperature of 100 degrees. This compares to figures of 293 megawatts in the 1994 Forecast and 312 megawatts in the 1992 Forecast. In 2000 the regression model predicts a peak of 334 megawatts compared to the 1994 Forecast of 320 megawatts.

Black Hills Power and Light
P.U. 19124.110
Historical Winter Peaks
15-Nov-94

Table 7-1
Page 1 of 2

Year	Season's Heating Degree-Days	Date	Hour	Day of Week	Peak	Daily Energy	Daily Load Factor	Maximum Temperature	Minimum Temperature	Average Temperature	Heating Degree-Days
	(1)				MW	MWh	%	F	F	F	F
1982-1983	6,787	11/22/82	18	Monday	202	4085	84.26%	23	12	18	47
		11/21/82	18	Sunday	163	3250	83.08%	28	22	25	40
		11/20/82	18	Saturday	155	3159	84.92%	44	26	35	30
		11/19/82	18	Friday	165	3402	85.91%	58	34	46	19
		11/18/82	18	Thursday	165	3368	85.05%	63	35	49	16
		Average						43	26	35	30
1983-1984	7,360	12/20/83	18	Tuesday	220	4560	86.36%	-1	-6	-4	69
		12/19/83	18	Monday	217	4450	85.45%	-1	-8	-5	70
		12/18/83	18	Sunday	197	4108	86.89%	-1	-7	-4	69
		12/17/83	19	Saturday	200	4205	87.60%	-1	-5	-3	68
		12/16/83	18	Friday	205	4254	86.46%	12	-3	5	60
		Average						2	-6	-2	67
1984-1985	7,645	1/31/85	19	Thursday	219	4723	89.86%	11	-8	2	63
		1/30/85	20	Wednesday	211	4591	90.66%	0	-9	-5	70
		1/29/85	18	Tuesday	205	4279	86.97%	24	1	13	52
		1/28/85	17	Monday	188	3941	87.34%	34	14	24	41
		1/27/85	19	Sunday	192	3229	88.51%	35	17	26	39
		Average						21	3	12	53
1985-1986	7,665	11/21/85	16	Thursday	231	4717	85.08%	6	-4	1	64
		11/20/85	18	Wednesday	222	4633	86.96%	5	-6	-1	66
		11/19/85	18	Tuesday	219	4577	87.08%	12	1	7	58
		11/18/85	18	Monday	220	4352	82.42%	24	6	15	50
		11/17/85	18	Sunday	167	3356	83.73%	35	24	30	35
		Average						16	4	10	55
1986-1987	6,496	12/9/86	18	Tuesday	232	4762	85.52%	20	1	11	54
		12/8/86	18	Monday	220	4482	84.51%	33	20	27	38
		12/7/86	18	Sunday	180	3708	85.83%	32	18	25	40
		12/6/86	18	Saturday	190	3985	87.39%	28	19	24	41
		12/5/86	18	Friday	201	4193	86.92%	44	22	33	32
		Average						31	16	24	41
1987-1988	6,891	1/8/88	18	Friday	244	5147	87.89%	5	-11	-3	68
		1/7/88	8	Thursday	235	5003	88.71%	23	-1	11	54
		1/6/88	18	Wednesday	242	5190	89.36%	14	-16	-1	66
		1/5/88	8	Tuesday	238	5124	89.71%	7	-17	-5	70
		1/4/88	18	Monday	238	5052	88.45%	10	-7	2	63
		Average						12	-10	1	64
1988-1989	7,217	2/2/89	18	Thursday	282	6010	88.80%	-18	-24	-21	86
		2/1/89	20	Wednesday	267	5591	87.25%	-6	-17	-12	77
		1/31/89	19	Tuesday	230	4361	79.00%	61	-4	29	36
		1/30/89	9	Monday	196	4080	86.73%	72	31	52	13
		1/29/89	19	Sunday	173	3676	88.54%	55	19	37	28
		Average						33	1	17	48
1989-1990	8,859	12/21/89	18	Thursday	266	5791	90.71%	-10	-24	-17	82
		12/20/89	18	Wednesday	261	5447	86.96%	1	-10	-5	70
		12/19/89	18	Tuesday	252	5423	89.67%	5	-12	-4	69
		12/18/89	18	Monday	253	5309	87.43%	4	-9	-3	68
		12/17/89	19	Sunday	223	4624	86.40%	17	-3	7	58
		Average						3	-12	-4	69

Black Hills Power and Light
P.N. 19124.110
Historical Winter Peaks
16-Nov-94

Year	Season's Heating Degree-Days	Date	Hour	Day of Week	Peak	Daily Energy	Daily Load Factor	Maximum Temperature	Minimum Temperature	Average Temperature	Heating Degree-Days
	(1)				MW	MWh	%	F	F	F	F
1990-1991	6,736	12/20/90	18	Thursday	293	6319	89.86%	-14	-18	-16	81
		12/19/90	18	Wednesday	284	5992	87.91%	-2	-15	-9	74
		12/18/90	18	Tuesday	247	5026	84.78%	39	0	20	45
		12/17/90	19	Monday	240	4971	86.30%	28	11	20	45
		12/16/90	18	Sunday	208	4280	85.74%	37	13	25	40
		Average						18	-2	8	57
1991-1992	6,256	11/1/91	18	Friday	256	5470	89.03%	15	2	9	56
		10/31/91	9	Thursday	244	5240	89.48%	30	-1	15	50
		10/30/91	8	Wednesday	246	5324	90.18%	15	3	9	56
		10/29/91	19	Tuesday	247	5198	87.69%	17	1	9	56
		10/28/91	18	Monday	255	5243	85.75%	21	12	17	48
		Average						20	3	12	53
1992-1993	7,996	12/30/92	10	Wednesday	284	6034	88.53%	-5	-11	-8	73
		12/29/92	10	Tuesday	271	5738	88.22%	8	-9	-1	66
		12/28/92	11	Monday	277	5798	87.21%	13	-3	5	60
		12/27/92	20	Sunday	214	4319	84.09%	38	15	27	38
		12/26/92	18	Saturday	198	4249	89.41%	37	11	24	41
		Average						18	1	9	56
1993-1994	6,347	1/17/94	12	Monday	278	5918	88.70%	5	0	3	63
		1/16/94	19	Sunday	242	5000	86.09%	37	5	21	44
		1/15/94	11	Saturday	231	5022	90.58%	40	9	25	41
		1/14/94	11	Friday	249	5319	89.36%	14	8	11	54
		1/13/94	19	Thursday	235	4922	87.27%	42	16	29	36
		Average						28	8	18	48

(1) Normal annual heating degree-days are 7,301.

Black Hills Power and Light
P.U. 19124.110
Historical Summer Peaks
16-Nov-94

Year	Season's Cooling Degree-Days	Date	Hour	Day of Week	Peak	Daily Energy	Daily Load Factor	Maximum Temperature	Minimum Temperature	Average Temperature	Cooling Degree-Days
	(1)				MW	MWh	%	F	F	F	F
1983	848	August 9	17	Tuesday	224	4290	79.80%	100	65	83	18
		August 8	17	Monday	206	4018	81.27%	90	68	79	14
		August 7	18	Sunday	177	3507	82.56%	97	67	82	17
		August 6	19	Saturday	173	3482	83.86%	91	63	77	12
		August 5	14	Friday	195	3771	80.58%	90	67	79	14
		Average						94	66	80	15
1984	646	August 13	16	Monday	214	4019	78.25%	96	68	82	17
		August 12	17	Sunday	164	3356	85.26%	95	63	79	14
		August 11	16	Saturday	177	3568	83.99%	96	61	79	14
		August 10	16	Friday	200	3820	79.58%	93	55	74	9
		August 9	16	Thursday	192	3743	81.23%	86	58	72	7
		Average						93	61	77	12
1985	648	July 11	15	Thursday	229	4461	81.17%	101	66	84	19
		July 10	16	Wednesday	224	4367	81.23%	99	61	80	15
		July 9	15	Tuesday	221	4249	80.11%	94	67	81	16
		July 8	14	Monday	217	4175	80.17%	96	75	86	21
		July 7	16	Sunday	179	3554	82.73%	101	66	84	19
		Average						98	67	83	18
1986	491	August 19	16	Tuesday	230	4481	81.18%	103	64	84	19
		August 18	17	Monday	220	4221	79.94%	92	62	77	12
		August 17	22	Sunday	161	3153	81.60%	79	56	68	3
		August 16	17	Saturday	163	3460	88.45%	85	61	73	8
		August 15	14	Friday	212	4074	80.07%	98	58	78	13
		Average						91	60	76	11
1987	702	July 30	16	Thursday	254	4958	81.33%	102	72	87	22
		July 29	14	Wednesday	251	4873	80.89%	103	68	86	21
		July 28	13	Tuesday	239	4755	82.90%	99	72	86	21
		July 27	15	Monday	250	4759	79.32%	102	71	87	22
		July 26	17	Sunday	195	3921	83.78%	103	69	86	21
		Average						102	70	86	21
1988	1014	June 27	14	Monday	261	4865	77.67%	101	65	83	18
		June 26	18	Sunday	200	3984	83.00%	95	62	79	14
		June 25	18	Saturday	203	4183	85.86%	90	64	77	12
		June 24	14	Friday	250	4952	82.53%	104	69	87	22
		June 23	15	Thursday	249	4826	80.76%	97	66	82	17
		Average						97	65	82	17
1989	834	July 7	15	Friday	250	4931	82.18%	108	63	86	21
		July 6	17	Thursday	232	4667	83.82%	87	64	76	11
		July 5	14	Wednesday	247	4868	82.12%	101	74	88	23
		July 4	13	Tuesday	197	4004	84.69%	106	63	85	20
		July 3	13	Monday	209	4140	82.54%	93	60	77	12
		Average						99	65	82	17
1990	784	July 2	15	Monday	275	5373	81.41%	105	74	90	25
		July 1	17	Sunday	228	4659	85.14%	100	72	86	21
		June 30	17	Saturday	238	4793	83.91%	98	64	81	16
		June 29	17	Friday	253	5033	82.89%	90	66	78	13
		June 28	16	Thursday	254	5041	82.69%	91	64	78	13
		Average						97	68	83	18

Black Hills Power and Light
P.N. 19124.110
Historical Summer Peaks
16-Nov-94

Year	Season's Cooling Degree-Days	Date	Hour	Day of Week	Peak	Daily Energy	Daily Load Factor	Maximum Temperature	Minimum Temperature	Average Temperature	Cooling Degree-Days
	(1)				MW	MWh	%	F	F	F	F
1991	749	August 27	15	Tuesday	276	5446	82.22%	103	69	86	21
		August 26	15	Monday	273	5276	80.53%	101	65	83	18
		August 25	18	Sunday	227	4457	81.81%	103	65	84	19
		August 24	15	Saturday	224	4528	84.23%	99	67	83	18
		August 23	15	Friday	237	4763	83.74%	96	56	76	11
		Average						100	64	82	17
1992	338	August 7	16	Friday	251	5098	84.63%	95	57	76	11
		August 6	15	Thursday	234	4887	87.02%	84	58	71	6
		August 5	13	Wednesday	224	4719	87.78%	79	54	67	2
		August 4	13	Tuesday	229	4708	85.66%	77	54	66	1
		August 3	10	Monday	230	4623	83.75%	69	55	62	0
		Average						81	56	68	4
1993	247	July 30	16	Friday	267	5161	80.54%	95	66	81	16
		July 29	15	Thursday	252	5021	83.02%	88	54	71	6
		July 28	15	Wednesday	228	4666	85.27%	81	51	66	1
		July 27	12	Tuesday	218	4433	84.73%	70	51	61	0
		July 26	14	Monday	228	4485	81.96%	78	59	69	4
		Average						82	56	70	5
1994	488	August 22	14	Monday	279	5612	80.82%	94	66	80	15
		August 21	21	Sunday	224	4393	81.72%	87	55	71	6
		August 20	18	Saturday	210	4416	87.62%	81	54	68	3
		August 19	14	Friday	232	4707	84.54%	76	55	66	1
		August 18	16	Thursday	265	5258	82.67%	85	63	74	9
		Average						85	59	72	7

(1) 1994 is approximate number through August.
Normal annual cooling degree-days are 667.
1983-1993 average annual cooling degree-days are 748.

Black Hills Power & Light
Proj. No. 19124.110
Analysis of Winter Peaks

Table 7-3

Regression Output:

Constant - MW	138.1051
Std Err of Y Est	9.306465
R Squared	0.891786
No. of Observations	1754
Degrees of Freedom	1749

	TREND	WE/HOL	GILLETTE	HDD
	MW/day	MW	MW	MW/CDD
X Coefficient(s)	0.017239	-26.4800	-6.46077	1.016608
Std Err of Coef.	0.000355	0.476977	0.878332	0.015729
T	48.47275	-55.5163	-7.35572	64.63185

Annual Trend 6.292571 MW

	Regression Model High	Low	1992 Forecast	1994 Forecast
	MW	MW	MW	MW
HDD	80	65		
1994-95	288	273	284	276
1995-96	295	273	291	287
1996-97	301	279	299	294
1997-98	307	286	307	300
1998-99	313	292	315	305
1999-2000	320	298	323	309
2000-2001	326	304	331	317

Black Hills Power & Light
Proj. No. 19124.110
Analysis of Summer Peaks

Table 7-4

Regression Output:

Constant - MW	142.7189
Std Err of Y Est	8.661563
R Squared	0.918175
No. of Observations	1434
Degrees of Freedom	1428

	TREND	WE/HOL	GILLETTE	CDD	5DAY MAX
	MW/day	MW	MW	MW/CDD	MW/Deg.
X Coefficient(s)	0.017416	-32.1076	-2.31778	2.657467	0.160913
Std Err of Coef.	0.000368	0.498249	0.910069	0.057338	0.036270
T	47.29244	-64.4410	-2.54681	46.34724	4.436505

Annual Trend 6.357121 MW

	Regression Model High	Regression Model Low	1992 Forecast	1994 Forecast
	MW	MW	MW	MW
5 Day Max Avg. Tem	100	90		
CDD	25	15		
1995	303	274	312	293
1996	309	281	321	303
1997	315	287	329	309
1998	322	294	338	314
1999	328	300	347	319
2000	334	306	355	320

Black Hills Power & Light Company
Summary of Approximate Annual Growth Rates
South Dakota Jurisdiction
11-Oct-94

Class	1988 Report			1990 Report			1992 Report			1994 Report		
	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use
							(3)			(4)		
Residential + Residential Water Heat	1.99%	1.76%	1.76%	1.96%	1.69%	1.69%	2.35%	2.35%	2.35%	0.72%	1.82%	1.82%
Residential All Electric	2.10%	1.83%	1.83%	1.27%	0.29%	0.29%	-0.15%	-0.19%	-0.19%	-1.67%	0.02%	0.02%
Residential Others	*7.94%	13.86%	13.56%	62.53%	10.42%	10.43%	26.26%	7.84%	7.84%	18.88%	6.95%	6.95%
General Service	3.87%	0.96%	1.50%	3.86%	2.92%	2.92%	4.76%	3.38%	3.38%	3.42%	3.54%	3.54%
Large General Service	3.76%	2.51%	2.51%	4.43%	4.43%	4.43%	5.54%	3.71%	3.71%	4.92%	3.42%	3.42%
General Service All Electric	4.41%	3.62%	3.62%	3.61%	1.69%	2.50%	1.88%	1.59%	1.59%	1.21%	1.82%	1.82%
Area Lighting	-0.34%	0.53%	0.53%	-0.74%	-0.01%	-0.01%	-0.49%	-0.51%	-0.51%	-0.48%	-0.36%	-0.36%
General Service - Irrigation	3.11%	0.84%	0.84%	7.02%	-3.65%	-3.65%	12.04%	4.48%	4.48%	14.52%	-0.12%	-0.12%
Other General Service	72.80%	0.00%	2.00%	36.38%	9.34%	9.34%	16.81%	8.92%	8.92%	39.77%	8.89%	8.89%
Industrial	4.14%	-0.44%	0.00%	4.89%	3.60%	3.60%	10.91%	5.61%	5.61%	6.69%	4.04%	4.04%
Contract Industrial (1)	9.55%	3.28%	0.00%	8.58%	5.01%	0.00%	2.98%	2.35%	1.00%	2.43%	1.94%	-0.96%
Street Lighting (1)	0.94%	3.62%	1.76%	-1.30%	-0.12%	1.00%	-7.41%	1.61%	1.61%	-1.19%	2.55%	2.55%
Municipal Pumping	3.39%	1.92%	1.92%	3.55%	0.17%	2.00%	-1.25%	1.88%	1.88%	0.36%	-0.04%	-0.04%
Total South Dakota	4.83%	2.40%	2.27%	4.81%	3.52%	2.13%	3.97%	3.07%	3.07%	2.80%	2.80%	2.80%

(1) Growth rates do not reflect direct adjustments made to 1988 report.
(2) Small numbers are not statistically different from 0.
(3) Based on data from 1987 - 1992.
(4) Based on data from 1988 - June 1994.

Black Hills Power & Light Company
Summary of Approximate Annual Growth Rates
Wyoming Jurisdiction
26-Oct-94

Class	1988 Report			1990 Report			1992 Report			1994 Report		
	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use
							(4)		(3)	(5)	(3)	
Residential	-1.68%	1.25%	1.25%	-1.90%	-0.04%	-0.04%	-0.68%	-0.47%	-0.47%	-0.84%	-0.02%	-0.02%
Residential All Electric	-0.13%	3.80%	3.80%	-1.29%	-1.49%	0.00%	-0.60%	-0.65%	-0.65%	-2.37%	0.01%	0.01%
Residential Others	20.27%	23.52%	23.72%	40.34%	6.31%	6.31%	8.82%	4.84%	4.84%	1.13%	0.06%	0.06%
General Service	3.03%	1.06%	0.00%	2.64%	0.75%	0.75%	-2.53%	-4.06%	-4.06%	-2.49%	1.21%	1.21%
Large General Service	4.78%	0.00%	0.00%	6.63%	5.93%	5.93%	11.13%	5.79%	5.79%	8.24%	2.92%	2.92%
General Service All Electric	-0.06%	2.20%	0.00%	-3.11%	-0.17%	-0.17%	-7.05%	-8.03%	-8.03%	-5.26%	-2.25%	-2.25%
Area Lighting	0.62%	0.00%	0.00%	-0.04%	-0.02%	-0.02%	-2.08%	-2.08%	-2.08%	-1.55%	-1.55%	-1.55%
Industrial	0.34%	0.33%	0.33%	-0.54%	-0.52%	-0.52%	-0.11%	-0.11%	-0.11%	2.68%	2.31%	2.31%
Street Lighting (1),(2)	NA	NA	NA	-0.16%	0.39%	0.39%	-6.02%	-4.86%	-4.86%	-7.73%	-0.01%	-0.01%
Municipal Pumping	5.81%	4.06%	4.06%	1.00%	0.01%	0.01%	-8.57%	-0.32%	-0.32%	-10.88%	0.00%	0.00%
Total Wyoming	0.57%	1.11%	0.94%	-0.14%	0.10%	0.15%	-0.87%	-0.15%	-0.08%	1.57%	1.82%	1.82%

(1) Growth rates do not reflect direct adjustments made to 1988 report.
(2) Includes Customer-Owned Street Lighting and Traffic Signals.
(3) Small numbers are not statistically different from 0.
(4) Based on data from 1987 - 1992.
(5) Based on data from 1988 - June 1994.

Black Hills Power & Light Company
Summary of Approximate Annual Growth Rates
Montana Jurisdiction
22-Apr-92

Class	1988 Report			1990 Report			1992 Report			1994 Report		
	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use
			(1)				(3)		(2)	(4)		
Residential	-10.73%	0.15%	-1.00%	-13.29%	-0.07%	-0.07%	-16.76%	-0.23%	-0.23%			
General Service	3.56%	2.99%	-1.00%	-2.00%	0.03%	0.03%	-9.74%	0.15%	0.15%			
Industrial	-7.11%	-1.72%	0.00%	-8.67%	-28.27%	0.00%	-15.71%	-0.14%	-0.14%			
Area Lighting	0.12%	0.00%	0.00%	-1.04%	0.00%	0.00%	-7.05%	0.05%	0.05%			
Total Montana	-0.83%	-1.13%	0.45%	-8.53%	-26.25%	-0.02%	-15.50%	-0.13%	-0.13%	-19.72%	-19.72%	0.00%

(1) Signs are opposite in 1988 report due to small contribution to total of residential and general service and the statistical insignificance of the calculated growth rates.
(2) Small numbers are not statistically different from 0.
(3) Based on data from 1987 - 1992.
(4) Based on data from 1988 - June 1994.

Black Hills Power & Light Company
Calculation of Approximate Annual Growth Rates
Gillette, Wyoming Total Requirements
26-Oct-94

	Historical	Future	Use
1988 Report	8.47%	2.66%	0.00%(1) 2.66%(2)
1990 Report	7.40%	3.21%	3.21%
1992 Report	2.96%	2.35%	2.35%
1994 Report (3)	0.60%	1.21%	1.21%

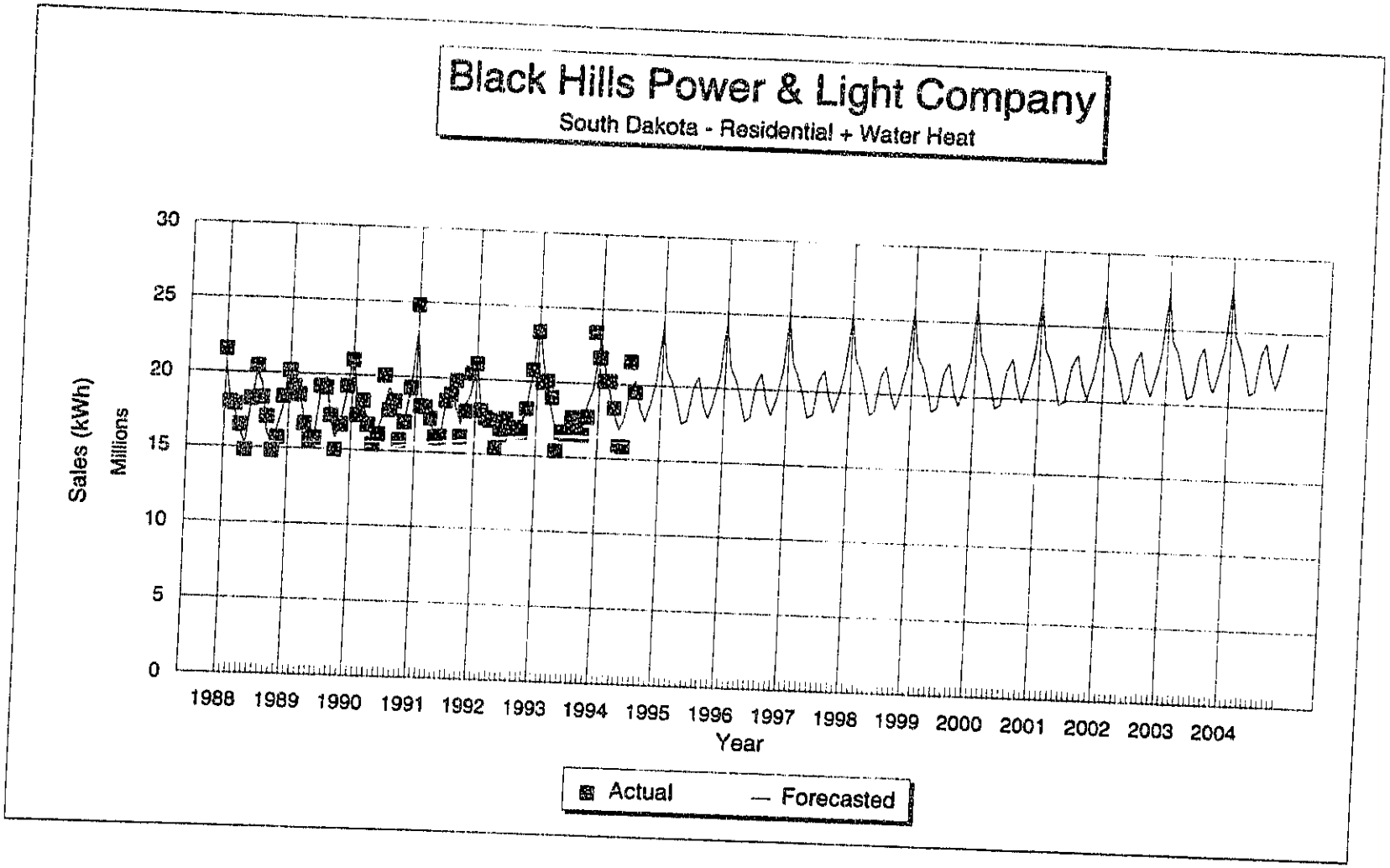
(1) 1988-1990
(2) 1990 on
(3) Based on data from 1988 - June 1994.

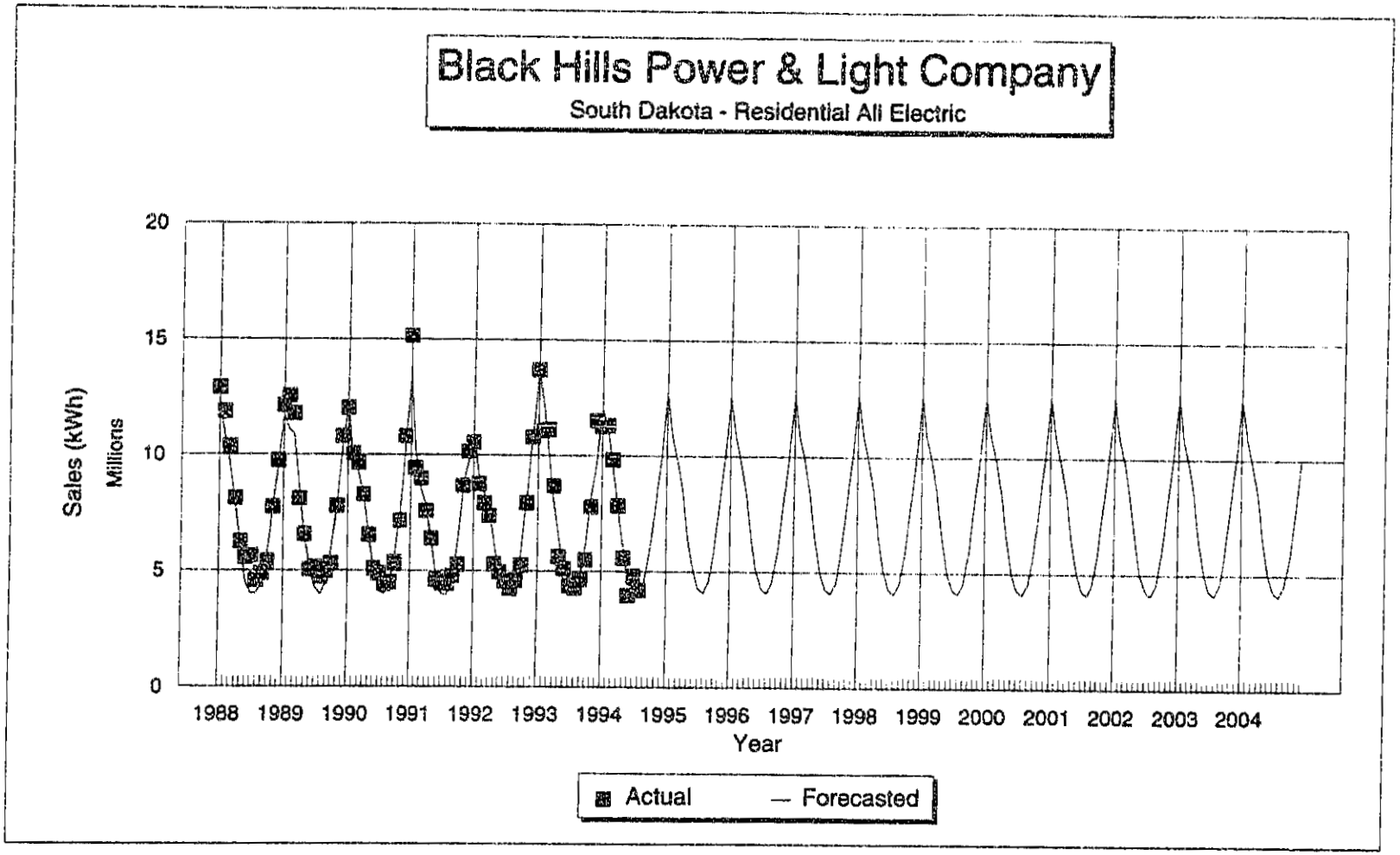
Black Hills Power and Light Company
Total Company Approximate Annual Growth Rate
Regression Output
16-Nov-94

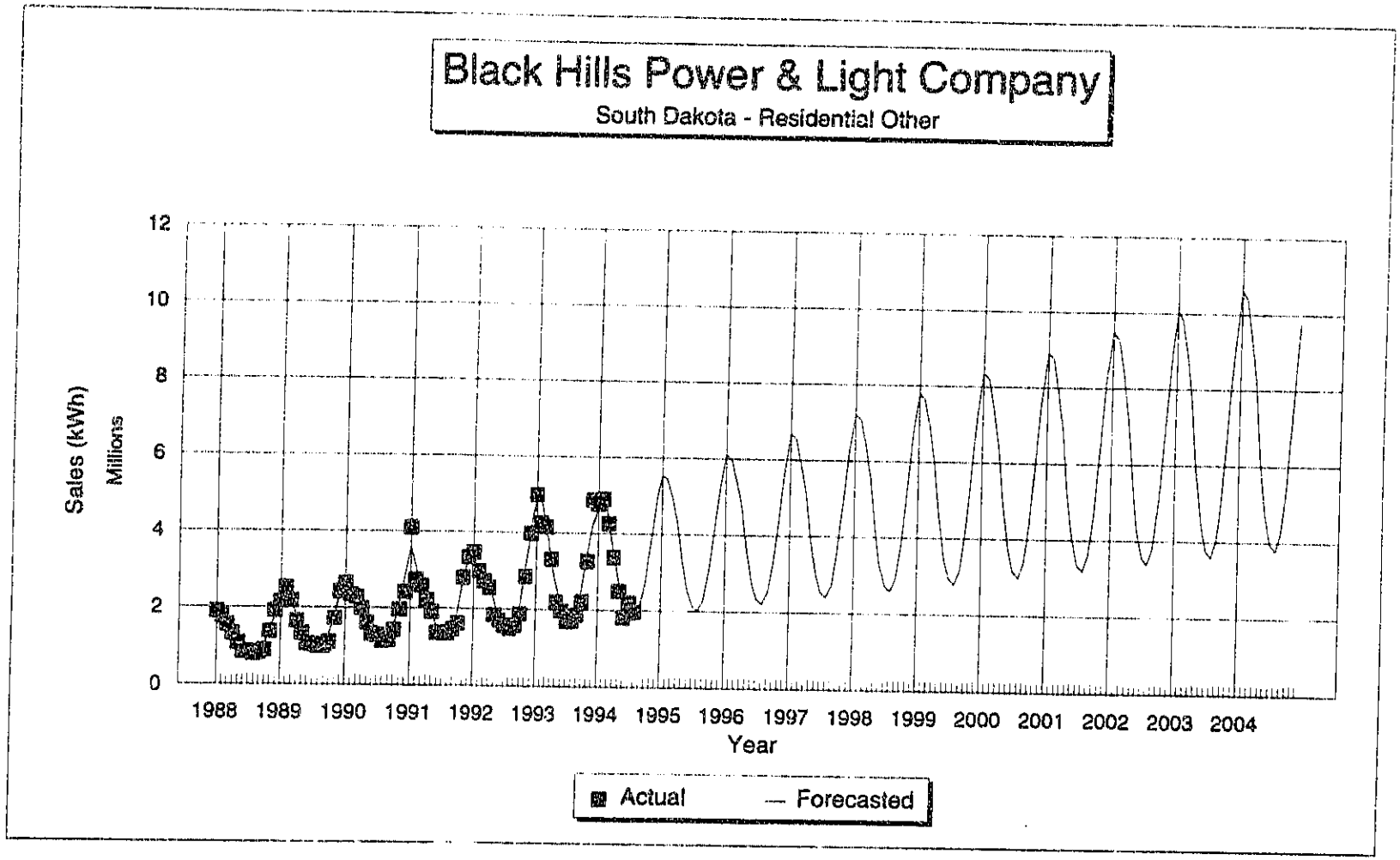
Historical Regression Output (1)		Annual Growth Rate
		%
With Gillette		
Regression Output:		
Constant	7.93971208	
Std Err of Y Est	0.026908948	
R Squared	0.376902978	
No. of Observations	80	
Degrees of Freedom	78	
X Coefficient(s)	0.000894892	
Std Err of Coef.	0.000130283	
Implied Monthly Growth Rate	1.002063	
Implied Annual Growth Rate	1.025035	2.50%
Without Gillette		
Regression Output:		
Constant	7.973920	
Std Err of Y Est	0.020030	
R Squared	0.717484	
No. of Observations	143.000000	
Degrees of Freedom	146.000000	
X Coefficient(s)	0.000742	
Std Err of Coef.	0.000039	
Implied Monthly Growth Rate	1.001710	
Implied Annual Growth Rate	1.020716	2.07%

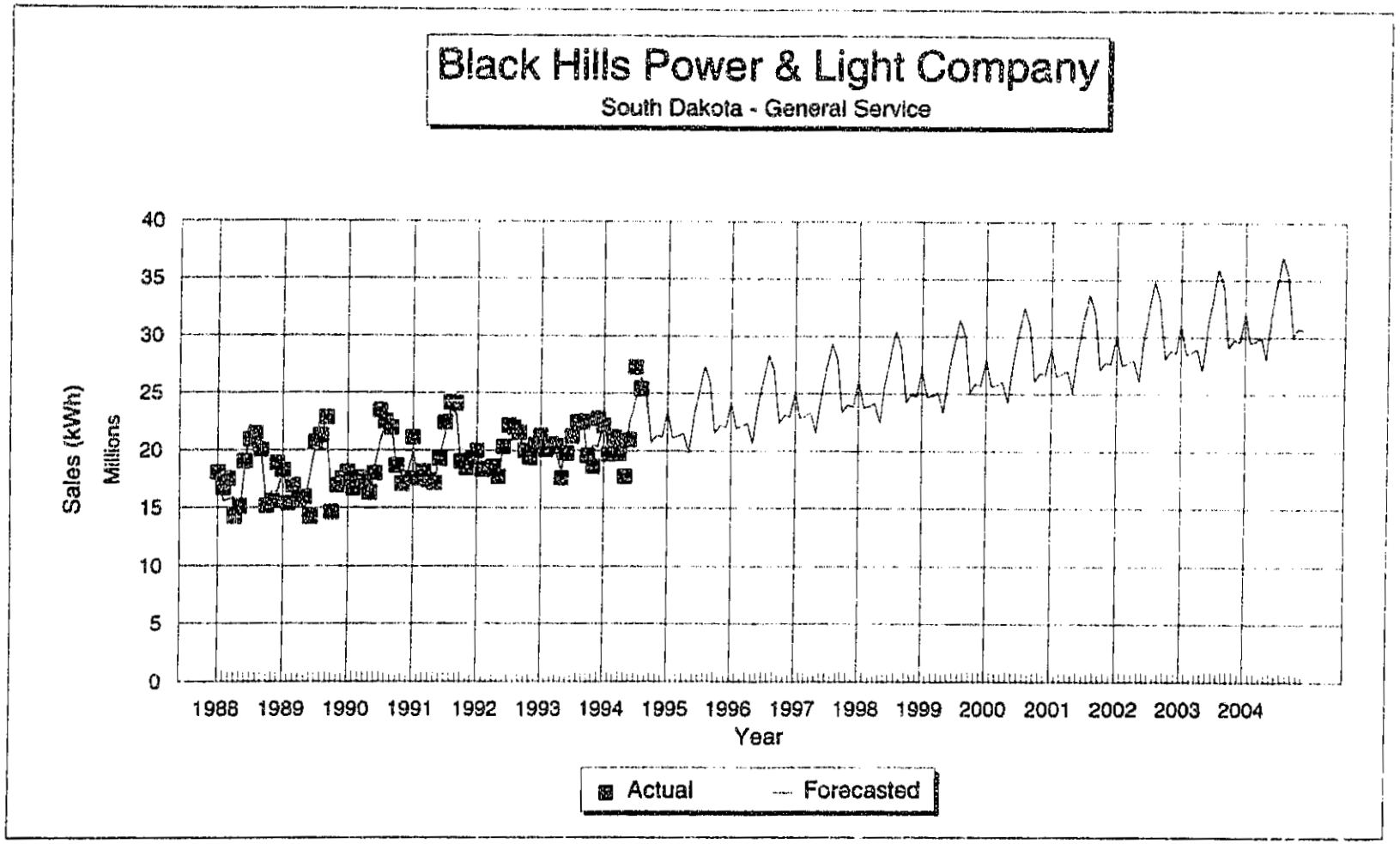
Future Regression Output (2)		Annual Growth Rate
		%
With Gillette		
Regression Output:		
Constant	8.073558	
Std Err of Y Est	0.021998	
R Squared	0.465282	
No. of Observations	148.000000	
Degrees of Freedom	146.000000	
X Coefficient(s)	0.000477	
Std Err of Coef.	0.000042	
Implied Monthly Growth Rate	1.001099	
Implied Annual Growth Rate	1.013268	1.33%
Without Gillette		
Regression Output:		
Constant	7.973920	
Std Err of Y Est	0.020030	
R Squared	0.717484	
No. of Observations	143.000000	
Degrees of Freedom	146.000000	
X Coefficient(s)	0.000742	
Std Err of Coef.	0.000039	
Implied Monthly Growth Rate	1.001710	
Implied Annual Growth Rate	1.020716	2.07%

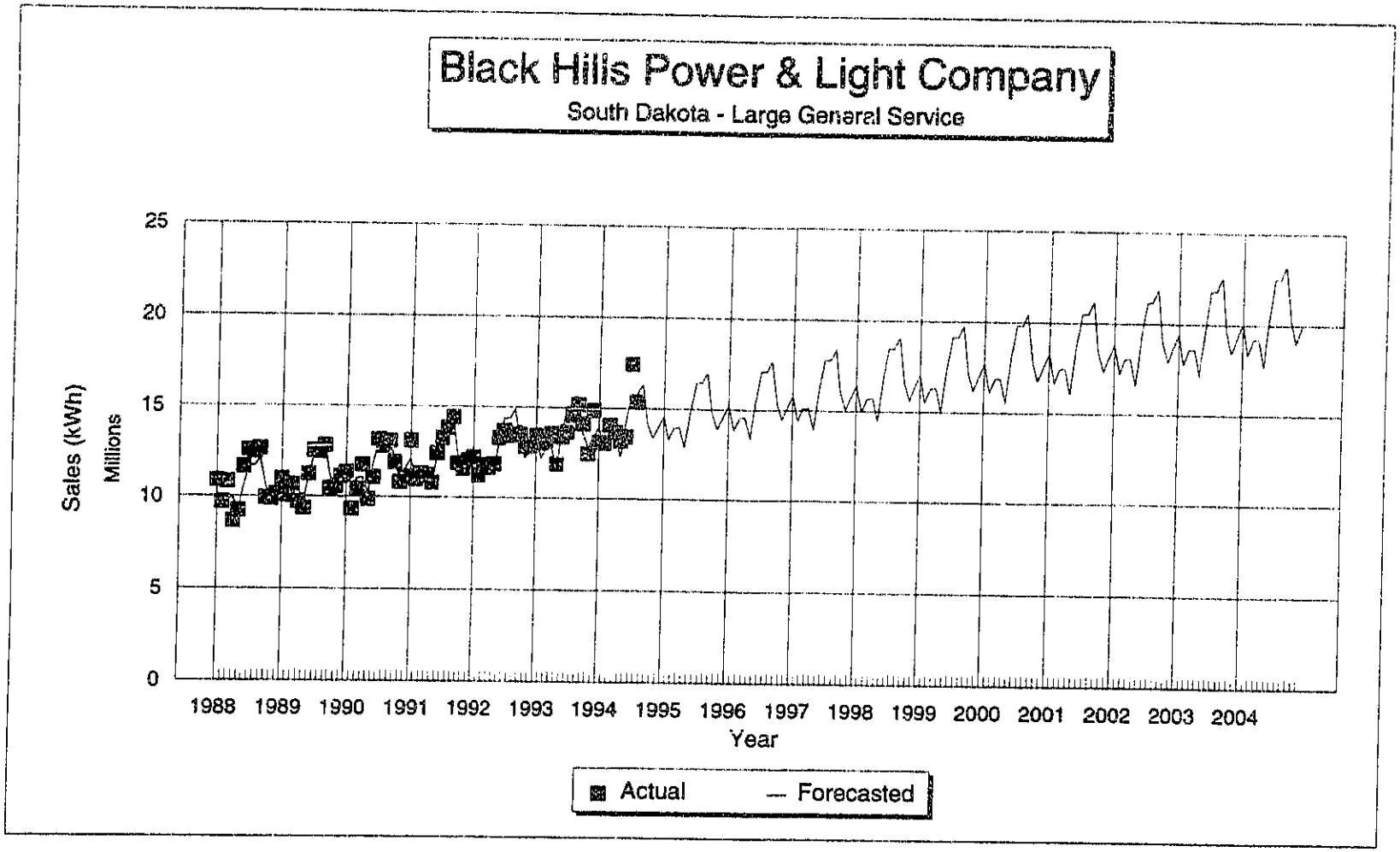
(1) Based on data from 1988 - August 1994.
(2) Forecasted September 1994 through 2006 sales.

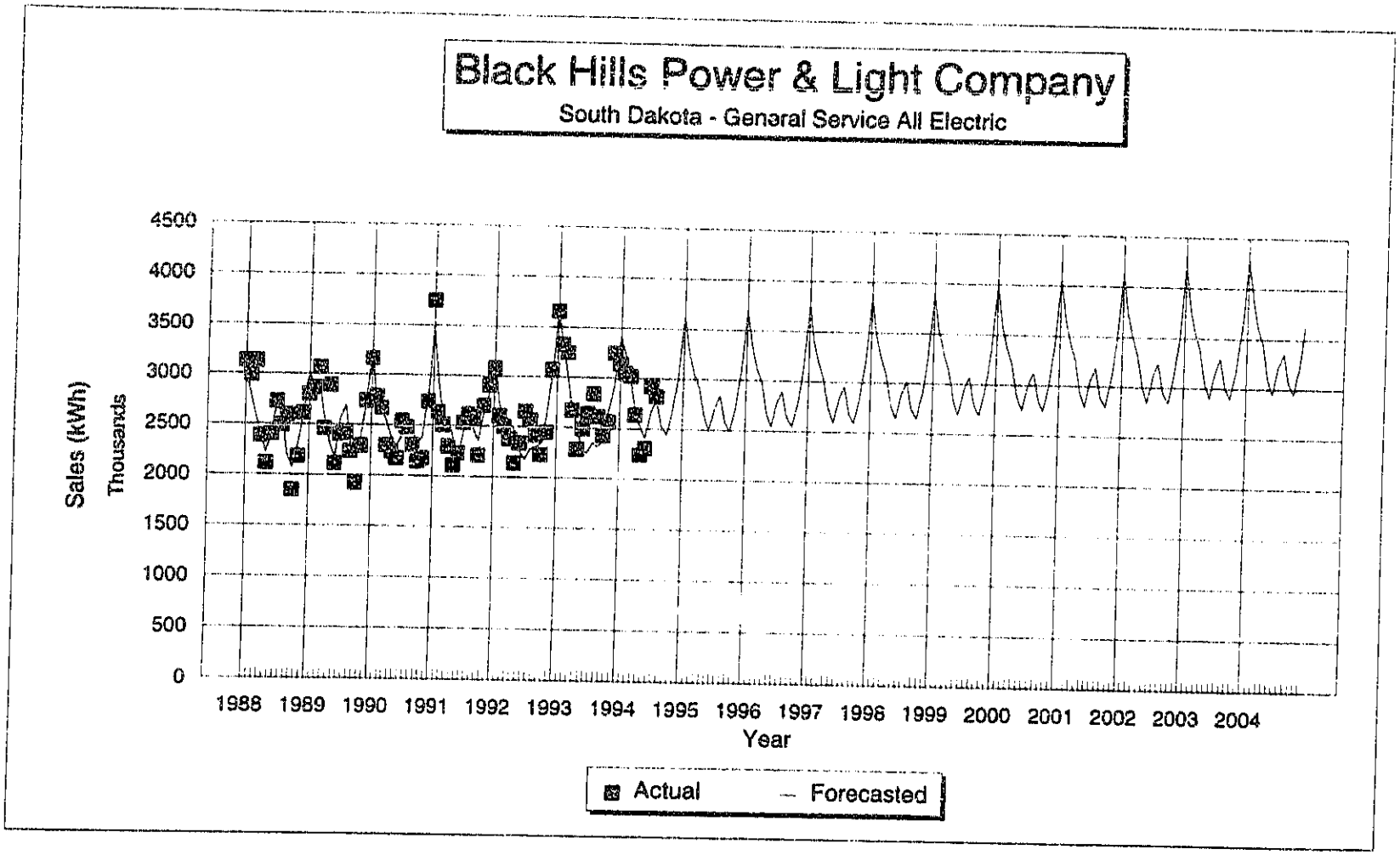

Black Hills Power & Light Company
South Dakota - Residential + Water Heat
Sales (kWh)
Millions
30
25
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

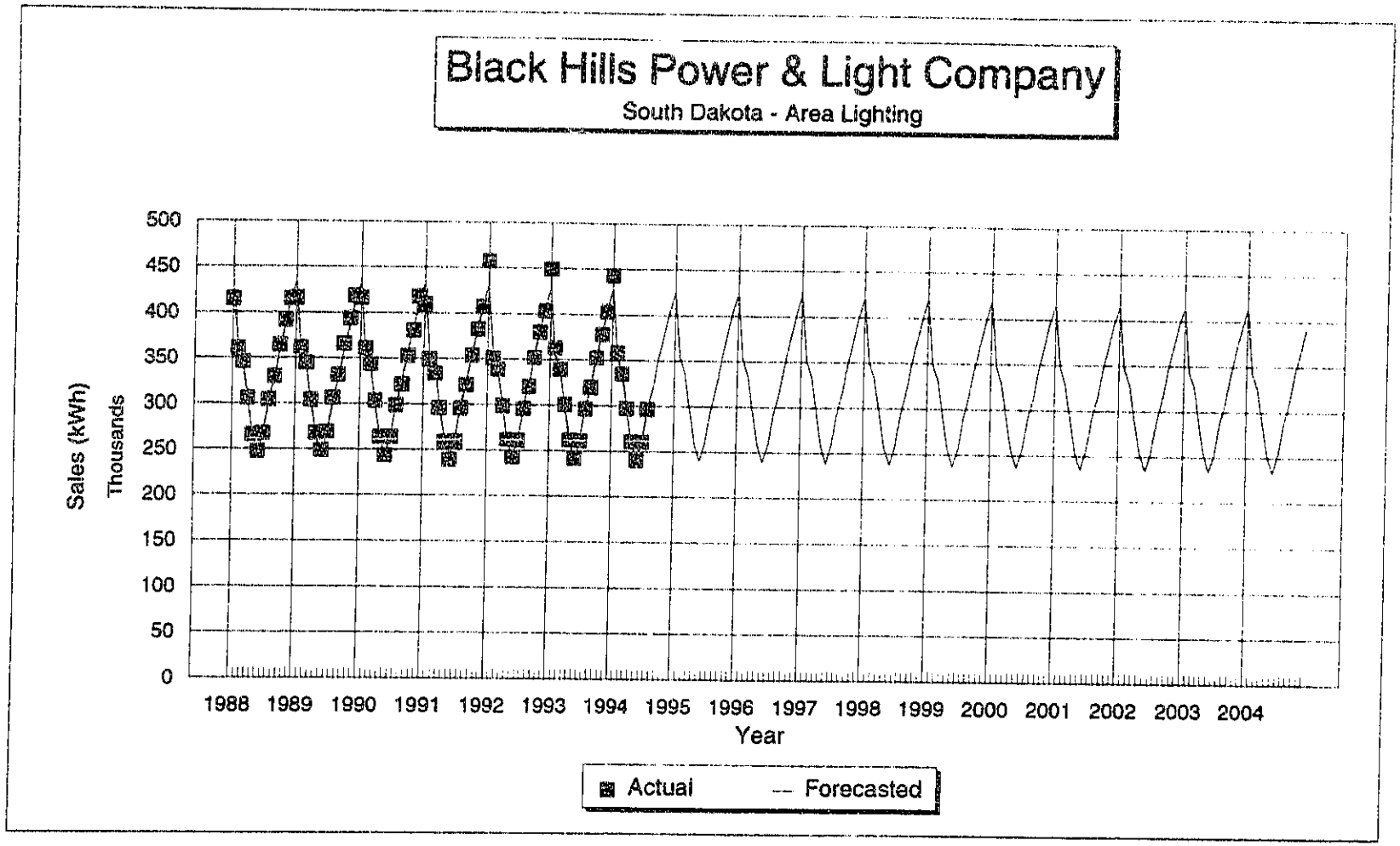

Black Hills Power & Light Company
South Dakota - Residential All Electric
Sales (kWh)
Millions
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

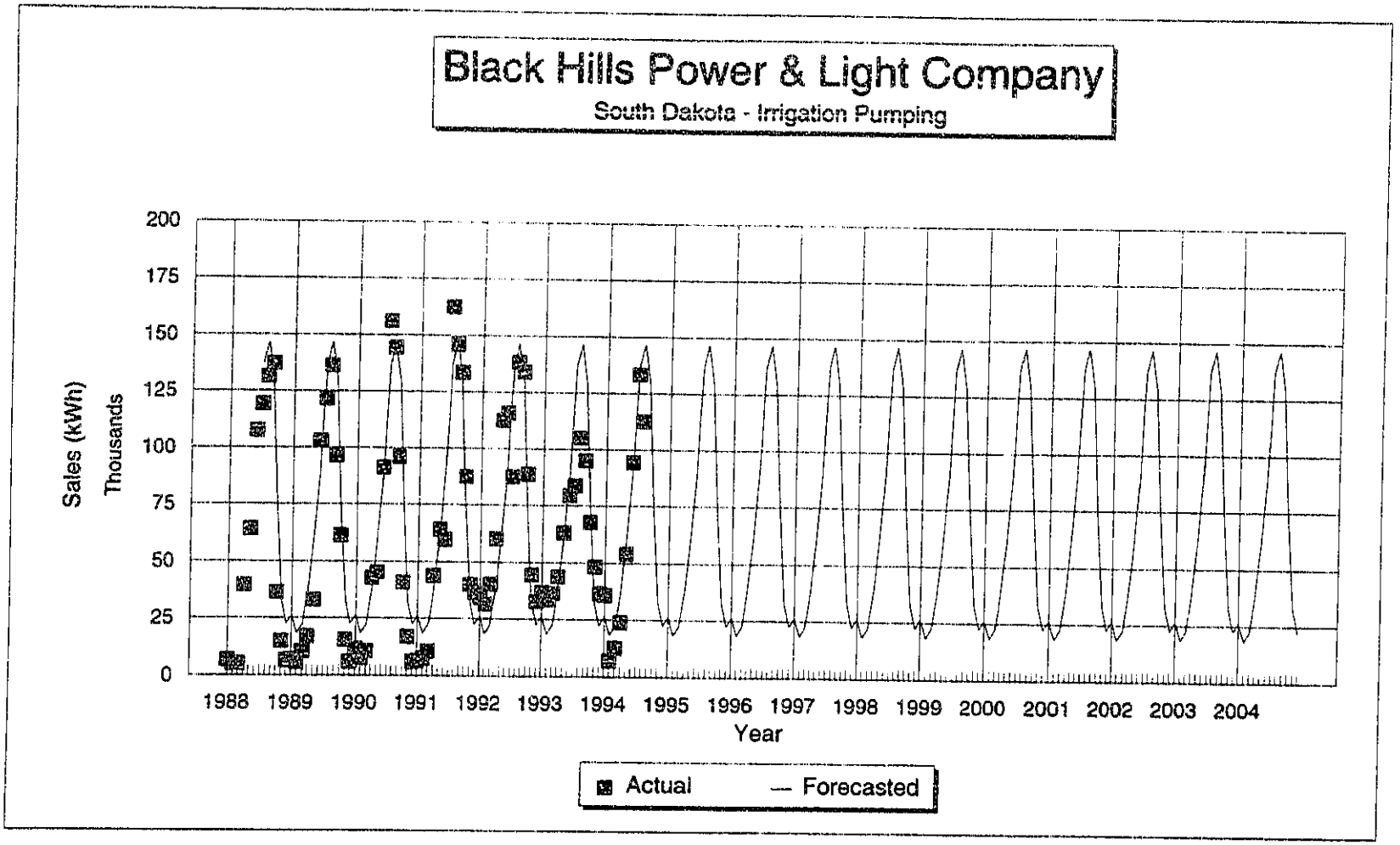

Black Hills Power & Light Company
South Dakota - Residential Other
Sales (kWh)
Millions
12
10
8
6
4
2
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

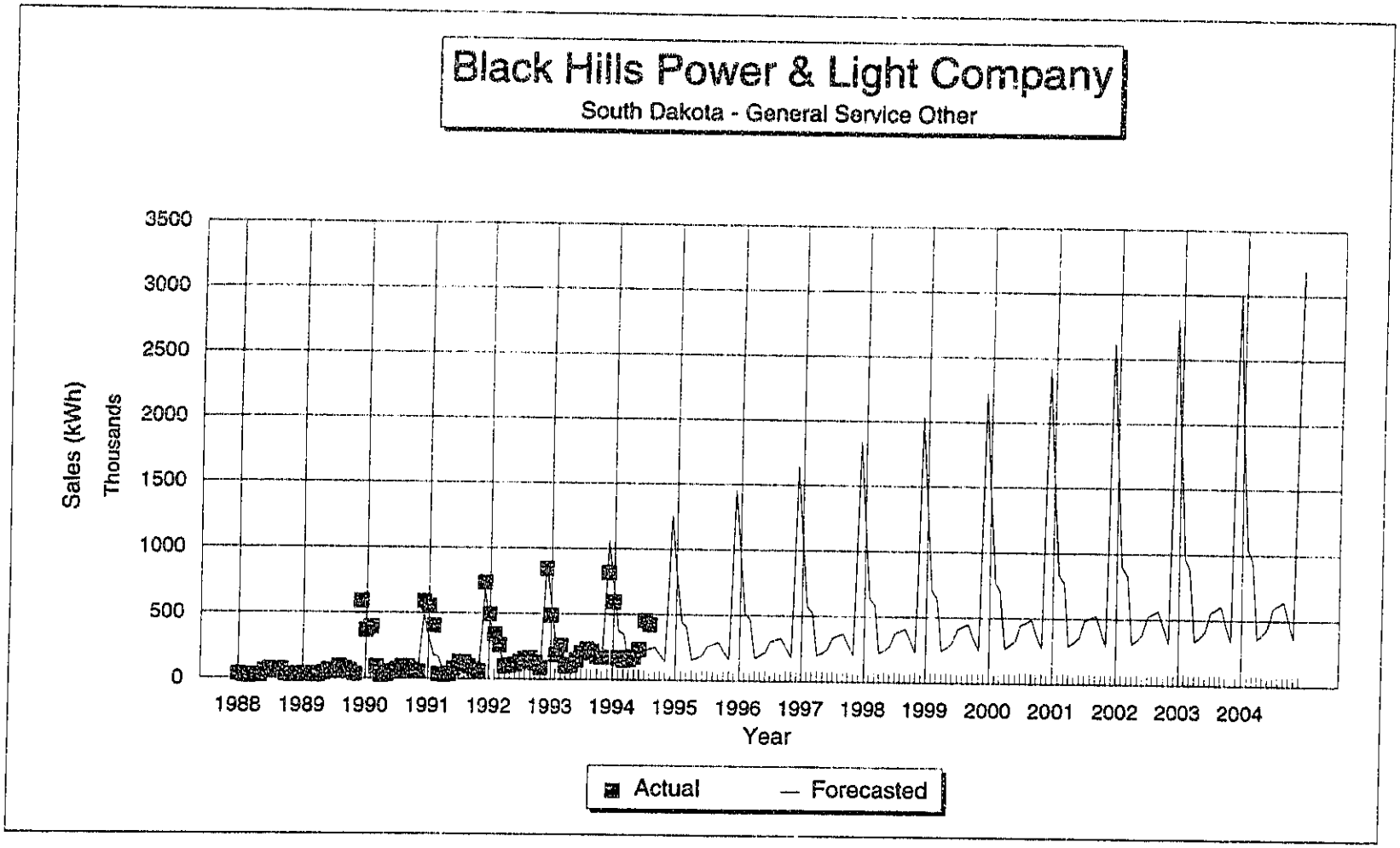

Black Hills Power & Light Company
South Dakota - General Service
Sales (kWh)
Millions
40
35
30
25
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

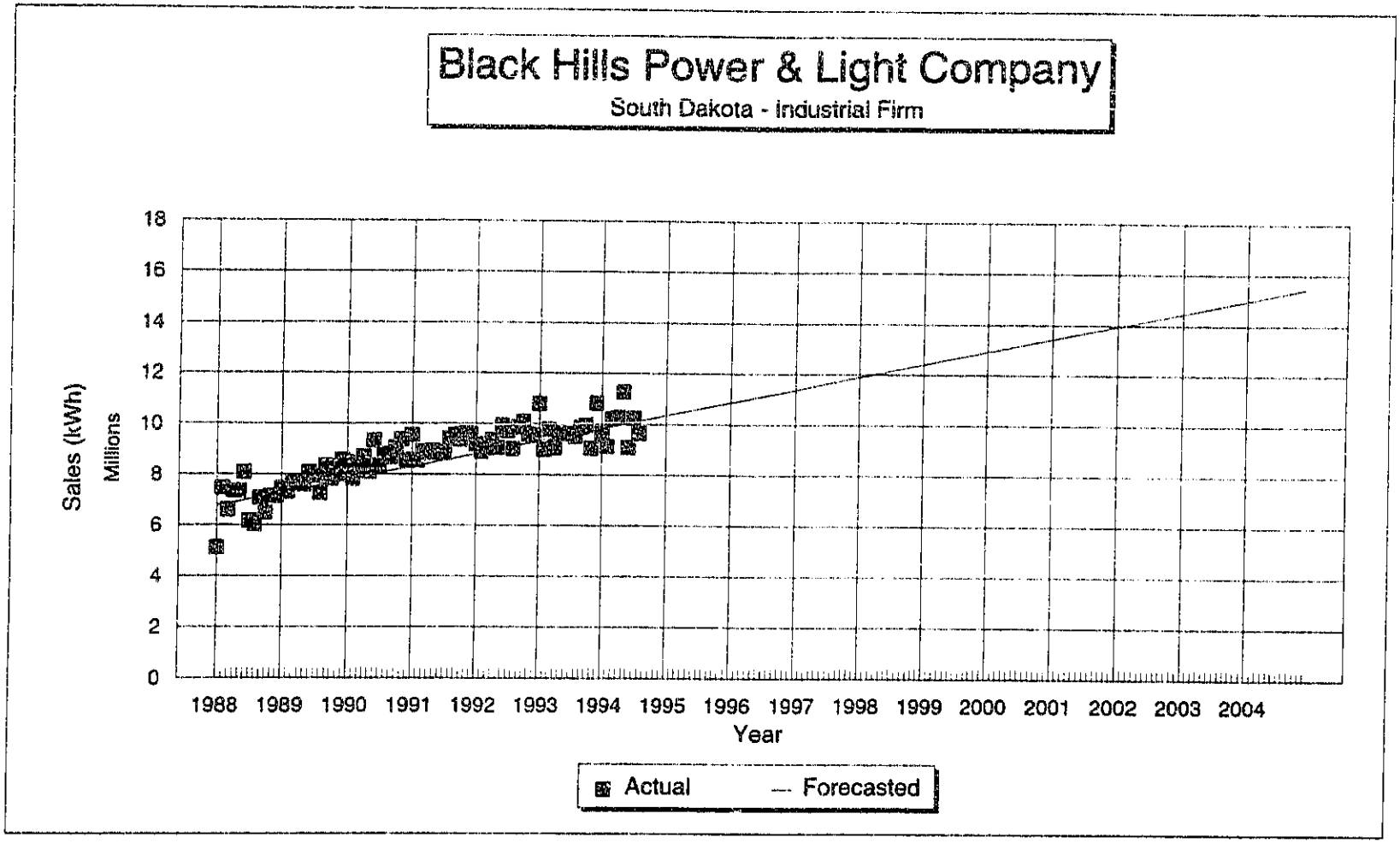

Black Hills Power & Light Company
South Dakota - Large General Service
Sales (kWh)
Millions
25
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

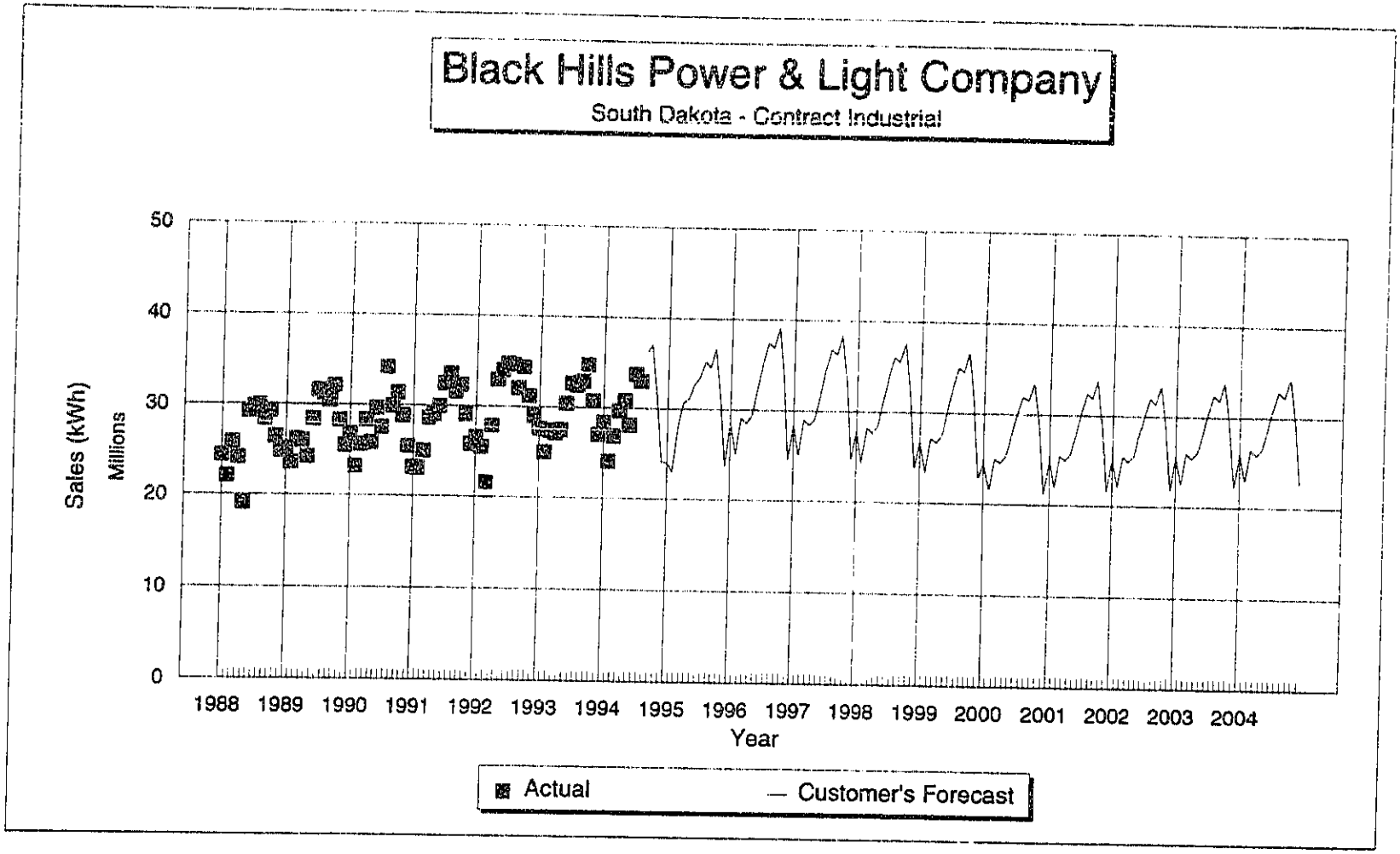

Black Hills Power & Light Company
South Dakota - General Service All Electric
Sales (kWh)
Thousands
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

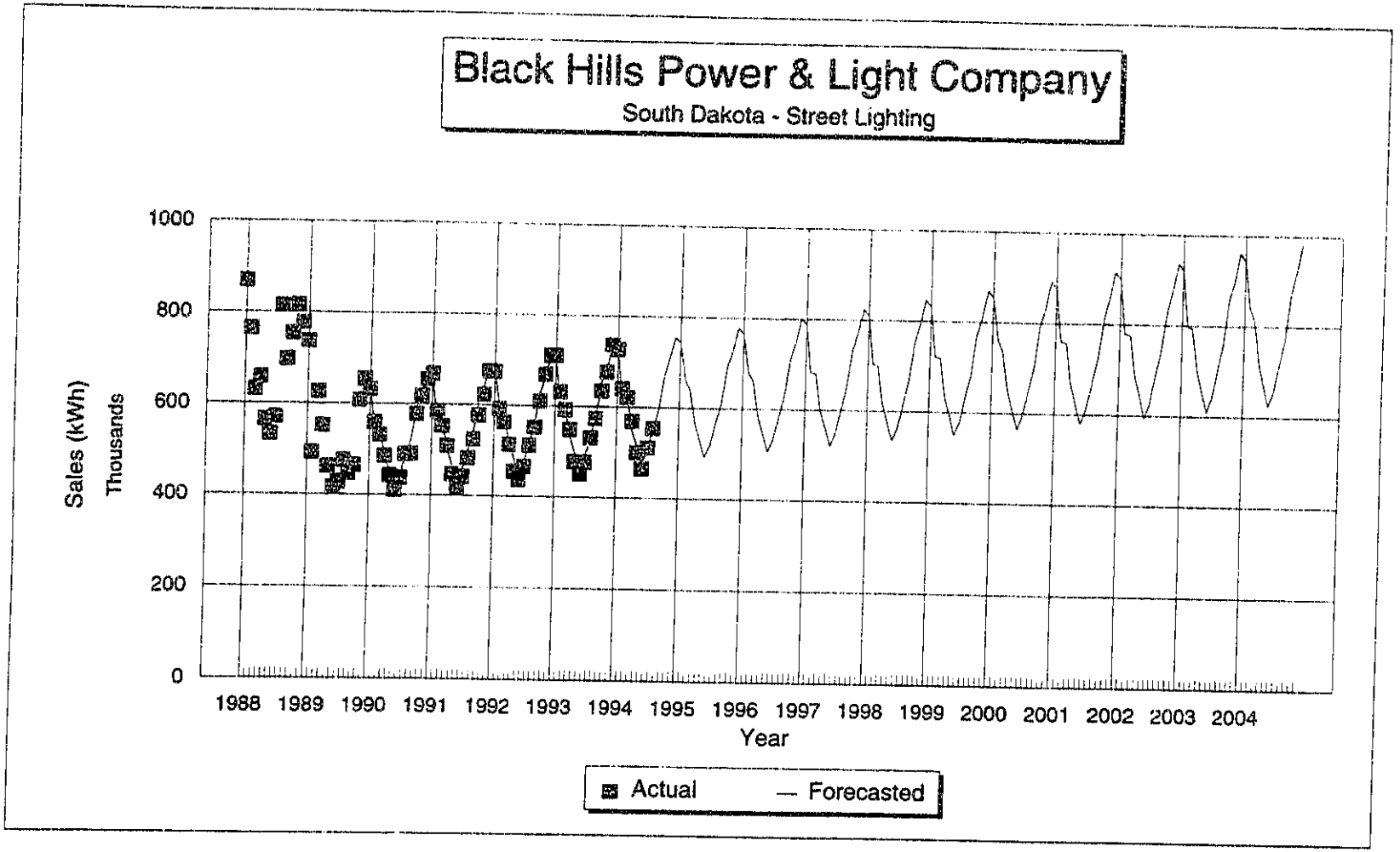

Black Hills Power & Light Company
South Dakota - Area Lighting
Sales (kWh)
Thousands
500
450
400
350
300
250
200
150
100
50
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

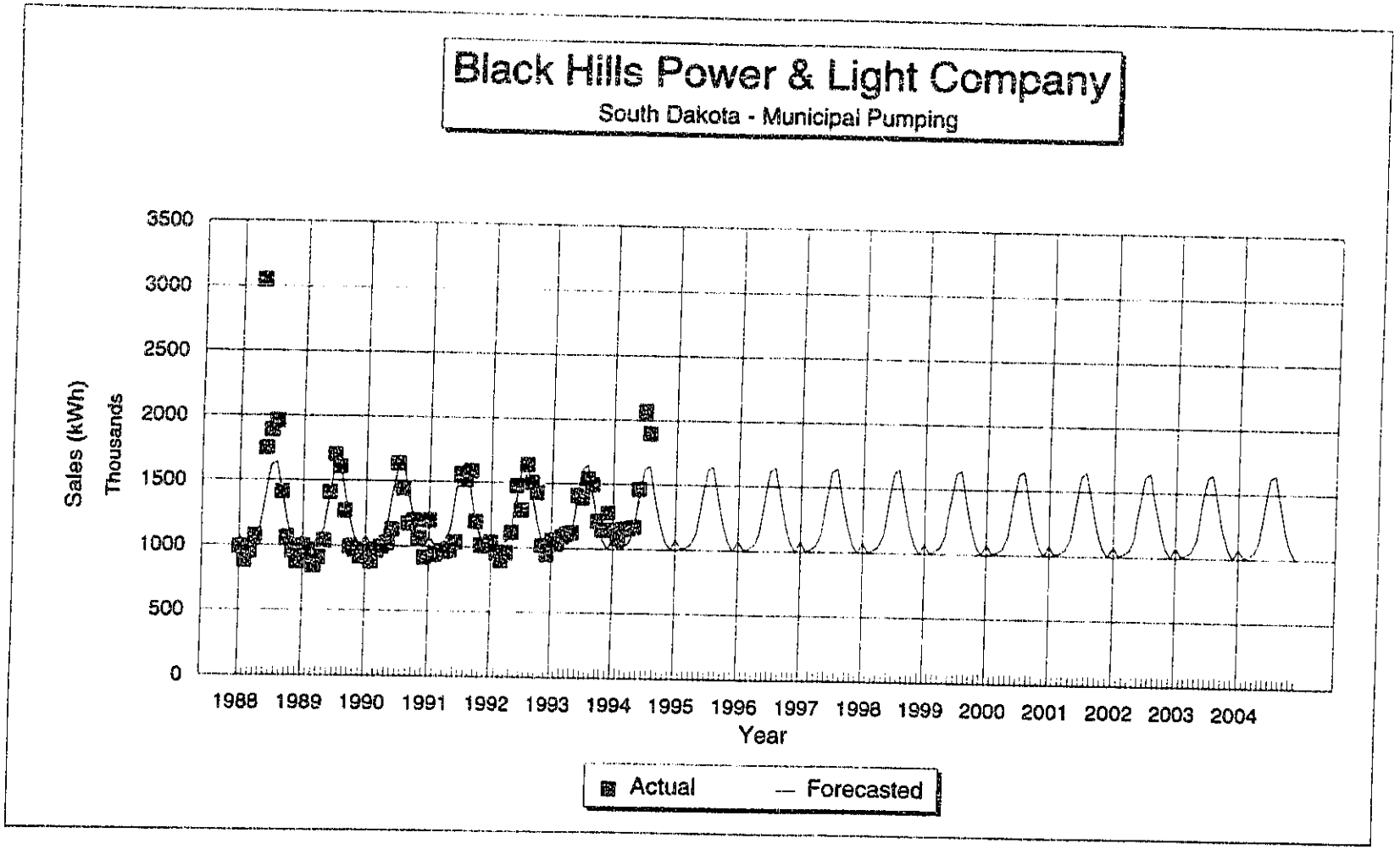

Black Hills Power & Light Company
South Dakota - Irrigation Pumping
Sales (kWh)
Thousands
200
175
150
125
100
75
50
25
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

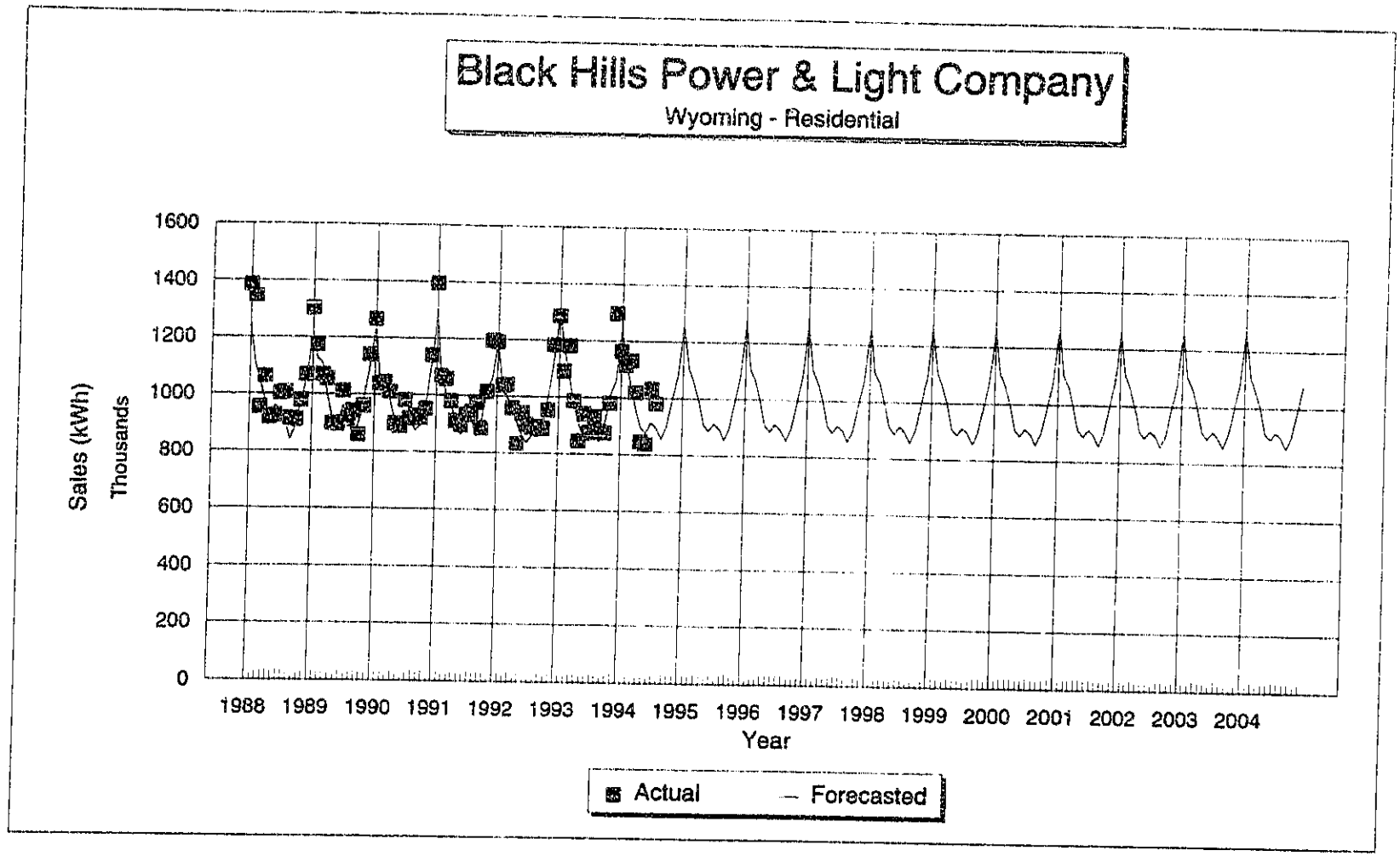

Black Hills Power & Light Company
South Dakota - General Service Other
Sales (kWh)
Thousands
3500
3000
2500
2000
1500
1000
500
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

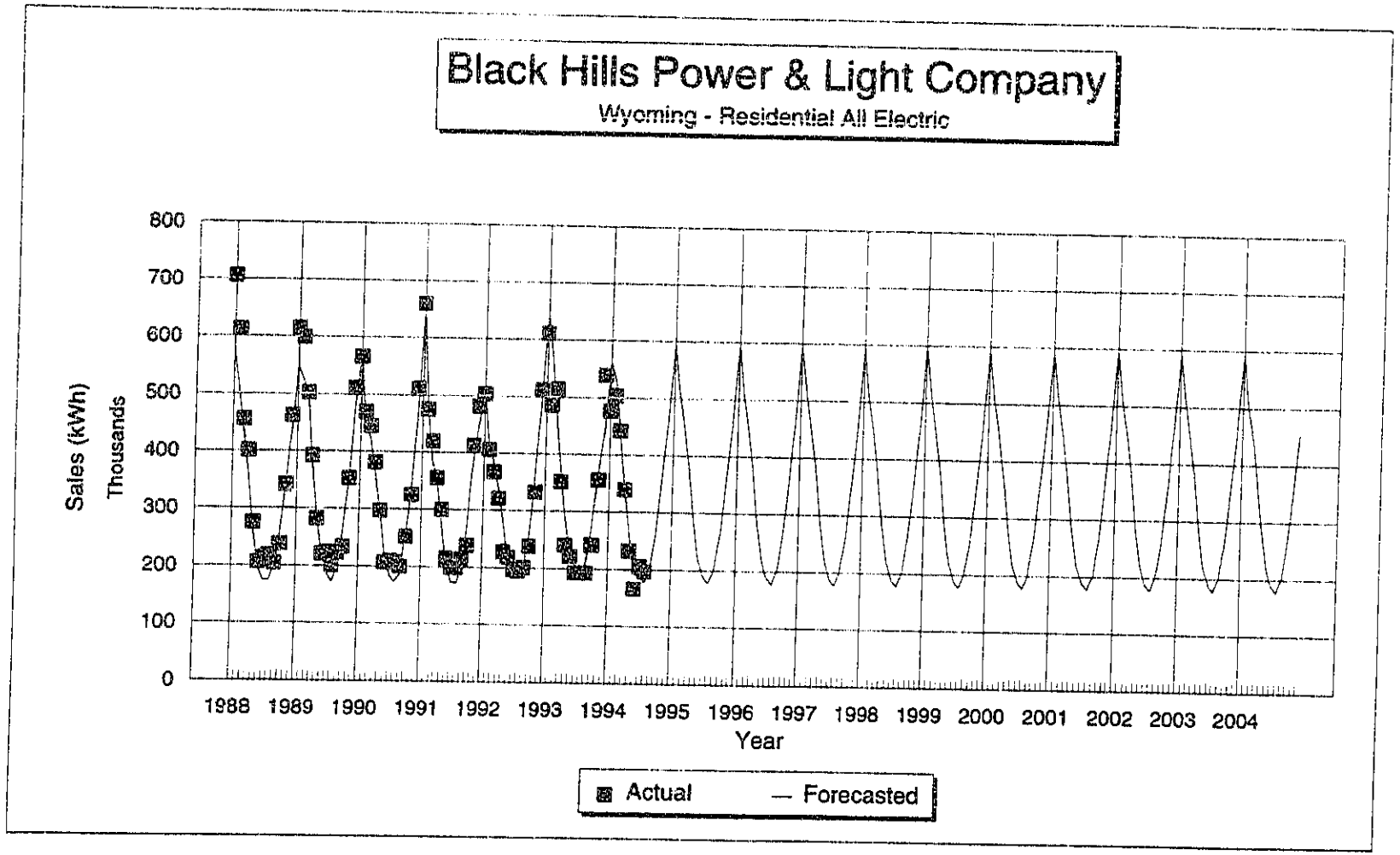

Black Hills Power & Light Company
South Dakota - Industrial Firm
Sales (kWh)
Millions
18
16
14
12
10
8
6
4
2
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

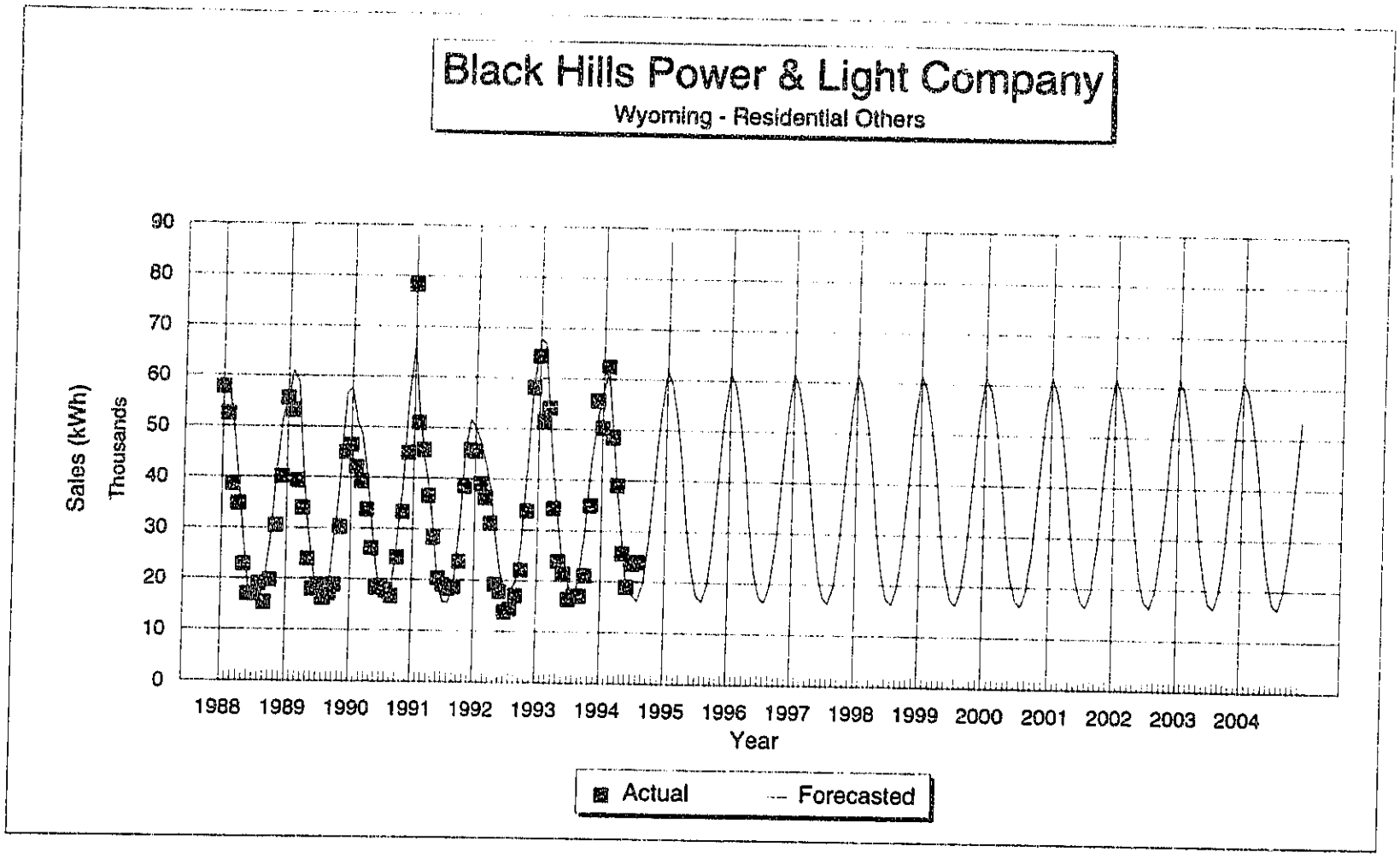

Black Hills Power & Light Company
South Dakota - Contract Industrial
Sales (kWh)
Millions
50
40
30
20
10
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Customer's Forecast

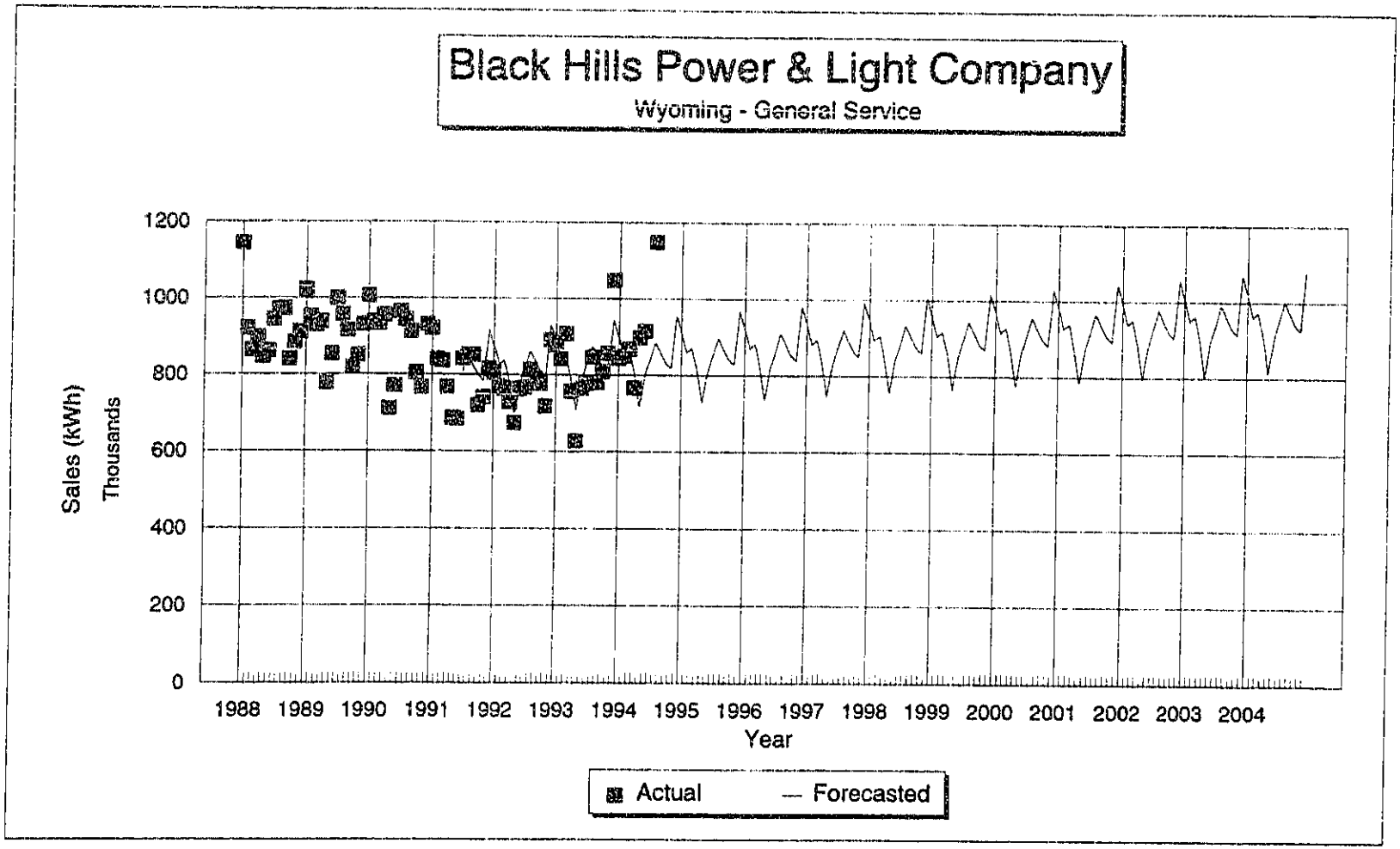

Black Hills Power & Light Company
South Dakota - Street Lighting
Sales (kWh)
Thousands
1000
800
600
400
200
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

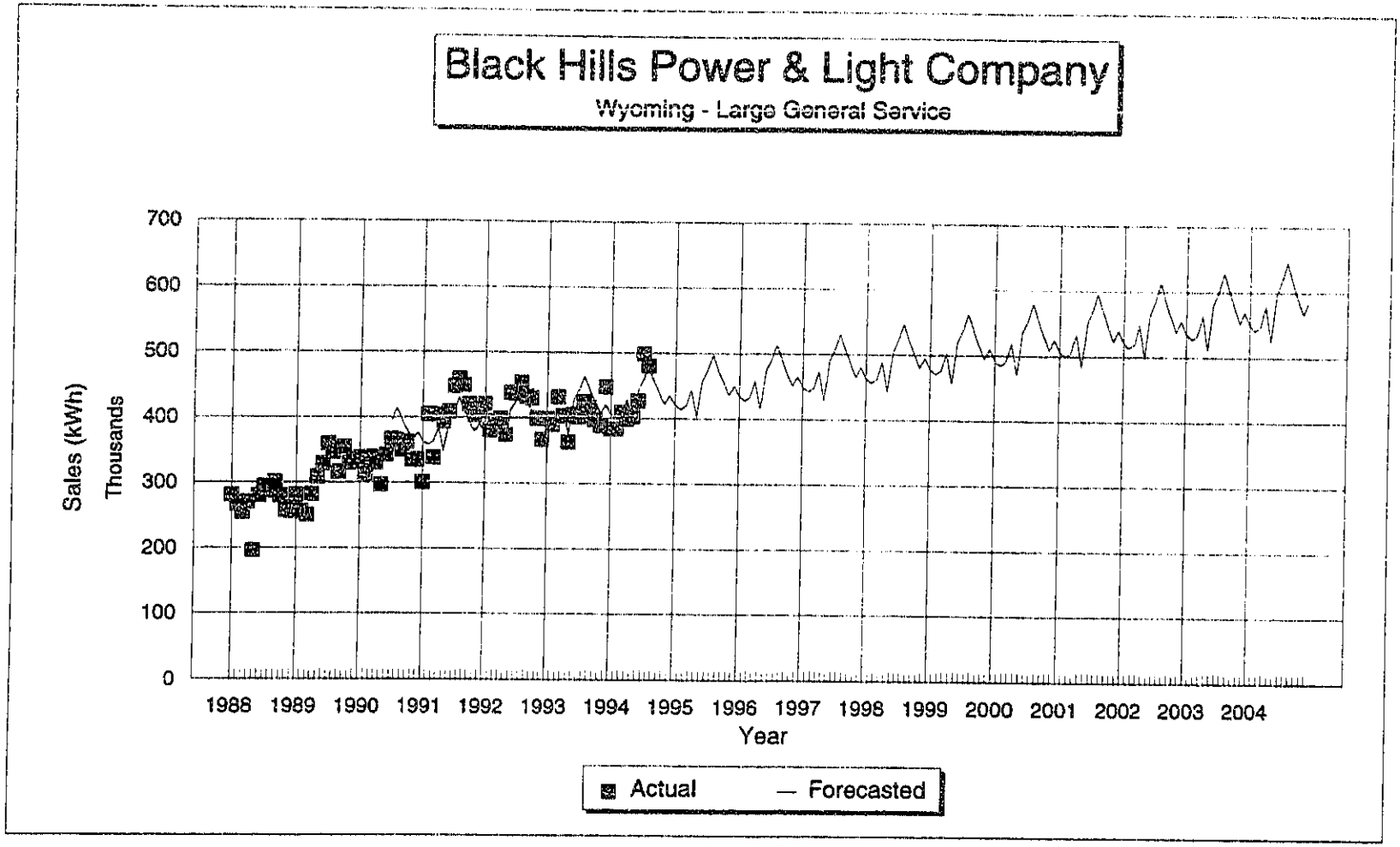

Black Hills Power & Light Company
South Dakota - Municipal Pumping
Sales (kWh)
Thousands
3500
3000
2500
2000
1500
1000
500
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

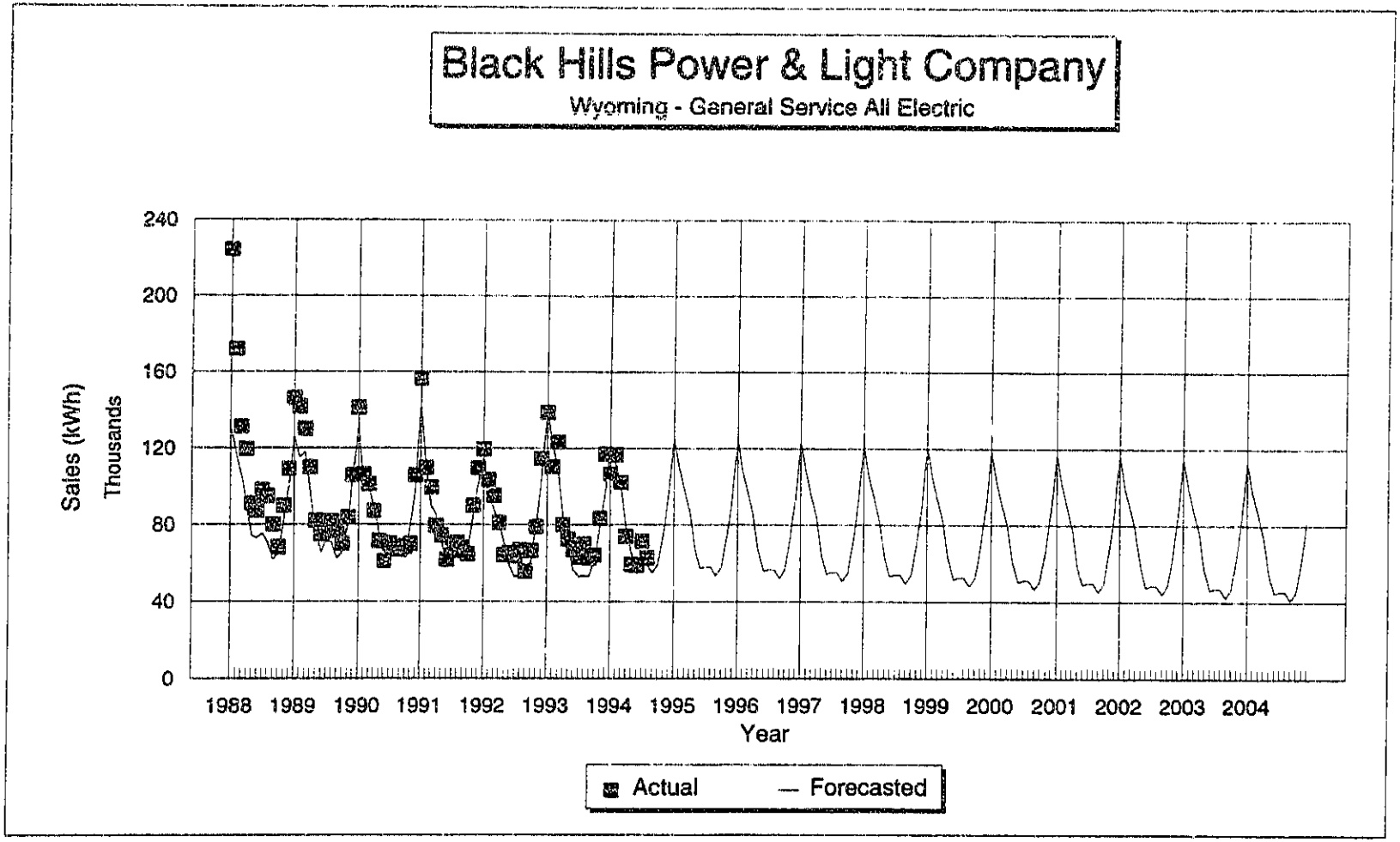

Black Hills Power & Light Company
Wyoming - Residential
Sales (kWh)
Thousands
1600
1400
1200
1000
800
600
400
200
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

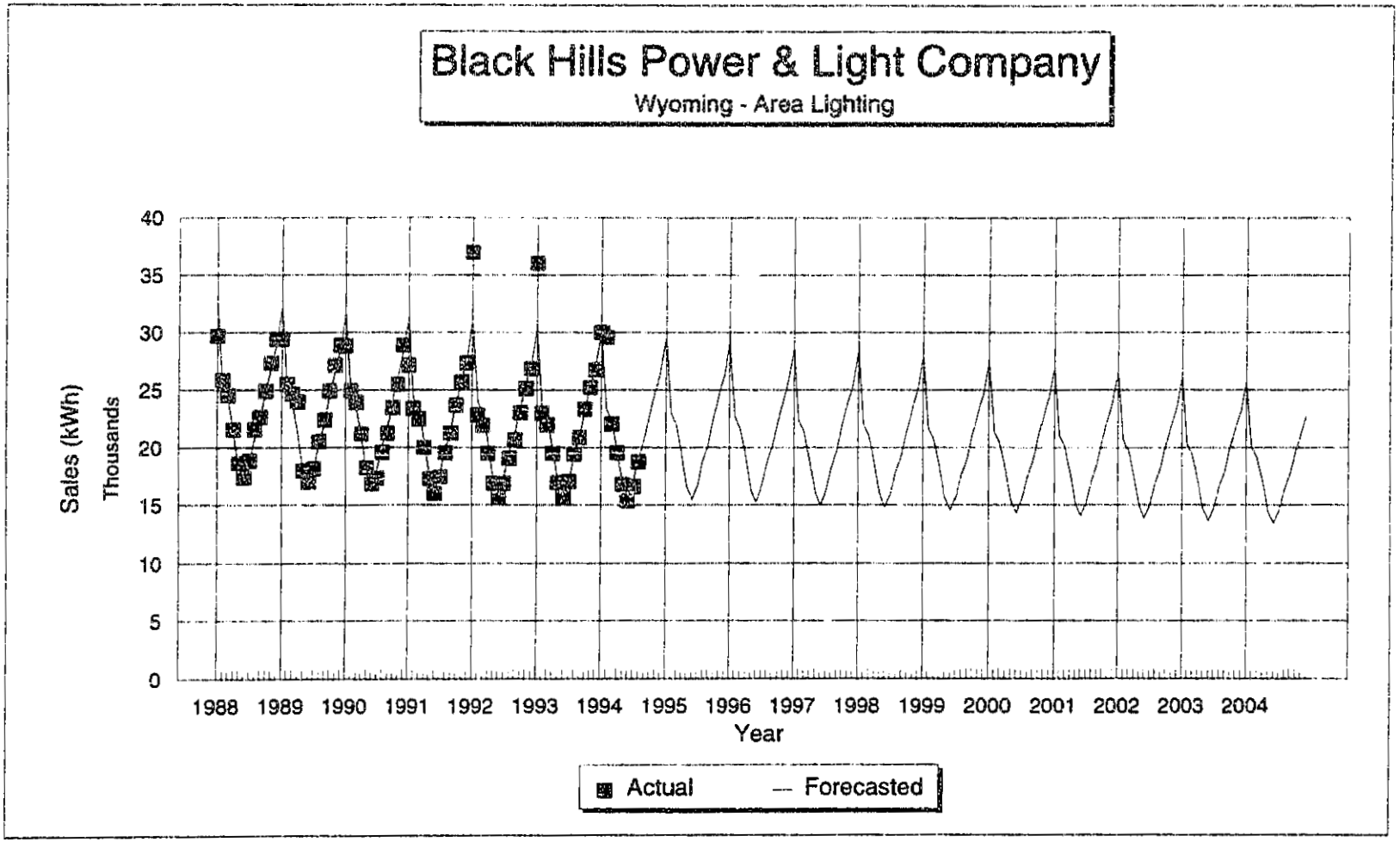

Black Hills Power & Light Company
Wyoming - Residential All Electric
Sales (kWh)
Thousands
800
700
600
500
400
300
200
100
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

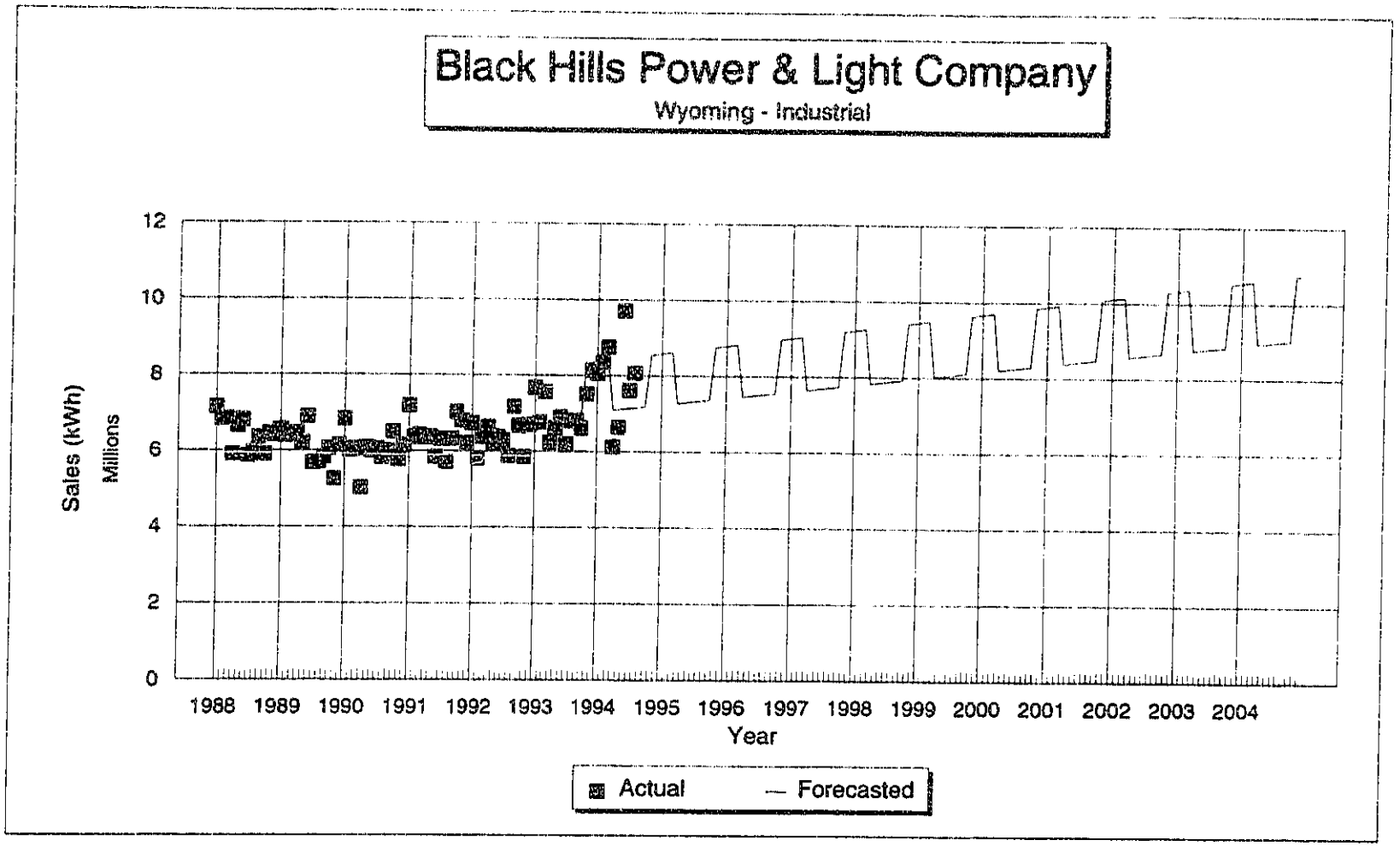

Black Hills Power & Light Company
Wyoming - Residential Others
Sales (kWh)
Thousands
90
80
70
60
50
40
30
20
10
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

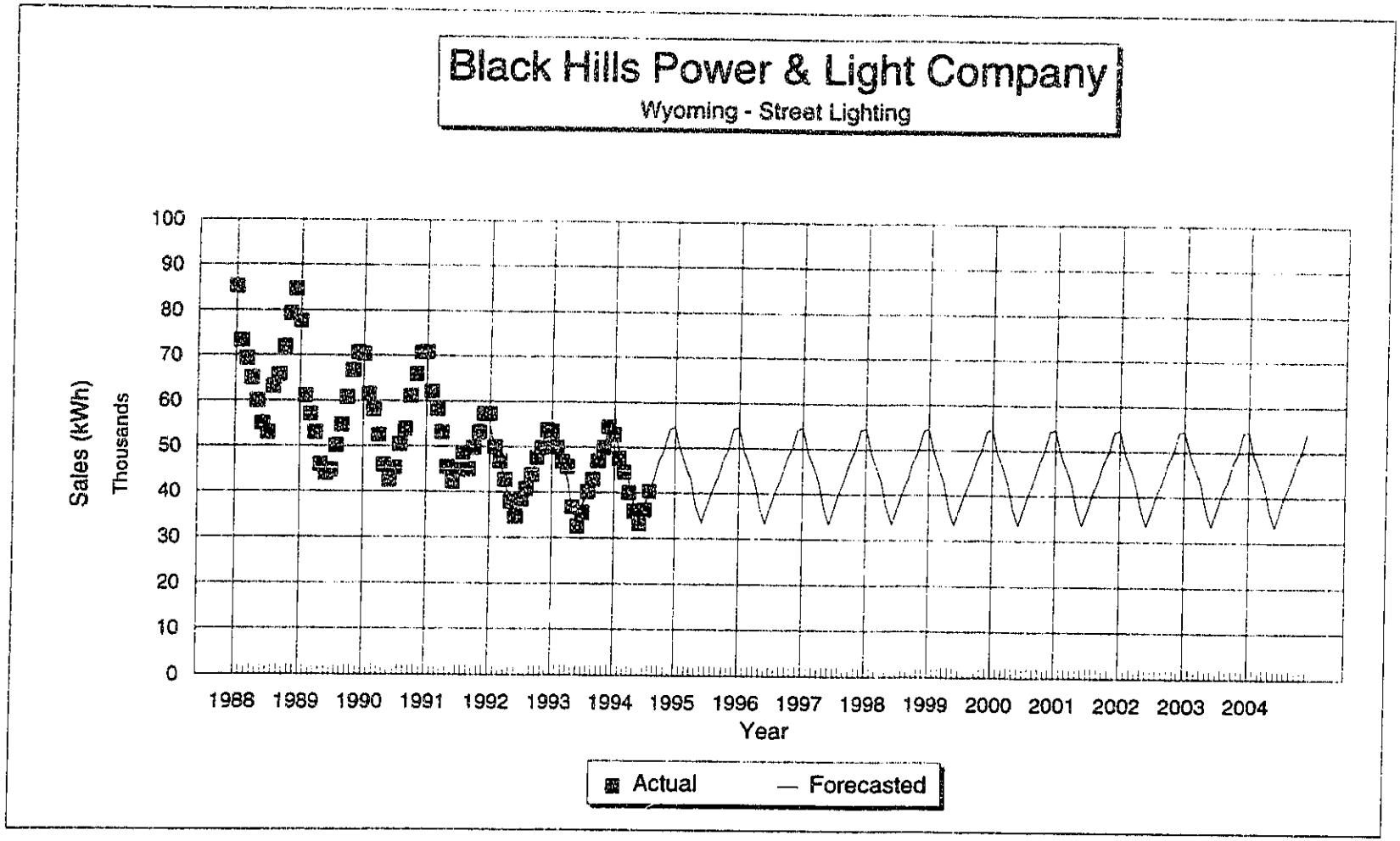

Black Hills Power & Light Company
Wyoming - General Service
Sales (kWh)
Thousands
1200
1000
800
600
400
200
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

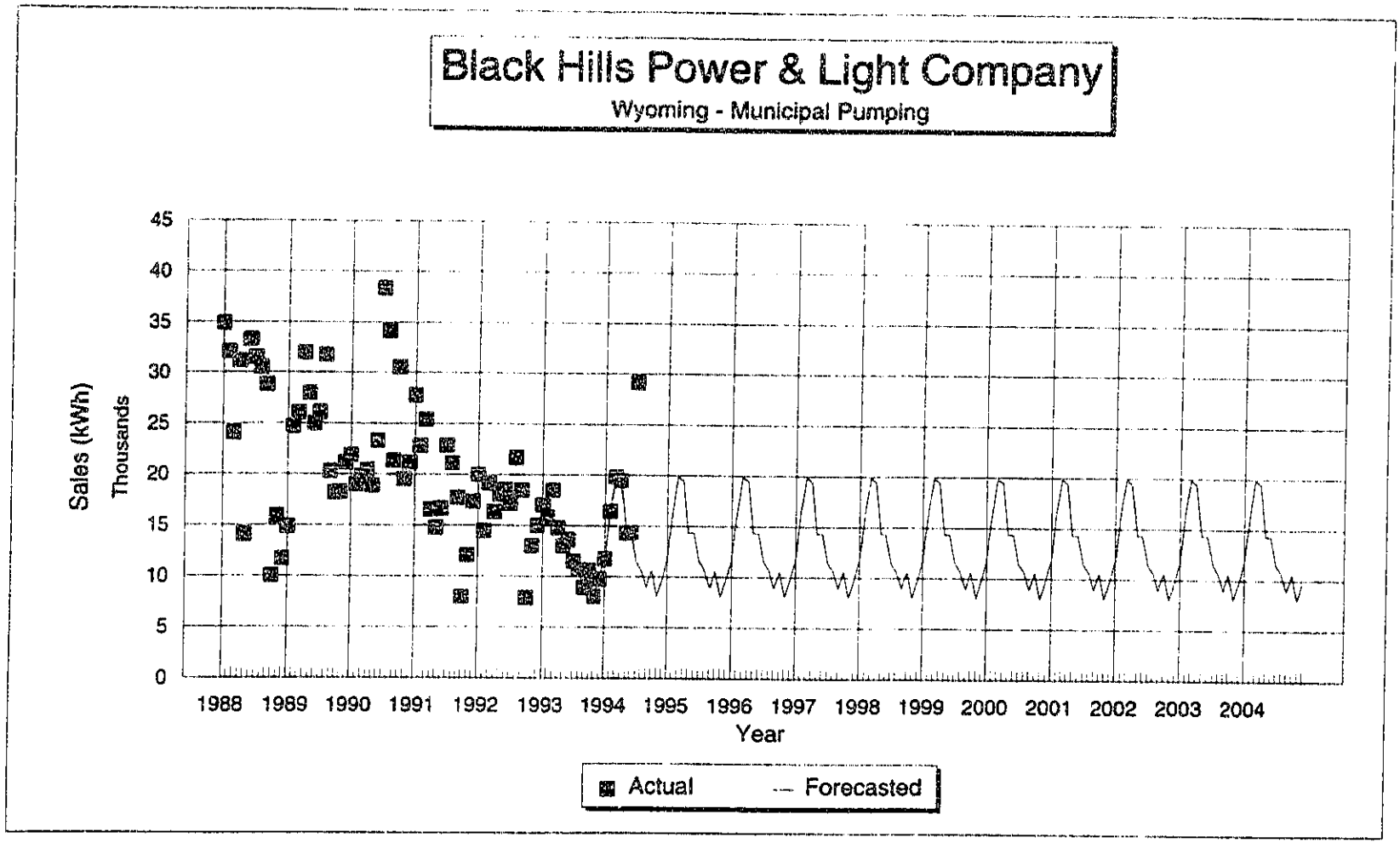

Black Hills Power & Light Company
Wyoming - Large General Service
Sales (kWh)
Thousands
700
600
500
400
300
200
100
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted


Black Hills Power & Light Company
Wyoming - General Service All Electric
Sales (kWh)
Thousands
240
200
160
120
80
40
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted


Black Hills Power & Light Company
Wyoming - Area Lighting
Sales (kWh)
Thousands
40
35
30
25
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted


Black Hills Power & Light Company
Wyoming - Industrial
Sales (kWh)
Millions
12
10
8
6
4
2
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted


Black Hills Power & Light Company
Wyoming - Street Lighting
Sales (kWh)
Thousands
100
90
80
70
60
50
40
30
20
10
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted


Black Hills Power & Light Company
Wyoming - Municipal Pumping
Sales (kWh)
Thousands
45
40
35
30
25
20
15
10
5
0
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004
Year
Actual
Forecasted

Black Hills Power and Light Company
Ratio of Energy to Sales Excluding Gillette
Summary of Calculation Methods
16-Mar-94

Month	Percent of Total Annual Sales (1)	Average 1983-94	Average 1989-94	1983-94 Regression Constant	1983-94 Regression R^2	1989-94 Regression Constant	1989-94 Regression R^2	Most "Normal" Year	Use	Major Consideration
January	9.12%	1.025	1.025	1.040	59.96%	1.043	77.59%	1.035	1.033	Average of all measures
February	8.05%	1.017	1.032	1.002	42.48%	1.017	91.97%	1.011	1.017	89-94 Regression
March	8.21%	1.053	1.039	1.071	55.12%	1.069	50.25%	1.053	1.039	89-94 Average
April	8.02%	1.001	1.009	0.985	51.29%	1.001	75.45%	1.008	1.009	89-94 Average
May	7.53%	1.066	1.076	1.072	49.38%	1.076	16.91%	1.089	1.076	89-94 Average
June	7.97%	1.057	1.067	1.056	0.97%	1.079	74.76%	1.036	1.067	89-94 Average
July	8.56%	1.068	1.056	1.075	64.67%	1.059	63.65%	1.098	1.071	Average of all measures
August	8.53%	1.056	1.082	1.041	72.82%	1.072	66.26%	1.066	1.063	Average of all measures
September	8.63%	0.970	0.976	0.973	33.00%	0.971	59.67%	0.929	0.976	89-94 Average
October	8.20%	1.080	1.081	1.079	2.03%	1.080	87.76%	1.088	1.080	89-94 Regression
November	8.24%	1.068	1.087	1.067	11.70%	1.081	27.10%	1.031	1.067	Average of all measures
December	8.87%	1.095	1.095	1.096	70.83%	1.083	85.03%	1.109	1.096	Average of all measures
Total (2)	100.00%	1.047	1.052	1.046		1.052		1.046	1.049	Use s.b. 1.040 to 1.050

(1) Over last five calender years (1989-1993)
(2) Sum of monthly ratios times monthly percent of sales.

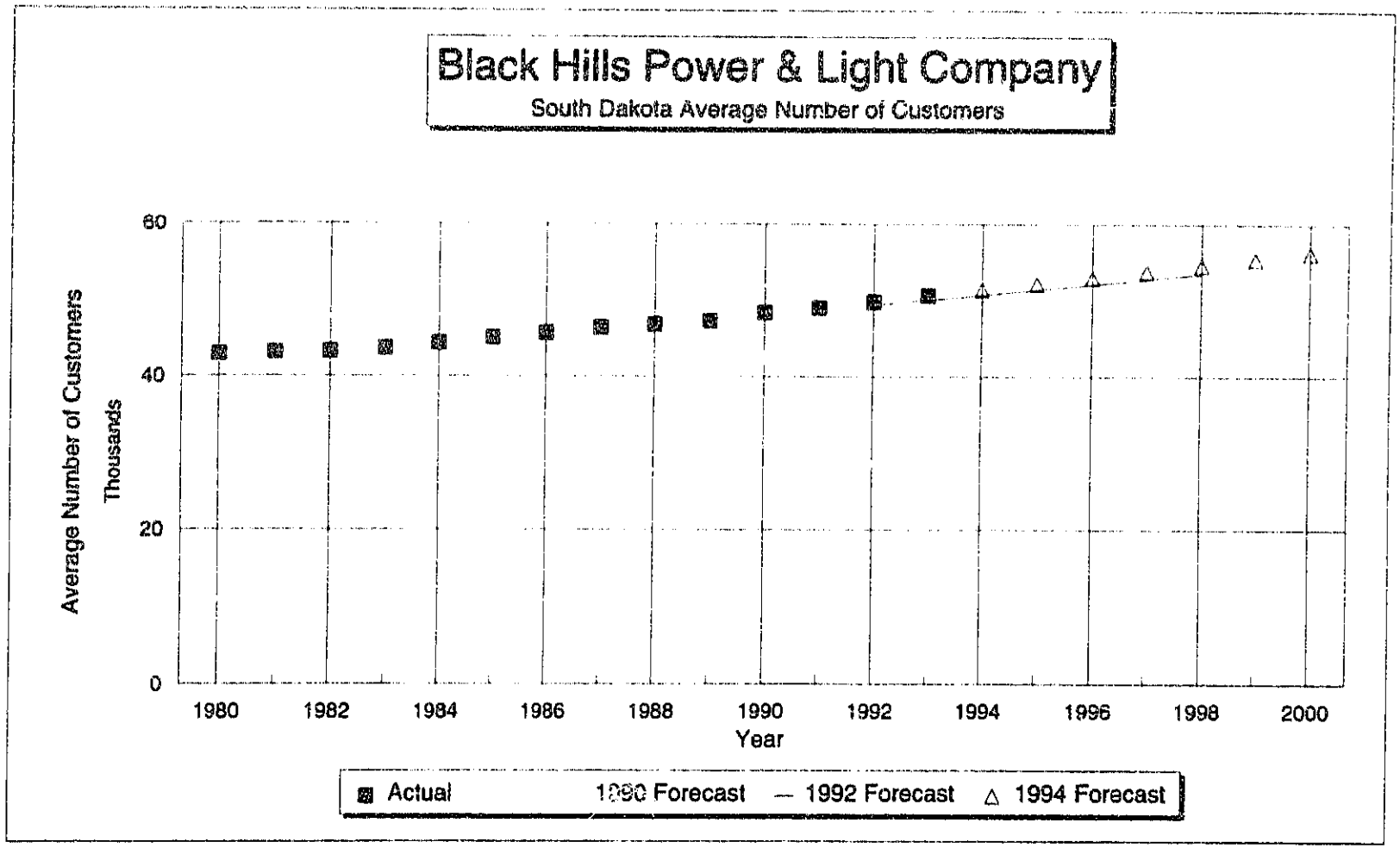
Note: Losses and company use have average about 4.0 percent over the last five years.

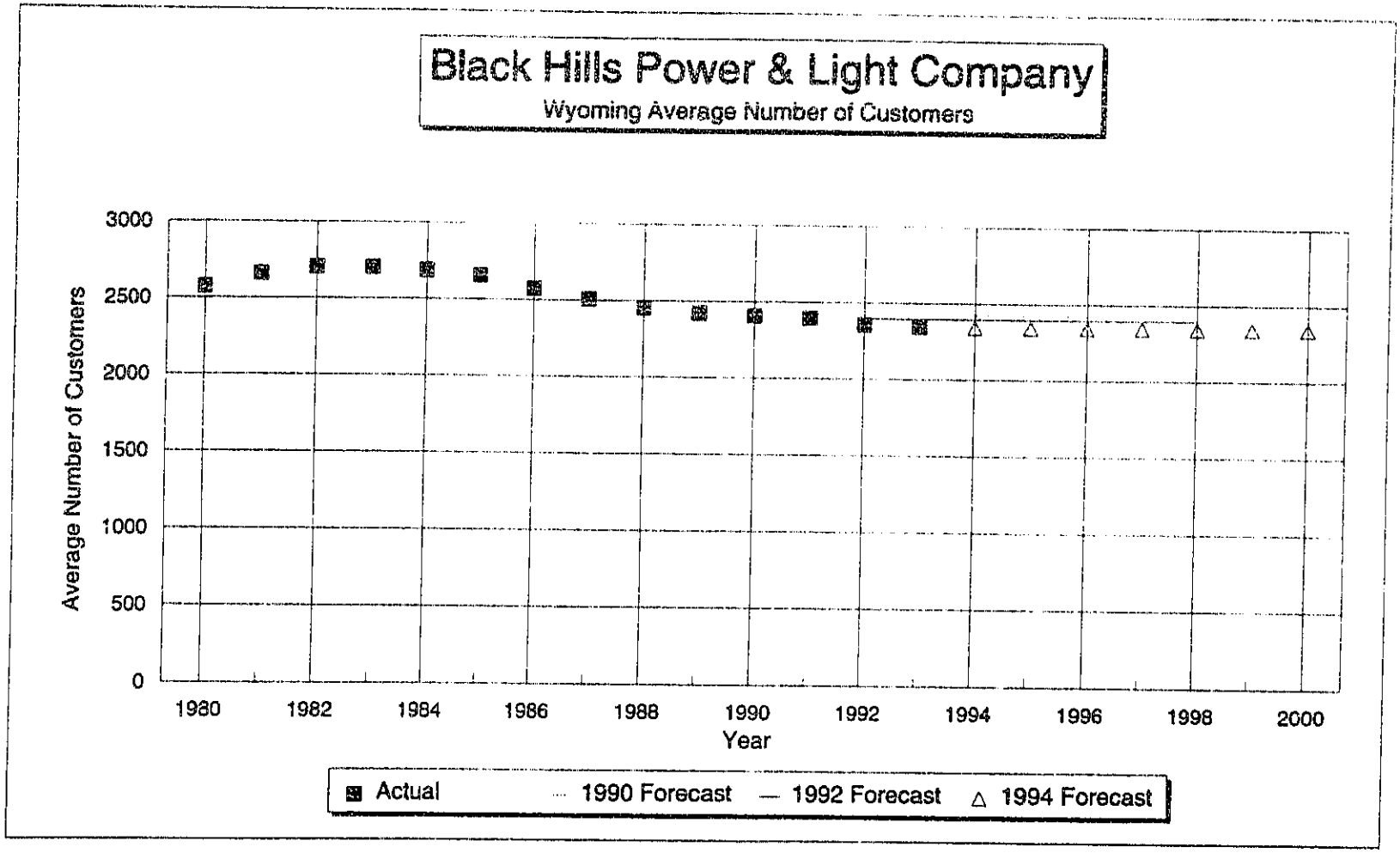
Black Hills Power and Light Company
Analysis of Historical Load Factors Excluding Gillette
For years 1983 - 1993
15-Nov-94

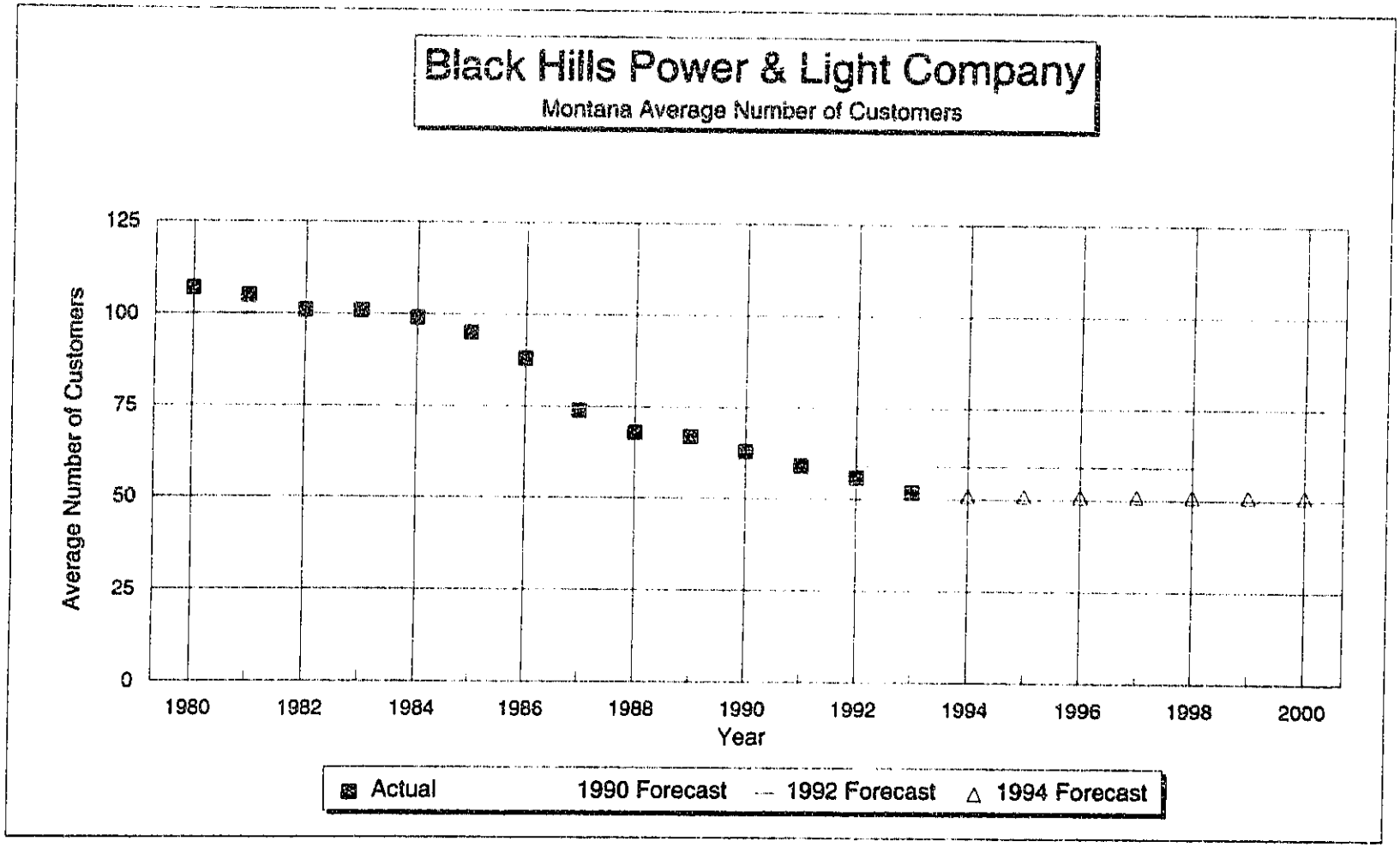
Year	January	February	March	April	May	June	July	August	September	October	November	December
1983	0.747	0.690	0.769	0.736	0.697	0.696	0.676	0.705	0.659	0.776	0.736	0.748
1984	0.715	0.784	0.769	0.728	0.731	0.733	0.713	0.683	0.748	0.729	0.739	0.778
1985	0.727	0.730	0.769	0.777	0.748	0.696	0.652	0.676	0.755	0.712	0.737	0.714
1986	0.740	0.737	0.743	0.731	0.755	0.675	0.691	0.663	0.791	0.749	0.715	0.722
1987	0.756	0.776	0.790	0.745	0.747	0.715	0.670	0.723	0.740	0.778	0.783	0.710
1988	0.749	0.749	0.783	0.755	0.728	0.679	0.676	0.679	0.718	0.774	0.754	0.756
1989	0.793	0.702	0.729	0.755	0.753	0.690	0.726	0.724	0.735	0.746	0.736	0.709
1990	0.766	0.733	0.748	0.755	0.776	0.655	0.652	0.697	0.714	0.771	0.755	0.706
1991	0.762	0.755	0.748	0.754	0.794	0.698	0.696	0.701	0.762	0.715	0.756	0.751
1992	0.731	0.701	0.763	0.721	0.726	0.744	0.763	0.762	0.741	0.781	0.793	0.735
1993	0.752	0.695	0.763	0.733	0.788	0.709	0.694	0.705	0.755	0.788	0.713	0.787
1994	0.745	0.688	0.767	0.745	0.767	0.725	0.690	0.731				
Average	0.749	0.731	0.761	0.745	0.750	0.701	0.692	0.704	0.738	0.756	0.747	0.738
Std Dev/Avg.	2.54%	4.78%	2.21%	1.99%	3.44%	3.45%	4.35%	3.76%	4.36%	3.48%	3.20%	3.67%
1987-94	0.758	0.729	0.761	0.746	0.759	0.702	0.696	0.715	0.738	0.765	0.756	0.736
Std Dev/Avg.	2.05%	4.86%	2.50%	1.57%	3.01%	3.65%	4.67%	3.32%	2.21%	3.13%	3.32%	3.84%
1987-94 (Exc. 1992)						0.696	0.686	0.708				
1987-94 (Exc. 93-94)		0.741										0.728
Use	0.758	0.741	0.761	0.746	0.759	0.696	0.686	0.708	0.738	0.765	0.756	0.728
FC Growth	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%	2.07%
Long Term LF	70.81%	69.11%	71.10%	69.56%	70.89%	64.60%	63.63%	65.85%	68.79%	71.47%	70.58%	67.80%
LF Trend	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010	0.0010
% of Use	0.1366%	0.1396%	0.1361%	0.1383%	0.1365%	0.1488%	0.1509%	0.1462%	0.1404%	0.1354%	0.1370%	0.1423%
1994	0.757	0.740	0.760	0.745	0.758	0.695	0.685	0.707	0.737	0.764	0.755	0.727
1995	0.756	0.739	0.759	0.743	0.757	0.694	0.684	0.706	0.736	0.763	0.754	0.726
1996	0.755	0.738	0.758	0.742	0.756	0.693	0.683	0.705	0.735	0.762	0.753	0.725
1997	0.754	0.737	0.757	0.741	0.755	0.692	0.682	0.704	0.734	0.761	0.752	0.724
1998	0.753	0.736	0.756	0.740	0.754	0.691	0.681	0.703	0.733	0.760	0.751	0.723
1999	0.752	0.735	0.755	0.739	0.753	0.690	0.680	0.702	0.732	0.759	0.750	0.722
2000	0.751	0.734	0.754	0.738	0.752	0.689	0.679	0.701	0.731	0.758	0.749	0.721
2001	0.750	0.733	0.753	0.737	0.751	0.688	0.678	0.700	0.730	0.756	0.748	0.720
2002	0.749	0.732	0.752	0.736	0.750	0.687	0.677	0.699	0.729	0.755	0.747	0.719
2003	0.748	0.731	0.751	0.735	0.749	0.686	0.676	0.698	0.728	0.754	0.746	0.718
2004	0.747	0.730	0.750	0.734	0.748	0.685	0.675	0.697	0.727	0.753	0.745	0.717
2005	0.746	0.729	0.749	0.733	0.747	0.684	0.674	0.696	0.726	0.752	0.743	0.716
2006	0.745	0.728	0.748	0.732	0.746	0.683	0.673	0.695	0.725	0.751	0.742	0.715
2007	0.744	0.727	0.747	0.731	0.745	0.682	0.672	0.694	0.724	0.750	0.741	0.714
2008	0.743	0.726	0.746	0.730	0.744	0.681	0.671	0.693	0.723	0.749	0.740	0.713
2009	0.742	0.725	0.745	0.729	0.743	0.680	0.670	0.692	0.722	0.748	0.739	0.712
2010	0.741	0.724	0.744	0.728	0.742	0.679	0.669	0.691	0.721	0.747	0.738	0.711
2011	0.740	0.723	0.743	0.727	0.741	0.678	0.668	0.690	0.719	0.746	0.737	0.710
2012	0.739	0.722	0.742	0.726	0.739	0.677	0.667	0.689	0.718	0.745	0.736	0.709
2013	0.738	0.721	0.741	0.725	0.738	0.676	0.666	0.688	0.717	0.744	0.735	0.708
2014	0.737	0.720	0.740	0.724	0.737	0.675	0.665	0.687	0.716	0.743	0.734	0.707
2015	0.736	0.719	0.739	0.723	0.736	0.674	0.664	0.686	0.715	0.742	0.733	0.706
2016	0.735	0.718	0.738	0.722	0.735	0.673	0.663	0.685	0.714	0.741	0.732	0.705

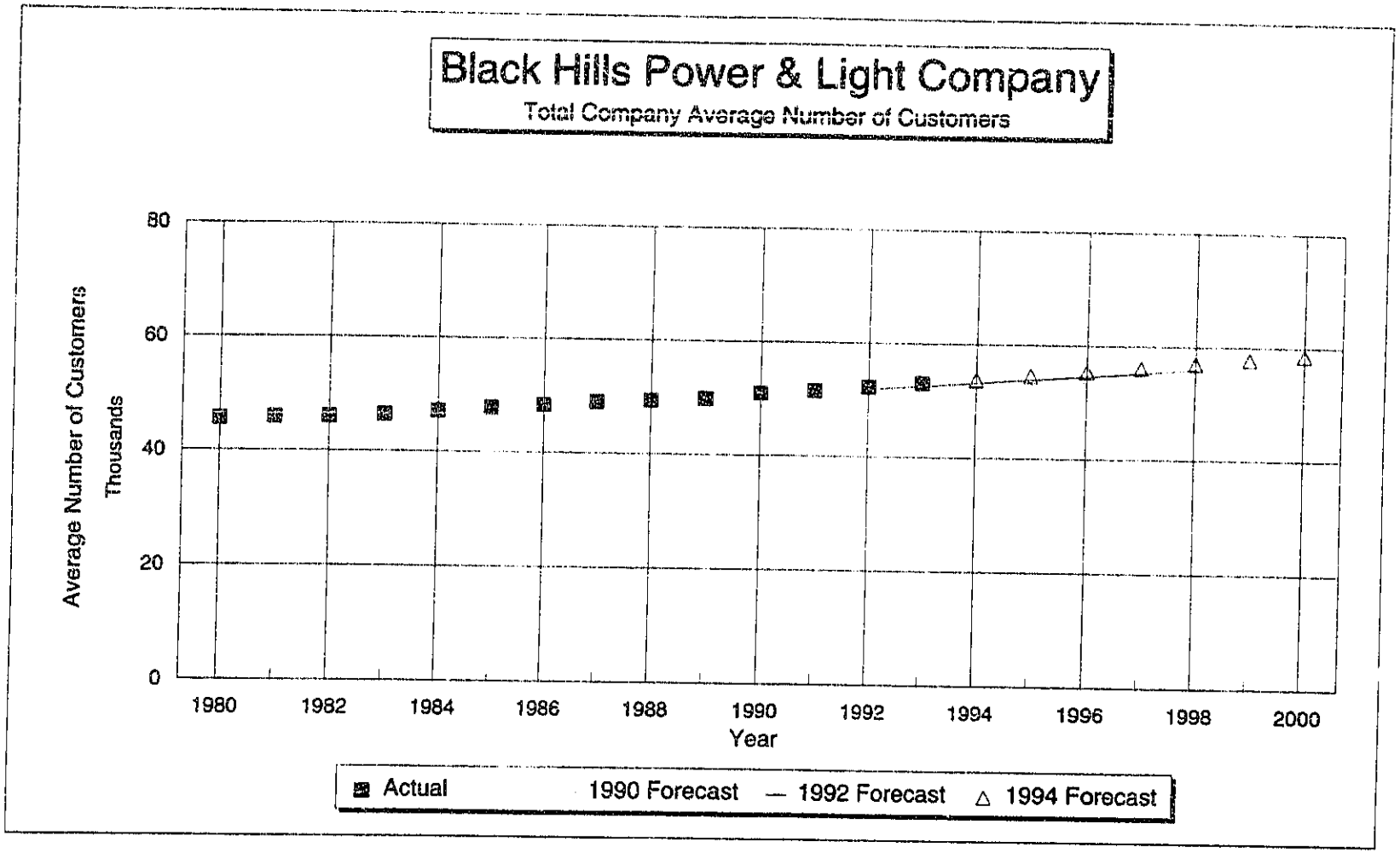
Black Hills Power and Light Company
P.N. 191Z4.100
Gillette, Wyoming
Determination of Gillette Load Factor
16-Nov-94

Year	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Requirement (SCADA)												
1987	16,117	13,423	14,537	12,449	12,277	11,750	12,779	12,210	11,741	12,949	13,454	15,951
1988	17,213	13,402	15,673	13,156	12,693	13,745	14,745	14,099	11,764	12,415	15,272	16,341
1989	16,863	16,918	15,451	13,838	12,274	12,604	14,436	14,204	12,714	13,832	14,411	17,042
1990	16,684	14,969	15,516	13,629	13,600	13,222	14,327	14,665	13,662	14,680	14,984	18,767
1991	15,769	14,431	15,532	14,376	13,709	13,110	15,068	15,296	13,470	14,838	16,069	16,827
1992	16,923	14,767	14,970	13,913	13,463	13,023	13,375	14,246	13,322	14,203	16,102	18,827
1993	18,837	16,248	16,045	14,144	13,356	12,937	13,644	14,138	12,938	14,294	16,430	17,395
1994	17,629	16,414	15,538	14,020	13,628	13,959	15,285	16,167				
Total Metered Capacity (1 Hour CP)												
1987	29.6	26.6	27.4	23.2	23.1	23.2	25.8	25.6	23.5	23.6	26.1	29.3
1988	30.0	30.0	27.0	23.0	23.0	27.0	28.0	25.0	18.0	23.0	27.0	29.0
1989	32.0	36.0	31.0	25.0	22.0	26.0	28.0	28.0	25.0	25.0	28.0	34.0
1990	29.0	29.0	25.0	26.0	21.0	29.0	30.0	26.0	26.0	25.0	31.0	39.0
1991	31.0	28.0	28.0	27.0	24.0	26.0	30.0	31.0	27.0	32.0	32.0	31.0
1992	32.0	30.0	24.0	26.0	26.0	25.0	26.0	28.0	26.0	26.0	38.0	33.0
1993	32.0	32.0	29.0	25.0	23.0	25.0	30.0	28.0	23.0	28.0	33.0	30.0
1994	33.0	33.0	27.0	24.0	24.0	28.0	29.0	30.0				
Load Factor												
1987	0.732	0.757	0.728	0.745	0.714	0.703	0.666	0.641	0.694	0.737	0.716	0.732
1988	0.771	0.764	0.780	0.794	0.742	0.707	0.708	0.758	0.908	0.726	0.786	0.757
1989	0.708	0.719	0.687	0.758	0.811	0.673	0.693	0.682	0.706	0.744	0.715	0.674
1990	0.773	0.768	0.834	0.728	0.870	0.633	0.642	0.758	0.678	0.778	0.671	0.647
1991	0.814	0.767	0.746	0.740	0.768	0.700	0.675	0.663	0.693	0.623	0.697	0.730
1992	0.711	0.732	0.838	0.743	0.696	0.724	0.691	0.684	0.712	0.734	0.589	0.759
1993	0.791	0.756	0.744	0.786	0.781	0.719	0.611	0.731	0.781	0.686	0.691	0.779
1994	0.718	0.740	0.773	0.811	0.763	0.692	0.708	0.724				
Average	0.752	0.750	0.766	0.763	0.768	0.694	0.674	0.705	0.739	0.718	0.695	0.725
Std Dev/Avg	5.00%	2.23%	6.31%	3.69%	6.71%	3.91%	4.70%	5.82%	10.23%	6.45%	7.87%	6.15%
Load Factor (removing outliers)												
1987	0.732	0.757	0.728	0.745	0.714	0.703	0.666	0.641	0.694	0.737	0.716	0.732
1988	0.771	0.764	0.780	0.794	0.742	0.707	0.708	0.758		0.726	0.786	0.757
1989	0.708	0.719		0.758	0.811	0.673	0.693	0.682	0.706	0.744	0.715	0.674
1990	0.773	0.768		0.728		0.633	0.642	0.758	0.678	0.778	0.671	0.647
1991	0.814	0.767	0.746	0.740	0.768	0.700	0.675	0.663	0.693		0.697	0.730
1992	0.711	0.732		0.743	0.696	0.724	0.691	0.684	0.712	0.734		0.759
1993	0.791	0.756	0.744	0.786	0.781	0.719	0.611	0.731	0.781	0.686	0.691	0.779
1994	0.718	0.740	0.773	0.811	0.763	0.692	0.708	0.724				
Average	0.752	0.750	0.754	0.763	0.754	0.694	0.674	0.705	0.711	0.734	0.713	0.725
Std Dev/Avg	5.00%	2.23%	2.61%	3.69%	4.84%	3.91%	4.70%	5.82%	4.70%	3.71%	5.03%	6.15%


Black Hills Power & Light Company
South Dakota Average Number of Customers
Average Number of Customers
Thousands
60
40
20
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Year
Actual
1990 Forecast
1992 Forecast
1994 Forecast


Black Hills Power & Light Company
Wyoming Average Number of Customers
Average Number of Customers
3000
2500
2000
1500
1000
500
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Year
Actual
1990 Forecast
1992 Forecast
1994 Forecast


Black Hills Power & Light Company
Montana Average Number of Customers
Average Number of Customers
125
100
75
50
25
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Year
Actual
1990 Forecast
1992 Forecast
1994 Forecast


Black Hills Power & Light Company
Total Company Average Number of Customers
Average Number of Customers
Thousands
80
60
40
20
0
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Year
Actual
1990 Forecast
1992 Forecast
1994 Forecast

BHPL EXHIBIT LWL-2

1992 LOAD FORECAST



BLACK & VEATCH

[illegible]

April 23, 1992

Mr. Tom Ohlmacher
Director Engineering & Operations
Black Hills Power and Light Company
399 Deadwood Avenue
Rapid City, South Dakota 57702

Dear Mr. Ohlmacher:

We are submitting herewith our report on the Black Hills Power and Light Company System Load Forecast. Submitted under a separate cover are a set of computer disks containing a System Forecasting Model based on Lotus 1-2-3 spreadsheet software. This model is being supplied in order to permit revision and updating of the forecasts to reflect the most current information. Instructions for use of the model are included.

Two sets of forecasts are presented in this report - short term and long term. The short term forecasts are intended to be used in the Black Hills Power and Light Company budgeting process and provide forecasts of energy sales by customer rate class and jurisdiction monthly through December 1998 and annually through 2004. Long term forecasts of peak demand and system energy requirements are provided monthly through 2004 and annually through 2014. These forecasts are intended as an aid for long term generation planning.

We appreciate the opportunity to work with you on this matter and look forward to working with you in the future. If you have any questions concerning the enclosed, please do not hesitate to contact either Tom Sullivan or me.

Very truly yours,

BLACK & VEATCH

L. W. Loos

lkm
Enclosure

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Chapter 1 - Executive Summary

This report presents the results of an analysis and forecast of Black Hills Power and Light Company (Black Hills or BHPL) demand and energy requirements. Two sets of forecasts are presented - short term and long term. The short term forecasts include monthly energy sales forecasts by customer rate class and jurisdiction monthly through December 1998 and annually through 2004. The detailed individual forecasts will be very sensitive to changing economic conditions. Since their primary use is in the preparation of short term budgets, they should be frequently revised and updated. Extrapolation of these short term forecasts beyond the period presented is discouraged, since the accuracy of the forecasting method used decreases rapidly after the first two to three years. It is recommended that the short term forecasts contained herein be updated every two years in order to maintain an acceptable level of reliability.

Long term forecasts of system energy requirements and peak demand are provided monthly through 2004 and annually through 2014. The long term energy forecasts are developed directly from the total sales forecast through the application of an energy to sales ratio. Total energy to sales ratios for each month are developed from analyses of historical relationships. This ratio represents the difference between sales and energy due to the effects of cycle billing, company use and unaccounted for energy. The long term peak forecasts are calculated directly from the energy forecast based on monthly (through 2004) and annual (2005 through 2014) load factors. Monthly load factors for 1992 are based on the averages experienced from 1987 through 1991. A small declining annual trend is applied to load factors used in future years to recognize that future growth rates for the higher load factor industrial customers have been adjusted downward to reflect the results of the Company's large customer survey.

The short range monthly forecasts by rate class and jurisdiction exhibit strong seasonal behavior and are not amenable to generalization. The long range trends, however, have been remarkably stable for several years over a wide range of economic and weather conditions and are expected to continue to be valid for intermediate term projections. It is recommended that the long term forecasts be updated coincidentally with short term forecast updates.

The results of the sales and peak forecasts are briefly summarized below in Table 1-1 and Table 1-2. Total Company sales are forecasted to increase from actual sales of 1,523 GWh in 1991 to 1,558 GWh in 1992 and 2,026 GWh in 2002. The equivalent annual compound rate of growth over the ten year period ended 2002 is forecasted to be 2.5 percent. The larger percentage increase from 1992 to 1993 (3.8 percent) results from reflecting actual January and February 1992 sales in the 1992 forecast. January and February weather conditions were much warmer than normal.

TABLE 1-1
Total Company Sales and Peak Forecast

	1992	1993	1994	1997	2002
Sales - GWh	1,558	1,618	1,662	1,794	2,026
Summer Peak - MW	287	297	304	329	373
Winter Peak - MW	269	277	284	307	348

TABLE 1-2
Equivalent Annual Compound Growth Rates (1)

	1992-93	1993-94	1993-97	1993-2002
Sales	3.83%	2.76%	2.63%	2.53%
Summer Peak	3.16%	2.68%	2.63%	2.59%
Winter Peak	2.81%	2.64%	2.64%	2.58%

(1) Applicable only to the specific time periods shown.

As shown in Table 1-1, the Total Company peak is forecasted to occur during the summer. Total Company peak is forecasted to increase from 287 MW in 1992 to 297 MW in 1993 and 373 MW in 2002. The equivalent annual compound rate of growth over the ten year period ended 2002 is forecasted to be 2.6 percent. The winter peak is forecasted to grow at about the same rate as the summer peak but at a level which is about 20 to 25 MW less than the summer peak.

The chapters that follow discuss the load forecast in more detail. Chapter 2 contains a brief discussion of Black Hills and its service territory. Chapter 3 discusses the statistical methods used to develop the forecasts in this report. Chapter 4 discusses the other significant considerations which have an impact on the load forecast. Chapter 5 discusses the sales, energy and load forecasts in detail. Finally, Chapter 6 discusses the forecast for average number of customers by rate and jurisdiction.

Chapter 2 - Regional Overview

The Black Hills Corporation is a diversified company consisting of three principle businesses: electric service, coal mining, and oil and gas operations. The electric operations of the Black Hills Corporation are conducted by its public utility division under the name of Black Hills Power and Light Company. Black Hills Power and Light Company provides electric utility services in 11 counties in western South Dakota, northeastern Wyoming, and southeastern Montana. The Company serves a total of about 51,000 customers, 95 percent of which are in South Dakota. Most of the remaining customers are located in Wyoming. Only a few residential and general service customers and three industrial customers are served in Montana. The bulk of the energy sales in Montana are accounted for by the three industrial customers.

The Wyoming jurisdiction contains a mix of residential, commercial, and industrial customers and the Company's only wholesale customer - the City of Gillette. The City of Gillette at the present time accounts for approximately 10 percent of the Company's total energy sales.

The South Dakota jurisdiction, with 95 percent of the Company's customers and 81 percent of the Company's energy sales, has experienced a long period of relatively stable growth, without the "boom and bust" cycles experienced in the other two jurisdictions. This relatively stable growth pattern is attributed to the larger population base and greater diversity of economic activity in the South Dakota jurisdiction, where a decline in one sector of the economy can be offset by growth in another.

The Montana and Wyoming jurisdictions, however, have been severely impacted by the recent declines in oil and gas prices and the resultant cutbacks in the oil and gas sectors of the economy. This impact has been especially noticeable in Montana where the loss of jobs and industrial activity has resulted in a sharp decrease in the number of Black Hills Power and Light customers and energy sales. In Wyoming, the economy of the City of Gillette has been significantly affected by the decline in oil and gas production and exploration activity. This is demonstrated by the total annual electric energy sales to the City, which over the 10 year period from 1975 to 1985 exhibited growth at an average annual rate of over 13 percent. This trend reversed in 1986, stabilized during 1987 through 1989 and has resumed a more modest rate of growth through 1991. It is expected that Gillette will begin to show a smaller positive growth in the future. It is considered doubtful that the explosive rate of the 1975-1985 period will be repeated unless oil prices drastically increase.

Even though the South Dakota jurisdiction has exhibited a much more stable economy than the Wyoming and Montana jurisdictions, economic dislocations can still have a strong effect on demand and energy forecasts in this area. Short term forecasts need to be adjusted

regularly to accommodate the most recent changes and trends in economic activity. The Black Hills Power and Light Company is in a unique position to evaluate trends and activities in the local economy due to its involvement, through the other divisions of the Black Hills Corporation, in the major industries of the area - oil and gas production, and mining. The forecasts developed in this study reflect inputs and evaluations from Black Hills Power and Light personnel. The computer model provided is designed to allow modification of the forecasts by Black Hills Power and Light as conditions change.

Chapter 3 - Discussion of Forecasting Methodologies

General

Forecasting techniques fall into two major categories:

1. Quantitative
2. Qualitative or technological

This study is concerned only with quantitative forecasting, since numerical estimates of energy sales and system demand are needed for budgeting and long-term planning purposes. Application of any of the quantitative forecasting methods requires that three conditions be met:

1. Information about the past is available.
2. This information can be quantified in the form of numerical data.
3. At least some aspects or patterns of past conditions are expected to continue into the future.

This last condition, known as the assumption of continuity, is an underlying premise of all quantitative forecasting methods. Even the most sophisticated econometric models assume that relationships or patterns determined on the basis of historical data will continue to remain valid for the future.

There are two major types of quantitative forecasting models: time series and causal (regression) models. In time series models, prediction of the future is based on determining the pattern in the historical data series and extrapolating that pattern into the future. Causal models, on the other hand, assume that the factor to be forecasted exhibits a cause and effect relationship with one or more independent variables. The purpose of the causal model is to discover the form of that relationship and use it to forecast future values of the dependent variable. Both time series and causal models have advantages in certain situations.

If the main concern is to project what will happen without knowing why, time series models are frequently easier to use and generally produce more accurate short and medium term forecasts. This is especially true in situations with very complex systems involving multiple independent variables and non-linear relationships between variables.

Regression-based modeling techniques, on the other hand, are very popular as a forecasting means, especially in academic circles, since they may aid in providing insights into the underlying principles and interactions of economic and social systems. Regression methods are easy to understand and can generate statistical measures which may seem to provide a mathematical proof that the methodology is correct. One of these measures, the coefficient of determination or R^2, should be used with considerable caution in evaluating regression models for forecasting. The R^2 factor does not indicate how well the regression equation fits the data, but only how well the shape of the regression line corresponds to the

shape of the data line. Confidence intervals, which are frequently computed for regression models, should also be used with caution, as they apply only to that portion of the regression line which lies within the historical range of values of the independent variables and do not apply to extrapolations beyond this range. Attempts to use the regression model beyond the historical data range may not yield usable projections. In order to develop a valid regression model for forecasting, several conditions should exist including:

1. A long series of historical data for both dependent and independent variable(s).
2. The values of the independent and dependent variable(s) should show significant change during the historical period so that the relationship(s) between the independent and dependent variable(s) can be determined.
3. The relationship(s) between the independent and dependent variable(s) must remain stable over the historical and forecast period.

If the model is to be used as a forecasting tool, an additional condition must be met.

4. The independent variable(s) must be either determined or projected to a greater degree of accuracy than that desired in the dependent variable.

If all these conditions are met, regression based models can provide excellent forecasting tools. The forecasts prepared in the course of this study employed both time series and regression forecasting methods. The following presents a description of the methodologies used in this report.

Time Series Techniques

The time series forecasting techniques employed in this study were simple linear regression, log regression, and the Census X-11 decomposition technique.

The basic approach taken by the seasonal adjustment (decomposition) methods represented by the Census X-11 approach is to separate historical time series data into three components: trend, seasonality, and randomness. The trend component is then projected using smoothing or regression techniques and the seasonality factors reintroduced to provide the forecast.

The Census X-11 decomposition method was originally developed by Julius Shiskin for the U. S. Department of Labor. It may be used with monthly or quarterly data that displays multiplicative seasonality. The technique involves what is known as a ratio to moving averages approach. That is, the Census X-11 technique uses various length moving averages depending upon the amount of randomness in the data -- the more randomness, the longer the moving average. Decomposition techniques require a substantial history of monthly or quarterly data. The Census X-11 requires at least five years of data (i.e., 60 observations for monthly data or 20 observations for quarterly data). Although the Census

X-11 method is considered very accurate. it should not be used with highly volatile data or data that contains negative numbers or zeros. In order to avoid volatility problems. the data we received was closely analyzed and adjusted as necessary to eliminate the effect of obvious billing corrections. errors and missing data points.

The multiplicative Census X-11 decomposition model takes the form:

TH = T * S * E

where

TH is the time series

T is the trend

S is the seasonal factor

E is the random component

The following steps are required to forecast using the Census X-11 method:

1. Define the underlying trend.
2. Compute the seasonal-irregular ratios (historical data divided by trend).
3. Replace statistically extreme irregular ratios.
4. Derive seasonal factors.
5. Compute seasonally adjusted series.

These procedural steps require a large number of complex computational steps, as indicated below:

1. The data is smoothed over a 12-month period.
2. The data is smoothed again using 2-month smoothing to produce the initial trend.
3. The seasonal-irregular ratios are identified by calculating the ratio of the observations to the trend.

The irregular values are computed as follows:

1. Smooth the seasonal-irregular ratios for each month using a weighted moving average.
2. Compute centered 12-month moving averages of the preliminary seasonal factors for the entire series. These factors should total 12 for any 12-month period.
3. Compute the estimates of the irregular component by dividing the seasonal-irregular ratios by the seasonal factor estimates.
4. Compute a moving standard deviation of the irregulars for each five years of data.
5. Remove any irregulars with a standard deviation of more than 2.5 in the center year; then compute the moving 5-year standard deviation again.

6. Weight the irregulars as follows:
   a. Those in the center year beyond a standard deviation of 2.5 equal 0 weight.
   b. Those with less than 1.5 equal full weight.
   c. Those 1.5 - 2.5 receive a linear weight ranging from 1.0 at 1.5 and 0 weight at 2.5.
7. For irregulars receiving less than full weight, replace the seasonal-irregular ratios with the average of weight times ratio. The two preceding and following ratios receive full weight. This procedure results in a new set of seasonal-irregular ratios without the effect of extreme outliers
8. The first two steps are repeated to obtain the preliminary seasonal factors.

Once the trend, seasonal, and irregular components have been determined, either a regression technique or appropriate smoothing technique may be applied to the trend component in order to generate a forecast of the component trend. This trend forecast is then multiplied by the appropriate seasonal factors to generate the forecast. The irregular factors are not used in the final forecast since they represent random disturbances which are by definition unforecastable. These factors, however, will give some indication of the goodness of fit of the predicted values to the original data, in a manner analogous to the R^2 values for a regression analysis.

Regression Techniques

The three regression based techniques used in this study are simple linear regression, log regression, and multiple regression. Simple linear regression is used to examine the relationship between two variables. This two variable method is known as linear regression because it yields an equation in the form $y = ax + b$ where

y is the dependent variable
x is the independent variable
b is a constant
a is the slope of the regression line

This method can also be used in many cases where the relationship between the two variables is non-linear if the relationship can be transformed to a linear relationship application of various mathematical transforms such as log regression. Log regression was utilized in several classes in the Wyoming jurisdiction that were exhibiting downward trends which would eventually plummet to zero if simple linear regression were used. Log regression transforms the data such that the regression curve of y on x is exponential. The data approaches a limit of zero rather than actually ever equalling zero or falling below zero.

If the transform is successful in producing a nearly linear relationship the method of least squares, which minimizes the sum of the squared deviation of the actual data points from the regression line, can be used to determine the coefficients of the regression equation. This equation can then be used to forecast values for the dependent variable, given an assumed value of the independent variable. It should be noted, however, that assuming values for the independent variable which lie outside the range of the historical data used in deriving the equation may not yield valid forecasts, especially for those cases where the apparent relationship between the dependent and independent variables is not strong initially.

The third regression technique utilized is multiple regression, which is an extension of simple regression. It examines the relationship between the dependent variable and two or more explanatory variables. Multiple regression is used to:

1. Predict the value of a dependent variable using some or all of the dependent variables. The aim here is generally to explain the dependent variable accurately with as few independent variables as possible.
2. Examine the influence and relative importance of each independent variable on the dependent variable. This involves looking at the magnitude and size of the standardized regression coefficients as well as the significance of the individual regression coefficients. Multiple regression yields an equation of the form:

$$Y = B + A_1X_1 + A_2X_2 + \ldots + A_KX_K$$

where

Y	is the dependent variable
$X_1 \ldots X_K$	are the independent variables
B	is the intercept
$A_1 \ldots A_K$	are the coefficients

This analysis is considerably more difficult than simple regression and regression equations which exhibit high R^2 values may have variable coefficients which fly in the face of logic, such as a negative coefficient for the number of customers in a peak load analysis. This would indicate that peak loads decrease as the number of customers increased and would cast considerable doubt on the validity of the equation.

Another caution to be observed in multiple regression analysis is that the number of independent variables should not become too large if the equation is to be used for forecasting purposes rather than as an explanation of the determinants of the dependent variable. For use as a forecasting tool for the dependent variable, all of the independent variables must be forecasted. This requirement severely limits the practicality of elaborate regression models as forecasting tools.

There are other time series and regression modeling techniques which could be used to provide demand and energy forecasts for the Black Hills Power and Light Company. Some of them, such as the Box-Jenkins method for time series analysis, may provide some improved accuracy but only at the expense of greatly increased computational and analysis time. Other forms of analysis were screened during the course of preparing this report but were discarded as offering less accuracy than those selected.

Monthly Energy Sales by Jurisdiction and Rate Class Forecast

These forecasts all utilize time series methods, primarily the Census X-11. For certain smaller classes of customers a straight line extrapolation of the trend is used. These forecasts are computed for a seven year period but, due to the nature of the data and the methodology, reliability will diminish considerably after the first two years.

System Energy Requirements Forecast

This forecast is developed directly from the total sales forecast by using an energy to sales ratio based on historical relationship experienced by Black Hills.

System Load Forecast

This forecast is developed from the system energy forecast using historical monthly load factors. A slight negative annual trend is introduced into the monthly load factors to recognize the lower load factors associated with the customer loads contributing to growth.

Number of Customers by Rate Class and By Jurisdiction

This forecast takes into consideration both the historical growth rate in average number of customers and the underlying sales forecast annual growth rate for each rate class within each jurisdiction.

Chapter 4 - Other Considerations

In addition to the statistical analyses discussed in the prior chapter, other non-statistical considerations have an impact on the forecasts. The most significant non-statistical considerations include the following: Gillette, Wyoming forecast, large customer survey, demand side load management programs, and rate impacts.

Gillette, Wyoming Forecast

Gillette, Wyoming is Black Hills' sole wholesale customer and accounted for approximately 10 percent of the Company's sales in 1991. Prior to mid-1989, Black Hills provided virtually 100 percent of Gillette's capacity requirements and almost all of Gillette's energy requirements. In 1989, Gillette began taking approximately 27-28 MWh per year of energy and 4 MW of capacity from the Western Area Power Administration (WAPA). Currently, Black Hills is providing firm power to the City of Gillette under a long term power supply agreement which generally requires Black Hills to serve up to 60 percent of Gillette's historical peak and associated energy above that supplied by WAPA. Prior to early 1991, Black Hills provided the capacity and energy requirements above the WAPA and firm power supply agreement to Gillette under a seasonal non-firm power sales agreement. Black Hills has exercised an option to cancel this non-firm agreement and the City of Gillette is currently obtaining peaking capacity and energy from another source.

In the load forecast, it assumed that Black Hills provides capacity to Gillette equal to 60 percent of Gillette's historical peak. Gillette's current historical peak of 38.8 MW occurred in December 1990. Sixty percent of the current historical peak amounts to 23.3 MW. This 23.3 MW level increases in the future as Gillette's total peak is forecasted to increase above 38.8 MW. Black Hills is assumed to provide energy to Gillette corresponding to the firm capacity provided by Black Hills. This amount is equal to Gillette's total requirements, less energy supplied by WAPA, minus peaking energy requirements above WAPA's 4 MW and BHPL's 60 percent of historical peak. This results in a projection for Black Hills providing about 83 percent of Gillette's energy requirements through the period analyzed.

As discussed above, this load forecast assumes that Gillette will obtain all of their energy requirements above Black Hills' 60 percent of historical peak plus WAPA capacity from sources other than Black Hills. It should be noted that Gillette has a contractual option that if exercised could require Black Hills to serve additional capacity and energy above the 60 percent level assumed in this forecast. The Company believes that Gillette's statements and actions indicate that this option will not be exercised. In the event that this option is

exercised, the load forecast may need to be modified to reflect any additional capacity and energy to be provided by Black Hills.

The portions of Gillette's sales, energy, and peak requirements met by Black Hills are forecasted independent of the other jurisdictions' retail sales, energy and peak requirements met by Black Hills. The energy to sales ratios and load factors used to determine energy and peak requirements of the other jurisdictions are developed excluding Gillette. This approach makes it easy to isolate the portion of BHPL's total sales, energy and peak attributable to Gillette and makes adjustments to the forecast relatively simple should Black Hill's commitments to Gillette change.

Customer Survey

During February and March of 1992, Black Hills conducted a survey of large general service and industrial customers. The intent of this survey was to obtain input from customers with regard to their expected levels of energy demand in the future.

Customer surveys can provide very important information which cannot be obtained from purely statistical analysis. Statistical analysis of historical data can provide insight into seasonal usage patterns and the past growth or decline in sales and a foundation to extrapolate such information into the future. The key assumption of such an analysis of historical data is that the recent past is the best indication of the near future. But for customer classes which contain a relatively few large customers and which add customers either infrequently or in small increments, statistical analysis of historical data alone may not provide the best results. Further, usage changes for these classes tend to follow irregular patterns. Usage changes usually occur from one of two sources: 1) addition or loss of customer and 2) changes in usage characteristics of existing customers. Frequently, these changes can be rather abrupt. On the other hand, customer classes which contain a large number of small customers such as a residential class, changes in usage characteristics occur infrequently and generally over long periods of time and customer additions occur on a fairly consistent and regular basis.

Surveys of existing large customers are helpful in identifying the potential loss of a customer and projected changes in usage characteristics. Further, the survey can also identify new customers. For example, a customer survey may discover that an existing grocery store chain intends to add another store. Information regarding new large customers may be known in advance by utility personnel either through their involvement in the community or because the utility has been contacted by a potential large commercial or industrial customer researching building sites. Such information is invaluable to generating a more accurate forecast for large customer classes.

As a result of Black Hills customer survey, it was concluded that the statistical analysis of the large general service classes provided a reasonable projection of the load growth expected in these classes. Analysis of survey results for the industrial classes indicated that modifications to the statistical analysis were warranted in South Dakota and Wyoming. The following adjustments have been incorporated into the forecasts in this report.

The South Dakota Contract Industrial class has contained the following three customers since 1988: Homestake Mining Company, South Dakota Cement Plant and Merillat Industries. Currently, the Company has no indication that there will be any change in the number of customers. Therefore, any change in total sales will result from a change in usage characteristics by these customers. Linear regression of the sales for this class indicated that sales would increase by an average of 2.35 percent in the future. The customer survey indicated that such a rate will likely occur for only one year, followed by a much lower rate of growth of 1 percent per year.

Based on the customer survey, Black Hills expects additional load from three existing Industrial Firm customers in addition to the underlying growth in the class. The underlying growth in the Industrial Firm class is forecasted to average 5.6 percent through the period ending 2004. This underlying growth primarily reflects the increase in customers from 23 in 1987 to 29 in 1991. The customer survey indicates that the following customers expect to increase usage: Pope & Talbot by 40 MWh per month beginning in July 1992, Wharf Mining by 175 MWh per month beginning in July 1992 and Golden Reward Mining by 420 MWh per month beginning in October 1992.

The Wyoming Industrial class has contained 7 customers since 1988 who have exhibited essentially constant use over this time period. The customer survey indicates that the following three customers expect to increase usage in the future: Wyoming Refining by 83 MWh per month beginning January 1992, Bentonite Corporation by 33 MWh per month in January 1993, and Wyodak Resources by 110 MWh per month beginning in July 1993.

Demand Side Load Management

In June 1989, Black & Veatch issued a report titled "Demand Side Load Management." This report concluded that because of Black Hills' relatively high load factor and nearly equal summer and winter peaks, that aggressive demand side management (DSM) could result in a deterioration of load factor and shift in the seasonal balance and therefore result in higher unit costs. Further, the report concluded that the DSM measures currently in place by Black Hills predominantly in the form of pricing services and programs encouraging customers and contractors to install energy efficient equipment and use demand controllers were effective and should be maintained and expanded where appropriate.

Even though the load forecast indicates that summer peaks will exceed winter peaks in the future, the difference between summer and winter peaks under expected conditions are not expected to be significantly different. Further, the variations that can exist in weather conditions are such that winter peaks can be expected to occasionally exceed summer peaks. Therefore, current conditions are not significantly different from those existing at the time of the 1989 load management report to lead to different conclusions with regard to load management programs.

Therefore, because the load management programs currently in place in the form of rates and energy efficiency incentives have existed in the historical data used as a basis for the load forecast developed in this report, the impact of such load management programs are reflected in the forecasts of future sales. At such time when the company may change its approach to load management through new forms of pricing, significant changes to energy efficiency incentives, or through direct attempts to control load, the load forecast may need to be modified based on the expected impacts of the specific rates or programs.

Rate Impacts

The statistical analyses in this load forecast generally use historical data from the last five years. This time frame can be characterized as a period with relatively constant rates. The company has not filed for base rate changes since the early 1980's and phase-in of the 1983 Power Sales Agreement with Pacific Power and Light Company was completed in 1988.

It is anticipated that rates will be increased in the future due to increased investment by Black Hills in generation and transmission facilities. Rate increases have the potential to exert negative impacts on electricity usage. Such impacts are dependent upon the size of the increases and the overall resultant level of rates. Small rate increases over a relatively long period of time which do not significantly exceed the overall rate of inflation generally can be expected to have a negligible impact on sales. Large one time increases can be expected to have a significant short term negative impact on sales. If the large one time increase results in rates significantly above the average of locations with which the utility competes for large commercial and industrial customers, the negative impact can be not only significant in the short term but also long term.

In this report, it is assumed that any future rate increases will be phased in over a long enough period of time to minimize disruption and therefore have a minimal long term impact on sales and the Company's ability to attract and retain commercial and industrial load. However, in the event that there are large rate increases over relatively short time frames in the future, the load forecast should be adjusted downward. The negative impact of large rate increases would likely manifest itself in two ways. First, the growth rates in sales to most customer classes would likely be less especially in the years immediately following the rate

increases. Second, industrial and large commercial load growth may decline or some industrial and commercial customers may be lost all together depending upon such factors as the economics of the customer's industry and the cost of alternative energy supplies.

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Chapter 5 - Sales, Energy, and Peak Forecasts

The sales, energy and peak forecasts are developed to meet two needs of Black Hills. The first is to provide Black Hills with monthly sales forecasts by rate class by jurisdiction through 1998 so that five year budgets for 1993 through 1997 and 1994 through 1998 can be prepared. The monthly sales forecasts by rate class by jurisdiction are prepared through 2004 because they are needed in preparing total company sales, energy and peak by month through 2004. The second purpose is to provide Black Hills with total company sales, energy and peak forecasts monthly through 2004 and annually through 2014 with upper and lower bandwidths to assist in the short and long term planning of system operations.

As discussed in Chapter 4, sales, energy and peak are forecasted separately for Gillette and the retail jurisdictions. The Gillette forecast is performed in two steps. Total Gillette energy and peak requirements are forecasted and then the BHPL share of Gillette energy and peak requirements are determined based on the criteria discussed in Chapter 4. The retail forecast and the forecast of BHPL's share of Gillette are added together to arrive at the sales, energy and peak forecast for the total company.

At the time this study was prepared, actual sales, energy, and peak demand through December 1991 were available (some data was available through February 1992). Monthly sales forecasts are developed for each rate class in each jurisdiction through 2004. The monthly sales forecasts are developed to recognize seasonal variations and the underlying trend or growth rate. The basic forecasts do not consider the random influences that cause sales to vary from the forecasted values (weather, for example). Upper and lower bandwidths have been calculated for each rate class based on these minor unexplained influences. These bandwidths are equal to plus and minus one standard deviation of these unexplained differences. Between the individual classes there is a wide range of resulting bandwidths. Generally, the large bandwidths are associated with small classes that exhibit extreme growth rates or extreme seasonal variation. The larger classes (residential, general service and industrial) generally have bandwidths in the area of plus and minus 5 percent. The upper and lower bandwidths for each class are not presented in this report but are carried through to the upper and lower bandwidths for the total sales of each jurisdictions. The upper and lower bandwidths for each jurisdiction are equal to the sum of the upper and lower bandwidths for each class within the jurisdiction.

The sales forecasts contained in this report reflect the other considerations discussed in Chapter 4. The direct impact of these considerations is reflected in the determination of the sales, energy and peak forecasts for Gillette and in the sales forecasts for the retail rate classes. Appendix A contains tables summarizing the approximate underlying average annual growth rates. In addition, Appendix A contains, for comparison purposes, the growth rates

in the 1988 and 1990 reports. The growth rates shown in Appendix A are the approximate average annual exponential growth rates. Because not all of the trend forecasts for each class are based on the application of an equal annual exponential growth rate, the growth rates shown in Appendix A should be considered only to approximate the actual growth forecasted. The growth rates shown in Appendix A are calculated assuming an equal annual exponential growth rate in order to provide a meaningful way to compare the forecasts of each class and jurisdiction.

If any significant economic changes occur in the areas served by Black Hills, the level of sales could vary significantly from the basic forecasts. Forecasting the factors that could cause such significant changes is not possible due to the inability to predict the national and international events which can affect the economic conditions in the Black Hills service area. Some of the significant factors which could impact the accuracy of the forecast or necessitate revisions to the forecast are discussed in Chapter 4.

The sales, energy and peak forecasts for the South Dakota, Wyoming and Montana jurisdictions are developed in three steps: 1) development of sales forecast by rate class by jurisdiction, 2) development of monthly energy to sales ratios (excluding Gillette) and 3) development of monthly load factors (excluding Gillette). For Gillette, sales and energy are assumed to be equal; therefore, there is no determination of energy to sales ratios for Gillette.

Monthly energy to sales ratios (excluding Gillette) are developed to produce the retail energy forecast directly from the retail sales forecast. The main reason for using this approach was to insure consistency between the sales and energy forecasts and to use a mechanism that allows changes made to the sales forecast to be reflected in the energy forecast. Appendix C summarizes the monthly sales to energy ratios used to develop the energy forecast from the sales forecast. Appendix C was developed based on the historical energy to sales ratios experienced in each month with consideration given to the expected relationships between months. In general, the energy to sales ratio recognizes the three basic differences between the sales and energy levels recorded by Black Hills for each month: timing differences due to cycle billing of sales, company use and unaccounted for. For Gillette, the sales and energy forecast are assumed to be equal. The total company sales and energy forecasts are developed by adding the retail and BHPL share of Gillette forecasts.

Monthly load factors are developed separately for the retail jurisdictions and Gillette to produce the peak demand forecasts directly from the respective energy forecasts. Appendix D summarizes the monthly load factors used. For 1992, the monthly load factors used are equal to the average of the period 1987 through 1991 adjusted to remove outliers (load factors significantly different from the average). For years beyond 1992, a slight negative trend is introduced into the monthly load factors for the retail jurisdictions, recognizing that the future growth rates for the higher load factor industrial customers have

been adjusted downward based on the Company's large customer survey. Load factors for Gillette are assumed to be constant throughout the forecast period. The total company peak is developed by adding the retail jurisdiction peak to BHPL's share of the Gillette peak.

The following sections discuss the sales forecasts for each jurisdiction and the sales, energy and peak forecasts for Gillette and Total Company (excluding and including Gillette).

South Dakota Sales Forecast

The South Dakota jurisdiction is divided into 13 rate classes: Residential plus Residential Water Heating, Residential All Electric, Residential Others, General Service, Large General Service, General Service All Electric, Area Lighting, General Service Irrigation, General Service Others, Industrial, Contract Industrial, Street Lighting and Municipal Pumping. South Dakota sales accounted for approximately 81 percent of Total Company sales in 1991. Contract Industrial, Residential and General Service sales combined account for about two-thirds of the sales in South Dakota. South Dakota sales have experienced consistent growth since 1980, averaging almost 5 percent annually. South Dakota sales generally experience a peak during the summer months.

Table 5-1 summarizes the South Dakota jurisdiction sales forecast. Total jurisdiction sales are forecasted to grow at about 2.3 percent per year from about 1.24 million megawatt-hours in 1991 to 1.27 million megawatt-hours in 1992 and 1.53 million megawatt-hours in 1998. The approximate individual class annual growth rates are summarized on Page 1 of Appendix A. The 1990 System Load Forecast forecasted South Dakota sales of 1.21 million megawatt-hours in 1991 and 1.39 million megawatt-hours in 1998. Minor differences in the individual rate classes between the two forecasts seem to balance out, resulting in very little change in the forecast total South Dakota sales. The past forecasts have tended to be slightly conservative in predicting actual sales. Figure 5-1 graphically depicts actual (1987-1991) and forecasted sales (1992-2000) for the South Dakota jurisdiction. The graphs for the individual rate classes are contained in Appendix B.

Wyoming Sales Forecast

The Wyoming jurisdiction is divided into 10 rate classes: Residential, Residential All Electric, Residential Others, General Service, Large General Service, General Service All Electric, Area Lighting, Industrial, Street Lighting and Municipal Pumping. Wyoming sales accounted for about 7 percent of Total Company sales in 1991. Industrial sales account for about 70 percent of total Wyoming sales. Total Wyoming sales have been essentially flat over the past several years. Wyoming sales exhibit a fairly strong winter peak.

Table 5-2 summarizes the Wyoming jurisdiction sales forecast. Sales are forecasted to remain constant at the level experienced in 1991 of about 110,000 megawatt-hours per

year. A slight dip in 1992 sales of about 2,000 megawatt hours is forecasted based on inclusion of actual sales for January and February. The approximate individual class annual growth rates are summarized on Page 2 of Appendix A. The 1990 Report forecasted a relatively constant level of sales for 1991-1996 of about 109,000 megawatt-hours per year, which is not significantly different from the current forecast. Figure 5-2 graphically depicts actual (1987-1991) and forecasted (1992-2000) sales for Wyoming. The graphs for the individual rate classes are contained in Appendix B.

Montana Sales Forecast

The Montana jurisdiction is divided into four rate classes: Residential, General Service, Industrial and Area Lighting. The Montana jurisdiction accounted for about 1 percent of Total Company sales in 1991 (down from 2 percent at the time of the 1990 Report). Industrial class sales account for more than 95 percent of Montana sales. Total Montana sales have experienced a significant decline in sales from about 60,000 megawatt-hours in 1983 to about 20,000 megawatt-hours in 1991. Sales in the Montana jurisdiction have a slight winter peak.

Table 5-3 summarizes the Montana jurisdiction sales forecast. Sales are forecasted to remain constant at the level experienced in 1991 of about 21,000 megawatt-hours per year. A slight dip in 1992 sales of about 400 megawatt-hours is forecasted based on inclusion of actual sales for January and February. The approximate individual class annual growth rates are summarized on Page 3 of Appendix A. The 1990 Report forecasted a constant level of sales for the 1991-1996 period at about 30,000 megawatt-hours per year. The prior forecasts have been optimistic in projecting a levelling off in sales. Figure 5-3 graphically depicts actual (1987-1991) and forecasted (1992-2000) sales for Montana. The graphs for the individual rate classes are contained in Appendix B.

Total Excluding Gillette

In Tables 5-6 through 5-8, sales, energy and peak forecasts are developed independent of the forecasts for Gillette, Wyoming. In this report, the total company forecast excluding Gillette is also referred to as the retail jurisdiction forecast. Table 5-6 shows expected sales, energy and peak on a monthly basis through 2004 and an annual basis through 2014. Tables 5-7 and 5-8 are the upper and lower bandwidth forecasts, respectively. Total sales excluding Gillette have increased on average about 3 percent per year over the last five years. In the future, this increase is expected to slow slightly to about 2.5 percent per year over the 1992 through 2004 period.

Monthly Total Sales excluding Gillette is simply the sum of the sales forecast for each of the jurisdictions discussed above. Total Sales excluding Gillette are forecasted to increase

from actual sales of 1,368 GWh in 1991 to 1,829 GWh in 2002. Monthly Total Energy excluding Gillette is equal to Monthly Total Sales excluding Gillette times a monthly energy to sales ratio. The monthly energy to sales ratios exclude Gillette and are developed in Appendix C. Because energy requirements are calculated directly from sales using sales to energy ratios which are assumed to be constant over time, the energy forecast has the same trend as the sales forecast (approximately 2.5 percent per year).

Monthly Peak excluding Gillette is equal to the Monthly Total Energy excluding Gillette times a monthly load factor. The monthly load factors exclude Gillette and are developed in Appendix D.

Gillette, Wyoming Sales Forecast

Black Hills share of total Gillette, Wyoming sales accounted for about 10 percent of Total Company sales in 1991. Historically, Gillette has been the fastest growing portion of Total Company sales. But declining growth in Gillette combined with an increasing amount of Gillette's requirements being met by sources other than Black Hills are resulting in Gillette's declining share of Total Company Sales. Approximately 15 percent of Gillette requirements in 1991 were met by sources other than Black Hills. This level is forecasted to increase gradually to be about 18 percent by 2004 thereby reducing Gillette's share of Total Company Sales to about 9 percent.

During 1991, 12 percent of Gillette's peak demand was met by sources other than Black Hills. In the forecasted period, 40 percent of Gillette's peak demand is met by sources other than Black Hills as discussed in more detail in Chapter 4. Gillette experiences a very pronounced winter peak. With Black Hills forecasted to provide less of Gillette's peak requirements, the impact on the total company peak forecast is to reduce Black Hills winter peak relative to summer peak. This is a major contributing factor in the peak forecast showing Black Hills summer peak exceeding its winter peak in the future.

Table 5-4 summarizes the calculation of total Gillette sales, energy and peak, and the portions met through WAPA, Other, and Black Hills' purchases. Total Gillette expected energy requirements are forecasted to grow at about 2.35 percent per year from 181,500 megawatt-hours in 1991 to 249,260 megawatt-hours in 2004. WAPA purchases are forecasted at a constant 27,000 megawatt-hours per year. Other purchases by Gillette are forecasted to increase from 2,700 megawatt-hours in 1992 to 16,100 megawatt-hours in 2004. The remainder of Gillette requirements are met by purchases from Black Hills. Gillette's expected peak is forecasted to grow from 33 MW in 1991 to 47 MW in 2004. As discussed in Chapter 4, it is assumed that Black Hills provides 60 percent of Gillette's peak requirements. BHPL's share of Gillette's expected peak is assumed to increase from the current level of 23.3 MW to 28.1 MW in 2004.

The 1990 Report forecasted total requirements of 201,000 megawatt-hours in 1992. This figure compares to a current forecast of 186,000 megawatt-hours for 1992. The changes which have occurred in Gillette's supply mix over the last few years make it difficult to compare the previous and current forecasts with regard to the portion of Gillette's requirements being met by Black Hills. As discussed in Chapter 4, the assumption regarding how much of Gillette's energy and peak requirements are met by Black Hills is very specific and detailed. If circumstances change such that the assumptions made are no longer valid, the forecast for Gillette contained in this report must be modified accordingly.

Actual and forecasted total Gillette requirements are graphically depicted in Figure 5-4.

Total Company Sales, Energy, and Peak Forecasts

Table 5-5 summarizes monthly expected, upper bandwidth and lower bandwidth sales, energy and peak forecasts for the period 1992 through 2004. Tables 5-6 through 5-8 show the detailed calculations of the figures summarized in Table 5-5. The calculations in Tables 5-6 through 5-8 are discussed at the beginning of this chapter.

Total Company sales (summarized on Page 1 of Table 5-5) represent the sum of the sales in South Dakota, Wyoming, and Montana plus sales made by Black Hills to Gillette, Wyoming. Sales are forecasted to increase from the actual sales of 1,523 GWh in 1991 to 1,558 GWh in 1992 and 2,026 GWh in 2002. The equivalent annual compound rate of sales growth over the ten year period ended 2002 is forecasted to be approximately 2.5 percent. The larger increase from 1992 to 1993 (60 GWh or 3.8 percent) primarily reflects the actual January and February 1992 sales contained in the 1992 forecast. Sales were depressed in these two months by the much warmer than normal weather experienced. Forecasted sales for these two months under normal or expected weather conditions would have been about 10 GWh higher than the level actually experienced.

The Total Company energy figures (summarized on Page 2 of Table 5-5) represent the sum of the Total Company energy figures excluding Gillette plus the portion of Gillette's energy requirements supplied by Black Hills. Total Company energy requirements are forecasted to increase from the actual level of 1,590 GWh in 1991 to 1,620 GWh in 1992 and 2,105 GWh in 2002. The equivalent annual compound rate of energy growth over the ten year period ended 2002 is forecasted to be approximately 2.5 percent.

The Total Company peak figures (summarized on Page 3 of Table 5-5) represent the sum of the Total Company peak figures excluding Gillette plus the portion of Gillette's peak requirements supplied by Black Hills. Annual peaks are forecasted to occur during the summer (July). Total Company peak is forecasted to increase from 287 MW in 1992 to 373 MW in 2002. The winter peak is forecasted to increase from 269 MW in 1992 to 348 MW

in 2002. The equivalent annual compound rate of growth over the ten year period ended 2002 for both the summer and winter peaks is forecasted to be approximately 2.6 percent.

Several factors discussed in this report are contributing to the trend towards higher summer than winter peaks. First, sales in the South Dakota jurisdiction during the peak summer and winter months are approximately equal. But, the much higher load factor that the Company experiences in the winter results in South Dakota jurisdiction having a summer peak. Second, the General Service and Large General Service classes are very strong summer peaking classes and these classes are forecasted to grow faster than the Residential class. The Residential class has sales during the peak summer month which are about 8 percent less than the peak winter month. But taking into consideration the higher winter load factor, the Residential class' summer and winter peak are virtually equal. Third, sales in Wyoming (which has a winter peak) as a percentage of total sales have been declining. Fourth, sales to Gillette (which also has a winter peak) as a percentage of total sales is forecasted to decline. Finally, the higher winter peaks Black Hills experienced in 1989 and 1990 are not comparable to the "expected" peaks forecasted in this report. The 1989 and 1990 peaks included Gillette at almost full requirements whereas in future years, Black Hills' share of Gillette's winter peak is assumed not to exceed 60 percent of Gillette's historical winter peak. Further, the conditions that existed in February 1989 and December 1990 were typical of design conditions rather than expected or normal conditions. It should be noted that Black Hills' service territory has not experienced any summer conditions over the last five years which would be considered design conditions.

Figures 5-5, 5-6, 5-7, and 5-8 graphically depict the annual sales, energy, summer peak, and winter peak demand forecasts, respectively, showing actual (1983-1991) and forecasted (1992-2014) for the Total Company.

Black Hills Power & Light Company
Monthly Sales Forecast
South Dakota Jurisdiction
Megawatt-Hours
09-Apr-92

Year	Month	Residential + Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	General Service Irrigation	General Service Others	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
1991 (1)	January	24,826	15,150	4,102	21,152	13,130	3,747	409	6	555	9,560	23,256	667	1,203	117,764
	February	18,070	9,437	2,750	17,560	10,950	2,639	349	123	404	8,528	23,144	586	938	95,518
	March	18,015	8,968	2,591	18,179	11,336	2,511	334	(62)	33	8,918	25,061	553	967	97,416
	April	17,256	7,574	2,221	17,400	11,221	2,295	296	44	30	8,852	28,667	509	965	97,330
	May	15,950	6,385	1,909	17,171	10,827	2,109	259	64	37	8,945	29,080	447	979	94,204
	June	16,094	4,611	1,560	19,291	12,431	2,229	240	60	77	8,805	29,949	421	1,037	98,665
	July	18,497	4,445	1,368	22,438	13,285	2,535	260	163	128	8,842	32,459	442	1,563	106,435
	August	18,029	4,439	1,339	24,159	13,641	2,619	296	146	159	9,432	33,588	482	1,519	110,918
	September	19,883	4,768	1,462	24,091	14,427	2,586	321	137	97	9,575	31,578	524	1,591	111,037
	October	16,115	5,273	1,609	19,086	11,901	2,715	354	88	79	9,380	32,345	577	1,199	100,220
	November	17,827	8,678	2,818	18,464	11,597	2,706	383	40	59	9,655	29,103	622	1,017	102,967
	December	20,379	10,175	3,353	19,275	12,069	2,914	408	37	738	9,507	25,878	675	1,011	106,519
	Total	221,863	89,924	26,881	238,262	147,053	31,106	3,909	836	2,363	110,158	344,117	6,504	13,989	1,236,994
1992	January (1)	21,038	10,554	3,481	19,973	12,240	3,081	427	34	496	9,195	26,027	674	1,040	108,691
	February (1)	17,929	8,767	2,932	18,345	11,260	2,908	351	32	341	8,908	25,563	592	958	98,623
	March	18,310	9,951	3,272	19,604	12,125	2,944	337	18	85	9,847	25,549	558	1,028	104,730
	April	17,766	7,953	2,707	18,379	12,008	2,484	298	40	35	9,912	29,340	516	1,082	102,519
	May	16,415	6,459	2,226	18,068	11,087	2,286	261	59	47	9,978	29,763	454	1,169	98,293
	June	16,885	4,959	1,702	19,331	12,996	2,306	242	112	64	10,044	30,853	424	1,383	101,123
	July	20,505	4,915	1,666	24,503	14,519	2,634	261	188	125	10,329	33,232	449	1,383	113,219
	August	19,504	4,499	1,548	24,727	14,443	2,587	297	170	144	10,350	34,377	506	1,664	114,857
	September	19,217	4,732	1,591	23,979	14,881	2,482	321	121	123	10,456	32,320	515	1,336	112,074
	October	18,168	5,219	1,753	18,973	12,664	2,305	356	59	94	10,942	33,105	594	1,174	103,003
	November	17,695	7,719	2,733	18,971	12,068	2,429	382	20	73	11,007	29,787	650	1,048	104,581
	December	20,401	10,413	3,421	19,770	12,576	2,868	411	11	849	12,073	25,486	688	971	109,957
	Total	222,911	86,140	29,093	244,643	152,869	30,816	3,971	864	2,514	122,074	356,903	6,620	14,869	1,273,869
1993	January	22,893	11,859	4,207	22,066	13,677	3,213	406	9	691	11,139	24,041	673	1,122	116,222
	February	19,587	10,739	3,866	19,174	11,798	2,990	352	9	610	10,206	23,925	593	999	105,844
	March	19,744	8,833	3,703	20,119	12,490	2,995	335	19	99	11,270	25,906	564	1,050	108,751
	April	18,183	7,950	3,059	18,141	12,566	2,527	296	42	41	11,336	29,634	525	1,104	106,391
	May	16,801	6,447	2,513	18,836	11,602	2,325	259	63	55	11,401	30,061	482	1,193	102,015
	June	17,282	4,950	1,918	20,127	13,504	2,346	240	119	97	11,467	30,360	432	1,432	104,965
	July	21,069	4,906	1,877	25,509	15,185	2,879	268	199	145	11,533	33,564	457	1,851	119,236
	August	19,962	4,490	1,741	25,738	15,104	2,832	295	186	167	11,598	34,721	515	1,609	118,843
	September	18,869	4,723	1,787	24,956	15,598	2,526	320	178	143	11,664	32,643	524	1,364	116,603
	October	16,542	5,208	1,966	19,743	13,030	2,141	352	82	109	11,730	33,436	564	1,199	106,830
	November	18,110	7,704	3,064	19,738	12,613	2,471	380	22	55	11,795	30,004	630	1,020	107,308
	December	20,680	10,393	3,830	20,566	13,343	2,917	409	11	1,005	11,861	26,701	700	991	113,480
	Total	230,756	89,410	33,634	256,015	160,552	31,769	3,905	862	3,245	137,998	355,726	6,734	15,058	1,325,038
1994	January	23,430	12,962	4,818	22,953	14,291	3,288	406	10	785	11,927	24,281	685	1,149	119,960
	February	20,059	10,713	4,319	19,942	12,319	3,041	350	9	691	11,993	24,144	603	1,020	108,525
	March	20,328	9,814	4,134	21,215	13,255	3,045	333	20	112	12,058	26,190	578	1,071	112,650
	April	18,610	7,923	3,412	19,903	13,122	2,570	295	44	46	12,124	29,930	536	1,127	109,640
	May	17,195	6,435	2,749	19,563	12,152	2,366	264	64	62	12,190	30,362	479	1,218	105,115
	June	17,687	4,960	2,136	20,312	14,193	2,366	238	125	115	12,255	31,260	439	1,441	108,166
	July	21,564	4,867	2,087	26,516	15,491	2,725	258	210	164	12,321	33,950	465	1,891	122,847
	August	20,430	4,682	1,935	26,749	15,764	2,677	294	190	149	12,387	35,088	524	1,736	122,432
	September	18,131	4,314	1,583	25,933	16,731	2,569	318	134	102	12,452	32,969	513	1,291	118,526
	October	16,936	5,139	2,182	20,514	13,566	2,376	350	45	123	12,456	33,270	614	1,228	109,269
	November	18,536	7,690	3,265	20,506	13,358	2,913	378	23	66	12,586	30,385	679	1,068	115,227
	December	21,340	10,374	4,240	21,365	13,788	2,987	407	12	1,142	12,660	27,069	742	1,051	118,976
	Total	238,470	89,241	36,410	286,120	169,858	37,306	3,865	910	3,886	149,451	368,281	6,870	15,304	1,360,704

Black Hills Power & Light Company
Monthly Sales Forecast
South Dakota Jurisdiction
Megawatt-Hours
09-Apr-92

Year	Month	Residential - Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	General Service Irrigation	General Service Others	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
1995	January	23,981	11,939	5,329	23,840	14,904	3,323	402	10	879	12,715	24,526	697	1,168	123,712
	February	20,529	10,893	4,773	20,711	12,846	3,092	349	10	776	12,781	24,406	614	1,040	112,618
	March	20,703	9,895	4,564	22,050	13,820	3,098	332	21	126	12,846	26,427	588	1,093	115,563
	April	19,047	7,908	3,754	20,665	13,680	2,616	293	47	52	12,912	30,229	543	1,150	112,903
	May	17,599	6,423	3,065	20,330	12,625	2,405	257	70	70	12,978	30,665	478	1,242	108,227
	June	18,103	6,931	2,953	21,719	14,791	2,426	238	132	124	13,044	31,582	447	1,470	111,359
	July	22,070	8,888	3,297	27,520	16,517	2,771	257	221	184	13,109	34,239	473	1,929	126,474
	August	20,818	8,473	3,128	27,760	16,424	2,722	292	200	212	13,175	35,419	533	1,768	126,016
	September	20,604	6,705	2,180	26,910	16,914	2,612	316	142	181	13,241	33,299	542	1,419	123,064
	October	17,334	5,198	2,396	21,285	14,150	2,214	348	69	138	13,306	34,108	625	1,247	112,420
	November	18,971	7,679	3,725	21,374	13,704	2,555	376	24	107	13,372	30,589	584	1,113	116,269
	December	21,672	10,354	4,650	22,163	14,275	3,016	405	12	1,279	13,438	27,289	724	1,031	120,507
	Total	241,722	89,072	41,244	278,326	174,661	32,847	3,866	957	4,128	156,916	362,876	6,947	15,672	1,607,132
1996	January	24,544	11,916	5,840	24,727	15,516	3,379	400	11	973	13,503	24,769	708	1,192	127,480
	February	23,011	10,672	5,227	21,478	13,373	3,143	347	10	859	13,569	24,650	624	1,061	116,026
	March	21,189	9,876	4,995	22,866	14,365	3,149	330	22	130	13,635	26,691	598	1,114	118,989
	April	19,694	7,893	4,116	21,426	14,237	2,657	292	49	58	13,700	30,532	552	1,172	116,179
	May	18,012	6,410	3,372	21,077	13,138	2,444	255	73	77	13,766	30,972	486	1,267	111,351
	June	18,528	4,922	2,569	22,515	15,390	2,466	237	138	137	13,832	31,898	454	1,499	114,585
	July	22,589	4,678	2,507	28,595	17,183	2,816	256	232	204	13,897	34,561	481	1,967	130,116
	August	21,401	4,465	2,321	28,771	17,084	2,766	291	209	235	13,963	35,773	542	1,803	129,625
	September	21,087	4,696	2,376	27,887	17,592	2,854	315	148	201	14,029	33,632	551	1,447	126,615
	October	17,741	5,180	2,611	22,055	14,726	2,250	347	72	153	14,095	34,449	635	1,272	115,585
	November	19,417	7,660	4,056	22,042	14,249	2,597	374	25	118	14,160	30,996	696	1,135	117,525
	December	22,386	10,334	5,059	22,960	14,841	3,065	403	13	1,416	14,226	27,562	736	1,052	124,052
	Total	247,399	88,903	45,050	286,331	181,715	33,388	3,846	1,004	4,569	166,375	366,505	7,063	15,980	1,448,127
1997	January	25,120	11,894	6,351	25,614	16,131	3,434	398	11	1,067	14,292	25,017	720	1,215	131,264
	February	21,504	10,652	5,681	22,247	13,900	3,195	345	11	942	14,357	24,896	634	1,082	119,446
	March	21,887	9,858	5,425	23,681	14,950	3,200	328	23	153	14,423	26,958	608	1,136	122,430
	April	18,952	7,878	4,469	22,188	14,794	2,700	290	51	63	14,489	30,837	561	1,195	119,468
	May	16,435	6,398	3,659	21,825	13,650	2,484	254	77	84	14,554	31,282	494	1,291	114,488
	June	16,963	4,912	2,786	23,311	15,988	2,506	236	145	150	14,620	32,217	462	1,528	117,624
	July	23,119	4,569	2,717	29,530	17,849	2,862	255	243	223	14,686	34,927	489	2,005	133,773
	August	21,904	4,456	2,514	29,703	17,744	2,811	289	219	257	14,751	36,131	550	1,838	133,248
	September	21,583	4,587	2,572	28,864	18,269	2,697	313	155	220	14,817	33,968	560	1,475	130,182
	October	18,158	5,170	2,825	22,826	15,291	2,287	345	75	168	14,883	34,793	546	1,296	116,762
	November	19,893	7,646	4,387	22,810	14,794	2,679	372	26	130	14,948	31,306	707	1,156	120,794
	December	22,911	10,315	5,469	23,758	15,407	3,114	401	14	1,552	15,014	27,837	748	1,072	127,612
		253,209	88,734	48,855	296,437	188,769	33,929	3,827	1,051	5,010	175,834	370,170	7,179	16,287	1,489,292
1998	January	25,710	11,871	6,861	26,501	16,745	3,489	396	12	1,161	15,080	25,267	732	1,238	135,064
	February	22,009	10,632	6,135	23,016	14,427	3,246	343	12	1,025	15,146	25,145	645	1,102	122,881
	March	22,196	9,839	5,856	24,497	15,515	3,252	327	24	166	15,211	27,227	618	1,157	125,885
	April	20,421	7,863	4,821	22,950	15,352	2,743	289	54	69	15,277	31,145	570	1,218	122,771
	May	18,868	6,306	3,946	22,572	14,163	2,524	253	80	92	15,343	31,594	502	1,316	117,638
	June	19,408	4,903	3,003	24,107	16,587	2,546	234	152	164	15,408	32,539	469	1,557	121,077
	July	23,662	4,860	2,927	30,536	18,516	2,907	254	253	243	15,474	35,276	497	2,042	137,447
	August	22,418	4,448	2,707	30,794	18,404	2,856	288	229	280	15,540	36,492	559	1,872	136,888
	September	22,090	4,678	2,769	29,841	18,947	2,740	312	162	239	15,605	34,308	569	1,502	133,763
	October	18,584	5,160	3,039	23,598	15,856	2,323	343	79	182	15,671	35,141	656	1,321	121,952
	November	20,339	7,631	4,717	23,578	15,340	2,680	370	27	141	15,737	31,619	718	1,178	124,077
	December	23,449	10,295	5,879	24,555	15,973	3,164	398	14	1,689	15,802	28,116	760	1,092	131,187
	Total	259,156	88,565	52,660	305,542	195,824	34,470	3,867	1,098	5,452	185,293	373,872	7,295	16,595	1,530,629

Black Hills Power & Light Company
Monthly Sales Forecast
South Dakota Jurisdiction
Megawatt-Hours
09-Apr-92

Year	Month	Residential & Water Heat	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	General Service Irrigation	General Service Others	Industrial	Contract Industrial	Street Lighting	Municipal Pumping	Total (2)
1999	Total	265,248	68,396	56,466	316,547	202,870	35,012	3,788	1,146	5,893	194,752	327,610	7,411	16,903	1,572,144
2000	Total	271,472	68,227	60,271	326,753	209,932	35,553	3,768	1,193	6,334	204,211	381,387	7,527	17,211	1,813,938
2001	Total	277,847	68,058	64,076	336,958	216,987	36,094	3,749	1,240	6,776	213,670	385,290	7,643	17,518	1,855,717
2002	Total	284,373	67,889	67,882	346,964	224,041	36,635	3,729	1,287	7,217	223,129	389,052	7,759	17,826	1,897,784
2003	Total	291,051	67,720	71,687	357,069	231,096	37,177	3,710	1,334	7,658	232,588	392,643	7,875	18,134	1,940,042
2004	Total	297,887	67,551	75,492	367,175	238,150	37,718	3,690	1,382	8,099	242,047	396,872	7,991	18,442	1,982,496

(1) Actual.
(2) Total may differ slightly from sum of individual rates because of rounding.

Black Hills Power & Light Company
Monthly Sales Forecast
Wyoming Jurisdiction
Megawatt-Hours
01-Apr-02

Table 5-2
Page 1 of 3

Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
1991 (1)	January	1,394	660	78	921	301	156	27	7,192	71	28	10,830
	February	1,069	476	51	841	305	110	23	6,355	62	23	9,415
	March	1,058	420	46	837	339	99	22	6,435	58	25	9,340
	April	900	356	37	708	404	80	20	6,559	53	17	9,073
	May	911	300	28	688	394	74	17	6,383	45	15	8,856
	June	897	216	20	686	409	62	16	5,651	42	17	8,215
	July	933	199	19	843	448	67	17	6,321	45	23	8,915
	August	944	199	18	853	450	71	20	5,707	49	21	8,342
	September	976	215	19	852	450	68	21	6,337	45	18	9,003
	October	888	238	24	722	421	65	24	7,032	50	8	9,471
	November	1,015	414	39	742	404	90	26	6,807	53	12	9,602
	December	1,197	462	46	816	412	110	27	6,221	57	17	9,387
	Total	12,266	4,176	424	9,569	4,847	1,051	261	77,000	631	223	110,448
1992	January (1)	1,192	504	45	806	421	120	37	6,741	57	20	9,941
	February (1)	1,038	407	39	770	381	103	23	5,803	50	14	8,629
	March	1,055	449	48	816	379	95	23	6,501	53	25	9,444
	April	1,015	372	41	805	412	79	20	5,869	45	17	8,675
	May	900	287	30	674	402	65	17	6,426	39	15	8,855
	June	895	210	22	710	433	57	16	6,699	40	17	9,098
	July	974	207	22	850	466	62	17	6,125	42	23	8,787
	August	928	200	21	835	450	63	19	5,885	48	21	8,480
	September	933	210	20	818	442	60	21	6,189	49	18	8,756
	October	877	236	25	713	447	55	23	6,534	55	8	8,974
	November	957	339	39	722	416	87	25	6,251	60	12	8,868
	December	1,127	490	49	812	422	87	27	6,422	65	17	9,517
	Total	11,891	3,910	401	9,329	5,081	912	268	75,443	604	207	106,047
1993	January	1,312	609	67	857	447	120	27	7,094	63	28	10,624
	February	1,086	509	61	795	420	96	23	6,495	53	23	9,562
	March	1,050	446	51	783	411	87	22	6,528	50	25	9,454
	April	1,010	370	43	772	447	73	20	5,895	42	17	8,690
	May	896	285	32	647	435	60	17	6,452	37	15	8,876
	June	891	209	23	681	469	53	16	6,725	38	17	9,120
	July	969	208	23	815	504	57	17	6,262	40	23	8,915
	August	924	199	22	802	497	58	19	6,022	45	21	8,608
	September	929	208	22	784	477	55	20	6,325	47	18	8,885
	October	873	235	27	684	483	51	22	6,670	53	8	9,105
	November	952	337	42	693	449	62	24	6,387	57	12	9,015
	December	1,122	487	52	779	455	80	27	6,558	61	17	9,638
	Total	12,015	4,099	464	9,091	5,493	850	253	77,413	588	223	110,491
1994	January	1,306	605	71	822	482	111	26	7,197	60	28	10,707
	February	1,081	506	64	763	453	88	23	6,599	51	23	9,650
	March	1,045	443	54	751	443	80	22	6,831	48	25	9,542
	April	1,006	368	46	741	481	67	19	5,999	40	17	8,784
	May	892	283	34	620	468	55	17	6,556	35	15	8,975
	June	887	207	25	653	504	48	15	6,828	36	17	9,220
	July	965	205	25	782	541	52	16	6,255	38	23	8,902
	August	919	197	23	769	534	53	18	6,016	43	21	8,595
	September	925	207	23	752	513	50	20	6,319	45	18	8,871
	October	869	233	29	656	516	47	22	6,663	50	8	9,095
	November	948	335	44	665	482	57	24	6,381	55	12	9,001
	December	1,187	484	55	747	489	73	26	6,551	58	17	9,617
	Total	11,959	4,073	493	8,722	5,907	782	248	77,993	560	223	110,959

Black Hills Power & Light Company
Monthly Sales Forecast
Wyoming Jurisdiction
Megawatt-Hours
01-Apr-92

Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
1995	January	1,200	601	75	789	517	102	26	7,189	57	28	10,583
	February	1,076	503	68	732	485	81	22	6,592	48	23	9,630
	March	1,060	441	57	721	475	74	21	6,624	45	25	9,523
	April	1,021	365	49	711	515	62	19	5,993	38	17	8,769
	May	887	281	38	595	502	51	16	6,569	34	15	8,966
	June	883	286	26	627	540	45	15	6,821	34	17	9,212
	July	960	203	26	760	579	48	16	6,249	36	23	8,891
	August	915	198	25	736	571	49	18	6,010	41	21	8,583
	September	920	208	24	722	548	46	19	6,312	43	18	8,858
	October	865	232	30	829	554	43	22	6,656	48	8	9,087
	November	944	332	46	838	514	52	23	6,374	52	12	8,988
	December	1,111	481	58	717	522	67	26	6,544	56	17	9,599
	Total	11,903	4,047	521	8,368	6,322	719	243	77,912	532	223	110,791
1996	January	1,284	597	79	757	592	94	25	7,182	54	28	10,661
	February	1,071	500	72	702	518	75	22	6,585	46	23	9,613
	March	1,035	436	60	691	508	69	21	6,617	43	25	9,505
	April	986	363	51	662	549	57	19	5,987	37	17	8,757
	May	883	279	38	571	535	47	16	6,542	32	15	8,958
	June	879	205	28	601	575	41	15	6,813	33	17	9,206
	July	956	202	28	720	617	44	16	6,242	35	23	8,882
	August	911	195	26	708	608	45	18	6,004	39	23	8,514
	September	916	204	25	693	584	43	19	6,306	40	18	8,847
	October	861	230	32	804	580	39	21	6,849	45	8	9,080
	November	939	330	49	812	647	48	23	6,367	49	12	8,978
	December	1,106	478	61	688	555	62	25	6,536	51	17	9,582
	Total	11,847	4,022	549	8,028	6,730	661	238	77,832	507	223	110,643
1997	January	1,288	593	84	726	587	86	25	7,174	52	28	10,642
	February	1,066	497	76	674	550	69	23	6,578	46	23	9,597
	March	1,031	435	64	663	538	62	20	6,010	41	25	9,490
	April	982	361	54	654	564	52	18	5,982	35	17	8,765
	May	879	278	40	548	568	43	16	6,536	30	15	8,951
	June	875	204	29	577	610	38	16	6,806	31	17	9,200
	July	951	201	29	691	656	41	15	6,236	33	23	8,874
	August	908	194	27	670	643	41	17	5,997	37	21	8,566
	September	912	203	27	663	619	39	19	6,299	38	18	8,836
	October	857	229	33	539	624	36	21	6,643	43	8	9,074
	November	826	328	51	587	580	44	23	6,381	47	12	8,908
	December	1,144	495	69	660	668	67	25	6,553	50	17	9,568
	Total	11,792	3,996	577	7,702	7,150	628	283	77,752	482	223	110,516
1998	January	1,282	589	88	697	622	79	24	7,167	49	28	10,624
	February	1,061	494	75	646	583	63	21	6,571	42	23	9,583
	March	1,026	432	67	635	570	57	20	6,603	39	25	9,676
	April	967	358	56	628	616	48	18	5,975	33	17	8,737
	May	875	276	42	526	661	40	15	6,429	29	15	8,548
	June	870	202	30	553	640	35	16	6,798	30	17	9,197
	July	947	200	30	662	693	37	15	6,229	31	23	8,860
	August	902	192	29	653	683	38	17	5,931	35	21	8,562
	September	907	202	28	638	656	36	18	6,283	37	18	8,859
	October	853	227	36	556	661	33	20	6,636	41	8	9,260
	November	930	328	54	563	635	40	22	6,356	45	12	9,064
	December	1,288	473	69	623	621	55	24	6,534	48	17	9,555
	Total	13,737	3,948	608	7,369	7,585	580	270	77,672	459	223	110,667

Black Hills Power & Light Company
Monthly Sales Forecast
Wyoming Jurisdiction
Megawatt-Hours
01-Apr-92

Table 5-2
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Year	Month	Residential	Residential All Electric	Residential Others	General Service	Large General Service	General Service All Electric	Area Lighting	Industrial	Street Lighting	Municipal Pumping	Total (2)
1999	Total	11,682	3,945	633	7,089	7,979	515	223	77,592	436	223	110,317
2000	Total	11,625	3,919	661	6,801	8,393	473	219	77,512	415	223	110,244
2001	Total	11,573	3,893	689	6,525	8,809	435	214	77,432	395	223	110,188
2002	Total	11,519	3,867	718	6,260	9,222	400	210	77,352	376	223	110,147
2003	Total	11,465	3,842	746	6,006	9,636	368	205	77,272	357	223	110,121
2004	Total	11,411	3,816	774	5,762	10,051	339	201	77,193	340	223	110,110

(1) Actual.
(2) Total may differ slightly from sum of individual rates because of rounding.

Black Hills Power & Light Company
Monthly Sales Forecast
Montana Jurisdiction
Megawatt-Hours
02-Apr-92

Year	Month	Residential	General Service	Industrial	Area Lighting	Total (2)
1991 (1)	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	43	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636
1992	January (1)	10	93	1,937	2	2,046
	February (1)	20	97	1,676	2	1,785
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	121	831	19,242	23	20,217
1993	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636
1994	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636

E 205 Level overflow

Increment to a medium BIP

Black Hills Power & Light Company
Hourly Sales Forecast
Montana Jurisdiction
Megawatt-Hours
02-Apr-92

Table 5-3
Page 2 of 3

Year	Month	Residential	General Service	Industrial	Area Lighting	Total (2)
1995	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636
1996	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636
1997	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636
1998	January	19	59	2,082	2	2,163
	February	17	56	2,013	2	2,088
	March	7	65	2,023	2	2,098
	April	12	63	1,997	2	2,074
	May	10	78	1,432	2	1,521
	June	9	49	1,189	1	1,248
	July	10	41	1,194	2	1,246
	August	11	40	958	2	1,010
	September	11	58	1,126	2	1,198
	October	9	62	1,489	2	1,562
	November	10	84	2,091	2	2,187
	December	11	97	2,130	2	2,241
	Total	137	752	19,724	23	20,636

Black Hills Power & Light Company
Monthly Sales Forecast
Montana Jurisdiction
Megawatt-Hours
02-Apr-92

Year	Month	Residential	General Service	Commercial	Area Lighting	Total (2)
1999		137	752	18,729	23	20,636
2000		137	752	18,729	23	20,636
2001		137	752	18,729	23	20,636
2002		137	752	18,729	23	20,636
2003		137	752	18,729	23	20,636
2004		137	752	18,729	23	20,636

(1) Actual.
(2) Total may differ slightly from sum of individual values because of rounding.

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
02-Apr-92

Table 5-4
Page 1 of 12

Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1991 (1)	January	18,789		33.1	2,294	4	19.9						16,475	29.1
	February	14,451		28.6	1,970	4	17.3						12,611	24.9
	March	16,532		29.0	1,984	4	17.4						14,548	25.0
	April	14,376		28.8	2,068	4	16.1						12,308	22.8
	May	13,709		25.7	2,169	3	15.4						11,540	22.7
	June	13,110		25.1	2,460	5	15.7						10,650	21.1
	July	15,068		30.5	3,007	5	18.3						12,061	25.5
	August	15,294		31.4	2,480	6	18.8						12,814	25.4
	September	13,470		27.2	1,828	4	16.3						11,642	23.2
	October	14,838		31.9	2,172	6	19.1						12,666	25.9
	November	16,069		32.6	2,160	7	19.6						13,909	25.6
	December	16,827		33.9	2,356	6	18.5						14,471	24.9
	Total	181,493	0.620	33.1	26,798								154,695	29.1
1992	January (1)	16,923		32.0	2,294	4	19.2					172	14,457	27.0
	February (1)	14,767		30.0	1,827	4	18.0					28	12,912	24.0
	March	18,604	0.720	31.0	1,995	4	18.6	23.3	27.3	88%	2.0%	324	16,285	23.3
	April	14,612	0.731	27.7	2,069	4	16.6	23.3	27.3	98%	0.2%	32	12,511	23.3
	May	14,773	0.724	26.5	2,169	4	15.9	23.3	27.3	103%	0.0%	1	12,104	22.5
	June	13,709	0.678	28.2	2,494	4	16.9	23.3	27.3	97%	0.2%	30	11,181	23.3
	July	15,447	0.670	31.0	3,118	4	18.6	23.3	27.3	88%	2.0%	301	12,027	23.3
	August	15,451	0.668	31.1	2,494	4	18.6	23.3	27.3	88%	2.0%	302	12,655	23.3
	September	13,912	0.687	28.1	1,828	4	16.9	23.3	27.3	97%	0.2%	30	12,053	23.3
	October	15,029	0.747	27.0	2,175	4	16.2	23.3	27.3	101%	0.0%	1	12,853	23.0
	November	18,191	0.710	31.7	2,175	4	19.0	23.3	27.3	86%	2.0%	316	13,700	23.3
	December	18,666	0.700	35.5	2,381	4	21.3	23.3	27.3	77%	6.1%	1,139	15,146	23.3
	Total	185,579	0.596	35.5	27,019						1.4%	2,675	155,685	27.0
1993	January	19,043	0.746	34.3	2,316	4	20.6	23.3	27.3	80%	6.1%	1,162	15,565	23.3
	February	16,535	0.724	34.0	1,828	4	20.4	23.3	27.3	80%	3.6%	590	14,108	23.3
	March	17,053	0.720	31.8	1,995	4	19.1	23.3	27.3	86%	2.0%	333	14,726	23.3
	April	15,008	0.731	28.6	2,069	4	17.1	23.3	27.3	96%	0.2%	33	12,905	23.3
	May	14,656	0.724	27.2	2,169	4	16.3	23.3	27.3	100%	0.0%	1	12,488	23.2
	June	14,073	0.676	28.9	2,494	4	17.4	23.3	27.3	94%	0.7%	99	11,480	23.3
	July	15,881	0.670	31.8	3,118	4	19.1	23.3	27.3	86%	2.0%	310	12,433	23.3
	August	15,866	0.668	31.9	2,494	4	19.1	23.3	27.3	86%	2.0%	310	13,061	23.3
	September	14,283	0.687	28.9	1,828	4	17.3	23.3	27.3	95%	0.7%	100	12,355	23.3
	October	15,429	0.747	27.8	2,175	4	16.7	23.3	27.3	98%	0.2%	34	13,220	23.3
	November	18,621	0.710	32.5	2,175	4	19.5	23.3	27.3	84%	3.6%	593	13,853	23.3
	December	19,161	0.705	36.5	2,381	4	21.9	23.3	27.3	75%	10.7%	2,052	14,728	23.3
	Total	193,579	0.606	36.5	27,042						2.9%	5,615	160,922	23.3
1994	January	19,547	0.746	35.2	2,316	4	21.1	23.3	27.3	78%	6.1%	1,192	16,038	23.3
	February	16,962	0.724	34.9	1,828	4	20.9	23.3	27.3	78%	6.1%	1,035	14,099	23.3
	March	17,503	0.720	32.7	1,995	4	19.6	23.3	27.3	84%	3.6%	625	14,883	23.3
	April	15,401	0.731	29.2	2,069	4	17.5	23.3	27.3	93%	0.7%	108	13,224	23.3
	May	15,042	0.724	27.9	2,169	4	16.8	23.3	27.3	98%	0.2%	33	12,841	23.3
	June	14,442	0.678	29.7	2,494	4	17.8	23.3	27.3	92%	0.7%	102	11,846	23.3
	July	16,275	0.670	32.6	3,118	4	19.6	23.3	27.3	84%	3.6%	581	12,576	23.3
	August	16,278	0.668	32.7	2,494	4	19.6	23.3	27.3	83%	3.6%	581	13,203	23.3
	September	14,654	0.687	29.6	1,828	4	17.8	23.3	27.3	92%	0.7%	103	12,723	23.3
	October	15,829	0.747	28.5	2,175	4	17.1	23.3	27.3	96%	0.2%	34	13,620	23.3
	November	17,052	0.710	33.4	2,175	4	20.0	23.3	27.3	82%	3.6%	609	14,268	23.3
	December	19,656	0.705	37.4	2,381	4	22.5	23.3	27.3	73%	10.7%	2,105	15,170	23.3
	Total	198,640	0.606	37.4	27,042						3.6%	7,107	164,491	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
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Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (1)	MWh	MWh	MW
1995	January	20,050	0.746	36.1	2,316	4	21.7	23.3	27.3	76%	6.1%	1,223	16,511	23.3
	February	17,990	0.724	35.1	1,828	4	21.4	23.3	27.3	78%	6.1%	1,061	14,509	23.3
	March	12,957	0.720	31.8	1,995	4	20.1	23.3	27.3	86%	3.6%	641	15,316	23.3
	April	15,705	0.731	30.0	2,069	4	18.0	23.3	27.3	91%	0.7%	111	13,615	23.3
	May	18,437	0.724	28.7	2,160	4	17.2	23.3	27.3	95%	0.2%	34	13,224	23.3
	June	16,810	0.676	30.4	2,494	4	18.2	23.3	27.3	90%	2.0%	289	12,027	23.3
	July	18,669	0.670	33.5	3,118	4	20.1	23.3	27.3	82%	3.8%	598	12,976	23.3
	August	16,891	0.868	32.6	2,494	4	19.6	23.3	27.3	84%	3.6%	596	13,601	23.3
	September	15,028	0.867	30.6	1,828	4	18.4	23.3	27.3	89%	2.0%	293	12,904	23.3
	October	16,830	0.747	29.2	1,995	4	17.5	23.3	27.3	93%	0.7%	114	13,941	23.3
	November	17,482	0.710	34.1	2,069	4	20.5	23.3	27.3	80%	6.1%	1,066	14,241	23.3
	December	20,151	0.706	38.4	2,381	4	23.0	23.3	27.3	71%	10.7%	2,158	15,612	23.3
	Total	203,702	0.608	38.4	27,042						4.0%	8,182	168,478	23.3
1996	January	20,554	0.746	37.0	2,316	4	22.2	23.3	27.3	74%	10.7%	2,202	16,037	23.3
	February	17,834	0.724	35.4	1,828	4	21.2	23.3	27.3	77%	6.1%	1,088	14,919	23.3
	March	14,401	0.720	34.4	1,995	4	20.6	23.3	27.3	79%	6.1%	1,122	15,284	23.3
	April	16,190	0.731	30.7	2,069	4	18.4	23.3	27.3	89%	2.0%	316	13,605	23.3
	May	16,811	0.724	29.4	2,160	4	17.6	23.3	27.3	93%	0.7%	111	13,531	23.3
	June	16,378	0.676	31.2	2,494	4	18.7	23.3	27.3	87%	2.0%	296	12,358	23.3
	July	17,104	0.670	34.3	3,118	4	20.6	23.3	27.3	80%	6.1%	1,043	12,942	23.3
	August	17,104	0.868	33.4	2,494	4	20.0	23.3	27.3	82%	6.1%	1,043	13,567	23.3
	September	15,397	0.867	31.3	1,828	4	18.8	23.3	27.3	87%	2.0%	301	13,269	23.3
	October	16,630	0.747	29.9	1,995	4	18.0	23.3	27.3	91%	0.7%	117	14,338	23.3
	November	17,913	0.710	35.0	2,069	4	21.0	23.3	27.3	78%	6.1%	1,093	14,645	23.3
	December	20,648	0.706	39.3	2,381	4	23.6	23.3	27.6	70%	10.7%	2,212	16,054	23.6
	Total	208,764	0.606	39.3	27,042						5.2%	10,944	170,778	23.6
1997	January	21,056	0.746	37.9	2,316	4	22.8	23.6	27.6	73%	10.7%	2,256	16,487	23.6
	February	18,271	0.724	37.5	1,828	4	22.5	23.6	27.6	73%	10.7%	1,957	14,486	23.6
	March	18,851	0.720	35.7	1,995	4	21.4	23.6	27.6	78%	6.1%	1,150	15,706	23.6
	April	16,584	0.731	31.5	2,069	4	18.9	23.6	27.6	88%	2.0%	324	14,192	23.6
	May	16,196	0.724	30.1	2,160	4	18.1	23.6	27.6	92%	0.7%	114	13,915	23.6
	June	15,947	0.676	32.0	2,494	4	19.2	23.6	27.6	86%	2.0%	303	12,749	23.6
	July	17,518	0.670	35.1	3,118	4	21.1	23.6	27.6	79%	6.1%	1,069	13,331	23.6
	August	17,518	0.868	35.2	2,494	4	21.1	23.6	27.6	78%	6.1%	1,069	13,955	23.6
	September	15,769	0.867	31.9	1,828	4	19.1	23.6	27.6	87%	2.0%	308	13,633	23.6
	October	17,030	0.747	30.7	2,175	4	18.4	23.6	27.6	91%	0.7%	120	14,736	23.6
	November	18,341	0.710	36.0	2,175	4	21.5	23.6	27.6	77%	6.1%	1,119	15,049	23.6
	December	21,141	0.706	40.3	2,381	4	24.2	24.2	28.2	70%	14.5%	3,074	15,686	24.2
	Total	213,825	0.606	40.3	27,042						6.0%	12,961	173,922	24.2
1998	January	21,562	0.746	38.8	2,316	4	23.3	24.2	28.2	72%	10.7%	2,310	16,937	24.2
	February	18,707	0.724	38.4	1,828	4	23.1	24.2	28.2	73%	10.7%	2,004	14,835	24.2
	March	19,302	0.720	36.6	1,995	4	21.9	24.2	28.2	78%	6.1%	1,177	16,128	24.2
	April	16,979	0.731	32.2	2,069	4	19.3	24.2	28.2	87%	2.0%	331	14,578	24.2
	May	16,580	0.724	30.8	2,160	4	18.5	24.2	28.2	91%	0.7%	117	14,295	24.2
	June	15,945	0.676	32.7	2,494	4	19.6	24.2	28.2	86%	2.0%	311	13,110	24.2
	July	17,932	0.670	36.0	3,118	4	21.6	24.2	28.2	78%	6.1%	1,098	13,720	24.2
	August	17,931	0.868	36.1	2,494	4	21.6	24.2	28.2	78%	6.1%	1,098	14,349	24.2
	September	16,140	0.867	32.6	1,828	4	19.6	24.2	28.2	86%	2.0%	315	13,997	24.2
	October	17,431	0.747	31.4	2,175	4	18.8	24.2	28.2	90%	0.7%	120	15,071	24.2
	November	18,773	0.710	36.7	2,175	4	22.0	24.2	28.2	77%	6.1%	1,145	15,453	24.2
	December	21,636	0.706	41.2	2,381	4	24.7	24.7	28.7	70%	14.5%	3,146	16,310	24.7
	Total	218,887	0.608	41.2	27,042						6.1%	13,363	176,462	24.7

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
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Table 5-4
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Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1999	January	22,066	0.746	39.6	2,316	4	23.9	24.7	28.7	72%	10.7%	2,364	17,386	24.7
	February	18,143	0.724	39.3	1,828	4	23.6	24.7	28.7	73%	10.7%	2,051	15,265	24.7
	March	19,749	0.720	36.9	1,995	4	22.1	24.7	28.7	78%	6.1%	1,205	16,549	24.7
	April	17,373	0.731	33.0	2,069	4	19.8	24.7	28.7	87%	2.0%	339	14,965	24.7
	May	16,865	0.724	31.5	2,169	4	18.9	24.7	28.7	91%	0.7%	119	14,677	24.7
	June	16,283	0.676	33.5	2,494	4	20.1	24.7	28.7	86%	2.0%	318	13,472	24.7
	July	18,346	0.670	36.0	3,118	4	22.1	24.7	28.7	78%	6.1%	1,119	14,109	24.7
	August	18,345	0.668	36.9	2,494	4	22.1	24.7	28.7	78%	6.1%	1,119	14,732	24.7
	September	16,511	0.687	33.4	1,828	4	20.0	24.7	28.7	86%	2.0%	322	14,361	24.7
	October	17,831	0.747	32.1	2,175	4	19.3	24.7	28.7	89%	2.0%	348	15,308	24.7
	November	19,204	0.710	37.6	2,175	4	22.5	24.7	28.7	76%	6.1%	1,171	15,857	24.7
	December	22,133	0.706	42.1	2,381	4	25.3	25.3	29.3	69%	14.5%	3,218	16,533	25.3
	Total	223,948	0.607	42.1	27,042						6.1%	13,692	183,214	25.3
2000	January	22,570	0.746	40.7	2,316	4	24.4	25.3	29.3	72%	10.7%	2,418	17,836	25.3
	February	19,580	0.724	40.2	1,828	4	24.1	25.3	29.3	73%	10.7%	2,097	15,655	25.3
	March	20,198	0.720	37.7	1,995	4	22.6	25.3	29.3	78%	6.1%	1,232	16,971	25.3
	April	17,768	0.731	33.7	2,069	4	20.2	25.3	29.3	87%	2.0%	347	15,352	25.3
	May	17,249	0.724	32.2	2,169	4	19.3	25.3	29.3	91%	0.7%	122	15,058	25.3
	June	16,652	0.676	34.2	2,494	4	20.5	25.3	29.3	86%	2.0%	325	13,833	25.3
	July	18,761	0.670	37.6	3,118	4	22.6	25.3	29.3	78%	6.1%	1,144	14,498	25.3
	August	18,758	0.668	37.7	2,494	4	22.6	25.3	29.3	78%	6.1%	1,144	15,120	25.3
	September	16,883	0.687	34.1	1,828	4	20.5	25.3	29.3	86%	2.0%	329	14,725	25.3
	October	18,231	0.747	32.8	2,175	4	19.7	25.3	29.3	89%	2.0%	356	15,701	25.3
	November	19,634	0.710	38.4	2,175	4	23.0	25.3	29.3	76%	6.1%	1,198	16,261	25.3
	December	22,626	0.706	43.1	2,381	4	25.9	25.9	29.9	69%	14.5%	3,290	16,956	25.9
	Total	229,010	0.607	43.1	27,042						6.1%	14,002	187,966	25.9
2001	January	23,076	0.746	41.6	2,316	4	24.9	25.9	29.9	72%	10.7%	2,472	18,286	25.9
	February	20,016	0.724	41.1	1,828	4	24.7	25.9	29.9	73%	10.7%	2,144	16,044	25.9
	March	20,648	0.720	38.6	1,995	4	23.1	25.9	29.9	77%	6.1%	1,260	17,393	25.9
	April	18,162	0.731	34.5	2,069	4	20.7	25.9	29.9	87%	2.0%	364	15,739	25.9
	May	17,734	0.724	32.9	2,169	4	19.8	25.9	29.9	91%	0.7%	125	15,440	25.9
	June	17,020	0.676	35.0	2,494	4	21.0	25.9	29.9	85%	2.0%	332	14,194	25.9
	July	19,175	0.670	38.5	3,118	4	23.1	25.9	29.9	78%	6.1%	1,170	14,887	25.9
	August	19,172	0.668	38.5	2,494	4	23.1	25.9	29.9	77%	6.1%	1,169	15,508	25.9
	September	17,256	0.687	34.9	1,828	4	20.9	25.9	29.9	86%	2.0%	337	15,089	25.9
	October	18,632	0.747	33.5	2,175	4	20.1	25.9	29.9	89%	2.0%	364	16,093	25.9
	November	20,064	0.710	39.3	2,175	4	23.6	25.9	29.9	76%	6.1%	1,224	16,665	25.9
	December	23,121	0.706	44.0	2,381	4	26.4	26.4	30.4	69%	14.5%	3,362	17,379	26.4
	Total	234,071	0.607	44.0	27,042						6.1%	14,311	192,718	26.4
2002	January	23,578	0.746	42.5	2,316	4	25.5	26.4	30.4	72%	10.7%	2,526	18,736	26.4
	February	20,452	0.724	42.0	1,828	4	25.2	26.4	30.4	72%	10.7%	2,191	16,434	26.4
	March	21,097	0.720	39.4	1,995	4	23.6	26.4	30.4	77%	6.1%	1,287	17,815	26.4
	April	18,557	0.731	35.2	2,069	4	21.1	26.4	30.4	86%	2.0%	362	16,126	26.4
	May	18,118	0.724	33.7	2,169	4	20.2	26.4	30.4	90%	0.7%	127	15,822	26.4
	June	17,388	0.676	35.7	2,494	4	21.4	26.4	30.4	85%	2.0%	339	14,555	26.4
	July	19,589	0.670	39.3	3,118	4	23.6	26.4	30.4	77%	6.1%	1,195	15,276	26.4
	August	19,585	0.668	39.4	2,494	4	23.6	26.4	30.4	77%	6.1%	1,195	15,896	26.4
	September	17,626	0.687	35.6	1,828	4	21.4	26.4	30.4	85%	2.0%	344	15,454	26.4
	October	19,032	0.747	34.3	2,175	4	20.6	26.4	30.4	89%	2.0%	371	16,486	26.4
	November	20,495	0.710	40.1	2,175	4	24.1	26.4	30.4	76%	6.1%	1,250	17,069	26.4
	December	23,616	0.706	45.0	2,381	4	27.0	27.0	31.0	69%	14.5%	3,434	17,602	27.0
	Total	239,133	0.607	45.0	27,042						6.1%	14,621	197,470	27.0

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Expected
02-Apr-92

Year	Month	Total Gillette, Wyoming Sales and Energy	Total Gillette, Wyoming Load Factor	Total Gillette, Wyoming Peak	WAPA Sales and Energy	WAPA Peak	60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources Percent of Total	Energy - Other Sources Sales and Energy	BHPL Share Sales and Energy	BHPL Share Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (1)	MWh	MWh	MW
2003	January	24,082	0.746	43.4	2,316	4	26.0	27.0	31.0	71%	10.7%	2,579	19,186	27.0
	February	20,089	0.724	42.9	1,028	4	25.8	27.0	31.0	72%	10.7%	2,237	16,823	27.0
	March	21,546	0.720	40.2	1,995	4	24.1	27.0	31.0	73%	6.1%	1,314	18,237	27.0
	April	18,951	0.731	36.0	2,089	4	21.6	27.0	31.0	86%	2.0%	370	16,512	27.0
	May	16,503	0.724	34.4	2,169	4	20.6	27.0	31.0	90%	0.7%	130	16,204	27.0
	June	17,757	0.676	36.5	2,494	4	21.9	27.0	31.0	85%	3.6%	634	14,629	27.0
	July	20,002	0.670	40.1	3,110	4	24.1	27.0	31.0	77%	6.1%	1,220	15,665	27.0
	August	19,998	0.668	40.2	2,494	4	24.1	27.0	31.0	77%	6.1%	1,220	16,284	27.0
	September	17,997	0.687	36.4	1,028	4	21.8	27.0	31.0	85%	2.0%	351	15,818	27.0
	October	19,432	0.747	35.0	2,175	4	21.0	27.0	31.0	89%	2.0%	379	16,878	27.0
	November	20,925	0.710	40.9	2,175	4	24.6	27.0	31.0	76%	6.1%	1,276	17,474	27.0
	December	24,111	0.706	45.9	2,381	4	27.6	27.6	31.6	69%	14.5%	3,506	18,225	27.6
	Total	244,195	0.607	45.9	27,042						6.2%	15,218	201,935	27.6
2004	January	24,588	0.746	44.3	2,316	4	26.6	27.6	31.6	71%	10.7%	2,633	19,636	27.6
	February	21,325	0.724	42.8	1,028	4	26.3	27.6	31.6	72%	10.7%	2,284	17,213	27.6
	March	21,996	0.720	41.1	1,995	4	24.6	27.6	31.6	73%	6.1%	1,342	18,659	27.6
	April	19,346	0.731	36.7	2,089	4	22.0	27.6	31.6	86%	2.0%	378	16,899	27.6
	May	16,887	0.724	35.1	2,169	4	21.1	27.6	31.6	90%	0.7%	133	16,754	27.6
	June	18,125	0.676	37.3	2,494	4	22.4	27.6	31.6	85%	3.6%	647	14,984	27.6
	July	20,418	0.670	41.0	3,110	4	24.6	27.6	31.6	77%	6.1%	1,245	16,054	27.6
	August	20,412	0.668	41.0	2,494	4	24.6	27.6	31.6	77%	6.1%	1,245	16,673	27.6
	September	18,368	0.687	37.1	1,028	4	22.3	27.6	31.6	85%	3.6%	655	15,885	27.6
	October	19,833	0.747	35.7	2,175	4	21.4	27.6	31.6	88%	2.0%	387	17,271	27.6
	November	21,355	0.710	41.8	2,175	4	25.1	27.6	31.6	76%	6.1%	1,303	17,870	27.6
	December	24,606	0.706	46.9	2,381	4	28.1	28.1	32.1	69%	14.5%	3,578	18,648	28.1
	Total	249,258	0.607	46.9	27,042						6.4%	16,066	206,148	28.1

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Upper Bensulath
02-Apr-82

Year	Month	Total Gillette, Wyoming			MAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + MAPA Share of Peak	Maximum BHPL + MAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1981 (1)	January	18,763		33.1	2,294	4	19.9						16,475	29.1
	February	14,431		28.9	1,820	4	17.3						12,611	24.9
	March	15,532		29.0	1,984	4	17.4						13,548	25.0
	April	14,336		26.8	2,058	4	16.1						12,308	22.8
	May	13,709		25.7	2,169	3	15.4						11,540	22.7
	June	13,110		26.1	2,460	5	15.7						10,650	21.1
	July	15,068		30.5	3,007	5	18.3						12,061	25.5
	August	15,294		31.4	2,480	6	18.8						12,814	25.4
	September	13,470		27.2	1,828	4	16.3						11,642	23.2
	October	14,838		31.9	2,172	6	19.1						12,666	25.9
	November	16,069		32.6	2,160	7	19.6						13,909	25.6
	December	16,627		30.9	2,356	6	18.5						14,471	24.9
	Total	181,493	0.626	33.1	26,798								154,695	29.1
1982	January (1)	16,923		32.0	2,294	4	19.2					122	14,457	27.0
	February (1)	16,767		30.0	1,827	4	18.0					28	12,912	24.0
	March	17,075	0.720	31.9	1,995	4	19.1	23.3	27.3	86%	2.0%	333	14,746	23.3
	April	15,026	0.731	28.5	2,069	4	17.1	23.3	27.3	96%	0.2%	33	12,924	23.3
	May	14,678	0.724	27.3	2,169	4	16.4	23.3	27.3	100%	0.0%	1	12,508	23.3
	June	14,093	0.676	29.0	2,494	4	17.4	23.3	27.3	94%	0.7%	98	11,500	23.3
	July	15,885	0.670	31.9	3,118	4	19.1	23.3	27.3	86%	2.0%	310	12,457	23.3
	August	15,889	0.668	31.9	2,494	4	19.2	23.3	27.3	85%	2.0%	310	13,085	23.3
	September	14,306	0.687	28.9	1,828	4	17.4	23.3	27.3	94%	0.7%	101	12,377	23.3
	October	15,465	0.747	27.8	2,175	4	16.7	23.3	27.3	98%	0.2%	34	13,246	23.3
	November	16,650	0.710	32.6	2,175	4	19.5	23.3	27.3	84%	3.6%	594	13,881	23.3
	December	19,195	0.706	36.6	2,381	4	21.9	23.3	27.3	75%	10.7%	2,056	14,758	23.3
	Total	189,940	0.593	36.6	27,019						2.1%	4,070	158,851	27.0
1983	January	19,582	0.746	35.3	2,316	4	21.2	23.3	27.3	77%	6.1%	1,195	16,072	23.3
	February	16,994	0.724	34.9	1,828	4	21.0	23.3	27.3	78%	6.1%	1,037	14,129	23.3
	March	17,537	0.720	32.8	1,995	4	19.7	23.3	27.3	83%	3.6%	626	14,916	23.3
	April	15,432	0.731	29.3	2,069	4	17.6	23.3	27.3	93%	0.7%	108	13,254	23.3
	May	15,073	0.724	28.0	2,169	4	16.8	23.3	27.3	98%	0.2%	33	12,871	23.3
	June	14,472	0.676	29.7	2,494	4	17.8	23.3	27.3	92%	0.7%	102	11,876	23.3
	July	16,310	0.670	32.7	3,118	4	19.6	23.3	27.3	83%	3.6%	582	12,610	23.3
	August	16,314	0.668	32.8	2,494	4	19.7	23.3	27.3	83%	3.6%	582	13,238	23.3
	September	14,688	0.687	29.7	1,828	4	17.8	23.3	27.3	92%	0.7%	103	12,756	23.3
	October	15,866	0.747	28.6	2,175	4	17.1	23.3	27.3	96%	0.2%	35	13,657	23.3
	November	17,093	0.710	33.4	2,175	4	20.1	23.3	27.3	82%	3.6%	610	14,308	23.3
	December	19,704	0.706	37.5	2,381	4	22.5	23.3	27.3	73%	10.7%	2,111	15,213	23.3
	Total	199,065	0.606	37.5	27,042						3.6%	7,122	164,900	23.3
1984	January	20,100	0.746	36.2	2,316	4	21.7	23.3	27.3	75%	6.1%	1,226	16,558	23.3
	February	17,442	0.724	35.8	1,828	4	21.5	23.3	27.3	76%	6.1%	1,064	14,550	23.3
	March	17,999	0.720	33.5	1,995	4	20.2	23.3	27.3	81%	3.6%	642	15,361	23.3
	April	15,837	0.731	30.1	2,069	4	18.0	23.3	27.3	91%	0.7%	111	13,657	23.3
	May	15,469	0.724	28.7	2,169	4	17.2	23.3	27.3	95%	0.2%	34	13,266	23.3
	June	14,851	0.676	30.5	2,494	4	18.3	23.3	27.3	89%	2.0%	290	12,067	23.3
	July	16,736	0.670	33.6	3,118	4	20.1	23.3	27.3	81%	3.6%	597	13,021	23.3
	August	16,739	0.668	33.7	2,494	4	20.2	23.3	27.3	81%	3.6%	597	13,648	23.3
	September	15,070	0.687	30.5	1,828	4	18.3	23.3	27.3	90%	2.0%	294	12,947	23.3
	October	16,270	0.747	29.3	2,175	4	17.6	23.3	27.3	93%	0.7%	114	13,989	23.3
	November	17,535	0.710	34.3	2,175	4	20.6	23.3	27.3	80%	6.1%	1,070	14,290	23.3
	December	20,213	0.706	38.5	2,381	4	23.1	23.3	27.3	71%	10.7%	2,165	15,667	23.3
	Total	204,270	0.606	38.5	27,042						4.0%	8,205	169,023	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Upper Bandwidth
02-Apr-92

Table 5-4
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Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum (BHPL + WAPA) Share of Peak	Maximum (BHPL + WAPA) As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1995	January	20,619	0.746	37.1	2,316	4	22.3	23.1	27.1	73%	10.7%	2,209	16,094	23.1
	February	17,891	0.734	36.8	1,828	4	22.1	23.1	27.1	74%	10.7%	1,916	14,147	23.1
	March	18,461	0.720	34.5	1,995	4	20.7	23.1	27.1	79%	6.1%	1,126	15,340	23.1
	April	16,245	0.731	30.8	2,069	4	18.5	23.1	27.1	88%	2.0%	317	13,857	23.1
	May	15,884	0.724	29.5	2,169	4	17.7	23.1	27.1	92%	0.7%	112	13,583	23.1
	June	19,230	0.676	31.3	2,494	4	18.8	23.1	27.1	87%	2.0%	297	12,435	23.1
	July	27,182	0.830	36.4	3,118	4	20.7	23.1	27.1	74%	6.1%	1,047	12,998	23.1
	August	27,164	0.868	34.5	2,494	4	20.7	23.1	27.1	79%	6.1%	1,047	13,623	23.1
	September	18,652	0.687	31.8	1,828	4	18.7	23.1	27.1	85%	2.0%	302	13,322	23.1
	October	19,890	0.767	35.0	2,175	4	18.9	23.1	27.1	77%	6.1%	117	14,397	23.1
	November	17,978	0.710	35.2	2,175	4	21.1	23.1	27.1	91%	6.1%	1,097	14,706	23.1
	December	20,722	0.706	39.3	2,381	4	23.7	23.7	27.7	70%	10.7%	2,220	16,122	23.7
	Total	209,475	0.608	39.3	27,042						5.6%	11,806	170,627	23.7
1996	January	21,137	0.746	38.1	2,316	4	22.8	23.7	27.7	73%	10.7%	2,264	16,557	23.7
	February	18,340	0.724	36.4	1,828	4	21.8	23.7	27.7	76%	6.1%	1,119	15,393	23.7
	March	18,923	0.720	35.3	1,995	4	21.2	23.7	27.7	78%	6.1%	1,154	15,773	23.7
	April	16,659	0.731	31.8	2,069	4	19.0	23.7	27.7	87%	2.0%	325	14,255	23.7
	May	16,269	0.724	30.2	2,169	4	18.1	23.7	27.7	92%	0.7%	114	13,976	23.7
	June	19,698	0.676	32.1	2,494	4	19.3	23.7	27.7	86%	2.0%	305	12,810	23.7
	July	27,838	0.830	35.3	3,118	4	21.2	23.7	27.7	78%	6.1%	1,073	13,368	23.7
	August	27,809	0.868	35.6	2,494	4	21.2	23.7	27.7	78%	6.1%	1,073	14,022	23.7
	September	19,833	0.687	32.8	1,828	4	19.7	23.7	27.7	84%	2.0%	309	14,090	23.7
	October	17,301	0.767	30.8	2,175	4	18.5	23.7	27.7	90%	2.0%	334	14,593	23.7
	November	18,489	0.710	35.0	2,175	4	21.0	23.7	27.7	77%	6.1%	1,124	15,122	23.7
	December	21,238	0.706	40.4	2,381	4	24.3	24.3	28.3	70%	14.5%	3,087	15,763	24.3
	Total	234,680	0.668	40.4	27,042						5.7%	12,280	175,356	24.3
1997	January	25,655	0.746	39.0	2,316	4	23.4	24.3	28.3	72%	10.7%	2,320	17,019	24.3
	February	18,789	0.724	38.6	1,828	4	23.2	24.3	28.3	73%	10.7%	2,013	14,948	24.3
	March	19,385	0.720	36.7	1,995	4	21.7	24.3	28.3	78%	6.1%	1,182	16,207	24.3
	April	17,054	0.731	32.4	2,069	4	18.4	24.3	28.3	87%	2.0%	333	14,652	24.3
	May	16,655	0.724	30.9	2,169	4	18.6	24.3	28.3	91%	0.7%	117	14,369	24.3
	June	15,907	0.676	32.9	2,494	4	19.7	24.3	28.3	86%	2.0%	312	13,181	24.3
	July	28,014	0.830	36.1	3,118	4	21.7	24.3	28.3	78%	6.1%	1,099	13,798	24.3
	August	28,014	0.868	36.2	2,494	4	21.7	24.3	28.3	78%	6.1%	1,099	16,421	24.3
	September	16,219	0.687	32.8	1,828	4	19.7	24.3	28.3	84%	2.0%	318	14,071	24.3
	October	17,513	0.767	31.5	2,175	4	18.9	24.3	28.3	90%	2.0%	342	14,596	24.3
	November	18,863	0.710	36.9	2,175	4	22.1	24.3	28.3	77%	6.1%	1,151	15,537	24.3
	December	21,740	0.706	41.4	2,381	4	24.8	24.8	28.8	70%	14.5%	3,161	16,198	24.8
	Total	245,845	0.668	41.4	27,042						6.1%	13,644	170,399	24.8
1998	January	22,173	0.746	39.9	2,316	4	24.0	24.8	28.8	72%	10.7%	2,375	17,482	24.8
	February	19,237	0.724	39.5	1,828	4	23.7	24.8	28.8	73%	10.7%	2,061	15,309	24.8
	March	19,847	0.720	37.1	1,995	4	22.2	24.8	28.8	78%	6.1%	1,211	16,641	24.8
	April	17,460	0.731	33.2	2,069	4	19.9	24.8	28.8	87%	2.0%	341	15,050	24.8
	May	17,050	0.724	31.7	2,169	4	19.0	24.8	28.8	91%	0.7%	120	14,761	24.8
	June	16,296	0.676	33.6	2,494	4	20.2	24.8	28.8	86%	2.0%	319	13,553	24.8
	July	28,646	0.830	37.0	3,118	4	22.2	24.8	28.8	78%	6.1%	1,125	14,197	24.8
	August	28,639	0.868	37.1	2,494	4	22.2	24.8	28.8	78%	6.1%	1,125	16,821	24.8
	September	16,587	0.687	33.6	1,828	4	20.1	24.8	28.8	86%	2.0%	326	14,445	24.8
	October	17,925	0.767	32.3	2,175	4	19.4	24.8	28.8	89%	2.0%	350	15,020	24.8
	November	19,368	0.710	37.8	2,175	4	22.7	24.8	28.8	76%	6.1%	1,178	15,953	24.8
	December	23,248	0.706	42.4	2,381	4	25.4	25.4	29.4	69%	14.5%	3,235	16,834	25.4
	Total	251,060	0.676	42.4	27,042						6.1%	13,762	186,269	25.4

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Upper Bandwidth
02-Apr-92

Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1999	January	22,691	0.746	40.9	2,316	4	24.5	25.4	29.4	72%	10.7%	2,431	17,945	25.4
	February	19,865	0.724	40.5	1,828	4	24.3	25.4	29.4	73%	10.7%	2,109	15,749	25.4
	March	20,309	0.720	37.9	1,995	4	22.8	25.4	29.4	78%	6.1%	1,239	17,075	25.4
	April	17,860	0.731	33.9	2,069	4	20.4	25.4	29.4	87%	2.0%	349	15,448	25.4
	May	17,445	0.724	32.4	2,169	4	19.4	25.4	29.4	91%	0.7%	123	15,154	25.4
	June	16,745	0.676	34.6	2,494	4	20.7	25.4	29.4	85%	2.0%	327	13,924	25.4
	July	18,866	0.670	37.8	3,118	4	22.7	25.4	29.4	78%	6.1%	1,151	14,597	25.4
	August	18,865	0.668	37.9	2,494	4	22.8	25.4	29.4	78%	6.1%	1,151	15,220	25.4
	September	16,978	0.687	34.3	1,828	4	20.6	25.4	29.4	86%	2.0%	331	14,820	25.4
	October	18,336	0.747	33.0	2,175	4	19.8	25.4	29.4	89%	2.0%	358	15,803	25.4
	November	19,748	0.710	38.6	2,175	4	23.2	25.4	29.4	76%	6.1%	1,205	16,358	25.4
	December	22,758	0.706	43.3	2,381	4	26.0	26.0	30.0	69%	14.5%	3,309	17,069	26.0
	Total	230,295	0.607	43.3	27,042						6.1%	14,081	189,172	26.0
2000	January	23,210	0.746	41.8	2,316	4	25.1	26.0	30.0	72%	10.7%	2,486	18,407	26.0
	February	20,135	0.724	41.6	1,828	4	24.8	26.0	30.0	73%	10.7%	2,157	16,150	26.0
	March	20,771	0.720	38.8	1,995	4	23.3	26.0	30.0	77%	6.1%	1,267	17,509	26.0
	April	18,271	0.731	34.7	2,069	4	20.8	26.0	30.0	86%	2.0%	357	15,846	26.0
	May	17,841	0.724	33.1	2,169	4	19.9	26.0	30.0	91%	0.7%	125	15,546	26.0
	June	17,124	0.676	35.2	2,494	4	21.1	26.0	30.0	85%	2.0%	334	14,295	26.0
	July	19,292	0.670	38.7	3,118	4	23.2	26.0	30.0	78%	6.1%	1,177	14,997	26.0
	August	19,290	0.668	38.8	2,494	4	23.3	26.0	30.0	77%	6.1%	1,177	15,619	26.0
	September	17,361	0.687	35.1	1,828	4	21.1	26.0	30.0	85%	2.0%	339	15,194	26.0
	October	18,748	0.747	33.7	2,175	4	20.2	26.0	30.0	89%	2.0%	366	16,207	26.0
	November	20,190	0.710	39.5	2,175	4	23.7	26.0	30.0	76%	6.1%	1,232	16,784	26.0
	December	23,268	0.706	44.3	2,381	4	26.6	26.6	30.6	69%	14.5%	3,383	17,504	26.6
	Total	235,500	0.607	44.3	27,042						6.1%	14,399	194,059	26.6
2001	January	23,728	0.746	42.7	2,316	4	25.6	26.6	30.6	72%	10.7%	2,542	18,870	26.6
	February	20,583	0.724	42.3	1,828	4	25.4	26.6	30.6	72%	10.7%	2,205	16,551	26.6
	March	21,233	0.720	39.7	1,995	4	23.8	26.6	30.6	77%	6.1%	1,295	17,943	26.6
	April	18,677	0.731	35.5	2,069	4	21.3	26.6	30.6	86%	2.0%	365	16,243	26.6
	May	18,236	0.724	33.9	2,169	4	20.3	26.6	30.6	90%	0.7%	128	15,939	26.6
	June	17,502	0.676	36.0	2,494	4	21.6	26.6	30.6	85%	2.0%	342	14,667	26.6
	July	19,718	0.670	39.6	3,118	4	23.7	26.6	30.6	77%	6.1%	1,203	15,397	26.6
	August	19,715	0.668	39.6	2,494	4	23.8	26.6	30.6	77%	6.1%	1,203	16,018	26.6
	September	17,743	0.687	35.9	1,828	4	21.5	26.6	30.6	85%	2.0%	346	15,569	26.6
	October	19,160	0.747	34.5	2,175	4	20.7	26.6	30.6	89%	2.0%	374	16,611	26.6
	November	20,633	0.710	40.4	2,175	4	24.2	26.6	30.6	76%	6.1%	1,259	17,199	26.6
	December	23,777	0.706	45.3	2,381	4	27.2	27.2	31.2	69%	14.5%	3,457	17,939	27.2
	Total	240,705	0.607	45.3	27,042						6.1%	14,717	198,946	27.2
2002	January	24,246	0.746	43.7	2,316	4	26.2	27.2	31.2	71%	10.7%	2,597	19,333	27.2
	February	21,032	0.724	43.2	1,828	4	25.9	27.2	31.2	72%	10.7%	2,253	16,951	27.2
	March	21,695	0.720	40.5	1,995	4	24.3	27.2	31.2	77%	6.1%	1,323	18,376	27.2
	April	19,083	0.731	36.2	2,069	4	21.7	27.2	31.2	86%	2.0%	372	16,641	27.2
	May	18,632	0.724	34.6	2,169	4	20.8	27.2	31.2	90%	0.7%	131	16,332	27.2
	June	17,881	0.676	36.8	2,494	4	22.1	27.2	31.2	85%	3.6%	638	14,749	27.2
	July	20,144	0.670	40.4	3,118	4	24.2	27.2	31.2	77%	6.1%	1,229	15,797	27.2
	August	20,140	0.668	40.5	2,494	4	24.3	27.2	31.2	77%	6.1%	1,229	16,417	27.2
	September	18,125	0.687	36.6	1,828	4	22.0	27.2	31.2	85%	2.0%	354	15,943	27.2
	October	19,571	0.747	35.2	2,175	4	21.1	27.2	31.2	88%	2.0%	382	17,014	27.2
	November	21,075	0.710	41.2	2,175	4	24.7	27.2	31.2	76%	6.1%	1,286	17,615	27.2
	December	24,286	0.706	46.3	2,381	4	27.8	27.8	31.8	69%	14.5%	3,531	18,374	27.8
	Total	245,910	0.607	46.3	27,042						6.2%	15,324	203,543	27.8

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Upper Bandwidth
02-Apr-92

Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
2003	January	24,764	0.765	44.0	2,316	4	26.8	27.8	31.8	71%	10.7%	2,653	19,795	27.8
	February	21,481	0.724	44.1	1,828	4	26.5	27.8	31.8	72%	10.7%	2,301	17,352	27.8
	March	22,357	0.720	41.6	1,995	4	24.8	27.8	31.8	77%	6.1%	1,352	18,110	27.8
	April	19,488	0.731	37.0	2,069	4	22.2	27.8	31.8	86%	2.0%	380	17,039	27.8
	May	19,023	0.724	35.3	2,169	4	21.2	27.8	31.8	90%	2.0%	371	16,487	27.8
	June	18,260	0.676	37.5	2,494	4	22.5	27.8	31.8	85%	3.6%	652	15,314	27.8
	July	20,570	0.670	41.3	3,118	4	24.8	27.8	31.8	77%	6.1%	1,255	16,197	27.8
	August	20,563	0.668	41.4	2,495	4	24.8	27.8	31.8	77%	6.1%	1,256	16,817	27.8
	September	18,607	0.687	37.4	1,828	4	22.4	27.8	31.8	85%	3.6%	650	16,018	27.8
	October	19,983	0.747	36.0	2,175	4	21.6	27.8	31.8	88%	2.0%	390	17,418	27.8
	November	22,518	0.710	42.1	2,175	4	25.3	27.8	31.8	75%	6.1%	1,311	18,010	27.8
	December	24,765	0.708	47.2	2,381	4	28.3	28.3	32.3	68%	14.5%	3,605	18,809	28.3
	Total	251,115	0.607	47.2	27,042						6.4%	16,186	207,607	28.3
2004	January	25,282	0.746	45.5	2,316	4	27.3	28.3	32.3	71%	10.7%	2,708	20,258	28.3
	February	21,929	0.724	45.1	1,828	4	27.0	28.3	32.3	72%	10.7%	2,349	17,752	28.3
	March	22,818	0.720	42.2	1,995	4	25.3	28.3	32.3	77%	6.1%	1,380	19,244	28.3
	April	19,894	0.731	37.8	2,069	4	22.7	28.3	32.3	86%	2.0%	388	17,437	28.3
	May	19,422	0.724	36.1	2,169	4	21.6	28.3	32.3	90%	2.0%	379	16,874	28.3
	June	18,639	0.676	38.3	2,494	4	23.0	28.3	32.3	84%	3.6%	665	15,480	28.3
	July	20,996	0.670	42.1	3,118	4	25.3	28.3	32.3	77%	6.1%	1,281	16,597	28.3
	August	20,990	0.668	42.2	2,494	4	25.3	28.3	32.3	77%	6.1%	1,280	17,216	28.3
	September	18,989	0.687	38.2	1,828	4	22.9	28.3	32.3	85%	3.6%	674	16,387	28.3
	October	20,385	0.747	36.7	2,175	4	22.0	28.3	32.3	88%	2.0%	398	17,822	28.3
	November	21,960	0.710	43.0	2,175	4	25.8	28.3	32.3	75%	0.5%	1,340	18,446	28.3
	December	25,394	0.708	48.2	2,381	4	28.9	28.9	32.9	68%	14.5%	3,679	19,244	28.9
	Total	256,320	0.607	48.2	27,042						6.4%	16,521	212,757	28.9

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bandwidth
02-Apr-92

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Year	Month	Total Gillette, Wyoming Sales and Energy	Total Gillette, Wyoming Load Factor	Total Gillette, Wyoming Peak	WAPA Sales and Energy	WAPA Peak	80 Percent of Gillette Peak	Maximum BHPL Share of Peak (2)	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources Percent of Total (3)	Energy - Other Sources Sales and Energy	BHPL Share Sales and Energy	BHPL Share Peak
		MWh		MW	MWh	MW	MW	MW	MW	%	%	MWh	MWh	MW
1991 (1)	January	18,765		33.1	2,268	4	19.9						16,475	29.1
	February	14,431		28.9	1,820	4	17.3						12,611	24.9
	March	15,532		29.0	1,984	4	17.4						13,548	25.0
	April	14,376		25.8	2,068	4	16.1						12,308	22.8
	May	13,709		25.7	2,169	3	15.4						11,540	22.7
	June	13,110		26.1	2,460	5	15.7						10,650	21.1
	July	15,058		30.5	3,007	5	18.3						12,061	25.5
	August	15,204		31.4	2,480	6	18.8						12,824	25.4
	September	13,470		27.2	1,828	4	16.3						11,642	23.2
	October	14,838		31.9	2,172	6	19.1						12,666	25.9
	November	16,069		32.6	2,160	7	19.6						13,909	25.6
	December	16,827		30.9	2,356	6	18.5						14,471	24.9
	Total	181,493	0.626	33.1	26,798								154,695	29.1
1992	January	16,923		32.0	2,294	4	19.2					172	14,457	27.0
	February	14,767		30.0	1,827	4	18.0					28	12,912	24.0
	March	16,134	0.720	30.1	1,995	4	18.1	23.3	27.3	91%	0.7%	113	14,025	23.3
	April	14,198	0.731	27.0	2,069	4	16.2	23.3	27.3	101%	0.0%	1	12,128	23.0
	May	13,869	0.724	25.8	2,169	4	15.5	23.3	27.3	106%	0.0%	1	11,699	21.6
	June	13,317	0.676	27.4	2,494	4	16.4	23.3	27.3	100%	0.2%	29	10,794	23.3
	July	15,009	0.670	30.1	3,118	4	18.1	23.3	27.3	91%	0.7%	105	11,786	23.3
	August	15,013	0.668	30.2	2,494	4	18.1	23.3	27.3	90%	0.7%	106	12,413	23.3
	September	13,517	0.687	27.3	1,828	4	16.4	23.3	27.3	100%	0.2%	29	11,660	23.3
	October	14,603	0.747	26.3	2,175	6	15.8	23.3	27.3	104%	0.0%	1	12,427	22.3
	November	15,732	0.710	30.8	2,175	4	18.5	23.3	27.3	89%	2.0%	307	13,250	23.3
	December	18,137	0.706	34.5	2,381	4	20.7	23.3	27.3	79%	6.1%	1,106	14,650	23.3
	Total	181,218	0.599	34.5	27,019						1.1%	1,998	152,201	27.0
1993	January	18,503	0.746	33.3	2,316	4	20.0	23.3	27.3	82%	3.6%	660	15,527	23.3
	February	16,057	0.724	33.0	1,828	4	19.8	23.3	27.3	83%	3.6%	573	13,656	23.3
	March	16,570	0.720	30.9	1,995	4	18.6	23.3	27.3	88%	2.0%	323	14,252	23.3
	April	14,581	0.731	27.7	2,069	4	16.6	23.3	27.3	99%	0.2%	32	12,480	23.3
	May	14,262	0.724	26.5	2,169	4	15.9	23.3	27.3	103%	0.0%	1	12,073	22.5
	June	13,674	0.676	28.1	2,494	4	16.9	23.3	27.3	97%	0.2%	30	11,151	23.3
	July	15,412	0.670	30.9	3,118	4	18.5	23.3	27.3	88%	2.0%	301	11,993	23.3
	August	15,415	0.668	31.0	2,494	4	18.6	23.3	27.3	88%	2.0%	301	12,620	23.3
	September	13,878	0.687	28.1	1,828	4	16.8	23.3	27.3	97%	0.2%	30	12,020	23.3
	October	14,992	0.747	27.0	2,175	4	16.2	23.3	27.3	101%	0.0%	1	12,816	23.0
	November	16,150	0.710	31.6	2,175	4	19.0	23.3	27.3	86%	2.0%	315	13,660	23.3
	December	18,618	0.706	35.5	2,381	4	21.3	23.3	27.3	77%	6.1%	1,136	15,101	23.3
	Total	188,093	0.606	35.5	27,042						2.0%	3,702	157,349	23.3
1994	January	18,993	0.746	34.2	2,316	4	20.5	23.3	27.3	80%	6.1%	1,159	15,518	23.3
	February	16,481	0.724	33.9	1,828	4	20.3	23.3	27.3	81%	3.6%	588	14,065	23.3
	March	17,007	0.720	31.8	1,995	4	19.1	23.3	27.3	86%	2.0%	332	14,680	23.3
	April	14,956	0.731	28.4	2,069	4	17.1	23.3	27.3	96%	0.2%	33	12,853	23.3
	May	14,616	0.724	27.2	2,169	4	16.3	23.3	27.3	101%	0.0%	1	12,446	23.2
	June	14,032	0.676	28.8	2,494	4	17.3	23.3	27.3	95%	0.7%	99	11,440	23.3
	July	15,814	0.670	31.7	3,118	4	19.0	23.3	27.3	86%	2.0%	309	12,387	23.3
	August	15,816	0.668	31.8	2,494	4	19.1	23.3	27.3	86%	2.0%	309	13,014	23.3
	September	14,239	0.687	28.8	1,828	4	17.3	23.3	27.3	95%	0.7%	100	12,311	23.3
	October	15,381	0.747	27.7	2,175	4	16.6	23.3	27.3	99%	0.2%	33	13,172	23.3
	November	16,569	0.710	32.4	2,175	4	19.4	23.3	27.3	84%	3.6%	591	13,802	23.3
	December	19,099	0.706	36.4	2,381	4	21.8	23.3	27.3	75%	6.1%	1,165	15,553	23.3
	Total	193,011	0.606	36.4	27,042						2.4%	4,718	161,251	23.3

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bandwidth
02-Apr-02

Table 5-4
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Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
1995	January	19,482	0.746	35.1	2,316	4	21.1	23.3	27.3	78%	6.1%	1,188	15,978	23.3
	February	18,904	0.726	34.7	1,828	4	20.8	23.3	27.3	79%	6.1%	1,031	14,046	23.3
	March	17,645	0.720	32.6	1,995	4	19.5	23.3	27.3	84%	3.6%	622	14,826	23.3
	April	15,348	0.731	28.1	2,069	4	17.5	23.3	27.3	94%	0.7%	108	13,171	23.3
	May	14,990	0.724	27.8	2,169	4	16.7	23.3	27.3	98%	0.2%	33	12,788	23.3
	June	14,350	0.676	29.8	2,496	4	17.7	23.3	27.3	92%	0.7%	101	11,795	23.3
	July	16,217	0.670	32.5	3,118	4	19.5	23.3	27.3	84%	3.6%	579	12,520	23.3
	August	16,216	0.668	32.6	2,494	4	19.6	23.3	27.3	84%	3.6%	579	13,145	23.3
	September	14,600	0.687	29.5	1,628	4	17.7	23.3	27.3	92%	0.7%	103	12,669	23.3
	October	15,770	0.747	28.4	2,175	4	17.0	23.3	27.3	96%	0.2%	34	13,560	23.3
	November	18,987	0.710	33.2	2,175	4	19.9	23.3	27.3	82%	3.6%	606	14,206	23.3
	December	19,589	0.706	37.3	2,381	4	22.4	23.3	27.3	73%	10.7%	2,097	15,102	23.3
	Total	197,929	0.606	37.3	27,042						3.6%	7,082	163,806	23.3
1996	January	19,972	0.746	36.0	2,316	4	21.6	23.3	27.3	76%	6.1%	1,218	16,438	23.3
	February	17,329	0.724	34.4	1,828	4	20.6	23.3	27.3	79%	6.1%	1,057	14,444	23.3
	March	17,860	0.720	33.4	1,995	4	20.0	23.3	27.3	82%	3.6%	638	15,287	23.3
	April	15,731	0.731	28.9	2,069	4	17.9	23.3	27.3	91%	0.7%	111	13,551	23.3
	May	15,363	0.724	28.5	2,169	4	17.1	23.3	27.3	96%	0.2%	33	13,161	23.3
	June	14,748	0.676	30.3	2,496	4	18.2	23.3	27.3	90%	0.7%	104	12,151	23.3
	July	16,619	0.670	33.2	3,118	4	20.0	23.3	27.3	82%	3.6%	593	12,908	23.3
	August	16,620	0.668	33.4	2,494	4	20.1	23.3	27.3	82%	3.6%	593	13,533	23.3
	September	14,961	0.687	30.2	1,628	4	18.1	23.3	27.3	90%	0.7%	105	13,028	23.3
	October	16,159	0.747	29.1	2,175	4	17.5	23.3	27.3	94%	0.7%	114	13,870	23.3
	November	17,465	0.710	34.0	2,175	4	20.4	23.3	27.3	80%	3.6%	621	14,569	23.3
	December	20,081	0.706	38.2	2,381	4	22.9	23.3	27.3	71%	10.7%	2,149	15,531	23.3
	Total	202,847	0.606	38.2	27,042						3.6%	7,336	168,469	23.3
1997	January	20,481	0.746	36.9	2,316	4	22.1	23.3	27.3	74%	10.7%	2,192	15,954	23.3
	February	17,753	0.724	34.5	1,828	4	21.9	23.3	27.3	75%	10.7%	1,902	14,023	23.3
	March	18,316	0.720	34.2	1,995	4	20.5	23.3	27.3	80%	6.1%	1,117	15,206	23.3
	April	16,114	0.731	30.6	2,069	4	18.4	23.3	27.3	89%	2.0%	316	13,731	23.3
	May	15,737	0.724	29.2	2,169	4	17.5	23.3	27.3	93%	0.7%	111	13,457	23.3
	June	15,106	0.676	31.1	2,496	4	18.6	23.3	27.3	88%	2.0%	295	12,317	23.3
	July	17,021	0.670	34.1	3,118	4	20.5	23.3	27.3	80%	6.1%	1,038	12,885	23.3
	August	17,021	0.668	34.2	2,494	4	20.5	23.3	27.3	80%	6.1%	1,038	13,489	23.3
	September	15,322	0.687	31.0	1,628	4	18.6	23.3	27.3	88%	2.0%	299	13,195	23.3
	October	16,548	0.747	29.8	2,175	4	17.9	23.3	27.3	92%	0.7%	118	14,256	23.3
	November	17,823	0.710	34.9	2,175	4	20.9	23.3	27.3	78%	6.1%	1,087	14,561	23.3
	December	20,642	0.706	39.1	2,381	4	23.5	23.3	27.3	70%	10.7%	2,200	15,961	23.3
	Total	207,765	0.606	39.1	27,042						5.6%	11,710	169,013	23.3
1998	January	20,951	0.746	37.7	2,316	4	22.6	23.3	27.3	73%	10.7%	2,244	16,391	23.3
	February	18,177	0.724	35.3	1,828	4	22.6	23.3	27.3	74%	10.7%	1,947	14,402	23.3
	March	18,753	0.720	35.0	1,995	4	21.0	23.3	27.3	78%	6.1%	1,144	15,614	23.3
	April	16,499	0.731	31.3	2,069	4	18.8	23.3	27.3	87%	2.0%	324	14,107	23.3
	May	16,118	0.724	29.9	2,169	4	18.0	23.3	27.3	91%	0.7%	113	13,828	23.3
	June	15,464	0.676	31.8	2,496	4	19.1	23.3	27.3	86%	2.0%	302	12,668	23.3
	July	17,424	0.670	35.0	3,118	4	21.0	23.3	27.3	78%	6.1%	1,063	13,243	23.3
	August	17,423	0.668	35.0	2,494	4	21.0	23.3	27.3	78%	6.1%	1,063	13,866	23.3
	September	15,683	0.687	33.2	1,628	4	19.2	23.3	27.3	82%	2.0%	306	13,366	23.3
	October	16,937	0.747	30.5	2,175	4	18.3	23.3	27.3	89%	0.7%	119	14,643	23.3
	November	18,248	0.710	35.7	2,175	4	21.4	23.3	27.3	76%	6.1%	1,113	14,963	23.3
	December	21,023	0.706	40.0	2,381	4	24.0	24.0	28.0	70%	14.5%	3,047	15,586	24.0
	Total	212,864	0.606	40.0	27,042						6.0%	12,992	172,849	24.0

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bandwidth
02-Apr-92

Table 5-4
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Year	Month	Total Gillette, Wyoming Sales and Energy	Load Factor	Peak	WAPA Sales and Energy	WAPA Peak	40 Percent of Gillette Peak	Maximum BHPL Share of Peak (2)	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources Percent of Total (3)	BHPL Share Sales and Energy	BHPL Share Peak
		MWh		MW	MWh	MW	MW	MW	MW	%	%	MWh	MW
1999	January	21,441	0.746	38.6	2,316	4	23.2	24.0	28.0	73%	10.7%	2,297	18,820	24.0
	February	16,601	0.726	38.2	1,828	4	22.9	24.0	28.0	73%	10.7%	1,992	14,781	24.0
	March	18,189	0.730	35.8	1,995	4	21.5	24.0	28.0	78%	6.1%	1,171	16,024	24.0
	April	16,881	0.731	32.1	2,069	4	19.2	24.0	28.0	87%	2.0%	329	14,482	24.0
	May	16,486	0.728	30.6	2,169	4	18.4	24.0	28.0	92%	0.7%	116	14,199	24.0
	June	15,822	0.676	32.5	2,494	4	19.5	24.0	28.0	86%	2.0%	309	13,019	24.0
	July	17,826	0.670	35.8	3,118	4	21.5	24.0	28.0	78%	6.1%	1,087	13,621	24.0
	August	17,825	0.668	35.8	2,494	4	21.5	24.0	28.0	78%	6.1%	1,087	14,244	24.0
	September	16,043	0.667	32.4	1,828	4	19.5	24.0	28.0	86%	2.0%	313	13,902	24.0
	October	17,328	0.747	31.2	2,175	4	18.7	24.0	28.0	90%	2.0%	338	14,813	24.0
	November	18,659	0.710	36.5	2,175	4	21.9	24.0	28.0	77%	6.1%	1,138	15,346	24.0
	December	21,504	0.705	41.0	2,381	4	24.6	24.6	28.6	70%	14.5%	3,127	15,997	24.6
	Total	217,602	0.607	41.0	27,042						6.1%	13,304	177,255	24.6
2000	January	21,930	0.746	39.5	2,316	4	23.7	24.6	28.6	72%	10.7%	2,349	17,265	24.6
	February	19,025	0.724	39.1	1,828	4	23.5	24.6	28.6	73%	10.7%	2,038	15,159	24.6
	March	19,626	0.720	36.7	1,995	4	22.0	24.6	28.6	78%	6.1%	1,197	16,434	24.6
	April	17,256	0.731	32.8	2,069	4	19.7	24.6	28.6	87%	2.0%	337	14,850	24.6
	May	16,858	0.724	31.3	2,169	4	18.8	24.6	28.6	91%	0.7%	118	14,570	24.6
	June	16,180	0.678	33.3	2,494	4	20.0	24.6	28.6	86%	2.0%	316	13,370	24.6
	July	18,229	0.670	36.6	3,118	4	21.9	24.6	28.6	78%	6.1%	1,112	13,999	24.6
	August	18,227	0.668	36.6	2,494	4	22.0	24.6	28.6	78%	6.1%	1,112	14,621	24.6
	September	16,406	0.687	33.2	1,828	4	19.9	24.6	28.6	86%	2.0%	320	14,256	24.6
	October	17,715	0.747	31.9	2,175	4	19.1	24.6	28.6	90%	2.0%	346	15,194	24.6
	November	19,078	0.710	37.3	2,175	4	22.4	24.6	28.6	77%	6.1%	1,164	15,739	24.6
	December	21,985	0.705	41.9	2,381	4	25.1	25.1	29.1	70%	14.5%	3,196	16,408	25.1
	Total	222,520	0.607	41.9	27,042						6.1%	13,605	181,873	25.1
2001	January	22,420	0.746	40.4	2,316	4	24.2	25.1	29.1	72%	10.7%	2,401	17,702	25.1
	February	19,449	0.724	40.0	1,828	4	24.0	25.1	29.1	73%	10.7%	2,083	15,538	25.1
	March	20,063	0.720	37.5	1,995	4	22.5	25.1	29.1	78%	6.1%	1,224	16,844	25.1
	April	17,648	0.731	33.5	2,069	4	20.1	25.1	29.1	87%	2.0%	344	15,234	25.1
	May	17,231	0.724	32.0	2,169	4	19.2	25.1	29.1	91%	0.7%	121	14,941	25.1
	June	16,538	0.676	34.0	2,494	4	20.4	25.1	29.1	86%	2.0%	323	13,721	25.1
	July	18,231	0.670	37.4	3,118	4	22.4	25.1	29.1	78%	6.1%	1,137	14,377	25.1
	August	18,228	0.668	37.5	2,494	4	22.5	25.1	29.1	78%	6.1%	1,136	14,998	25.1
	September	16,765	0.687	33.9	1,828	4	20.3	25.1	29.1	86%	2.0%	327	14,610	25.1
	October	18,104	0.747	32.6	2,175	4	19.6	25.1	29.1	89%	2.0%	353	15,575	25.1
	November	19,495	0.710	38.1	2,175	4	22.9	25.1	29.1	76%	6.1%	1,189	16,131	25.1
	December	22,466	0.705	42.8	2,381	4	25.7	25.7	29.7	69%	14.5%	3,266	16,819	25.7
	Total	227,438	0.607	42.8	27,042						6.1%	13,906	186,490	25.7
2002	January	22,910	0.746	41.3	2,316	4	24.8	25.7	29.7	72%	10.7%	2,454	18,140	25.7
	February	19,873	0.724	40.8	1,828	4	24.5	25.7	29.7	73%	10.7%	2,129	15,916	25.7
	March	20,499	0.720	38.3	1,995	4	23.0	25.7	29.7	78%	6.1%	1,250	17,254	25.7
	April	18,031	0.731	34.2	2,069	4	20.5	25.7	29.7	87%	2.0%	352	15,610	25.7
	May	17,605	0.724	32.7	2,169	4	19.6	25.7	29.7	91%	0.7%	124	15,312	25.7
	June	16,896	0.676	34.7	2,494	4	20.8	25.7	29.7	85%	2.0%	330	14,072	25.7
	July	19,034	0.670	38.2	3,118	4	22.9	25.7	29.7	78%	6.1%	1,161	14,755	25.7
	August	19,030	0.668	38.3	2,494	4	23.0	25.7	29.7	78%	6.1%	1,161	15,375	25.7
	September	17,126	0.687	34.6	1,828	4	20.8	25.7	29.7	86%	2.0%	334	14,964	25.7
	October	18,493	0.747	33.3	2,175	4	20.0	25.7	29.7	89%	2.0%	361	15,957	25.7
	November	19,914	0.710	39.0	2,175	4	23.4	25.7	29.7	76%	6.1%	1,215	16,524	25.7
	December	22,947	0.705	43.7	2,381	4	26.2	26.2	30.2	69%	14.5%	3,336	17,230	26.2
	Total	232,356	0.607	43.7	27,042						6.1%	14,207	191,108	26.2

Black Hills Power & Light Company
Monthly Sales Forecast
Gillette, Wyoming Requirements - Lower Bandwidth
02-Apr-92

Year	Month	Total Gillette, Wyoming			WAPA		60 Percent of Gillette Peak	Maximum BHPL Share of Peak	Maximum BHPL + WAPA Share of Peak	Maximum BHPL + WAPA As Percent of Total	Energy - Other Sources		BHPL Share	
		Sales and Energy	Load Factor	Peak	Sales and Energy	Peak					Percent of Total	Sales and Energy	Sales and Energy	Peak
		MWh		MW	MWh	MW	MW	MW (2)	MW	%	% (3)	MWh	MWh	MW
2001	January	23,399	0.746	42.2	2,316	6	25.3	26.2	30.2	72%	10.7%	2,504	18,577	26.2
	February	20,297	0.724	41.7	1,878	6	25.0	26.2	30.2	72%	10.7%	2,174	16,245	26.2
	March	20,936	0.720	39.1	1,095	6	23.5	26.2	30.2	77%	8.1%	1,277	17,664	26.2
	April	18,414	0.731	35.0	2,068	4	21.0	26.2	30.2	86%	2.0%	359	15,886	26.2
	May	17,078	0.724	33.4	2,169	4	20.0	26.2	30.2	90%	0.7%	126	15,683	26.2
	June	17,256	0.676	35.5	2,494	4	21.3	26.2	30.2	85%	2.0%	337	14,423	26.2
	July	18,436	0.870	39.0	2,118	4	23.4	26.2	30.2	78%	6.1%	1,188	15,131	26.2
	August	19,432	0.666	39.5	2,494	4	23.4	26.2	30.2	77%	6.1%	1,185	15,752	26.2
	September	17,603	0.667	35.4	1,828	4	21.2	26.2	30.2	85%	2.0%	341	15,318	26.2
	October	18,862	0.747	36.0	2,175	4	20.4	26.2	30.2	89%	2.0%	369	16,338	26.2
	November	22,332	0.710	39.6	2,175	4	23.9	26.2	30.2	76%	6.1%	1,240	16,917	26.2
	December	23,428	0.708	44.8	2,381	4	26.8	26.8	30.8	69%	14.5%	3,406	17,041	26.8
	Total	237,274	0.607	44.8	27,042						6.1%	14,507	195,725	26.8
2004	January	23,889	0.746	61.0	2,316	4	25.8	26.8	30.8	72%	10.7%	2,559	19,014	26.8
	February	20,721	0.724	42.6	1,828	4	25.5	26.8	30.8	72%	10.7%	2,219	16,623	26.8
	March	21,372	0.720	39.9	1,095	4	23.9	26.8	30.8	77%	8.1%	1,304	18,074	26.8
	April	18,797	0.731	35.7	2,068	4	21.4	26.8	30.8	86%	2.0%	367	16,362	26.8
	May	18,352	0.724	34.1	2,169	4	20.5	26.8	30.8	90%	0.7%	129	16,054	26.8
	June	17,611	0.676	36.2	2,494	4	21.7	26.8	30.8	85%	2.0%	344	14,709	26.8
	July	19,839	0.870	39.8	2,118	4	23.9	26.8	30.8	77%	6.1%	1,210	15,511	26.8
	August	19,833	0.666	39.9	2,494	4	23.9	26.8	30.8	77%	6.1%	1,210	16,129	26.8
	September	17,848	0.667	36.1	1,828	4	21.7	26.8	30.8	85%	2.0%	348	15,671	26.8
	October	19,273	0.747	36.7	2,175	4	20.8	26.8	30.8	89%	2.0%	378	16,720	26.8
	November	20,750	0.710	40.6	2,175	4	24.4	26.8	30.8	76%	6.1%	1,266	17,309	26.8
	December	23,909	0.708	45.5	2,381	4	27.3	27.3	31.3	69%	14.5%	3,476	18,052	27.3
	Total	242,193	0.607	45.5	27,042						6.2%	15,093	200,958	27.3

(1) Total Sales and WAPA Sales are actual.
(2) Equal to 60 percent of maximum historical Gillette peak.
(3) Percentage of energy above BHPL + WAPA share of peak based on Gillette Load Duration Curve.

Black Hills Power and Light Company
Monthly Sales Forecast
Total Company
09-Apr-92

Table 3-3
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Month	Description	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
January (1)	Upper Bandwidth - MWh	135,337	151,996	156,514	159,988	164,404	168,841	173,297	177,771	182,265	186,779	191,313	195,867	200,442
	Expected - MWh	135,337	144,573	148,868	153,089	156,341	160,555	164,787	169,037	173,306	177,594	181,900	186,226	190,572
	Lower Bandwidth - MWh	135,337	137,821	141,222	145,202	148,198	152,269	156,277	160,303	164,347	168,408	172,488	176,586	180,702
February (1)	Upper Bandwidth - MWh	121,948	137,929	142,012	145,172	149,998	153,149	157,162	161,192	165,239	169,304	173,385	177,485	181,601
	Expected - MWh	121,948	131,602	135,662	139,846	142,845	146,647	149,428	153,254	157,097	160,956	164,832	168,725	172,636
	Lower Bandwidth - MWh	121,948	124,845	128,529	131,895	135,292	138,946	141,693	145,316	148,955	152,609	156,280	159,968	163,669
March	Upper Bandwidth - MWh	137,227	141,658	145,786	149,349	153,383	157,434	161,502	165,587	169,689	173,809	177,946	182,102	186,275
	Expected - MWh	130,597	135,029	138,673	142,500	145,877	149,723	153,586	157,466	161,361	165,274	169,203	173,150	177,114
	Lower Bandwidth - MWh	124,088	128,114	131,835	135,184	138,623	142,013	145,671	149,344	153,034	156,739	160,460	164,198	167,951
April	Upper Bandwidth - MWh	132,209	136,649	140,582	144,214	148,058	151,919	155,796	159,689	163,599	167,525	171,469	175,430	179,408
	Expected - MWh	125,775	130,059	133,721	137,361	140,814	144,480	148,161	151,857	155,569	159,298	163,043	166,804	170,582
	Lower Bandwidth - MWh	119,378	123,394	126,933	130,306	133,767	137,041	140,525	144,025	147,540	151,070	154,616	158,178	161,755
May	Upper Bandwidth - MWh	126,944	131,267	135,039	138,634	142,320	146,019	149,734	153,465	157,210	160,972	164,749	168,305	172,110
	Expected - MWh	120,773	124,921	128,492	131,938	135,361	138,874	142,401	145,942	149,498	153,070	156,656	160,258	163,640
	Lower Bandwidth - MWh	114,603	118,503	121,896	125,165	128,478	131,728	135,067	138,420	141,786	145,167	148,563	151,973	155,399
June	Upper Bandwidth - MWh	128,880	133,323	137,000	140,757	144,530	148,318	152,122	155,941	159,776	163,627	167,206	171,064	174,979
	Expected - MWh	122,650	126,794	130,460	133,846	137,427	141,022	144,632	148,257	151,897	155,552	159,224	162,624	166,321
	Lower Bandwidth - MWh	116,351	120,331	123,735	127,114	130,507	133,725	137,142	140,572	144,018	147,477	150,952	154,442	157,663
July	Upper Bandwidth - MWh	144,379	148,914	153,127	156,924	161,162	165,418	169,692	173,985	178,297	182,628	186,978	191,348	195,736
	Expected - MWh	137,279	141,830	145,572	149,587	153,186	157,225	161,281	165,355	169,447	173,557	177,686	181,834	186,001
	Lower Bandwidth - MWh	130,367	134,483	138,272	141,816	145,631	149,032	152,870	156,725	160,597	164,487	168,394	172,320	176,263
August	Upper Bandwidth - MWh	144,040	148,540	152,718	156,478	160,680	164,899	169,135	173,390	177,663	181,955	186,265	190,595	194,943
	Expected - MWh	137,002	141,521	145,229	149,211	152,775	156,780	160,801	164,839	168,895	172,968	177,060	181,169	185,297
	Lower Bandwidth - MWh	130,152	134,238	137,996	141,508	145,292	148,660	152,466	156,288	160,126	163,981	167,854	171,744	175,652
September	Upper Bandwidth - MWh	140,663	145,528	149,675	153,522	157,635	161,766	165,914	170,080	174,264	178,466	182,686	186,925	191,876
	Expected - MWh	134,083	138,840	142,318	146,024	149,929	153,850	157,788	161,742	165,714	169,701	173,709	177,733	181,676
	Lower Bandwidth - MWh	127,233	131,420	135,023	138,708	142,408	145,933	149,661	153,404	157,164	160,940	164,732	168,542	172,369
October	Upper Bandwidth - MWh	132,778	136,628	140,264	143,993	147,522	151,275	155,044	158,828	162,627	166,441	170,275	174,123	177,984
	Expected - MWh	126,393	130,018	133,547	137,010	140,565	144,134	147,500	151,094	154,703	158,327	161,966	165,621	169,292
	Lower Bandwidth - MWh	119,974	123,440	126,750	130,104	133,394	136,775	140,169	143,361	146,778	150,211	153,658	157,120	160,597
November	Upper Bandwidth - MWh	135,676	139,632	143,010	146,837	150,679	154,536	158,410	162,300	166,207	170,130	174,070	178,027	182,002
	Expected - MWh	129,357	132,853	136,484	139,686	143,335	146,999	150,678	154,372	158,083	161,809	165,552	169,311	173,086
	Lower Bandwidth - MWh	122,768	126,336	129,513	132,965	136,431	139,461	142,945	146,445	149,959	153,488	157,033	160,594	164,171
December	Upper Bandwidth - MWh	142,966	147,244	151,390	155,552	158,919	163,097	167,292	171,505	175,736	179,986	184,254	188,541	192,847
	Expected - MWh	136,862	140,066	144,005	147,959	151,930	155,108	159,093	163,095	167,114	171,151	175,206	179,279	183,370
	Lower Bandwidth - MWh	129,873	133,747	137,500	140,365	144,127	147,905	150,893	154,605	158,493	162,317	166,159	170,017	173,894
Total	Upper Bandwidth - MWh	1,623,246	1,699,306	1,746,859	1,791,418	1,839,291	1,886,672	1,935,101	1,983,733	2,032,573	2,081,622	2,130,595	2,179,531	2,229,212
	Expected - MWh	1,558,018	1,617,686	1,662,390	1,707,037	1,750,184	1,794,366	1,840,134	1,886,310	1,932,684	1,979,259	2,026,037	2,072,734	2,119,390
	Lower Bandwidth - MWh	1,492,072	1,536,471	1,579,204	1,620,132	1,663,349	1,702,626	1,745,379	1,788,888	1,832,796	1,876,895	1,921,189	1,965,680	2,010,086
Expected Percent Increase			3.83%	2.76%	2.69%	2.53%	2.52%	2.55%	2.51%	2.46%	2.41%	2.36%	2.30%	2.25%

(1) 1992 Figures are actuals.

Black Hills Power and Light Company
Monthly Energy Forecast
Total Company
09-Apr-92

Month	Description	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
January (1)	Upper Bandwidth - MWh	138,017	156,350	161,000	164,598	169,143	173,707	178,291	182,894	187,517	192,161	196,825	201,510	206,217
	Expected - MWh	138,017	148,708	153,125	157,446	160,838	165,173	169,526	173,898	176,289	182,700	187,130	191,580	196,051
	Lower Bandwidth - MWh	138,017	141,534	145,251	149,314	151,454	156,638	160,761	164,902	167,061	173,238	177,435	181,650	185,885
February (1)	Upper Bandwidth - MWh	125,646	139,602	143,632	146,837	151,709	154,905	158,965	163,041	167,134	171,245	175,373	179,520	183,685
	Expected - MWh	125,646	133,005	136,599	140,426	144,268	147,284	151,138	155,008	158,895	162,798	166,718	170,656	174,611
	Lower Bandwidth - MWh	125,646	126,258	129,984	133,190	136,828	139,662	143,311	146,975	150,655	154,351	158,063	161,792	165,537
March	Upper Bandwidth - MWh	142,608	147,327	151,516	155,236	159,429	163,639	167,866	172,111	176,375	180,656	184,957	189,276	193,614
	Expected - MWh	135,685	140,313	144,112	148,068	151,814	155,813	159,825	163,851	167,705	171,771	175,854	179,956	184,076
	Lower Bandwidth - MWh	128,924	133,118	136,982	140,472	144,252	147,584	151,185	155,202	159,035	162,885	166,752	170,636	174,538
April	Upper Bandwidth - MWh	137,802	137,263	141,214	144,862	148,724	152,602	156,496	160,406	164,331	168,278	172,239	176,218	180,214
	Expected - MWh	128,342	130,642	134,321	137,977	141,446	145,129	148,825	152,530	156,247	160,012	163,773	167,551	171,346
	Lower Bandwidth - MWh	118,912	123,945	127,500	130,889	134,365	137,654	141,154	144,670	148,200	151,746	155,307	158,885	162,478
May	Upper Bandwidth - MWh	133,526	138,078	142,043	145,827	149,701	153,592	157,498	161,420	165,359	169,314	173,286	177,037	181,019
	Expected - MWh	127,024	131,366	135,152	138,768	142,369	146,061	149,769	153,492	157,231	160,986	164,757	168,544	172,112
	Lower Bandwidth - MWh	120,521	124,625	128,191	131,628	135,111	138,531	142,040	145,565	149,104	152,658	156,227	159,812	163,413
June	Upper Bandwidth - MWh	136,876	141,598	145,611	149,499	153,504	157,525	161,562	165,616	169,687	173,775	177,592	181,710	185,815
	Expected - MWh	130,243	134,649	138,541	142,145	145,945	149,751	153,592	157,439	161,303	165,183	169,079	172,766	176,431
	Lower Bandwidth - MWh	123,542	127,769	131,386	134,971	138,570	142,096	145,622	149,262	152,918	156,590	160,277	163,981	167,437
July	Upper Bandwidth - MWh	154,000	158,855	163,345	167,820	171,934	176,475	181,032	185,609	190,206	194,824	199,462	204,122	208,803
	Expected - MWh	148,414	151,267	155,271	159,550	163,614	167,719	172,043	176,385	180,767	185,129	189,531	193,953	198,395
	Lower Bandwidth - MWh	139,013	143,416	147,453	151,545	155,310	158,962	163,053	167,161	171,288	175,434	179,599	183,783	187,987
August	Upper Bandwidth - MWh	145,745	151,335	155,590	159,429	163,709	168,007	172,323	176,657	181,010	185,382	189,773	194,184	198,615
	Expected - MWh	139,571	144,174	147,956	152,012	155,651	159,330	163,026	167,939	172,071	176,221	180,388	184,575	188,781
	Lower Bandwidth - MWh	132,584	136,750	140,576	144,160	148,013	151,452	155,329	159,222	163,132	167,059	171,003	174,966	178,947
September	Upper Bandwidth - MWh	135,965	140,467	144,222	148,178	152,149	156,136	160,141	164,162	168,200	172,256	176,330	180,422	184,535
	Expected - MWh	129,431	133,634	137,378	140,949	144,719	148,505	152,307	156,124	159,958	163,809	167,677	171,561	175,465
	Lower Bandwidth - MWh	122,828	126,869	130,349	133,904	137,477	140,873	144,472	148,086	151,716	155,362	159,023	162,701	166,395
October	Upper Bandwidth - MWh	142,569	146,634	150,539	154,537	158,636	162,764	166,918	170,965	174,581	178,638	182,745	186,873	191,023
	Expected - MWh	133,631	139,522	143,306	147,024	150,836	154,663	158,288	162,142	166,013	169,900	173,803	177,724	181,661
	Lower Bandwidth - MWh	128,725	132,441	135,991	139,587	143,320	146,743	150,162	153,820	157,495	161,185	164,892	168,614	172,353
November	Upper Bandwidth - MWh	146,536	148,349	152,355	156,449	160,540	164,648	168,774	172,916	177,077	181,255	185,452	189,667	193,900
	Expected - MWh	137,770	141,330	145,174	148,812	152,697	156,598	160,415	164,449	168,500	172,568	176,653	180,756	184,877
	Lower Bandwidth - MWh	130,254	134,533	137,930	141,604	145,293	148,567	152,256	155,982	159,723	163,481	167,255	171,046	174,854
December	Upper Bandwidth - MWh	154,279	159,410	163,895	168,399	172,510	176,632	181,274	185,735	190,315	194,916	199,538	204,179	208,842
	Expected - MWh	148,077	151,815	155,875	160,153	164,649	167,954	172,267	176,599	180,950	185,320	189,709	194,118	198,547
	Lower Bandwidth - MWh	140,489	144,879	148,758	151,907	155,976	160,082	163,760	167,465	171,586	175,723	179,881	184,057	188,253
Total	Upper Bandwidth - MWh	1,668,005	1,765,464	1,814,883	1,861,272	1,910,993	1,960,232	2,010,520	2,061,033	2,111,755	2,162,697	2,213,571	2,264,417	2,316,018
	Expected - MWh	1,619,931	1,680,496	1,726,959	1,773,348	1,818,245	1,864,385	1,911,720	1,959,671	2,007,599	2,056,194	2,104,223	2,151,380	2,201,758
	Lower Bandwidth - MWh	1,550,939	1,595,935	1,640,337	1,682,995	1,727,168	1,766,709	1,811,125	1,858,109	1,903,901	1,949,632	1,995,666	2,041,885	2,086,908
Expected Percent Increase			3.75%	2.76%	2.69%	2.53%	2.53%	2.55%	2.51%	2.48%	2.41%	2.36%	2.24%	2.35%

(1) 1992 Figures are actuals

Black Hills Power and Light Company
Monthly Peak Demand Forecast
Total Company
09-Apr-92

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Month	Description	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
January (1)	Upper Bandwidth - MW	251	289	277	285	293	302	310	319	328	336	345	354	363
	Expected - MW	251	257	264	272	279	287	295	303	311	320	328	337	34[illegible]
	Lower Bandwidth - MW	251	244	252	258	265	272	280	287	295	303	311	319	327
February (1)	Upper Bandwidth - MW	241	272	280	288	296	304	313	321	330	338	347	356	364
	Expected - MW	241	260	267	274	282	289	297	305	313	322	330	338	346
	Lower Bandwidth - MW	241	247	254	261	268	275	282	289	297	305	313	320	328
March	Upper Bandwidth - MW	251	259	266	273	281	289	297	305	313	321	329	337	345
	Expected - MW	239	247	254	261	267	275	282	290	297	305	313	321	328
	Lower Bandwidth - MW	227	235	241	248	254	261	268	275	282	289	297	304	311
April	Upper Bandwidth - MW	244	252	259	265	273	280	288	295	303	311	319	327	334
	Expected - MW	233	240	247	253	260	267	274	281	288	296	303	311	318
	Lower Bandwidth - MW	221	229	235	241	247	253	260	267	273	280	287	294	302
May	Upper Bandwidth - MW	236	244	251	258	265	272	279	287	294	302	310	317	325
	Expected - MW	225	233	240	246	252	259	266	273	280	287	294	302	309
	Lower Bandwidth - MW	213	221	228	234	240	246	252	259	266	272	279	286	293
June	Upper Bandwidth - MW	276	285	293	301	309	317	326	334	343	351	360	369	378
	Expected - MW	263	272	279	286	294	302	310	318	326	334	342	351	359
	Lower Bandwidth - MW	250	258	266	272	279	286	294	301	309	317	324	332	340
July	Upper Bandwidth - MW	301	311	320	328	337	346	355	365	374	383	393	402	412
	Expected - MW	287	297	304	312	321	329	338	347	355	364	373	382	391
	Lower Bandwidth - MW	273	282	289	297	305	312	320	329	337	345	354	362	371
August	Upper Bandwidth - MW	279	288	296	304	312	321	330	338	347	356	365	374	383
	Expected - MW	266	274	282	289	297	305	313	322	329	339	347	356	364
	Lower Bandwidth - MW	253	261	268	275	282	290	297	305	312	321	329	337	345
September	Upper Bandwidth - MW	255	263	270	277	285	293	301	308	316	324	332	341	349
	Expected - MW	244	251	258	265	271	278	286	293	301	309	316	324	332
	Lower Bandwidth - MW	232	239	245	252	258	265	271	278	285	293	300	307	314
October	Upper Bandwidth - MW	253	260	266	273	281	288	296	304	311	319	327	335	343
	Expected - MW	241	248	254	261	267	274	282	289	296	304	311	319	326
	Lower Bandwidth - MW	229	236	242	248	254	261	267	274	281	288	295	302	309
November	Upper Bandwidth - MW	262	269	276	284	291	299	307	315	324	332	340	348	357
	Expected - MW	250	257	264	270	277	285	292	300	308	315	323	331	339
	Lower Bandwidth - MW	238	244	251	257	264	270	277	284	292	299	307	314	322
December	Upper Bandwidth - MW	282	290	298	306	315	323	331	340	349	357	366	375	384
	Expected - MW	269	277	284	291	299	307	315	323	331	340	348	356	365
	Lower Bandwidth - MW	256	263	270	277	284	291	299	307	314	322	330	338	346
Maximum	Upper Bandwidth - MW	301	311	320	328	337	346	355	365	374	383	393	402	412
	Expected - MW	287	297	304	312	321	329	338	347	355	364	373	382	391
	Lower Bandwidth - MW	273	282	289	297	305	312	320	329	337	345	354	362	371
Expected Percent Increase			3.16%	2.68%	2.63%	2.58%	2.63%	2.66%	2.61%	2.56%	2.51%	2.47%	2.42%	2.38%

(1) 1992 Figures are actuals.

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
09-Apr-92

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1991 (1)	January	117,764	10,830	2,163	130,757		131,525		230	16,475	29.1	147,232	148,000	259
	February	95,518	9,415	2,056	107,021		104,989		198	12,611	24.9	119,632	117,600	223
	March	97,416	9,340	2,098	108,854		114,052		206	13,548	25.0	122,402	127,600	229
	April	97,330	9,073	2,074	108,477		111,292		205	12,308	22.8	120,785	123,600	218
	May	94,204	8,856	1,521	104,581		112,760		189	11,540	22.7	116,121	124,300	212
	June	96,665	8,219	1,248	106,128		116,650		220	10,650	21.1	116,778	126,300	250
	July	106,635	8,815	1,246	116,696		129,839		249	12,061	23.5	126,857	141,900	274
	August	110,918	8,342	1,010	120,269		130,685		251	12,814	23.4	133,083	143,700	276
	September	111,037	9,003	1,198	121,238		115,258		210	11,642	23.2	132,880	126,900	233
	October	100,220	9,471	1,562	111,254		121,634		229	12,666	25.9	123,920	134,300	255
	November	102,967	9,602	2,187	114,757		125,691		230	13,909	25.6	128,866	139,600	256
	December	106,519	9,387	2,241	118,147		122,329		219	14,471	24.9	132,618	136,800	244
	Total	1,236,994	110,448	20,636	1,368,078	1.049	1,434,905	0.654	251	154,695	29.1	1,522,773	1,589,600	276
1992	January (1)	108,091	8,941	2,046	120,880		123,560		224	14,457	27.0	135,337	138,017	251
	February (1)	98,823	8,629	1,785	109,038		113,734		217	12,912	24.0	121,948	126,646	241
	March	104,730	9,444	2,098	116,272	1.046	121,380	0.726	216	14,285	23.3	130,557	135,665	239
	April	102,619	8,875	2,074	113,787	1.005	113,831	0.750	209	12,311	23.3	125,778	126,142	233
	May	98,293	8,955	1,521	108,670	1.058	114,920	0.763	202	12,104	22.5	120,773	127,024	225
	June	101,122	9,068	1,248	111,468	1.068	119,062	0.690	240	11,101	23.3	122,650	130,243	263
	July	115,219	8,787	1,246	125,252	1.073	134,386	0.684	264	12,027	23.3	137,279	146,414	287
	August	114,857	8,480	1,010	124,347	1.021	126,915	0.703	245	12,655	23.3	137,002	139,571	266
	September	110,076	8,758	1,198	120,032	0.962	117,378	0.740	220	12,053	23.3	134,085	128,431	244
	October	103,003	8,974	1,562	113,540	1.081	122,778	0.758	218	12,853	23.0	126,399	135,631	241
	November	104,881	8,886	2,187	115,957	1.073	124,010	0.761	226	13,700	23.3	129,357	137,370	250
	December	109,957	9,557	2,241	121,716	1.092	132,930	0.727	248	15,146	23.3	136,862	148,077	268
	Total	1,273,869	108,047	20,217	1,402,133	1.044	1,481,945	0.633	266	155,884	27.0	1,588,018	1,619,931	287
1993	January	118,272	10,524	2,163	129,008	1.032	133,141	0.706	234	15,565	23.3	144,573	146,708	257
	February	105,644	9,562	2,056	117,496	1.013	118,988	0.749	216	14,108	23.3	121,802	123,096	240
	March	108,751	9,454	2,098	120,302	1.044	125,588	0.755	244	14,726	23.3	135,028	140,313	247
	April	100,391	8,890	2,074	117,156	1.005	117,737	0.754	217	12,905	23.3	130,059	130,642	240
	May	102,015	8,878	1,521	112,413	1.058	118,878	0.762	210	12,488	23.2	124,901	131,366	239
	June	104,845	9,120	1,248	115,213	1.068	123,169	0.689	248	11,480	23.3	126,798	134,649	272
	July	119,236	8,815	1,246	129,297	1.073	138,834	0.683	273	12,433	23.3	141,833	151,267	297
	August	118,363	8,602	1,010	128,360	1.021	131,118	0.702	255	13,061	23.3	141,521	144,174	274
	September	114,003	8,885	1,198	124,086	0.962	121,280	0.739	220	12,355	23.3	136,440	133,634	251
	October	105,130	9,105	1,562	116,798	1.081	126,301	0.756	224	13,220	23.3	130,018	139,522	246
	November	107,798	9,015	2,187	119,000	1.073	127,653	0.759	234	13,663	23.3	132,663	141,316	253
	December	113,466	9,638	2,241	125,344		134,647	0.728	253	14,328	23.3	140,066	151,815	277
	Total	1,328,536	110,491	20,636	1,456,364	1.043	1,510,575	0.635	273	160,922	23.3	1,617,686	1,680,496	297
1994	January	119,960	10,707	2,163	132,829	1.032	137,087	0.366	241	16,038	23.3	148,868	153,125	264
	February	102,225	9,650	2,088	129,963	1.013	122,300	0.748	246	14,099	23.3	135,062	136,399	267
	March	112,150	9,549	2,098	121,790	1.044	128,228	0.753	231	16,883	23.3	138,673	144,112	254
	April	108,640	8,786	2,074	120,498	1.005	121,097	0.753	223	13,274	23.3	153,721	134,371	247
	May	105,115	8,935	1,521	115,611	1.058	122,281	0.760	216	12,841	23.2	128,452	135,102	240
	June	108,146	9,220	1,248	118,614	1.066	126,495	0.666	256	11,946	23.3	130,460	138,441	279
	July	122,845	8,902	1,248	132,996	1.073	142,695	0.682	281	12,576	23.3	145,572	155,271	304
	August	122,422	8,585	1,010	132,026	1.021	134,756	0.700	259	13,263	23.3	145,289	147,958	282
	September	118,526	8,871	1,198	128,595	0.962	124,611	0.738	225	12,723	23.3	141,318	137,378	258
	October	108,266	9,005	1,562	118,833	1.081	128,483	0.755	231	13,620	23.3	132,547	142,104	254
	November	111,022	9,004	2,187	122,213	1.073	131,106	0.758	240	14,208	23.3	136,684	145,314	264
	December	116,976	9,617	2,241	128,834	1.092	140,708	0.729	261	15,170	23.3	144,005	155,875	284
	Total	1,386,350	110,950	20,636	1,497,809	1.043	1,562,666	0.626	291	168,621	23.3	1,682,100	1,720,050	304

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
09-Apr-92

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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1995	January	123,712	10,603	2,163	136,558	1.032	140,935	0.762	248	16,511	23.3	153,069	157,446	272
	February	112,618	9,630	2,088	124,337	1.013	125,917	0.746	251	14,509	23.3	138,846	140,426	274
	March	119,563	9,523	2,098	127,184	1.044	132,771	0.752	237	15,316	23.3	142,500	148,088	261
	April	112,903	8,769	2,074	123,746	1.005	124,361	0.761	230	13,615	23.3	137,361	137,977	253
	May	108,227	8,066	1,521	118,714	1.058	125,542	0.758	223	13,224	23.3	131,938	138,766	246
	June	111,359	9,212	1,248	121,819	1.068	130,118	0.687	263	12,027	23.3	133,846	142,145	286
	July	126,476	8,091	1,246	135,811	1.073	146,574	0.681	289	12,976	23.3	149,587	159,550	312
	August	126,016	8,583	1,010	135,609	1.021	138,410	0.699	266	13,601	23.3	149,211	152,012	289
	September	123,064	8,858	1,198	133,119	0.962	128,045	0.737	241	12,904	23.3	146,024	140,949	265
	October	112,420	9,087	1,562	123,070	1.081	133,083	0.753	239	13,941	23.3	138,010	147,024	261
	November	114,269	8,068	2,187	125,445	1.073	134,571	0.756	247	14,241	23.3	139,686	148,812	270
	December	120,507	9,599	2,241	132,347	1.092	144,541	0.725	268	15,612	23.3	147,959	160,153	291
	Total	1,407,132	110,791	20,636	1,538,359	1.043	1,604,870	0.634	289	168,478	23.3	1,707,037	1,773,348	312
1996	January	127,480	10,661	2,163	140,304	1.032	144,801	0.761	256	16,037	23.3	156,341	160,838	279
	February	115,028	9,613	2,098	127,725	1.013	129,350	0.745	258	14,919	23.3	142,645	144,268	282
	March	118,969	9,505	2,098	130,593	1.044	136,330	0.750	244	15,284	23.3	145,877	151,614	267
	April	118,179	8,757	2,074	127,009	1.005	127,641	0.750	236	13,805	23.3	140,814	141,446	260
	May	113,391	8,038	1,521	121,830	1.058	128,828	0.757	229	13,531	23.3	135,361	142,369	252
	June	114,585	9,206	1,248	125,039	1.068	133,557	0.686	271	12,388	23.3	137,427	145,945	294
	July	130,110	8,882	1,246	140,244	1.073	150,471	0.680	297	12,942	23.3	153,186	163,414	321
	August	129,625	8,574	1,010	139,208	1.021	142,084	0.698	274	13,567	23.3	152,775	155,651	297
	September	126,615	8,847	1,198	135,660	0.962	131,451	0.736	248	13,269	23.3	148,929	144,719	271
	October	115,585	9,060	1,562	126,227	1.081	136,497	0.752	244	14,338	23.3	140,565	150,836	267
	November	117,525	8,978	2,187	128,690	1.073	138,052	0.755	254	14,645	23.3	143,335	152,697	277
	December	124,052	9,582	2,241	135,876	1.092	148,395	0.724	275	16,054	23.6	151,930	164,449	299
	Total	1,448,127	110,643	20,636	1,579,406	1.043	1,647,467	0.633	297	170,778	23.6	1,750,184	1,810,245	321
1997	January	131,264	10,642	2,163	144,068	1.032	148,686	0.759	263	16,487	23.6	160,555	165,173	287
	February	119,448	9,597	2,086	131,132	1.013	132,798	0.744	266	14,486	23.6	145,617	147,284	289
	March	122,430	9,490	2,098	134,018	1.044	139,906	0.748	251	15,706	23.6	149,723	155,611	275
	April	119,468	8,766	2,074	130,288	1.005	130,936	0.748	243	14,192	23.6	144,480	145,128	267
	May	114,488	8,951	1,521	124,961	1.058	132,148	0.755	235	13,913	23.6	138,874	146,061	259
	June	117,824	9,200	1,248	128,273	1.068	137,011	0.685	278	12,749	23.6	141,022	149,761	302
	July	133,773	8,874	1,246	143,893	1.073	154,387	0.679	305	13,331	23.6	157,225	167,719	329
	August	133,248	8,566	1,010	142,824	1.021	145,774	0.698	281	13,955	23.6	156,780	159,730	305
	September	130,182	8,838	1,198	140,217	0.962	134,872	0.735	255	13,633	23.6	153,850	148,505	278
	October	118,762	9,074	1,562	129,399	1.081	139,927	0.750	251	14,736	23.6	144,134	154,663	274
	November	120,794	8,968	2,187	131,950	1.073	141,549	0.753	261	15,049	23.6	146,999	156,598	285
	December	127,612	9,558	2,241	139,411	1.092	152,267	0.725	283	15,686	24.2	155,108	167,954	307
	Total	1,489,292	110,516	20,636	1,620,443	1.043	1,690,262	0.632	305	173,922	24.2	1,794,366	1,864,185	329
1998	January	135,064	10,624	2,163	147,850	1.032	152,589	0.757	271	16,937	24.2	164,787	169,526	295
	February	122,881	9,583	2,086	134,552	1.013	136,262	0.742	273	14,875	24.2	149,428	151,138	297
	March	125,685	9,476	2,098	137,459	1.044	143,498	0.748	258	16,128	24.2	153,586	159,625	282
	April	122,771	8,737	2,074	133,582	1.005	134,247	0.747	250	14,578	24.2	148,161	148,825	274
	May	117,638	8,946	1,521	128,106	1.058	135,474	0.754	242	14,295	24.2	142,401	149,769	266
	June	121,077	9,197	1,248	131,521	1.068	140,481	0.684	285	13,110	24.2	144,632	153,592	310
	July	137,447	8,868	1,246	147,561	1.073	158,322	0.679	314	13,720	24.2	161,281	172,043	338
	August	136,886	8,560	1,010	146,457	1.021	149,482	0.695	289	14,343	24.2	160,801	163,826	313
	September	133,763	8,830	1,198	143,791	0.962	138,310	0.734	262	13,997	24.2	157,788	152,307	286
	October	121,952	9,070	1,562	132,585	1.081	143,373	0.749	257	14,915	24.2	147,500	158,288	282
	November	124,077	8,961	2,187	135,225	1.073	145,062	0.751	268	15,453	24.2	150,678	160,515	292
	December	131,187	9,555	2,241	142,983	1.092	156,157	0.723	290	16,110	24.7	159,093	172,267	315
	Total	1,530,629	110,407	20,636	1,661,673	1.043	1,733,255	0.631	314	176,462	24.7	1,840,134	1,911,720	338

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
09-Apr-92

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1999	January	138,680	10,609	2,163	151,651	1.032	156,511	0.755	278	17,386	24.7	169,037	173,898	303
	February	128,331	9,571	2,088	137,989	1.013	139,742	0.741	281	15,255	24.7	153,254	155,000	305
	March	129,355	9,484	2,088	140,916	1.044	147,107	0.746	265	16,549	24.7	157,466	163,657	290
	April	126,008	8,730	2,074	136,892	1.005	137,573	0.746	256	14,965	24.7	151,857	152,538	281
	May	120,802	8,943	1,521	131,266	1.058	138,816	0.752	248	14,677	24.7	145,942	153,492	273
	June	124,343	9,194	1,248	134,785	1.068	143,968	0.683	293	13,472	24.7	148,257	157,439	318
	July	141,126	8,863	1,246	151,245	1.073	162,276	0.678	322	14,809	24.7	165,355	176,305	347
	August	140,542	8,555	1,010	150,107	1.021	153,208	0.694	297	14,732	24.7	164,839	167,939	322
	September	137,359	8,824	1,198	147,381	0.962	141,763	0.733	269	14,361	24.7	161,742	156,124	293
	October	125,156	9,068	1,562	135,786	1.081	146,834	0.747	264	15,308	24.7	151,094	162,142	289
	November	127,374	8,954	2,187	138,515	1.073	148,592	0.750	275	15,857	24.7	154,372	164,449	300
	December	134,778	9,543	2,241	146,562	1.092	160,066	0.722	298	16,533	25.3	163,095	176,599	323
	Total	1,572,144	110,317	20,636	1,703,097	1.043	1,776,457	0.630	322	183,214	25.1	1,688,310	1,959,671	347
2000	January	142,712	10,595	2,163	155,470	1.032	160,453	0.754	286	17,836	25.3	173,306	178,289	311
	February	129,395	9,560	2,086	141,443	1.013	143,240	0.740	286	15,655	25.3	157,097	158,895	313
	March	132,839	9,453	2,098	144,390	1.044	150,736	0.745	272	16,271	25.3	161,361	167,705	297
	April	129,420	8,724	2,074	140,217	1.005	140,915	0.744	263	15,352	25.3	155,569	156,267	288
	May	123,979	8,940	1,521	134,440	1.058	142,173	0.750	255	15,058	25.3	149,498	157,231	280
	June	127,823	9,193	1,248	138,064	1.068	147,470	0.682	301	13,833	25.3	151,897	161,303	326
	July	144,863	8,863	1,246	154,949	1.073	166,249	0.671	330	14,498	25.3	169,447	180,747	355
	August	144,213	8,552	1,010	153,775	1.021	156,951	0.694	304	15,120	25.3	168,895	172,071	329
	September	140,872	8,819	1,198	150,889	0.962	145,233	0.732	276	14,725	25.3	165,714	159,958	301
	October	128,374	9,066	1,562	139,002	1.081	150,312	0.748	271	15,701	25.3	154,703	166,013	296
	November	130,695	8,949	2,187	141,822	1.073	152,139	0.748	282	16,261	25.3	158,083	168,400	308
	December	138,384	9,533	2,241	150,159	1.092	163,994	0.721	306	10,956	25.9	161,114	180,950	331
	Total	1,613,838	110,244	20,636	1,744,719	1.043	1,819,862	0.629	330	187,866	25.9	1,932,684	2,007,828	359
2001	January	146,582	10,583	2,163	159,307	1.032	164,413	0.762	294	18,288	25.9	177,594	182,709	320
	February	133,273	9,551	2,088	144,912	1.013	146,756	0.739	296	16,044	25.9	160,956	162,798	322
	March	135,339	9,444	2,098	147,881	1.044	154,371	0.743	279	17,393	25.9	165,274	171,771	305
	April	132,788	8,719	2,074	143,599	1.005	144,279	0.743	270	15,739	25.9	159,298	160,017	296
	May	127,169	8,938	1,521	137,630	1.058	145,646	0.749	261	15,440	25.9	153,070	160,986	287
	June	130,918	9,193	1,248	141,359	1.068	150,989	0.681	308	14,104	25.9	155,552	165,181	334
	July	148,506	8,850	1,246	158,610	1.073	170,242	0.676	336	14,887	25.9	173,557	185,129	364
	August	147,900	8,550	1,010	157,460	1.021	160,712	0.691	311	15,508	25.9	172,968	176,221	339
	September	144,605	8,818	1,198	154,613	0.962	148,720	0.731	283	15,089	25.9	169,703	163,809	309
	October	131,608	9,068	1,562	142,238	1.081	153,807	0.744	278	16,093	25.9	158,327	169,900	304
	November	134,011	8,945	2,187	145,146	1.073	155,703	0.747	290	16,665	25.9	161,809	172,368	315
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Total	1,655,717	110,188	20,636	1,786,561	1.043	1,863,476	0.629	338	192,718	26.4	1,939,259	2,056,194	364
2002	January	150,429	10,432	2,163	163,154	1.032	168,394	0.750	302	18,736	26.4	181,900	187,130	326
	February	135,768	9,543	2,088	148,399	1.013	150,285	0.739	303	18,434	26.4	166,832	168,718	330
	March	138,858	9,436	2,098	151,392	1.044	158,038	0.742	286	17,819	26.4	169,203	175,854	313
	April	136,127	8,716	2,074	146,917	1.005	147,668	0.741	277	16,125	26.4	163,043	163,793	303
	May	130,374	8,930	1,521	140,824	1.058	148,935	0.747	268	15,822	26.4	156,646	166,757	294
	June	134,227	9,184	1,248	144,659	1.068	154,524	0.680	316	14,565	26.4	159,224	169,079	342
	July	152,350	8,858	1,246	162,453	1.073	174,265	0.675	347	15,278	26.4	177,586	189,531	373
	August	151,826	8,548	1,010	161,383	1.021	164,692	0.689	321	15,936	26.4	177,060	180,368	347
	September	148,266	8,815	1,198	158,279	0.962	152,223	0.730	290	15,484	26.4	173,709	167,677	316
	October	134,852	9,067	1,562	145,480	1.081	157,318	0.743	285	16,486	26.4	161,966	173,803	311
	November	137,252	8,943	2,187	148,382	1.073	159,284	0.743	297	17,068	26.4	165,450	176,352	322
	December	145,645	9,516	2,241	157,402	1.092	171,967	0.720	321	17,802	27.0	175,204	189,769	346
	Total	1,697,168	110,187	20,636	1,828,587	1.043	1,887,373	0.626	347	197,670	27.0	2,028,033	2,096,731	373

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Expected
Total Company
09-Apr-92

Table 5-6
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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	MDPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
2003	January	154,314	10,563	2,163	167,040	1.032	172,394	0.749	310	19,186	27.0	186,226	191,580	317
	February	140,277	9,537	2,088	151,902	1.013	153,833	0.736	311	16,823	27.0	168,725	170,656	338
	March	143,386	9,428	2,098	154,913	1.044	161,719	0.749	294	18,237	27.0	173,150	179,956	321
	April	139,504	8,714	2,074	150,291	1.005	151,039	0.740	284	16,512	27.0	166,804	167,551	311
	May	133,594	8,995	1,521	144,054	1.058	152,340	0.745	275	16,204	27.0	160,258	168,544	302
	June	137,551	9,196	1,248	147,995	1.068	158,077	0.679	324	14,629	27.0	162,624	172,706	351
	July	156,064	8,859	1,246	166,169	1.073	178,288	0.674	355	15,665	27.0	181,834	193,953	382
	August	155,325	8,550	1,010	164,885	1.021	168,501	0.688	329	16,284	27.0	181,169	184,785	356
	September	151,905	8,812	1,198	161,916	0.962	155,744	0.729	297	15,818	27.0	177,733	171,561	324
	October	138,112	9,069	1,562	148,743	1.081	160,845	0.741	292	16,878	27.0	165,621	177,724	319
	November	140,709	8,941	2,187	151,837	1.073	162,883	0.744	304	17,474	27.0	169,311	180,356	331
	December	149,301	9,512	2,241	161,054	1.092	175,893	0.719	329	18,225	27.6	179,279	194,118	356
	Total	1,740,042	110,121	20,636	1,870,799	1.043	1,951,345	0.627	355	201,935	27.6	2,072,734	2,153,280	382
2004	January	158,218	10,556	2,163	170,936	1.032	176,415	0.747	317	19,636	27.6	190,572	196,051	345
	February	143,893	9,531	2,088	155,423	1.013	157,398	0.735	319	17,213	27.6	172,636	174,611	346
	March	146,934	9,424	2,098	158,455	1.044	165,417	0.739	301	18,659	27.6	177,114	184,076	328
	April	142,896	8,713	2,074	153,683	1.005	154,447	0.738	290	16,899	27.6	170,582	171,346	318
	May	136,828	8,941	1,521	147,290	1.058	155,762	0.744	281	16,350	27.6	163,640	172,112	309
	June	140,890	9,199	1,248	151,337	1.068	161,647	0.678	338	14,984	27.6	166,321	176,631	359
	July	159,840	8,861	1,246	169,947	1.073	182,341	0.673	361	16,054	27.6	186,001	198,395	391
	August	159,063	8,552	1,010	168,625	1.021	172,108	0.687	337	16,673	27.6	185,297	188,781	364
	September	155,583	8,813	1,198	165,594	0.962	159,281	0.728	304	15,885	27.6	181,478	175,166	332
	October	141,387	9,072	1,562	152,022	1.081	164,391	0.740	299	17,271	27.6	169,292	181,661	326
	November	144,081	8,941	2,187	155,209	1.073	166,500	0.742	312	17,878	27.6	173,086	184,377	339
	December	152,973	9,508	2,241	164,722	1.092	179,900	0.718	337	18,648	28.1	183,370	198,548	365
	Total	1,782,496	110,130	20,636	1,913,242	1.043	1,995,606	0.626	364	206,148	28.1	2,119,390	2,201,754	191
2005	Total	1,825,985	110,098	20,636	1,956,720	1.043	2,040,956	0.625	373	210,450	29	2,167,170	2,251,406	401
2006	Total	1,870,537	110,087	20,636	2,001,260	1.043	2,087,413	0.624	382	214,840	29	2,216,100	2,302,257	411
2007	Total	1,916,175	110,075	20,636	2,046,886	1.043	2,135,003	0.623	391	219,323	30	2,266,209	2,354,326	421
2008	Total	1,962,926	110,063	20,636	2,093,626	1.043	2,183,756	0.623	400	223,899	30	2,317,525	2,407,655	431
2009	Total	2,010,819	110,052	20,636	2,141,506	1.043	2,233,697	0.622	410	228,571	31	2,370,077	2,462,268	441
2010	Total	2,059,879	110,040	20,636	2,190,555	1.043	2,284,858	0.621	420	233,340	32	2,423,895	2,518,198	452
2011	Total	2,110,137	110,029	20,636	2,240,801	1.043	2,337,267	0.620	430	238,208	32	2,479,010	2,575,475	463
2012	Total	2,161,621	110,017	20,636	2,292,274	1.043	2,390,955	0.619	441	243,178	33	2,535,452	2,634,133	474
2013	Total	2,214,361	110,005	20,636	2,345,002	1.043	2,445,953	0.618	451	248,252	34	2,593,254	2,694,205	485
2014	Total	2,268,387	109,994	20,636	2,399,017	1.043	2,502,294	0.618	462	253,432	34	2,652,449	2,755,726	497

(1) Actual.

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Upper Bandwidth
Total Company
Mega-Watt-Hours
09-Apr-92

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette Sales and Energy	Peak	Including Gillette, Wyoming Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1991 (1)	January	117,784	10,830	2,163	130,757		131,525		230	16,475	29.1	147,232	148,000	259
	February	95,518	9,414	2,088	107,021		104,989		198	12,611	24.9	119,632	117,600	223
	March	97,416	9,340	2,098	108,854		114,052		204	13,548	25.0	122,402	127,600	229
	April	97,330	9,073	2,074	108,477		111,292		205	12,308	22.8	120,785	123,600	228
	May	94,204	8,856	1,521	104,581		112,760		189	11,540	22.7	116,121	124,300	212
	June	93,665	8,215	1,248	103,128		114,650		229	10,650	21.1	116,778	125,300	250
	July	106,435	8,915	1,246	116,596		129,839		249	12,061	25.5	128,657	141,900	274
	August	110,018	8,342	1,010	120,369		130,886		251	12,814	25.4	133,083	143,700	276
	September	111,017	9,003	1,198	121,218		115,258		210	11,642	23.2	132,880	126,900	231
	October	100,220	9,471	1,562	111,254		121,634		229	12,666	25.9	123,920	134,300	255
	November	102,967	9,602	2,187	114,757		125,691		230	13,909	25.6	128,666	139,600	256
	December	108,319	9,387	2,941	118,147		122,329		219	14,471	24.9	132,618	136,800	244
	Total	1,238,904	110,449	20,636	1,369,978	1.049	1,434,905	0.654	251	154,695	29.1	1,527,773	1,589,600	276
1992	January (1)	108,891	9,941	2,048	120,880		123,560		224	14,457	27.0	135,337	138,017	251
	February (1)	98,823	8,629	1,785	109,036		112,734		217	12,912	24.0	121,948	125,646	241
	March	110,364	9,893	2,203	122,460	1.044	127,861	0.756	227	14,746	23.3	137,127	142,608	251
	April	108,022	9,085	2,178	119,285	1.005	119,878	0.756	220	12,924	21.3	132,209	132,802	244
	May	103,570	9,262	1,598	114,430	1.058	121,018	0.763	213	12,508	22.3	126,944	133,526	236
	June	106,548	9,521	1,310	117,379	1.068	125,376	0.690	252	15,500	23.3	128,880	136,876	276
	July	121,418	9,199	1,308	131,923	1.073	141,543	0.684	276	12,457	23.3	144,379	154,000	301
	August	121,018	8,879	1,060	130,955	1.021	133,660	0.701	256	13,085	23.3	144,040	146,745	279
	September	118,068	9,169	1,258	128,486	0.982	123,580	0.740	232	12,377	23.3	140,863	135,985	255
	October	108,498	9,365	1,641	119,532	1.081	129,258	0.758	229	13,246	23.3	132,778	142,504	253
	November	110,289	9,319	2,298	121,795	1.073	130,656	0.761	239	13,801	23.3	135,676	144,536	262
	December	115,883	9,971	2,353	128,208	1.092	140,021	0.727	259	14,758	23.3	142,966	154,779	282
	Total	1,331,095	112,263	21,037	1,464,395	1.046	1,529,153	0.627	278	158,891	27.0	1,623,246	1,688,025	301
1993	January	122,819	11,183	2,271	135,922	1.032	140,279	0.766	246	16,072	23.3	151,994	156,350	269
	February	111,588	10,018	2,183	123,800	1.013	125,373	0.749	249	14,129	23.3	137,929	139,502	272
	March	114,657	9,903	2,203	126,762	1.046	132,511	0.755	236	14,916	23.3	141,678	147,227	259
	April	112,117	9,101	2,116	123,335	1.005	124,009	0.754	226	13,254	23.3	136,049	137,263	252
	May	107,406	9,240	1,598	118,295	1.058	125,205	0.762	221	12,871	23.3	131,267	138,076	244
	June	110,592	9,544	1,119	121,446	1.066	129,720	0.689	262	11,674	23.3	133,323	141,566	285
	July	125,643	9,333	1,300	136,304	1.073	146,244	0.683	286	12,610	23.3	148,614	158,855	311
	August	125,575	9,043	1,060	135,302	1.021	138,097	0.702	265	13,230	23.3	148,540	151,334	288
	September	122,911	9,302	1,258	132,771	0.982	127,710	0.739	240	12,756	23.3	145,528	140,467	263
	October	111,798	9,632	1,641	122,971	1.081	132,977	0.758	236	13,662	23.3	136,634	146,639	259
	November	113,666	9,660	2,298	125,624	1.073	134,842	0.759	246	14,208	23.3	139,832	149,049	269
	December	119,961	10,098	2,353	132,032	1.092	144,197	0.726	267	16,213	23.3	147,244	160,410	290
	Total	1,397,032	115,706	21,668	1,534,406	1.043	1,600,503	0.695	284	164,900	23.3	1,699,308	1,765,664	311
1994	January	120,465	11,220	2,278	133,965	1.032	144,341	0.784	254	16,558	23.3	150,514	161,000	277
	February	110,159	10,110	2,103	122,462	1.013	124,082	0.748	257	14,150	23.3	142,612	143,632	280
	March	118,227	9,995	2,203	130,425	1.044	136,155	0.753	243	15,361	23.3	145,786	151,516	266
	April	115,550	9,150	2,178	126,925	1.005	127,557	0.753	235	14,457	23.3	140,582	142,214	252
	May	110,702	9,343	1,598	121,773	1.058	128,777	0.780	224	12,266	23.3	135,039	141,043	251
	June	113,976	9,040	1,260	124,931	1.068	133,446	0.688	269	12,067	23.3	137,000	145,511	293
	July	129,978	9,319	1,306	140,109	1.073	150,324	0.682	296	13,021	23.3	151,027	163,345	320
	August	129,361	8,999	1,060	139,370	1.021	141,965	0.700	272	12,648	23.3	152,018	155,580	296
	September	126,935	9,286	1,258	136,477	0.982	131,275	0.738	247	12,987	23.3	149,425	144,221	270
	October	115,154	9,521	1,641	126,316	1.081	136,550	0.755	243	13,949	23.3	140,264	150,539	266
	November	118,550	9,457	2,298	130,720	1.073	138,084	0.758	253	14,290	23.3	143,010	152,374	276
	December	123,894	10,034	2,353	136,721	1.092	148,228	0.725	275	15,667	23.3	152,388	163,895	298
	Total	1,433,385	116,135	21,668	1,571,848	1.043	1,640,860	0.698	296	169,420	23.3	1,748,869	1,814,868	329

Black Hills Power and Light Company
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Total Company
Megawatt-Hours
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					Excluding Gillette, Wyoming				BHPL Share of Gillette			Including Gillette, Wyoming		
Year	Month	South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Sales and Energy	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1995	January	130,427	11,194	2,271	143,892	1.032	148,504	0.762	262	16,094	23.3	159,986	164,598	285
	February	118,746	10,089	2,191	131,025	1.013	132,690	0.746	265	14,147	23.3	145,172	146,837	288
	March	121,832	9,974	2,203	134,009	1.044	139,897	0.752	250	15,340	23.3	149,349	155,236	273
	April	118,998	9,184	2,178	130,357	1.005	131,005	0.751	242	13,857	23.3	144,214	144,862	265
	May	116,070	9,384	1,598	125,051	1.058	132,264	0.758	234	13,583	23.3	138,634	145,827	258
	June	117,369	9,640	1,310	128,319	1.068	137,061	0.687	277	12,436	23.3	140,755	149,499	301
	July	133,311	9,308	1,308	143,928	1.073	154,423	0.681	305	12,998	23.3	156,924	167,420	328
	August	132,808	8,987	1,060	142,855	1.021	145,806	0.699	280	13,623	23.3	156,478	159,429	304
	September	129,665	9,273	1,258	140,200	0.962	134,856	0.737	254	13,322	23.3	153,522	148,178	277
	October	118,642	9,512	1,641	129,595	1.081	140,140	0.753	250	14,397	23.3	143,993	154,537	273
	November	120,420	9,414	2,296	132,131	1.073	141,743	0.756	260	14,706	23.3	146,837	156,449	284
	December	127,021	10,057	2,353	139,431	1.092	152,278	0.725	282	16,122	23.7	155,552	168,399	306
	Total	1,483,108	116,016	21,668	1,620,791	1.043	1,690,646	0.633	305	170,627	23.7	1,791,418	1,861,277	328
1996	January	134,406	11,171	2,271	147,848	1.032	152,586	0.761	270	16,557	23.7	164,404	169,143	293
	February	122,342	10,070	2,193	134,605	1.013	136,316	0.745	272	15,393	23.7	149,998	151,709	296
	March	125,451	9,956	2,203	137,610	1.044	143,655	0.750	257	15,773	23.7	153,383	159,429	281
	April	122,455	9,171	2,178	133,804	1.005	134,469	0.750	249	14,255	23.7	148,058	148,724	273
	May	117,370	9,376	1,598	128,343	1.058	135,725	0.757	241	13,976	23.7	142,320	149,701	265
	June	120,777	9,633	1,310	131,720	1.068	140,694	0.686	285	12,810	23.7	144,530	153,504	309
	July	137,158	9,298	1,308	147,764	1.073	158,541	0.680	313	13,398	23.7	161,162	171,938	337
	August	136,620	8,977	1,060	146,657	1.021	149,687	0.698	288	14,022	23.7	160,680	163,709	312
	September	133,420	9,262	1,258	143,939	0.962	138,452	0.736	261	13,696	23.7	157,635	152,149	285
	October	121,784	9,505	1,641	132,930	1.081	143,746	0.752	257	14,593	23.7	147,522	158,338	281
	November	122,858	9,402	2,296	135,557	1.073	145,419	0.755	268	15,122	23.7	150,679	160,540	291
	December	130,763	10,039	2,353	143,156	1.092	156,346	0.724	290	15,763	24.3	158,919	172,110	315
	Total	1,525,405	115,860	21,668	1,663,933	1.043	1,735,636	0.633	313	175,358	24.3	1,839,291	1,910,993	337
1997	January	138,401	11,150	2,271	151,822	1.032	156,668	0.759	278	17,019	24.3	168,841	173,707	302
	February	125,955	10,054	2,193	138,201	1.013	139,957	0.744	280	14,948	24.3	153,149	154,905	304
	March	129,085	9,939	2,203	141,227	1.044	147,431	0.749	265	16,207	24.3	157,434	163,639	289
	April	125,929	9,160	2,178	137,267	1.005	137,949	0.748	256	14,652	24.3	151,919	152,602	280
	May	120,684	9,369	1,598	131,651	1.058	139,223	0.755	248	14,369	24.3	146,019	153,592	272
	June	124,199	9,628	1,310	135,137	1.068	144,343	0.685	293	13,181	24.3	148,318	157,525	317
	July	141,022	9,290	1,308	151,620	1.073	162,678	0.679	322	13,798	24.3	165,418	176,475	346
	August	140,448	8,969	1,060	150,477	1.021	153,585	0.696	297	14,421	24.3	164,899	168,007	321
	September	137,186	9,252	1,258	147,695	0.962	142,068	0.735	268	14,071	24.3	161,766	156,136	293
	October	125,139	9,498	1,641	136,279	1.081	147,367	0.750	264	14,996	24.3	151,275	162,364	288
	November	127,310	9,393	2,296	138,999	1.073	149,111	0.753	275	15,537	24.3	154,536	164,648	299
	December	134,522	10,024	2,353	146,898	1.092	160,433	0.723	298	16,198	24.8	163,097	176,632	323
	Total	1,569,879	115,727	21,668	1,707,274	1.043	1,780,833	0.632	322	179,399	24.8	1,886,672	1,960,232	346
1998	January	142,412	11,132	2,271	155,815	1.032	160,809	0.757	285	17,482	24.8	173,297	178,291	310
	February	129,502	10,039	2,193	141,814	1.013	143,616	0.742	288	15,349	24.8	157,162	158,964	313
	March	132,733	9,925	2,203	144,861	1.044	151,225	0.748	272	16,641	24.8	161,502	167,866	297
	April	129,418	9,150	2,178	140,746	1.005	141,446	0.747	263	15,050	24.8	155,796	156,496	288
	May	124,012	9,364	1,598	134,973	1.058	142,736	0.754	255	14,761	24.8	149,734	157,498	279
	June	127,635	9,624	1,310	138,569	1.068	148,009	0.684	301	13,553	24.8	152,122	161,562	326
	July	144,903	9,284	1,308	155,495	1.073	166,835	0.679	330	14,197	24.8	169,692	181,032	355
	August	144,292	8,963	1,060	154,315	1.021	157,502	0.695	305	14,821	24.8	169,135	172,323	330
	September	140,968	9,244	1,258	151,469	0.962	145,695	0.734	276	14,445	24.8	165,915	160,141	301
	October	128,508	9,495	1,641	139,644	1.081	151,005	0.749	271	15,400	24.8	155,044	166,406	296
	November	130,777	9,384	2,296	142,458	1.073	152,821	0.751	282	15,953	24.8	158,410	168,774	307
	December	138,295	10,010	2,353	150,659	1.092	164,540	0.723	306	16,634	25.4	167,292	181,174	331
	Total	1,613,534	115,614	21,668	1,750,815	1.043	1,826,240	0.631	330	184,285	25.4	1,935,101	2,010,526	355

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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming					BHPL Share of Gillette		Including Gillette, Wyoming		
					Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Sales and Energy	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1999	January	146,441	11,115	2,271	159,827	1.032	164,949	0.755	293	17,945	25.4	177,771	182,894	319
	February	133,226	10,026	2,193	145,443	1.013	147,291	0.741	298	15,749	25.4	161,192	163,041	321
	March	136,397	8,912	2,209	148,517	1.044	155,038	0.748	279	17,075	25.4	165,587	172,111	305
	April	132,921	9,143	2,178	144,241	1.005	144,958	0.748	270	15,448	25.4	159,689	160,406	295
	May	127,353	9,360	1,598	138,311	1.058	146,266	0.752	261	15,154	25.4	153,465	161,420	287
	June	131,089	9,822	1,310	142,017	1.068	151,692	0.683	309	13,924	25.4	155,941	165,616	334
	July	148,800	9,279	1,308	159,388	1.073	171,017	0.678	339	14,597	25.4	173,985	185,609	365
	August	148,152	8,958	1,060	158,170	1.021	161,437	0.694	313	15,220	25.4	173,390	176,657	338
	September	134,745	9,238	1,258	145,261	0.982	149,342	0.733	283	14,620	25.4	170,080	164,162	308
	October	131,891	9,492	1,641	143,024	1.081	154,681	0.747	278	15,803	25.4	158,828	170,485	304
	November	134,258	9,378	2,296	145,932	1.073	156,548	0.750	290	16,368	25.4	162,300	172,916	315
	December	142,065	9,998	2,353	154,417	1.092	168,666	0.722	314	17,080	26.0	171,505	185,735	340
	Total	1,657,373	115,520	21,668	1,794,561	1.043	1,871,860	0.630	379	189,172	26.0	1,983,733	2,061,033	365
2000	January	150,487	11,101	2,271	163,858	1.032	169,110	0.756	302	18,607	26.0	182,265	187,517	328
	February	136,882	10,019	2,193	149,089	1.013	150,984	0.740	304	16,150	26.0	165,239	167,134	330
	March	140,077	9,901	2,203	152,180	1.044	158,884	0.745	287	17,509	26.0	169,689	176,375	313
	April	135,439	9,136	2,178	147,753	1.005	148,489	0.744	277	15,846	26.0	161,599	164,334	303
	May	130,700	9,358	1,598	141,656	1.058	149,812	0.750	268	15,546	26.0	157,210	165,359	295
	June	134,550	9,821	1,310	145,681	1.068	155,502	0.682	317	14,295	26.0	159,976	169,657	343
	July	152,715	9,276	1,308	163,299	1.073	175,209	0.677	348	14,997	26.0	178,297	190,206	374
	August	152,029	8,955	1,060	162,044	1.021	165,391	0.694	321	15,619	26.0	177,663	181,010	347
	September	148,579	9,233	1,258	159,070	0.982	153,006	0.732	290	15,194	26.0	174,264	168,200	316
	October	135,289	9,491	1,641	146,420	1.081	158,334	0.748	285	16,767	26.0	162,877	174,581	311
	November	137,754	9,372	2,296	149,423	1.073	160,293	0.748	297	16,784	26.0	166,907	177,077	324
	December	145,092	9,987	2,353	156,233	1.092	170,612	0.721	322	17,504	26.0	173,736	188,315	340
	Total	1,701,401	114,845	21,668	1,838,514	1.043	1,917,696	0.629	352	191,099	25.6	2,032,573	2,111,755	374
2001	January	154,550	11,088	2,271	167,909	1.032	173,201	0.752	310	18,870	26.0	186,778	192,161	336
	February	140,559	10,005	2,193	152,757	1.013	154,698	0.735	312	16,551	26.0	169,304	171,245	338
	March	143,772	9,891	2,203	155,868	1.044	162,714	0.743	294	17,943	26.0	173,809	180,658	321
	April	138,973	9,132	2,178	151,282	1.005	152,034	0.743	284	16,243	26.0	167,525	168,278	311
	May	134,079	9,356	1,598	145,033	1.058	153,375	0.749	275	15,939	26.0	160,972	169,314	302
	June	138,050	9,821	1,310	148,981	1.068	159,109	0.683	325	14,667	26.0	163,647	173,776	351
	July	156,848	9,275	1,308	167,430	1.073	179,626	0.676	357	15,397	26.0	182,828	195,024	383
	August	155,924	8,953	1,060	165,937	1.021	169,366	0.691	330	16,018	26.0	181,955	185,382	356
	September	152,410	9,229	1,258	162,897	0.982	156,987	0.731	298	15,569	26.0	178,466	172,556	324
	October	138,701	9,491	1,641	149,832	1.081	162,023	0.744	293	16,611	26.0	166,443	178,634	319
	November	141,266	9,368	2,296	152,931	1.073	164,056	0.747	305	17,199	26.0	170,130	181,255	332
	December	148,716	9,979	2,353	161,047	1.092	175,864	0.721	330	17,939	27.2	179,096	194,918	357
	Total	1,745,823	115,387	21,668	1,882,898	1.043	1,963,751	0.628	347	198,948	26.6	2,081,622	2,162,697	383
2002	January	158,632	11,377	2,271	171,980	1.032	177,492	0.750	318	19,133	27.2	191,313	198,825	345
	February	144,244	9,997	2,193	156,434	1.013	158,428	0.737	320	16,951	27.2	173,385	175,379	347
	March	147,484	9,848	2,203	159,536	1.044	166,603	0.742	307	18,376	27.2	177,948	184,947	329
	April	142,522	9,128	2,178	153,828	1.005	154,638	0.741	292	16,641	27.2	170,469	171,279	319
	May	137,464	9,356	1,598	148,418	1.058	156,956	0.747	282	16,332	27.2	164,789	173,288	313
	June	141,524	9,822	1,310	152,457	1.068	162,843	0.680	333	14,948	27.2	167,304	177,792	362
	July	163,698	9,274	1,308	174,281	1.073	183,685	0.675	366	15,737	27.2	188,978	199,422	391
	August	158,830	8,952	1,060	168,842	1.021	173,326	0.688	338	16,417	27.2	185,365	186,775	365
	September	156,256	9,227	1,258	166,742	0.982	160,328	0.730	305	15,983	27.2	182,486	176,311	332
	October	142,128	9,482	1,641	153,250	1.081	165,730	0.743	300	17,014	27.2	170,264	182,744	327
	November	144,793	9,368	2,296	156,456	1.073	167,817	0.745	313	17,614	27.2	174,070	185,432	340
	December	153,644	9,976	2,353	165,973	1.092	181,264	0.720	338	18,374	27.8	186,254	199,638	366
	Total	1,792,938	115,362	21,668	1,927,968	1.043	2,010,909	0.628	366	203,548	27.8	2,140,368	2,215,571	393

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Upper Bandwidth
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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	WAPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
2003	January	162,793	11,068	2,271	176,072	1.032	181,715	0.749	326	19,795	27.8	195,867	201,510	354
	February	157,950	9,991	2,193	170,133	1.013	172,368	0.736	328	17,352	27.8	177,485	179,520	356
	March	151,212	9,876	2,203	163,291	1.044	170,485	0.740	309	18,810	27.8	182,102	189,236	337
	April	147,687	8,126	2,178	158,991	1.005	159,179	0.740	299	17,039	27.8	175,430	176,218	327
	May	140,863	9,357	1,598	151,818	1.068	160,551	0.745	289	16,487	27.8	168,305	177,037	317
	June	148,035	9,625	1,310	155,970	1.068	166,595	0.679	341	15,114	27.8	171,084	181,710	369
	July	164,567	9,275	1,308	175,151	1.073	187,925	0.674	375	16,197	27.8	191,348	204,122	402
	August	163,765	8,953	1,060	173,778	1.021	177,367	0.688	348	16,817	27.8	190,595	194,184	374
	September	160,123	9,226	1,258	170,606	0.962	164,103	0.729	313	16,018	27.8	186,625	180,122	341
	October	145,570	9,494	1,641	156,705	1.081	169,455	0.741	307	17,418	27.8	174,123	185,873	335
	November	148,336	9,364	2,296	159,997	1.073	171,636	0.744	321	18,030	27.8	178,027	189,667	348
	December	157,413	9,965	2,353	169,732	1.092	185,371	0.719	346	18,809	28.3	188,541	204,179	375
	Total	1,834,654	115,322	21,668	1,971,644	1.043	2,056,530	0.627	375	207,887	28.3	2,179,531	2,264,417	402
2004	January	166,853	11,060	2,271	180,183	1.032	185,959	0.747	335	20,258	28.3	200,442	206,217	363
	February	161,672	9,986	2,193	173,850	1.013	176,932	0.735	336	17,752	28.3	181,603	183,685	364
	March	154,958	9,871	2,203	167,031	1.044	174,370	0.739	317	19,244	28.3	186,275	193,614	345
	April	150,668	9,126	2,178	161,972	1.005	162,777	0.738	306	17,437	28.3	179,408	180,214	334
	May	144,279	9,360	1,598	155,238	1.058	164,165	0.744	297	16,874	28.3	172,110	181,039	325
	June	148,561	9,628	1,310	159,499	1.068	170,356	0.678	349	15,480	28.3	174,979	185,845	378
	July	168,555	9,276	1,308	179,141	1.073	192,206	0.673	384	16,597	28.3	195,738	208,803	412
	August	167,712	8,955	1,060	177,728	1.021	181,399	0.688	355	17,216	28.3	194,943	198,615	383
	September	164,005	9,227	1,258	174,490	0.962	167,838	0.728	320	16,387	28.3	190,876	184,225	349
	October	149,028	9,497	1,641	160,166	1.081	173,198	0.740	315	17,822	28.3	177,988	191,020	343
	November	151,896	9,364	2,296	163,556	1.073	175,454	0.742	328	18,446	28.3	182,002	193,900	357
	December	161,269	9,961	2,353	173,603	1.092	189,599	0.718	355	19,244	28.9	192,847	208,842	384
	Total	1,879,476	115,312	21,668	2,016,455	1.043	2,103,262	0.626	384	212,757	28.9	2,229,212	2,316,018	412
2005	Total	1,925,392	115,302	21,668	2,062,362	1.043	2,151,144	0.625	393	217,740	30	2,280,102	2,368,885	422
2006	Total	1,972,430	115,293	21,668	2,109,390	1.043	2,200,197	0.624	402	222,841	30	2,332,231	2,423,038	432
2007	Total	2,020,617	115,283	21,668	2,157,567	1.043	2,250,449	0.623	412	228,060	31	2,385,628	2,478,509	443
2008	Total	2,069,981	115,273	21,668	2,206,922	1.043	2,301,928	0.623	422	233,403	31	2,440,325	2,535,330	453
2009	Total	2,120,551	115,264	21,668	2,257,483	1.043	2,354,665	0.622	432	238,870	32	2,496,352	2,593,535	464
2010	Total	2,172,357	115,254	21,668	2,309,279	1.043	2,408,691	0.621	443	244,465	33	2,553,744	2,653,156	476
2011	Total	2,225,428	115,244	21,668	2,362,340	1.043	2,464,037	0.620	454	250,191	33	2,612,532	2,714,228	487
2012	Total	2,279,786	115,235	21,668	2,416,699	1.043	2,520,735	0.619	465	256,052	34	2,672,750	2,776,787	499
2013	Total	2,335,492	115,225	21,668	2,472,385	1.043	2,578,819	0.618	476	262,049	35	2,734,434	2,840,868	511
2014	Total	2,392,549	115,215	21,668	2,529,432	1.043	2,638,322	0.618	488	268,188	35	2,797,620	2,906,509	523

(1) Actual.

Black Hills Power and Light Company
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Total Company
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Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	BHPL Share of Gillette Sales and Energy	Peak	Including Gillette, Wyoming Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1991 (1)	January	117,764	10,830	2,163	130,757		131,525		230	16,475	29.1	147,232	148,000	259
	February	95,518	9,415	2,068	107,021		104,589		198	12,611	24.9	119,632	117,600	223
	March	97,416	9,340	2,098	108,854		114,052		204	13,548	25.0	122,402	127,600	229
	April	97,330	8,073	2,074	105,477		111,292		205	12,308	22.8	120,785	123,600	228
	May	98,284	8,856	1,321	108,581		112,760		189	11,540	22.7	116,128	124,300	212
	June	98,665	8,215	1,248	108,128		114,650		229	10,650	21.1	118,778	125,300	250
	July	108,435	8,915	1,246	118,596		129,839		249	12,061	25.5	128,657	141,900	274
	August	110,818	8,342	1,010	120,269		130,886		251	12,814	25.4	133,083	143,700	276
	September	111,037	9,003	1,198	121,238		115,258		210	11,642	23.2	132,880	126,900	233
	October	105,280	9,471	1,563	111,254		121,834		228	12,666	25.9	123,920	134,300	255
	November	102,967	9,602	2,187	114,757		125,691		230	13,909	25.8	128,668	139,600	256
	December	108,519	9,307	2,241	118,147		122,329		219	14,471	24.9	132,618	136,800	244
	Total	1,236,994	110,648	20,630	1,368,078	1.049	1,434,905	0.654	251	154,695	29.1	1,522,773	1,589,600	276
1992	January (1)	106,691	9,941	2,048	120,880		123,560		224	14,452	27.0	135,337	138,017	251
	February (1)	98,623	8,629	1,765	109,038		112,734		217	12,912	24.0	121,948	125,646	241
	March	99,075	8,995	1,993	110,063	1.064	116,899	0.756	204	14,025	23.3	124,088	128,924	227
	April	97,016	8,284	1,970	107,250	1.005	107,784	0.756	198	12,128	23.0	119,378	119,912	221
	May	93,016	8,442	1,445	102,904	1.058	108,822	0.763	192	11,699	21.8	116,603	120,521	213
	June	98,697	8,678	1,186	108,558	1.068	112,749	0.690	227	10,794	21.3	118,351	123,542	250
	July	108,923	8,375	1,183	118,581	1.073	127,229	0.684	250	11,786	23.3	130,367	139,015	273
	August	108,698	8,050	959	117,739	1.021	120,171	0.703	230	12,415	23.3	130,152	132,584	253
	September	106,089	8,347	1,338	115,574	0.962	111,188	0.740	209	11,660	23.3	127,233	122,828	232
	October	97,510	8,953	1,484	107,947	1.081	116,298	0.760	206	12,427	22.3	119,974	128,725	229
	November	98,974	8,466	2,078	109,518	1.073	117,605	0.761	214	13,250	23.3	122,768	130,735	238
	December	104,032	9,052	2,139	115,223	1.092	125,839	0.727	233	14,650	23.3	129,873	140,489	256
	Total	1,216,643	103,830	19,398	1,339,871	1.044	1,398,737	0.839	250	152,201	27.0	1,492,072	1,550,939	273
1993	January	109,926	10,114	2,054	122,094	1.032	126,008	0.756	221	15,527	23.3	137,621	141,534	244
	February	100,100	9,105	1,984	111,189	1.013	112,602	0.749	224	13,656	23.3	124,845	126,258	247
	March	102,864	9,005	1,993	113,862	1.044	118,865	0.735	212	14,252	23.5	128,114	133,118	235
	April	100,664	8,279	1,970	110,913	1.005	111,465	0.754	205	12,480	23.3	122,394	123,945	223
	May	95,593	8,492	1,445	105,530	1.058	111,652	0.762	199	12,073	22.5	118,503	124,625	221
	June	99,298	8,696	1,186	109,180	1.066	116,818	0.689	235	11,151	23.3	120,331	127,769	258
	July	118,809	8,498	1,183	122,490	1.073	131,423	0.683	259	11,993	23.3	134,483	143,416	282
	August	117,456	8,203	959	121,618	1.021	124,130	0.702	238	12,020	23.3	134,238	136,750	261
	September	109,794	8,456	1,338	119,400	0.962	114,849	0.739	216	12,020	23.3	131,420	126,869	239
	October	102,631	8,878	1,484	110,624	1.081	119,625	0.756	213	12,816	23.0	123,440	132,441	236
	November	102,610	8,568	2,078	112,676	1.073	120,872	0.760	221	13,660	23.3	126,336	134,531	244
	December	107,952	9,222	2,220	119,648	1.092	129,977	0.726	240	14,701	23.3	131,747	144,679	263
	Total	1,254,246	105,275	19,804	1,379,123	1.043	1,438,566	0.835	250	157,349	23.3	1,536,471	1,595,935	282
1994	January	113,456	10,195	2,054	125,704	1.032	129,753	0.764	228	15,518	23.3	141,222	145,251	252
	February	103,290	9,190	1,984	114,464	1.013	115,919	0.748	231	14,065	23.3	128,529	129,984	256
	March	106,673	8,960	1,993	117,355	1.044	122,502	0.753	218	14,680	23.5	132,035	136,982	241
	April	103,731	8,369	1,970	114,070	1.005	114,637	0.753	212	12,858	23.3	126,893	127,500	235
	May	98,448	8,556	1,445	108,449	1.058	115,745	0.760	205	12,446	23.3	121,896	128,191	228
	June	102,318	8,792	1,186	112,296	1.066	119,965	0.668	242	11,440	23.3	123,735	131,406	266
	July	122,506	8,445	1,183	126,133	1.073	135,066	0.682	266	12,307	23.3	138,372	147,453	288
	August	121,213	8,190	959	130,362	1.021	127,504	0.700	245	13,014	23.3	137,996	140,518	268
	September	113,424	8,456	1,338	122,718	0.962	118,014	0.738	222	12,318	23.3	135,023	130,365	245
	October	105,968	8,669	1,484	116,119	1.081	122,878	0.755	219	13,272	23.3	136,750	136,991	242
	November	105,968	8,575	2,078	115,710	1.073	124,178	0.758	228	13,862	23.3	139,613	137,830	254
	December	118,259	9,158	2,129	125,547	1.092	132,183	0.729	243	15,503	23.3	141,500	148,786	270
	Total	1,265,823	105,705	19,806	1,417,982	1.043	1,479,875	0.634	260	167,351	23.3	1,579,704	1,642,327	288

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Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Lower Bandwidth
Total Company
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Year	Month	Excluding Gillette, Wyoming								BHPL Share of Gillette		Including Gillette, Wyoming		
		South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	Sales and Energy	Peak	Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1995	January	118,997	10,172	2,054	129,224	1.032	133,368	0.762	235	15,978	23.3	145,202	149,344	258
	February	106,483	9,172	1,984	117,649	1.013	119,144	0.746	238	14,046	23.3	131,695	133,190	261
	March	109,294	9,072	1,993	120,358	1.044	125,646	0.752	225	14,826	23.3	130,306	130,889	241
	April	106,810	8,355	1,970	117,135	1.005	117,738	0.751	218	13,171	23.3	126,165	131,628	234
	May	102,364	8,546	1,445	112,377	1.058	118,840	0.758	211	12,788	23.3	127,114	134,971	272
	June	105,349	8,784	1,186	115,319	1.068	123,176	0.687	249	11,795	23.3	141,816	151,245	297
	July	119,637	8,435	1,183	129,295	1.073	138,725	0.681	274	12,520	23.3	143,508	144,160	275
	August	119,224	8,180	959	128,363	1.021	131,015	0.699	252	13,143	23.3	138,708	139,904	252
	September	116,458	8,443	1,138	126,039	0.962	121,234	0.737	228	12,669	23.3	130,104	139,587	248
	October	106,399	8,661	1,484	116,544	1.081	126,027	0.753	225	13,560	23.3	132,985	141,604	257
	November	108,118	8,563	2,078	118,759	1.073	127,399	0.756	234	14,206	23.3	140,365	151,907	277
	December	113,093	9,141	2,129	125,264	1.092	136,895	0.725	254	15,102	23.3			
	Total	1,331,157	105,566	19,604	1,456,327	1.043	1,519,094	0.634	274	163,806	23.3	1,620,132	1,682,899	297
1996	January	120,555	10,152	2,054	132,761	1.032	137,016	0.761	242	16,438	23.3	149,199	153,454	265
	February	109,709	9,155	1,984	120,848	1.013	122,384	0.745	244	14,444	23.3	135,292	136,828	268
	March	112,528	9,055	1,993	123,576	1.044	129,005	0.750	231	15,247	23.3	138,823	144,252	254
	April	109,902	8,343	1,970	120,215	1.005	120,813	0.750	224	13,551	23.3	133,767	134,365	247
	May	105,332	8,540	1,445	115,317	1.058	121,950	0.757	217	13,161	23.3	128,478	135,111	240
	June	108,393	8,778	1,186	118,357	1.068	126,420	0.686	256	12,151	23.3	130,507	138,570	279
	July	123,074	8,466	1,183	132,723	1.073	142,402	0.680	281	12,908	23.3	145,631	155,310	305
	August	122,629	8,171	959	131,759	1.021	134,681	0.698	259	13,533	23.3	145,292	148,013	282
	September	119,811	8,433	1,138	129,381	0.962	124,449	0.736	235	13,028	23.3	142,408	137,477	258
	October	109,385	8,655	1,484	119,524	1.081	129,249	0.752	231	13,870	23.3	133,394	143,120	254
	November	111,192	8,553	2,078	121,822	1.073	130,685	0.755	241	14,609	23.3	136,431	145,293	264
	December	117,341	9,126	2,129	128,596	1.092	140,444	0.724	261	15,531	23.3	144,127	155,976	284
	Total	1,369,850	105,426	19,604	1,494,879	1.043	1,559,298	0.633	281	168,469	23.3	1,663,349	1,727,768	305
1997	January	124,127	10,133	2,054	136,315	1.032	140,686	0.759	249	15,954	23.3	152,269	156,638	272
	February	112,938	9,140	1,984	124,062	1.013	125,639	0.744	251	14,023	23.3	138,086	139,662	275
	March	115,776	9,040	1,993	126,809	1.044	132,380	0.749	238	15,204	23.3	142,013	147,584	261
	April	113,006	8,333	1,970	123,310	1.005	123,923	0.748	230	13,731	23.3	137,041	137,654	253
	May	108,292	8,534	1,445	118,271	1.058	125,074	0.755	223	13,457	23.3	131,728	138,531	246
	June	111,450	8,773	1,186	121,408	1.068	129,679	0.685	263	12,317	23.3	133,725	141,996	286
	July	126,525	8,458	1,183	136,166	1.073	146,097	0.679	289	12,865	23.3	149,032	158,962	312
	August	126,049	8,163	959	135,171	1.021	137,963	0.696	266	13,489	23.3	148,660	151,452	290
	September	123,177	8,424	1,138	132,739	0.962	127,679	0.735	241	13,195	23.3	145,933	140,873	265
	October	112,384	8,649	1,484	122,518	1.081	132,407	0.750	237	14,256	23.3	136,775	146,743	261
	November	114,278	8,544	2,078	124,900	1.073	133,986	0.753	247	14,561	23.3	139,461	148,547	270
	December	120,703	9,112	2,129	131,944	1.092	144,101	0.723	258	15,961	23.3	147,905	160,062	291
	Total	1,408,705	105,304	19,604	1,533,613	1.043	1,599,692	0.632	289	169,013	23.5	1,702,626	1,768,705	312
1998	January	127,715	10,117	2,054	139,886	1.032	144,370	0.757	256	16,301	23.5	156,277	160,761	280
	February	116,181	9,127	1,984	127,291	1.013	128,909	0.742	258	14,402	23.5	141,693	143,311	282
	March	119,037	9,027	1,993	130,057	1.044	135,771	0.748	244	15,614	23.5	145,671	151,385	268
	April	116,124	8,325	1,970	126,419	1.005	127,048	0.747	236	14,107	23.5	140,525	141,154	260
	May	111,265	8,529	1,445	121,239	1.058	128,212	0.754	229	13,828	23.5	135,067	142,040	252
	June	114,519	8,769	1,186	124,474	1.068	132,954	0.684	270	12,668	23.5	137,142	145,622	294
	July	129,991	8,452	1,183	139,627	1.073	149,810	0.679	297	13,243	23.5	152,870	163,053	320
	August	129,483	8,157	959	138,600	1.021	141,462	0.695	274	13,866	23.5	152,466	155,329	297
	September	126,558	8,416	1,138	136,112	0.962	130,924	0.734	248	13,548	23.5	149,661	144,472	271
	October	115,396	8,646	1,484	125,526	1.081	135,740	0.749	244	14,643	23.5	140,169	150,382	267
	November	117,377	8,537	2,078	127,992	1.073	137,303	0.751	256	14,953	23.5	142,945	152,256	277
	December	124,079	9,099	2,129	135,308	1.092	147,775	0.723	275	15,586	24.0	150,893	163,360	299
	Total	1,447,725	105,201	19,604	1,572,530	1.043	1,640,276	0.631	297	172,849	24.0	1,745,379	1,813,125	320

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Lower Bandwidth
Total Company
Megawatt-Hours
09-Apr-02

Year	Month	South Dakota	Wyoming	Montana	Excluding Gillette, Wyoming: Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	DPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
1999	January	131,319	10,102	2,056	143,475	1.032	148,074	0.755	263	18,828	24.0	160,303	164,902	287
	February	119,437	9,135	1,904	130,536	1.013	132,195	0.741	265	14,781	24.0	145,316	146,975	259
	March	122,312	9,015	1,993	133,320	1.044	139,178	0.748	251	16,034	24.0	149,344	155,202	275
	April	119,255	8,317	1,970	129,543	1.005	130,187	0.746	243	14,482	24.0	144,025	144,670	267
	May	114,250	8,925	1,649	124,721	1.058	131,365	0.752	235	14,199	24.0	138,420	145,566	259
	June	117,801	8,767	1,186	127,853	1.058	136,243	0.683	277	13,019	24.0	140,572	149,262	301
	July	133,473	8,448	1,183	143,104	1.073	153,540	0.678	304	13,681	24.0	156,788	168,221	329
	August	132,933	8,158	958	142,044	1.021	144,978	0.694	281	14,264	24.0	153,404	148,086	278
	September	128,956	8,410	1,138	138,502	0.962	134,184	0.795	254	13,902	24.0	143,351	153,820	274
	October	116,421	8,843	1,484	126,648	1.061	139,007	0.747	250	14,813	24.0	146,445	155,982	284
	November	120,490	8,231	2,078	131,098	1.073	140,636	0.750	260	15,346	24.0	154,685	167,463	307
	December	127,470	9,089	2,129	138,688	1.092	151,487	0.722	282	15,997				
	Total	1,468,914	105,114	19,804	1,811,632	1.043	1,681,054	0.630	304	177,255	24.0	1,780,838	1,858,309	329
2000	January	134,938	10,089	2,054	147,081	1.032	151,796	0.754	271	17,785	24.0	164,347	169,081	295
	February	122,767	9,103	1,944	133,796	1.013	135,496	0.740	273	15,139	24.0	148,955	150,655	297
	March	128,682	9,005	1,993	139,680	1.044	142,601	0.748	257	16,434	24.0	153,038	159,035	282
	April	122,400	8,511	1,970	132,882	1.005	133,342	0.744	249	14,858	24.0	147,560	148,200	273
	May	117,048	8,823	1,445	127,316	1.058	134,656	0.780	241	14,570	24.0	141,786	149,104	266
	June	120,697	8,785	1,165	130,648	1.068	139,548	0.682	284	13,370	24.0	144,018	152,918	309
	July	138,970	8,464	1,183	148,598	1.073	159,389	0.677	312	13,949	24.0	160,597	171,288	337
	August	135,397	8,169	958	145,508	1.021	148,511	0.694	288	14,621	24.0	160,126	163,132	312
	September	133,354	8,406	1,138	142,907	0.962	137,460	0.732	261	14,255	24.0	157,164	151,715	285
	October	121,458	8,841	1,484	131,588	1.061	142,295	0.746	256	15,194	24.0	146,778	157,489	281
	November	123,616	8,526	2,078	134,220	1.073	143,984	0.748	267	15,739	24.0	140,959	159,723	292
	December	130,878	9,079	2,129	142,085	1.092	155,176	0.721	289	16,406	25.1	156,493	171,584	314
	Total	1,578,275	105,043	18,664	1,650,923	1.043	1,722,028	0.629	312	181,871	25.1	1,832,996	1,903,901	337
2001	January	135,574	10,077	2,054	150,706	1.032	155,536	0.752	278	17,702	25.1	168,406	173,238	303
	February	125,992	9,088	1,984	137,072	1.013	138,814	0.739	280	15,938	25.1	152,809	154,751	305
	March	128,906	8,906	1,993	139,805	1.044	146,041	0.743	264	16,844	25.1	156,739	162,885	289
	April	125,350	8,307	1,970	135,626	1.005	136,312	0.743	255	15,236	25.1	151,070	151,746	280
	May	120,280	8,521	1,445	130,246	1.058	137,717	0.749	247	14,941	25.1	145,187	152,658	272
	June	123,806	8,765	1,186	133,757	1.068	142,869	0.681	292	13,721	25.1	147,477	156,590	317
	July	140,684	8,442	1,195	150,110	1.073	161,057	0.676	320	14,377	25.1	164,487	175,434	345
	August	139,877	8,147	958	148,986	1.021	152,051	0.691	296	14,998	25.1	163,981	167,049	321
	September	135,700	8,402	1,138	145,335	0.962	140,752	0.731	268	14,810	25.1	160,960	155,562	293
	October	124,510	8,841	1,484	134,835	1.081	145,990	0.744	263	15,575	25.1	150,211	161,565	286
	November	126,757	8,522	2,078	137,357	1.073	147,388	0.747	274	16,132	25.1	153,480	163,481	299
	December	130,398	9,081	2,329	141,808	1.092	154,806	0.721	296	16,810	25.1	158,218	171,123	322
	Total	1,557,833	104,843	19,604	1,680,405	1.043	1,763,202	0.629	320	186,460	25.1	1,876,095	1,949,662	345
2002	January	142,226	10,082	2,054	154,368	1.032	159,295	0.750	285	18,840	25.7	172,486	177,435	311
	February	129,291	9,089	1,984	140,365	1.013	142,147	0.737	287	15,916	25.7	156,280	158,063	313
	March	132,225	8,986	1,993	143,207	1.044	149,498	0.742	271	17,254	25.7	160,460	166,752	297
	April	128,733	8,303	1,970	138,006	1.005	138,698	0.741	262	15,610	25.7	154,616	154,307	287
	May	123,285	8,521	1,445	133,251	1.058	140,915	0.747	254	15,342	25.7	148,563	156,227	279
	June	126,929	8,765	1,186	136,880	1.068	146,205	0.680	293	14,072	25.7	150,952	160,277	324
	July	144,014	8,442	1,183	153,639	1.073	164,864	0.675	328	14,755	25.7	168,394	179,593	354
	August	143,373	8,146	958	152,479	1.021	155,626	0.689	303	15,375	25.7	167,854	171,003	329
	September	140,231	8,400	1,134	149,765	0.962	144,060	0.730	274	14,964	25.7	164,732	159,023	309
	October	127,575	8,842	1,484	137,901	1.061	146,305	0.763	269	15,957	25.7	153,858	162,262	295
	November	129,912	8,520	2,078	140,509	1.073	150,731	0.745	281	16,524	25.7	157,035	167,255	307
	December	137,735	9,065	2,329	148,529	1.092	162,455	0.720	304	17,230	25.7	166,358	179,681	330
	Total	1,605,533	100,948	19,604	1,726,081	1.043	1,800,578	0.626	328	186,108	25.7	1,921,189	1,955,868	354

Black Hills Power and Light Company
Monthly Sales, Energy and Peak Forecast - Lower Bandwidth
Total Company
Megawatt-Hours
09-Apr-92

Year	Month	Excluding Gillette, Wyoming: South Dakota	Wyoming	Montana	Total Sales	Energy to Sales Ratio	Total Energy	Load Factor	Peak	DMPL Share of Gillette: Sales and Energy	Peak	Including Gillette, Wyoming: Total Sales	Total Energy	Peak
		MWh	MWh	MWh	MWh		MWh		MW	MWh	MW	MWh	MWh	MW
2003	January	145,886	10,059	2,054	158,009	1.032	163,073	0.749	291	18,577	26.2	176,586	181,650	319
	February	132,605	9,062	1,984	143,671	1.013	145,497	0.736	278	17,664	26.2	159,966	161,792	304
	March	135,560	8,982	1,993	146,535	1.044	152,973	0.740	268	15,986	26.2	168,178	168,885	294
	April	131,921	8,301	1,970	142,192	1.005	142,899	0.740	260	15,688	26.2	151,973	159,812	286
	May	126,324	8,521	1,445	136,290	1.058	144,129	0.745	306	14,423	26.2	154,442	163,981	332
	June	130,067	8,787	1,186	140,019	1.066	149,558	0.679	336	15,133	26.2	172,320	183,783	362
	July	147,561	8,642	1,183	157,187	1.073	168,651	0.674	311	15,752	26.2	171,744	174,966	337
	August	146,886	8,146	959	155,992	1.021	159,214	0.688	281	15,318	26.2	168,542	182,701	307
	September	143,688	8,399	1,138	153,225	0.962	147,384	0.729	276	16,318	26.2	157,120	168,574	302
	October	130,654	8,643	1,484	140,781	1.081	152,236	0.741	288	16,917	26.2	160,594	171,046	314
	November	133,081	8,518	2,078	143,677	1.073	154,130	0.744	311	17,641	26.8	170,017	184,057	338
	December	141,188	9,059	2,129	152,376	1.092	166,416	0.719						
	Total	1,645,430	104,921	19,604	1,769,955	1.043	1,846,160	0.627	336	195,725	26.8	1,965,680	2,041,585	362
2004	January	149,582	10,052	2,054	161,689	1.032	166,871	0.747	300	19,014	26.8	180,702	185,885	327
	February	135,934	9,077	1,984	146,996	1.013	148,864	0.735	302	16,673	26.8	163,669	165,537	328
	March	138,910	8,977	1,993	149,879	1.044	156,464	0.739	285	18,074	26.8	167,953	174,518	311
	April	135,123	8,300	1,970	145,394	1.005	146,117	0.738	275	16,362	26.8	161,755	162,478	302
	May	129,377	8,523	1,445	139,345	1.058	147,359	0.744	266	16,056	26.8	155,399	163,413	293
	June	133,218	8,770	1,186	143,174	1.068	152,928	0.678	313	14,489	26.8	157,663	167,417	340
	July	151,125	8,444	1,183	160,753	1.073	172,476	0.673	344	15,511	26.8	176,263	187,987	371
	August	150,415	8,148	959	159,522	1.021	162,817	0.687	319	16,179	26.8	175,652	178,947	345
	September	147,161	8,399	1,138	156,698	0.962	150,725	0.728	288	15,671	26.8	172,369	166,396	314
	October	133,747	8,646	1,484	143,877	1.081	155,554	0.740	283	16,720	26.8	160,597	172,303	309
	November	136,266	8,518	2,078	146,861	1.073	157,545	0.742	295	17,309	26.8	164,171	174,854	322
	December	144,658	9,055	2,129	155,842	1.092	170,201	0.718	318	18,052	27.3	173,894	188,253	346
	Total	1,685,517	104,907	19,604	1,810,028	1.043	1,887,950	0.626	344	200,058	27.3	2,010,086	2,088,008	371
2005	Total	1,726,560	104,894	19,604	1,851,079	1.043	1,930,768	0.625	353	204,486	28	2,056,565	2,135,254	380
2006	Total	1,768,645	104,881	19,604	1,893,129	1.043	1,974,629	0.624	361	209,013	28	2,102,142	2,183,642	389
2007	Total	1,811,733	104,867	19,604	1,936,205	1.043	2,019,558	0.624	370	213,640	29	2,149,844	2,233,198	399
2008	Total	1,855,872	104,854	19,604	1,980,330	1.043	2,065,583	0.623	379	218,369	30	2,198,699	2,283,952	408
2009	Total	1,901,086	104,840	19,604	2,025,530	1.043	2,112,730	0.622	388	223,203	30	2,248,733	2,335,933	418
2010	Total	1,947,401	104,827	19,604	2,071,832	1.043	2,161,025	0.621	397	228,144	31	2,299,976	2,389,169	428
2011	Total	1,994,845	104,813	19,604	2,119,263	1.043	2,210,497	0.620	407	233,194	31	2,352,457	2,443,691	438
2012	Total	2,043,445	104,800	19,604	2,167,849	1.043	2,261,175	0.619	417	238,356	32	2,406,205	2,499,531	449
2013	Total	2,093,229	104,786	19,604	2,217,619	1.043	2,313,088	0.619	427	243,633	33	2,461,252	2,556,721	460
2014	Total	2,144,225	104,773	19,604	2,268,603	1.043	2,366,266	0.618	437	249,026	33	2,517,628	2,615,292	471

(1) Actual.

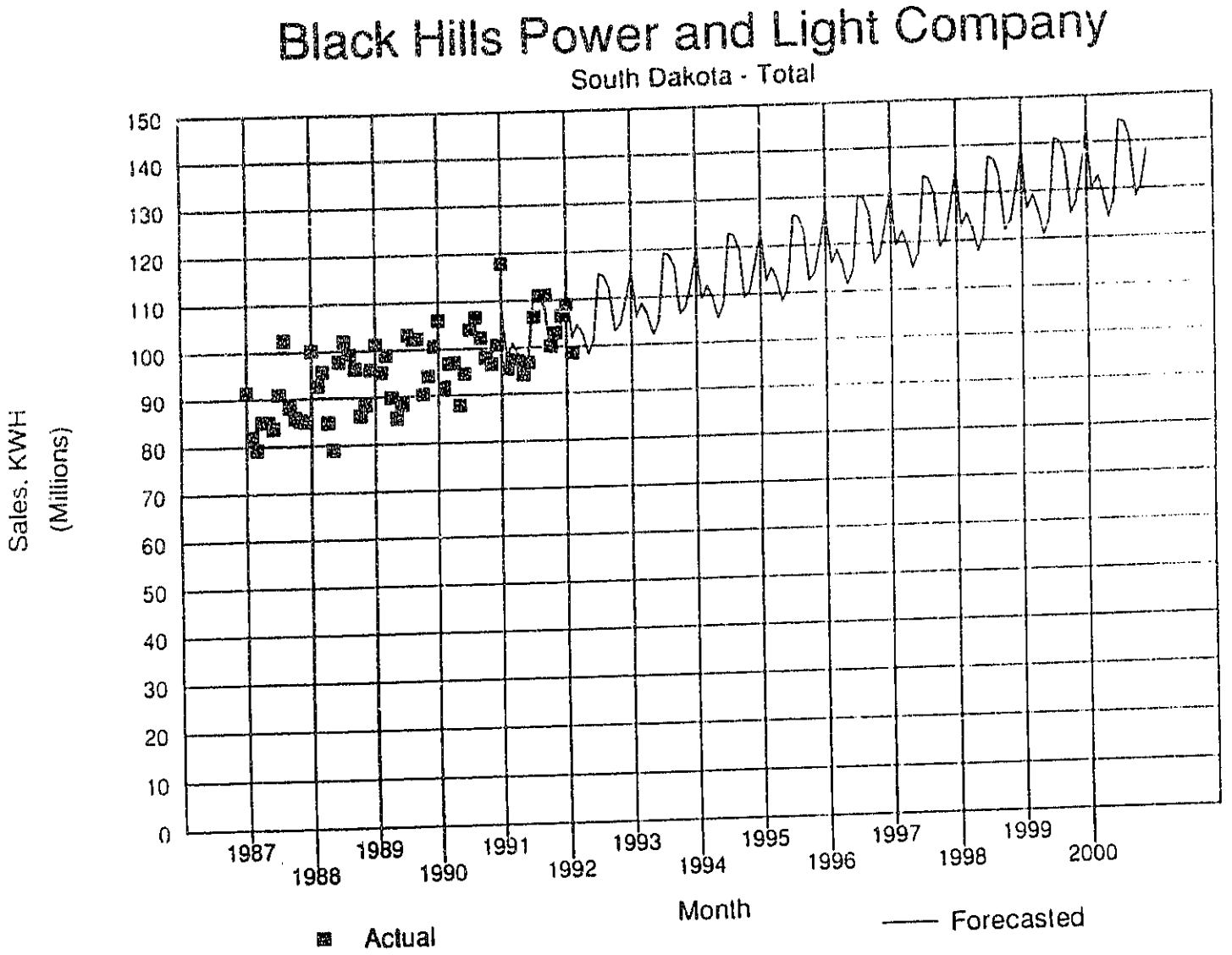

Black Hills Power and Light Company
South Dakota - Total
Sales, KWH
(Millions)
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Figure 5-1

Black Hills Power and Light Company

Wyoming - Total

Figure 5-2

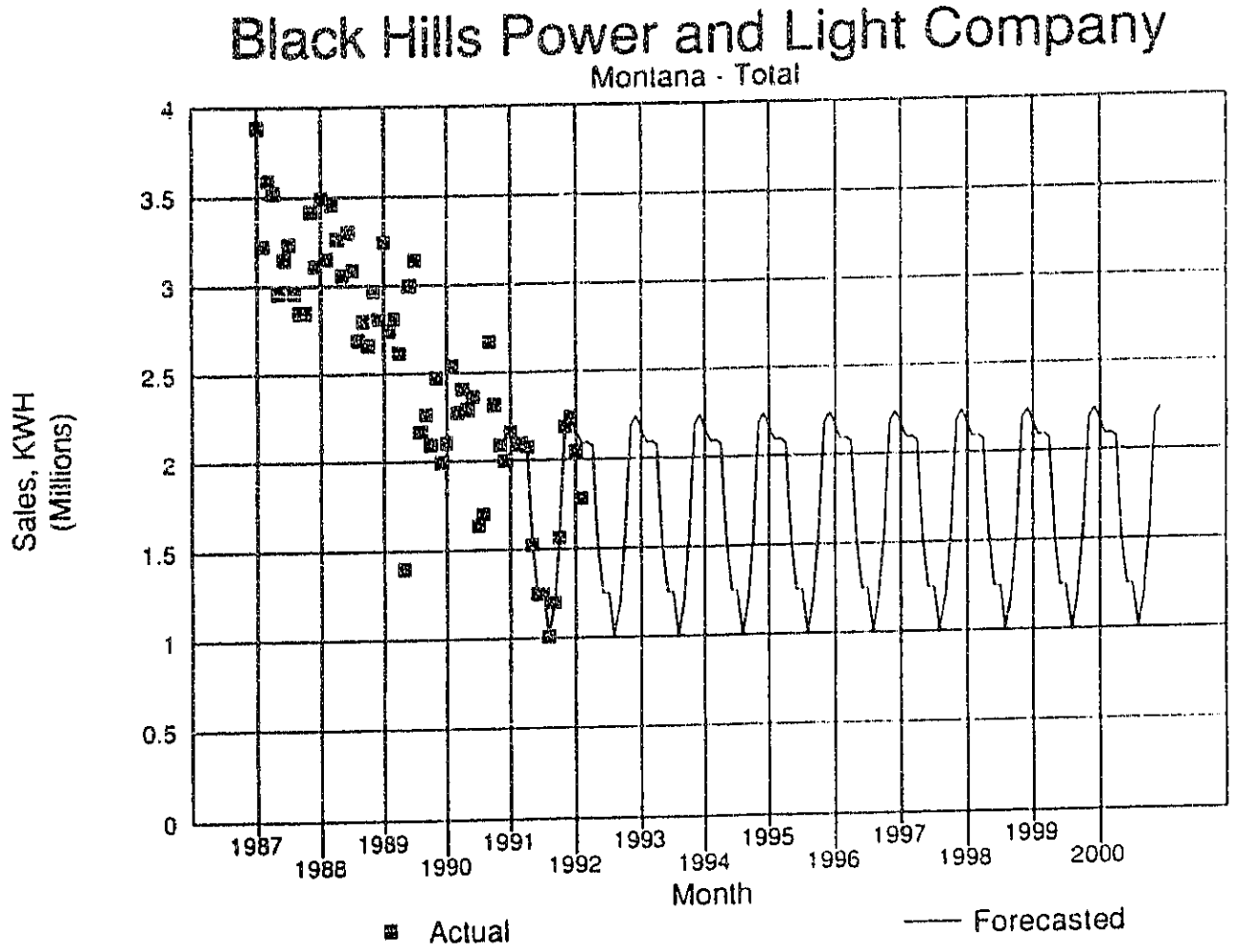

Black Hills Power and Light Company
Montana - Total
Sales, KWH
(Millions)
4
3.5
3
2.5
2
1.5
1
0.5
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Figure 5-3

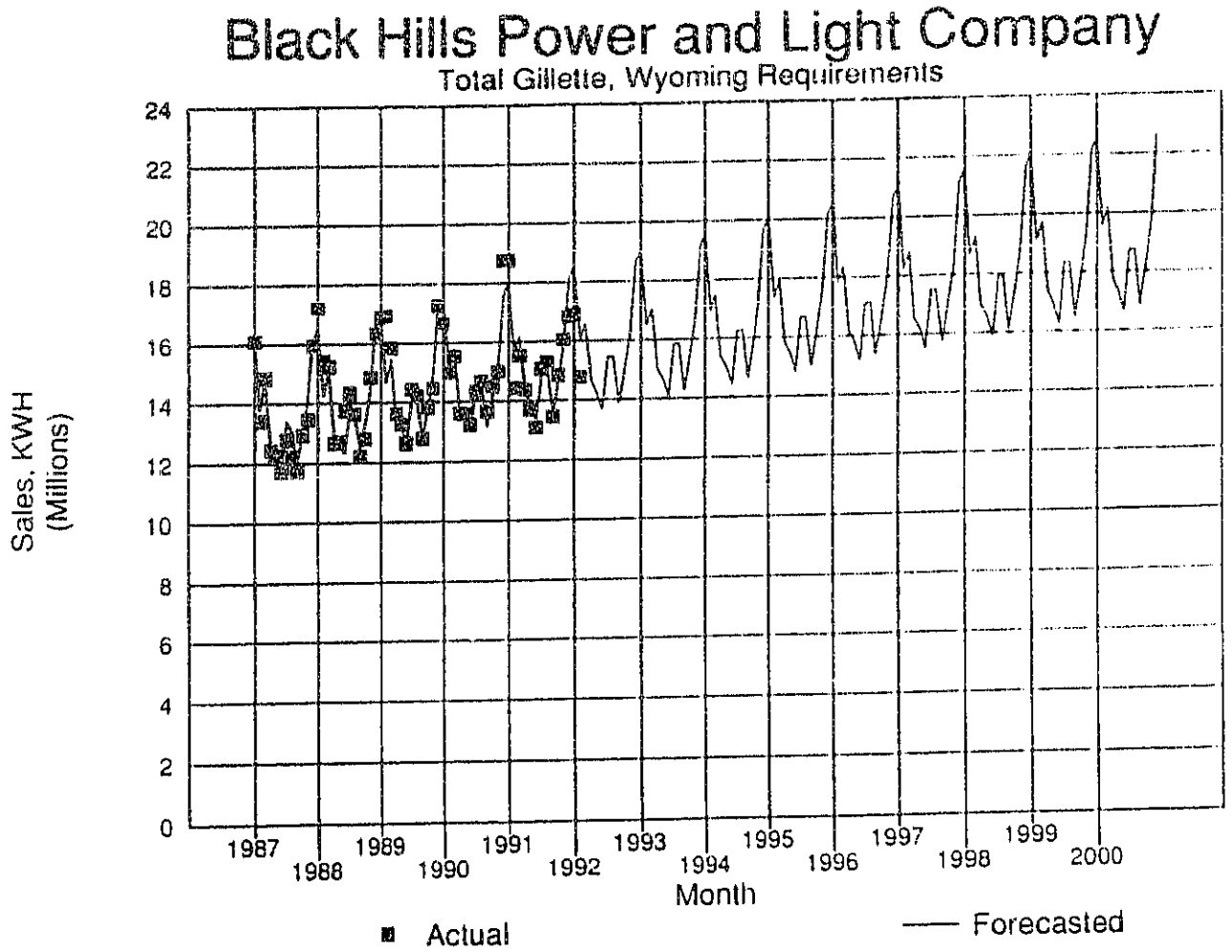

Black Hills Power and Light Company
Total Gillette, Wyoming Requirements
Sales, KWH (Millions)
24
22
20
18
16
14
12
10
8
6
4
2
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Figure 5-4

Black Hills Power and Light Company

Figure 5-5

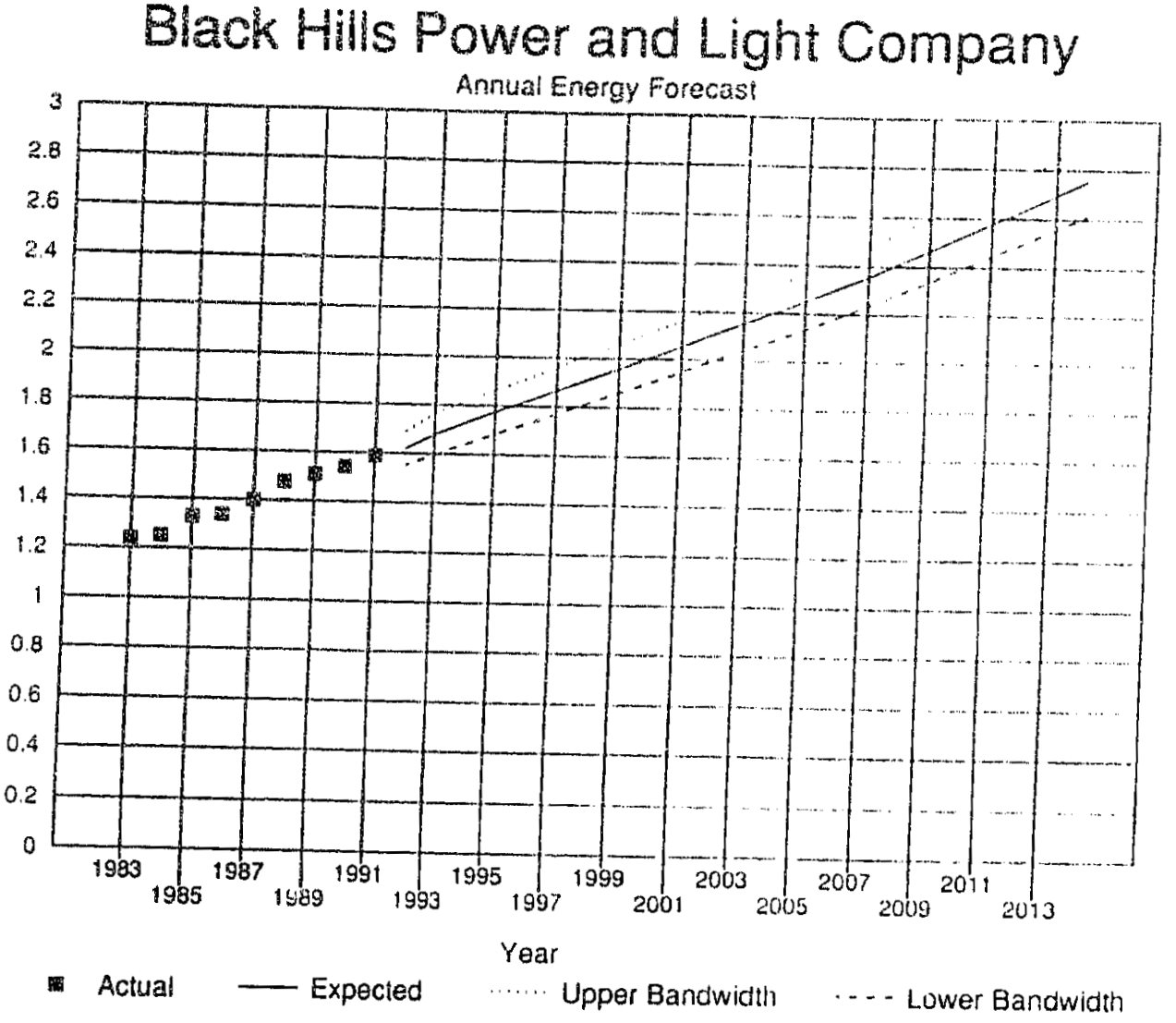

Black Hills Power and Light Company
Annual Energy Forecast
Energy, MWH (Millions)
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-6

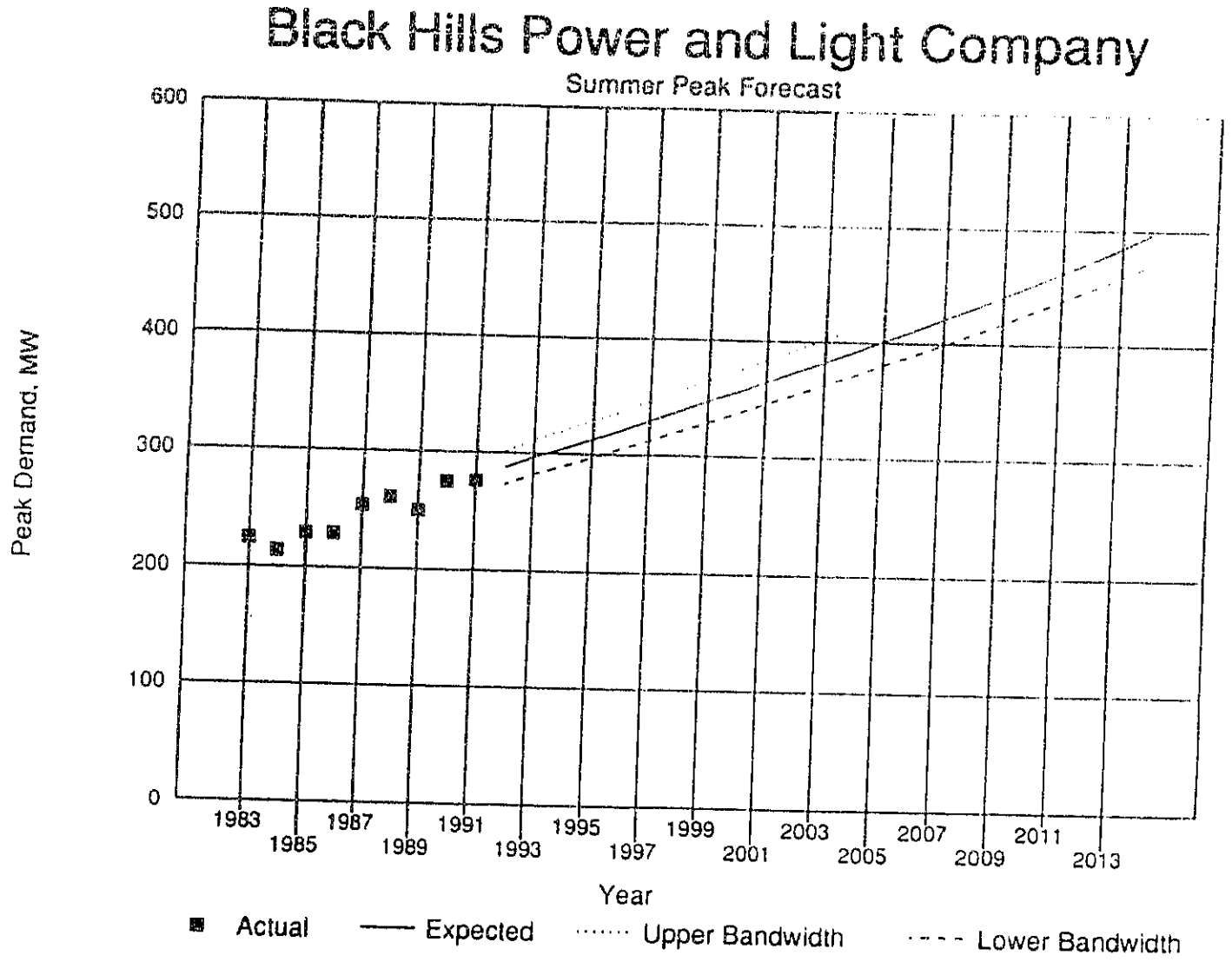

Black Hills Power and Light Company
Summer Peak Forecast
Peak Demand, MW
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-7

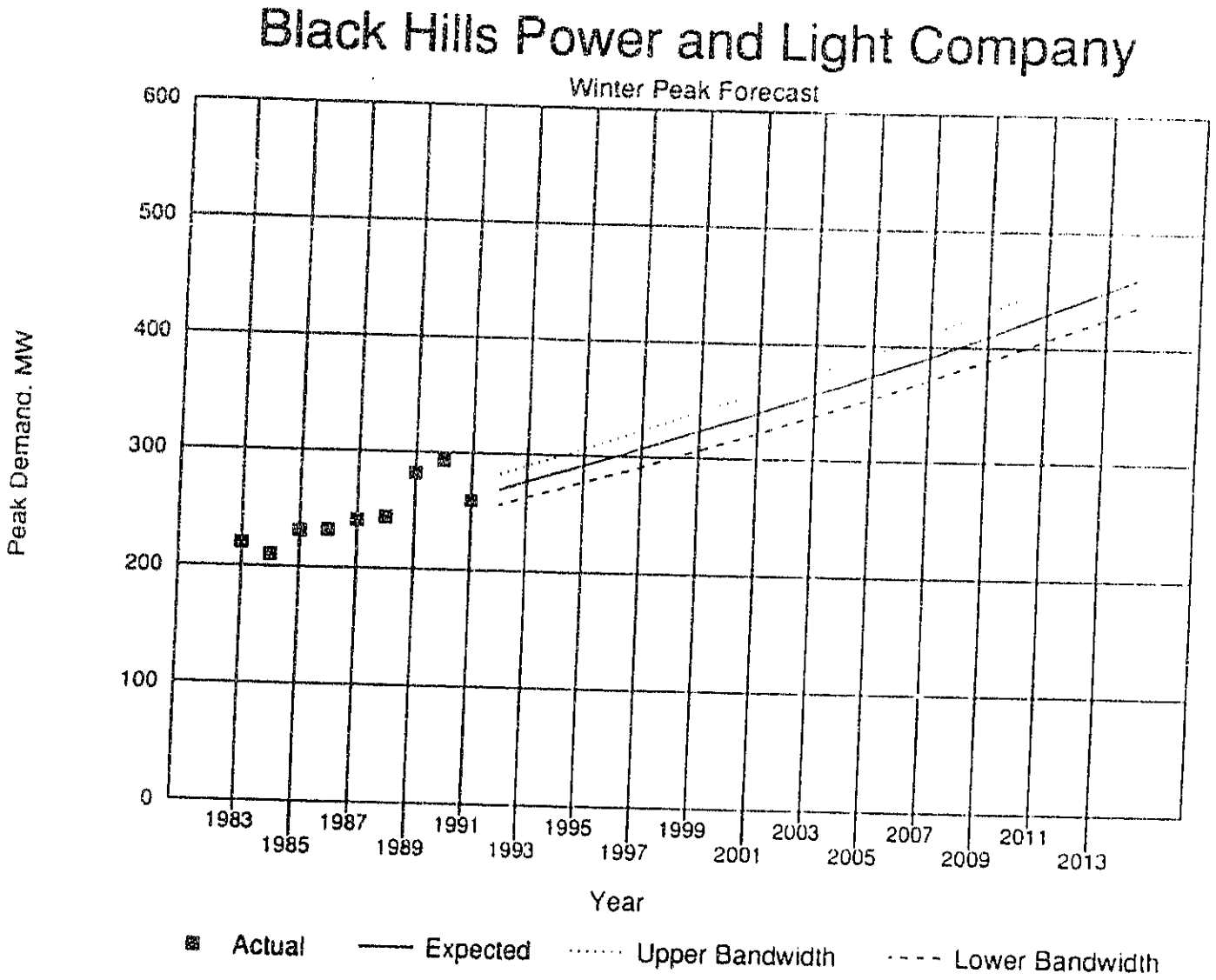

Black Hills Power and Light Company
Winter Peak Forecast
Peak Demand, MW
600
500
400
300
200
100
0
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Year
Actual
Expected
Upper Bandwidth
Lower Bandwidth

Figure 5-8

Chapter 6 - Customer Forecast

The annual average number of customers is forecasted for the South Dakota, Wyoming, and Montana jurisdictions for the years 1992 through 1998. Tables 6-1 through 6-4 summarize the historical annual average number of customers for the years 1980 through 1991, forecasts set forth in the 1988 and 1990 Reports, as well as the current forecasts for the period 1992 through 1998. The average number of customers forecast is made through 1998 so that five year budgets for 1993 through 1997 and 1994 through 1998 can be prepared. The growth rates used in the current forecast are derived from historical trends in customer growth as well as consideration of sales projections.

Historical number of customers in each jurisdiction are set forth on Page 1 of each of Tables 6-1 through 6-4. The South Dakota customer base has shown a somewhat steady increase since 1980 from 42,941 customers to a 1991 average of 48,824 customers. This upward trend is expected to continue. The Wyoming and Montana jurisdictions have experienced decreases in the average number of customers. The Wyoming jurisdiction experienced moderate growth from a 1980 level of 2,575 customers to a 1982 level of 2,706. However, a steady decline has occurred since then, principally attributable to a decline in residential customers, to a 1991 level of 2,396 customers. The Montana jurisdiction has experienced a decline, as well, from a 1980 average of 107 customers to a 1991 level of 59 customers. Although the downward trends in these jurisdictions appear to be leveling, the decline itself is not seen as significant when the relative size of the customer base in these jurisdictions is compared to that of the Total Company.

The Total Company customer base (Table 6-4, Page 1) is the sum of the three jurisdictions and shows consistent overall annual growth rate of approximately 1.25 percent for the period 1980 through 1991. This overall rate is principally affected by the growth experienced in the South Dakota jurisdiction. The annual average of total customers grew from a 1980 level of 45,623 to 51,279 in 1991.

The projections of the Black Hills customer base by jurisdiction and rate class for the period 1992 through 1998 (1992 Report) are shown on Page 2 of each of Tables 6-1 through 6-4. The projections for 1988 through 1992 set forth in the 1988 Report and the period 1990 through 1996 in the 1990 Report are summarized on Page 3 of each of Tables 6-1 through 6-4. Projections for the South Dakota jurisdiction (Table 6-1) are based on historical trends in customer growth as well as consideration of sales projections. The most significant growth in this jurisdiction is expected to occur in the Residential-Demand rate class, 8 percent annually, and in the General Service-Utility Controlled rate class, 10 percent annually. These growth rates are partially attributable to customers migrating to these rate classes from other classes. Generally, growth in the General Service rate class should closely track growth in

Black Hills Power & Light Company
Average Number of Customers Forecast
15-Nov-92

Table 6-1
Page 1 of 4

Class	Actual 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
South Dakota												
Residential Service	25,462	25,481	29,091	31,554	32,034	32,318	32,575	32,902	33,043	33,340	34,073	34,358
Residential - Water Heating (1)	5,281	5,161	1,539	0	0	0	0	0	0	0	0	
Residential - All Electric	4,671	4,937	5,098	5,232	5,405	5,542	5,879	6,016	6,064	5,989	5,909	5,844
Residential - Demand	0	0	0	33	125	226	317	424	600	759	917	1,059
Residential - Energy Storage	0	0	0	1	1	0	0	1	0	0	1	1
Residential - Utility Controlled	0	0	0	1	1	1	1	1	0	0	2	5
Total Residential	35,414	35,579	36,638	36,981	37,566	38,187	38,772	39,344	39,707	40,068	40,902	41,347
General Service	5,964	6,009	6,023	6,146	6,212	6,287	6,297	6,390	6,461	6,514	6,760	6,873
General Service - Large	69	72	75	77	80	84	95	93	95	93	93	98
General Service - All Electric	344	351	356	361	358	392	431	452	478	512	525	525
General Service - Utility Controlled	0	0	3	3	1	4	7	10	13	13	16	18
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	0	0	0	1	2	1	1	1	0	0	1	0
Irrigation Pumping	16	16	15	15	16	15	15	14	14	15	23	24
Industrial	25	25	24	24	25	22	14	13	23	24	29	25
Industrial - Contract	2	2	2	2	2	2	2	2	3	3	3	3
Industrial - Curtailable	0	0	0	0	0	0	0	0	0	0	0	1
Total Commercial & Industrial Sales	6,420	6,475	6,493	6,629	6,696	6,807	6,872	6,985	7,087	7,174	7,451	7,571
Street Lighting	23	23	24	22	23	23	23	23	23	24	26	26
Customer-Owned Street Lighting	5	5	7	7	7	7	7	7	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	28	28	31	29	30	30	30	30	23	24	26	26
Municipal Pumping	79	77	78	75	73	76	78	74	71	74	78	80
Total Customers	42,941	43,159	43,240	43,691	44,355	45,100	45,750	46,433	46,893	47,360	48,457	48,824

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-1
Page 1 of 4

Class	Forecasted (1992 Report) 1992	1993	1994	1995	1996	1997	1998	Basis of forecast
South Dakota								
Residential Service	34,823	35,263	35,708	36,158	36,602	37,060	37,522	1.25% Growth
Residential - Water Heating (1)								Included in Residential
Residential - All Electric	5,844	5,844	5,844	5,844	5,844	5,844	5,844	0.00% Growth
Residential - Demand	1,187	1,252	1,325	1,398	1,478	1,565	1,665	8.00% Growth
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	41,859	42,359	42,937	43,600	44,062	44,549	45,252	
General Service	6,756	6,868	6,926	7,013	7,101	7,190	7,280	1.25% Growth
General Service - Large	102	106	110	114	119	124	129	4.00% Growth
General Service - All Electric	535	547	558	569	580	592	604	2.00% Growth
General Service - Utility Controlled	23	22	24	26	29	32	35	10.00% Growth
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping	25	26	27	28	29	30	31	4.00% Growth
Industrial	30	31	32	33	34	35	36	4.00% Growth
Industrial - Contract	3	3	3	3	3	3	3	0.00% Growth
Industrial - Curtailable								
Total Commercial & Industrial Sales	7,472	7,575	7,680	7,786	7,895	8,006	8,118	
Street Lighting	27	28	29	30	31	32	33	2.00% Growth
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	27	28	29	30	31	32	33	
Municipal Pumping	82	84	86	88	90	92	94	2.00% Growth
Total Customers	49,440	50,026	50,728	51,394	52,078	52,779	53,497	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

the Residential rate class over the long term. Growth of approximately 1.25 percent annually is expected in the General Service class as well as in the Residential Service class. The South Dakota customer growth rate in the 1992 forecast is essentially the same as the 1990 forecast.

The customer base for the Wyoming and Montana jurisdictions is projected to remain constant through 1998. In both of these jurisdictions, the historical long term decline appears to be leveling. The current projections for the Montana and Wyoming jurisdictions vary from the 1988 and 1990 forecasts principally due to the assumption in the these forecasts that economic conditions in these areas would level off or improve. These assumptions have thus far been too optimistic.

Total Company average number of customers is the sum of the average number of customers in each of the three jurisdictions. The equivalent annual compound growth rate in total Company average number of customers is forecasted to be approximately 1.25 percent. Total Company average number of customers is forecasted to increase from 51,279 in 1992 to 55,952 in 1998.

Historical, 1988 Forecasts, 1990 Forecasts, and 1992 Forecasts are graphically illustrated for total customers by jurisdiction and for the Total Company in Appendix E.

Black Hills Power & Light Company
Average Number of Customers Forecast
8-Apr-92

Table 6-I
Page 3 of 4

Class	Forecasted (1988 Report)					Forecasted (1990 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996
Retail Details												
Residential Service	33,481	34,370	34,670	35,280	35,901	33,673	34,310	34,350	34,594	35,041	35,391	35,745
Residential - Water Heating (1)												
Residential - All Electric	5,125	5,228	5,352	5,468	5,566	5,389	5,389	5,389	5,389	5,389	5,389	5,389
Residential - Propane	483	493	525	713	812	835	919	1,011	1,112	1,223	1,345	1,480
Residential - Energy Storage	1	1	1	1	1	3	3	3	3	3	3	3
Residential - Utility Controlled	1	1	1	1	1	3	3	3	3	3	3	3
Total Residential	43,292	44,860	45,550	47,463	48,281	45,497	46,918	48,350	48,735	49,253	49,725	50,214
General Service	6,436	6,583	6,682	6,782	6,884	6,579	6,645	6,711	6,778	6,846	6,914	6,983
General Service - Large	95	97	99	101	104	93	93	93	93	93	93	93
General Service - All Electric	468	485	503	521	540	522	522	543	554	565	576	588
General Service - Utility Controlled	13	13	13	13	13	13	13	13	13	13	13	13
General Service - Curtailable												
Area Lighting (2)												
Energy Storage Service	1	1	1	1	1	3	3	3	3	0	0	0
Irrigation Pumping	14	14	14	14	14	15	15	15	15	15	15	15
Industrial	23	23	23	23	23	24	24	24	24	24	24	24
Industrial - Contract	2	2	2	2	2	3	3	3	3	3	3	3
Industrial - Curtailable												
Total Commercial & Industrial Sales	7,099	7,215	7,334	7,454	7,578	7,249	7,325	7,402	7,480	7,559	7,638	7,719
Street Lighting	23	23	23	23	23	24	24	24	24	24	24	24
Customer-Owned Street Lighting	7	7	7	7	7	0	0	0	0	0	0	0
Traffic Signals (3)												
Total Public Street Lighting Sales	30	30	30	30	30	24	24	24	24	24	24	24
Municipal Pumping	74	74	74	74	74	74	74	74	74	74	74	74
Total Customers	50,495	49,179	49,008	50,021	50,963	47,844	48,341	48,850	49,373	49,910	50,461	51,031

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-1
Page 4 of 4

Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1992	1988-1992	1989-1992	1990-1992
South Dakota							
Residential Service	0.80%	1.06%	1.10%	1.12%	1.35%	1.57%	0.95%
Residential - Water Heating (1)							
Residential - All Electric	2.07%	0.93%	-0.12%	-0.73%	-1.22%	-1.22%	-1.10%
Residential - Demand	53.44%	32.33%	28.23%	26.68%	22.35%	20.33%	19.85%
Residential - Energy Storage							
Residential - Utility Controlled							
Total Residential	1.31%	1.38%	1.25%	1.25%	1.36%	1.55%	1.09%
General Service	0.55%	1.46%	1.17%	1.09%	1.08%	1.31%	-1.29%
General Service - Large	3.06%	2.06%	0.62%	1.32%	1.04%	2.65%	5.38%
General Service - All Electric	7.42%	6.06%	4.02%	3.81%	3.18%	1.26%	-0.19%
General Service - Utility Controlled	57.03%	31.55%	20.79%	15.83%	11.46%	17.67%	12.50%
General Service - Curtailable							
Area Lighting (2)							
Energy Storage Service							
Irrigation Pumping	-1.23%	8.92%	9.86%	14.42%	19.66%	26.49%	4.35%
Industrial	-0.81%	5.66%	3.86%	5.97%	8.03%	9.92%	0.00%
Industrial - Contract	8.45%	8.45%	8.45%	10.67%	0.00%	0.00%	0.00%
Industrial - Curtailable							
Total Commercial & Industrial Sales	1.29%	1.82%	1.61%	1.35%	1.32%	1.16%	-1.07%
Street Lighting	0.45%	2.48%	2.46%	3.11%	-2.44%	4.08%	0.00%
Customer-Owned Street Lighting							
Traffic Signals (3)							
Total Public Street Lighting Sales	-6.35%	-2.82%	-2.82%	-3.51%	-2.44%	4.08%	0.00%
Municipal Pumping	0.27%	0.52%	1.63%	1.97%	4.06%	3.98%	2.55%
Total Customers	1.32%	1.45%	1.31%	1.26%	1.35%	1.53%	0.76%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

...ck Hills Power & Light Company
...erage Number of Customers Forecast
...ber 1992

Table 6-2
Page 1 of 4

Class	Actual 1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Heating												
Residential Service	1,108	1,159	1,268	1,342	1,303	1,365	1,705	1,741	1,587	1,551	1,533	1,525
Residential - Water Heating (1)	783	796	3	3	3	3	3	3	3	3	3	3
Residential - All Electric	195	217	257	277	285	298	289	277	274	276	275	271
Residential - Demand	9	9	9	9	9	9	9	12	15	16	15	15
Residential - Energy Storage	3	3	3	3	3	3	3	3	3	3	3	3
Residential - Utility Controlled	3	3	3	3	3	3	3	3	3	3	3	3
Total Residential	2,091	2,172	2,225	2,319	2,295	2,369	2,994	2,031	1,977	1,943	1,924	1,915
General Service	437	440	432	435	419	433	425	427	429	434	429	434
General Service - Large	3	3	3	3	3	3	4	4	4	5	5	5
General Service - All Electric	24	23	23	23	21	33	33	30	29	27	25	25
General Service - Utility Controlled	3	3	3	3	3	3	3	3	3	3	1	1
General Service - Curtailable	3	3	3	3	3	3	3	3	3	3	3	3
Area Lighting (2)	3	3	3	3	3	3	3	3	3	1	3	3
Energy Storage Service	3	3	3	3	3	3	3	3	3	3	3	3
Irrigation Pumping	3	3	3	3	3	3	3	3	3	3	3	3
Industrial	10	9	3	8	8	5	5	5	7	7	7	7
Industrial - Contract	3	3	3	3	3	3	3	3	3	3	3	3
Industrial - Curtailable	3	3	3	3	3	2	2	2	3	3	3	3
Total Commercial & Industrial Sales	474	480	472	475	481	477	471	469	469	473	478	473
Street Lighting	4	3	3	3	3	3	3	3	5	5	5	5
Customer-Owned Street Lighting	3	3	3	3	3	3	3	3	3	3	3	3
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	7	6	6	6	6	6	6	6	5	5	5	5
Municipal Pumping	3	3	3	5	5	5	4	4	4	3	3	3
Total Customers	2,575	2,661	2,708	2,705	2,687	2,857	2,575	2,510	2,455	2,424	2,410	2,396

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-2
Page 2 of 6

Class	Forecasted (1992 Report) 1992	1993	1994	1995	1996	1997	1998	Basis of Forecast
Wyoming								No Growth for entire state
Residential Service	1,626	1,626	1,626	1,626	1,626	1,626	1,626	
Residential - Water Heating (1)								
Residential - All Electric	271	271	271	271	271	271	271	
Residential - Demand	18	18	18	18	18	18	18	
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	1,915	1,915	1,915	1,915	1,915	1,915	1,915	
General Service	434	434	434	434	434	434	434	
General Service - Large	5	5	5	5	5	5	5	
General Service - All Electric	25	25	25	25	25	25	25	
General Service - Utility Controlled	1	1	1	1	1	1	1	
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping								
Industrial	7	7	7	7	7	7	7	
Industrial - Contract								
Industrial - Curtailable								
Total Commercial & Industrial Sales	473	473	473	473	473	473	473	
Street Lighting	5	5	5	5	5	5	5	
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	5	5	5	5	5	5	5	
Municipal Pumping	3	3	3	3	3	3	3	
Total Customers	2,396	2,396	2,396	2,396	2,396	2,396	2,396	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
13-Apr-92

Table 6-2
Page 3 of 4

Class	Forecasted (1988 Report)					Forecasted (1990 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996
Existing												
Residential Service	1,783	1,785	1,807	1,830	1,853	1,551	1,551	1,551	1,551	1,551	1,551	1,551
Residential - Water Heating (1)												
Residential - All Electric	288	299	310	322	334	276	276	276	276	276	276	276
Residential - Demand	15	18	22	27	33	16	16	16	16	16	16	16
Residential - Energy Storage	1	1	1	1	1	0	0	0	0	0	0	0
Residential - Utility Controlled												
Total Residential	2,087	2,103	2,140	2,180	2,221	1,843	1,843	1,843	1,843	1,843	1,843	1,843
General Service	427	427	427	427	427	434	434	434	434	434	434	434
General Service - Large	4	4	4	4	4	5	5	5	5	5	5	5
General Service - All Electric	20	20	20	20	20	27	27	27	27	27	27	27
General Service - Utility Controlled												
General Service - Curtailable												
Area Lighting (2)												
Energy Storage Service												
Irrigation Pumping												
Industrial	5	5	5	5	5	7	7	7	7	7	7	7
Industrial - Contract												
Industrial - Curtailable	2	2	2	2	2	0	0	0	0	0	0	0
Total Commercial & Industrial Sales	469	469	469	469	469	473	473	473	473	473	473	473
Street Lighting	3	3	3	3	3	5	5	5	5	5	5	5
Customer-Owned Street Lighting	3	3	3	3	3	0	0	0	0	0	0	0
Traffic Signals (3)												
Total Public Street Lighting Sales	6	6	6	6	6	5	5	5	5	5	5	5
Municipal Pumping	4	4	4	4	4	3	3	3	3	3	3	3
Total Customers	2,566	2,582	2,619	2,659	2,700	2,424	2,424	2,424	2,424	2,424	2,424	2,424

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
98-for-92

Table 6-2
Page 4 of 8

Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991
Wyoming							
Residential Service	-2.85%	-2.62%	-1.96%	-1.69%	-1.23%	-0.76%	-0.43%
Residential - Water Heating (1)							
Residential - All Electric	-3.64%	-1.55%	-1.28%	-0.35%	-0.37%	-0.91%	-1.45%
Residential - Demand	24.11%	25.19%	14.87%	10.67%	4.50%	5.07%	12.50%
Residential - Energy Storage							
Residential - Utility Controlled							
Total Residential	-2.51%	-2.37%	-1.77%	-1.46%	-1.06%	-0.72%	-0.47%
General Service	-0.23%	0.26%	1.37%	1.61%	0.39%	0.00%	-1.14%
General Service - Large	10.76%	10.76%	8.45%	10.69%	14.47%	9.54%	20.06%
General Service - All Electric	-2.73%	-4.66%	-5.40%	-4.46%	-4.83%	-3.77%	-3.85%
General Service - Utility Controlled							
General Service - Curtailable							
Area Lighting (2)							
Energy Storage Service							
Irrigation Pumping							
Industrial	-2.64%	3.13%	3.13%	3.93%	0.00%	0.00%	0.00%
Industrial - Contract							
Industrial - Curtailable							
Total Commercial & Industrial Sales	-0.33%	0.04%	0.08%	0.21%	0.28%	0.00%	-1.05%
Street Lighting	10.76%	10.76%	10.76%	15.62%	0.00%	0.00%	0.00%
Customer-Owned Street Lighting							
Traffic Signals (3)							
Total Public Street Lighting Sales	-3.58%	-3.58%	-3.58%	-4.66%	0.00%	0.00%	0.00%
Municipal Pumping	-8.71%	-8.71%	-5.59%	-6.94%	-8.14%	0.00%	0.00%
Total Customers	2.04%	-1.93%	-1.43%	-1.15%	-0.81%	-0.55%	-0.36%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
Arkansas

Table 6-3
Page 1 of 4

Class	Actual											
	1980	81	82	1983	1984	1985	1986	1987	1988	1989	1990	1991
Arkansas												
Residential Service	56	51	49	51	49	46	43	32	27	27	23	20
Residential - Water Heating (1)	5	5	5	3	3	3	3	1	1	1	1	1
Residential - All Electric	1	2	3	3	3	3	3	3	3	3	3	3
Residential - Seasonal	1	1	2	2	2	2	2	1	1	1	1	1
Residential - Energy Storage	1	1	1	1	1	1	1	1	1	1	1	1
Residential - Utility Controlled	1	1	1	1	1	1	1	1	1	1	1	0
Total Residential	65	63	61	61	59	56	53	39	34	34	29	26
General Service	22	17	19	20	21	20	21	17	15	15	15	14
General Service - Large	1	1	1	1	1	1	2	2	1	1	1	1
General Service - All Electric		1	1	1	1	1	1	1	1	2	2	2
General Service - Utility Controlled	1	1	1	1	1	1	1	1	1	1	1	1
General Service - Current Rate	1	1	1	1	1	1	0	1	1	0	0	0
Area Lighting (2)	1	1	1	1	1	1	1	1	1	1	1	1
Energy Storage Service	1	1	1	1	1	1	1	1	1	1	1	1
Irrigation Pumping	1	1	1	1	1	1	1	1	1	1	1	1
Industrial	10	5	5	5	5	5	5	3	3	3	3	3
Industrial - Contract	1	1	1	1	1	1	1	1	1	0	0	0
Industrial - Curtailable	1	1	1	1	1	1	1	1	1	0	0	0
Total Commercial & Industrial Sales	44	47	46	47	48	47	47	41	40	40	40	39
Street Lighting	1	1	0	0	0	0	0	0	0	0	0	0
Customer-Owned Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	1	1	0	0	0	0	0	0	0	0	0	0
Municipal Pumping	0	0	0	0	0	0	0	0	0	0	0	0
Total Customers	107	105	101	101	99	95	88	74	68	67	63	59

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-3
Page 2 of 4

Class	Forecasted (1992 Report) 1992	1993	1994	1995	1996	1997	1998	Basis of Forecast
Montana								% Growth for entire State
Residential Service	20	20	20	20	20	20	20	
Residential - Water Heating (1)								
Residential - All Electric								
Residential - Demand								
Residential - Energy Storage								
Residential - Utility Controlled								
Total Residential	20	20	20	20	20	20	20	
General Service	34	34	34	34	34	34	34	
General Service - Large								
General Service - All Electric	2	2	2	2	2	2	2	
General Service - Utility Controlled								
General Service - Curtailable								
Area Lighting (2)								
Energy Storage Service								
Irrigation Pumping								
Industrial	3	3	3	3	3	3	3	
Industrial - Contract								
Industrial - Curtailable								
Total Commercial & Industrial Sales	39	39	39	39	39	39	39	
Street Lighting								
Customer-Owned Street Lighting								
Traffic Signals (3)								
Total Public Street Lighting Sales	0	0	0	0	0	0	0	
Municipal Pumping								
Total Customers	59	59	59	59	59	59	59	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
13-Apr-92

Table 6-3
Page 3 of 4

Class	Forecasted (1988 Report)					Forecasted (1990 Report)						
	1988	1989	1990	1991	1992	1990	1991	1992	1993	1994	1995	1996
Montana												
Residential Service	33	33	33	33	33	27	27	27	27	27	27	27
Residential - Water Heating (1)												
Residential - All Electric												
Residential - Demand												
Residential - Energy Storage												
Residential - Utility Controlled												
Total Residential	33	33	33	33	33	27	27	27	27	27	27	27
General Service	37	37	37	37	37	35	35	35	35	35	35	35
General Service - Large												
General Service - All Electric	1	1	1	1	1	2	2	2	2	2	2	2
General Service - Utility Controlled												
General Service - Curtailable												
Area Lighting (2)												
Energy Storage Service												
Irrigation Pumping												
Industrial	3	3	3	3	3	3	3	3	3	3	3	3
Industrial - Contract												
Industrial - Curtailable												
Total Commercial & Industrial Sales	41	41	41	41	41	40	40	40	40	40	40	40
Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Customer-Owned Street Lighting	0	0	0	0	0	0	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	0	0	0	0	0	0	0	0	0	0	0	0
Municipal Pumping	0	0	0	0	0	0	0	0	0	0	0	0
Total Customers	74	74	74	74	74	67	67	67	67	67	67	67

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991
Montana							
Residential Service	-11.26%	-12.94%	-12.94%	-11.09%	-9.52%	-13.33%	-13.04%
Residential - Water Heating (1)							
Residential - All Electric							
Residential - Demand							
Residential - Energy Storage							
Residential - Utility Controlled							
Total Residential	-11.94%	-13.69%	-13.27%	-11.77%	-10.61%	-13.93%	-13.04%
General Service	-3.11%	-2.84%	-3.68%	-2.09%	-0.95%	-1.44%	-2.65%
General Service - Large							
General Service - All Electric	14.87%	14.87%	14.87%	18.32%	0.00%	0.00%	0.00%
General Service - Utility Controlled							
General Service - Curtailable							
Area Lighting (2)							
Energy Storage Service							
Irrigation Pumping							
Industrial	-12.94%	-12.94%	-9.71%	0.00%	0.00%	0.00%	0.00%
Industrial - Contract							
Industrial - Curtailable							
Total Commercial & Industrial Sales	-3.58%	-3.17%	-3.66%	-1.24%	-0.84%	-1.25%	-2.50%
Street Lighting							
Customer-Owned Street Lighting							
Traffic Signals (3)							
Total Public Street Lighting Sales							
Municipal Pumping							
Total Customers	-7.51%	-7.89%	-7.68%	-5.51%	-4.62%	-6.15%	-6.35%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Gulf Power & Light Company
Average Number of Customers Forecast
1-Apr-87

Table 6-4
Page 1 of 4

Class	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total Company																
Residential Service	35,626	36,671	37,718	38,687	39,791	41,229	42,410	43,575	44,757	45,918	46,729	47,584				
Residential - Water Heating (1)	1,285	1,342	1,539	0	0	0	0	0	0	0	0	0				
Residential - All Electric	1,252	1,175	1,153	1,515	1,532	1,540	1,559	1,583	1,558	1,555	1,184	1,115				
Residential - Demand	0	0	0	18	26	121	126	136	145	175	133	117				
Residential - Energy Storage	0	0	0	0	0	0	0	0	0	0	0	0				
Residential - Utility Controlled	0	0	0	0	0	0	0	0	0	0	0	0				
Total Residential	38,163	39,189	40,410	40,220	41,349	42,890	44,095	45,294	46,460	47,648	48,356	48,849	49,282	49,715	50,148	50,581
General Service	6,434	6,659	6,894	6,821	6,892	6,960	7,064	7,154	7,325	7,483	7,224	7,241				
General Service - Large	72	73	73	83	83	87	89	97	99	98	98	104				
General Service - All Electric	559	533	465	532	593	626	665	683	709	681	654	652				
General Service - Utility Controlled	0	0	0	0	0	5	7	10	13	13	17	19				
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0				
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0				
Energy Storage Service	0	0	0	0	0	0	0	0	0	0	0	0				
Irrigation Pumping	15	15	15	15	15	15	15	14	14	15	23	24				
Industrial	45	40	39	35	39	34	35	32	33	34	39	39				
Industrial - Contract	2	2	2	2	2	2	2	2	2	0	0	0				
Industrial - Curtailable	0	0	0	0	0	2	2	2	2	3	3	1				
Total Commercial & Industrial Sales	7,138	7,202	7,353	7,148	7,225	7,331	7,390	7,495	7,596	7,587	7,369	7,883	8,396	8,909	9,422	9,935
Street Lighting	27	25	27	25	26	25	25	25	33	29	31	31				
Customer-Owned Street Lighting	8	8	10	10	10	10	10	10	0	0	0	0				
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0				
Total Public Street Lighting Sales	35	34	37	35	36	36	35	35	33	29	31	31				
Municipal Pumping	82	89	79	80	78	81	80	78	75	77	81	83				
Total Customers	45,823	45,935	48,047	45,497	47,151	47,852	48,413	49,017	49,616	49,851	50,930	51,279	51,795	52,308	52,821	53,334

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-4
Page 2 of 4

Class	Forecasted (1992 Report) 1992	1993	1994	1995	1996	1997	1998	Basis of Forecast
Total Company								
Residential Service	36,474	36,909	37,350	37,796	38,248	38,706	39,169	
Residential - Water Heating (1)	3	0	3	3	3	3	3	
Residential - All Electric	5,115	5,115	5,115	5,115	5,115	5,115	5,115	
Residential - Demand	1,205	1,308	1,403	1,514	1,934	1,793	1,303	
Residential - Energy Storage	3	3	3	3	3	3	3	
Residential - Utility Controlled	3	3	3	3	3	3	3	
Total Residential	43,794	44,324	44,868	45,425	45,997	46,584	47,187	
General Service	7,224	7,308	7,394	7,481	7,569	7,658	7,748	
General Service - Large	108	112	116	120	125	130	135	
General Service - All Electric	563	574	585	596	607	618	631	
General Service - Utility Controlled	21	23	25	27	29	31	35	
General Service - Curtailable	0	0	0	0	0	0	0	
Area Lighting (2)	0	0	0	0	0	0	0	
Energy Storage Service	0	0	0	0	0	0	0	
Irrigation Pumping	25	26	27	28	29	30	31	
Industrial	40	41	42	43	44	45	46	
Industrial - Contract	3	3	3	3	3	3	3	
Industrial - Curtailable	0	0	0	0	0	0	0	
Total Commercial & Industrial Sales	7,984	8,087	8,192	8,298	8,407	8,518	8,630	
Street Lighting	32	33	34	35	36	37	38	
Customer-Owned Street Lighting	0	0	0	0	0	0	0	
Traffic Signals (3)	0	0	0	0	0	0	0	
Total Public Street Lighting Sales	32	33	34	35	36	37	38	
Municipal Pumping	85	87	89	91	93	95	97	
Total Customers	51,895	52,531	53,183	53,849	54,533	55,234	55,952	

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
08-Apr-92

Table 6-4
Page 3 of 4

Class	Forecasted (1988 Report) 1988	1989	1990	1991	1992	Forecasted (1990 Report) 1990	1991	1992	1993	1994	1995	1996
Total Company												
Residential Service	35,277	35,888	36,510	37,143	37,787	35,151	35,688	36,028	36,372	36,719	37,069	37,423
Residential - Water Heating (1)	0	0	0	0	0	0	0	0	0	0	0	0
Residential - All Electric	6,414	6,537	6,662	6,790	6,920	6,255	6,255	6,255	6,255	6,255	6,255	6,255
Residential - Demand	498	568	648	740	845	851	935	1,027	1,128	1,239	1,351	1,496
Residential - Energy Storage	2	2	2	2	2	0	0	0	0	0	0	0
Residential - Utility Controlled	1	1	1	1	1	0	0	0	0	0	0	0
Total Residential	42,192	42,996	43,823	44,676	45,555	42,467	42,888	43,320	43,765	44,223	44,695	45,184
General Service	6,950	7,047	7,145	7,245	7,348	7,043	7,134	7,180	7,247	7,315	7,383	7,452
General Service - Large	99	101	103	105	108	98	98	98	98	98	98	98
General Service - All Electric	499	516	534	552	571	551	561	572	583	594	605	617
General Service - Utility Controlled	10	10	10	10	10	13	13	13	13	13	13	13
General Service - Curtailable	0	0	0	0	0	0	0	0	0	0	0	0
Area Lighting (2)	0	0	0	0	0	0	0	0	0	0	0	0
Energy Storage Service	1	1	1	1	1	0	0	0	0	0	0	0
Irrigation Pumping	14	14	14	14	14	15	15	15	15	15	15	15
Industrial	32	32	32	32	32	34	34	34	34	34	34	34
Industrial - Contract	2	2	2	2	2	3	3	3	3	3	3	3
Industrial - Curtailable	2	2	2	2	2	0	0	0	0	0	0	0
Total Commercial & Industrial Sales	7,609	7,725	7,844	7,964	8,088	7,762	7,838	7,915	7,993	8,072	8,151	8,232
Street Lighting	25	25	25	25	25	29	29	29	29	29	29	29
Customer-Owned Street Lighting	10	10	10	10	10	0	0	0	0	0	0	0
Traffic Signals (3)	0	0	0	0	0	0	0	0	0	0	0	0
Total Public Street Lighting Sales	36	36	36	36	36	29	29	29	29	29	29	29
Municipal Pumping	78	78	78	78	78	77	77	77	77	77	77	77
Total Customers	49,915	50,835	51,781	52,754	53,757	50,335	50,832	51,341	51,864	52,401	52,952	53,522

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Average Number of Customers Forecast
05-Apr-92

Table 6-4
Page 4 of 4

Class	Historical Growth Rates 1984-1989	1985-1990	1986-1991	1987-1991	1988-1991	1989-1991	1990-1991
Total Company							
Residential Service	3.60%	3.56%	3.63%	3.97%	3.22%	2.45%	0.56%
Residential - Water Heating (1)							
Residential - All Electric	1.94%	0.81%	-0.19%	-0.71%	-1.19%	-1.20%	-1.12%
Residential - Demand	43.61%	32.21%	27.93%	26.52%	21.64%	23.02%	19.72%
Residential - Energy Storage							
Residential - Utility Controlled							
Total Residential	3.10%	3.16%	3.14%	3.11%	2.24%	1.44%	1.01%
General Service	0.85%	1.25%	1.05%	1.33%	1.03%	1.11%	-1.29%
General Service - Large	3.38%	2.41%	3.99%	1.75%	1.55%	3.01%	5.12%
General Service - All Electric	6.78%	5.46%	3.49%	3.25%	2.74%	1.01%	-3.36%
General Service - Utility Controlled	57.03%	33.56%	22.16%	17.41%	13.48%	20.83%	11.78%
General Service - Curtailable							
Area Lighting (2)							
Energy Storage Service							
Irrigation Pumping	-1.25%	9.92%	9.86%	14.42%	19.58%	25.44%	4.35%
Industrial	-2.71%	2.78%	2.19%	5.07%	5.73%	7.03%	0.00%
Industrial - Contract	8.45%	8.45%	8.45%	10.67%	0.00%	0.00%	0.00%
Industrial - Curtailable							
Total Commercial & Industrial Sales	3.25%	3.68%	3.30%	3.27%	3.24%	3.27%	-1.08%
Street Lighting	2.21%	3.58%	3.58%	4.56%	-2.06%	3.31%	0.00%
Customer-Owned Street Lighting							
Traffic Signals (3)							
Total Public Street Lighting Sales	-4.22%	-2.95%	-2.95%	-3.67%	-2.06%	3.31%	0.25%
Municipal Pumping	-0.25%	0.00%	0.74%	1.52%	3.44%	1.81%	2.47%
Total Customers	3.12%	3.25%	3.18%	3.13%	3.24%	3.43%	0.35%

(1) Included with Residential
(2) Included with General Service
(3) Included with other classes

Black Hills Power & Light Company
Summary of Approximate Annual Growth Rates
South Dakota Jurisdiction
29-Apr-92

Class	1988 Report			1990 Report			1992 Report (Current)		
	Historical	Future	Use	Historical	Future	Use	Historical (3)	Future	Use
Residential + Residential Water Heat	1.99%	1.76%	1.76%	1.36%	1.69%	1.69%	2.35%	2.35%	2.35%
Residential All Electric	1.10%	1.83%	1.83%	1.27%	1.29%	1.29%	-0.15%	-0.19%	-0.19%
Residential Others	13.34%	13.86%	13.86%	12.53%	10.43%	10.43%	14.24%	7.84%	7.84%
General Service	1.57%	1.96%	1.50%	1.36%	2.92%	2.92%	4.76%	3.33%	3.33%
Large General Service	1.76%	1.51%	1.51%	4.43%	4.43%	4.43%	5.54%	3.71%	3.71%
General Service All Electric	1.41%	1.52%	1.52%	1.51%	1.59%	1.50%	1.38%	1.59%	1.59%
Area Lighting	-0.34%	0.53%	0.53%	-0.74%	-0.01%	-0.01%	-0.49%	-0.51%	-0.51%
General Service - Irrigation	1.11%	1.84%	0.84%	7.82%	-1.65%	-1.65%	12.04%	4.48%	4.48%
Other General Service	12.80%	3.00%	3.00%	16.38%	9.34%	9.34%	16.81%	3.92%	3.92%
Industrial (1) (4)	4.24%	-0.44%	1.00%	4.89%	3.60%	3.60%	10.91%	5.61%	5.61%
Contract Industrial (1) (5)	3.55%	3.28%	3.00%	8.58%	5.01%	3.00%	2.98%	2.35%	1.50%
Street Lighting (1)	3.34%	3.62%	1.76%	-1.30%	-0.12%	1.00%	-7.41%	1.61%	1.61%
Municipal Pumping	3.29%	1.92%	1.92%	3.55%	3.17%	2.00%	-1.25%	1.38%	1.38%
Total South Dakota	4.33%	2.40%	2.27%	4.81%	3.62%	3.13%	3.97%	3.07%	2.77%

(1) Growth rates do not reflect direct adjustments made to 1988 report.
(2) Statistically insignificant growth rate, actual year to year change is 0.
(3) Most recent five years.
(4) Base forecast increased by 215 Mwh per month in July 1992 and 420 Mwh per month in October 1992.
(5) Use for 1992 Forecast for 1993 and on. Use 2.35 percent for 1992.

Black Hills Power & Light Company
Summary of Approximate Annual Growth Rates
Wyoming Jurisdiction
01-Apr-92

Appendix A
Page 2 of 5

Class	1988 Report			1990 Report			1992 Report (Current)		
	Historical	Future	Use	Historical	Future	Use	Historical (4)	Future	Use
Residential	-1.99%	1.25%	1.25%	-1.36%	-0.04%	-0.34%	-1.66%	-0.47%	-0.61%
Residential All Electric	-1.13%	3.30%	2.85%	-1.29%	-1.49%	3.00%	-0.60%	-0.65%	-0.65%
Residential Others	20.17%	23.32%	23.32%	46.34%	5.31%	5.31%	8.82%	4.84%	4.84%
General Service	2.53%	1.06%	3.00%	2.64%	3.75%	3.75%	-2.53%	-4.06%	-4.06%
Large General Service	4.78%	3.06%	3.00%	6.63%	5.93%	5.93%	11.13%	5.79%	5.79%
General Service All Electric	-1.05%	2.25%	3.00%	-1.11%	-0.17%	-0.17%	-7.05%	-4.03%	-4.03%
Area Lighting	2.62%	3.00%	3.00%	-0.04%	-0.02%	-0.02%	-2.08%	-2.06%	-2.06%
Industrial (5)	2.34%	3.33%	3.33%	-0.54%	-0.52%	-0.52%	-0.11%	-0.11%	-0.11% (3)
Street Lighting (1),(2)	NA	NA	NA	-0.10%	3.35%	3.35%	-6.02%	-4.66%	-4.36%
Municipal Pumping	3.81%	4.06%	4.06%	1.00%	3.01%	3.01%	-4.97%	-0.32%	-0.33% (3)
Total Wyoming	2.67%	1.51%	3.34%	-0.14%	1.10%	1.15%	-0.87%	-0.15%	-0.06%

(1) Growth rates do not reflect direct adjustments made to 1988 report.
(2) Includes Customer-Owned Street Lighting and Traffic Signals.
(3) Small numbers are not statistically different from 0
(4) Most recent five years.
(5) Base forecast increased by 83 MWh/months in 1992, 33 MWh/months in 1993 and 110 MWh/months in July 1993.

Black Hills Power & Light Company
Summary of Appropriate Annual Growth Rates
Montana Jurisdiction
02-Mar-92

Class	1988 Report			1990 Report			1992 Report (Current)		
	Historical	Future	Use	Historical	Future	Use	Historical	Future	Use
			(1)				(3)		
Residential	-0.73%	0.15%	-0.00%	-13.29%	-0.07%	-0.07%	-14.76%	-0.23%	-0.23% (2)
General Service	3.55%	2.99%	-0.00%	-2.00%	0.03%	0.03%	-9.74%	0.15%	0.15% (2)
Industrial	-7.11%	-1.72%	0.00%	-8.67%	-28.27%	0.00%	-15.71%	-0.14%	-0.14% (2)
Area Lighting	0.12%	0.00%	0.00%	-1.04%	0.00%	0.00%	-7.05%	0.05%	0.05% (2)
Total Montana	-0.83%	-0.13%	0.65%	-8.53%	-25.25%	-0.02%	-15.50%	-0.13%	-0.13% (2)

(1) Signs are opposite to 1988 report due to small contribution to total of residential and general service and the statistical insignificance of the calculated growth rates.
(2) Small numbers are not statistically different from 0.
(3) Most recent five years.

Black Hills Power & Light Company
Calculation of Approximate Annual Growth Rates
Regression Outputs
Gillette, Wyoming Total Residences
12-Apr-93

	Historical Regression Output	Future Regression Output	Growth Rate Used
1988 Report	3.47%	7.66%	3.00% 1989-1999 2.50% 1990 to
1990 Report	1.40%	3.21%	1.21%

Historical Regression Output:

Constant	-1.24798675
Std Err of Y Est	0.010595180
R Squared	0.771975415
No. of Observations	53
Degrees of Freedom	51
X Coefficient(s)	0.001954019
Std Err of Coef.	0.000073407
Implied Monthly Growth Rate	1.002430
Implied Annual Growth Rate	1.029552
Annual Percentage Rate	2.96%

Future Regression Output:

Constant	-1.40299940
Std Err of Y Est	0.001488060
R Squared	0.998476959
No. of Observations	156
Degrees of Freedom	154
X Coefficient(s)	0.000840614
Std Err of Coef.	0.000002545
Implied Monthly Growth Rate	1.001938
Implied Annual Growth Rate	1.023499
Annual Percentage Rate	2.35%

2.35%

Black Hills Power and Light Company
Total Company Appropriate Annual Growth Rate
Regression Output
09-Apr-92

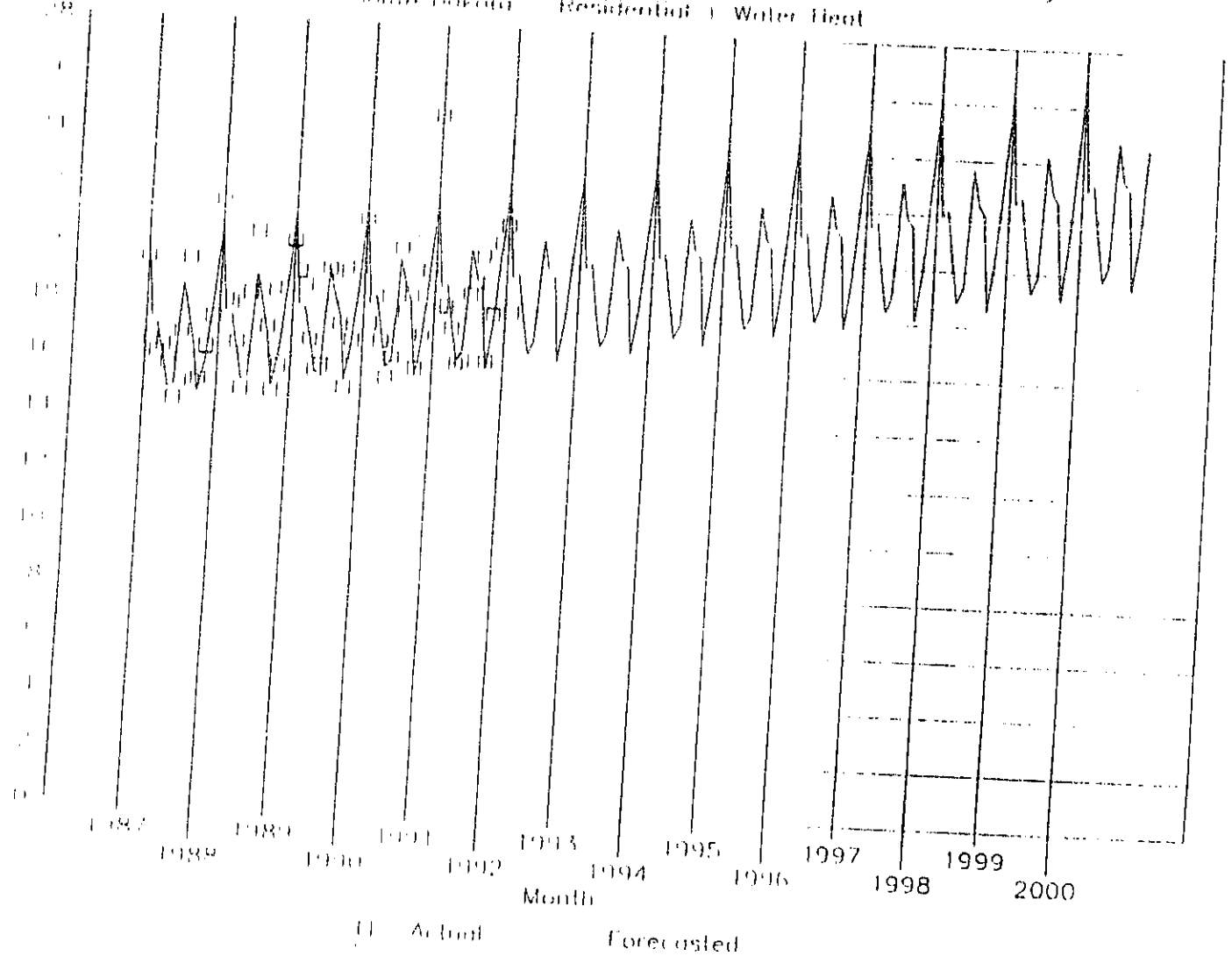
Historical Regression Output (1)		Annual Growth Rate
		%
With Gillette		
No meaningful figure available.		
Without Gillette		
Regression Output:		
Constant	7.917076025	
Std Err of Y Est	0.027113011	
R Squared	0.335011514	
No. of Observations	60	
Degrees of Freedom	58	
X Coefficient(s)	0.001052542	
Std Err of Coef.	0.000202116	
Implied Monthly Growth Rate	1.002519	
Implied Annual Growth Rate	1.030648	3.06%

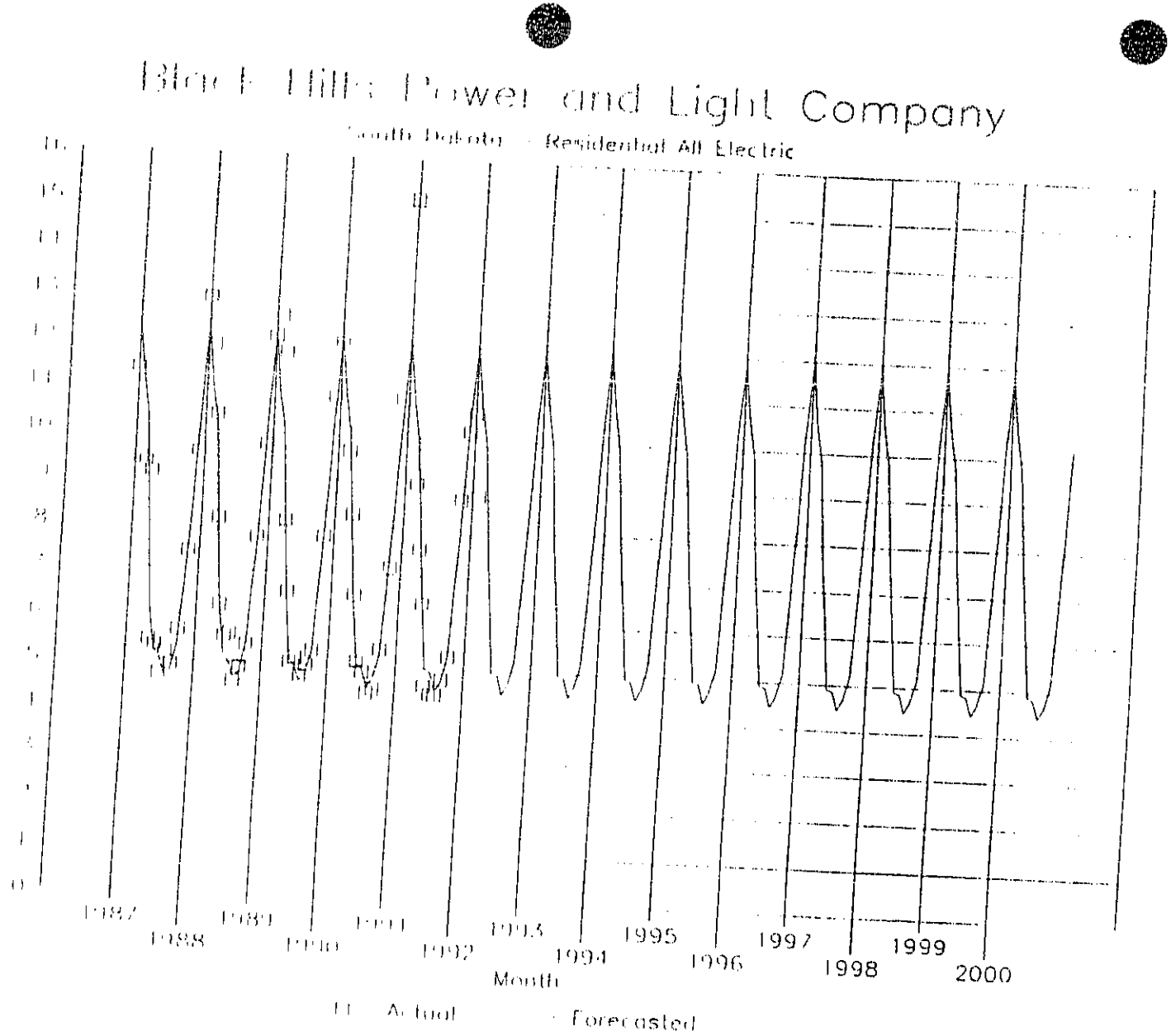
Future Regression Output (2)		Annual Growth Rate
		%
With Gillette		
Regression Output:		
Constant	7.994729216	
Std Err of Y Est	0.020141377	
R Squared	0.803555751	
No. of Observations	156	
Degrees of Freedom	154	
X Coefficient(s)	0.000898774	
Std Err of Coef.	0.000035809	
Implied Monthly Growth Rate	1.002072	
Implied Annual Growth Rate	1.025145	2.51%
Without Gillette		
Regression Output:		
Constant	7.948203978	
Std Err of Y Est	0.020886650	
R Squared	0.794875768	
No. of Observations	156	
Degrees of Freedom	154	
X Coefficient(s)	0.000907158	
Std Err of Coef.	0.000037134	
Implied Monthly Growth Rate	1.002091	
Implied Annual Growth Rate	1.025382	2.54%

(1) Last five years sales.
(2) Forecasted 1992 through 2004 sales.

Black Hills Power and Light Company

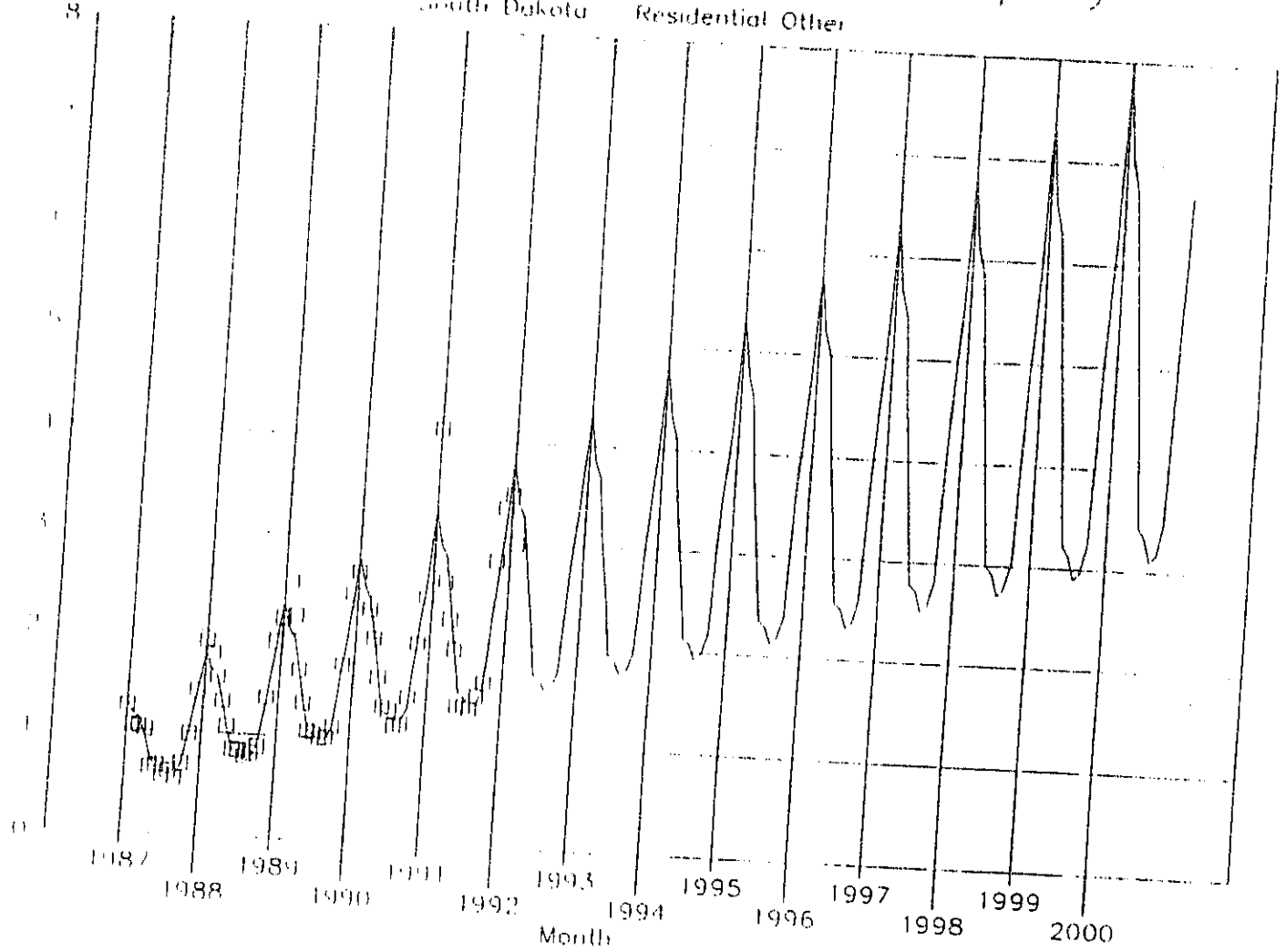
South Dakota Residential Water Heat



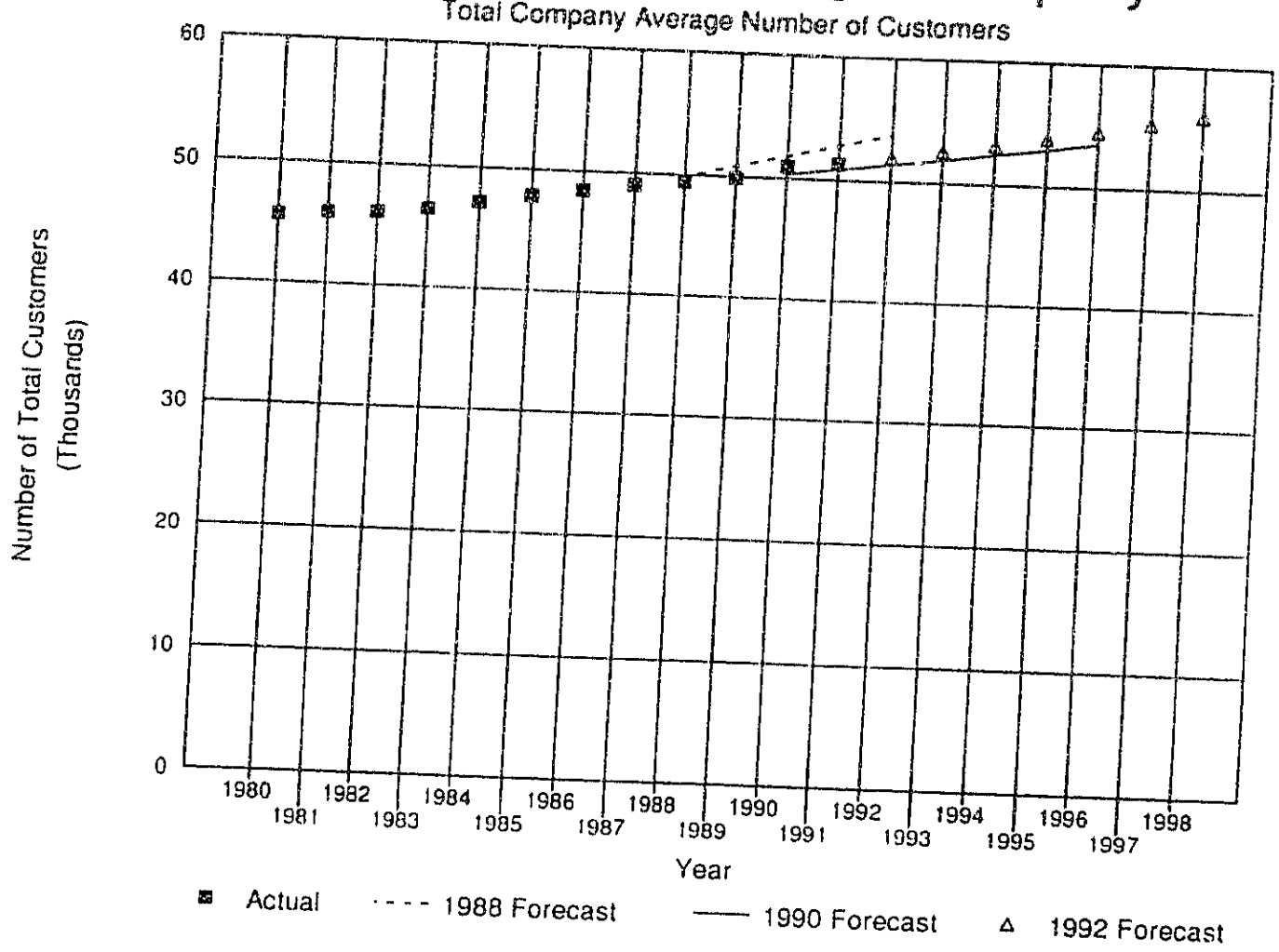

Black Hills Power and Light Company
South Dakota - Residential All Electric
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Black Hills Power and Light Company

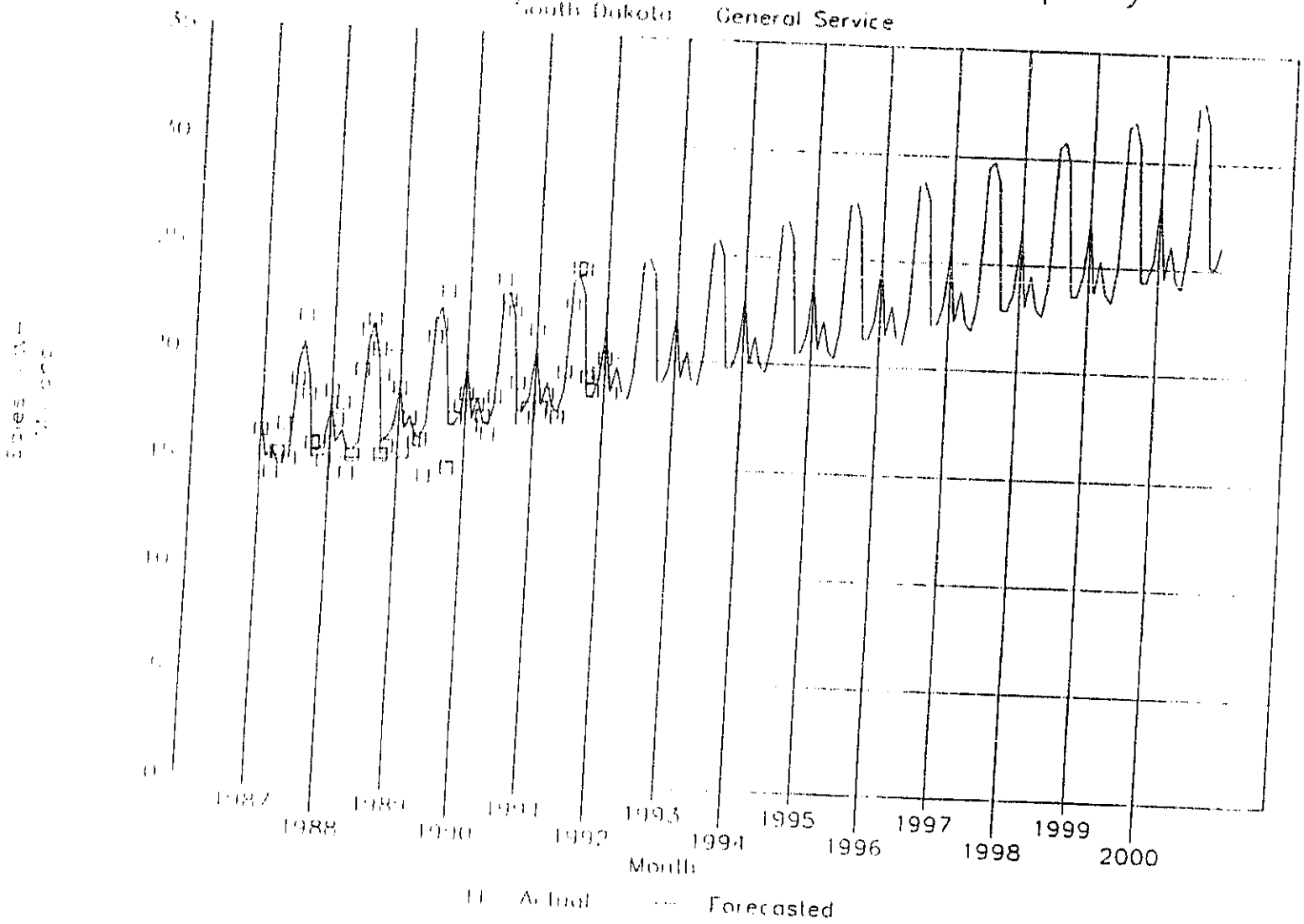
South Dakota Residential Other



Black Hills Power & Light Company

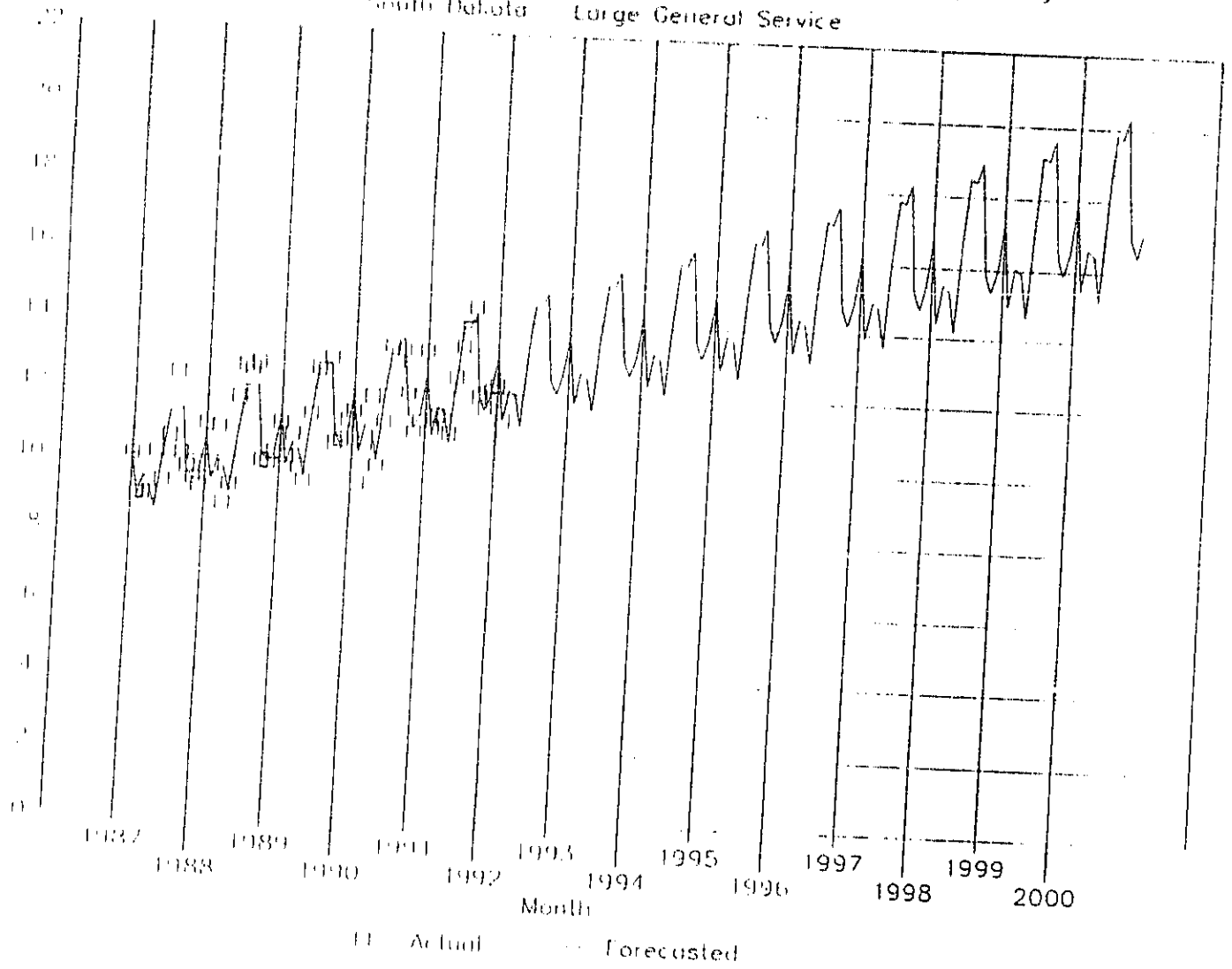


Black Hills Power and Light Company



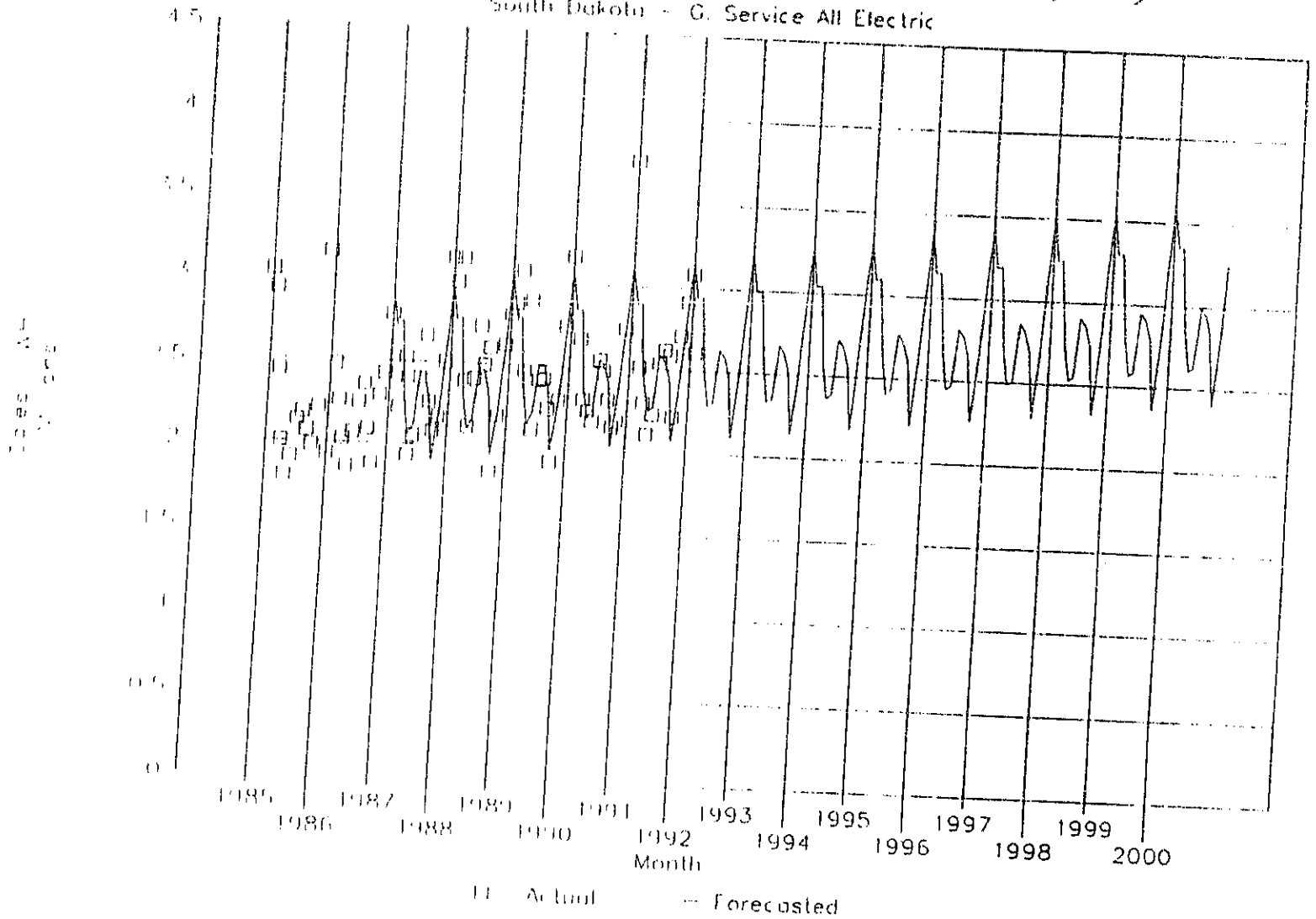
Black Hills Power and Light Company

South Dakota Large General Service



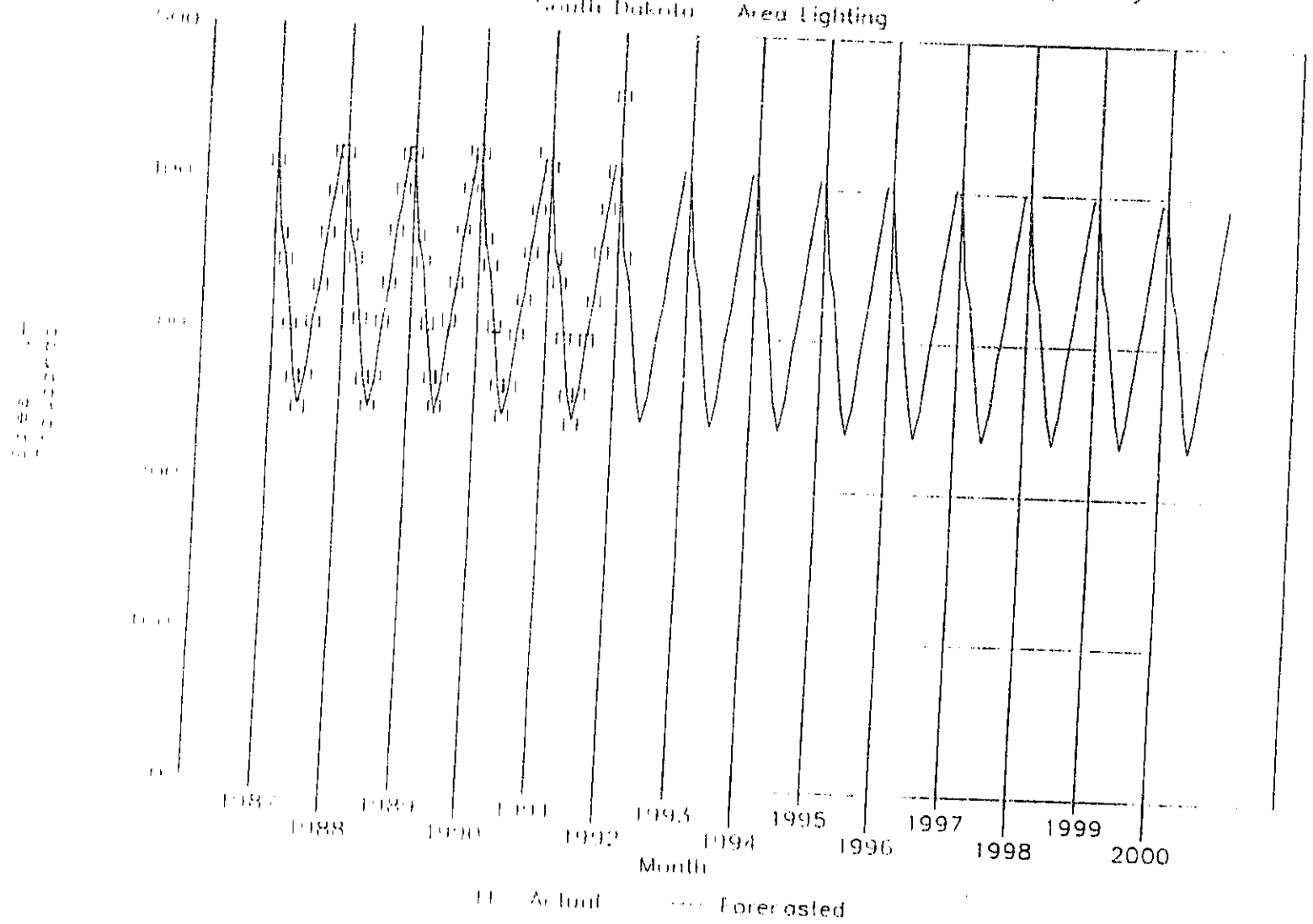
Black Hills Power and Light Company

South Dakota - G. Service All Electric



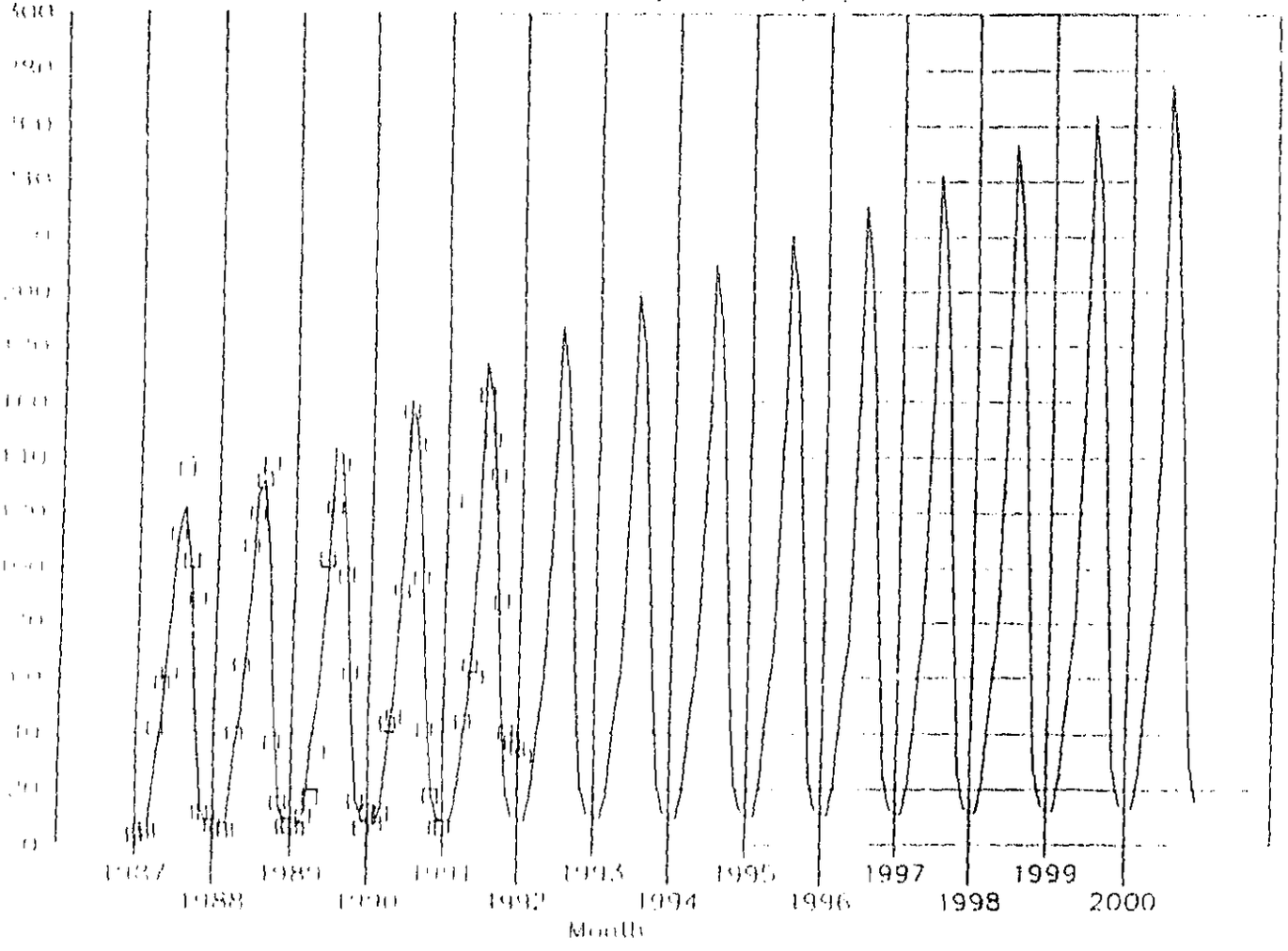
Black Hills Power and Light Company

South Dakota Area Lighting



Black Hills Power and Light Company

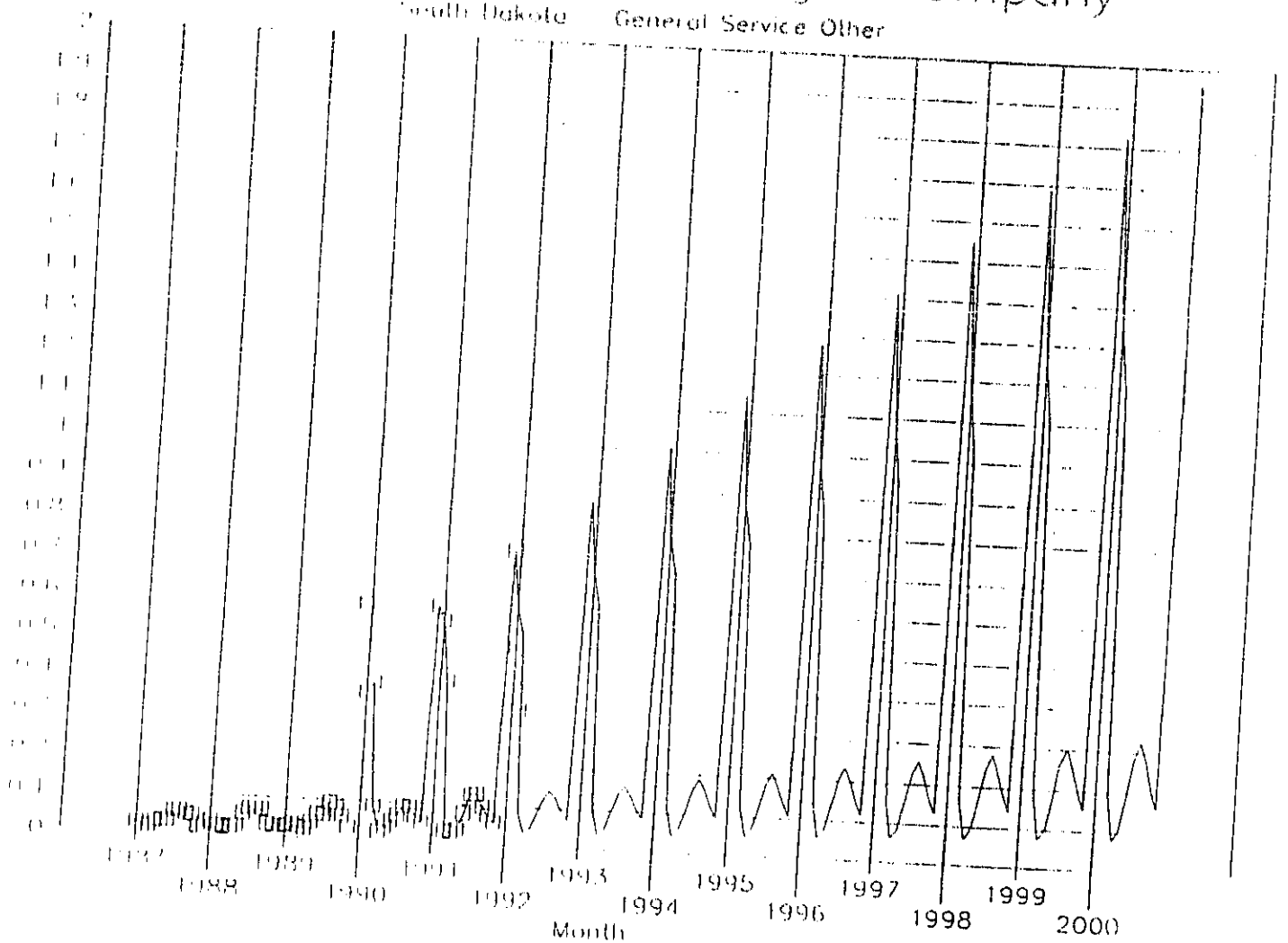
South Dakota - Irrigation Pumping

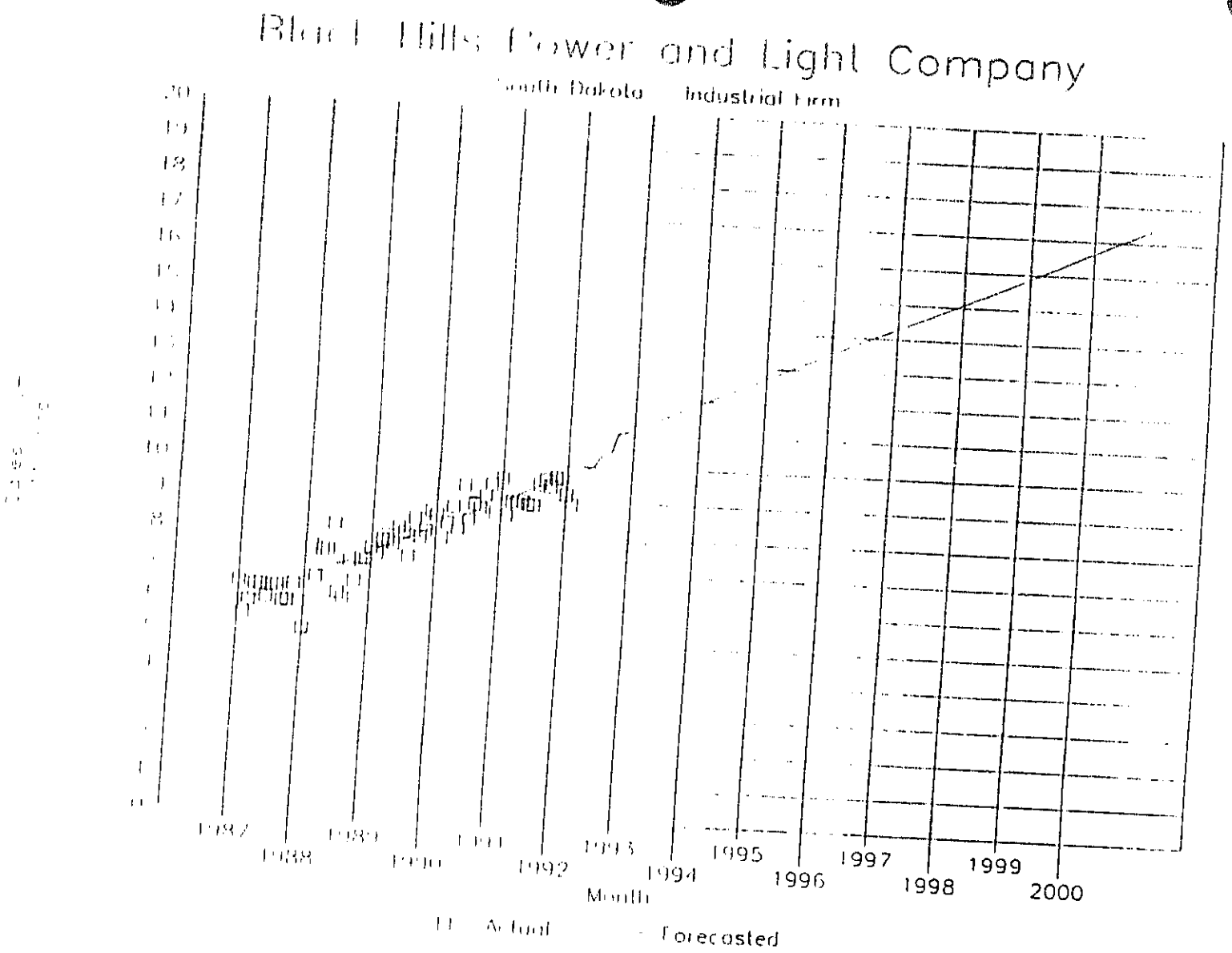


Actual - Forecasted

Black Hills Power and Light Company

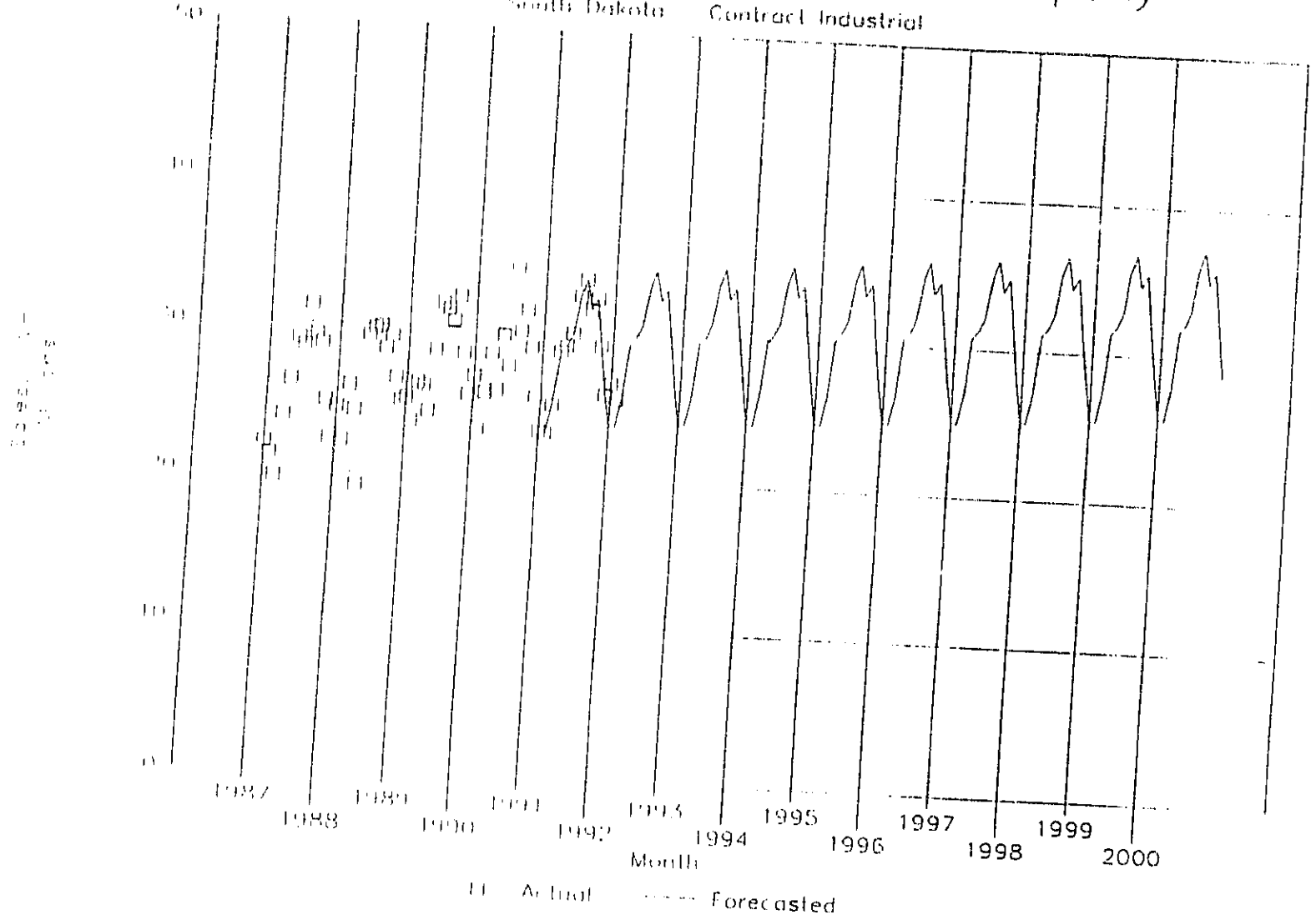
South Dakota General Service Other

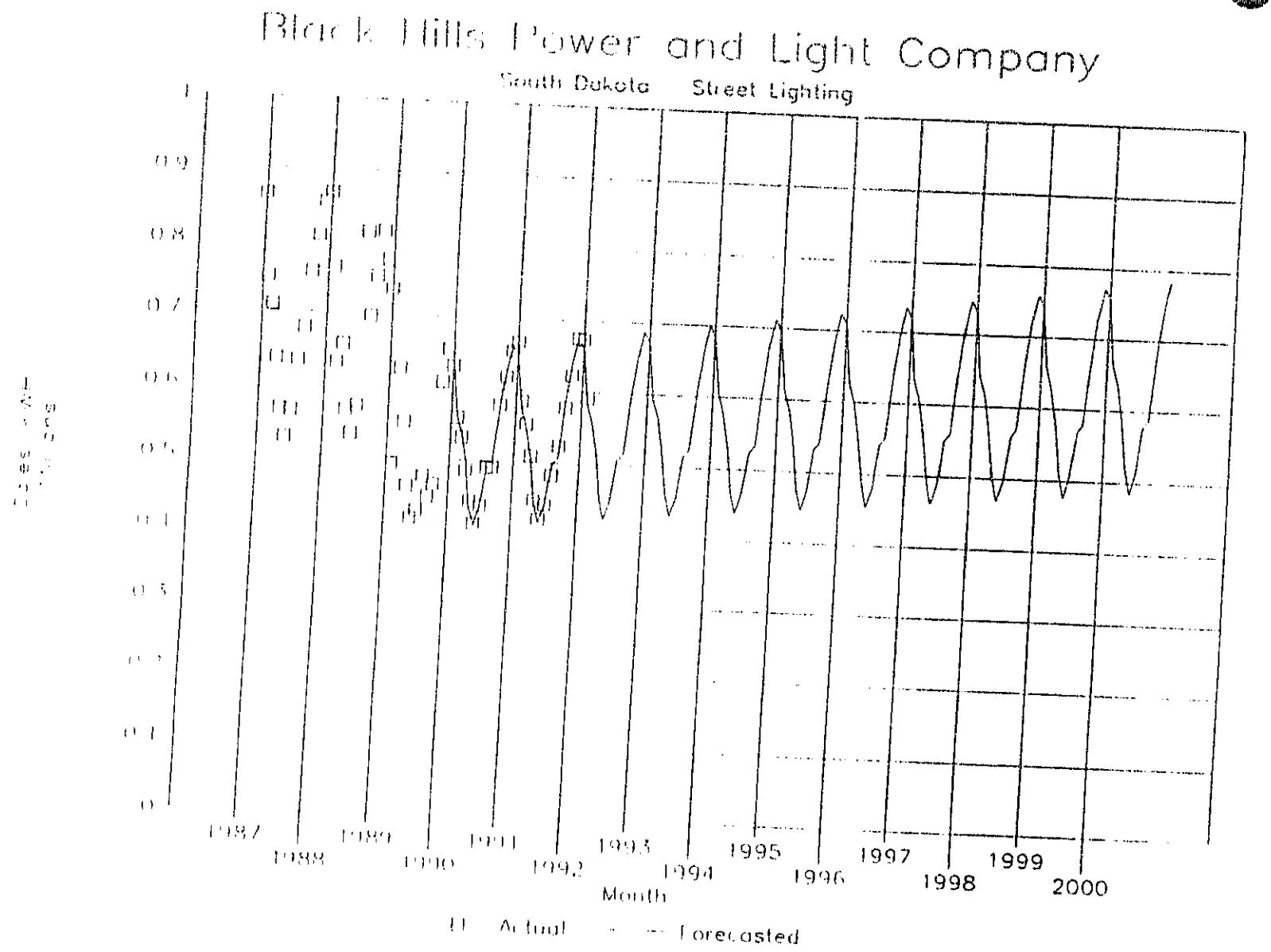



Black Hills Power and Light Company
South Dakota Industrial Firm
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Black Hills Power and Light Company

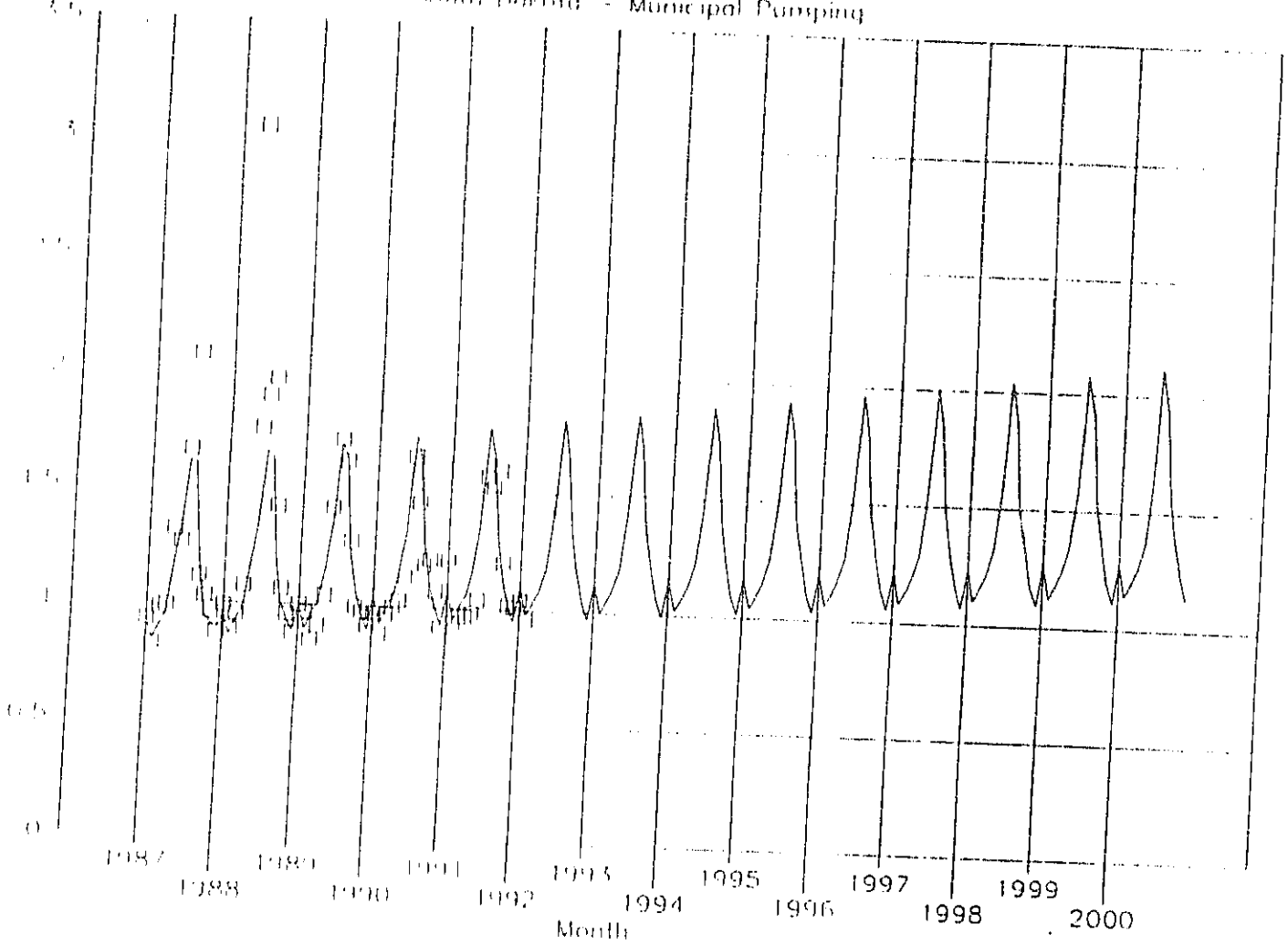
South Dakota Contract Industrial



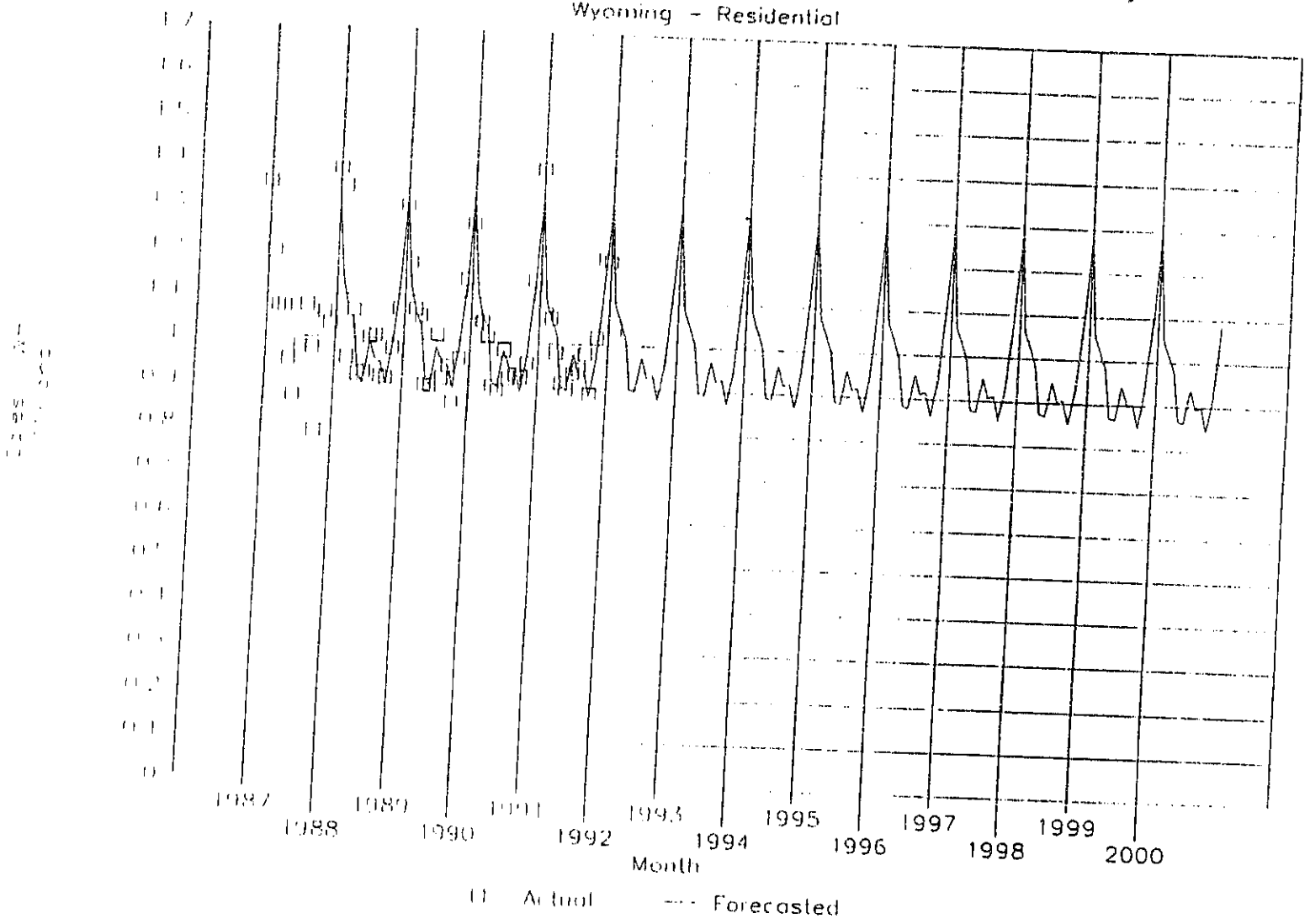

Black Hills Power and Light Company
South Dakota Street Lighting
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

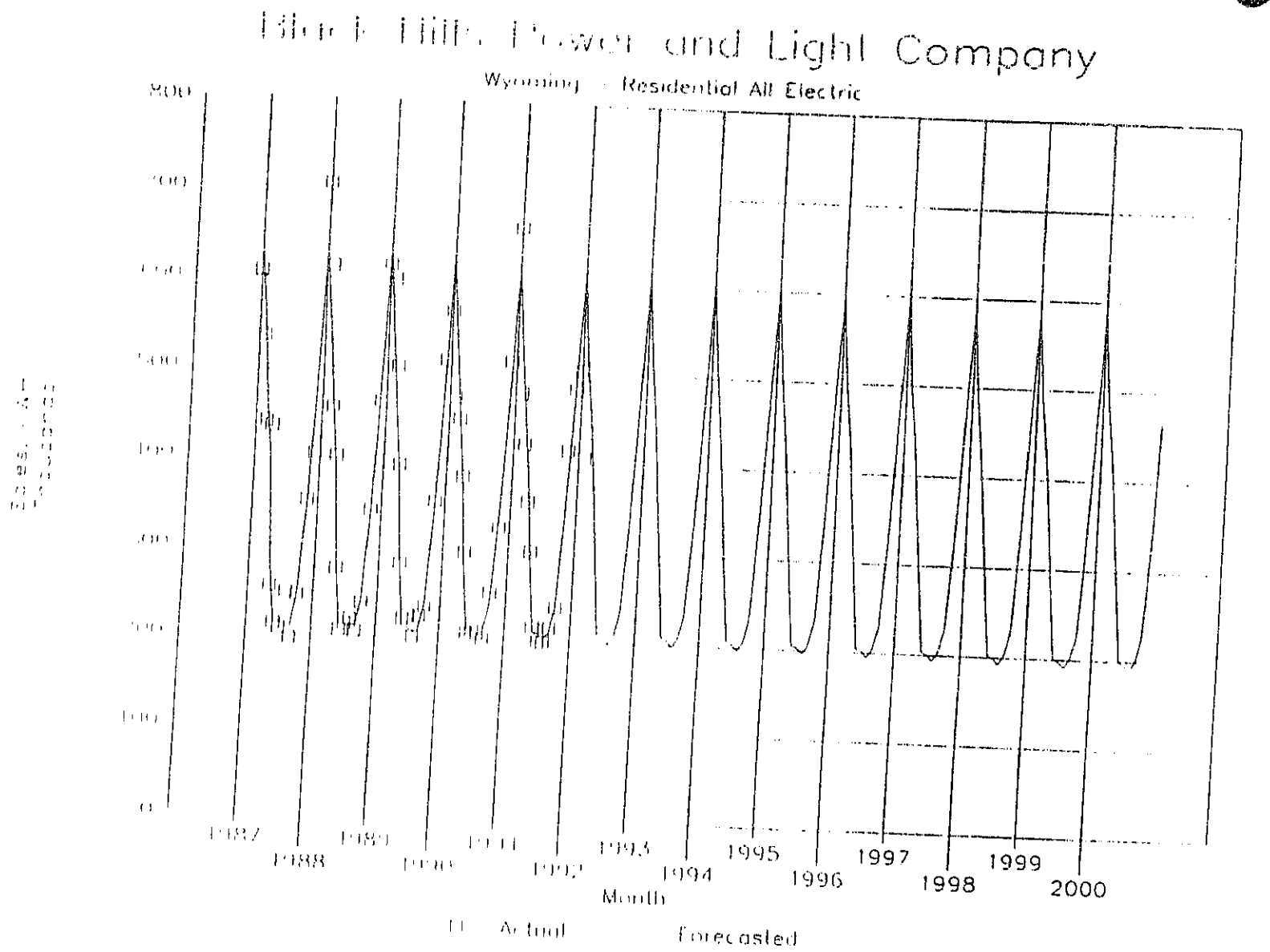
Black Hills Power and Light Company

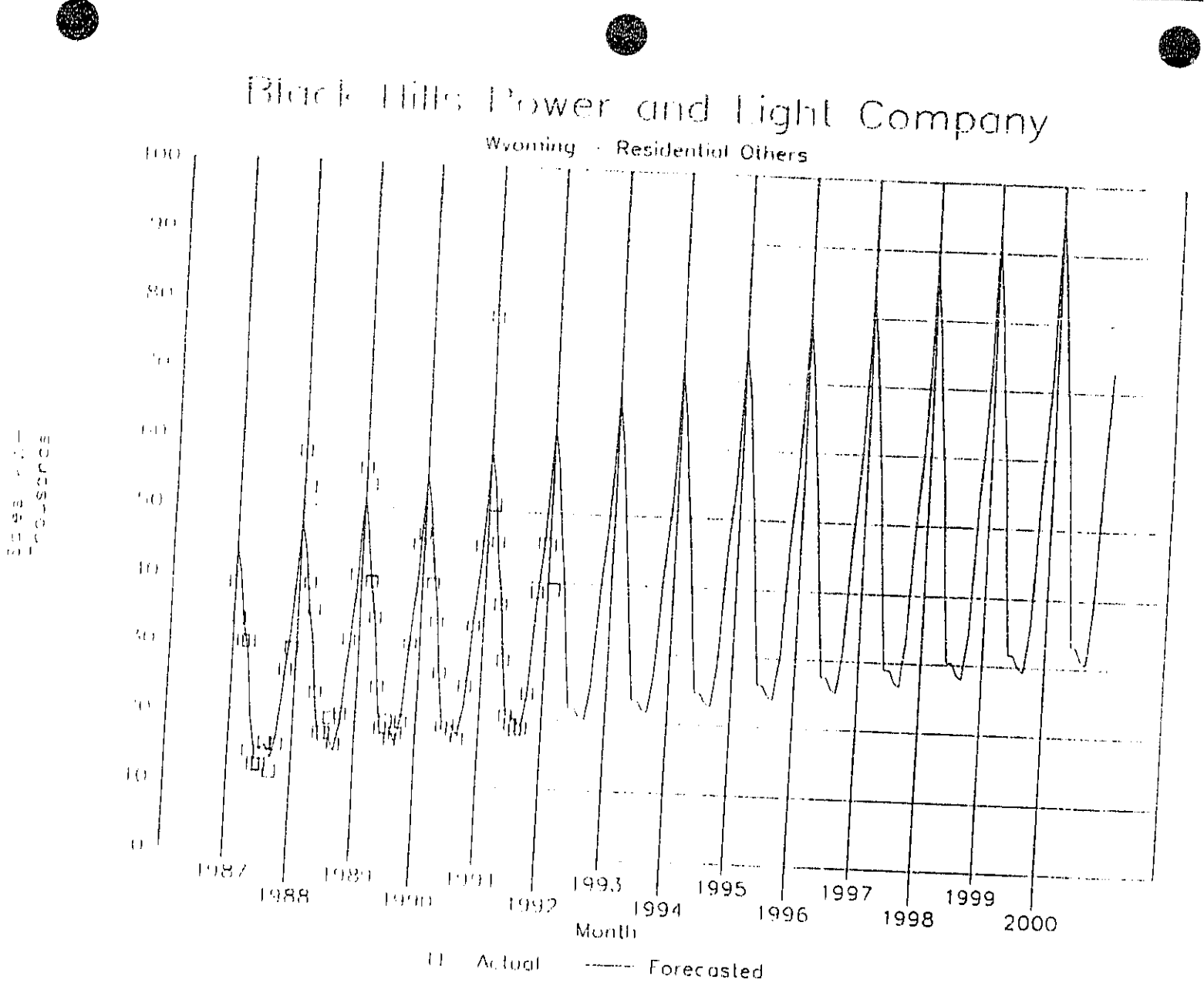
South Dakota - Municipal Pumping



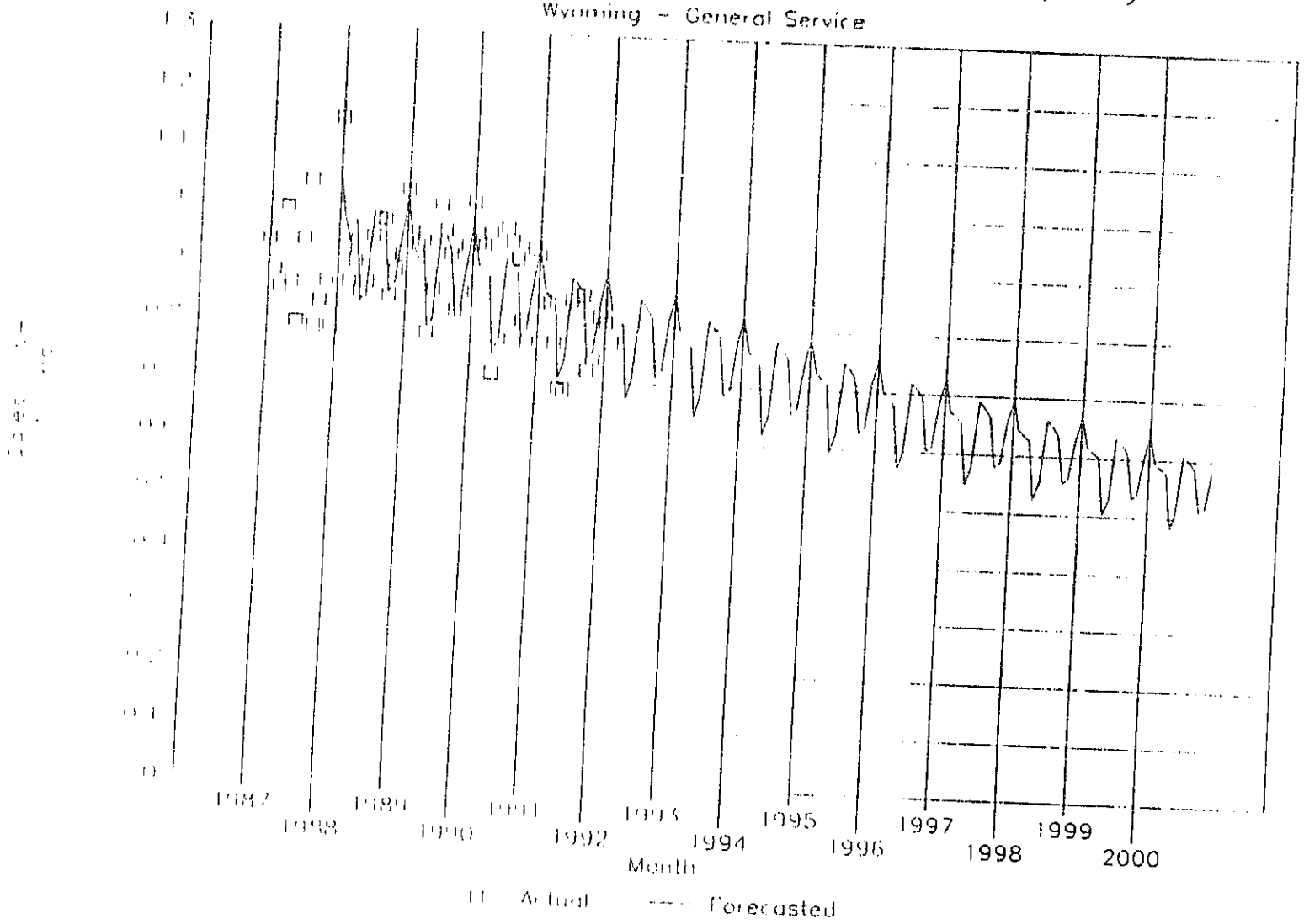
Black Hills Power and Light Company



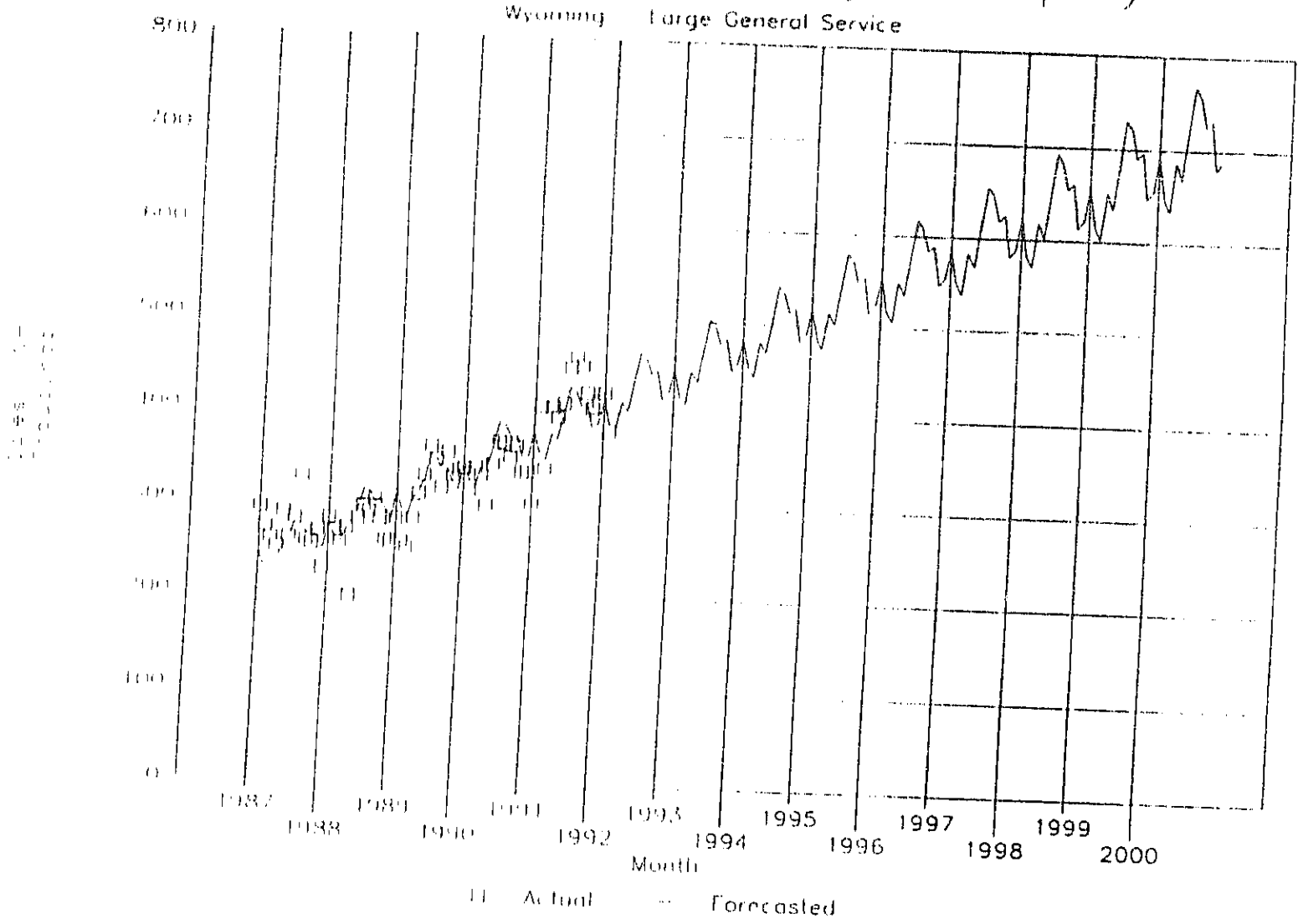

Black Hills Power and Light Company
Wyoming - Residential All Electric
1987
1988
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted


Black Hills Power and Light Company
Wyoming - Residential Others
100
90
80
70
60
50
40
30
20
10
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

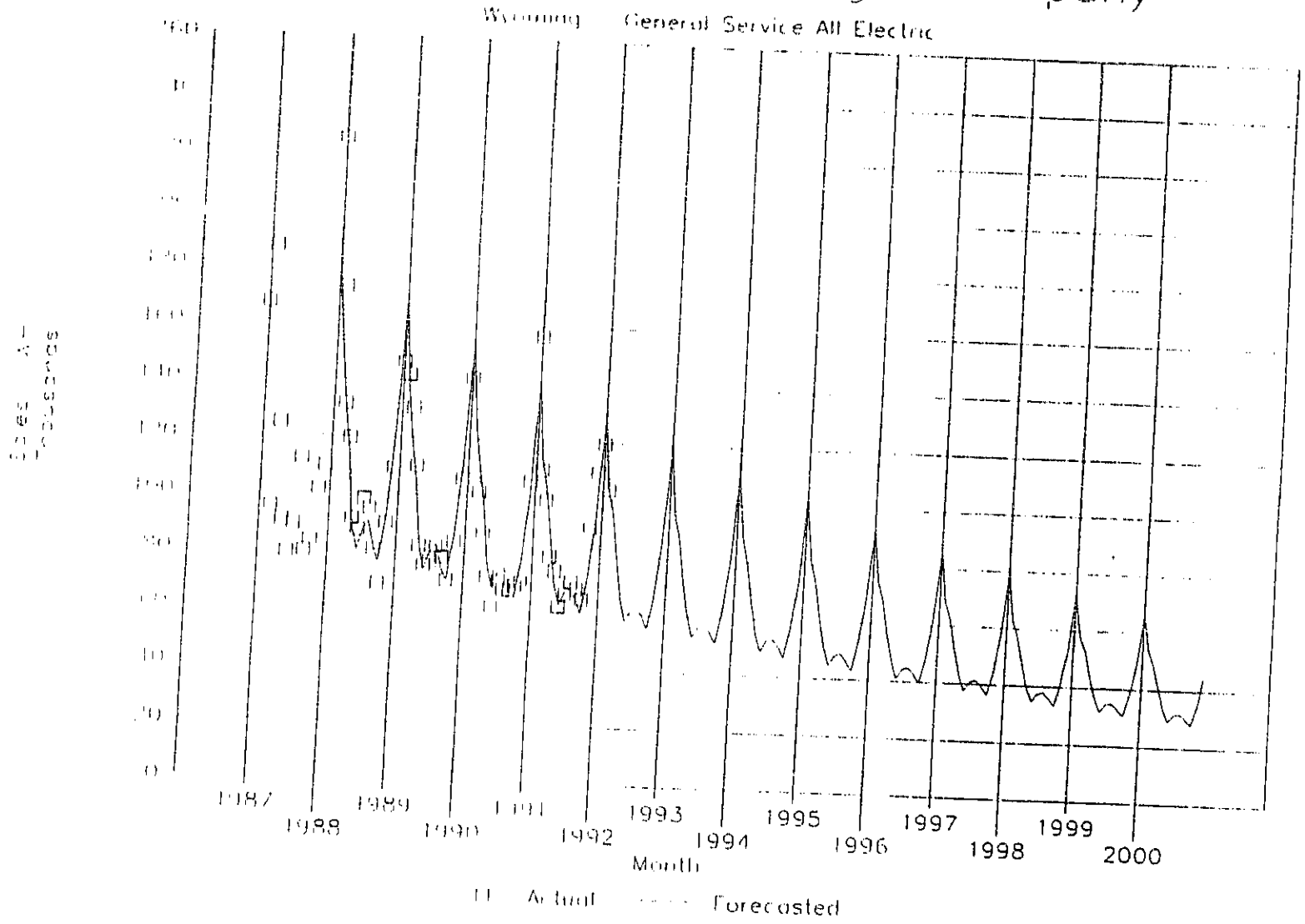
Black Hills Power and Light Company



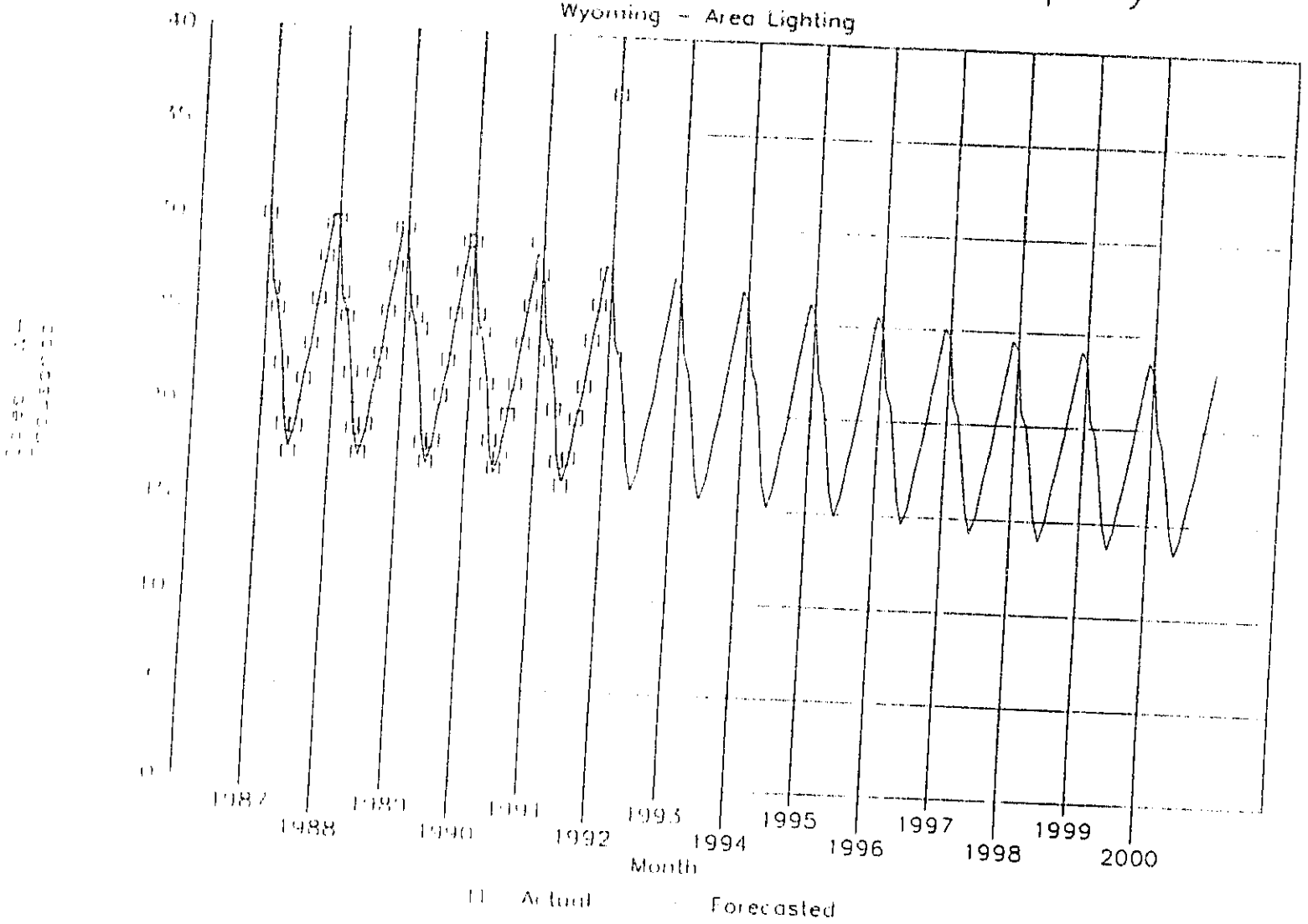
Black Hills Power and Light Company



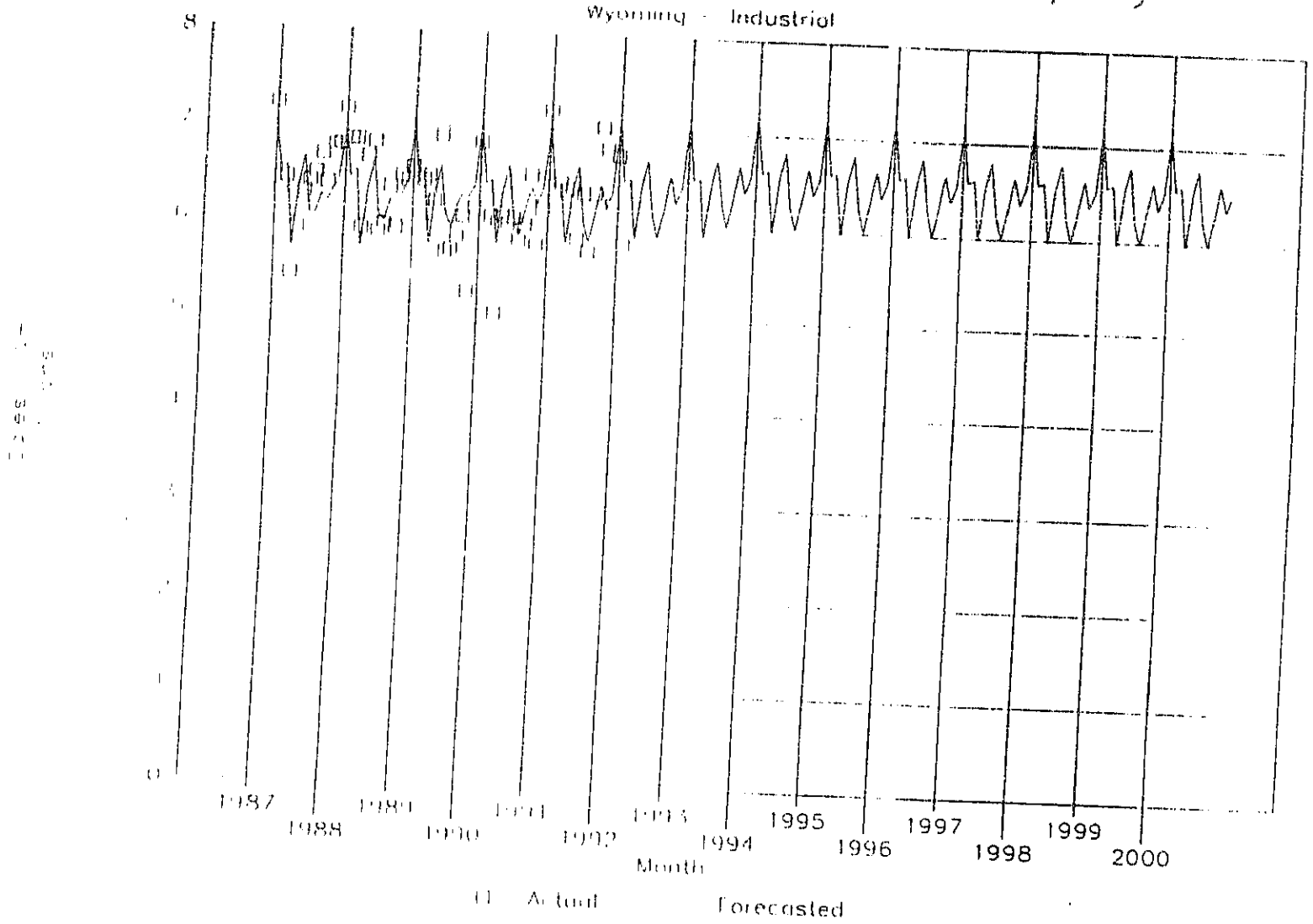
Black Hills Power and Light Company



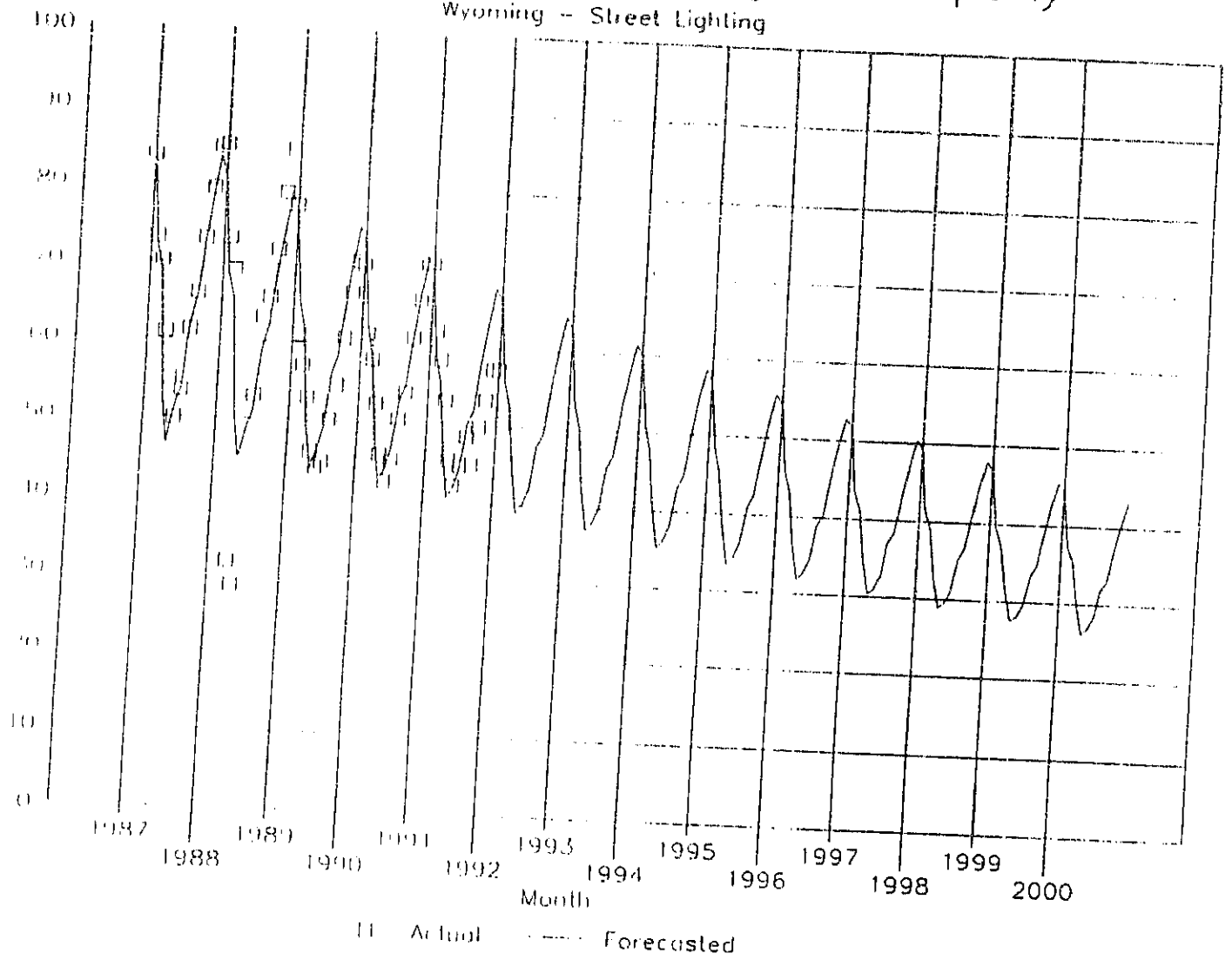
Black Hills Power and Light Company

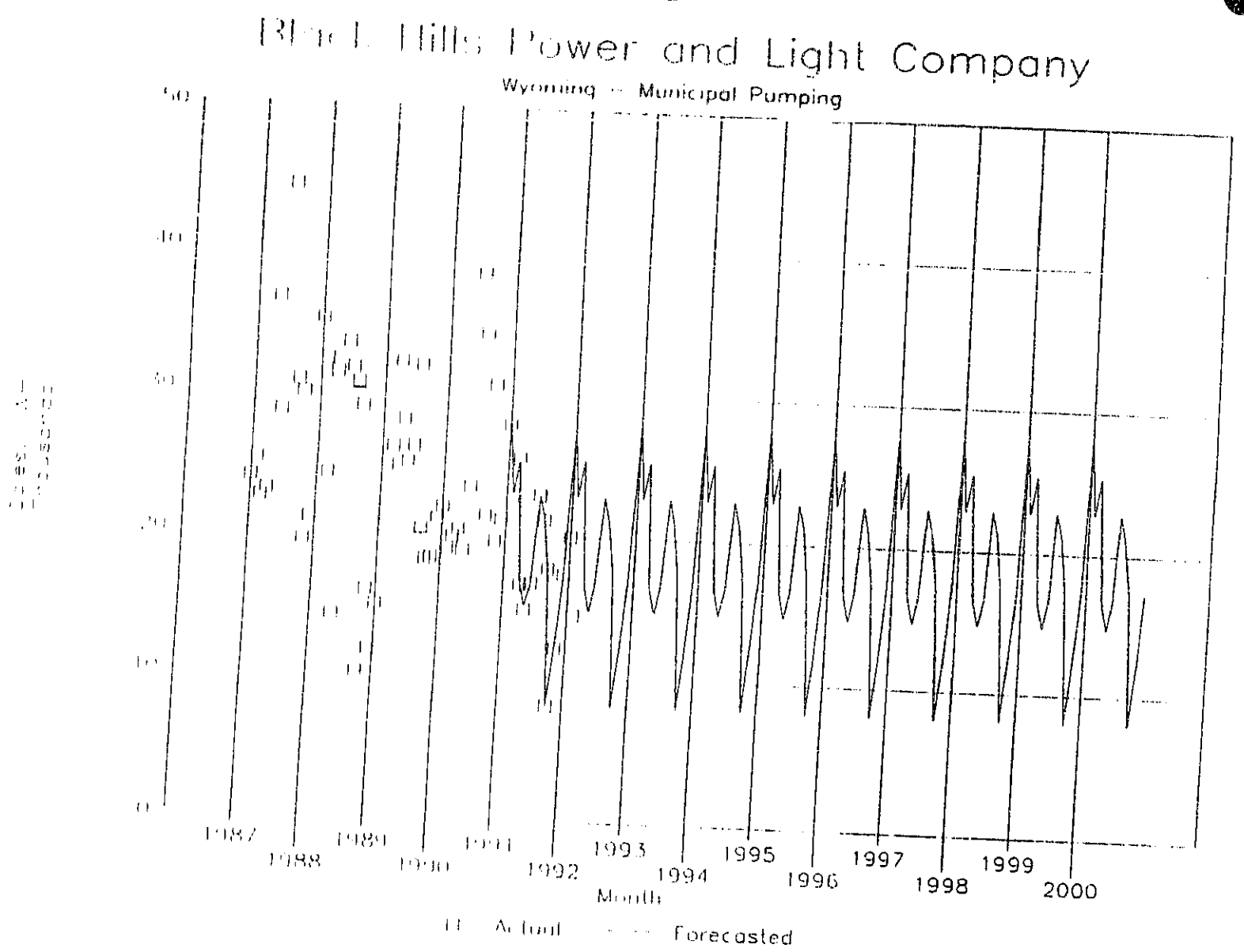


Black Hills Power and Light Company

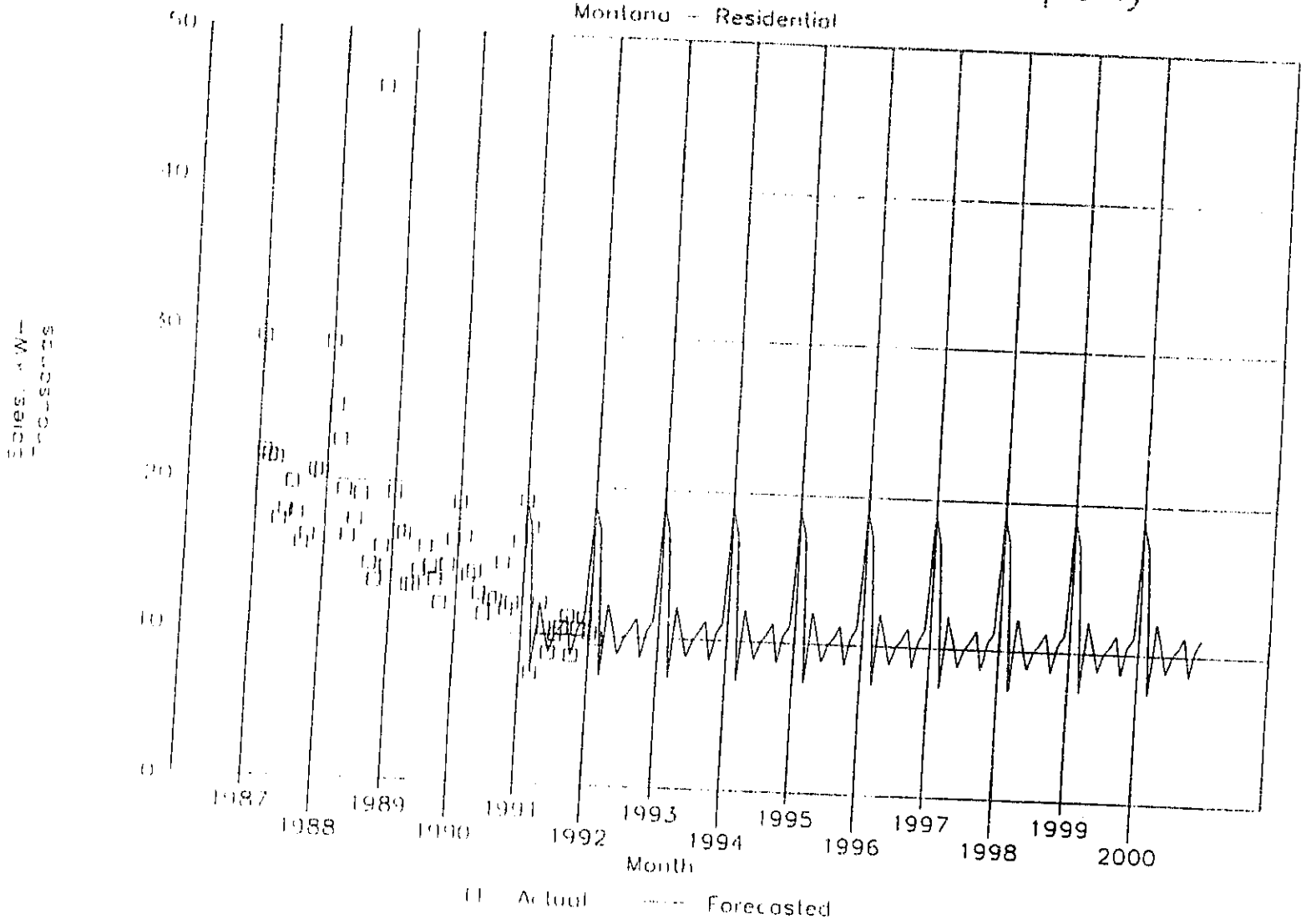


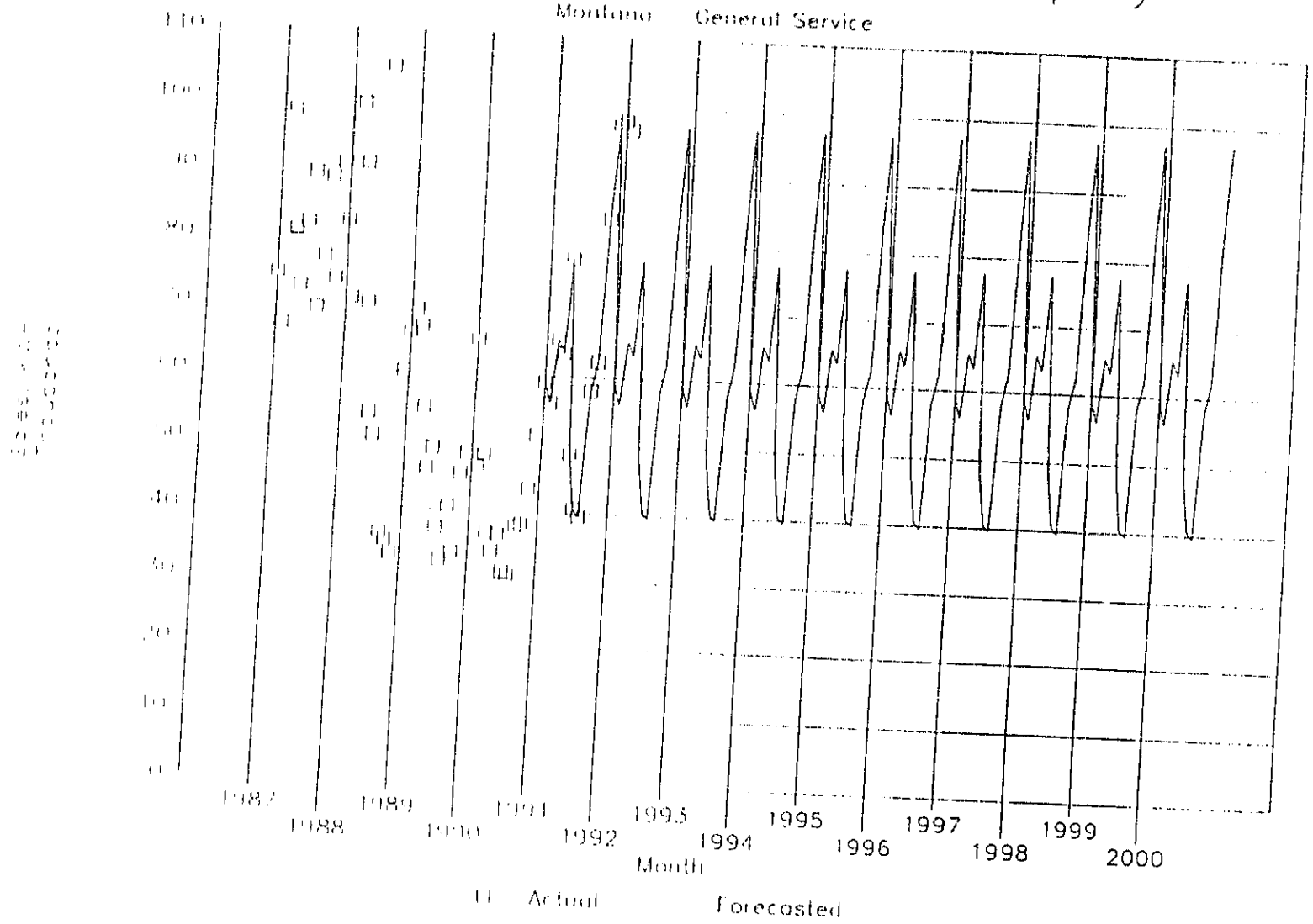
Black Hills Power and Light Company



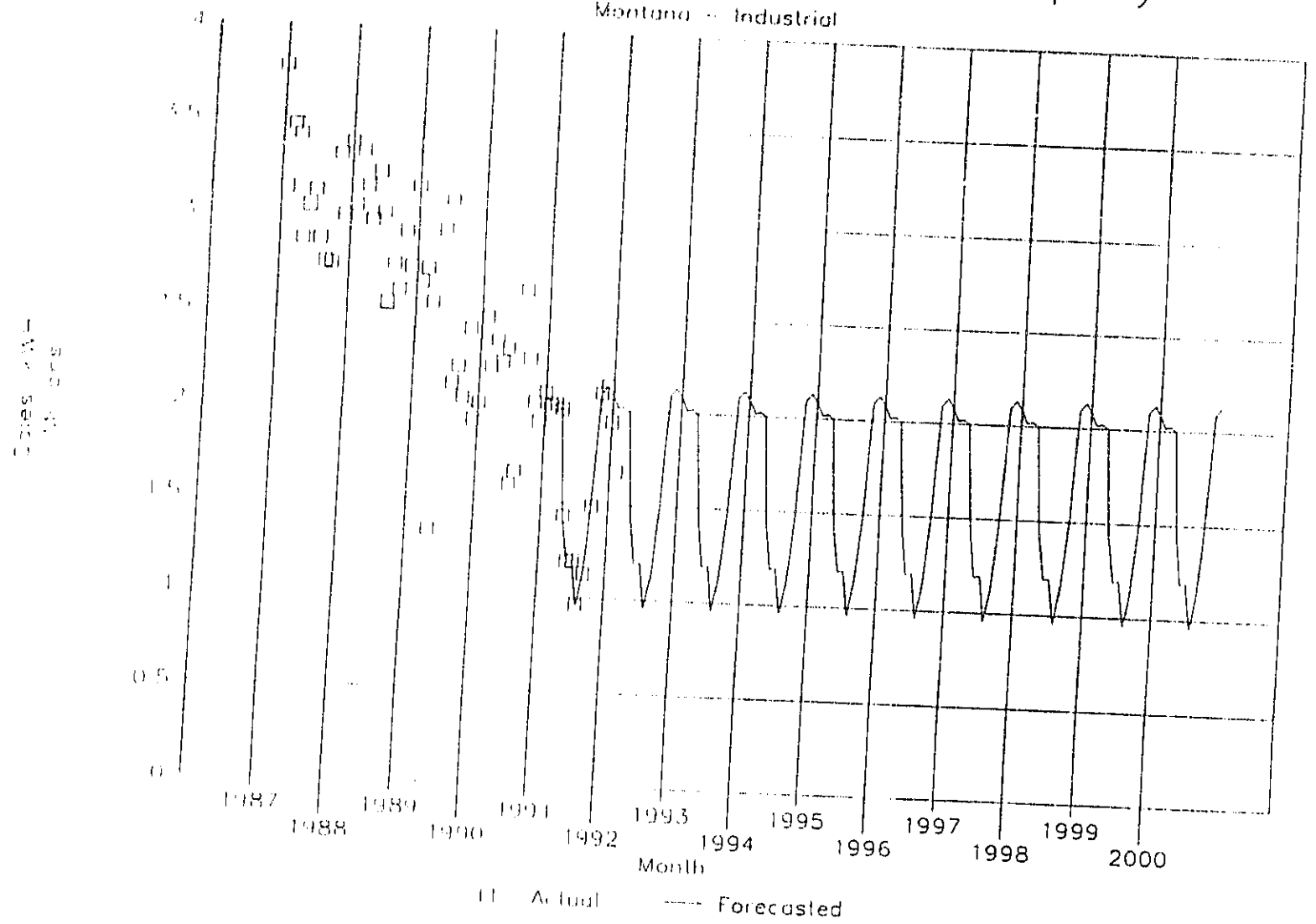

Black Hills Power and Light Company
Wyoming -- Municipal Pumping
50
40
30
20
10
0
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Black Hills Power and Light Company

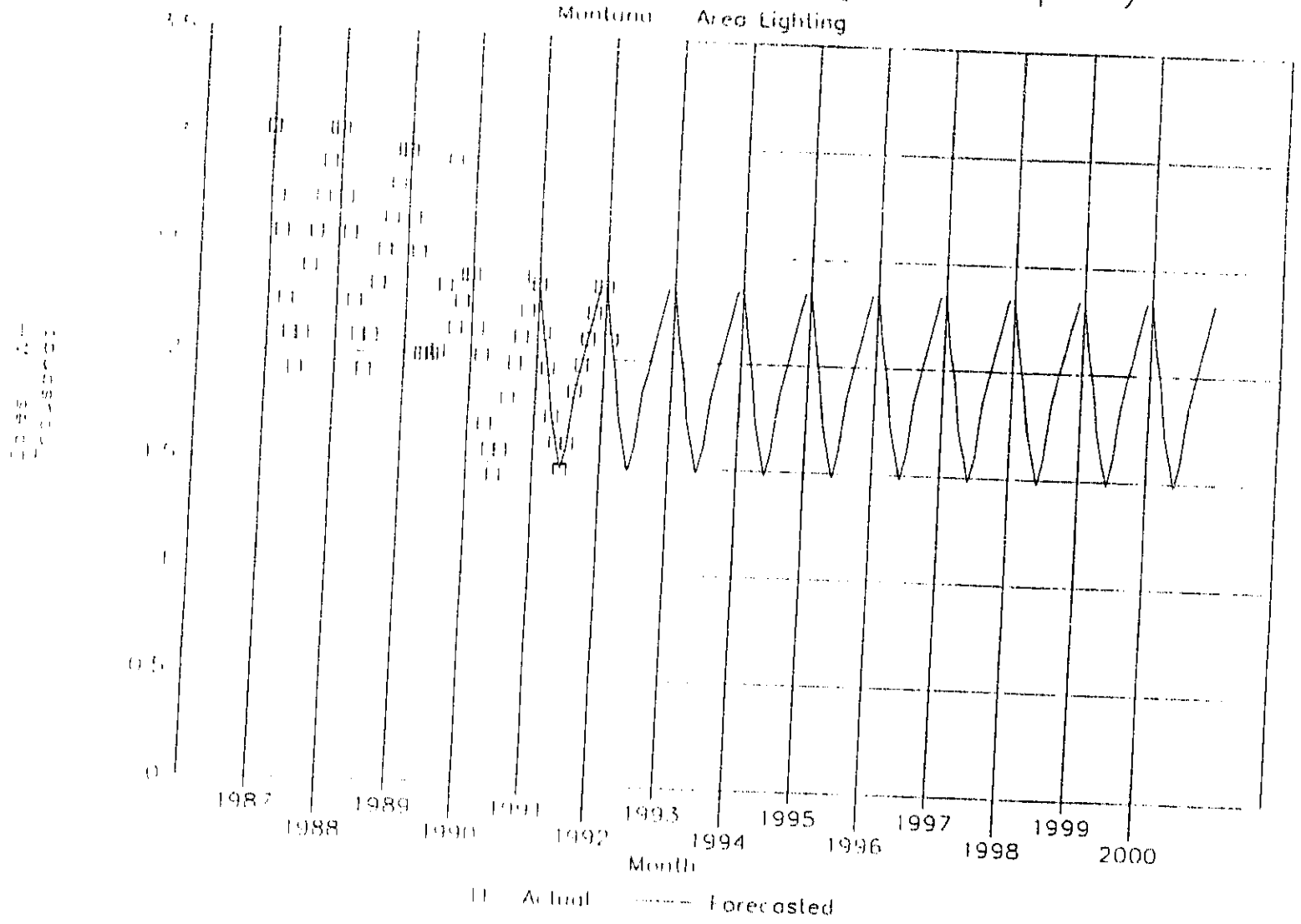



Black Hills Power and Light Company
Montana General Service
1982
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Month
Actual
Forecasted

Black Hills Power and Light Company



Black Hills Power and Light Company



Black Hills Power and Light Company
Ratio of Energy to Sales Excluding Gillette
Summary of Calculation Methods
03-Apr-92

Month	Percent of Total Annual Sales (1)	Average 1983-91	Average 1987-91	1983-91 Regression Constant	1983-91 Regression R^2	1987-91 Regression Constant	1987-91 Regression R^2	Most "Normal" Year	Use	Major Consideration
January	9.09%	1.020	1.021	1.035	63.39%	1.032	97.26%	1.035	1.032	87-91 Regression
February	8.87%	1.010	1.014	0.968	49.54%	1.013	92.56%	1.009	1.013	87-91 Regression
March	8.23%	1.078	1.040	1.060	46.68%	1.077	90.77%	1.128	1.044	87-91 Average
April	7.95%	1.002	1.003	0.987	49.16%	1.016	81.15%	1.022	1.005	87-91 Average
May	7.56%	1.059	1.058	1.063	53.65%	1.083	56.23%	1.033	1.058	87-91 Average
June	8.06%	1.054	1.058	1.058	8.99%	1.075	75.99%	1.093	1.068	87-91 Average
July	8.75%	1.080	1.073	1.081	45.66%	1.086	43.35%	1.114	1.073	87-91 Average
August	8.95%	1.037	1.032	1.023	35.71%	1.021	96.51%	1.015	1.021	87-91 Regression
September	8.64%	0.954	0.962	0.968	13.41%	0.955	55.34%	0.993	0.962	87-91 Average
October	8.02%	1.081	1.081	1.084	6.44%	1.092	76.35%	1.110	1.081	87-91 Average
November	8.16%	1.059	1.073	1.058	15.46%	1.078	47.50%	1.046	1.073	87-91 Average
December	8.52%	1.104	1.116	1.106	50.11%	1.092	87.84%	1.082	1.092	87-91 Regression
Total (2)	100.00%	1.045	1.046	1.042		1.051		1.056	1.043	Use s.d. 1.040 to 1.045

(1) Over last five years
(2) Sum of monthly ratios times monthly percent of sales.

Note: Losses and company use have average about 6.0 percent over the last five years.

Black Hills Power and Light Company
Ratio of Energy to Sales (Excluding Gillette)
19-Apr-82

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
1967	1.023	1.009	1.161	0.989	1.023	1.104	1.111	1.155	0.967	1.110	1.045	1.135	1.054
1968	1.078	1.004	1.134	0.957	1.050	1.021	1.083	1.071	0.976	1.132	0.988	1.124	1.044
1969	1.035	0.944	1.053	1.021	0.983	1.025	1.088	0.993	0.942	1.022	1.090	1.090	1.016
1970	1.044	1.012	1.068	1.021	1.044	1.000	1.083	1.016	0.988	1.058	1.045	1.102	1.037
1971	1.031	1.032	1.128	0.969	1.015	1.093	1.102	0.951	0.993	1.079	1.056	1.148	1.046
1972	1.043	1.020	0.988	1.014	1.093	1.024	1.036	1.015	0.924	1.083	1.081	1.082	1.035
1973	1.028	1.073	1.029	1.013	1.033	1.060	1.056	1.027	0.940	1.092	1.056	1.100	1.041
1974	1.056	1.024	1.048	1.007	1.072	1.078	1.059	1.066	1.001	1.059	1.076	1.218	1.058
1975	1.026	0.991	1.048	1.026	1.078	1.080	1.114	1.088	0.951	1.083	1.095	1.085	1.048
Average	1.035	1.018	1.079	1.002	1.052	1.054	1.090	1.037	0.964	1.081	1.059	1.104	1.066
Std Dev/Avg	2.05%	2.28%	5.05%	2.23%	3.69%	3.25%	2.43%	3.54%	3.81%	2.77%	3.89%	5.40%	1.94%
1963													
1964													
1965													
1966													
1967	1.031	1.032	1.128	0.969	1.015	1.093	1.102	0.951	0.993	1.079	1.056	1.148	1.046
1968	1.045	1.009	0.988	1.010	1.090	1.029	1.036	1.015	0.924	1.083	1.081	1.082	1.031
1969	1.028	1.073	1.029	1.013	1.033	1.060	1.056	1.027	0.940	1.092	1.056	1.100	1.041
1970	1.056	1.024	1.048	1.007	1.072	1.078	1.059	1.066	1.001	1.059	1.076	1.218	1.058
1971	1.026	0.991	1.048	1.026	1.078	1.080	1.114	1.088	0.951	1.083	1.095	1.085	1.048
Average	1.031	1.026	1.044	1.005	1.058	1.068	1.073	1.029	0.962	1.081	1.073	1.126	1.045
Std Dev/Avg	1.73%	2.96%	4.55%	1.32%	2.72%	3.03%	2.76%	4.59%	3.17%	1.15%	1.61%	5.27%	2.82%

Black Hills Power and Light Company
Degree-day Deviation From Normal
05-Apr-92

Year	January	February	March	April	May	June	July	August	September	October	November	December
	HDD	HDD	HDD	HDD	HDD	CDD	CDD	CDD	HDD	HDD	HDD	HDD
Normal	1,370	1,092	1,004	612	298	107	257	223	188	482	903	1,206
Actual												
1983	1,012	772	880	723	407	62	282	407	208	474	896	1,762
1984	1,139	832	968	926	368	41	234	309	268	546	820	1,349
1985	1,341	1,148	900	393	148	64	312	158	327	544	1,466	1,358
1986	1,083	1,211	672	617	317	124	192	164	256	497	1,025	1,060
1987	1,045	907	997	408	199	118	341	152	188	545	736	1,131
1988	1,340	1,103	905	533	195	341	355	255	163	470	850	1,127
1989	1,120	1,414	1,047	586	303	95	380	265	182	495	847	1,410
1990	1,004	1,004	880	597	363	120	228	282	112	514	730	1,462
1991	1,446	807	815	556	269	89	256	294	183	581	1,045	997
Deviation												
1983	(358)	(320)	(124)	111	109	(45)	25	184	20	(8)	(7)	556
1984	(231)	(260)	(56)	314	68	(66)	(23)	86	80	64	(83)	138
1985	(29)	56	(104)	(219)	(152)	(43)	55	(65)	139	62	563	152
1986	(287)	119	(332)	5	19	17	(65)	(59)	108	15	122	(146)
1987	(325)	(185)	(7)	(204)	(99)	11	84	(71)	0	63	(167)	(95)
1988	(30)	11	(99)	(79)	(103)	234	98	32	(25)	(12)	(53)	(79)
1989	(250)	322	43	(26)	5	(12)	123	42	(6)	13	(56)	204
1990	(366)	(88)	(124)	(15)	65	13	(31)	59	(76)	32	(173)	256
1991	76	(285)	(189)	(56)	(29)	(18)	(1)	71	(5)	99	142	(209)

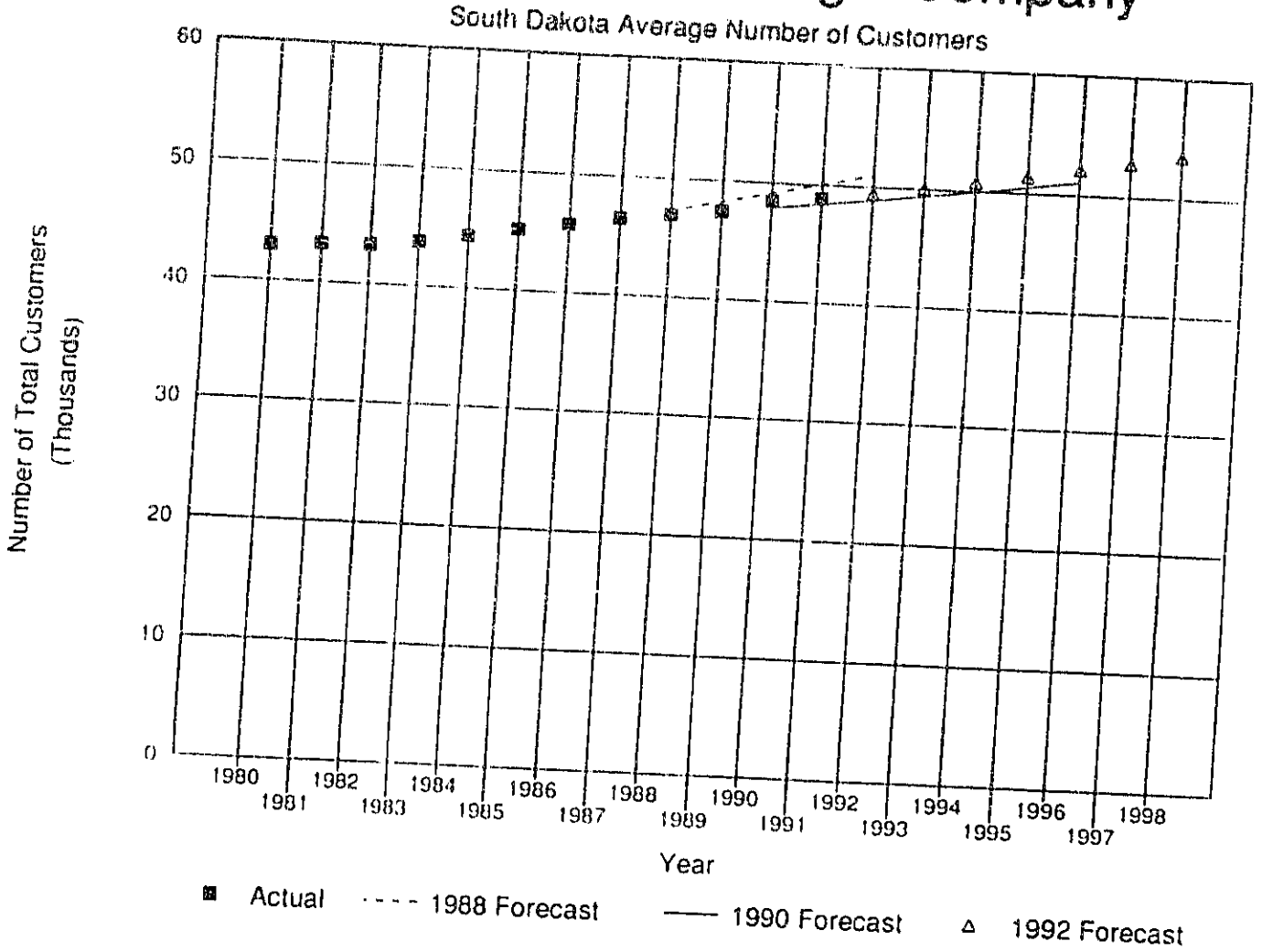
Black Hills Power and Light Company
Analysis of Historical Load Factors Excluding Gillette
For years 1983 - 1991
09-Apr-92

Year	January	February	March	April	May	June	July	August	September	October	November	December
1983	0.747	0.690	0.769	0.736	0.697	0.695	0.676	0.705	0.659	0.776	0.736	0.746
1984	0.715	0.764	0.769	0.728	0.731	0.733	0.713	0.683	0.748	0.729	0.739	0.778
1985	0.717	0.730	0.769	0.777	0.748	0.696	0.652	0.676	0.755	0.712	0.737	0.714
1986	0.710	0.737	0.743	0.731	0.755	0.675	0.691	0.683	0.791	0.749	0.715	0.722
1987	0.736	0.776	0.790	0.746	0.747	0.715	0.670	0.723	0.740	0.778	0.783	0.710
1988	0.755	0.753	0.783	0.769	0.738	0.679	0.684	0.682	0.737	0.778	0.750	0.763
1989	0.702	0.700	0.707	0.759	0.748	0.707	0.716	0.711	0.749	0.753	0.767	0.709
1990	0.767	0.740	0.758	0.758	0.791	0.656	0.652	0.705	0.716	0.773	0.754	0.704
1991	0.749	0.769	0.751	0.753	0.801	0.696	0.702	0.702	0.763	0.714	0.758	0.750
Average	0.733	0.744	0.760	0.751	0.751	0.695	0.684	0.694	0.740	0.751	0.749	0.733
Std Dev/Avg.	3.12%	4.65%	3.06%	2.09%	3.65%	3.04%	3.30%	2.52%	4.67%	3.43%	2.52%	3.65%
1987-91	0.769	0.751	0.758	0.757	0.765	0.691	0.685	0.704	0.741	0.759	0.762	0.727
Std Dev/Avg.	2.07%	4.12%	1.88%	0.96%	3.24%	2.95%	3.33%	1.87%	2.10%	3.24%	1.57%	3.34%
Use	0.769	0.751	0.758	0.757	0.765	0.691	0.685	0.704	0.741	0.759	0.762	0.727
YC Growth	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%	2.53%
Long Term LF	70.00%	70.00%	70.00%	70.00%	70.00%	65.00%	65.00%	65.00%	70.00%	70.00%	70.00%	70.00%
LF Trend	0.0010	0.0013	0.0015	0.0014	0.0016	0.0010	0.0009	0.0014	0.0010	0.0015	0.0016	0.0007
% of Use	0.2271%	0.1728%	0.1925%	0.1902%	0.2143%	0.1492%	0.1282%	0.1952%	0.1401%	0.1970%	0.2068%	0.0953%
1992	0.768	0.750	0.756	0.756	0.763	0.690	0.684	0.703	0.740	0.758	0.761	0.727
1993	0.768	0.769	0.755	0.754	0.762	0.689	0.683	0.702	0.739	0.756	0.759	0.726
1994	0.764	0.748	0.753	0.753	0.760	0.688	0.682	0.700	0.738	0.755	0.758	0.725
1995	0.762	0.746	0.752	0.751	0.758	0.687	0.681	0.699	0.737	0.753	0.756	0.725
1996	0.761	0.745	0.750	0.750	0.757	0.686	0.680	0.698	0.736	0.752	0.755	0.724
1997	0.759	0.744	0.749	0.748	0.755	0.685	0.679	0.696	0.735	0.750	0.753	0.723
1998	0.757	0.742	0.748	0.747	0.754	0.684	0.679	0.695	0.734	0.749	0.751	0.723
1999	0.755	0.741	0.746	0.745	0.752	0.683	0.678	0.694	0.733	0.747	0.750	0.722
2000	0.754	0.740	0.745	0.744	0.750	0.682	0.677	0.692	0.732	0.746	0.748	0.721
2001	0.752	0.739	0.743	0.743	0.749	0.681	0.676	0.691	0.731	0.744	0.747	0.721
2002	0.750	0.737	0.742	0.741	0.747	0.680	0.675	0.689	0.730	0.743	0.745	0.720
2003	0.749	0.736	0.740	0.740	0.745	0.679	0.674	0.688	0.729	0.741	0.744	0.719
2004	0.747	0.735	0.739	0.738	0.744	0.678	0.673	0.687	0.728	0.740	0.742	0.718
2005	0.745	0.733	0.738	0.737	0.742	0.677	0.673	0.685	0.727	0.739	0.741	0.718
2006	0.743	0.732	0.736	0.736	0.741	0.676	0.672	0.684	0.726	0.737	0.739	0.717
2007	0.742	0.731	0.735	0.734	0.739	0.674	0.671	0.683	0.725	0.736	0.738	0.716
2008	0.740	0.730	0.733	0.733	0.738	0.673	0.670	0.681	0.724	0.734	0.736	0.716
2009	0.738	0.728	0.732	0.731	0.736	0.672	0.669	0.680	0.723	0.733	0.735	0.715
2010	0.737	0.727	0.731	0.730	0.734	0.671	0.668	0.679	0.722	0.731	0.733	0.714
2011	0.735	0.726	0.729	0.729	0.733	0.670	0.667	0.677	0.721	0.730	0.731	0.714
2012	0.733	0.725	0.728	0.727	0.731	0.669	0.667	0.676	0.720	0.728	0.730	0.713
2013	0.732	0.723	0.726	0.726	0.730	0.668	0.666	0.675	0.719	0.727	0.728	0.712
2014	0.730	0.722	0.725	0.725	0.728	0.667	0.665	0.673	0.718	0.726	0.727	0.712

Black Hills Power and Light Company
P.N. 19326.100
Gillette, Wyoming
Determination of Gillette Load Factor
24-Feb-92

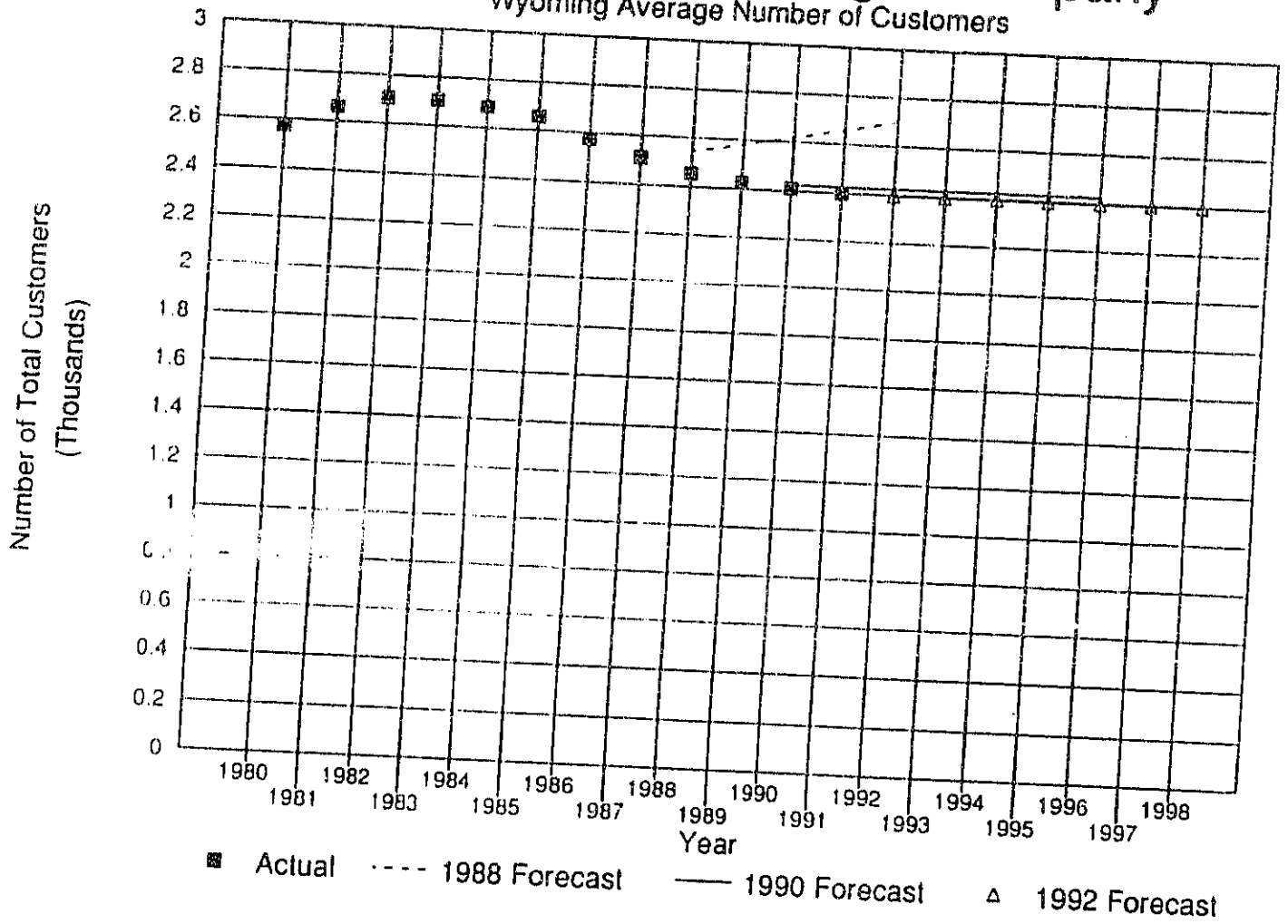
Year	January	February	March	April	May	June	July	August	September	October	November	December
Monthly Requirement (SCADA)												
1987	16,117	13,423	14,837	12,469	12,277	11,750	13,779	12,210	11,741	12,949	13,454	15,951
1988	17,213	15,424	15,271	12,666	12,707	13,759	14,318	13,654	12,315	12,650	14,553	16,358
1989	16,098	14,945	15,858	13,619	13,269	12,627	14,447	14,228	12,781	13,836	14,457	17,258
1990	16,685	14,991	15,536	13,623	13,681	13,223	14,327	14,666	13,662	14,494	14,985	16,768
1991	16,769	14,451	15,532	14,376	13,709	13,110	15,068	15,254	13,670	14,658	15,269	16,823
Total Metered Capacity (1 Hour)												
1987	29.6	26.4	27.4	23.2	23.1	23.2	25.8	25.6	23.5	23.6	26.1	29.3
1988	30.3	31.6	27.3	25.1	23.8	26.6	26.6	27.5	23.9	22.1	27.1	29.8
1989	32.1	35.0	31.5	26.9	26.8	25.6	27.7	27.8	26.2	26.2	31.7	34.5
1990	29.3	31.0	28.8	26.8	24.4	25.9	30.0	28.5	28.5	25.6	30.7	30.5
1991	33.1	28.9	29.0	26.8	25.7	26.1	30.5	31.4	27.2	31.9	32.6	32.8
Load Factor												
1987	0.732	0.757	0.728	0.745	0.714	0.703	0.666	0.641	0.694	0.737	0.716	0.732
1988	0.764	0.701	0.749	0.701	0.716	0.682	0.678	0.667	0.710	0.779	0.741	0.738
1989	0.708	0.700	0.676	0.760	0.720	0.659	0.701	0.668	0.678	0.710	0.633	0.672
1990	0.765	0.720	0.725	0.708	0.749	0.635	0.642	0.692	0.666	0.761	0.678	0.655
1991	0.762	0.743	0.720	0.745	0.717	0.698	0.664	0.655	0.688	0.625	0.685	0.732
Average	0.746	0.724	0.720	0.731	0.724	0.676	0.670	0.668	0.687	0.722	0.695	0.706
Std Dev/Avg	3.07%	3.10%	3.32%	3.21%	1.79%	3.73%	2.88%	2.87%	2.17%	7.45%	4.12%	4.94%
Load Factor (removing outliers)												
1987	0.732	0.757	0.728	0.745	0.714	0.703	0.666	0.641	0.694	0.737	0.716	0.732
1988	0.764	0.701	0.749	0.701	0.716	0.682	0.678	0.667	0.710	0.779	0.741	0.738
1989	0.708	0.700	0.676	0.760	0.720	0.659	0.701	0.668	0.678	0.710		0.672
1990	0.765	0.720	0.725	0.708	0.749	0.635	0.642	0.692	0.666	0.761	0.678	0.655
1991	0.762	0.743	0.720	0.745	0.717	0.698	0.664	0.655	0.688		0.685	0.732
Average	0.746	0.724	0.720	0.731	0.724	0.676	0.670	0.668	0.687	0.747	0.710	0.706
Std Dev/Avg	3.07%	3.10%	3.32%	3.21%	1.79%	3.73%	2.88%	2.87%	2.17%	3.45%	4.64%	4.94%

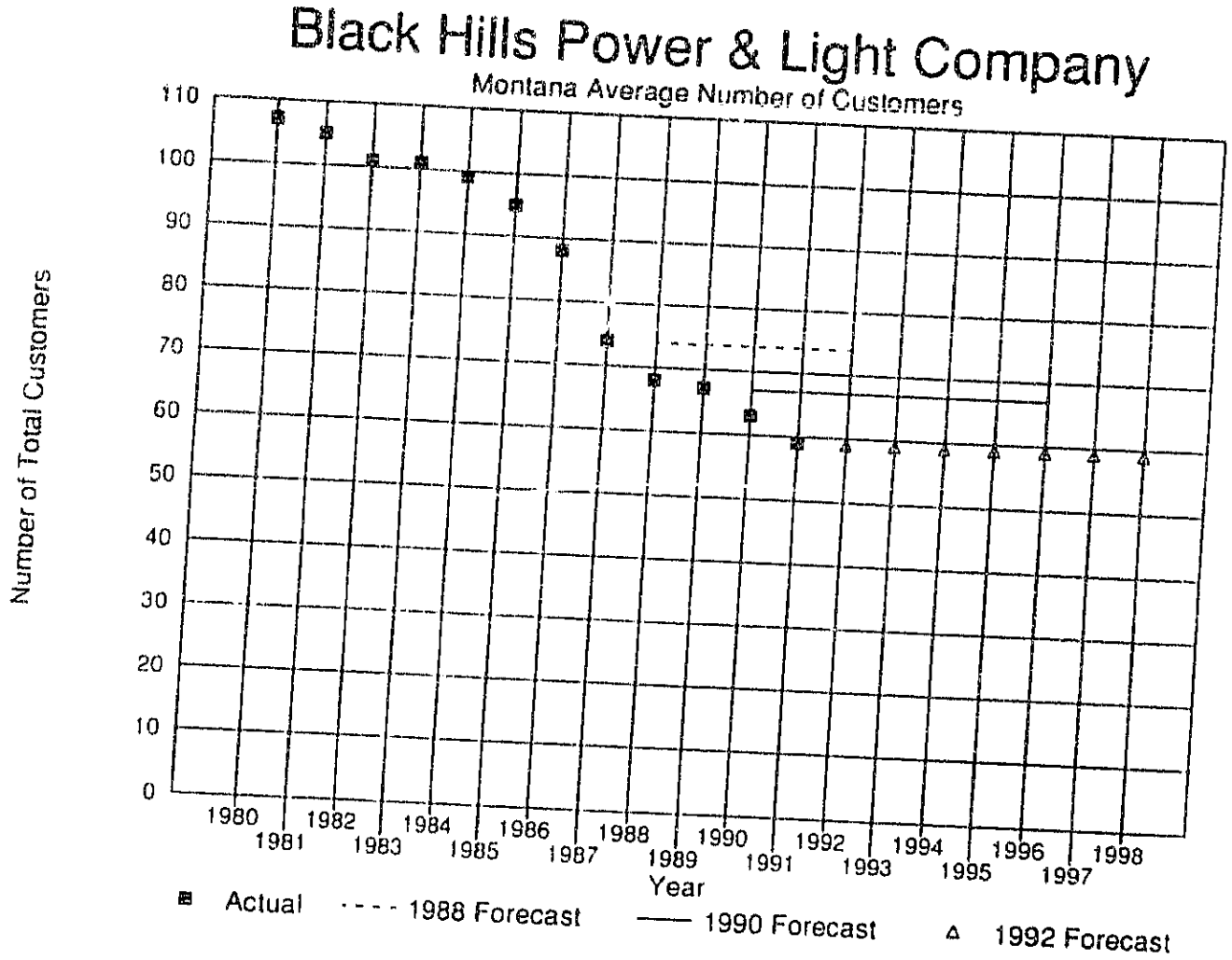
Black Hills Power & Light Company



Black Hills Power & Light Company

Wyoming Average Number of Customers




Black Hills Power & Light Company
Montana Average Number of Customers
Number of Total Customers
110
100
90
80
70
60
50
40
30
20
10
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
Year
Actual
1988 Forecast
1990 Forecast
1992 Forecast

DIRECT TESTIMONY OF JILL S. BAYLOR
SOUTH DAKOTA PUBLIC UTILITIES COMMISSION
BLACK HILLS POWER AND LIGHT COMPANY
APPLICATION FOR AN INCREASE IN ELECTRIC RATES
DOCKET NO. EL95-003

I. INTRODUCTION AND BACKGROUND

Q. Please state your name and business address.

A. My name is Jill S. Baylor. My business address is RCG/Hagler Bailly, Inc., P.O. Drawer O, Boulder, Colorado 80306.

Q. Who is your employer and what position do you hold?

A. I am employed by RCG/Hagler Bailly (Hagler Bailly) as a principal in electric utility planning.

Q. Please explain the nature of your firm, Hagler Bailly.

A. Hagler Bailly is an international management consulting firm that specializes in the fields of energy and the environment. The firm was founded in 1980 as Hagler Bailly & Company. In 1984, we became a subsidiary of RCG International, the management and technical services arm of Reliance Group Holdings.

Hagler Bailly is headquartered in the Washington, D.C. metropolitan area. The firm has several other offices in the United States, including offices in Boulder, Colorado;

Cambridge, Massachusetts; Philadelphia, Pennsylvania; and San Francisco, California. We also maintain a number of project offices overseas.

Hagler Bailly's approach to management consulting combines state-of-the-art economic, market, and business analysis with specialized engineering, environmental, and scientific expertise. The firm is unique in that its services focus exclusively on the energy, natural resources, and environmental fields. Hagler Bailly assists private and public organizations worldwide: we have undertaken assignments in more than 60 countries during the past 10 years.

Hagler Bailly's consulting practices are organized into three departments: resource application, resource supply, and environmental. The firm's full-time staff numbers over 200 employees worldwide. Eighty percent of the technical staff have master's or doctorate degrees, and the firm counts among it employees representatives from more than 20 different nations. Hagler Bailly operates as one integrated firm. We stress teamwork and communication within the company, enabling each consulting practice to draw upon the abilities of others.

Q. Could you provide some examples of the work your firm has provided for regulatory commissions?

A. Regulatory commission clients have included those listed below. The list is not meant to be inclusive.

Arizona Corporation Commission — Nuclear power plant planning prudence review.

California Public Utilities Commission — Study of the California-Oregon Transmission Project.

Georgia Public Service Commission — Review of Atlanta Gas Light's integrated resource plan.

Illinois Commerce Commission — Management audit.

Iowa Office of the Consumer Advocate — Coal procurement study for all Iowa investor-owned utilities.

Maine Public Utility Commission — Review of Central Maine Power's proposed power purchase from Hydro-Quebec.

Maryland People's Counsel — Review of Delmarva Power and Light's forecast and least cost plan.

Ohio Office of Consumer Counsel — Review of fuel supply planning procedures for two Ohio gas companies. Benefits of power pooling.

Pennsylvania Office of Consumer Advocate — Development of incentive fuel clause for the State of Pennsylvania.

Pennsylvania Public Utilities Commission — Management audit.

Public Service Commission of the District of Columbia — Fuel management audit of Potomac Electric Power Company.

Tennessee Public Service Commission — Evaluation of gas costs and procurement practices of three gas utilities.

United States Environmental Protection Agency — Several projects related to acid rain and global warming issues.

Q. Please summarize your background and experience.

A. I have a Bachelor of Science in Applied Mathematics with a minor in Electrical Engineering from the University of Virginia. I completed my Masters in Business Administration at the University of North Carolina at Charlotte. I am a registered professional engineer in Colorado.

I began my career in the System Planning Department at Duke Power Company, where I specialized in generation planning analyses. Upon leaving Duke Power, I joined Mobil Oil Corporation's Mining and Coal Division where I performed planning analyses of Mobil's coal mining operations. In 1984 I joined Stone & Webster Management Consultants, where I provided consulting services to the utility industry in integrated resource planning and fuels issues. In October 1992 I joined Hagler Bailly, where I am leading efforts in integrated resource planning, competitive bidding, and technical due diligence. In total, I have over 18 years of experience in conducting planning analyses. My detailed resume and publications list are shown as Exhibit JSB-1.

Q. Have you presented testimony to the South Dakota Public Utilities Commission previously?

A. Yes, in 1993. I testified on the subject of non-utility generation pertaining to Docket No. EL92-026 on behalf of Black Hills Power and Light (Black Hills).

Q. In what other jurisdictions have you presented testimony?

A. I have filed testimony before state regulatory bodies in Illinois, Kentucky, Maine, Missouri, Ohio, and Wyoming. In addition, I presented an affidavit before the Federal Energy Regulatory Commission. Detailed information on my testimony experience is contained in Exhibit JSB-2.

Q. Has the information presented in this testimony previously been testified to?

A. The majority of the information presented in this testimony, including the final report prepared by Hagler Bailly dated February 26, 1993, and titled "Integrated Resource Planning Analysis of Neil Simpson #2," was presented in testimony before the Wyoming Public Service Commission in Docket No. 20002-EA-92-27, in which Black Hills applied for a Certificate of Public Convenience and Necessity (CPCN) for Neil Simpson #2.

Q. What was the result of that docket?

A. The CPCN was issued by the Wyoming Public Service Commission in a bench order on the day of the hearing.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to demonstrate that Neil Simpson #2 was and remains the least cost alternative for Black Hills and thus was prudently constructed. In my testimony I describe the principles of integrated resource planning and discuss the integrated resource planning process (Section II), examine the assumptions that were made for conducting the 1993 analysis by Black & Veatch on behalf of Black Hills (Section III), present the rationale for additional analyses undertaken in 1993 by Black & Veatch and Black Hills at my firm's request (Section IV), present and explain the results of the 1993 analysis (Section V), present an update reflecting events that have transpired since 1993 (Section VI), and conclude that under a wide range of future plausible scenarios considering significant changes in key factors, the Neil Simpson #2 unit provides Black Hills with the most economic resource alternative (Section VII)

II. INTEGRATED RESOURCE PLANNING

Q. Please describe what is meant by integrated resource planning.

A. Integrated resource planning means that when a utility looks into the future to plan for the electricity needs of its customers, that utility examines options on both the supply side (providing electricity to meet customer requirements) and the demand side (reducing or managing electricity requirements). The utility considers the economic impacts (both rates and financing) of these options on its entire system and develops a plan that meets the customers' needs with the lowest cost combination of options

Several steps are undertaken to develop the integrated resource plan. These steps include the development of the load forecast, the selection of alternative options to be examined, and the process of optimizing resource selection.

Q. Please describe the load forecasting portion of integrated resource planning.

A. The first step in developing an integrated resource plan (IRP) is developing a load forecast. This is a projection of electricity requirements by customers throughout the planning period, often twenty or more years. The utility examines population growth in its service territory, the plans of industrial customers for expansion of facilities, and addition of new facilities and closures of existing facilities. It then projects future electricity requirements for each class of customers (residential, commercial, and industrial). The forecast is developed to provide seasonal peak demands for each year of the planning period, expressed in kilowatts or megawatts (the highest demand usually occurring on a hot summer day or a cold winter day), as well as the total electricity requirements over each year expressed in kilowatt-hours.

The load forecast will incorporate existing or historical levels of conservation or demand-side management (DSM) by the utility's customers. This reflects both naturally occurring conservation (resulting from the price of electricity and conservation measures on the market) and conservation resulting from the utility's own programs (often called DSM programs). In this manner, conservation is already reflected in the load forecast. In

addition, new or expanded DSM programs may be included among the resource options to be considered in developing an IRP.

Q. Please describe the process of selecting options for evaluation.

A. The alternative resources available for consideration in the future to meet customer demands are determined by examining the costs, commercialization status, fuel availability, resource availability, and construction period to eliminate those alternatives that are not feasible. The resources considered normally include both supply-side and demand-side options.

Q. Please describe the process followed in optimizing resource selection.

A. Several techniques were used by Black Hills to determine its IRP. These techniques included using 1) an engineering economics analysis process to develop busbar costs as a screening tool and 2) a production costing model developed by Black and Veatch (POWRPRO) for additional analysis. Spreadsheet analysis supplemented the POWRPRO computer model as appropriate. Through the combination of these tools, Black Hills was able to develop an IRP that addressed a wide number of concerns and selected the combination of resources that will provide electricity in the future in a least-cost manner.

A busbar analysis was used first to determine the economics of each possible resource option to be examined in the course of the IRP process. These busbar costs are used for what is called screening: examining all alternatives rapidly to allow the system planner

to pick out (or screen out) those alternatives that have the potential to be cost-effective and focusing efforts in the production costing analysis on only the likely cost-effective technologies instead of all possible alternatives available. Busbar analysis means determining, for each technology, the cost of generating electricity at the perimeter of the power plant site (at the busbar), when the electricity is ready for transmission and distribution to the utility's customers. The busbar cost includes the capital, fuel, and operation and maintenance costs over a range of capacity factors, levelized over the life of the unit.

The POWRPRO model utilized by Black and Veatch for the production costing evaluations reflects standard industry practices in operating generating units. The model simulates the operation of the units on the Black Hills system over the planning horizon (1996-2015) as different units are put into commercial operation and others are retired. To produce an IRP, the model was run using differing alternative combinations of units on the system to find the combination with the lowest total cost. Each plan was required to meet the reliability criteria of the Western Systems Coordinating Council and other appropriate constraints in order to be considered a feasible alternative. The plan that satisfied the planning criteria and provided power at the lowest present value of revenue requirements was selected.

Sensitivity analysis of the various plans is normally conducted to ascertain the validity of the results under a wide variety of future economic and demographic conditions. Such

analysis involves changing key parameters and examining the impacts of the changes on the IRP results.

The integrated resource planning process undertaken for Black Hills and the results are documented in a report, which is included as Exhibit JSB-3 to this testimony

Q. Is Exhibit JSB-3 the same report supplied in 1993 to the Wyoming Public Service Commission and the South Dakota Public Utilities Commission?

A. Yes. This report was attached to my testimony in Docket No. 20002-EA-92-27 before the Wyoming Public Service Commission. It was provided to the South Dakota Public Utilities Commission as part of Docket EL92-026, the case that was later withdrawn Tables ES-4 and 2-9 (which are the same table) were revised with the filing of my supplemental testimony in Wyoming to clarify the data presented in them I have made one small change on Figure 2-4 to correct the labeling on the y-axis of the four charts to MW from MWh

As part of Exhibit JSB-3, I have included materials that supplement the Hagler Bailly report. These materials are:

- "Black Hills Power and Light Company Integrated Resource Plan" dated September 1992 as prepared by Black & Veatch and presented in Docket EL92-026 before the South Dakota Public Utilities Commission

- Wind Resource Data writeup prepared by Dr. Donald M. Hardy presented in Docket No. 20002-EA-92-27 before the Wyoming Public Service Commission.

III. IRP ASSUMPTIONS

Q. Please comment on the Black Hills' load forecast.

A. The load forecast developed for Black Hills that served as the basis for the 1993 IRP utilized what is called a trend methodology, i.e., the future will resemble and build on the results of the past. Black Hills does adjust the trended forecast based on information known about specific customers. The forecast was developed such that an expected level was projected as well as an upper and lower bandwidth around the expected value. In addition, trending was done by rate class.

Although Hagler Bailly recommends that its clients use econometric or end-use forecasting, the technique used by Black Hills tempered the trend methodology with economic considerations. The results derived in the Black Hills forecast would not be expected to change much in the short term. There might be greater diversion between a trend forecast and an econometric or end-use forecast over the longer term. However, differences in possible load forecasts and the resulting impacts on the most economic resources have been addressed in the sensitivity analysis.

Higher and lower load growth scenarios have been evaluated in the sensitivity analysis to provide guidance in several areas: 1) the need for capacity that results in the expected and high load growth scenarios, and 2) whether Neil Simpson #2 would still be an economic choice under a low load growth scenario. These issues are addressed later in the testimony.

Q. Was DSM included in the analysis conducted?

A. Demand-side management programs undertaken in the past by Black Hills were incorporated in the load forecast projections made by Black Hills. No additional DSM programs were explicitly incorporated in the analysis.

Q. Have you read the testimony of Mr. Kyle White submitted as prefiled testimony in this case?

A. Yes, I have.

Q. Are you aware of Black Hills' current annual load factor?

A. Yes. I have been informed that for 1994, Black Hills' annual load factor was over 69 percent.

Q. What is your observation of Black Hill's summer and winter peaks as shown by its load forecast?

A. Summer and winter peaks for Black Hills have historically been fairly equal. At one time, the summer and winter peaks leapfrogged in being higher one season after another. Currently, the summer peak is trending higher. With the sale of power for the provision of the Montana-Dakota Utilities (MDU) Sheridan, Wyoming load (which is winter peaking), the Black Hills summer and winter peak loads will tend to be closer than if the MDU Sheridan load were not served.

Q. What is the significance, if any, of Black Hill's summer and winter peaks being approximately the same and Black Hill's high load factor as far as Black Hills being successful with DSM programs and reducing load growth?

A. A utility often implements DSM programs in an effort to reduce one of its seasonal peaks to more closely approximate its other seasonal peak. Examples of such DSM programs include high efficiency central air conditioners, swimming pool pump control, dual-fuel heating systems, and similar so-called "peak clipping programs." Reducing load growth in both seasons necessitates DSM programs such as energy efficient cooking appliances, water heater blanket and pipe insulation, heat pumps, and lighting programs.

It might be possible to identify cost-effective DSM programs that reduce both summer and winter peak load growth. Each program should be examined individually. However, the issue is whether the levels of DSM programs examined in the 1993 IRP analysis were

reasonable and what impact higher levels of cost-effective DSM programs would have on Black Hills' decision to proceed with the construction of Neil Simpson #2. The answer is that analysis was conducted assuming higher levels of successful DSM programs and Neil Simpson #2 was found to be the economic resource of choice even with the higher levels of DSM.

Q. Are there specific DSM programs that could be implemented on the Black Hills system to reduce load growth, not discussed in Kyle White's testimony, without increasing costs?

A. It is possible that additional cost-effective DSM programs might be found. However, the issue is whether the implementation of additional DSM programs changes the choice of Neil Simpson #2 as the most economic resource for Black Hills. Such implementation would not.

Q. What would you expect the impact of more aggressive DSM programs to be on Black Hills' plans to install Neil Simpson #2?

A. Higher levels of DSM programs would have the anticipated effect of lowering the amount of load growth experienced. The lower load growth cases examined in the sensitivity analysis, as well as the cases referenced as the "300 series" (Cases 300, 300A, 300G, and 300P in Exhibit JSB-3), reduce the peak load on the Black Hills system by an amount that could represent load which does not materialize because of DSM programs being implemented, customers moving out of the area, or population growth not occurring. The

reduction in load in the sensitivity analysis exceeds the level we feel could be practically achieved through implementation of aggressive DSM programs by Black Hills. Experience in the industry has shown that the most successful utilities achieve about a maximum 10% reduction in peak load due to DSM programs.

The sensitivity analysis shows that even under a low demand, low fuel price scenario as well as in the 300 series, Neil Simpson #2 remains the resource of economic choice.

Q. Are the data assumptions utilized in the Black & Veatch analysis reasonable?

A. Yes. Any analysis undertaken in performing an IRP depends on many assumptions made in putting together the data required for computer simulations and other evaluations. The types of data needed to model existing and known planned generating units include:

- Capacity of each generating unit on the system
- Commercial operation dates for any new committed units
- Retirement dates known for any existing units
- Energy limitations associated with any unit (hydro, wind, solar)
- Efficiencies of generating units (heat rates)
- Cost of fuel for each generating unit
- Operating and maintenance costs for each generating unit
- Frequency and duration of outages for maintenance
- Rates at which various costs escalate over time
- Reserve margin/reliability requirements

- Types, costs, and amounts of purchases from and sales to other utilities
- New generation options (with all appropriate data)
- Alternatives assumed for DSM options.

I have examined the assumptions for existing units as well as the related financial parameters including the discount rate and am of the opinion that they are reasonable.

Q. What resource options were utilized in Black Hills' integrated resource plan?

A. The options incorporated in the analysis for Black Hills include mature technologies, developing technologies, purchases from other utilities, and renewable energy resources. These were:

- pulverized coal-fired units
- combustion turbines
- combined cycle units
- purchased power from neighboring utilities
- purchased power from utilities located many miles away
- coal gasification
- wind energy conversion systems
- solar photovoltaics.

For these alternatives to be considered in the integrated resource planning process, data comparable to that needed for existing units as well as additional data had to be developed. Data comparable to that needed for existing units include:

- the size of the unit
- fuel costs
- fixed operating and maintenance costs
- variable operating and maintenance costs
- maintenance requirements
- forced outage rates
- unit efficiency

Additional data required for those resource options that are to be considered as capacity planning alternatives include:

- the time frame when the unit would be available
- the cost to build it (capital cost)
- financial parameters, including the fixed charge rates associated with capital expenditures
- fixed and variable operating and maintenance costs.

Data of these types were developed for each of the alternatives investigated. The renewable energy production credit was also investigated. I have reviewed these data and conclude that they are reasonable.

IV. ADDITIONAL ANALYSIS

Q. Please explain the additional analysis undertaken in 1993 by Black & Veatch and Black Hills.

A. Because future conditions are not known with certainty, a sensitivity analysis was undertaken that examined the impacts on the economic selection of Neil Simpson #2 of different future conditions. A probabilistic analysis that built on the results of the sensitivity analysis was performed. In addition, the results of the POWRPRO model were compared with a model commercially available to utilities to verify the results. A probabilistic sensitivity analysis was also conducted

Q. Why was sensitivity analysis conducted?

A. Any prediction of the future involves some uncertainty that cannot be avoided by simply delaying the decision. Uncertainty is thus addressed by an analysis of the potential sources of uncertainty, their likelihood to occur, and the significance of their impact on the results. Said another way, sensitivity analysis is conducted to determine how the outcome is likely to change if the future differs from projections

Q. What factors were examined in the sensitivity analysis?

A. Key factors that have the potential to seriously affect the results of the base case were analyzed to determine the magnitude of the variance that would result if these factors

were higher or lower than were assumed in the base case. Future conditions examined in the sensitivity analysis included:

- Lower load growth
- Higher load growth
- Lower fuel prices
- Higher fuel prices
- Alternative resources selected.

The required additional POWRPRO runs were made by Black and Veatch personnel.

Q. Please explain the probabilistic analysis performed.

A. Probabilistic analysis in the form of decision tree analysis was conducted after the sensitivity analysis. The analysis was performed in four steps:

Step 1. Develop probability distributions to represent the uncertainty in the critical input parameters.

Step 2. Construct a "probability tree" that represents, in a systematic and structured way, all possible combinations of values of the critical input parameters, on the basis of these distributions. Our probability tree has 81 possible combinations or "paths."

Step 3. Perform the economic analysis that yields the customer savings or net benefits for each path through the probability tree. A spreadsheet was used to facilitate this process and is shown in Exhibit JSB-3, Appendix A1.

Step 4. Calculate expected values and construct probability distributions from the results obtained in Step 3.

A regression model, called a "response surface model" in Exhibit JSB-3, was constructed to fit the sensitivity analysis results. This regression model served as a bridge between the sensitivity analysis and the probabilistic analysis. It was used in the probabilistic analysis to approximate the change relative to the base case of the production cost savings from Neil Simpson #2 in any scenario. Use of this regression model made it possible to interpolate between the results obtained from the POWRPRO sensitivity analysis.

Q. Please explain the comparison undertaken of the commercially available model to POWRPRO.

A. Computer simulations were undertaken by Black Hills of the same resource plans analyzed by POWRPRO using the widely known hourly, chronological, production simulation model ENPRO. Black Hills conducted this analysis using comparable data to that used by Black & Veatch with POWRPRO. The objective was to verify the cost differences between cases as determined from examination of the POWRPRO and ENPRO cases.

Q. Was any further analysis conducted?

A. Yes. In addition, to the probabilistic analysis, probabilistic sensitivity analysis was conducted. The purpose of this analysis was to examine the sensitivity of the

probabilistic analysis to the probability values selected. Probabilistic sensitivity analysis was conducted for demand, fuel price, alternative resource cost, costs for Neil Simpson #2, and a combined analysis of alternative resource cost and cost of Neil Simpson #2.

V. RESULTS

Q. Please explain the results of the base case analysis.

A. The base case, that case resulting in the lowest present value of total revenue requirements, was that case identified in Exhibit JSB-3 and on Exhibit JSB-4 as Case 106. It showed the installation of Neil Simpson #2 in 1996, followed by combustion turbines in 1997, 1998, 2001, 2005, 2011, and 2013, as well as additional coal-fired capacity in 2007 and 2012. The net present value of total revenue requirements for this case for just the 20 years of the POWRPRO run was $504.4 million discounted to 1993. The cases that were analyzed to determine that Case 106 resulted in the lowest present value of revenue requirements were enumerated in Exhibit JSB-4. Shown along with a description of the capacity installed in each case were the requirements for transmission lines and gas pipelines, the total production and incremental capital costs for each case, and the levelized cents/kWh for each case that corresponded to the total production and incremental capital costs. Case 106 also had the lowest levelized cents/kWh.

Alternatives to the base case were developed which include replacement capacity for Neil Simpson #2 in 1996 in the form of either an 80-MW purchase from PacifiCorp (PPL

Purchase), the installation of two 40-MW combustion turbines, the installation of an 80-MW combined cycle unit, 80 MW of wind (backed up with combustion turbine capacity), 80 MW of photovoltaics, or 80 MW of a purchase from Basin Electric. Each of these scenarios resulted in higher total revenue requirements than the Case 106, which incorporated the installation of the 80-MW Neil Simpson #2 unit in 1996. The customer savings that result from Neil Simpson #2 as compared to each of the above alternatives were shown in Exhibit JSB-5. The PPL purchase resulted in additional costs to Black Hills' customers of $90.25 million, combustion turbines $150.31 million, a combined cycle unit $89.45 million, wind $92.89 million, photovoltaics $107.61 million, and a purchase from Basin Electric $61.10 million.

Q. Why does your report focus on the purchase of power from PacifiCorp as the next lowest cost alternative and not a purchase of power from Basin Electric?

A. The power purchase from PacifiCorp was based on the PacifiCorp system and represented what is referred to in the industry as a firm purchase. Power would be available from PacifiCorp when needed by Black Hills. Basin Electric had offered unit power, for which power would be available to Black Hills when a specific unit on Basin's system was available to generate electricity, but not when that unit was out of service for planned or unscheduled outages. Thus, it was not a firm purchase. For this reason, we chose to focus on the PacifiCorp purchase. Please note, however, that either the Basin Electric purchase or a purchase from PacifiCorp would result in higher costs to Black Hills' customers than would result from the installation of Neil Simpson #2

Q. What were the conclusions of the sensitivity analysis?

A. The sensitivity runs showed that under a wide range of future conditions, customer savings would still result from the installation of Neil Simpson #2. Such savings would result even under a scenario with aggressive DSM programs and wind energy resources installed, as can be seen from Exhibit JSB-6 for the cases labeled 300, 300A, 300G, and 300P.

Q. What were the results of the probability analysis?

A. The probability analysis demonstrated that the probability was quite high that under a wide range of future conditions, customer savings would still be achieved through the installation of Neil Simpson #2. The results on Exhibit JSB-7 show that compared to a purchase of power from PacifiCorp, the probability that the installation of Neil Simpson #2 will yield customer savings is over 99%. The expected savings of installing Neil Simpson #2 versus buying power from PacifiCorp are $81 million. There is an 80 percent probability that the savings will fall between $13 million and $141 million, the values shown as the 10% fractile and 90% fractile.

The expected customer savings for installing Neil Simpson #2 versus the other alternatives are $143 million as compared to combustion turbines, $85 million as compared to a combined cycle unit, $94 million as compared to wind generation, $108 million as compared to photovoltaics, and $52 million as compared to a purchase from

Basin Electric. Thus the probability analysis confirms the level of projected customer savings from installing Neil Simpson #2 versus installing an alternative resource

Q. Please describe the results of the ENPRO versus POWRPRO comparison.

A. The ENPRO model derived production costing differences of a similar magnitude as observed between cases analyzed by the POWRPRO model as shown on Exhibit JSB-8. Thus, I am confident that the production costing values derived by the Black and Veatch analysis are reasonable.

Q. What were the results of the probabilistic sensitivity analysis?

A. The probabilistic sensitivity analysis shows that with lower availability assumed for Neil Simpson #2 as well as under the level of energy taxes proposed by the Clinton Administration in February 1993, customer savings still result with the installation of Neil Simpson #2 as compared to the alternatives.

Q. What would be the impact on the results of the analysis of lower coal prices?

A. The sensitivity analyses included the examination of lower fuel prices for all fuels -- coal, natural gas, and oil -- as well as examination of lower fuel prices in conjunction with lower growth in demand for electricity. The analysis showed that under a low fuel price scenario, as well as under a low fuel price, low demand scenario, customer savings would result from the installation of Neil Simpson #2. Reducing only the price of coal would improve the customer savings of installing Neil Simpson #2 versus any alternative.

VI. UPDATED INFORMATION

Q. What new data have become available since your study was completed in 1993?

A. Since the IRP study was completed in 1993, the following new information has become available:

- Updated load forecast
- Reduction in projected capital cost for Neil Simpson #2
- The off-system opportunity sale to MDU to serve its Sheridan, Wyoming load.

Q. What is the change in the load forecast?

A. The load forecast presented in the October 1994 report from Black & Veatch titled "Black Hills Power and Light Company System Load Forecast," presented by L.W. Loos and marked Black Hills Exhibit LWL-1, shows projections of annual sales and summer and winter peaks through the year 2004 on page 1-2 in Table 1-1. Exhibit JSB-9 presents the energy projections compared to those used in Exhibit JSB-3. As can be seen from Exhibit JSB-9, the expected and high bandwidth projections for energy consumption are within the bandwidth of load forecast values used in the sensitivity analysis in the 1993 study. The October 1994 projections for the lower bandwidth are below those values examined in the 1993 study.

Q. What is the impact of the change in the load forecast?

A. The results of our additional evaluation to examine the impacts of the new forecast demonstrate that Neil Simpson #2 is still the most economic resource for a wide range of parameter values.

Q. How did you determine this?

A. This was determined by re-running the probabilistic analysis with the new demand forecast scenarios. The low, medium, and high scenarios from the 1994 load forecast were simply substituted into the probabilistic analysis spreadsheet in place of the scenarios that were previously used. The spreadsheet was originally constructed to properly account for the effect of different load forecasts on production costs and net benefits from Neil Simpson #2 relative to various alternatives. Therefore it was able to accommodate the new forecasts without any further modifications.

Q. What results did you obtain?

A. Modeling just the change in the load forecast, the base case value of net benefits from Neil Simpson #2 relative to the next best alternative decreased from $90.25 million in the 1993 analysis to $60.39 million with the 1994 medium load scenario. The net benefits also decreased in other scenarios. The expected value of net benefits over all scenarios decreased from $81.15 million to $59.29 million. The probability of net negative benefits, that is, the probability of all scenarios in which the alternative would have been better than Neil Simpson #2, increased from 0.8% to 4.0%.

Q. What has occurred with the projected capital cost for Neil Simpson #2?

A. The projected capital cost for Neil Simpson #2 has decreased to about $121 million from $125 million.

Q. What is the impact of this change?

A. The decrease in capital costs associated with Neil Simpson #2 make the project even more attractive. The possibility of a lower capital cost for Neil Simpson #2 was envisioned in the 1993 IRP study. The result is that Neil Simpson #2 is a prudent investment for Black Hill.

Q. What effect does this have on the probabilistic analysis?

A. To determine the effect on the probabilistic analysis, the probability distribution representing uncertainty on the capital cost of Neil Simpson #2 was changed by applying a probability of 1.0 to the original estimate of $125.0 million. This is appropriate because construction is nearly complete and the range of uncertainty has been reduced to almost negligible width, at least on the high side. With a combination of this change and the 1994 load forecast scenarios, we obtained an expected value of net benefits from Neil Simpson #2 of $59.35 million and a probability of negative net benefits of zero.

Q. How do you explain the probability of zero?

A We looked at all of the scenarios that yielded negative net benefits after we changed the demand forecast scenarios — the scenarios that made up the probability of 4.0% in the

analysis that I previously described. All of the scenarios that yielded negative net benefits had both a combination of high capital cost for Neil Simpson #2 and low costs for the alternative. But given what we know now about the capital cost of Neil Simpson #2, the high cost scenario is essentially impossible. Thus the probability of all of the scenarios with negative net benefits is now zero.

Q. What is the off-system opportunity sale to MDU to serve its Sheridan, Wyoming load?

A. Black Hills was successful in securing the rights to make an off-system opportunity sale to serve MDU's Sheridan, Wyoming load through a bidding process. Information on the sale and the associated savings are presented in the testimony of Roxann Basham that I have reviewed. As I understand it, this sale is not on Black Hills' transmission system but will be delivered over the PacifiCorp transmission system. Black Hills was unaware of the potential for this sale as it proceeded with the decision to build Neil Simpson #2, permitted the plant, and commenced construction.

The sale represents additional summer peak load of approximately 32 MW and winter peak load of 45 MW with an associated 60 percent load factor. It is for a term of only ten years. Thus, unlike other customer additions, Black Hills has not incurred any long-term obligation to serve associated with this off-system opportunity sale. In addition, Black Hills is not obligated to plan for resources beyond the 10-year term of the sales agreement.

Q. Based upon your knowledge of Black Hill's IRP, will Black Hills be able to serve this Sheridan load? Please explain.

A. Yes. The load forecast used in the 1993 IRP examined low and high bandwidths around the base case values as well as base case values for each year of the forecast to allow examination of the net benefits of Neil Simpson #2 under a range of potential future conditions. The revised 1994 forecast has values for the expected and upper bandwidths that are lower than those used in the 1993 IRP. Addition of the Sheridan load to the forecasted peak demand and energy values, would still cause the 1994 forecasted levels to be within the ranges examined in the IRP. Thus not only is Black Hills in a position to serve the Sheridan load. I can also conclude that with the Sheridan load Neil Simpson #2 is the most economic resource for the Black Hills system.

Q. If Black Hills were able to serve the Sheridan, Wyoming load for ten years, does this indicate to you that Neil Simpson #2 was not required?

A No, it does not

Q. Why not?

A. The sensitivity analysis undertaken during the 1993 analysis examined higher and lower levels of the load forecast during the investigation into the impacts of changes in key parameters. This analysis allows us to conclude that under higher load levels as well as lower load levels, Neil Simpson #2 remains the resource of economic choice for Black Hills.

Q. **Please provide a brief summary of the probabilistic analyses you have just described.**

A. I have described three probabilistic analyses. The first was the analysis that was done in 1993, based on the information available then about future demand and the capital cost of Neil Simpson #2. That analysis showed that the expected value of net benefits from Neil Simpson #2, relevant to the next least cost alternative, was about $80 million and the probability of negative net benefits was 0.8%. The second analysis took into account more recent information about future demand. As a result of the lower demand forecast, the expected value of net benefits from Neil Simpson #2 declined to about $59 million and the probability of negative net benefits increased to 4.0%. When the most recent information about the capital cost of Neil Simpson #2 was taken into account along with the updated load forecast scenarios, in the third analysis, the expected value of net benefits remained about $59 million but the probability of negative net benefits became zero. These results are summarized in Exhibit JSB-10.

Q. **What then do you conclude about the effect of more recent information on the decision of Black Hills to build Neil Simpson #2?**

A. The quality of a decision must be evaluated on the basis of the information that was available at the time the decision was made. Our analysis in 1993 given the information available then showed that Neil Simpson #2 was indisputably the best resource available to Black Hills. The more recent information only confirms that conclusion.

VII. CONCLUSIONS

Q. What is your conclusion?

A. Under a wide range of possible future economic conditions and scenarios, customer savings of approximately $60 million are expected to result from the installation of Neil Simpson #2. Neil Simpson #2 represents the most economic next resource for Black Hills to install.

Q. Do you believe that at the time of your 1993 report, it was a prudent decision for Black Hills to build Neil Simpson #2?

A. Yes. In 1993, Neil Simpson #2 was the most economic next resource for Black Hills to install. It was a prudent decision.

Q. Black Hills responded to a widely distributed Request for Proposals to obtain the Sheridan, Wyoming load of MDU. The 1993 IRP does not mention an RFP. How can you conclude that Neil Simpson #2 was the most economic resource if Black Hills did not go through an extensive RFP process for determining the cost of alternatives?

A. During the conduct of the 1993 IRP, an extensive sensitivity analysis was undertaken to examine the impact of changes in key parameters on the choice of resources. One of the sensitivity analyses undertaken was an examination of the cost of alternative resources to Neil Simpson #2. The analysis examined both higher costs for the alternative resources

and lower costs. The conclusion was that even with alternative resources with significantly lower costs, Neil Simpson #2 was still the resource of economic choice.

Q. Is it still your opinion, based on the updated information available, that it is prudent to proceed with Neil Simpson #2?

A. Yes. Our updated analysis shows that Neil Simpson #2 is still the most economic resource for Black Hills to install. Thus, I believe it was a prudent decision.

Q. Why do you think that Neil Simpson #2 is economically attractive to Black Hills?

A. The proposed Neil Simpson #2 power plant has several advantages that make it economically attractive to Black Hill's customers. The ones that come immediately to mind include the capital cost, the fuel cost, and the location.

Black Hills is one of the few utilities in the country building a power plant; thus equipment manufacturers and architect/engineering firms competed very strongly for the business. There just is not very much business in this industry right now. The capital cost that Black Hills has been able to lock in is very attractive, especially for a facility of this size — 80 MW. And the project is expected to come in under budget, with a revised projection of $121 million.

Because Wyodak Resources is a subsidiary of Black Hills, significant price concessions have been achieved in the price of coal. These concessions further make Neil Simpson #2 very economically attractive. This is an advantage.

Certainly as important to the price of coal is the location of the proposed facility. Being at the mine mouth, coal does not have to be transported to Neil Simpson #2 and thus transportation costs do not have to be incurred.

All of these factors contribute to the customer savings that are expected to result from the installation of Neil Simpson #2.

Q. **Why is it reasonable for Neil Simpson #2 to be an economically attractive alternative with the resources already owned by Black Hills?**

A. Black Hills, like most utilities around the country, has a variety of existing generating resources, including many older small units. At the time those older units were installed, they were state of the art, represented the best economies of scale available, and were run in a base load mode. As time passed, however, they became small, less efficient units relative to the newer units that were being installed, and were relegated to intermediate service. The Osage, Kirk, and Ben French units, in fact, have been in operation for many years (35 to 47 years) and have high heat rates (13,188 to 16,065 Btu/kWh) (see Table 3-1 in the 1992 Black Hills IRP contained as part of Exhibit JSB-3 and prepared by Black & Veatch). These units have already operated for many years past their expected

lifetimes. Thus a unit such as Neil Simpson #2 that provides an economical, efficient, and new source of electricity generation is attractive when compared to these older, smaller, less efficient units

Q. Does this conclude your testimony?

A. Yes.