State of Minnesota
Department of Revenue

In the Matter of the Proposed Rules of the Department of Revenue Governing the Valuation and Assessment of Electric, Gas Distribution and Pipeline Companies (Utility Companies)

Statement of Need and Reasonableness

The above-captioned rules are being proposed in order to update and revise the current Rules and Regulations of the Department of Revenue Relating to Ad Valorem (Property) Taxes. The current rules have been in effect since 1975. They have been revised twice. Once in 1976, and once in 1979; however, it is the announced intention of the Department of Revenue to revise the rules whenever conditions, economic or otherwise, dictate a need for revision. This intention is clearly expressed in 13MCAR § 1.0001, Introduction, of the current rules, "The methods, procedures, indicators of value, capitalization rates, weighting percents, and allocation factors will be used as described in 13MCAR §§ 1.0003 - 1.0007 for 1979 and subsequent years, or until, in the opinion of the Commissioner of Revenue, different conditions justify a change." (emphasis supplied) It is now the opinion of the Commissioner of Revenue that the rules should be revised.

This document has been prepared as a verbatim affirmative presentation of the facts necessary to establish the statutory authority, need for, and reasonableness of the proposed new rules. It is submitted pursuant to 9MCAR § 2.104 requiring a Statement of Need and Reasonableness.

A Notice of Intent to Solicit Outside Information or Opinions in the preparation of these proposed rules was published in the State Register on November 10, 1980 (5SR 762). Open forum type discussion meetings were held on November 5, 1980, February 5, May 13, and June 14, 1981. These meetings were attended by members of the Department of Revenue together with city and county assessors and representatives of various utility companies. Lists of those in attendance, agendas, meeting notes, and correspondence received relative to these meetings will be submitted by the Department to the Hearings Office at the time of the Hearing. Various suggestions and comments made at these meetings were received and duly considered by the agency.

Authority to Adopt Rules

The agency published a Notice of Intent to Adopt Rules without a Public Hearing in the April 6, 1981 edition of the State Register (5SR1572-1582). This notice concerned basically the same rules which are now being proposed for adoption at hearing. The Notice of Intent solicited enough interest to warrant a public hearing. Accordingly, the agency withdrew its request to adopt the proposed rules without a public hearing and now proposes to adopt the rules utilizing the public hearing process. Copies of all material pertinent to the adoption of the rules without a public hearing; in addition to all comments received from interested parties will be submitted to the Hearing Office at the time of Hearing.

Minn. Stat. § 270.06 (14) states that the ..."Commissioner of Revenue may promulgate rules and regulations for the administration and enforcement of the property tax. Such rules and regulations shall have the force and effect of law..." The above captioned rules are encompassed within this authority.

Further, Minn. Stat. § 270.11, Subd. 1 and 6 gives the Commissioner of Revenue the authority to review, modify, revise, raise or lower the assessed valuation of any real or personal property of any individual, copartnership, company, association or corporation. The Commissioner of Revenue is also charged with the responsibility under Minn. Stat. §§ 273.33, Subd. 2; 273.37, Subd. 2; and 273.38 of assessing the... "personal property, consisting of the pipeline system of mains, pipes and equipment attached thereto, of pipeline companies and others engaged in the operations or business of transporting natural gas, gasoline or other petroleum products by pipelines... transmission lines of less than 69kv, transmission lines of 69kv and above located in an unorganized township and distribution lines, (of electric companies) and equipment attached thereto, having a fixed situs outside the corporate limits of cities... the distribution lines, and the attachments and appurtenances thereto, (of electric companies) used primarily for supplying electricity to farmers at retail...".

Adoption of Proposed Rules
Need and Reasonableness

13MCAR § 1.0002 Definitions: This section has been revised by the addition of two new terms. The words "throughout" and "standard" have been added to the alphabetical list of terms which already make up the definition section of the existing rules. These new definitions are needed in order to establish a common language for the obsolescence section of the proposed rules. The language used in defining the terms is as straightforward and simplistic as possible while still conveying the necessary meaning.

The agency has also made two non-substantive revisions to the Definitions section. One change has inserted the word "means" after the term defined rather than three dashes (---). This change brings the rules into conformity with the format prepared by the Office of Administrative Hearings. The second change involves the re-codifying of some established definitions. This change is necessary because the inclusion of the new definitions changes the alphabetical order of the existing definitions.

The agency believes that all the revisions made to the Definition section are necessary, useful and reasonable and should be adopted as proposed.

13MCAR § 1.0003 Valuation, Cost Approach. This section has been revised in a number of areas. The first change requires the utilities to report to the commissioner the original cost of any leased utility property. The second change increases the amount of depreciation allowed to electric, gas and pipeline companies. The third change increases the study period to be used in computing the "average cost per kilowatt of installed capacity" factor for steam and gas turbine electric generating plants from ten years to fifteen years. A fourth change is the addition of two allowances; one allowance for pollution control equipment, and an allowance for obsolescence; which will be used to adjust any added value which would accrue to a utility plant due to the use of the "average cost per kilowatt of installed capacity" factor. The need for, and reasonableness of these revisions is explained below.

The first revision is an attempt to correct an oversight in the present rules. A careful reading of the definitions contained in 13MCAR § 1.0002 will disclose that definition L. "Operating Property" means any property owned or leased except land, that is directly associated with the generation, transmission, or distribution of electricity, natural gas, gasoline, petroleum products or crude oil. Note that the words owned or leased appear in the definition of operating property. It is this operating property the rules attempt to value.

The valuation of the operating property is accomplished by using two indicators of value. Any income earned by the use of leased property would be included in the income indicator of value; however, leased property is normally not reported as part of a utility's system plant. A special reporting or listing is necessary so that this property may be included in the cost indicator of value thus retaining the compatibility of the two approaches to value. The agency believes that this is a necessary provision if the two valuation methods are to reflect the value of similar property.

During the course of our meetings with representatives of the utility industry it was learned that a lessee does not always have access to the cost of property which it is leasing. The agency did not want to jeopardize the lessee-lessor relationship by the imposition of these rules; therefore, the proposed rule provided for an estimate to be made by the commissioner in the event that cost information is not available. This cost estimate will be made based on capitalized lease payments. This process is not unique and is recognized as a valid method for making estimates of cost throughout the appraisal field.

The agency believes that this proposal is reasonable and is necessary in order to calculate an accurate cost indicator of value for utilities having leased property.

The second proposed change in the rules concern the amount of depreciation which will be allowed as a reduction of the cost of the utility's property. There are several types of cost which are used in the appraisal of utilities:

1. Original Cost - Original cost is the actual cost of a property when it was first acquired or constructed.
2. Book Cost - Book cost is the original cost of a property less accrued depreciation.
3. Reproduction Cost - Reproduction cost is the present dollar cost to reproduce a replica of the existing property, i.e. what the property would cost today. Reproduction cost is obtained by trending known costs up or down, depending on whether current construction costs are greater or less than when the property was first constructed.
4. Replacement Cost - Replacement cost is the present dollar cost to replace a property with one having similar or equal usefulness.

The estimation of value by use of the cost approach requires the use of the proper type of cost, and then computing the loss in value due to depreciation.

Depreciation is made up of three factors:

1. Physical deterioration which is the loss in value from original cost caused by normal use and wearing out of the property.
2. Functional obsolescence which is a loss in value because of functional deficiencies or inadequacies within the property itself. Normally, functional obsolescence would result from technological changes which result in better, more efficient techniques.
3. Economic obsolescence which is a loss in value caused by factors outside the property itself.

In the case of electric utilities the various elements of depreciation are considered by the Federal Energy Regulatory Commission which then specifies what rates of depreciation are to be used by the various utilities for different classes of assets.

The four major electric utilities operating within Minnesota are currently at the following depreciation level:

Original Cost of Plant in Service	$3,592,007,278
Accrued Depreciation	871,345,766
Book Cost of Plant in Service	2,720,661,512
Ratio of Depr. to Original Cost	(Approx.) 24%

The rules propose to allow the electric companies a maximum of 19% depreciation. The difference between 24% and 19% is the agency's method of calculating replacement cost for the utility's property and acts as a hedge against inflation.

Minn. Stat. § 273.11, Subd. 1 requires that ..."all property shall be valued at its market value." With most types of property the concept of market value equates to replacement cost. The owner of a 20 year old three bedroom, 1000 square foot rambler does not have his property valued by the local assessor at the original cost of $15,000; neither does the assessor use book cost. The assessor would use some form of either reproduction or replacement cost. When the house was built in 1960 construction costs must have been approximately $15 per square foot; hence, the selling price, (maket value, original cost) of $15,000. Today, inflation has pushed these same construction costs to $60 per square foot, so the market value or replacement cost of the property is $60,000.

The agency recognizes that a multimillion dollar utility does not sell in the same way a three bedroom rambler might. It also recognizes that in most instances the utility is limited in its earnings by its rate base; (rate base is normally original cost less depreciation). However, it is readily apparent that because of inflation the cost of replacing the facilities at today's prices would be more than the original cost at the time of installation. Our holding of the depreciation at a specified maximum attempts to recognize both the wearing out and obsolescence of the facilities together with the fact that to replace or reproduce the facility would produce more value. The agency believes that the proposed maximum depreciation allowance is a reasonable and viable method of accomplishing both these objectives.

The pipeline and gas distribution companies have the following depreciation levels.

Original Cost of Plant in Service	$4,139,665,100
Accrued Depreciation	1,660,591,335
Book Cost of Plant in Service	2,479,073,765
Ratio of Depr. to Original Cost	40%

The proposed values would allow pipeline and gas distribution companies a maximum of 47.5% depreciation. The overall industry average depreciation rate of 40% does not exceed the maximum allowable depreciation as in the case of electric utilities. The agency is aware of this difference. We believe that because of the dissimilarity between the industries that the depreciation rates are proper. The electric industry is constantly updating and replacing its property so that overall depreciation rate is fairly low. In the pipeline industry, on the other hand, it is common practice to build a line and leave it in place for years. Since the pipes are normally buried they are not easily accessible as are electric wires. In addition, the state of the art in the pipeline industry changes much more slowly than in the electric industry. There are only so many ways you can design a pipe, while new and different ways for transmitting electricity are regularly being discovered. (Witness the change from transporting electricity in A.C. form to the D.C. mode.) There is very little replacement and updating in the pipeline field. Minnesota has operating pipelines which were built in the 1940's. Because of this longer life span of pipeline property, a larger depreciation allowance is necessary to adequately reflect the loss in value of the property. The same rationale holds true in most instances for gas distribution companies.

There is a further consideration to be looked at as well. It is an acknowledged fact that the need for electricity will go on for the foreseeable future. The demand for electric power can be met in a number of ways; by hydro power, nuclear energy or coal fired generating plants. In short, the electric industry is here to stay. Gas and oil in the other hand are not quite as stable or certain. It may well be that a pipeline may not have nearly as long a life as the builder intended either because the source of supply is exhausted, or is cut off for political or economic reasons. This of course, has a decided effect on the market value of the property. A prospective buyer would be much more willing to pay a higher price for a long term monopoly utility, than for a relatively short term speculative utility. The larger depreciation allowance given to pipelines and gas distribution companies is one of the agency's methods of recognizing this fact. We believe the proposal to be reasonable in its concept, and necessary if we are to find a realistic estimate of market value for these types of utilities.

The third change in 13MCAR S 1.0003 concerns adjusting electric utility property to take into account the effect of inflation on property values. This change is aimed at a specific type of electric utility asset, the major generating plants. The adjustment is accomplished through the use of a special study called the "Average Cost per Kilowatt of Installed Capacity."

The "Average Cost per Kilowatt of Installed Capacity" is a method of replacement cost which computes the national average cost, over a specified term of years, of building a major generating plant. This average is then applied to all major plants operated by a utility. If the national average is higher than the original cost of the plant the original cost is increased to that of the average; if the national average is lower no adjustment is made.

The reason this average is computed and used can best be explained by again using the homeowner as a comparison. The appraiser can best estimate the value of the three bedroom rambler by using two methods; 1) comparable sales, and 2) cost per square foot of construction. It is apparent that major utility generating plants do not sell frequently on the open market. Therefore the comparable sales avenue of appraisal is not generally available to us. Major generating plants are not built on a square foot basis, but rather on a capacity basis. They are measured and classed as to how many kilowatts they can produce operating at maximum capacity. Therefore, instead of using the square foot construction costs of generating plants to estimate current worth, as we would in the case of a house, we utilize cost per kilowatt.

We feel that this is a fair and workable technique of calculating an accurate measure of replacement cost for a number of reasons.

1. It follows accepted appraisal techniques of comparing construction costs for like properties.
2. It makes no adjustment on smaller standby units which are often kept in working condition by a utility for emergency use only.
3. By using the national average, the utility in Minnesota receives the benefit of warm weather building methods which are usually less costly.
4. The method gives the utility the advantage of the most advanced technology used in building power plants, and refutes the argument "We wouldn't build a plant like that today."
5. It typically produces an additional value only for older plants and does not produce an across the board increase for the newer plants.

The proposed revision would lengthen the study period for computing the national average from ten to fifteen years for both steam and gas turbine plants. The agency believes that this revision is both necessary and reasonable because it provides a broader study base and eliminates drastic yearly fluctuations which are inherent in a small sample base.

Attached to this document is a schedule showing a sample calculation of the fifteen year national average cost per kilowatt for steam generating plants. Note that a ten year study encompasses only 122 steam plants while the fifteen year study uses 181 plants or almost 50% more plants. A sample gas turbine generating plant study would show 311 plants in a ten year study and 349 or 12% more plants in a fifteen year study. While the base for gas turbine plants does not expand as dramatically as that for steam plants, both studies are expanded to a significant degree, and this broader base gives the study better stability.

The agency recommends this revision very strongly because it will promote stability in the assessment of major generating plants. Most of these plants have a dynamic effect on the fiscal policies of local taxing districts. Values must be kept stable to protect the taxing districts. In addition to this change affecting the average cost per kilowatt of installed capacity, the agency is also proposing two additional revisions to the current rules. The revisions both concern allowances which will be applied to the gross additional value to be added to a plant because of the application of the average cost per kilowatt of installed capacity factor. The first allowance concerns pollution control equipment and the second an allowance for obsolescence.

It is a well accepted fact that a substantial portion of the construction costs of modern day power plants are expended for the abatement of pollution. The national average cost per kilowatt study mentioned above does not differentiate between dollars spent for pollution control and dollars spent for ordinary costs of construction; therefore, if an additional amount is added to a power plant as a result of the application of the average cost per kilowatt of installed capacity computation, part of the additional amount represents pollution control expenditures.

Minn. Stat. § 272.02, Subd. 1, Clause (b) grants a property tax exemption to... "real and personal property used primarily for the abatement and control of air, water, or land pollution to the extent that it is so used." This exemption is recognized in the valuation formula in 13MCAR 1.0005D; however, under current rules no recognition is given to the pollution control expenditures which are part of the added value given to a power plant due to the average cost per kilowatt computation.

The agency proposes to rectify this fact through the use of an allowance for pollution control equipment which is to be applied to the gross additional added value. The computation of this allowance is very simple. A total of the plant costs, excluding land, of all major generating plants within Minnesota will be made. The computation will be by type of plant; steam, hydro or gas turbine. Another total of the cost of the pollution control equipment installed in these plants, by type of plant, which has been approved for property tax exemption by the Department of Revenue, will also be made. This total cost of the pollution control equipment will be divided by the total of the plant costs and this percentage will be deducted from the gross additional value added to each major generating plant affected by the average cost per kilowatt of installed capacity computation.

Only Minnesota generating plants will be used for this computation because each state has unique pollution control laws and regulations. It is not possible to apply Minnesota pollution standards to plants in other states and expect to gain a meaningful result. The agency believes that the computation of the pollution control allowance and its application to Minnesota generating plants only, is reasonable and necessary. It recognizes the intent of Minn. Stat. § 270.02, Subd. 1, Clause (b), while still employing accepted appraisal principles in estimating market value for major generating plants.

The other allowance which the agency proposes to apply to the additional value to be added to a generating plant because of the application of the average cost per kilowatt of installed capacity factor is an obsolescence allowance. This obsolescence allowance is to be applied only to hydro and steam type generating plants.

Gas turbine plants will not be eligible for this allowance because the design and operation of these units has not changed appreciably from their introduction to the present time. These units were first introduced in the mid-1960's and are normally purchased in a packaged form much as one would buy an auxillary generator, the only difference being the size. The cost per kilowatt of installed capacity of these units has varied only slightly over the years and the operating characteristics of all the units is fairly uniform since most are based on a relatively standard aircraft type jet engine. The agency believes that at this time there is no need to apply an obsolescence allowance to the plants; however, this position may change in the future if technological discoveries advance the state of the art to a point where obsolescence is warranted.

The age and operating characteristics of hydro and steam plants varies a substantial amount. If the intent of the average cost per kilowatt of installed capacity concept is to bring the cost per kilowatt of older plants up to relatively present day levels then the agency believes that it is only proper and reasonable to recognize the fact that even though an older plant may generate, or be capable of generating, as much power as a newer plant it may well do so with much less efficiency. Since this lack of efficiency, or obsolescence, would have an effect on the plant's market value, the agency believes that an allowance should be made for this fact. The example of the residential home can again be used to illustrate this point. A home of 1,000 square feet with a very fuel efficient heating system would be worth more than a comparable size home with an outdated, inefficient furnace.

The agency proposes to measure this obsolescence by establishing a standard and comparing the specific plant to the standard. The amount the specific plant varies from the standard is the amount the plant is obsolete.

One of the standards used for this measurement of obsolescence is called the "plant factor." The plant factor compares how much electrical energy a generating plant actually produced in a year to the maximum amount of energy it could have produced. For example, if a plant could have produced 1,000,000 KWH but only produced 500,000 KWH it was operating at a plant factor of 50%.

The plant factor is a good indicator of a generating plant's obsolescence because it actually measures obsolescence in two ways, economic and functional. If there is a low demand for a generating plant's product, electricity, then the plant will be operated at less then full capacity; hence a low plant factor. This lack of demand, or economic obsolescence, impacts a property's market value in much the same manner as a hotel built on a secondary road would most likely have a lower market value than one built near a busy freeway.

The plant factor would also recognize the downtime a generating plant experiences for maintenance and repair. It is logical to assume that an older plant would experience more time out of service for repair than a new one; simply because the component parts of the older plant have been exposed to more wear and tear, or are of an outmoded design which is not as reliable as a newer design. Another term for this frequency of repair and maintenance would be functional obsolescence. Thus, the more a generating plant is down for maintenance, the lower its plant factor would be, and the more functional obsolescence would be applied to this plant.

In order to compute the standard factor, the agency again proposes to look at those plants which were used to compute the national average cost per kilowatt of installed capacity. Since these are the plants which serve to make up the basis of the additional value, it is only reasonable to use the operating characteristics of these same plants to compute the standard plant factor. The proposed rules detail how this standard is to be computed, and it is a very simple mathematical formula. The formula multiplies the installed capacity of the various plants in kilowatt hours (KWH) times the number of hours in a year; the product of this computation is the maximum amount of power the plant could have generated in a year. The amount of KWH the plant actually produced is then divided by this optimum generation amount and a percentage developed. This computation is done for all generating plants within the specified 15 year study period. The ten plants with the highest or best plant factor are then selected out of the study and an average computed of their plant factor. The use of ten plants insures that a stable index will be used each year without abrupt fluctuations due to one or two plants operating under highly unusual circumstances. This then becomes the standard. Plant factors are then computed in the same manner for each hydro or steam generating plant which would have additional cost dollars added to it because of the application of the average cost per kilowatt of installed capacity computation. Plant factors are computed for the most recent three years, and then averaged. A three year time span is used in order to minimize the downtime effect a major overhaul or repair due to an accident might have on the net generation of a plant. This three year average plant factor is then compared to the standard plant factor. The amount or percent the three year average deviates from the standard is the amount of obsolescence measured by the application of this method. This percentage will then be used to reduce the gross additional value added to the hydro-electric plants. Steam-electric plants will have an additional obsolescence factor computed.

Hydro-electric plants differ from steam plants in that hydro plants essentially use no fuel, they are powered by the movement of water. Steam electric plants on the other hand must burn a fuel to create heat to make steam; just as their name implies. Therefore, one of the measures of the efficiency of such a plant is the amount of fuel needed to produce a unit of electric power. This is called the "thermal efficiency factor." Since the fuels used in steam-electric plants vary; coal, oil, natural gas; the only common attribute of the various fuels is that they all contain British Thermal Units (BTU). The computation of the thermal efficiency factor measures the numbers of BTU's a plant would require to produce one KWH of electric power. This measure of a steam plants efficiency is a very viable measure of obsolescence, particularly in light of current costs of energy. A plant which requires a greater amount of fuel to produce a KWH would be less attractive to a buyer than one which could generate a KWH using a very small amount of fuel.

The thermal efficiency standard will be computed by again selecting the ten plants using the least amount of fuel or BTU's to produce a KWH from all those plants which comprise the 15 year study period used to calculate the average cost per kilowatt of installed capacity. This standard will then be compared to the actual thermal efficiency of the subject steam electric plants.

There is no need to use a three year average thermal efficiency factor because the operating characteristics of a plant do not vary from year to year with respect to the utilization of fuel. The plants are much like an automobile in that a particular model of car may be rated at 20 MPG; one year it may actually get 18 MPG, another 22 but it would not suddenly jump up to 40 MPG. The amount or percentage that the subject plant deviates from the standard is the amount of obsolescence in the subject plant as measured by this thermal efficiency factor.

These two measures of obsolescences for steam electric plants; plant factor and thermal efficiency factor, are then averaged and this average obsolescence percentage is used to reduce the gross additional value added to the plant.

The calculation of all of these averages and allowances may seem very complex and technical but in essence it can be reduced to a few simple facts or statements. The agency is proposing that 1) to build a major generating plant today would cost a minimum amount of dollars per kilowatt 2) if a generating plant has construction costs which are less than this minimum the construction costs will be raised to meet the minimum 3) any additional dollars added to the cost will be reduced by an allowance for pollution control expenditures which are an intergal part of any power plant and 4) additional allowances will be made to the added cost to recognize the fact that older plants are not as efficient in their operating characteristics as are new plants. The agency bases all of these proposal in sound appraisal practice. We believe that these proposals are extremely reasonable in their concept and necessary to the proper estimation of market value for electric companies.

13MCAR S 1.0003 D. The revision in this section concerns the income approach to valuation.

This approach utilizes the capitalization of income in a mathematical process in an attempt to derive a value which represents the present worth of the future earnings of the property. The capitalization process has two major factors: 1) the income to be capitalized and 2) the captialization rate. We propose to change one of these factors to more accurately reflect current economic conditions.

We currently use three years of net utility operating income as the income to be capitalized. This is the income after expenses, depreciation and taxes, but before interest expense. This level of income is usually referred to as the income developed by the regulatory agency. It excludes all income from operations and investments that are not directly related to the operation of the company. This particular income stream is preferred by most utility appraisers, and has the most acceptance throughout the country.

The agency uses three years of these net utility operating earnings in order to level out the peaks and valleys inherent in income determination. This leveling out provides for a relatively stable value, rather than a value which would vary widely from year to year. At present the three years are weighted 40% for the first year's income, 35% for the second and 25% for the third. This weighting of income provides for the most attention to be paid to the most recent performance of the company and attempts to strike a balance between stable income and the recognition of current economic conditions effecting a company.

A capitalization rate is then applied to this weighted income. The capitalization rate is an anticipated rate of return from an investment; a rate at which income is processed (capitalized) to indicate the probable capital value. Usually this rate is commensurate with the risk of the business venture.

In developing a capitalization rate three basic methods are available. They are:

1. The Summation Method - which uses the "safe rate" (usually that of government bonds) and adds to it an allowance for management, non-liquidity, and risk. This method is usually considered to be the least reliable and is not in common use by appraisers of utility property.

2. The Comparative Method - which computes a capitalization rate by measuring the actions of purchasers in the market place. However, since utilities very seldom sell as a unit there are few market transactions from which a rate can be developed. For this reason this method is rarely used in the field of utility valuation.
3. The Band of Investment Method - which is the combination of the rate applicable to the portion of the capital structure represented by debt with the rate applicable to the portion of the capital structure represented by equity. The rate developed is a weighted average, the weighting representing percentages of the mortgage and equity position or bands of investment. This method, which is currently used by the agency, is the most generally accepted method of developing a capitalization rate for use in the appraisal of utilities.

The computation of the capitalization rate using the band of investment method is done on the basis of an average utility within an industry; that is, all companies within one industry (i.e. electric, gas distribution, pipeline) share the same rate. This is done as a matter of convenience due to the agency's lack of time and personnel. It is common practice for utility appraisers all across the country to apply a single capitalization rate to companies within the same industry.

The information used in the computation of the cap rate is taken from the latest edition of Moody's Public Utility Manual and includes the following techniques:

1. A determination of what percent of the capital structure of the average utility is made up of long term debt, preferred stock and common equity.
2. A determination of the average interest rate for contracted indebtedness, commonly referred to as the embedded cost of debt. This average interest rate will make up the debt portion of the capitalization rate.
3. A determination of the average dividend rate of the outstanding preferred stock. This dividend rate will make up the preferred stock portion of the capitalization rate.

4. A determination of the rate of return for common equity; which will make up the equity portion of the cap rate.
5. The application of the determined rate to the various bands of investment to develop the capitalization rate for the average utility.
6. The final step is to assign a risk factor to each type of utility to establish a cap rate for that particular industry.

Attached to this document is an example of the application of these techniques. You will note that the average utility cap rate as computed is 8.75%. We have adjusted this rate to allow for risk as follows:

1. Electric utilities - adjusted to 8.50% because they have lower than average interest rates and better than average earnings stability.
2. Gas distribution utilities - no adjustment made. This group represents the average utility.
3. Pipeline companies - adjusted to 9.00% because they have a higher risk factor than the average utility. Pipelines usually pay a slightly higher rate of interest, and because they do not have a monopoly, as do electric and gas companies, their earnings are less stable.

The agency believes that the amending of the present rules to incorporate these revisions to the current capitalization rates is both reasonable and logical. The major factor causing the proposed changes in the capitalization rates, over those currently in use, is the increase in the interest rates. It is a matter of record that these rates have risen steadily over the past few years.

Interest rates may be advertised which would tend to indicate that our proposed capitalization rates are too low and should be adjusted to even higher levels; however, it must be kept in mind that the interest rates in question are those currently in effect. The income which comprises the income stream is an average of three year's historical income. The capitalization rate proposed by the agency is also based on historical information. It is paramount in appraisal practice to match the correct income stream to the corresponding capitalization rate. In the agency's judgment the rates as now proposed accurately reflect the proper capitalization rate to be applied to the weighted income stream. The combination of these two elements into the income indicator of value will produce an equitable estimate of the worth of a utility. The agency is committed to a policy of review and change, as it witnessed by our introductory statement on page 1 of this document. As economic conditions change, the computation of both the capitalization rate and the income stream may well change. At this time, however, the agency believes the rates as proposed should be adopted.

13MCAR S 1.0003 Valuation F. The agency proposes to delete the existing language of the rules and add expanded language together with a numerical example. The old language addressed specifically the method to be used in the valuation of cooperative associations. Since these associations do not have "profits" in the usual business sense, only the cost indicator of value could be used in the valuation process. The agency has found that there are other types of utility property which are also not operated for profit. A good example of this type of utility is a private pipeline which transports only its own product and does not function as a common carrier. New language has been added to this rule detailing how this type of utility is to be valued.

The agency believes that this proposed language is both reasonable and necessary. It is reasonable because it prescribes that only cost will be used when making valuations of certain types of utility property. Certainly this is reasonable because income cannot be used if the utility has no income to capitalize. The proposed rule is necessary in that it enables the agency to accomplish its task of valuing these utilities.

13MCAR S 1.003 Valuation, G. Obsolescence allowance. This proposal is the most extensive revision to the existing rules. The agency believes that it is an important revision because it deals with an important issue, the energy situation in the United States. The proposal addresses the manner in which a pipeline or a gas distribution company could receive a lower estimated market value through the use of an obsolescence allowance. The agency believes this is a critical area because it is charged with the responsibility of estimating the market value for these properties. It is reasonable to assume that a property would have a lower market value if a prospective buyer knows that in a few years the property's ability to generate income would be greatly diminished. This is the situation that some pipelines are finding themselves in at the present time. The certainty of a continuing source of supply for some pipelines is very unsure and this fact does have a decided impact on their market value. The agency proposes to recognize this fact and discharge its responsibility through the use of obsolescence allowance.

Obsolescence in the valuation process normally takes two forms; functional or economic. Functional obsolescence is a loss in value because of functional deficiencies or inadequacies within the property itself. Normally, functional obsolescence would result from technological changes which result in better and more efficient techniques; however, in the case of a pipeline it could be typified by a pipeline which was constructed of 10 inch pipe in order to handle 1,000,000 barrels of oil and now finds itself restricted to 500,000 barrels of oil. This pipeline appears to be overbuilt and functionally obsolete.

Economic obsolescence is usually defined as a loss in value caused by factors outside the property itself. A prime example of this type of obsolescence has occurred with the Canadian restriction on oil and natural gas exports. This restriction had a definite impact on the earnings and consequent market value of pipelines and gas distribution companies carrying these products. The agency has drawn up a proposal to recognize this shift in value.

The agency's first proposal in this matter is that the utility must meet certain standards or criteria. The agency has done considerable research on these standards and believes that they represent fair and reasonable benchmarks of a company which is faced with obsolescence. The first standard is self explanatory. The second and third standards concern depreciation. The agency believes that so long as the utility is able to lower its cost indicator of value by applying accrued depreciation to its original cost each year it has no need of an additional obsolescence allowance. It is only when a company has reached the maximum of 47.5% depreciation, as specified by 13MCAR 1.0003, C., that a special allowance should be computed.

The agency also believes that if a utility expects to be out of business within the near future, it will take steps to insure that its property is fully depreciated at that time. This is only good business practice, and it insures that the utility must convince a separate regulatory body that it truly does expect to go out of business soon.

The fourth and fifth standards are also only a reflection of common business sense. If a utility is expecting to terminate operations soon, it is reasonable to assume that they would not make major capital investments, or incur any long term debt. If either of these standards have not been met, the utility must explain the rationale for this action to the commissioner. There may be certain circumstances which would offer an explanation for these actions; however, if a reasonable explanation is not offered, the commissioner must assume that the utility is not going out of business, and no allowance for obsolescence will be made.

The agency believes that it is important that these standards be made part of the rules. The intent is not to lower the market value of every pipeline or gas distribution company, but rather to adjust the value of those truly in need of such an adjustment. Only by prescribing specific criteria can the agency make this adjustment in a fair and equitable manner. We believe the standards are reasonable in their concept and necessary to the purpose of this section of the rules. We urge they be adopted as proposed.

If a utility qualifies for an obsolescence allowance, this allowance may take the form of one of three methods proposed by the agency. We have proposed three methods because we foresee different circumstances which would fit one method but not another. For example: one pipeline could be in a situation whereby it was authorized to export 1,000,000 barrels of oil per year until its export permit expired in three years; at which time it could export none. Another pipeline might be faced with decreasing sources of supply: 1,000,000 barrels per year to 900,000, to 800,000, and so on; until final cessation of supply in ten years. Obsolescence allowance method #3 might work best for the first pipeline while method #1 would be more applicable to the latter situation. Each case will be examined, researched and the facts weighed; the commissioner will then determine which of the three methods best suit the situation.

Method 1 would adjust the cost indicator of value in a situation where the utility was experiencing declining throughput. The method is reasonable in both its concept and mathematical application. It accomplishes the desired result of adjusting the utility's market value in certain circumstances.

Method 2 also would lower a utility's market value by lowering the cost indicator of value. It too is simple in its concept and application. It would probably be used in the case of a pipeline which was almost fully depreciated.

Method 3 is a bit more complex in its theory but it follows sound appraisal practice. The method converts the capitalization rate specified in 13MCAR § 1.0003 D from one which assumes that the utility will continue in business indefinitely, to a rate for a specific term of years. The theory of capitalized income indicator of value expresses how much a buyer would pay for a company at the present time in anticipation of future benefits or profits. Obviously, if a buyer believed that a company would continue in business for a long time he would pay more for it than one which had only a few years of viability. Method 3 attempts to measure or recognize this difference.

The agency believes that all the proposed methods are reasonable in their construction, and are a necessary means to accomplish the end of adjusting market values of utilities to allow for obsolescence.

13 MCAR § 1.0003 Valuation 4. Retirements. The agency has proposed new language pertaining to the retirement of utility property. This language has been added to the existing body of the rules in order to protect both the utilities and the taxing districts. The section spells out what constitutes an "in place" retirement of utility property; specifies what takes property out of the utility's system and places it in the category of non-utility property. By specifying the conditions and requirements necessary for this type of retirement the utility company has certain and definite procedures to follow if it wishes to retire its operating property from utility usage while still retaining the physical structure and capability of the property. This will eliminate disagreement over what is, or what is not, retired. If the retirement meets the proposed criteria, the property can be considered to be effectively retired, if the standards are not met and the procedures are not followed, the property will continue to be valued and taxed as operating utility property.

The taxing districts are also protected in that the proposal calls for advance notification of any major retirement. In some instances the value of utility property makes up as much as 90% of the tax base within a community. This notification will put taxing districts on notice of any pending shifts or decreases in the tax base. Tax impacts of this potential magnitude require advance notice and planning. The agency believes that the proposed rule will provide a mechanism to provide this advance notice to impacted taxing districts.

The agency has written the rule in such a form as to make the administrative burden to the utility company as small as possible while still retaining some type of documentation. The agency further has given the utility the option of temporarily retiring a facility in place pending future developments. In these times of critical energy supplies, the agency believes this to be a reasonable and rational attempt to save sources of energy production, internal combustion generating plants for instance, by not imposing a unreasonable tax on these facilities.

It is most important to recognize the fact that the proposed rules do not attempt to exempt any property from taxation; merely to distinguish between utility and non-utility property. The agency believes that the rule is both reasonable in its conception and necessary in its application. We urge that it be adopted as proposed.

13MCAR § 1.0006 Apportionment B. 6. New wording has been proposed to the regulations addressing to the matter of reporting property information for newly created taxing districts. The Legislature in Minn. Stat. § 444.16 through 444.21 gave municipalities the authority to create special storm sewer taxing districts. The advantage of these taxing districts over the impositions of a special assessment is that the municipality does not have to prove that any property is specifically benefited, rather they are able to levy a specified millage on all property within the district.

This situation has caused some reporting problems for the utilities and the proposed language is intended to remedy this situation. The utilities have a difficult time under certain circumstances developing costs by specified area on items of distribution plant such as poles, wires and gas pipes. The proposed language enables the utilities to make estimates of the costs if it is apparent that the development of actual costs would be too burdensome. The mill rate imposed by the special taxing districts is usually limited to less than two mills. Therefore, so long as the estimates are reasonable, no adverse fiscal impact will be felt by either the utilities or the taxing districts.

The agency believes that the adoption of this language is both necessary to eliminate an existing problem area, and reasonable in its concept. We believe that its adoption will benefit taxing districts and utilities alike.

13MCAR § 1.0006 Apportionment C2. The agency has proposed to alter this section by an addition of a schedule which over the period of ten years will equalize all taxing districts utility plant costs for purposes of apportionment at 100% of original cost. The rules now in force have an inconsistency in that the older utility properties are taken into account at something less than 100% of original cost in the apportionment formula; usually 75% of original cost. The newer utility properties; however are taken into account at more than 75%, the newest properties may use as much as 100% of original cost. This fact gives the newer properties a disproportionate share of the unit value of the utility being valued.

The reason for this inconsistency is historical and dates back to the time that the unit value concept was first used to value utility property. At that time, the rules provided that the taxable unit value of a utility would be distributed to the various taxing districts based on the last market value of the utility property within a taxing district. We chose this method when the regulations were first adopted in 1975 for one major reason - stability. One of the agency's primary aims has always been to protect the taxing districts from major fluctuations in value. The use of the last market value basis accomplished this purpose in 1975; changes in value were small, no county varying by more than plus or minus 10% in comparable property from 1974 to 1975.

The agency subsequently made one change in the basis of distribution from the last market value, to the original cost of the property x 75% <u>or</u> the last market value - whichever is greater. We believed that this change was necessary due to the fact that the first system seemed to be creating inequities in the distribution of utility values.

The agency, after studing the way in which this revised apportionment method distributed value is still not convinced that an inequity does not exist. Thus, in keeping with our policy of revising the rules whenever conditions justify a change we are proposing a slightly different apportionment method described in the proposed rules.

The inequity the agency perceives stems from the fact that the older properties, those built prior to 1975, have a market value which is based on depreciated original cost. The method which was employed to value utility property prior to 1975 specified that original cost of each utility's property within a taxing district was to be depreciated 2 1/2% per year for ten years. This produced a maximum of 25% depreciation and a residual value of 75% of original cost. A property having an original cost of $1,000,000 in 1965 would have a market value of $750,000 in 1974. The distribution of the unit value in 1975 would be based on this $750,000 figure not the $1,000,000. The newer properties, those built after 1975, do not have this depreciation factor; therefore, their basis for distribution is larger. A property built in 1979 for $2,000,000 would have as its basis for distribution the total original cost of $2,000,000; no depreciation reduces this cost.

Another factor which further compounds this problem is that of inflation. A utility may have two identical properties; for example electrical substations; both having the same capacity, both having the same function. If these two substations are built ten years apart; one in 1965, one in 1975; not only will the depreciation factor come into play but inflation will have pushed the cost of the substation built in 1975 to perhaps twice that of the earlier one. Thus, the new property receives an even greater share of the unit value.

In order to attempt to remedy this situation the agency proposes to bring the older properties back to 100% of their original cost over a period of years. The schedule proposed would change the percent of original cost to be used in the apportionment process only 2.5% per year until 100% parity is reached. This narrows the gap between the old and new properties yet it protects the taxing districts by minimizing any drastic shifts in value. The agency believes this change to be a reasonable and equitable method of correcting a problem which experience has brought to our attention.

An important fact to bear in mind is that the unit value concept presupposes that all parts of the unit are equally important in determining the value of the entire entity. One piece of a pipeline is just as important as any other piece if the integrity and completness of the pipeline system is to be maintained. The agency believes this same fact to be true in apportionment as in valuation. All parts of the unit are important and the basis of apportionment should be uniform for all. We believe our proposal to be reasonable, rational and necessary if equity and equality are to be achieved by our apportionment system.

13MCAR § 1.0006 Apportionment E. The agency proposes to take this section out of the existing rules. Note that the statuatory reference cited in the rules, Minn. Stat. § 273.11, Subd. 2, is that portion of the law which referred to limited market values. The 1979 Legislature repealed this provision of the law. The agency proposes to bring the rules into conformity with the current statutes. The agency believes that this proposal is both necessary and reasonable if the rules are to be consistent with the law.

13MCAR § 1.0007 Comprehensive example. The agency is also proposing to delete this narrative together with the entire comprehensive example from a special section of the rules and incorporate the examples into the body of the rules. The examples we have employed throughout the existing rules, have been used only to inform and to illustrate. The examples were never intended to be rules in and of themselves. The agency believes that those persons effected by the rules will be much better served by having the numerical examples in close proximity to the narrative of the rule, rather than having to turn to a special section and search for the appropriate example. We believe this layout is much more reasonable in its design and is necessary if the clarity and readability of the rules is to be improved.

SP:N6

CAPITALIZATION OF AVERAGE UTILITY WORKSHEET

ALL INFORMATION FROM
1980 MOODY'S PUBLIC UTILITY MANUAL: SPECIAL FEATURES SECTION

10 YEAR STUDY - HOW THE AVERAGE UTILITY IS CAPITALIZED

	YEAR	% OF DEBT	% OF PREFERRED	% OF COMMON
ELECTRIC COMPANIES	1970	55.8%	10.9 %	33.3 %
	1971	54.8	11.7	33.5
	1972	53.8	12.4	33.8
	1973	53.8	12.4	33.8
	1974	55.0	12.7	32.3
	1975	53.5	12.8	33.7
	1976	52.5	12.9	34.6
	1977	50.9	13.1	36.1
	1978	50.5	12.9	36.6
	1979	51.4	12.7	35.8
AVERAGE		53.2%	12.5 %	34.4 %
TRANSMISSION COMPANIES	1970	63.2%	7.4 %	29.4 %
	1971	62.1	6.5	31.4
	1972	60.4	6.5	33.0
	1973	60.2	6.3	33.4
	1974	59.6	5.8	34.6
	1975	58.3	5.3	36.4
	1976	55.5	5.5	39.1
	1977	51.9	4.9	43.2
	1978	52.4	5.5	42.1
	1979	52.4	5.3	42.3
AVERAGE		57.6%	5.9 %	36.5 %
DISTRIBUTION COMPANIES	1970	55.9%	9.4 %	34.7 %
	1971	53.6	9.9	36.6
	1972	54.0	9.1	36.9
	1973	53.8	8.5	37.6
	1974	56.0	8.3	35.8
	1975	54.9	8.8	36.4
	1976	53.0	9.4	37.6
	1977	51.0	9.9	39.1
	1978	48.3	10.3	41.3
	1979	47.1	9.8	43.1
AVERAGE		52.8%	9.3 %	37.9 %
ROUNDED AVERAGE OF THREE INDUSTRY AVERAGES		55 %	9 %	36 %

PUBLIC UTILITY STOCK YIELD WORKSHEET

ALL INFORMATION FROM 1980 MOODY'S PUBLIC UTILITY MANUAL: SPECIAL FEATURES SECTION

20 YEAR STUDY
PREFERRED STOCK YIELD

YEAR	YIELD IN %
1960	5.43
1961	5.16
1962	4.63
1963	4.72
1964	4.74
1965	N/A
1966	5.37
1967	6.03
1968	6.44
1969	7.55
1970	9.01
1971	7.74
1972	7.53
1973	7.50
1974	9.95
1975	10.63
1976	9.12
1977	8.43
1978	9.03
1979	9.76
AVERAGE	7.30

10 YEAR STUDY
COMMON STOCK YIELD AND GROWTH IN EARNINGS

YEAR	AVERAGE MARKET PRICE	DIVIDENDS PER SHARE	DIVIDEND YIELD %	EARNINGS PER SHARE	5 YEAR MOVING AV. EARN. PER SHARE	% EARN. PER SHARE INCREASE	INDICATED RATE
1970	$79.06	$4.70	5.94%	$6.89	$6.69	2.92%	8.86%
1971	84.16	4.77	5.67	7.14	6.86	2.54	8.21
1972	80.20	4.87	6.07	7.73	7.07	3.06	9.13
1973	71.21	5.01	7.04	7.55	7.25	2.54	9.58
1974	48.26	4.83	10.01	7.63	7.39	1.93	11.94
1975	51.25	4.97	9.70	7.77	7.56	2.30	12.00
1976	60.10	5.18	8.62	7.86	7.71	1.98	10.60
1977	67.55	5.54	8.20	8.83	7.93	2.85	11.05
1978	63.54	5.81	9.14	8.59	8.16	2.64	11.78
1979	60.28	6.22	10.32	8.95	8.42	3.19	13.51
AVERAGE	$66.56	$5.19	8.07%	$7.90	$7.51	2.62%	10.69%

PUBLIC UTILITY

15 YEAR COST OF MONEY STUDY

YEAR	AVERAGE YIELD ALL UTILITY BONDS	AVERAGE YIELD NEWLY ISSUED UTILITY BONDS	AVERAGE YIELD NEW, GAS, LIGHT, POWER BONDS
1965	4.68%	4.37%	4.61%
1966	5.61	4.97	5.53
1967	6.01	5.35	6.07
19[illegible]	6.72	6.41	6.80
1969	7.99	7.07	7.98
1970	8.85	8.76	8.79
1971	7.71	7.47	7.70
1972	7.46	7.16	7.50
1973	7.88	7.45	7.91
1974	9.21	8.36	9.59
1975	9.76	8.90	9.97
1976	8.80	9.06	8.92
1977	8.35	8.17	8.43
1978	9.22	9.21	9.30
1979	10.64	10.39	10.85
AVERAGE	7.93%	7.82%	8.00%

AVERAGE OF 3 COST OF MONEY INDICATORS: 7.92%

COMPUTATION OF AVERAGE CAPITALIZATION RATE

1)	AVERAGE UTILITY DEBT COST	7.92%
2)	AVERAGE DEBT % OF CAPITALIZATION	55.00%
3)	WEIGHTED DEBT CAP. RATE FACTOR	4.36%
4)	AVERAGE UTILITY PREFERRED STOCK YIELD	7.30%
5)	AVERAGE PREFERRED STOCK % OF CAPITALIZATION	9.00%
6)	WEIGHTED PREFERRED STOCK CAP. RATE FACTOR	.66%
7)	AVERAGE UTILITY EQUITY RETURN	10.69%
8)	AVERAGE EQUITY % OF CAPITALIZATION	36.00%
9)	WEIGHTED EQUITY CAPITALIZATION RATE FACTOR	3.85%
	AVERAGE UTILITY CAP RATE	8.87%

IN THE APPRAISAL FIELD IT IS CUSTOMARY TO ROUND CAP RATES; THEREFORE, SAY 8.75%

STEAM PLANTS STUDY

Average Cost Per K.W. of Installed Capacity - 15 Year Study
Source: Steam Electric Plant Construction Cost and Annual Production Expenses
Published by the U. S. Department of Energy

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Phoenix	AZ	1st	$ 63,337	$ 12	$ 63,325	396.0
Hayded No. 2	CO	1st	97,587	105	97,482	275.4
Manatee	FL	1st	339,810	3,469	336,341	1,726.6
Wansley No. 1	GA	1st	292,350	2,493	289,857	952.0
Duck Creek	IL	1st	208,718	6,755	201,963	416.5
Canal No. 2	MA	1st	122,453	-	122,453	529.6
Sherburne Co.	MN	1st	363,219	835	362,384	1,440.0
Rusn Island	MO	1st	361,808	750	361,058	1,241.0
Southwest	MO	1st	N/R			
Mansfield Br.	PA	1st	794,589	998.5	784,604	1,827.5
Harrington	TX	1st	106,062	193	105,869	360.0
New Haven Har.	CT	2nd	135,782	3,832	131,950	464.6
Gibson	IN	2nd	273,979	2,856	271,123	1,336.0
Rodemacher	LA	2nd	68,587	2,189	66,398	445.5
Waterford	LA	2nd	125,639	2,821	122,818	891.0
Mystic #4 Unit #7	MA	2nd	134,648	-	134,648	617.0
B. F. Cleary	MA	2nd	22,021	167	21,854	110.0
Big Stone #1 #2	SD	2nd	164,455	708	163,747	455.8
Colstrip No. 1	MT	2nd	296,568	3,108	293,460	716.7
Leland Olds No. 2	ND	2nd	105,309	-	105,309	460.0
Miami Fort No. 7	OH	2nd	120,751	1,486	119,265	557.1
West Loraine	OH	2nd	47,183	197	46,986	235.3
Winyah No. 1	SC	2nd	67,346	1,481	65,865	315.0
Columbia #1 #2	WI	2nd	146,567	537	146,030	544.7
Neal #2 #3	IA	2nd	139,013	-	139,013	549.8
Gaston E.C. #5	AL	3rd	166,352	10	166,342	952.0
Navajo	AZ	3rd	657,875	-	657,875	2,409.5
Santan	AZ	3rd	58,808	149	58,659	414.0
Anclote	FL	3rd	101,327	1,037	100,290	556.2

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Smith Lansing	FL	12th	$ 63,604	$ 204	$ 63,400	2340.0
Branch Haritee	GA	12th	166,866	221	166,645	1,746.2
Coffeen	Il	12th	162,047	727	161,320	1,005.5
Robert Reid	KY	12th	12,527	243	12,284	81.6
Cooper	KY	12th	48,158	533	47,625	344.0
New Boston	MA	12th	78,403	138	78,265	717.7
Ried Gardner	NV	12th	116,203	819	115,384	340.9
Marshall	NC	12th	216,018	777	215,241	2,000.0
Co[illegible]rt B	AL	12th	80,403	114	80,289	550.0
San Angelo	TX	12th	11,285	55	11,230	133.5
Sim Gideon	TX	12th	50,619	463	50,156	612.0
Mt. Storm	WV	12th	302,873	865	302,008	1,662.5
Apache	AZ	13th	13,236	40	13,196	92.9
Chalk Point	MD	13th	277,948	822	277,126	1,328.6
Neal Nos. 1 & 2	IA	13th	73,895	141	73,754	501.8
Wilkes	TX	13th	59,527	172	59,355	881.5
Sunrise	NV	13th	13,498	88	13,410	81.6
Hudson	NV	13th	210,853	412	210,441	1,114.5
Asheville	NC	13th	55,995	2,168	53,827	413.6
Mooreland	OK	13th	50,824	97	50,727	351.0
Rio Pecos	TX	13th	14,722	73	14,649	141.5
Four Corners	NM	14th	109,259	64	109,195	633.6
Fitzhugh	AR	14th	7,383	62	7,321	59.8
McDonough	GA	14th	72,986	663	72,323	598.4
Ma[illegible]n	IL	14th	21,085	1,036	20,049	99.0
Cimmaron River	KS	14th	9,033	12	9,021	65.0
McPherson	KS	14th	3,564	22	3,542	32.0
Big Sandy	KY	14th	162,534	1,051	161,483	1,096.8
Brayton Point	MA	14th	296,889	806	296,083	1,600.2
Tracy	NV	14th	47,330	410	46,920	238.0
Ravenswood	NY	14th	289,754	3,273	286,481	1,827.7
Paradise A	KY	14th	204,097	416	203,681	1,408.0
Naughton #1	WY	14th	33,540	327	33,213	163.2
Cholla	AZ	15th	27,900	241	27,659	113.6
Haynes	CA	15th	208,610	1,041	207,569	1,606.0
Bailly	IN	15th	96,140	142	95,998	615.6

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Ghent	KY	3rd	$ 242,104	$ 2,737	$ 239,3678	1,113.3
G. Andrews	MS	3rd	110,441	330	110,111	781.5
Newington	NH	3rd	80,950	404	80,546	414.0
Gilbert	NJ	3rd	81,164	238	80,926	340.2
Roseton	NY	3rd	324,102	605	323,497	1,242.0
Belews Creek	NC	3rd	349,254	14,123	335,131	2,160.0
J. M. Gavins	OH	3rd	583,220	2,712	580,508	2,600.0
Riverside	OK	3rd	107,776	1,248	106,528	945.0
B. M. Davis	TX	3rd	98,711	3,104	95,607	703.8
Ft. Phanton	TX	3rd	47,364	114	47,250	363.6
Huntington #2	UT	3rd	147,955	2,186	145,769	446.4
Jim Bridger	WY	3rd	536,933	1,223	535,710	1,581.5
Monticello	TX	3rd	204,732	5,631	199,101	1,186.8
T. C. Ferguson	TX	3rd	58,029	270	57,759	446.4
Comanche	CO	4th	197,160	207	196,953	778.5
Edge Moor	DE	4th	75,818	-	75,818	446.4
La Cynge	KS	4th	434,990	3,503	431,487	1,578.6
Conesville #4	OH	4th	132,636	69	132,567	841.5
Comanche	OK	4th	31,406	346	31,060	290.0
Brunot Island	PA	4th	74,056	394	73,662	355.9
Williams	SC	4th	94,831	676	94,155	632.7
Cumberland	TN	4th	434,593	2,082	432,511	2,600.0
Station II	KY	4th	71,317	N/R	71,317	360.0
Erickson	MI	4th	33,759	498	33,261	160.0
San Juan	NM	4th	197,608	131	197,477	676.4
Mill Creek	KY	5th	116,906	842	116,064	711.0
Big Lajan	LA	5th	33,639	593	33,046	230.4
New Madrid	MO	5th	143,907	1,123	142,784	650.0
Bowline Point	NY	5th	251,733	1,124	250,609	1,242.0
Montour	PA	5th	258,948	2,837	256,111	1,641.7
O. W. Sommers	TX	5th	92,633	5,364	87,269	892.8
Harrison	WV	5th	390,765	5,423	385,342	2,052.0
Centralia	WA	5th	317,680	1,881	315,799	1,460.0
McClellan	AK	5th	17,285	79	17,206	136.0
Powerton	IL	5th	374,822	3,297	371,525	1,785.6
Mohave	NV	6th	211,815	772	211,043	1,636.2

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Ormond Beach	WI	6th	$ 180,453	$ 7,563	$ 172,890	1,612.8
A. B. Hepkins	FL	6th	37,347	N/R	37,347	118.3
Bowen	GA	6th	440,093	1,319	438,774	3,498.6
Monroe	MI	6th	589,778	3,443	586,335	3,279.6
Mitchell	WV	6th	249,670	761	248,909	1,632.6
Seminole	OK	6th	154,086	1,653	152,433	1,724.6
E. Joslin	TX	6th	29,723	320	29,403	261.0
Jones	TX	6th	53,953	522	53,431	5,120
Naughton #3	WY	6th	53,117	-	53,117	326.4
J. E. Amos	WV	6th	521,222	1,832	519,390	2,932.6
Big Brown	TX	6th	153,688	2,333	151,355	1,186.8
Morgontown	MD	7th	198,639	473	198,166	1,251.0
Big Bend	FL	7th	277,375	4,597	272,778	1,336.5
Baldwin	IL	7th	374,551	2,588	371,963	1,892.1
Warrick	IN	7th	36,399	1	36,398	380.0
Cayuga	IN	7th	161,766	425	161,341	1,062.0
Asbury	MO	7th	27,168	125	27,043	212.8
Lewis Creek	TX	7th	56,170	3,205	52,965	542.9
La Bodie	MO	7th	441,919	540	441,379	2,482.0
M. R. Young	ND	7th	43,160	871	42,289	256.5
J. M. Stuart	OH	7th	379,484	1,269	378,215	2,440.8
Cheswick	PA	7th	130,290	1,021	129,269	565.3
Conemauch	PA	7th	238,726	1,338	237,388	1,872.0
Jefferies #3 & #4	SC	7th	43,123	7	43,116	345.6
Wateree	SC	7th	102,211	378	101,832	771.8
Lake Hubbard	TX	7th	82,104	1,710	80,394	927.5
Paradise B	TN	7th	158,813	301	158,512	1,150.2
Tombigbee	AL	8th	14,545	96	14,449	75.0
Four Corners #4 & #5	NM	8th	184,133	44	184,089	1,636.2
F. E. Ratts	IN	8th	43,306	82	43,224	233.2
Coleman	KY	8th	73,704	175	73,529	521.3
Pathfinder	SD	8th	16,392	342	16,050	75.0
W. C. Beckjord	OH	8th	61,434	27	61,407	460.8
Homer City	PA	8th	484,856	3,188	481,668	2,011.5
Hatfield's Ferry	PA	8th	261,542	242	261,300	1,728.0
New Genoa	WI	8th	52,553	376	52,177	345.6

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Edgewater #4	WI	8th	$ 46,608	$ 266	$ 46,342	351.0
Dallman	IL	9th	N/R			
Prairie Creek	IA	9th	24,588	133	24,455	148.8
Burlington	IA	9th	25,364	81	25,283	212.0
Canal	MA	9th	60,874	236	60,638	542.5
Allen S. King	MN	9th	84,446	566	83,880	598.4
S. E. Corette	MT	9th	21,781	66	21,715	172.8
Fort Churchill	NV	9th	33,783	45	33,738	210.0
R. W. Miller	TX	9th	47,468	44	47,424	391.5
Naughton No. 2	WY	9th	35,744	-	35,744	217.6
Turkey Point	FL	10th	59,264	2,187	57,077	804.1
Kinkaid	IL	10th	161,959	5,796	156,163	1,319.4
Petersburg	IN	10th	403,691	464	403,227	1,298.8
Stanton	ND	10th	24,916	151	24,765	172.0
Sioux	MO	10th	142,688	363	142,325	1,099.6
Maddox	NM	10th	11,597	26	11,571	113.6
Northport	NY	10th	313,709	2,089	311,620	1,548.4
Cardinal Units #1 & #2	OH	10th	480,137	1,372	478,765	1,880.5
Keystone	PA	10th	210,317	4,044	206,273	1,872.0
Bull Run	TN	10th	143,201	2,083	141,118	950.0
Fort Martin	WV	10th	144,888	97	144,971	1,152.0
Carl Bailey	AR	11th	11,055	39	11,016	120.0
Crystal River	FL	11th	107,419	1,688	105,731	964.3
Northside	FL	11th	138,680	367	138,313	1,158.7
Quindaro No. 3	KS	11th	33,052	-	33,052	239.1
B. F. Cleary	MA	11th	4,236	47	4,189	28.3
Baxter Wilson	MS	11th	147,516	411	147,105	1,327.6
Thomas Hill	MO	11th	61,721	40	61,681	470.0
Roxboro	NC	11th	229,586	8,064	221,522	1,813.1
Leland Olds No. 4	ND	11th	35,628	394	35,234	240.0
Grainger #2	SC	11th	N/R			
P. H. Robinson	TX	11th	N/R			
V. H. Braunig	TX	11th	65,336	1,456	63,880	894.0
Greene County	AL	12th	75,010	165	74,845	568.5
Hayden #1	CO	12th	40,032	312	39,720	190.0
Cape Canaveral	FL	12th	58,815	804	58,011	804.1

Plant Name	Location	Study Year	Total Cost (000's)	Land (000's)	Cost Less Land (000's)	Mega Watts
Sabine	TX	15th	$ 139,784	$ 617	$ 139,167	1,543.6
Chas. Crane	MD	15th	71,885	357	71,528	399.8
J. H. Campbell	MI	15th	115,391	1,642	113,749	650.0
B. L. England	NJ	15th	96,579	336	96,243	475.6
Lea County	NM	15th	9,439	62	9,377	56.5
Canady's	SC	15th	66,138	185	65,953	489.6
Valley	TX	15th	N/R	N/R	N/R	N/R
Oak Creek	TX	15th	9,496	89	9,407	81.6
			$26,614,107	$210,421	$26,403,686	150,504.7

15 Year Average Cost Per K.W.: Cost Less Land divided by Mega Watts

$$\frac{26,403,686}{150,504.7} = 175 \text{ per K.W.}$$

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