COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC UTILITIES

RE: Petition of the Wilmington Chamber of Commerce et al. for an Investigation into the Rates and Practices of the Reading Municipal Light Department	DPU 85-121

TESTIMONY OF PAUL CHERNICK

ON BEHALF OF THE

WILMINGTON CHAMBER OF COMMERCE

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1 - INTRODUCTION AND QUALIFICATIONS

Q: Mr. Chernick, would you state your name, occupation and business address?

A: My name is Paul L. Chernick. I am employed as a research associate by Analysis and Inference, Inc., 10 Post Office Square, Suite 970, Boston, Massachusetts.

Q: Mr. Chernick, would you please briefly summarize your professional education and experience?

A: I received a S.B. degree from the Massachusetts Institute of Technology in June, 1974 from the Civil Engineering Department, and a S.M. degree from the Massachusetts Institute of Technology in February, 1978 in Technology and Policy. I have been elected to membership in the civil engineering honorary society Chi Epsilon, and the engineering honor society Tau Beta Pi, and to associate membership in the research honorary society Sigma Xi.

I was a Utility Analyst for the Massachusetts Attorney General for over three years, and was involved in numerous

aspects of utility rate design, costing, load forecasting, and evaluation of power supply options. My work at Analysis and Inference has included these and other topics, including revenue allocation and ratemaking.

In my current position, I have advised a variety of clients on utility matters. My resume is attached to this testimony as Appendix A.

Q: Mr. Chernick, have you testified previously in utility proceedings?

A: Yes. I have testified approximately thirty-five times on utility issues before such agencies as the Massachusetts Energy Facilities Siting Council, the Maine Public Utilities Commission, the Texas Public Utilities Commission, the Illinois Commerce Commission, the Vermont Public Service Board, the District of Columbia Public Service Commission, the New Hampshire Public Utilities Commission, the Connecticut Department of Public Utility Control, the Michigan Public Service Commission, the New Mexico Public Service Commission, the Pennsylvania Public Utilities Commission, and the Atomic Safety and Licensing Board of the U.S. Nuclear Regulatory Commission. A detailed list of my previous testimony is contained in my resume. Subjects I have testified on include cost allocation, rate design, long range energy and demand forecasts, costs of nuclear power, conservation costs and potential effectiveness, generation

system reliability, fuel efficiency standards, and ratemaking for utility production investments and conservation programs.

Q: Have you testified previously before this Commission?

A: Yes. I have testified approximately 18 times before this Commission, on topics including rate design, capacity planning, and ratemaking.

Q: What is the subject of your testimony?

A: I will discuss several topics which affect the rates charged by the Reading Municipal Light Department (RMLD) to its customers in the Town of Reading, and in the Towns of Wilmington, North Reading, and Lynnfield (the "other Towns") I will consider, in turn, the calculation of the allowed return on investment, streetlighting rates, voluntary payments to the Towns, and the allocation of revenue requirements between classes.

2 - CALCULATION OF RETURN ON INVESTMENT

Q: Have you reviewed the 1983 and 1984 audited financial statements of RMLD as they appear in the Annual Reports for the Town of Reading for those years, and the company's purported rate of return calculations?

A: Yes.

Q: Has RMLD calculated its percentage return in a meaningful and appropriate manner?

A: No. RMLD calculates a return figure which is inflated in five ways:

- RMLD's reported return is calculated on a gross "investment" base which includes plant which has already been depreciated: the ratepayers have already paid for this plant, so it is not part of RMLD's investment.

- RMLD's reported return includes an equity return on plant which is financed by debt, for which ratepayers are charged through the interest account.

- RMLD double-counts certain depreciation expense, for plant financed by debt.

- RMLD's gross plant, in addition to including depreciated plant, includes plant which was depreciated twice.

- RMLD excludes from both expenses and plant a $1.6 million credit, which should be flowed through to ratepayers.

Q: What economic principles should govern the question of whether to use gross or net plant as the measure of investment, in fairly computing the allowed return for RMLD?

A: The real issue is the amount of funds that RMLD has committed to serving the ratepayers. This is equal to the original cost of plant; minus the portion of that plant which was financed with borrowed funds and which the ratepayers are supporting by paying interest;[1] minus the portion of plant for which ratepayers have already repaid RMLD's investment. This is essentially the calculation used for determining the equity portion of rate base for investor-owned utilities (IOUs).

Consider one example of the absurdity of allowing RMLD to charge a return on investment for plant costs which ratepayers have already paid off. For 1985, RMLD has increased its rate of depreciation from 3% to 5% per year. It is my understanding that the increased depreciation rates were intended to fund expansion of the system, and to allow RMLD to raise money without additional borrowing, rather than to replace prematurely aging equipment. Thus, customers will

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1. Alternatively, RMLD may choose to neither charge ratepayers for interest nor exclude any plant due to debt financing.

be charged in 20 years the entire cost of existing plant which is expected to last 33 years.[2] Under RMLD's return calculation, it would charge a return on the entire original cost of that plant throughout its useful life, even though from years 20 to 33 the ratepayers would already have paid back every dime RMLD had invested in the plant.[3] Table 1 computes the annual rate effect and present value of rates, for 3% and 5% depreciation rates, and for standard and RMLD calculations of return. Note that the present value of the cost to ratepayers (evaluated at RMLD's allowed return) is essentially equal under 3% and 5% depreciation, so long as the depreciation reserve is subtracted from the plant cost.[4] If gross plant is used, the cost to customers rises with the depreciation rate; as the depreciation rate rises, return does not decrease, and the double counting problem becomes more severe.

Q: Is RMLD engaging in any kind of double-recovery by its use of gross plant as the basis for calculating return?

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2. RMLD has not indicated that any change in its assessment of the useful life of its plant (primarily distribution).

3. Alternatively, RMLD's practice could be thought of as charging customers 2% extra annually on old plant, to pay for new plant, and then charging them return for both the old plant and the new plant, which they paid for in advance. The practice is equally absurd under either characterization.

4. Minor timing differences cause the present value to be slightly larger than the original investment, in either of these cases.

A: Yes. RMLD charges customers once for the plant, by depreciating it, and then continues to charge them for it, by including it in the plant account used for calculating return. This is a preposterous situation: it is equivalent to a credit card company charging interest on the customer's previous balance, after a large portion of that balance has been paid off. It is my understanding that such a practice would generally be considered a form of consumer fraud.

Q: Have you recalculated the return on plant actually earned in recent years by RMLD, using net plant as the standard?

A: Yes. Table 2 provides this calculation. Note that Table 2 does not correct any of RMLD's other errors, which I noted above.[5]

Q: Have you determined the amount of excess revenues RMLD has earned in recent years, using net plant as the standard?

A: Yes. This calculation is performed in Table 3.

Q: Does RMLD properly account for debt financing in its calculation of return?

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5. In addition, Table 2 uses an average investment for the year, rather than RMLD's investment at the end of the rate year. The DPU allows rates to be set for IOUs based on rate base levels prior to the rate year, so average rate-year investment is very generous. It is also economically correct to use average investment, since the rates are received over the course of the year (not just at the end), and the return on investment in a period should be defined with respect to the investment in that period.

A: No. RMLD apparently expects its customers to pay it an 8% return for plant which was financed with debt, rather than RMLD surplus. Since the ratepayers are already paying the interest expense on the debt, they would be double-charged if required to pay again for an equity return on the same plant. Therefore, either the RMLD plant should be decreased by the amount which was not financed by RMLD equity, or the interest expense should be dropped from the expense calculation. The latter approach allows RMLD's owner (the Town of Reading) to earn a profit by charging an 8% return for funds raised with 5% and 6% bonds,[6] and therefore results in higher rates. Even with this more modest adjustment, expenses are lower by $48,400 in 1983 and $41,400 in 1984.

Similarly, RMLD effectively charges double depreciation on plant which was debt financed. It recovers the original cost of the plant through depreciation, and then also recovers the same cost as bond principal. The DPU prevents such double billing by IOUs by prohibiting them from charging customers for bond principal: IOU rates include only interest on bonds. Equivalently, the DPU can prevent this double-billing by RMLD by subtracting the bond principal payments from depreciation expense. This would reduce RMLD's indicated expenses by $130,000 annually (page 21, DPU Returns, and IR CC-4).

Q: Is any other correction necessary to eliminate the effects of RMLD's double depreciation?

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6. See DPU Returns, page 6.

A: Yes. RMLD has, as of the end of 1984, charged ratepayers for $2,645,900 of bond and note principal:

$2,475,000 in Bond Issues listed at page 6, DPU Return,

472,500 in retired Bonds listed at page 7A,

378,400 in Notes listed at page 7, minus

680,000 of Bonds still outstanding at 12/31/85 (p. 6)

All of the principal paid would apparently have been subject to the same double-counting error. RMLD's net plant should be reduced by this excess depreciation, which was effectively counted as an expense in previous rate determinations. Assuming that the Department stops RMLD's double counting early in 1986, this balance will stop growing at the end of 1985.

Q: Have you recalculated the return on plant actually earned in recent years by RMLD, based on net equity-financed plant, excluding depreciated plant and double-depreciated plant from investment, and excluding interest and excess depreciation from expenses?

A: Yes. Table 4 provides this calculation.

Q: Have you determined the amount of excess revenues RMLD has earned in recent years, using net plant and corrected expenses?

A: Yes. This calculation is performed in Table 5.

Q: Have you reviewed RMLD's accounting treatment of "reserved cash funds in the amount of $1,600,000?"

A: Yes. In essence, RMLD has received a negative bill (a cash credit) for a portion of its MMWEC participation. When RMLD pays its bills to MMWEC, or other power suppliers, it passes those costs onto its customers. It is therefore both logical and necessary that RMLD follow the same practice with regard to MMWEC credits. Since the ratepayers are exposed to the risk of MMWEC bills and charges, they should receive the benefits of MMWEC rebates.

For determining rates, however, RMLD appears to have chosen to keep this amount, neither returning it to ratepayers immediately as a reduction in expenses for ratemaking, nor returning it gradually as a reduction in rate base (net plant), with eventual amortization.

Q: Does this accounting treatment tend to depress the statement of actual return on plant earned?

A: Yes. If the reserve were treated in a manner consistent with recent DPU treatment of cancelled nuclear plant investments for IOUs, it might be amortized over five years. Thus, revenues would be increased (or expenses decreased) by more than $320,000 in the first year, with larger credits over the next four years, due to the accumulation of interest. Table 6 calculates this effect for 1984.

Q: RMLD has argued that it must be allowed to earn a 8% return on gross plant because of the unique economic situation of municipals. Is there an economic justification for calculating the rate of return using RMLD's method?

A: There is no economic justification for RMLD's position. If municipals need to raise funds, there are many ways for them to do so which are economically justified: earning an equity return on a non-existent investment (e.g., depreciated or debt-financed plant) to raise revenues makes no more sense than redefining a kilowatt-hour to be 500 (rather than 1000) watt-hours, which would also raise revenues. In RMLD's Memorandum of September 13, 1985, it asserts that IOUs "have many more ways to obtain funds than [does] a municipal" utility (page 16). Most of the asserted differences are incorrect or irrelevant:

1. "higher rates of return": IOU rates of return are set by the Department: if they want to be allowed higher returns, they must ask the DPU for higher returns. Municipal utilities' rates of return are set directly by the legislature: if they want to be allowed higher returns, they must request them from the legislature. RMLD can certainly ask the legislature for a 12% return (just as an IOU can ask the Department for a higher return). By inflating its rate base about 50%, RMLD is attempting to achieve a 12% actual return from an 8% nominal return.

2. "normalization versus flow through tax accounting": In essence, IOU's borrow money from their ratepayers for taxes which will not be paid for several years: in the meantime, the borrowed funds are subtracted from rate

base, effectively paying interest back to the ratepayers. The funds are eventually paid to the government. RMLD's inflated rate of return is not treated as a loan, is not accompanied by interest payments back to ratepayers, and will be used (according to RMLD) to build facilities for which ratepayers will be charged again, even though RMLD took the excess return from the ratepayers in the first place.

3. "internal generation of funds": RMLD can and does generate a large amount of funds internally, but it then pays them out to subsidize the Town of Reading. As I will discuss below, RMLD has paid at least $1 million more to the Town, in 1983 and 1984 alone, than would have been justified as in lieu of tax payments (at the rate paid to the other Towns). RMLD is in the position of a IOU which raises its dividend payout and then cries financial distress because it has no equity.

4. "short term debt which need not be approved by any entity": RMLD does not specify what entities would have to approve its securing a revolving credit line for distribution upgrades, or for financing the other system improvements which RMLD believes justify an artificially inflated rate base.

Municipal utilities also have several advantages in raising funds, compared to IOUs, including

1. No rate suspension periods.

2. No prohibition on overlapping test years.

3. The ability to raise rates more than once per year.

4. The ability to include CWIP in rate base.

5. The ability to increase depreciation rates to levels which have no reasonable connection with the useful life of plant, simply to generate cash. RMLD has taken advantage of this provision: its request to the Department for the higher depreciation rate gave no indication that its plant was wearing out faster than previously expected.

Given the purposes for which RMLD would legitimately need to raise funds (basically distribution investments for load growth), hookup charges and charges in aid of construction, rather than an inflated rate base, appear to be the appropriate mechanisms for meeting extraordinary capital requirements.

Q: If RMLD were allowed to continue its practice of calculating a return on gross plant, rather than investment, would this result in a controlled and predictable increase in return on investment?

A: No. For example, the return on investment would rise as the 5% depreciation rate [illegible] gradually increased the ratio of gross plant (which includes accrued depreciation) to

investment (which excludes it). Depreciation is now about 42% of gross plant: as the higher depreciation rate drives that ratio to 63% (assuming the same average age of plant), the ratio of gross plant to investment would rise from the current 1.72 to an eventual 2.7. This factor alone would increase an 8% return on gross plant to a 22% return on investment.

Under its definition of return, RMLD could achieve almost any return it desired, by appropriate accounting and financing behavior. Placing obsolete equipment in storage, rather than retiring it, would maintain a fictitiously high gross plant: since that old plant would be largely depreciated anyway, its disposition would be of little consequence for a return-on-investment calculation. Similarly, since RMLD charges for both return and interest on debt, it can increase its rates and its return on investment by increasing its leverage: the more debt it issues, the less investment RMLD must make with its own funds to achieve the same dollar return.

Contrary to RMLD's assertion, the concept of "investment" it employs in calculating return does more than merely improve the ability of municipal utilities to generate cash. It would entirely eliminate all restrains on municipal utility return on investment.

3 - STREETLIGHTING

Q: Have you reviewed and can you describe RMLD's streetlighting rates?

A: Yes. The pertinent point is that RMLD has two streetlighting rates: one for Reading, another for the other three Towns. Table 7 calculates cent/kWh rates charged under the two rates.

Q: Can there be any economic justification for the differences just described between the two streetlighting rates?

A: Not on the basis of location. RMLD has not provided any evidence to indicate that the legitimate reasons for differences in rates (differences in technology, differences in ownership of luminaires, towers, etc.) apply in this situation.

Q: What effect does the existence of the two different streetlighting rates have on customers residing outside of Reading?

A: The Reading streetlighting rate appears to be a subsidy to Reading from RMLD. The ratepayers in the other towns (representing over 80% of sales) thus wind up subsidizing the Town of Reading, without receiving any benefit thereby. The subsidized streetlighting rate would also be expected to encourage the wasteful use of electricity by Reading. There

is some reason to believe that Reading's use of streetlighting energy is rather high: with 57% of the residential use of the other Towns combined, Reading uses 87% as much electricity for streetlighting.[7]

Q: Have you determined how much more the Town of Reading would have paid for streetlighting in recent years, had it been billed at the out-of-town rate?

A: Yes. Table 8 calculates the additional cost to Reading, had it been charged the same cents/kWh rate as the other towns.

Q: What would you recommend the Department do in order to solve the problems you see with the existing streetlighting rates?

A: Transfers from RMLD to Reading should be made in ways which do not raise rates to other customers, such as by transfers from surplus. The streetlighting rates should not discriminate geographically. Optimally, the Reading streetlighting service should be billed at the same rate as the rate currently charged in the other towns. Alternatively, the streetlighting rates to the other Towns can be reduced to those charged the Town of Reading.

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7. In addition, reported streetlighting energy usage for Reading (but not for the other Towns) is rounded off to the 50,000 kWh level, and that reported usage has declined by exactly 100,000 kWh/year over the last few years. These reporting practices may indicate that RMLD does not carefully determine Reading street lighting usage, further decreasing incentives for conservation. RMLD also does not appear to apply a fuel adjustment charge to Reading streetlighting.

4 - VOLUNTARY PAYMENTS

Q: Can you describe the system of payments RMLD makes that have been referred to as "voluntary payments" and "in lieu of tax payments?".

A: Yes. RMLD makes payments each year to each of the four Towns it serves. It appears that RMLD arbitrarily selects a mill rate (i.e., $/1000$ of original cost) which will be applied to plant in service in each of the three other Towns to determine the "tax" payment to that Town.[8] RMLD makes much larger payments to the Town of Reading, which are styled as transfers of surplus: these are also completely arbitrary. Table 9 lists payments to the Towns for recent years, with corresponding effective tax rates.

Q: Is there any rational basis for this system of voluntary payments?

A: No. This system of payments results in one set of customers (those in the other Towns, representing 80% of sales) unfairly subsidizing another set of customers (those in Reading). RMLD charges the other Towns for the benefit of the Town of Reading by:

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8. See Response to CC-7 for a further description. These are not really tax payments in the conventional sense, since they are voluntary, but they are calculated as if they were real estate taxes (except that the property owner selects the tax rate), and RMLD books them as taxes. I will therefore call them taxes, for simplicity.

- generating excess profits from all of its customers collectively,

- paying a large portion of those profits out as a dividend to the Town of Reading, despite a professed need for greater equity investment in the Light Department, to finance expansion,

- raising rates to generate the cash needed for expansion,

- using the additional cash from ratepayers (e.g., from the increase in depreciation rates) as the source of yet more surplus, which is then available to be paid out to the Town of Reading.

In other words, RMLD is following a policy of disinvestment.[9] Just as is expected whenever an enterprise is treated as a "cash cow", this disinvestment has created a situation in which RMLD is no longer self-sustaining. RMLD's increased depreciation rate will simply milk the cash cow faster. Due to RMLD's peculiar method for calculating allowed return, the cow never runs dry.

This situation might not cause any problems for an ordinary municipal utility, which serves only the town whose citizens

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9. An IOU can pay a high portion of its earnings in dividends, since it can also attract new equity investment by issuing stock (which RMLD can not do) and new debt investment by issuing bonds (which RMLD has indicated it does not wish to do).

elect its board. Those citizens will tend to pay lower taxes, to the extent that they pay higher electric rates. That is not true of the residents and businesses of Lynnfield, North Reading, and Wilmington, who pay higher electric rates and receive no corresponding benefit in lowered taxes.

Q: From an economic perspective, can you recommend any systems of voluntary payments that would be fair and rational?

A: At the very least, RMLD should cap voluntary payments to Reading at the same mill rate on gross plant it applies for the other Towns.[10] Table 8 calculates, for recent years, RMLD's voluntary payments under an equal mill rate. Table 9 calculates the increase in RMLD's cash position which would have resulted from paying Reading an equalized payment, and demonstrates that the increase in the depreciation rate (which generates only about $500,000 annually) would not have been necessary if RMLD had been more restrained in its transfers to Reading.

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10. It also appears that RMLD's plant is highly concentrated in the Town of Reading. If this is an intentional pattern (as opposed to the result of technical or regulatory considerations), this is still a form of subsidy to the Town.

5 - REVENUE ALLOCATION ISSUES

Q: Could you begin by describing the process of revenue allocation?

A: In standard ratemaking, every electric utility rate case necessarily covers three conceptually distinct subjects: estimation of total revenue needs, allocation of total revenue needs to the various customer classes, and design of rates within each class to collect the revenue allocated to that class. The interclass revenue allocation problem (the second of the three steps) has traditionally been resolved in three steps. First, costs are **functionalized** in cost categories, such as production, transmission, distribution, and general costs, depending upon the manner in which the cost is incurred. Second, these costs are **classified** as energy related, demand related, or customer related, depending on the purpose or causation of each cost. Third, each of the cost categories is **allocated** to the customer classes: the most controversial allocations are usually those related to demand related costs.

Q: Is it necessary for the Department to address rate design questions before it can determine whether revenue allocations have been properly made?

A: No. The process generally proceeds in the opposite direction: the DPU would normally allocate revenues to classes, and then design rates to collect those revenues.

Q: Can you describe your understanding of department policy regarding revenue allocations, and particularly the types of COSS methodologies which the Department has approved?

A: It is my understanding that the DPU has approved a variety of COSSs in recent years. So far as I know, all have been basically embedded in nature. On the power supply side, the DPU has accepted capacity allocations based on Average and Excess (A/E), Average and Peak (A/P), and Full Availability Dispatch (FAD) methods. Power supply energy (basically fuel) costs have been allocated on the basis of energy, or occasionally on the FAD methodology. Subtransmission and distribution costs have been allocated with a variety of non-coincident peak and energy/peak methods.

Q: Have you reviewed a COSS performed for RMLD by UE&C?

A: Yes.

Q: What is your opinion of that study?

A: It appears to be a typical utility COSS, similar in basic structure to several that the DPU has adopted in recent years. It uses an A/E allocator (with the excess based on estimated non-coincident peak) for power supply capacity costs, and allocates power supply energy costs on the basis of energy use at the generation level. Distribution costs are allocated on the basis of non-coincident class peak by voltage level.

The UE&C study uses a fair amount of borrowed load data, for lack of RMLD data, but this seems unavoidable. Different loss percentages are used for each voltage level, and different load factors are used for each customer class.

Q: To your knowledge did RMLD have any other COSS, or any other basis, for the revenue allocations implicit in its most recently filed tariff?

A: No, not according to Mr. Rhinerson's deposition, or IR CC-5 (which discusses the basis of some rate designs, but not for cost allocations).

Q: Did RMLD adjust its cost allocations to be consistent with the UE&C COSS?

A: No. RMLD appears to have entirely ignored its consultant's report.

Q: Can you quantify the harm to the petitioners resulting from RMLD's failure to rely on the UE&C study for cost allocation?

A: Yes. According to the UE&C COSS, Rate C should have been paying approximately 54.63% of RMLD's non-fuel costs. As Table 10 demonstrates, Rate C has paid more than this percentage in 1983 and 1984, and was assigned more than this share of the 1985 rate increase. Had RMLD adjusted revenue allocations to fully comply with the results of the study within a reasonable period (say, 60 days), Rate C customers would have paid $3.1 million less between 1983 and 6/85.

This estimate assumes that the excess charges to Rate C would not have increased between 1984 and 1985, if not for the rate increase, and that RMLD would have imposed a fairly strict continuity constraint in 1983, such as limiting any class's initial rate increase due to the reallocation to 4% (less than inflation), and therefore would have reduced the 1983 overcharge to Rate C by only $400,000, rather than the full $800,000.[11]

Q: What is the basis for the class revenue allocations in RMLD's most recently filed tariffs?

A: There does not appear to be any basis for the allocations in the rates filed in June 1985.

Q: Have you performed any analysis of the impact of the present rates on any of the petitioning customers?

A: Yes. If the annual revenue increase approved by RMLD for the present rates were allocated on the basis of the UE&C COSS, the Rate C share would have been $400,000 smaller than in the present rates. Table 10 also applies the UE&C results to the 6/85 rate increase, and calculates a total differential between actual Rate C revenues and those indicated by RMLD's commissioned COSS.

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11. It is important to remember that Rate C customers are located almost entirely outside Reading, and therefore have no influence on the RMLD. We have already seen in the cases of voluntary payments and of streetlighting rates that RMLD is engaged in a pattern of predatory pricing with regard to the other Towns. Excessive charges to Rate C is yet one more way in which RMLD has preyed on the other Towns.

Q: In advance of seeing the company's direct testimony, what general recommendations would you make regarding RMLD's revenue allocations?

A: First, let us review the history of RMLD cost allocations. Until the completion of the UE&C study in 1983, RMLD had no basis for any class cost allocations. RMLD has not been able to provide any principled reason for failing to implement the UE&C COSS, once a basis for cost allocation became available. While the UE&C study is hardly a perfect product, it is certainly consistent with industry practice and Department precedents. Its weaknesses compared to many DPU-approved COSSs result more from RMLD's lack of data than from any conceptual differences.

Second, while RMLD has prepared a new COSS for the purposes of this proceeding, that COSS was initiated only after the present rates were put into effect and only after this case was filed. Therefore, it can not be regarded as the basis for the last three years of rates. An analysis prepared to retrospectively justify pricing decisions (which could not have been based on any similar analysis) should be viewed with considerable suspicion.

Q: Given that RMLD has prepared a COSS for this case, on what basis should the Department determine the allocation of RMLD's rates in the future?

A: Since the new COSS has been provided to us only very recently (and with very little documentation, some of which is internally contradictory), it was not possible to include a review of that study in this testimony. Following the filing of RMLD testimony (if any) in support of the new study, and an opportunity for discovery, it may be appropriate to comment on the new study in rebuttal testimony.

Q: Does this conclude your direct testimony in this proceeding?

A: Yes.

Table 1: Comparison of Return on Investment to Return on Net Plant

Standard Rate Computation, Based on Return on Investment

Year	Investment @ Year End	Depreciation @ 3%	Return @ 8%	Total Rate Effect	Investment @ Year End	Depreciation @ 5%	Return @ 8%	Total Rate Effect
0	1000				1000			
1	970	30	78.8	108.8	950	50	78	128
2	940	30	76.4	106.4	900	50	74	124
3	910	30	74	104	850	50	70	120
4	880	30	71.6	101.6	800	50	66	116
5	850	30	69.2	99.2	750	50	62	112
6	820	30	66.8	96.8	700	50	58	108
7	790	30	64.4	94.4	650	50	54	104
8	760	30	62	92	600	50	50	100
9	730	30	59.6	89.6	550	50	46	96
10	700	30	57.2	87.2	500	50	42	92
11	670	30	54.8	84.8	450	50	38	88
12	640	30	52.4	82.4	400	50	34	84
13	610	30	50	80	350	50	30	80
14	580	30	47.6	77.6	300	50	26	76
15	550	30	45.2	75.2	250	50	22	72
16	520	30	42.8	72.8	200	50	18	68
17	490	30	40.4	70.4	150	50	14	64
18	460	30	38	68	100	50	10	60
19	430	30	35.6	65.6	50	50	6	56
20	400	30	33.2	63.2	0	50	2	52
21	370	30	30.8	60.8	-50	50	-2	48
22	340	30	28.4	58.4	-100	50	-6	44
23	310	30	26	56	-150	50	-10	40
24	280	30	23.6	53.6	-200	50	-14	36
25	250	30	21.2	51.2	-250	50	-18	32
26	220	30	18.8	48.8	-300	50	-22	28
27	190	30	16.4	46.4	-350	50	-26	24
28	160	30	14	44	-400	50	-30	20
29	130	30	11.6	41.6	-450	50	-34	16
30	100	30	9.2	39.2	-500	50	-38	12
31	70	30	6.8	36.8	-550	50	-42	8
32	40	30	4.4	34.4	-600	50	-46	4
33	10	30	2	32	-650	50	-50	0
34	0	10	0.1	10.1	-667	16.7	-17.6	-0.9
Amort [1]				0				-667
PV over 20 years								1019
PV over 33 1/3 years				1025				1022

Notes: 1. Amortization of net plant at retirement.
2. Positive return on negative investment.
3. Year 34 is 1/3 year long.
4. PV's taken to end of year zero.

Table 1: (Continued)

RMLO Rate Computation, Based on Return on Gross Plant

Year	Gross Plant @ Year End	Depreciation @ 3%	Return @ 8%	Total Rate Effect	Return on Investment	Gross Plant @ Year End	Depreciation @ 5%	Return @ 8%	Total Rate Effect	
0	1000					1000				
1	1000	30	80	110	8.1%	1000	50	80	130	8.2%
2	1000	30	80	110	8.4%	1000	50	80	130	8.6%
3	1000	30	80	110	8.6%	1000	50	80	130	9.1%
4	1000	30	80	110	8.9%	1000	50	80	130	9.7%
5	1000	30	80	110	9.2%	1000	50	80	130	10.3%
6	1000	30	80	110	9.6%	1000	50	80	130	11.0%
7	1000	30	80	110	9.9%	1000	50	80	130	11.9%
8	1000	30	80	110	10.3%	1000	50	80	130	12.8%
9	1000	30	80	110	10.7%	1000	50	80	130	13.9%
10	1000	30	80	110	11.2%	1000	50	80	130	15.2%
11	1000	30	80	110	11.7%	1000	50	80	130	16.8%
12	1000	30	80	110	12.2%	1000	50	80	130	18.8%
13	1000	30	80	110	12.8%	1000	50	80	130	21.3%
14	1000	30	80	110	13.4%	1000	50	80	130	24.6%
15	1000	30	80	110	14.2%	1000	50	80	130	29.1%
16	1000	30	80	110	15.0%	1000	50	80	130	35.6%
17	1000	30	80	110	15.8%	1000	50	80	130	45.7%
18	1000	30	80	110	16.8%	1000	50	80	130	64.0%
19	1000	30	80	110	18.0%	1000	50	80	130	106.7%
20	1000	30	80	110	19.3%	1000	50	80	130	320.0%
21	1000	30	80	110	20.8%	1000	50	80	130	[2]
22	1000	30	80	110	22.5%	1000	50	80	130	[2]
23	1000	30	80	110	24.6%	1000	50	80	130	[2]
24	1000	30	80	110	27.1%	1000	50	80	130	[2]
25	1000	30	80	110	30.2%	1000	50	80	130	[2]
26	1000	30	80	110	34.0%	1000	50	80	130	[2]
27	1000	30	80	110	39.0%	1000	50	80	130	[2]
28	1000	30	80	110	45.7%	1000	50	80	130	[2]
29	1000	30	80	110	55.2%	1000	50	80	130	[2]
30	1000	30	80	110	69.6%	1000	50	80	130	[2]
31	1000	30	80	110	94.1%	1000	50	80	130	[2]
32	1000	30	80	110	145.5%	1000	50	80	130	[2]
33	1000	30	80	110	320.0%	1000	50	80	130	[2]
34	1000	10	26.7	36.7	533.3%	1000	16.7	26.7	43	[2]
Amort [1]				0					-667	
PV over 20 years									1326	
PV over 33 1/3 years				1319					1512	

Notes: 1. Amortization of net plant at retirement.
2. Positive return on negative investment.
3. Year 34 is 1/3 year long.

Table 2: RMLD Return on Investment

Year	1981	1982	1983	1984
1.0 Net Income		$1,608,165	$2,920,781	$1,731,594
1.1 Depreciation and Reserve Fund Income		$250,000	$156,341	$273,520
1.2 MMWEC Rebate			$1,600,000	
1.3 Bond Principal Payments		$130,000	$130,000	$130,000
2.0 Income Subject to 8% Limitation		$1,228,165	$1,034,440	$1,328,074
3.0 Original Cost of Plant at Year End		$21,239,250	$22,674,182	$24,412,507
3.1 Depreciation Reserve at End of Year			$9,806,365	$10,324,472
4.0 Net Investment at End of Year	$10,952,076	$11,856,116	$12,867,317	$14,088,035
5.0 Average Investment During Year		$11,404,096	$12,361,717	$13,477,676
6.0 Rate of Return on Average Investment		10.77%	8.37%	9.85%
6.1 Rate of Return on Year-End Investment		10.36%	8.04%	9.43%

Table 3: Calculation of Allowed Rates at 8% Return Corrected for Net Plant

Year	1982	1983	1984
Investment	$11,404,096	$12,361,717	$13,477,676
8% return	$912,328	$988,937	$1,078,214
Net Income Exempt From Limitation	$380,000	$1,886,341	$403,520
Total Allowed Net Income	$1,292,328	$2,875,278	$1,481,734
Actual Income	$1,608,165	$2,920,781	$1,731,594
Excess Income	$315,837	$45,503	$249,860

Table 4: RMLD Rate of Return on Investment,
Corrected for Depreciation and Debt Effects

Year	1981	1982	1983	1984
1.0 Net Income		$1,608,165	$2,920,781	$1,731,594
1.1 Depreciation and Reserve Fund Income		$250,000	$156,341	$273,520
1.2 MMWEC Rebate			$1,600,000	
1.3 Bond Principal Payments		$130,000	$130,000	$130,000
1.4 Interest		$73,815	$60,338	$50,000
1.5 Double-counted Depreciation		$130,000	$130,000	$130,000
2.0 Income Subject to 8% Limitation		$1,431,980	$1,224,778	$1,508,074
3.0 Original Cost of Plant at Year End	19000000	$21,239,250	$22,674,182	$24,412,507
3.1 Depreciation Reserve at End of Year	$8,047,924	$9,383,134	$9,806,865	$10,324,472
3.2 Duplicative Depreciation In Plant	$2,255,900	$2,385,900	$2,515,900	$2,645,900
4.0 Net Investment at End of Year	$8,696,176	$9,470,216	$10,351,417	$11,442,135
5.0 Average Investment During Year		$9,083,196	$9,910,817	$10,896,776
6.0 Rate of Return on Average Investment		15.77%	12.36%	13.84%
6.1 Rate of Return on Year-End Investment		15.12%	11.83%	13.18%

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Table 5: Calculation of Allowed Rates at 8% Return
Corrected for Net Plant and Debt Effects

Year	1982	1983	1984
Investment	$9,083,196	$9,910,817	$10,896,776
8% return	$726,656	$792,865	$871,742
Net Income Exempt from Limitation	$176,185	$1,696,003	$223,520
Total Allowed Net Income	$902,841	$2,488,868	$1,095,262
Actual Income	$1,608,165	$2,920,781	$1,731,594
Excess Income	$705,324	$431,913	$636,332

Table 6: Rate Effect of MMWEC Reserve Amortization, 1984

	RMLD Accounting	Net Plant	Net Plant With Debt Effects
Investment	$24,412,507	$13,477,676	$10,896,776
8% return	$1,953,001	$1,078,214	$871,742
Net Income Exempt from Limitation	$403,520	$403,520	$223,520
Total Allowed Net Income	$2,356,521	$1,481,734	$1,095,262
Expenses	$41,141,612	$41,141,612	$41,141,612
Interest Charges	$53,356	$53,356	$53,356
Other Income	$607,332	$607,332	$607,332
Revenue Required	$42,944,157	$42,069,370	$41,682,898
Revenue from Amortizing Reserve	$320,000	$320,000	$320,000
Required Rate Revenue	$42,624,157	$41,749,370	$41,362,898
Reduction	0.75%	0.76%	0.77%

Table 7: RMLD Streetlighting Rates for Reading and Other Towns

Year	Town(s)	kWh Usage	Revenue Received	Cents per kWh
1980	Reading	1,900,000	$112,593.10	5.9260
1980	Others	1,732,712	$214,425.00	12.3751
1981	Reading	1,700,000	$118,390.00	6.9641
1981	Others	1,816,006	$285,825.89	15.7393
1982	Reading	1,650,000	$125,558.00	7.6096
1982	Others	1,806,733	$275,642.88	15.2564
1983	Reading	1,550,000	$118,801.60	7.6646
1983	Others	1,789,881	$277,012.17	15.4766
1984	Reading	1,450,000	$118,227.42	8.1536
1984	Others	1,757,618	$293,304.37	16.6876

Table 8: Reading Streetlighting Revenue
At Rate Charged Other Towns

Year	Cents per kWh Other Towns	Reading kWh	Reading Streetlighting Revenue at Rate Charged Other Towns	Actual Reading Street-lighting Revenue	Difference
1980	12.3751	1,900,000	$235,127	$112,593	$122,534
1981	15.7393	1,700,000	$267,567	$118,390	$149,177
1982	15.2564	1,650,000	$251,731	$125,558	$126,173
1983	15.4766	1,550,000	$239,887	$118,802	$121,085
1984	16.6876	1,450,000	$241,970	$118,227	$123,743
Total					$642,712

Table 9: RMLD Voluntary Payments to Towns

Year		Actual Payments				Reading Payment At Other Towns' Rate	Difference
		Lynnfield	N. Reading	Wilmington	Reading		
1975	Gross Plant	$906,865	$1,137,796	$2,487,833	$7,861,506		
	Payment	$33,514	$53,624	$104,711	$684,000	$330,641	$353,359
	Mill Rate	$37	$47	$42	$87		
1976	Gross Plant		DATA	INCOMPLETE			
	Payment	$26,923	$61,346	$121,240	$445,000	ERR	ERR
	Mill Rate	ERR	ERR	ERR	ERR		
1977	Gross Plant		DATA	INCOMPLETE			
	Payment	$19,376	$70,192	$142,520	$439,000	ERR	ERR
	Mill Rate	ERR	ERR	ERR	ERR		
1978	Gross Plant	$1,061,657	DATA	INCOMPLETE			
	Payment	$33,645	$65,914	$142,097	$589,000	ERR	ERR
	Mill Rate	$32	ERR	ERR	ERR		
1979	Gross Plant	$1,104,149	$1,355,855	$3,633,363	$9,674,633		
	Payment	$44,166	$54,234	$145,335	$586,000	$386,985	$199,015
	Mill Rate	$40	$40	$40	$61		
1980	Gross Plant	$1,144,346	$1,439,001	$4,151,364	$10,483,289		
	Payment	$45,774	$57,560	$166,055	$673,000	$419,332	$253,668
	Mill Rate	$40	$40	$40	$64		
1981	Gross Plant	$1,246,380	$1,582,761	$4,566,320	$11,139,540		
	Payment	$49,855	$63,310	$182,653	$1,087,000	$445,582	$641,418
	Mill Rate	$40	$40	$40	$98		
1982	Gross Plant	$1,370,510	$1,724,741	$5,023,895	$11,971,854		
	Payment	$54,820	$68,990	$200,956	$1,054,000	$478,874	$575,126
	Mill Rate	$40	$40	$40	$88		
1983	Gross Plant	$1,465,626	$2,080,335	$5,368,464	$12,324,575		
	Payment	$58,625	$83,213	$213,205	$800,000	$491,809	$308,191
	Mill Rate	$40	$40	$40	$65		
1984	Gross Plant	$1,591,878	$2,469,056	$5,627,458	$12,985,608		
	Payment	$31,838	$49,381	$112,313	$1,000,000	$259,530	$740,470
	Mill Rate	$20	$20	$20	$77		

Table 10: Calculation of Excess Revenues from Rate C

		Revenues	MWH Sales	Fuel Charge $/MWH	Non-Fuel Revenues	Rate C Share of Non-fuel Revenues	Excess Over 54.630% — %	Excess Over 54.630% — $
1983	Rate C	$21,538,510	290,923	$33.94	$11,663,169	58.889%	4.259%	$843,598
	Total	$35,088,062	450,226	$33.94	$19,805,182			
1984	Rate C	$26,590,954	314,642	$47.86	$11,533,428	60.396%	5.766%	$1,101,111
	Total	$42,045,708	479,550	$47.86	$19,096,317			
1985	Prior to Increase							
	(Assume 1984 differential, despite growth in difference 1983-1984)							$1,101,111
1985	Increase							
	Rate C	$1,859,266			$1,859,266	75.642%	21.012%	$516,468
	Total	$2,457,986			$2,457,986			
Total								$3,562,288

APPENDIX A:

RESUME OF PAUL CHERNICK