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SSU
Southern States Utilities • 1000 Color Place • Apopka, FL 32703 • 407/880-0058

December 5, 1996

Ms. Blanca Bayó, Director
Division of Records & Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

via Federal Express

Re: Docket No. 960258-WS -- Petition to Adopt rules on Margin Reserve and Imputation of Contributions-in-aid-of-construction on Margin Reserve Calculation by the Florida Waterworks Association

Dear Ms. Bayó:

I write to make two corrections to exhibits Southern States Utilities, Inc. ("SSU") has previously filed. I address these matters now because no prehearing conference is scheduled for this matter, and I hope to save time at the beginning of the December 10 and 11 hearing. An original and 15 copies of this letter are enclosed for filing.

Attached hereto are 16 copies of Revised Exhibits GCH-3 and RMH-7. Upon review of the original Exhibit GCH-3, SSU elected to enlarge the information depicted to make same more readable. Accordingly, the attached Revised Exhibit GCH-3 depicts the same graphical information as the original, but magnified and on a larger size of paper. Original Exhibit RMH-7 is the incorrect Department of Environmental Protection ("DEP") rule. The text of Mr. Harvey's testimony references the correct rule, and Revised Exhibit RMH-7 is the correct rule.

If you have any questions regarding the above, please call me at (407) 880-0058, ext. 260.

Sincerely yours,

Matthew Feil

Matthew Feil, Esq.
Staff Attorney

c: All parties

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APP 1 More
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2. The preliminary design report does not provide reasonable assurances that the proposed wastewater facility technology will function as intended at the design capacity requested by the permittee.

(c) When the permit includes the treatment facilities and reuse or disposal systems, different permitted capacities may be established for the treatment, reuse, and disposal systems.

(4) *Sampling Points*

(a) Provisions shall be made in the design for easy access points for the purpose of obtaining representative influent and effluent samples. These access points shall be dry points which can be reached safely.

(b) Provisions for flow measurements shall be in accordance with Chapter 62-601, F.A.C.

Specific Authority: 403.061, 403.087, F.S.
Law Implemented: 403.021, 403.061, 403.062, 403.086, 403.087, 403.088, F.S.
History: New 11-27-89, Amended 1-30-91, 6-8-93, Formerly 17-600.400.

62-600.405 Planning for Wastewater Facilities Expansion.

(1) The permittee shall provide for the timely planning, design, and construction of wastewater facilities necessary to provide proper treatment and reuse or disposal of domestic wastewater and management of domestic wastewater residuals.

(2) The permittee shall routinely compare flows being treated at the wastewater facilities with the permitted capacities of the treatment, residuals, reuse, and disposal facilities.

(3) When the three-month average daily flow for the most recent three consecutive months exceeds 50 percent of the permitted capacity of the treatment plant or reuse and disposal systems, the permittee shall submit to the Department a capacity analysis report.

(4) The initial capacity analysis report shall be submitted according to the following:

(a) For new or expanded wastewater facilities for which the Department received a complete construction permit application after July 1, 1991, the initial capacity analysis report shall be submitted within 180 days after the last day of the last month in the three-month period referenced in Rule 62-600.405(3), F.A.C.

(b) For wastewater facilities for which the Department received a complete construction permit application on or before July 1, 1991, the initial capacity analysis report shall be submitted when the next application for a permit to construct or operate wastewater facilities is submitted to the Department unless:

1. The three-month average daily flow for any three consecutive months during the period July 1, 1990, to June 30, 1991, exceeds 90 percent of the permitted

capacity. In such cases, the initial capacity analysis report shall be submitted to the Department no later than January 1, 1992.

2. The three–month average daily flow for any three consecutive months during the period July 1, 1990, to June 30, 1991, exceeds 75 percent of the permitted capacity. In such cases, the initial capacity analysis report shall be submitted to the Department no later than July 1, 1992.

(c) In no case shall the initial capacity analysis report be required to be submitted before July 1, 1991, or before the three–month average daily flow exceeds 50 percent of the permitted capacity of the treatment plant or reuse or disposal systems, as described in Rule 62–600.405(3), F.A.C.

(5) The permittee shall submit updated capacity analysis reports to the Department according to the following:

(a) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will not be equaled or exceeded for at least 10 years, an updated capacity analysis report shall be submitted to the Department at five–year intervals or at each time the permittee applies for an operation permit or renewal of an operation permit, whichever occurs first.

(b) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next 10 years, an updated capacity analysis shall be submitted to the Department annually.

(6) The capacity analysis report or an update of the capacity analysis report shall evaluate the capacity of the plant and contain data showing the permitted capacity; monthly average daily flows, three–month average daily flows, and annual average daily flows for the past 10 years or for the length of time the facility has been in operation, whichever is less; seasonal variations in flow; flow projections based on local population growth rates and water usage rates for at least the next 10 years; an estimate of the time required for the three–month average daily flow to reach the permitted capacity; recommendations for expansions; and a detailed schedule showing dates for planning, design, permit application submittal, start of construction, and placing new or expanded facilities into operation. The report shall update the flow–related and loading information contained in the preliminary design report submitted as part of the most recent permit application for the wastewater facilities pursuant to Rules 62–600.710 and 62–600.715, F.A.C.

(7) The capacity analysis report shall be signed by the permittee and shall be signed and sealed by a professional engineer registered in Florida.

(8) Documentation of timely planning, design, and construction of needed expansions shall be submitted according to the following schedule:

(a) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next five years, the report shall include a statement, signed and sealed by a professional engineer registered in Florida, that planning and preliminary design of the necessary expansion have been initiated.

(b) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next four years, the report shall include a statement, signed and sealed by an engineer registered in Florida, that plans and specifications for the necessary expansion are being prepared.

(c) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next three years, the permittee shall submit a complete construction permit application to the Department within 30 days of submittal of the initial capacity analysis report or the update of the capacity analysis report.

(d) If the initial capacity analysis report or an update of the capacity analysis report documents that the permitted capacity will be equaled or exceeded within the next six months, the permittee shall submit to the Department an application for an operation permit for the expanded facility. The operation permit application shall be submitted no later than the submittal of the initial capacity analysis report or the update of the capacity analysis report.

(9) If requested by the permittee, and if justified in the initial capacity analysis report or an update to the capacity analysis report based on design and construction schedules, population growth rates, flow projections, and the timing of new connections to the sewerage system such that adequate capacity will be available at the wastewater facility, the Secretary or Secretary's designee shall adjust the schedule specified in Rule 62–600.405(8), F.A.C.

Specific Authority: 403.061, 403.087, F.S.
Law Implemented: 403.021, 403.061, 403.086, 403.087, 403.088, 403.0881, [1]403.101, F.S.
History: New 1–30–91, Formerly 17–600.405.

62–600.410 Operation and Maintenance Requirements.

(1) All domestic wastewater treatment plants shall be operated and maintained in accordance with the applicable provisions of this chapter and so as to attain, at a minimum, the reclaimed water or effluent quality required by the operational criteria specified in this chapter, and to meet the appropriate domestic wastewater residuals management criteria specified in Chapters 62–2, 62–7, 62–640, and 62–701, F.A.C.

(2) All reuse and land application systems shall be operated and maintained in accordance with the applicable provisions of this chapter and the provisions of Chapter 62–610, F.A.C.

(3) All underground injection effluent disposal systems shall be operated and maintained in accordance with the applicable provisions of this chapter and the provisions of Chapter [8] 62–28, F.A.C.

(4) Wetlands application systems shall be operated and maintained in accordance with the applicable provisions of this chapter and the provisions of Chapter 62–611, F.A.C.

2. The preliminary design report does not provide reasonable assurances that the proposed wastewater facility technology will function as intended at the design capacity requested by the permittee.

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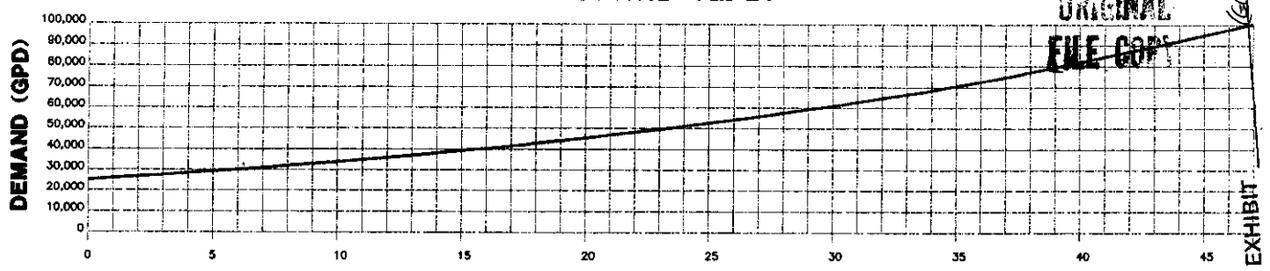
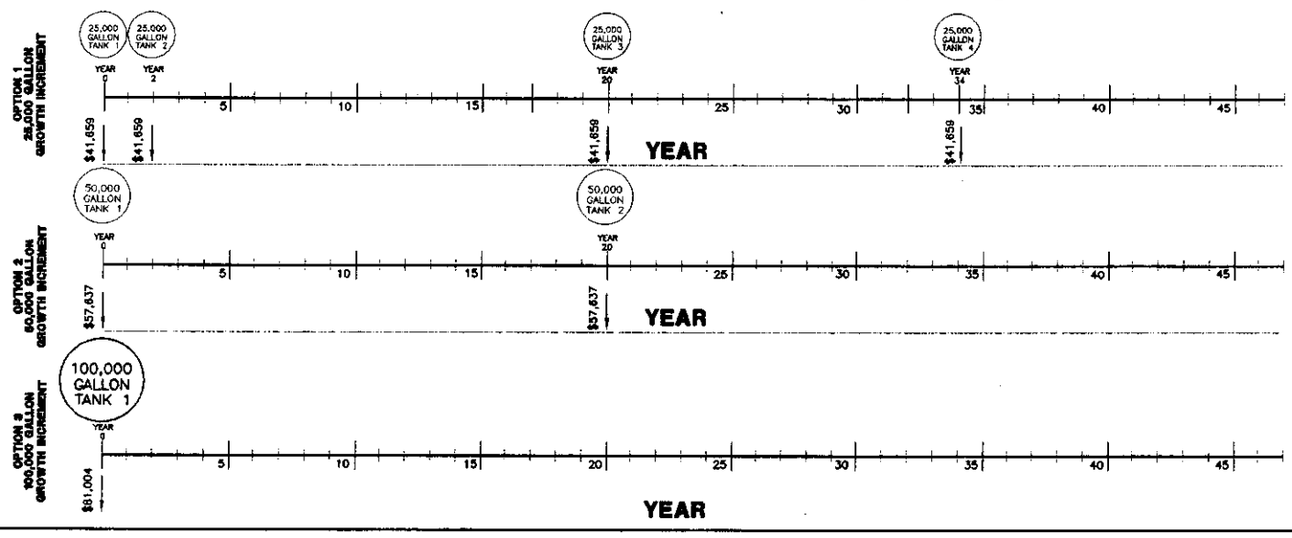
EXHIBIT (GM-3) PAGE 1 OF 12

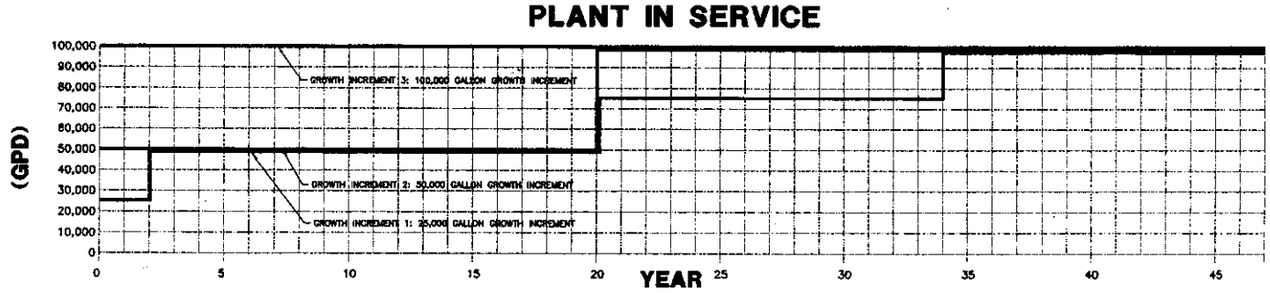
DEMAND (GPD)



FACILITY PHASING SCHEDULE AND CASH FLOW



PLANT IN SERVICE



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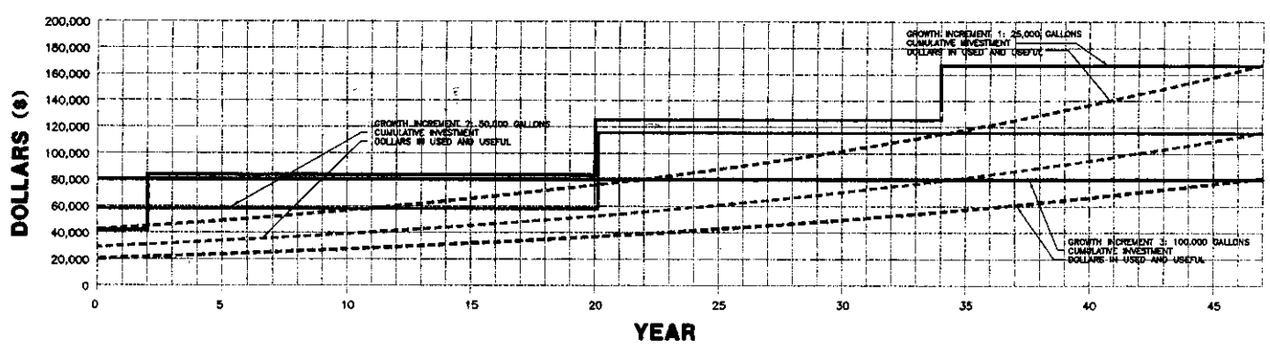
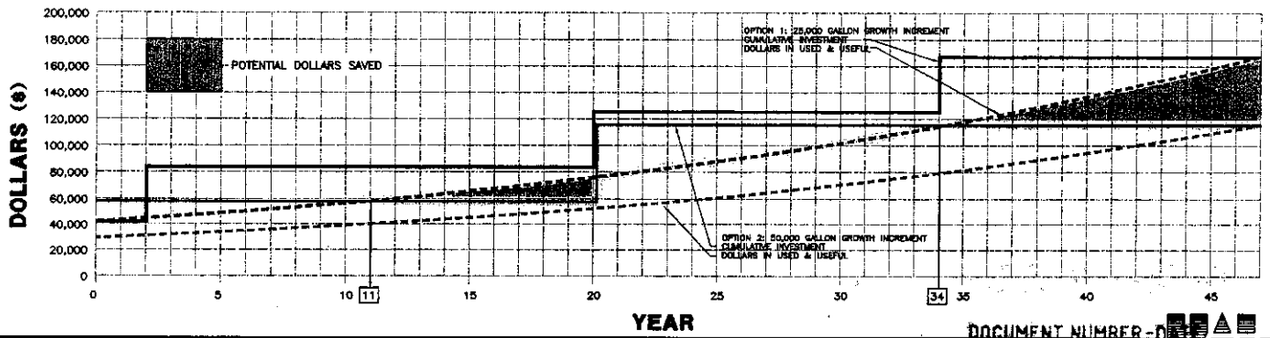
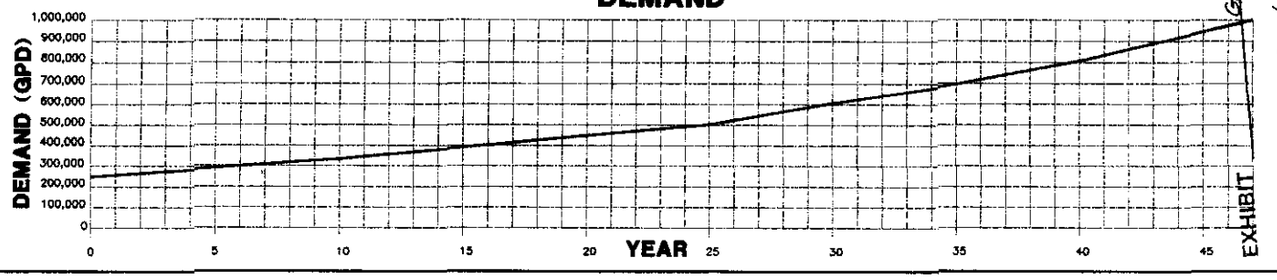


MARGIN RESERVE



STEEL GROUND STORAGE TANKS - 25,000-100,000 GALLONS

DEMAND



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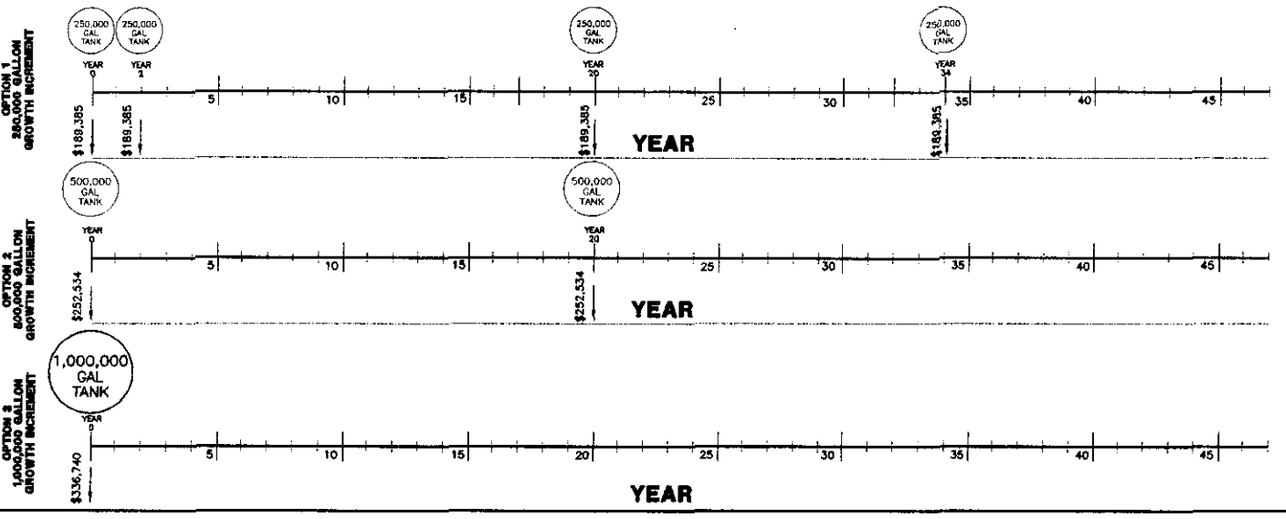

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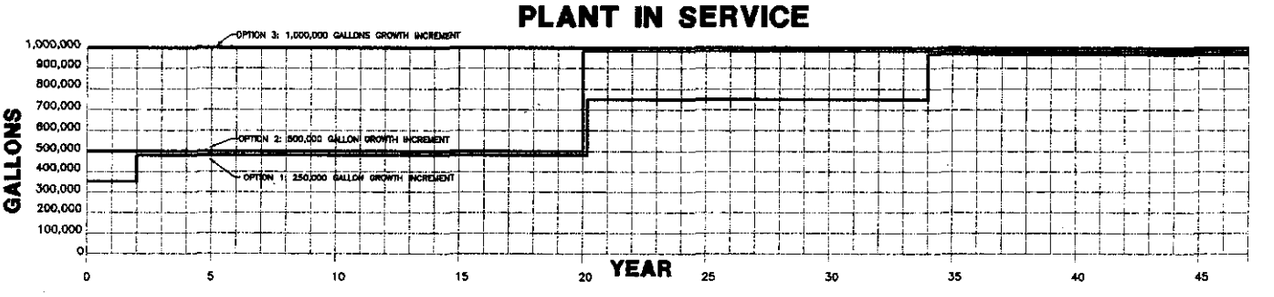
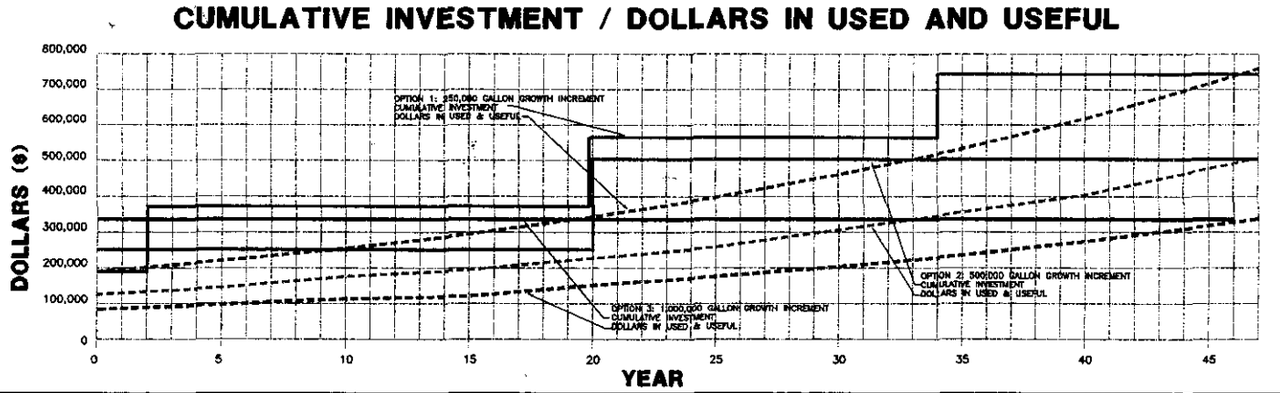


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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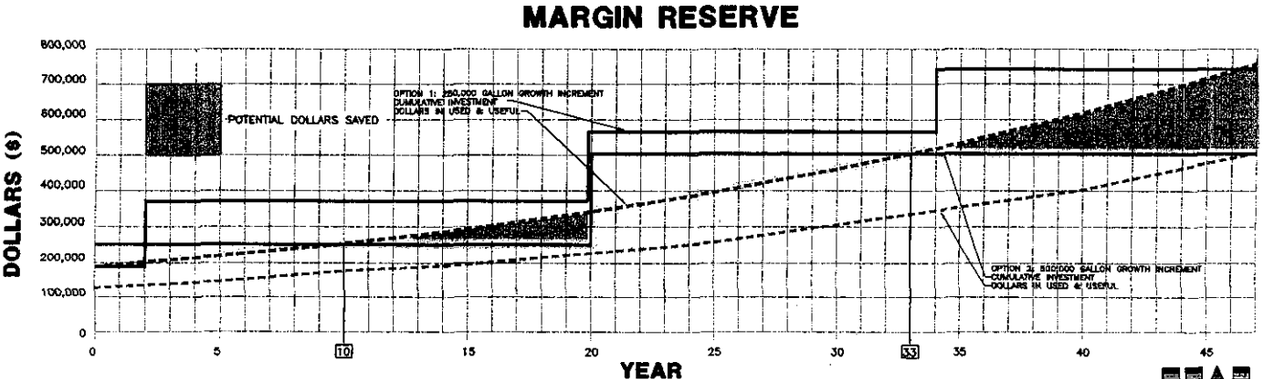


PRE-STRESSED CONCRETE GROUND STORAGE TANK - 250,000-1,000,000 GALLONS

DEMAND (GPD) 100,000 GPD TO 300,000 GPD

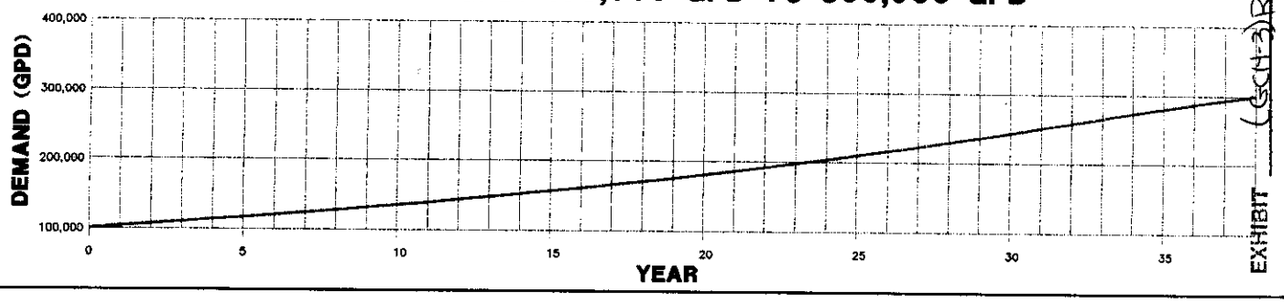
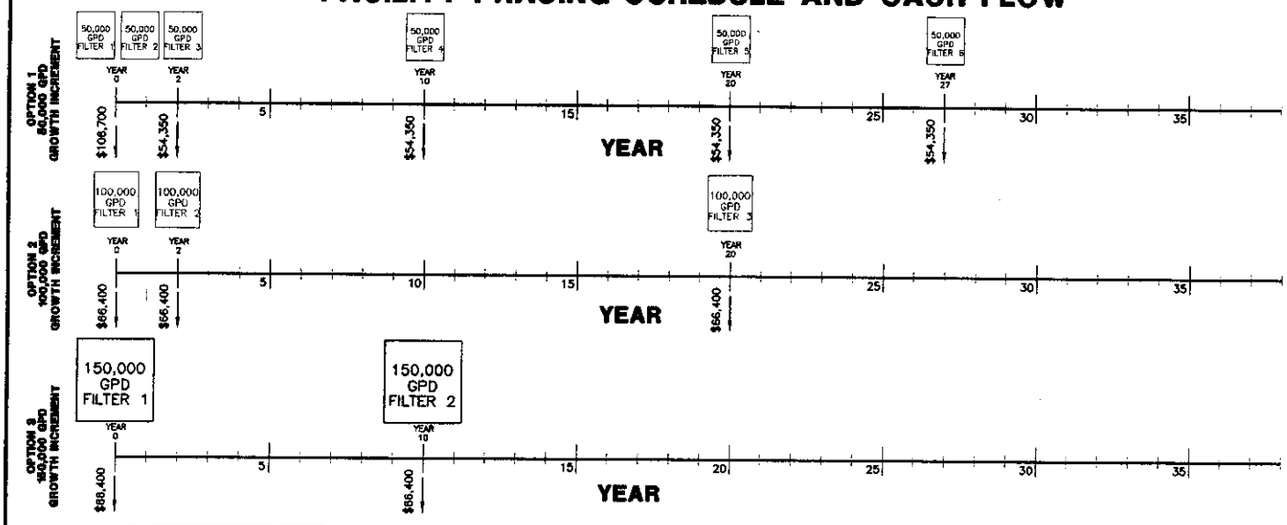
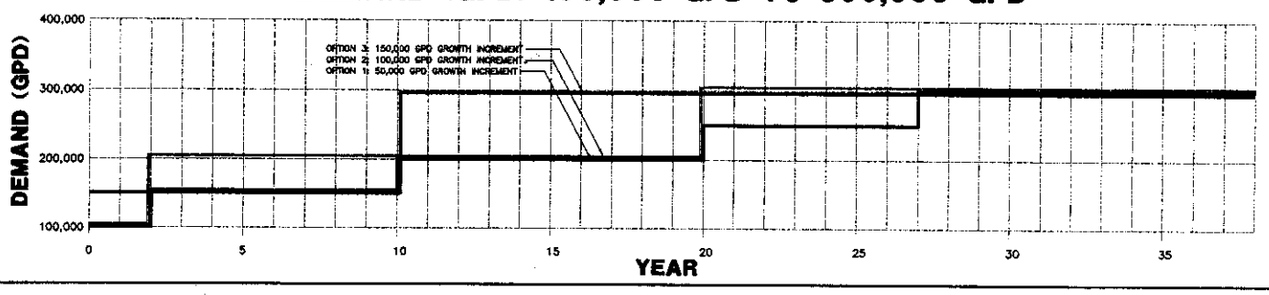


EXHIBIT (Gen-3)Rev
PAGE 2 OF 18

FACILITY PHASING SCHEDULE AND CASH FLOW



DEMAND (GPD) 100,000 GPD TO 300,000 GPD



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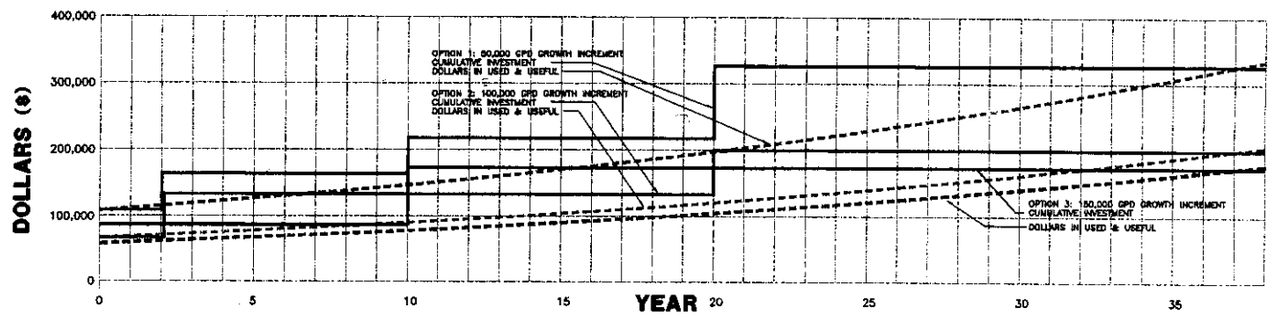

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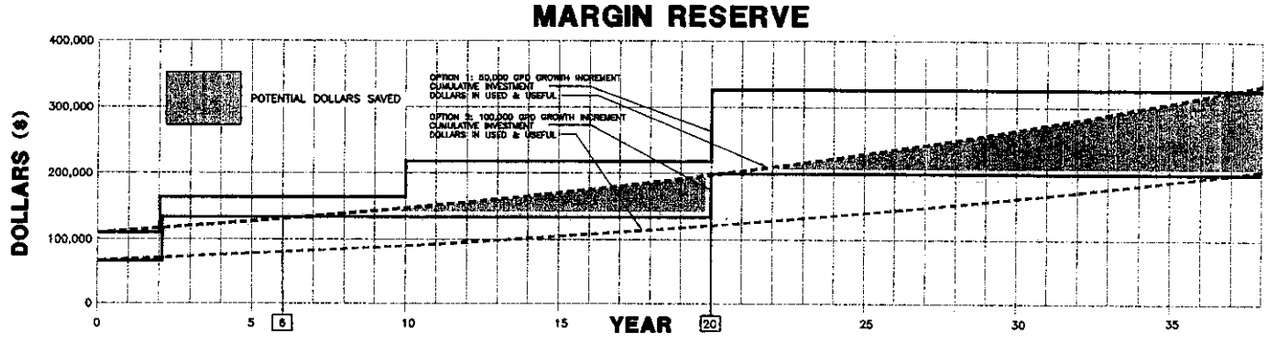

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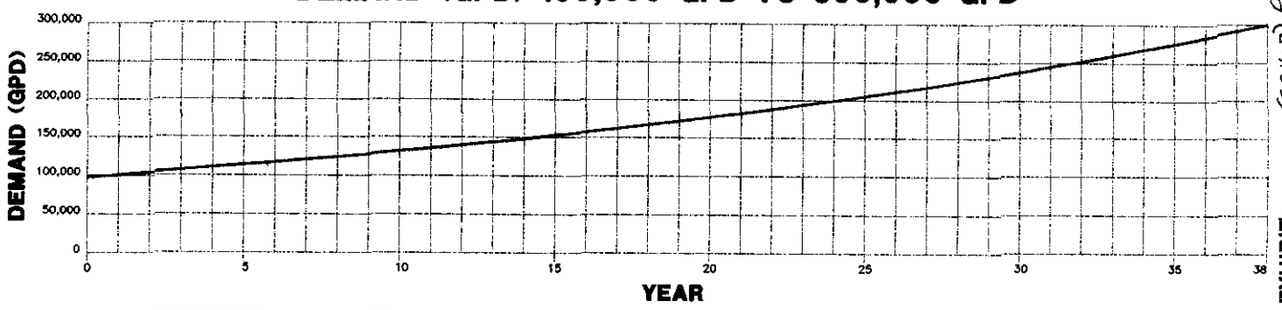
TERTIARY GRAVITY FILTERS - 100,000-300,000 GPD

DEMAND (GPD) 100,000 GPD TO 300,000 GPD



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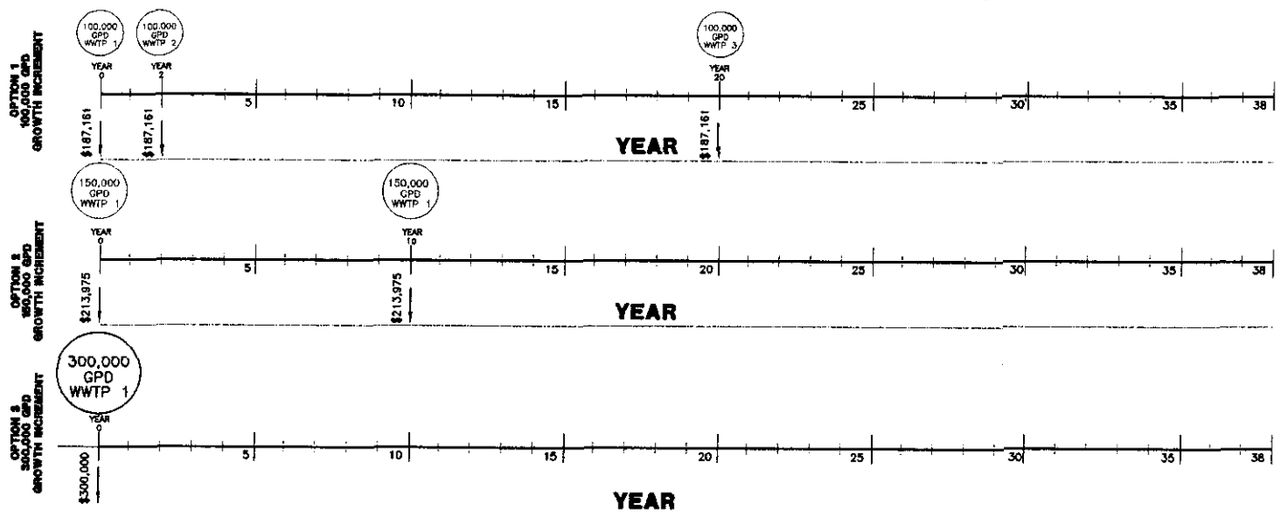
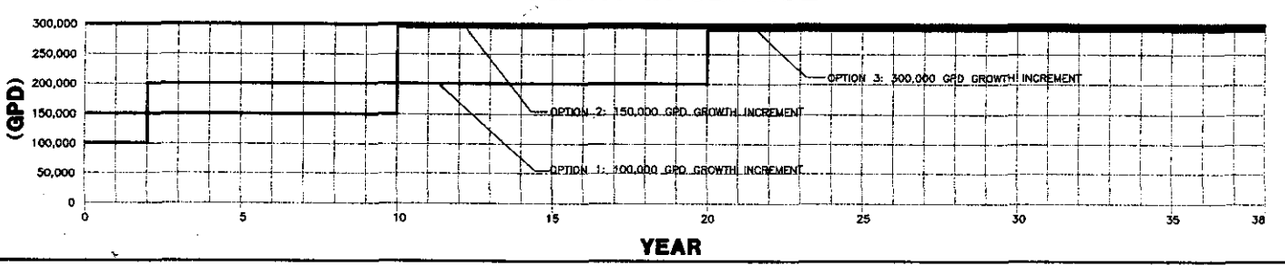


PLANT IN SERVICE



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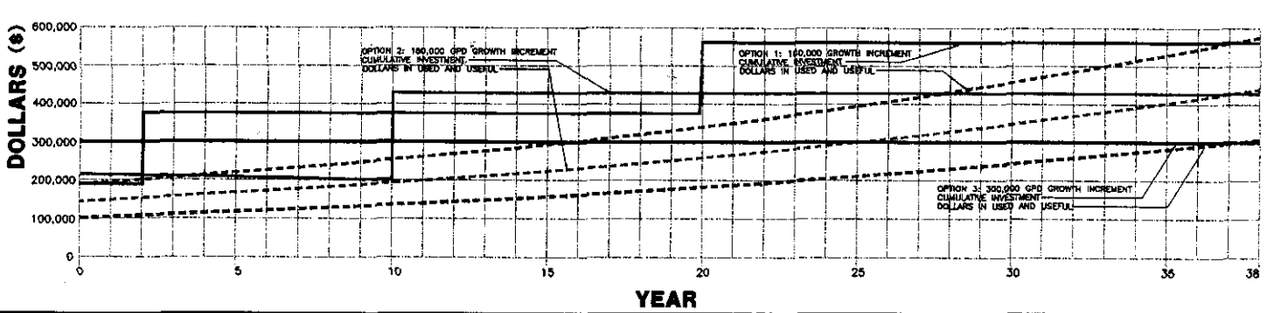

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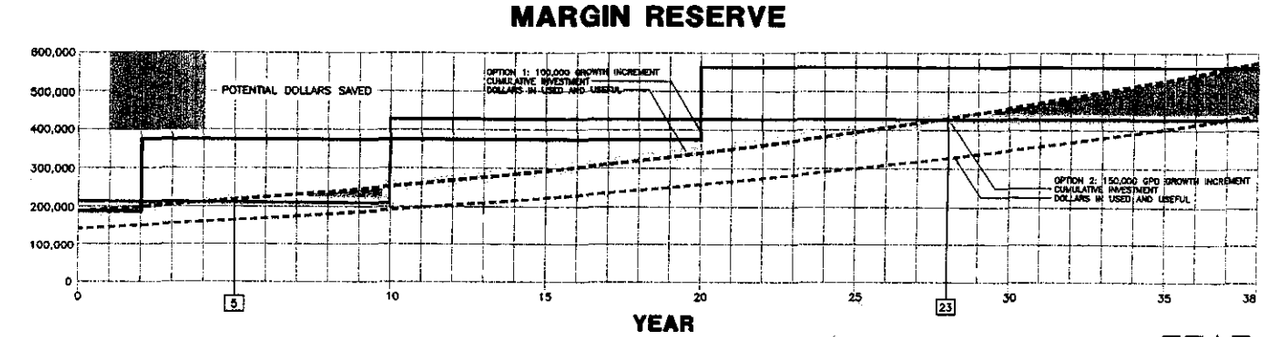

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DEMAND (GPD) 250,000 GPD TO 1,000,000 GPD

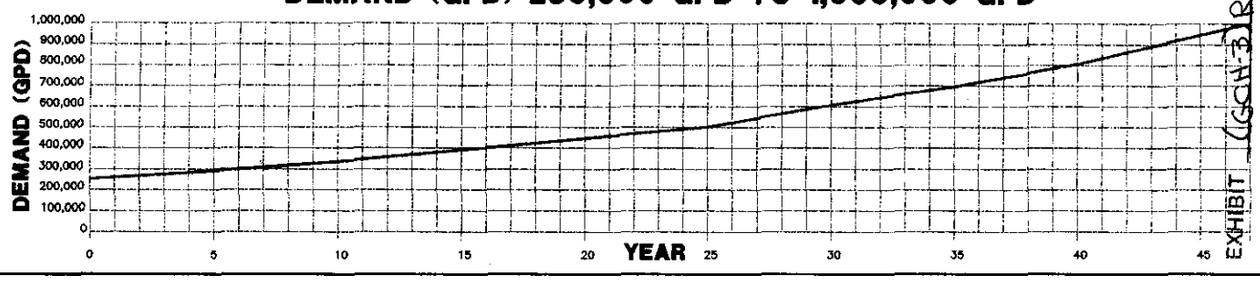

EXHIBIT (GCH-3) Rev

PAGE 5 OF 12

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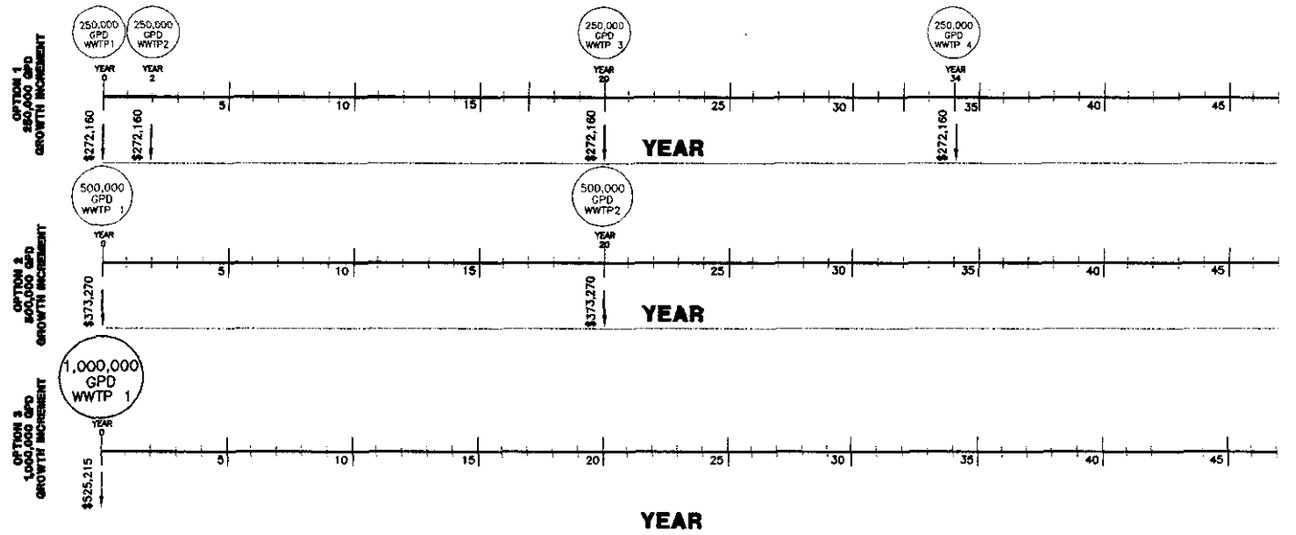

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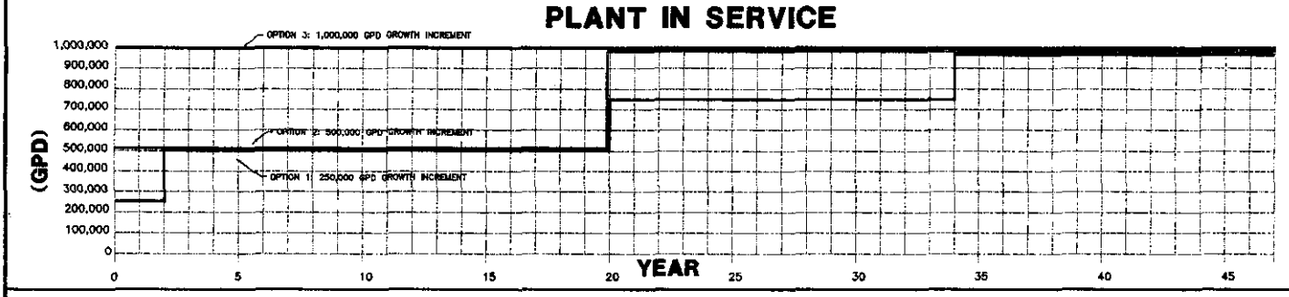

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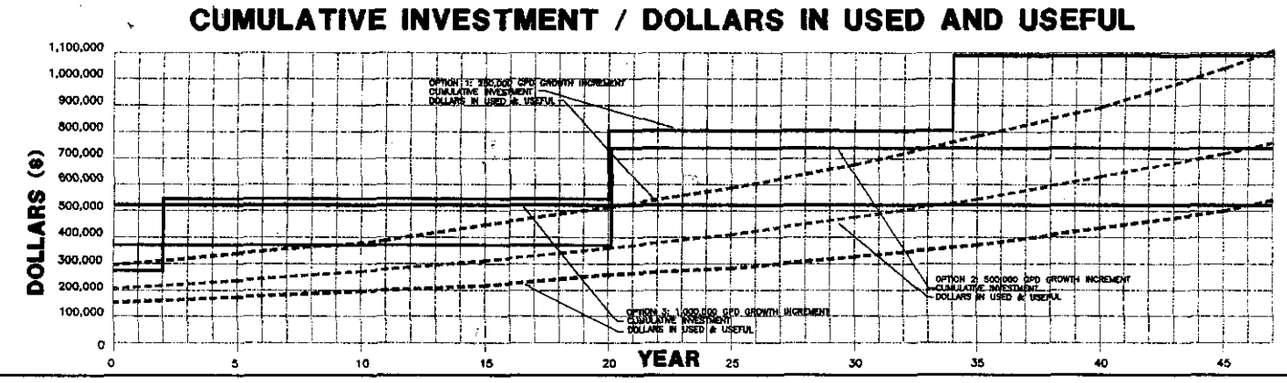

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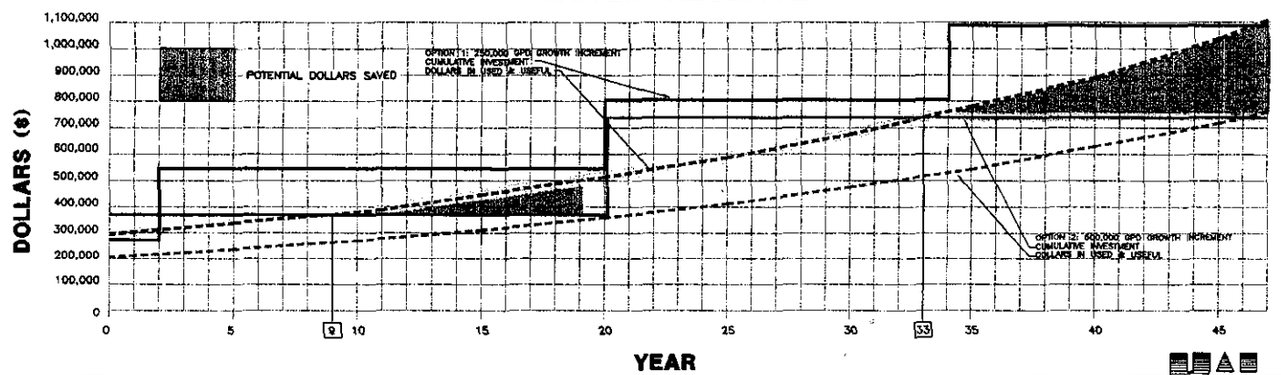

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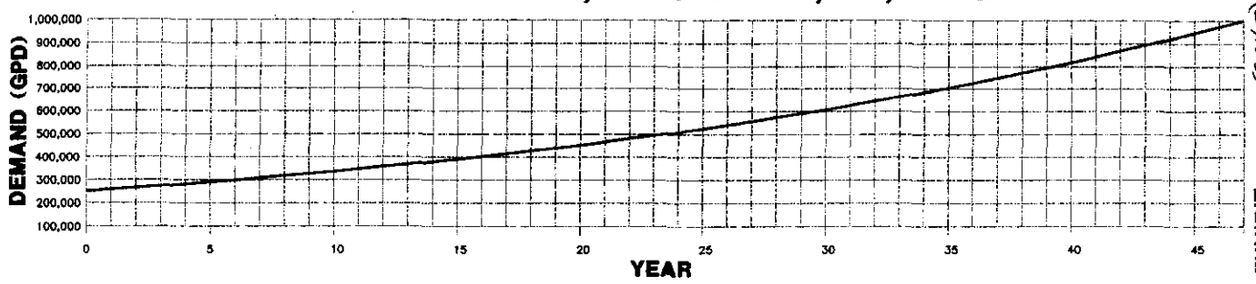

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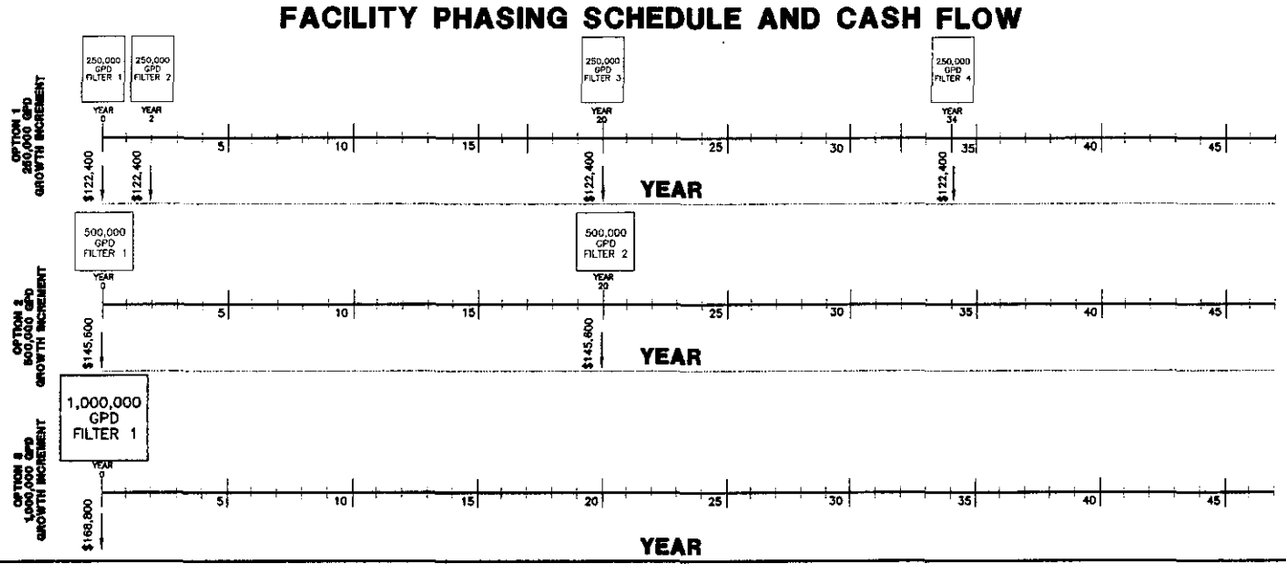
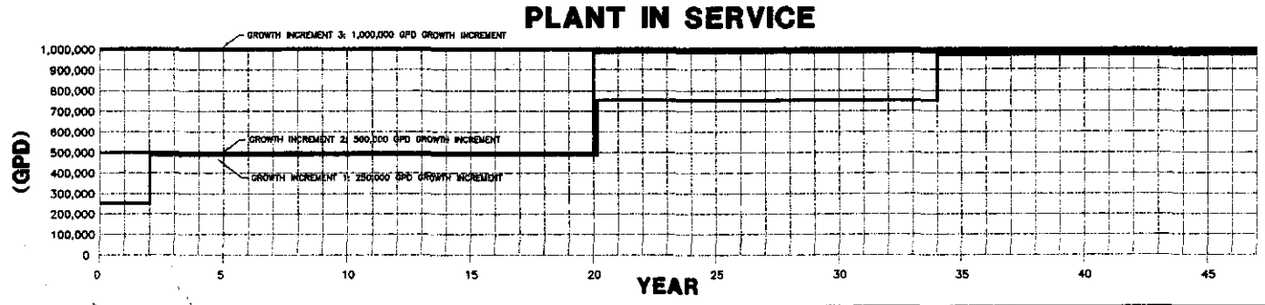
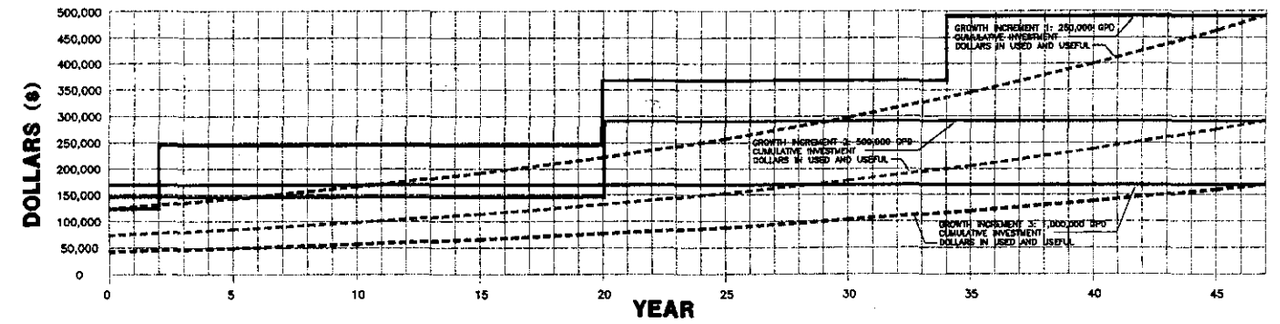


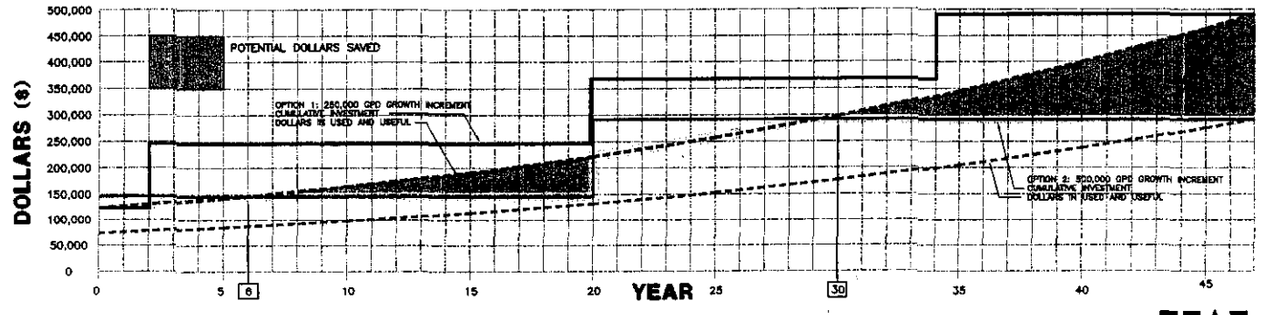
PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE



TERTIARY FILTERS - TRAVELING BRIDGE

96/45800F1A

DEMAND (GPD) 250,000 GPD TO 1,000,000 GPD

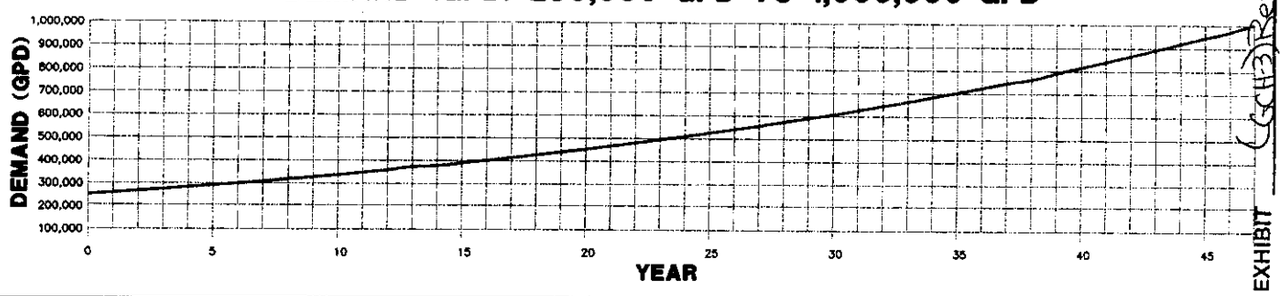
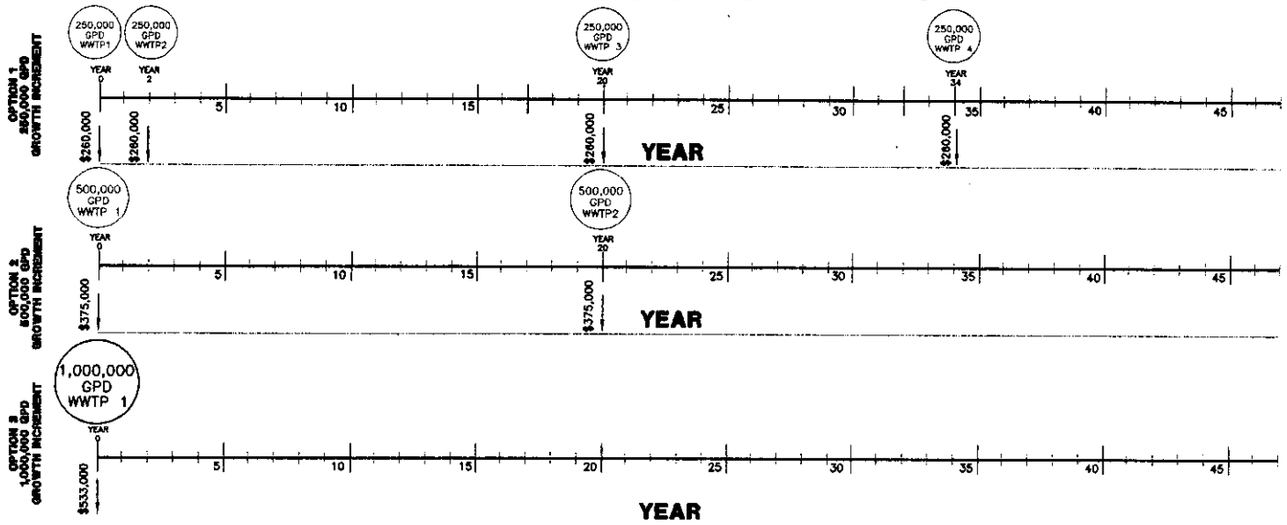


EXHIBIT 7 (GCH-3) Rev

PAGE 7 OF 12

FACILITY PHASING SCHEDULE AND CASH FLOW



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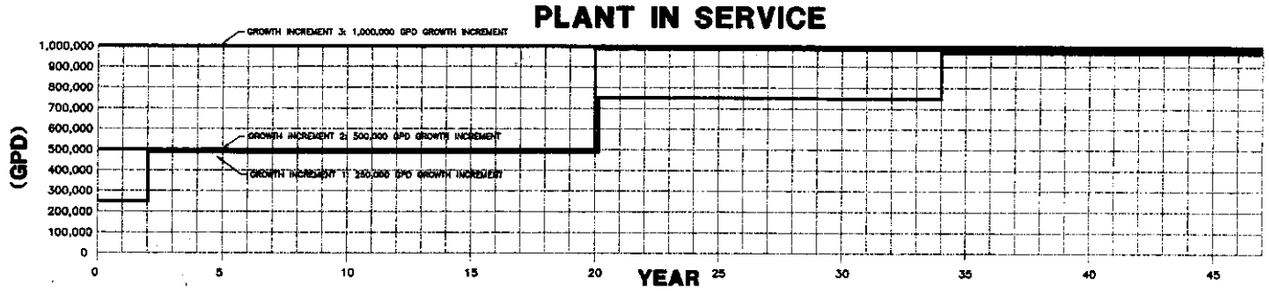
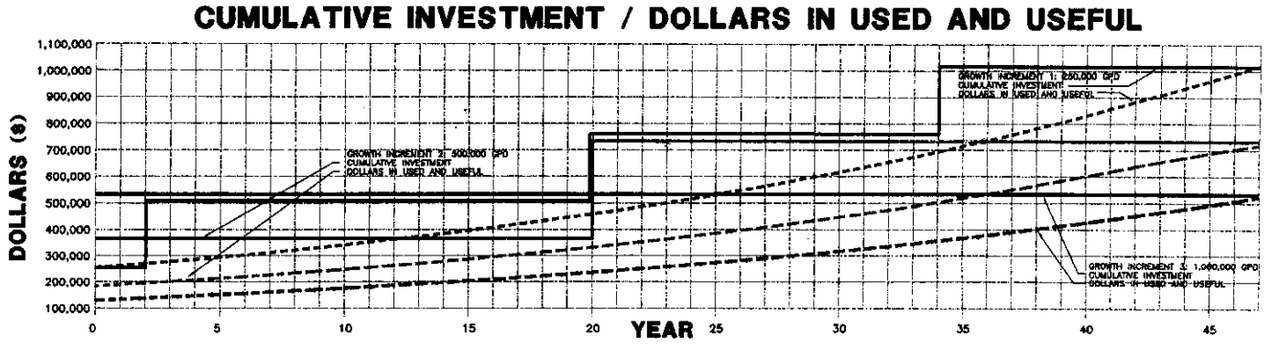


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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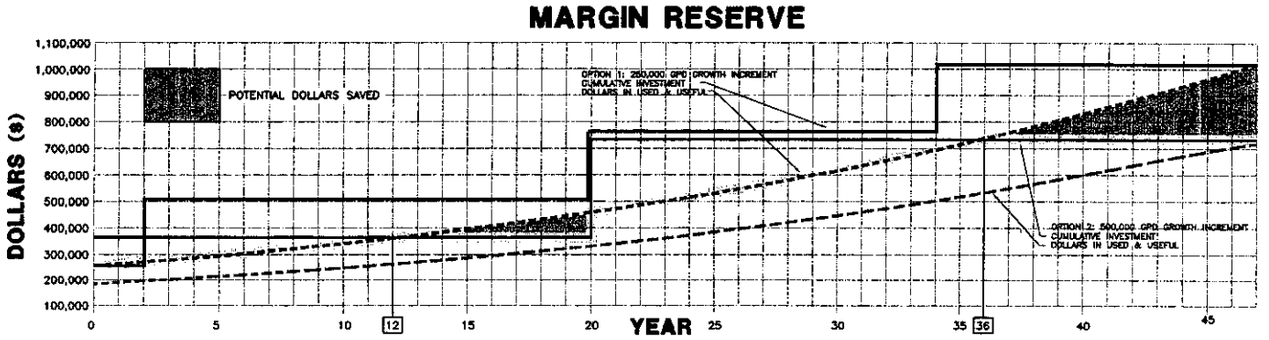
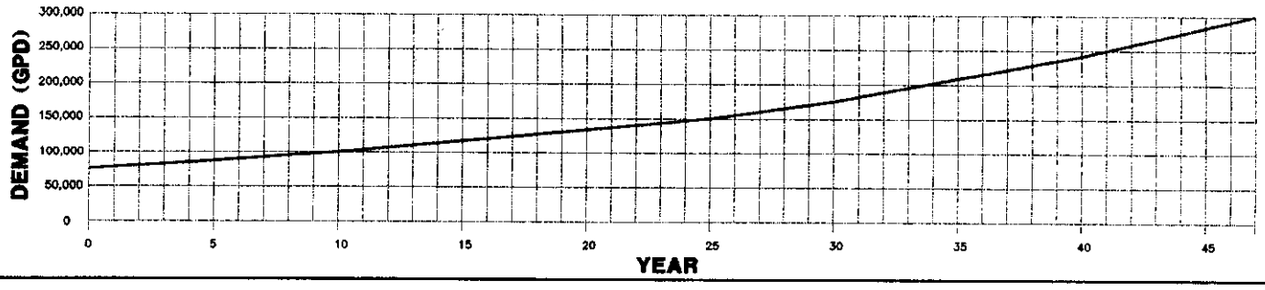


96/45800F02

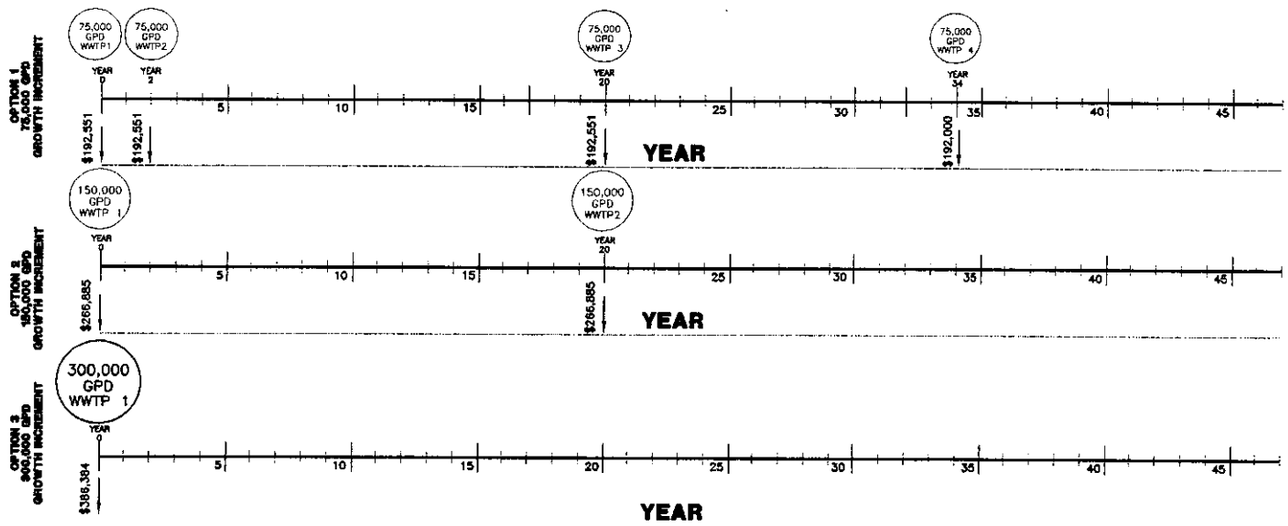
EXHIBIT (GCM-3)Rev4

PAGE 8 OF 12

DEMAND (GPD) 75,000 GPD TO 300,000 GPD



FACILITY PHASING SCHEDULE AND CASH FLOW



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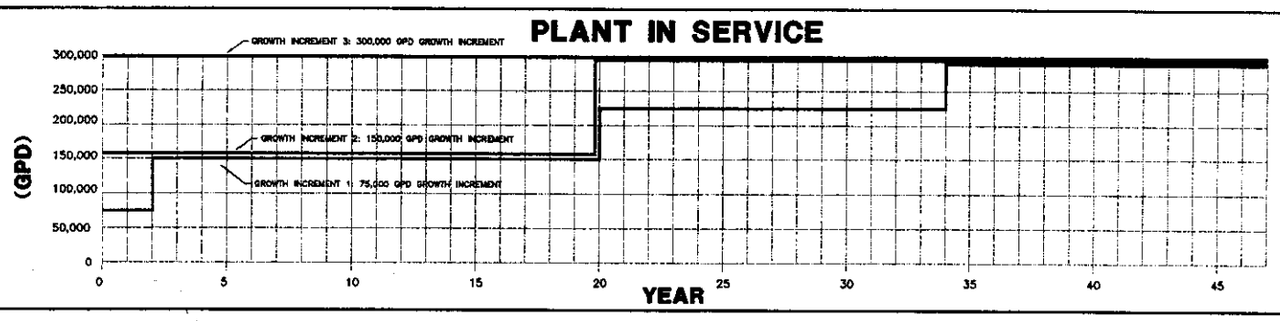
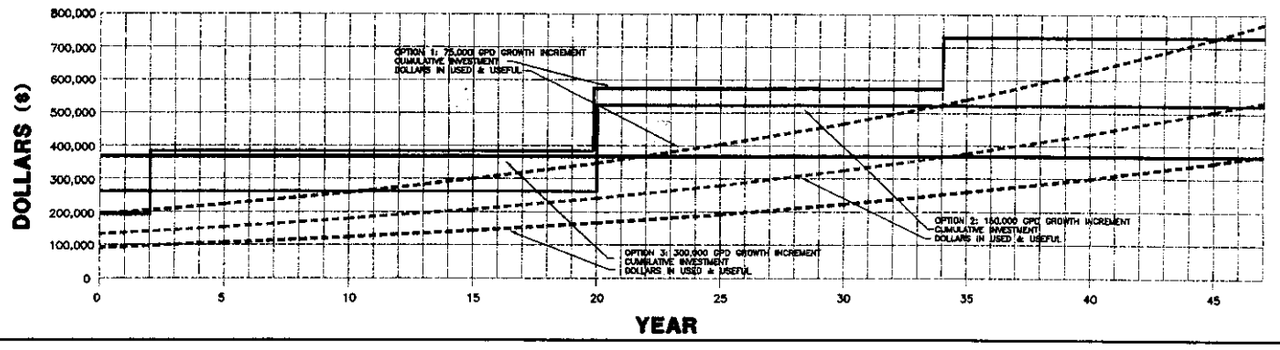


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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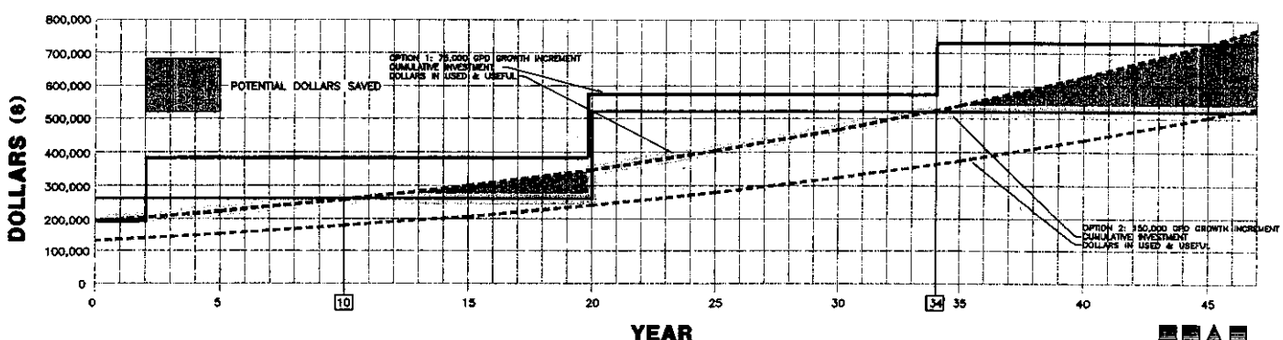
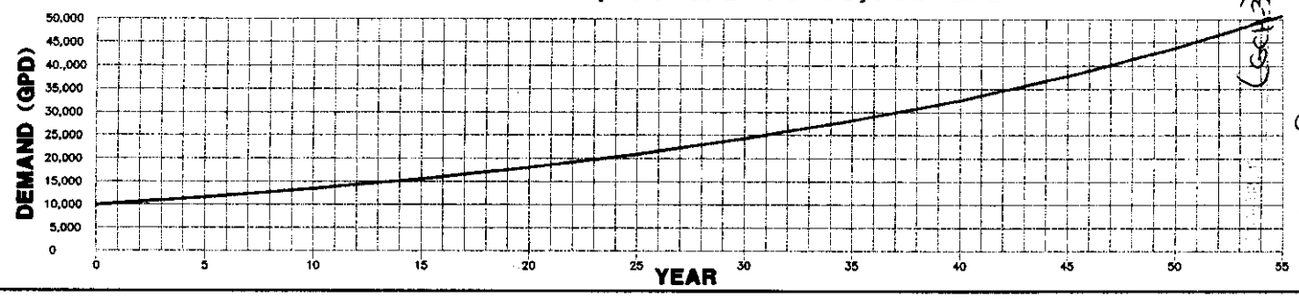


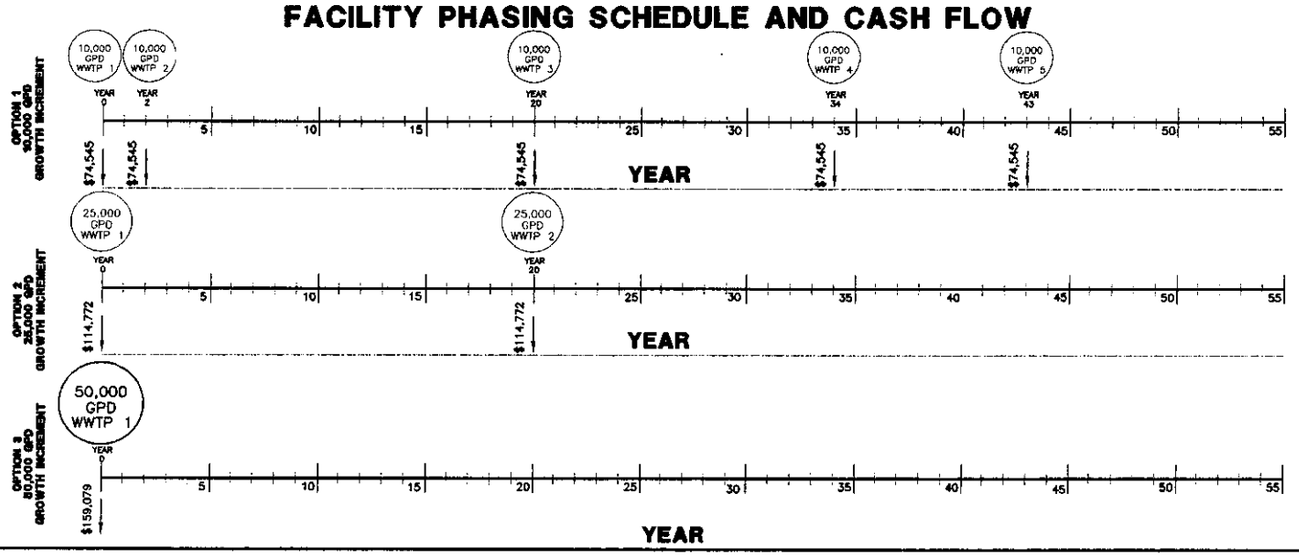
EXTENDED AERATION PACKAGE WWTP - 75,000-300,000 GPD

(Sch-3) Rev
9 of 12

DEMAND (GPD) 10,000 GPD TO 50,000 GPD



FACILITY PHASING SCHEDULE AND CASH FLOW



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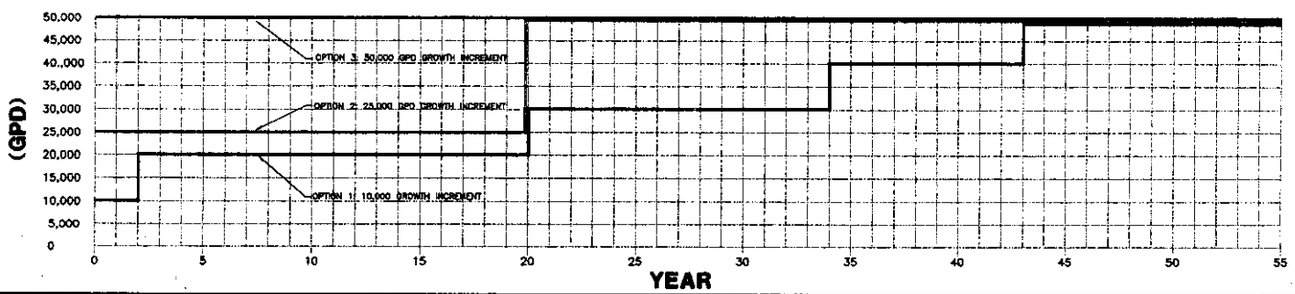
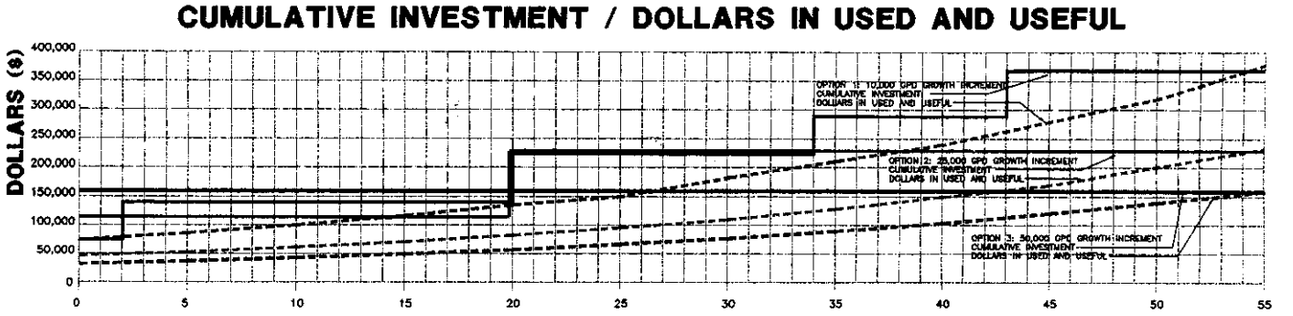
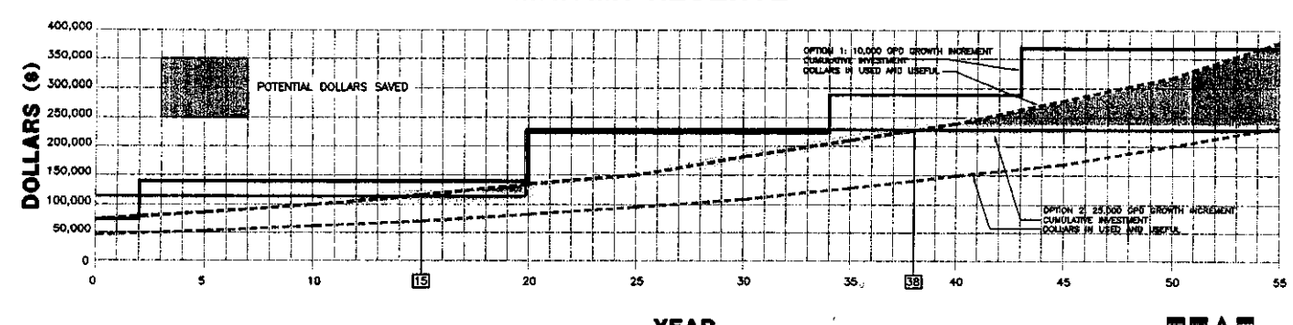


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL

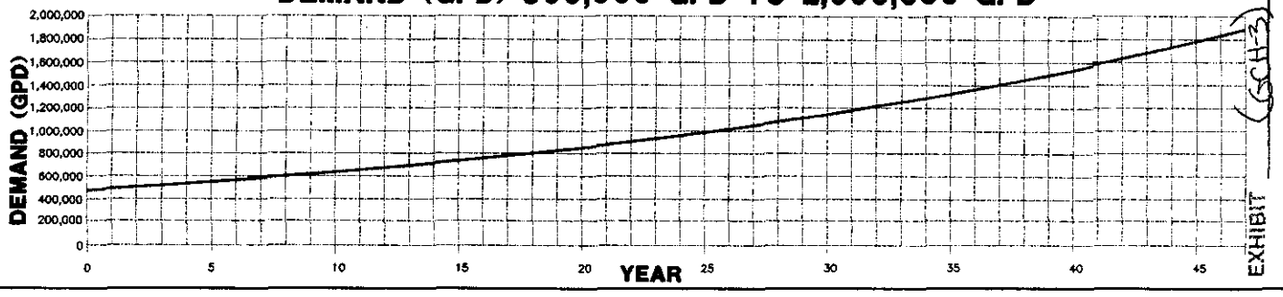


MARGIN RESERVE

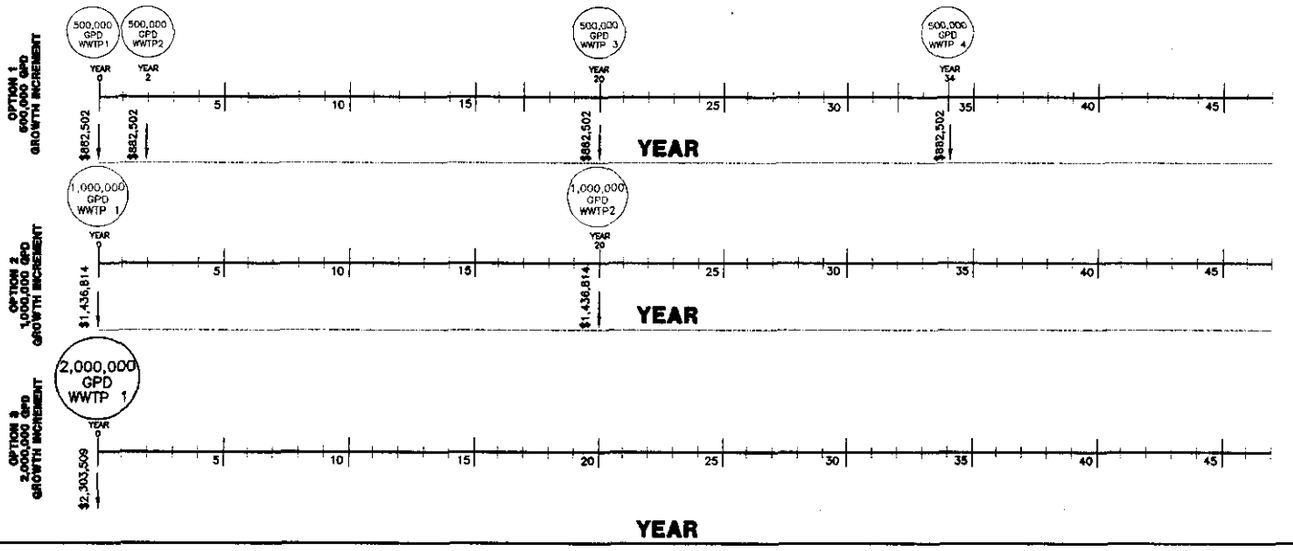


EXTENDED AERATION PACKAGE WWTP - 10,000-50,000 GPD

DEMAND (GPD) 500,000 GPD TO 2,000,000 GPD



FACILITY PHASING SCHEDULE AND CASH FLOW



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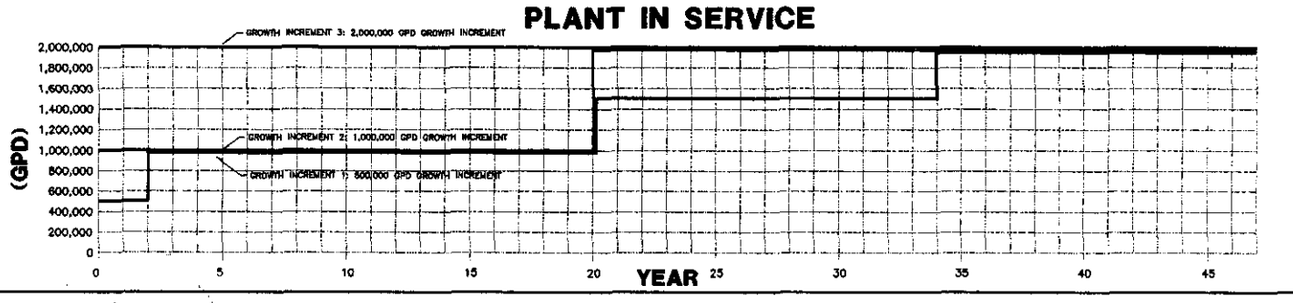
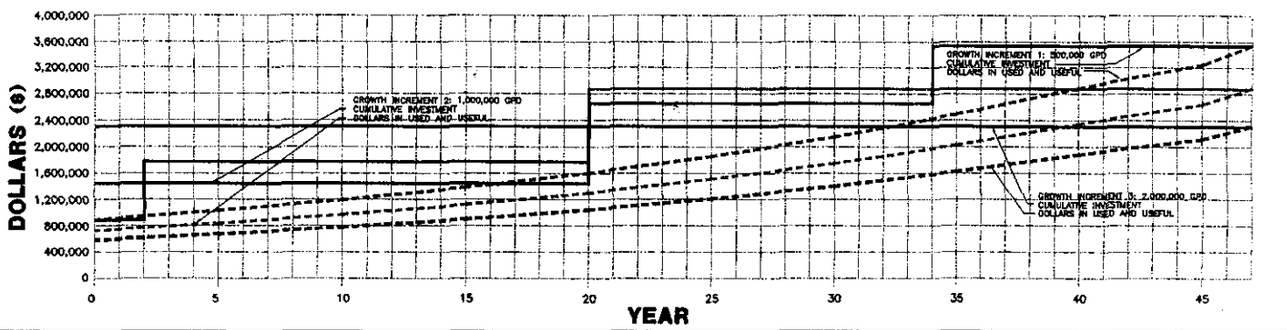


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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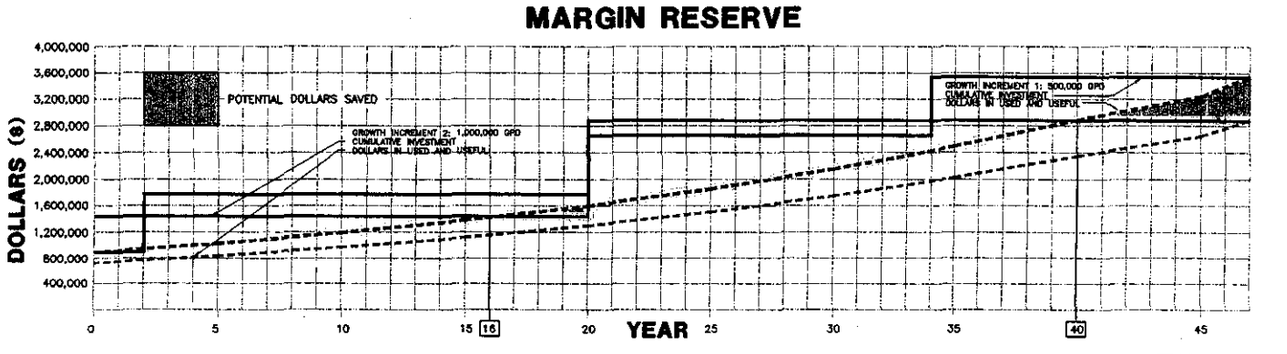


DEMAND (GPD) 1 MGD TO 4 MGD

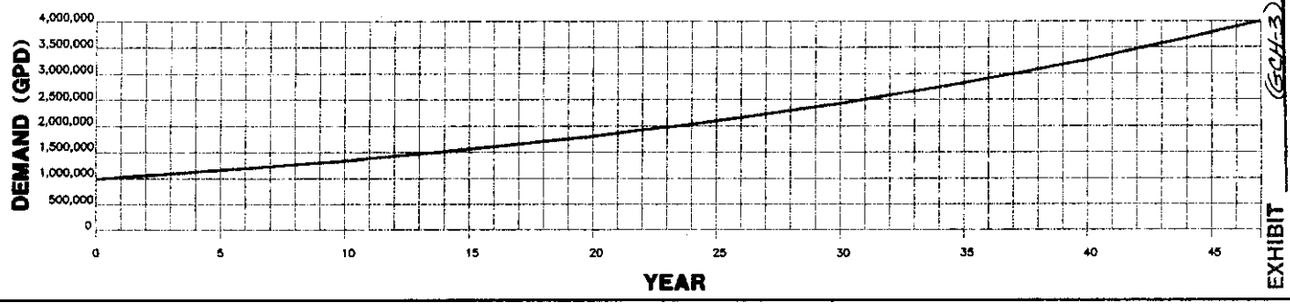
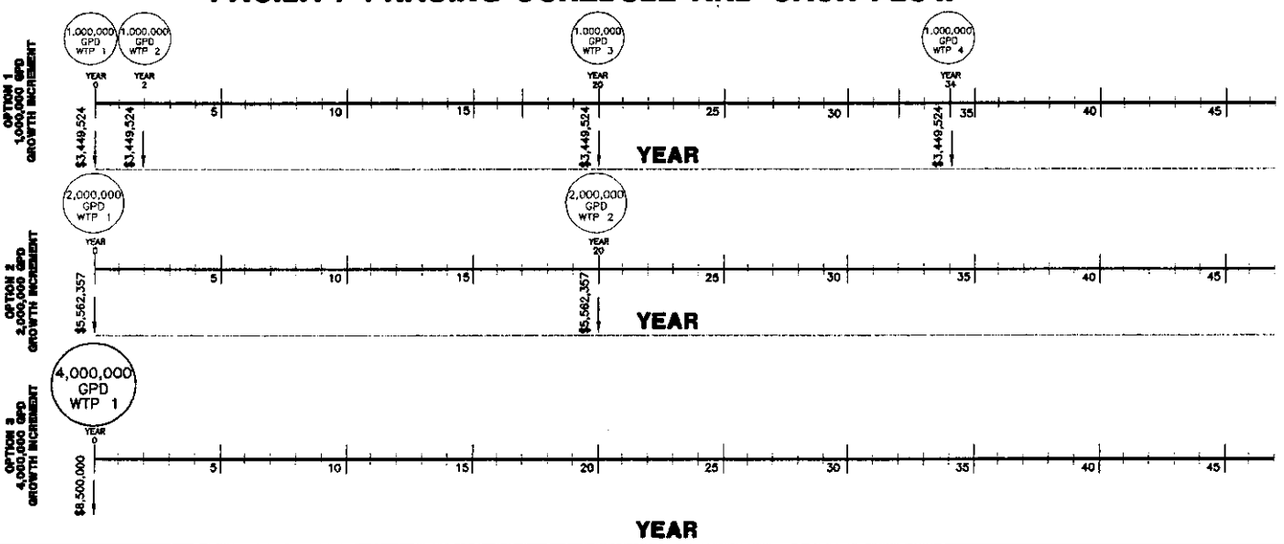


EXHIBIT (GCH-3) Rev

PAGE 11 OF 12

FACILITY PHASING SCHEDULE AND CASH FLOW



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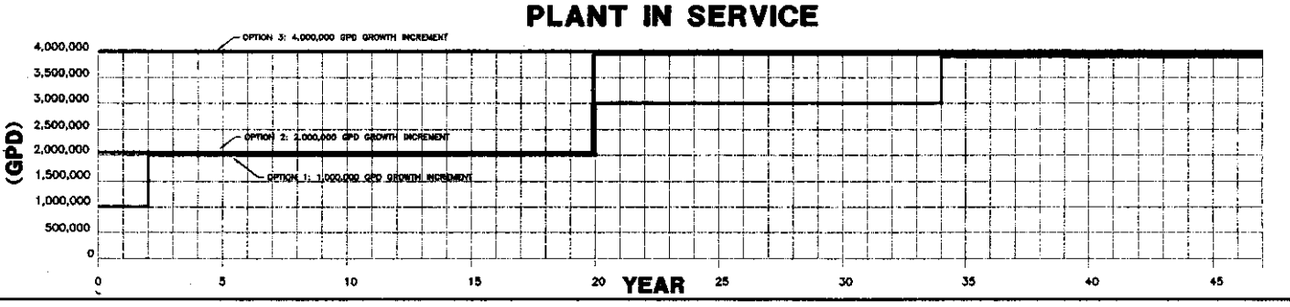
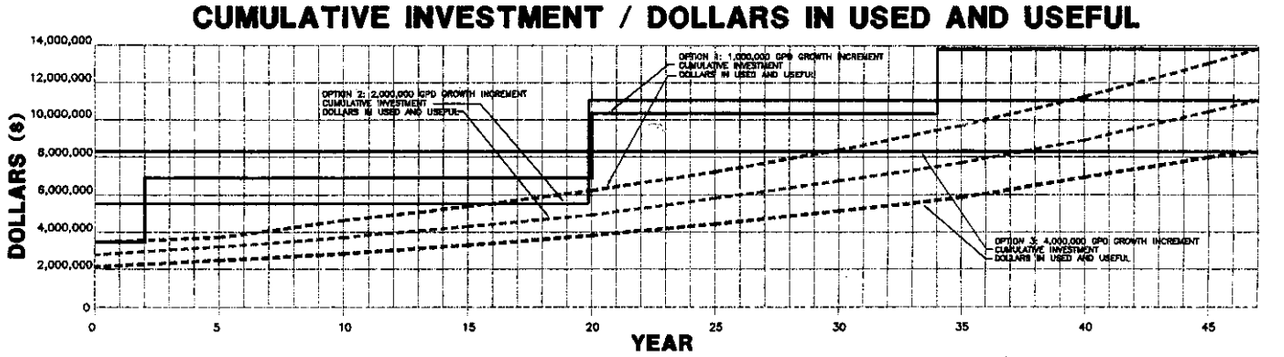


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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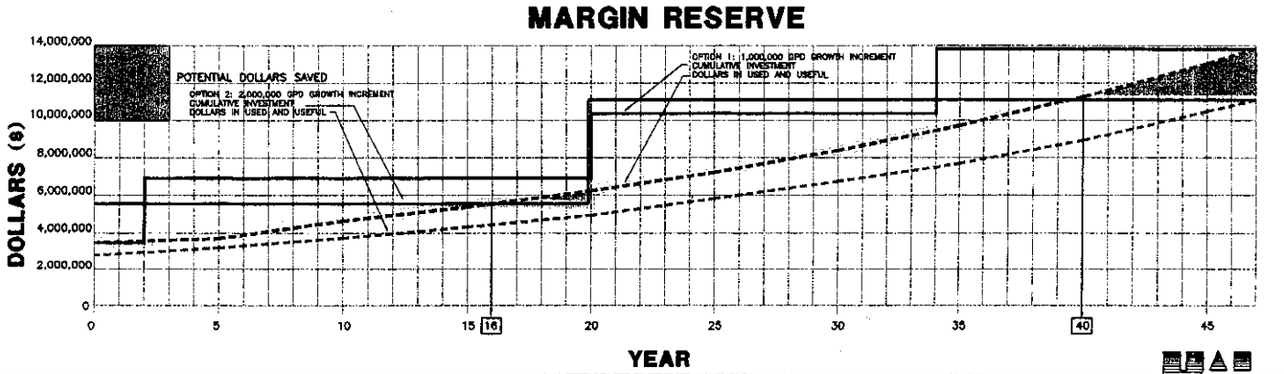
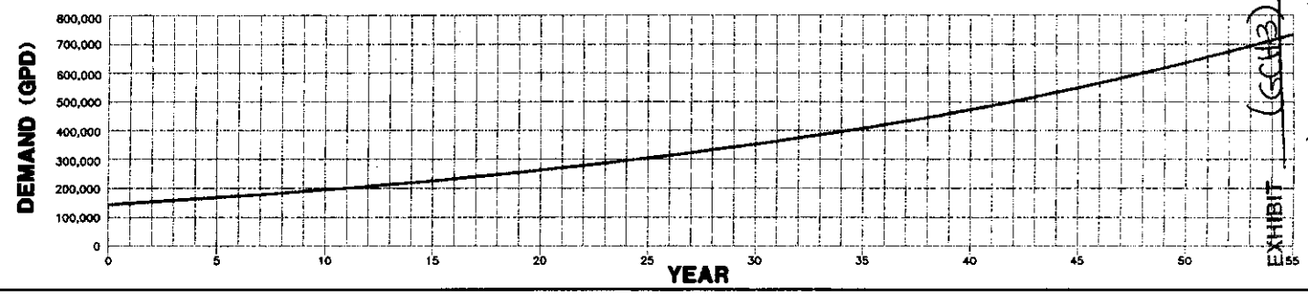
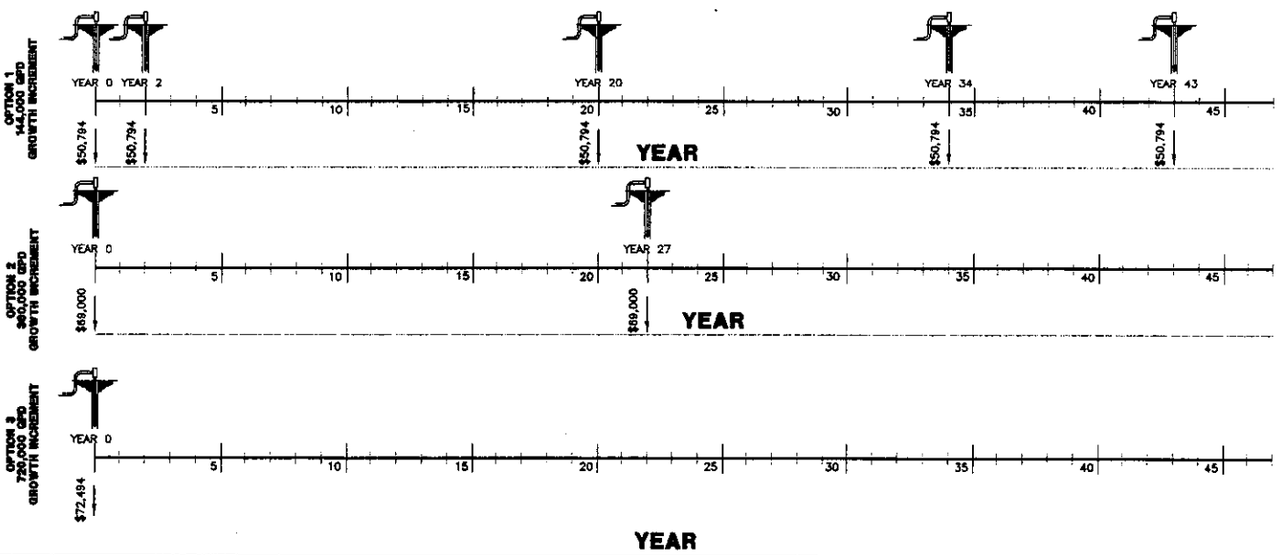


DEMAND (GPD) 144,000 GPD TO 720,000 GPD



FACILITY PHASING SCHEDULE AND CASH FLOW



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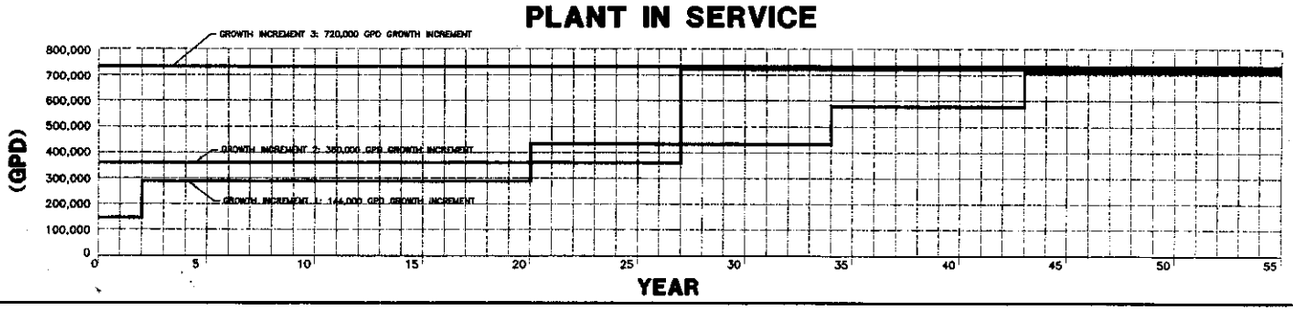
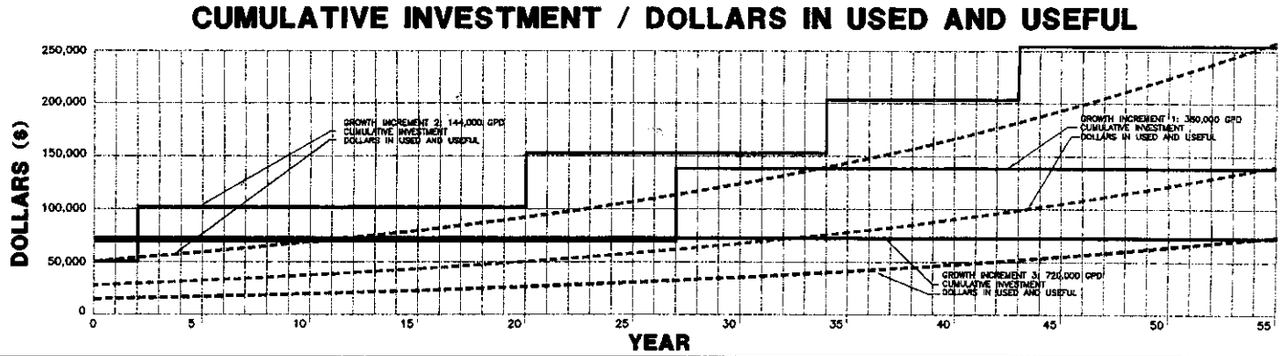


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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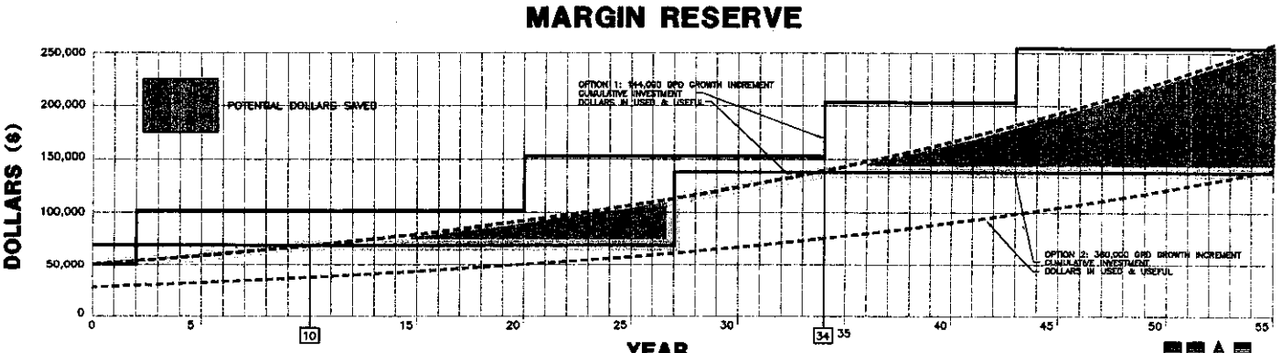

POTABLE WATER SUPPLY WELLS (250' DEEP) - 144,000-720,000 GPD

ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT

Henry Dean Executive Director
John R. Wehle Assistant Executive Director
Charles T. Myers III Deputy Assistant Executive Director

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Melbourne, Florida 32935-8109
407-254-1762
TDD 407-253-1203

October 17, 1996

Chairman Susan F. Clark
Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, Florida 23299-0850

Re: Proposed Public Service Commission Margin Reserve Rule

Dear Chairman Clark:

In an effort to coordinate with the Public Service Commission in providing for the safe, reliable, and affordable water supply for the citizens of Florida, this letter is written to provide you with several of the water management districts' collective comments on your rule proposal.

Considering Florida's burgeoning population as well as its increased focus on satisfaction of environmental water supply demands, the water management districts have in recent years expended considerable amounts of staff time and resources on long-term water supply planning and development. The Governor's recent Executive Order and the newly established Water Supply Development and Funding Work Group are reflections of the now intense interest in water supply issues. Our various agencies efforts are generally directed toward satisfying the demands of all uses, human and environmental. As you know, this task requires a delicate balance to satisfy these sometimes competing demands. A significant part of the solution to this state-wide effort involves innovative use of alternative water supplies and an increased focus on water conservation. Future use of alternative supplies is coupled with on-going requirements placed on all permitted users to conserve water. We think coordination between our programs' conservation goals and additional user reliance on alternative sources must be matched with the PSC's rate-setting authority in a manner which fosters accomplishment of the state-wide water policies.

The PSC's proposed rule may impact the districts in the areas of long-term planning, water conservation and alternative supply development. Defining the margin reserve period to be eighteen months and the relationship of this component to the "used and useful" rate base determination seems to dissuade utilities from implementing alternative water supply projects designed to meet utilities' anticipated and even permitted demand. Generally, the districts authorize public water supply uses on the basis of anticipated demands projected to occur over the ensuing ten years. In this manner, the districts and utilities are better able to anticipate short-falls in supply and, where appropriate, develop alternative sources. For example, the typical time period necessary to plan, construct and begin supplying reclaimed water will far exceed the proposed 18 month margin reserve period due to the complexities associated with timing of improvements undertaken by the supplier and end-users. While some reuse projects may be for the purpose of accommodating new customers, many reuse projects are for the purpose of allowing utilities to meet existing uses with a lower quality source, thus conserving higher quality sources for the benefit of both existing and future customers. As such, the "used and useful" method of accounting (with the margin reserve period), which seems to be designed to address expansion of capacity,

EX 3

does not appear to be adequate in considering these factors which are unique to reuse and the development of alternative supplies. If "used and useful" is continued to be applied to allow recovery of costs for reuse projects, then the margin reserve period needs to be significantly longer. Over the years, users from all use classes, including public water suppliers, have championed longer duration water use permits to obtain more secure capital financing for the facilities which they forecast will be necessary to satisfy demand during the duration of the permit.

The margin reserve "used and useful" rule appears to be incongruent with this public water supply utility trend. Innovative approaches such as marginal cost rate structures might well be an effective substitute for the proposed rule. Discussions during last week's meeting between several of our respective staffs seemed to indicate an interest on the part of the PSC to entertain alternatives to the margin reserve rule which would support the districts' and public water supply utilities' desire to implement alternative water supply technologies including reuse and conservation. We strongly support continued discussion on this issue between the PSC and the water management districts, and other interested parties.

To address these concerns, we recommend that the published rule be amended to include a specific recognition that reuse and other alternative water supply projects required by a water management district be allowed a significantly larger margin reserve period. Under the spirit of our "MOU" on conservation, we plan to work with the PSC staff to prepare a proposed amendment to the draft language for your consideration during the rule adoption hearing.

In making these comments and recommendations, the districts recognize we are not the only agencies in Florida charged with addressing water supply issues. The PSC clearly plays an important role in this complex arena. Of particular import in regard to the proposed rule is the apparent intent to defer the costs of future facilities away from existing customers. Achieving equity between existing and future water users is certainly an important goal. However, we hope this goal can be accomplished in a manner which recognizes the districts' equally important resource related objectives and the desire to assure an adequate and reliable supply for all water uses. We do understand that the environmental protection mandated by state law and state water policy, often increases the need for planning and imposes higher costs for water and wastewater service. However, we maintain that the objective of maintaining affordable rates for essential water, wastewater, and reuse services can and should be balanced with the need to protect the State's water resources.

We are hopeful that continued dialogue between our agencies as well as joint participation in each agencies' rulemaking processes will improve our collective management of water related issues. Thank you for the opportunity to comment.

Kindest Personal Regards.

Sincerely,

Henry Dean
Executive Director

CC: Commissioner J. Terry Deason
Commissioner Julia L. Johnson
Commissioner Joe Garcia
Commissioner Diane K. Keisling

South Florida Water Management District

3301 Gun Club Road, West Palm Beach, Florida 33406 • (407) 686-8800 • FL WATS 1-800-432-2045

GOV 04-34

October 17, 1996

Chairman Susan F. Clark
Commissioner J. Terry Deason
Commissioner Joe Garcia
Commissioner Julia L. Johnson
Commissioner Diane K. Keisling

Florida Public Service Commission
2540 Shumard Oak Blvd.
Tallahassee, Florida 23299-0850

Subject: Proposed Public Service Commission Margin Reserve Rule

Dear Chairman Clark and Commissioners:

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Sincerely,

Samuel E. Poole III
Executive Director
South Florida Water Management District

SEP/myk

Southwest Florida Water Management District

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Assistant Executive Director
Edward B. Helvenston
General Counsel

October 17, 1996

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Florida Public Service Comm.
Commissioner Clark

Chairman Susan F. Clark
Commissioner J. Terry Deason
Commissioner Joe Garcia
Commissioner Julia L. Johnson
Commissioner Diane K. Keisling

Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Subject: Proposed Public Service Commission Margin Reserve Rule

Dear Chairman Clark and Commissioners:

In an effort to coordinate with the Public Service Commission (PSC) in providing for the safe, reliable, and affordable water supply for the citizens of Florida, this letter is written to provide you with several of the water management districts' collective comments on your rule proposal.

Considering Florida's burgeoning population as well as its increased focus on satisfaction of environmental water supply demands, the water management districts have in recent years expended considerable amounts of staff time and resources on long-term water supply planning and development. The Governor's recent Executive Order and the newly established Water Supply Development and Funding Work Group are reflections of the now intense interest in water supply issues. Our various agencies efforts are generally directed toward satisfying the demands of all users, human and environmental. As you know, this task requires delicate balance to satisfy these sometimes competing demands. A significant part of the solution of this state-wide effort involves innovative use of alternative water supplies and an increased focus on water conservation. Future use of alternative supplies is coupled with on-going requirements placed on all permitted users to conserve water. We think coordination between our programs' conservation goals and additional user reliance on alternative sources must be matched with the PSC's rate-setting authority in a manner which fosters accomplishment of the state-wide water policies.

Excellence Through Quality Service

The PSC's proposed rules may impact the districts in the areas of long-term planning, water conservation and alternative supply development. Defining the margin reserve period to be 18 months and the relationship of this component to the "used and useful" rate base determination seems to dissuade utilities from implementing alternative water supply projects designed to meet utilities' anticipated and even permitted demand. Generally, the districts authorize public water supply uses on the basis of anticipated demand projected to occur over the ensuing 10 years. In this manner, the districts and utilities are better able to anticipate short-falls in supply and, where appropriate, develop alternative sources. For example, the typical time period necessary to plan, construct and begin supplying reclaimed water will far exceed the proposed 18 month margin reserve period due to the complexities associated with timing of improvements undertaken by the supplier and end-users. While some reuse projects may be for the purpose of accommodating new customers, many reuse projects are for the purpose of allowing utilities to meet existing uses with a lower quality source, thus conserving higher quality sources for the benefit of both existing and future customers. As such, the "used and useful" method of accounting (with the margin reserve period), which seems to be designed to address expansion of capacity, does not appear to be adequate in considering these factors which are unique to reuse and the development of alternative supplies. If "used and useful" is continued to be applied to allow recovery of costs for reuse projects, then the margin reserve period needs to be significantly longer. Over the years, users from all use classes, including public water suppliers, have championed longer duration water use permits to obtain more secure capital financing for the facilities which they forecast will be necessary to satisfy demand during the duration of the permit.

The margin reserve "used and useful" rule appears to be incongruent with this public water supply utility trend. Innovative approaches such as marginal cost rate structures might well be an effective substitute for the proposed rule. Discussions during last week's meeting between several of our respective staffs seemed to indicate an interest on the part of the PSC to entertain alternatives to the margin reserve rule which would support the districts' and public water supply utilities' desire to implement alternative water supply technologies including reuse and conservation. We strongly support continued discussion on this issue between the PSC and the water management districts, and other interested parties.

To address these concerns, we recommend that the published rule be amended to include a specific recognition that reuse and other alternative water supply projects required by a water management district be allowed a significantly longer margin reserve period. Under the spirit of our "MOU" on conservation, we plan to work with the PSC staff to prepare a proposed amendment to the draft language for your consideration during the rule adoption hearing.

In making these comments and recommendations, the districts recognize they are not the only agencies in Florida charged with addressing water supply issues. The PSC clearly plays an

important role in this complex arena. Of particular import in regard to the proposed rule is the apparent intent to defer the costs of future facilities away from existing customers. Achieving equity between existing and future water users is certainly an important goal. However, we hope this goal can be accomplished in a manner which recognizes the districts' equally important resource related objectives and the desire to assure an adequate and reliable supply for all water users. We do understand that the environmental protection mandated by state law and state water policy often increases the need for planning and imposes higher costs for water and wastewater service. However, we maintain that the objective of maintaining affordable rates for essential water, wastewater and reuse services can and should be balanced with the need to protect the State's water resources.

We are hopeful that continued dialogue between our agencies, as well as joint participation in each agencies' rulemaking processes, will improve our collective management of water related issues. Thank you for the opportunity to comment.

Sincerely,

Peter G. Hubbell
Executive Director

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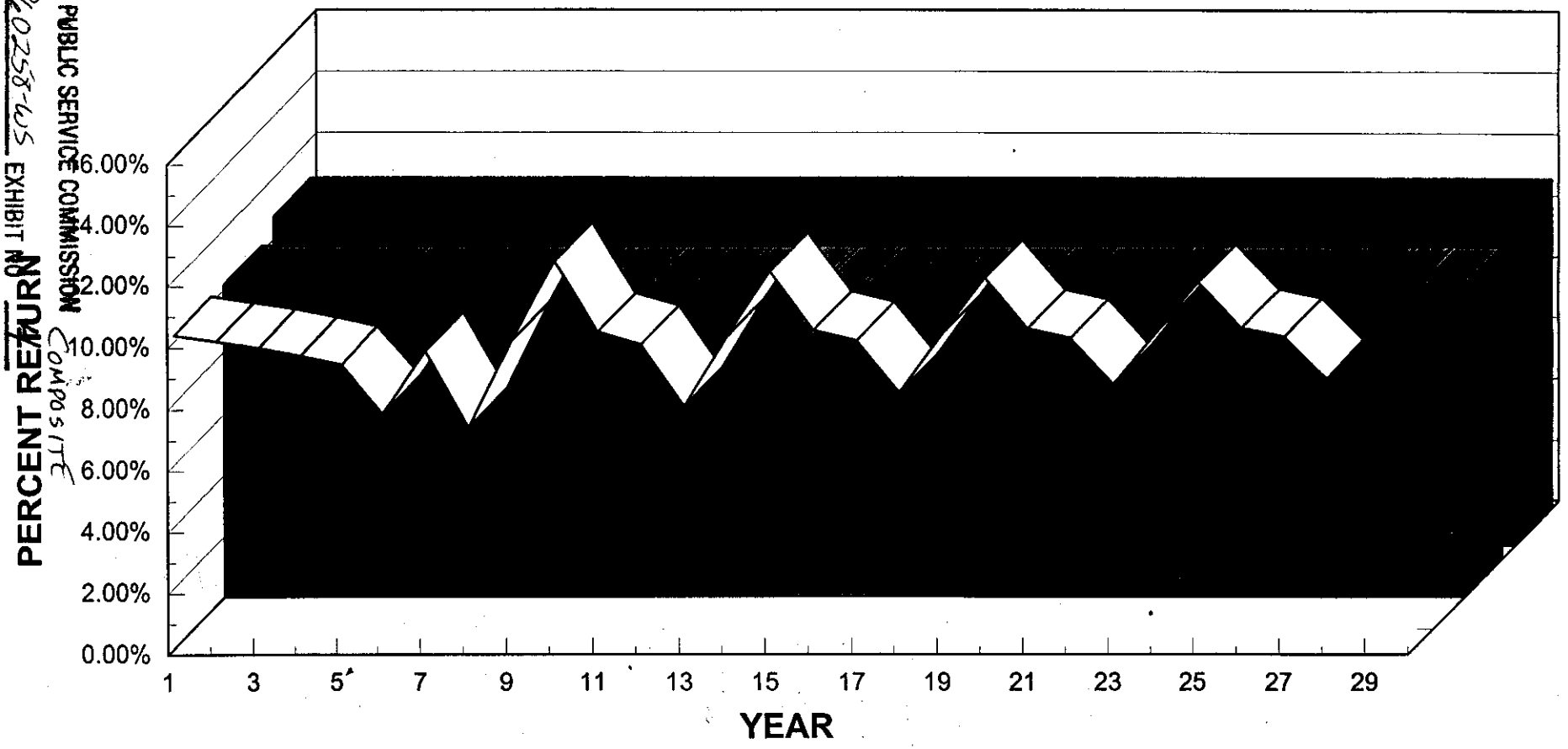
EXHIBIT DS - 5

FWA Proposal - 5 Year Margin Reserve / No Imputation of CIAC
Comparison - Actual Return to Allowed Return

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 960258-WS EXHIBIT 10
COMPANY/ Composite
WITNESS:
DATE 12-10-96



Ex 4

Milian, Swain & Associates, Inc.

backup to DS-5

REVISED DRAFT 12/04/96

Schedule I

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 60 month MR / No CIAC Imputation
PROJECTED NET INVESTMENT - AVERAGE BALANCES

a	b	c	d	e	f	g	h	i	j	k	l
	Net Investment				Return on Investment						Overall
YEAR	CWIP	Net Plant	Net CIAC	Total (b+c+d)	Rate Base	Allowed Rate of Return	Allowed Return (f * g)	AFUDC	AFPI	Total (h+j)	Rate of Return (j / e)
1	256,852	0	0	256,852	0		0	26,203	0	26,203	10.20%
2	1,310,461	0	0	1,310,461	0		0	131,016	0	131,016	10.00%
3	3,850,975	0	0	3,850,975	0		0	376,825	0	376,825	9.79%
4	8,055,813	0	0	8,055,813	0		0	767,345	0	767,345	9.53%
5	13,982,362	0	0	13,982,362	0		0	1,293,670	0	1,293,670	9.25%
6	13,876,347	11,556,940	(1,645,188)	23,788,098	9,911,751	10.75%	1,065,513	757,747	0	1,823,261	7.66%
7	13,482,140	11,085,228	(4,868,414)	19,698,954	6,216,814	10.75%	668,307	1,241,759	0	1,910,067	9.70%
8	12,509,201	16,618,785	(7,957,339)	21,170,646	8,661,446	10.75%	931,105	598,750	0	1,529,856	7.23%
9	11,293,156	21,902,123	(10,911,963)	22,283,316	10,990,160	10.75%	1,181,442	1,051,775	0	2,233,217	10.02%
10	10,391,532	27,783,706	(13,732,286)	24,442,953	14,051,421	10.75%	1,510,528	1,580,824	0	3,091,351	12.65%
11	9,250,948	33,379,718	(16,418,307)	26,212,359	16,961,411	10.75%	1,823,352	878,437	0	2,701,788	10.31%
12	15,629,496	31,836,423	(18,970,028)	28,495,890	12,866,395	10.75%	1,383,137	1,439,539	0	2,822,677	9.91%
13	14,501,592	37,254,880	(21,387,447)	30,369,024	15,867,432	10.75%	1,705,749	694,116	0	2,399,865	7.90%
14	13,091,863	42,383,264	(23,670,566)	31,804,561	18,712,698	10.75%	2,011,615	1,219,295	0	3,230,910	10.16%
15	12,046,634	48,205,179	(25,819,383)	34,432,430	22,385,796	10.75%	2,406,473	1,832,608	0	4,239,081	12.31%
16	10,724,384	53,696,038	(27,833,899)	36,586,523	25,862,139	10.75%	2,780,180	1,018,349	0	3,798,529	10.38%
17	18,118,869	50,910,484	(29,714,114)	39,315,239	21,196,369	10.75%	2,278,610	1,668,821	0	3,947,431	10.04%
18	16,811,320	56,195,509	(31,460,028)	41,546,800	24,735,480	10.75%	2,659,064	804,670	0	3,463,734	8.34%
19	15,177,057	61,144,259	(33,071,641)	43,249,675	28,072,618	10.75%	3,017,806	1,413,497	0	4,431,304	10.25%
20	13,965,350	66,897,003	(34,548,953)	46,313,400	32,348,049	10.75%	3,477,415	2,124,495	0	5,601,910	12.10%
21	12,432,500	72,265,961	(35,891,964)	48,806,497	36,373,997	10.75%	3,910,205	1,180,546	0	5,090,750	10.43%
22	21,004,735	68,040,288	(37,100,674)	51,944,349	30,939,614	10.75%	3,326,008	1,934,621	0	5,260,629	10.13%
23	19,488,927	73,170,627	(38,175,083)	54,484,472	34,995,545	10.75%	3,762,021	932,833	0	4,694,854	8.62%
24	17,594,369	77,911,133	(39,115,190)	56,390,313	38,795,943	10.75%	4,170,564	1,638,631	0	5,809,195	10.30%
25	16,189,669	83,583,688	(39,920,997)	59,852,360	43,662,691	10.75%	4,693,739	2,462,872	0	7,156,611	11.96%
26	14,412,675	88,811,330	(40,592,502)	62,631,503	48,218,828	10.75%	5,183,524	1,368,576	0	6,552,100	10.46%
27	24,350,245	82,916,164	(41,129,706)	66,136,703	41,786,458	10.75%	4,492,044	2,242,756	0	6,734,800	10.18%
28	22,593,008	87,867,182	(41,532,610)	68,927,580	46,334,572	10.75%	4,980,967	1,081,409	0	6,062,376	8.80%
29	20,396,696	92,366,275	(41,801,212)	70,961,760	50,565,064	10.75%	5,435,744	1,899,622	0	7,335,366	10.34%
30	18,768,263	97,945,868	(41,935,513)	74,778,619	56,010,356	10.75%	6,021,113	2,855,143	0	8,876,256	11.87%
			AVG	37,069,350					AVG	3,779,766	10.20%
			NPV	186,041,183		NPV	10,429,799	7,944,290	0	18,374,089	9.88%

Data supporting Exhibit DS-5

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MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed

(1) Average Cost per ERC / year

	Rates	Service Availability	AFPI	Total
Five Years	$178	$127	$133	$438
Ten Years	162	64	150	375
Fifteen Years	161	42	159	363
Twenty Years	165	32	164	360
Twenty-five Years	169	25	166	361

Total cost per ERC over twenty-five years $9,020

(2) Net Present Value of Revenue Requirement:

Rates	$24,302,988
CIAC	11,894,710
AFPI	2,931,886
Total	$39,129,584

(3) Net Present Value of Return to the Utility

Rates	$5,440,750
AFPI	2,931,886
Total	$8,372,635

(4) Average Rate of Return on Investment Earned 9.86%

REVISED Schedule I

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED NET INVESTMENT

a YEAR	b CWIP	c Net Plant	d Net CIAC	e Net Investment	f Rate Base	g Allowed Rate of Return	h Net Income at Allowed Rate of Rtn	i AFUDC	j AFPI	k Total	l Overall Rate of Return
1	376,716	0	0	376,716	0	10.75%	0	38,431	0	38,431	10.20%
2	1,922,009	0	0	1,922,009	0	10.75%	0	192,156	0	192,156	10.00%
3	5,248,440	0	0	5,248,440	0	10.75%	0	511,904	0	511,904	9.75%
4	9,776,132	0	0	9,776,132	0	10.75%	0	921,581	0	921,581	9.43%
5	14,939,395	0	0	14,939,395	0	10.75%	0	1,354,303	0	1,354,303	9.07%
6	9,980,476	16,950,178	(1,132,108)	25,798,546	2,251,638	10.75%	242,051	133,657	278,673	654,381	2.54%
7	4,156,258	16,258,334	(3,350,117)	17,064,475	3,008,559	10.75%	323,420	408,100	806,545	1,538,065	9.01%
8	8,708,798	15,566,490	(5,475,708)	18,799,581	3,581,159	10.75%	384,975	830,901	1,337,011	2,552,887	13.58%
9	14,199,467	14,874,646	(7,508,882)	21,565,231	3,969,439	10.75%	426,715	1,306,275	0	1,732,990	8.04%
10	8,785,995	24,234,947	(9,449,639)	23,571,303	1,695,004	10.75%	182,213	1,688,963	0	1,871,176	7.94%
11	1,544,647	33,176,408	(11,297,980)	23,423,075	8,529,181	10.75%	916,887	154,945	199,255	1,271,087	5.43%
12	4,818,242	31,646,885	(13,053,903)	23,411,224	8,867,280	10.75%	953,233	473,099	574,407	2,000,739	8.55%
13	10,095,884	30,117,362	(14,717,409)	25,495,838	8,991,892	10.75%	966,628	963,242	946,991	2,876,861	11.28%
14	16,461,073	28,587,840	(16,288,498)	28,760,415	8,903,016	10.75%	957,074	1,514,331	1,303,429	3,774,834	13.13%
15	10,185,376	38,711,507	(17,767,170)	31,129,714	7,224,943	10.75%	776,681	1,957,972	0	2,734,653	8.78%
16	1,790,669	48,349,626	(19,153,425)	30,986,869	16,129,950	10.75%	1,733,970	179,624	212,255	2,125,848	6.86%
17	5,585,663	45,849,004	(20,447,264)	30,987,403	15,892,214	10.75%	1,708,413	548,452	612,324	2,869,189	9.26%
18	11,703,897	43,348,382	(21,648,685)	33,403,594	15,413,480	10.75%	1,656,949	1,116,662	1,010,599	3,784,210	11.33%
19	19,082,896	40,847,760	(22,757,689)	37,172,967	14,693,746	10.75%	1,579,578	1,755,524	1,392,731	4,727,833	12.72%
20	11,807,643	51,856,379	(23,774,276)	39,889,746	14,314,502	10.75%	1,538,809	2,269,826	0	3,808,635	9.55%
21	2,075,877	62,302,114	(24,698,446)	39,679,545	24,862,026	10.75%	2,672,668	208,233	213,200	3,094,101	7.80%
22	6,475,314	58,675,722	(25,530,199)	39,620,837	23,881,625	10.75%	2,567,275	635,806	615,136	3,818,216	9.64%
23	13,568,024	55,049,330	(26,269,535)	42,347,819	22,631,003	10.75%	2,432,833	1,294,517	1,015,380	4,742,730	11.20%
24	22,122,306	51,422,938	(26,916,454)	46,628,790	21,110,158	10.75%	2,269,342	2,035,134	1,399,480	5,703,956	12.23%
25	13,688,294	63,457,459	(27,470,956)	49,674,797	22,436,984	10.75%	2,411,976	2,631,350	0	5,043,326	10.15%
26	2,406,510	74,839,443	(27,933,041)	49,312,911	34,529,343	10.75%	3,711,904	241,400	208,709	4,162,013	8.44%
27	7,506,664	69,907,975	(28,302,710)	49,111,929	32,616,302	10.75%	3,506,252	737,073	602,020	4,845,346	9.87%
28	15,729,059	64,976,506	(28,579,961)	52,125,605	30,401,161	10.75%	3,268,125	1,500,700	993,358	5,762,183	11.05%
29	25,645,816	60,045,038	(28,764,795)	56,926,060	27,883,919	10.75%	2,997,521	2,359,278	1,368,552	6,725,351	11.81%
30	15,868,485	73,268,861	(28,857,212)	60,280,134	31,246,143	10.75%	3,358,960	3,050,456	0	6,409,416	10.63%
			AVG	30,981,037					AVG	3,054,947	9.86%
			NPV	167,295,898		NPV	5,440,750	6,859,526	2,931,886	15,232,161	9.10%

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MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$194	$185	$21	$378
Ten years	183	92	37	275
Fifteen years	186	62	43	248
Twenty years	193	46	46	240
Twenty-five years	202	37	47	238

Total cost per ERC over twenty-five years $5,962

(2) Net Present Value of Revenue Requirement

Rates	$28,138,655
CIAC	17,285,480
AFPI	788,292
Total	$46,212,428

(3) Net Present Value of Return to the Utility

Rates	$6,708,917
AFPI	788,292
Total	$7,497,209

(4) Average Rate of Return on Investment Earned 8.92%

REVISED Schedule I

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED NET INVESTMENT - AVERAGE BALANCES

a	b	c	d	e	f	g	h	i	j	k	l
	Net Investment				Return on Investment						Overall
YEAR	CWIP	Net Plant	Net CIAC	Total (b+c+d)	Rate Base	Allowed Rate of Return	Allowed Return (f * g)	AFUDC	AFPI	Total (h+j)	Rate of Return (j / e)
1	256,852	0	0	256,852	0		0	26,203	0	26,203	10.20%
2	1,310,461	0	0	1,310,461	0		0	131,016	0	131,016	10.00%
3	3,850,975	0	0	3,850,975	0		0	376,825	0	376,825	9.79%
4	8,055,813	0	0	8,055,813	0		0	767,345	0	767,345	9.53%
5	13,982,362	0	0	13,982,362	0		0	1,293,670	0	1,293,670	9.25%
6	13,876,347	11,556,940	(1,645,188)	23,788,098	2,664,799	10.75%	286,466	757,747	102,347	1,146,560	4.82%
7	13,482,140	11,085,228	(4,868,414)	19,698,954	2,926,437	10.75%	314,592	1,241,759	0	1,556,351	7.90%
8	12,509,201	16,618,785	(7,957,339)	21,170,646	402,124	10.75%	43,228	598,750	73,587	715,566	3.38%
9	11,293,156	21,902,123	(10,911,963)	22,283,316	6,054,595	10.75%	650,869	1,051,775	199,736	1,902,380	8.54%
10	10,391,532	27,783,706	(13,732,286)	24,442,953	3,559,115	10.75%	382,605	1,580,824	0	1,963,428	8.03%
11	9,250,948	33,379,718	(16,418,307)	26,212,359	9,800,532	10.75%	1,053,557	878,437	304,577	2,236,571	8.53%
12	15,629,496	31,836,423	(18,970,028)	28,495,890	9,576,018	10.75%	1,029,422	1,439,539	366,493	2,835,454	9.95%
13	14,501,592	37,254,880	(21,387,447)	30,369,024	7,206,380	10.75%	774,686	694,116	82,481	1,551,283	5.11%
14	13,091,863	42,383,264	(23,670,566)	31,804,561	13,777,133	10.75%	1,481,042	1,219,295	223,878	2,924,215	9.19%
15	12,046,634	48,205,179	(25,819,383)	34,432,430	11,665,610	10.75%	1,254,053	1,832,608	0	3,086,661	8.96%
16	10,724,384	53,696,038	(27,833,899)	36,586,523	18,778,733	10.75%	2,018,714	1,018,349	317,067	3,354,130	9.17%
17	18,118,869	50,910,484	(29,714,114)	39,315,239	17,905,993	10.75%	1,924,894	1,668,821	381,641	3,975,356	10.11%
18	16,811,320	56,195,509	(31,460,028)	41,546,800	16,053,548	10.75%	1,725,756	804,670	82,943	2,613,370	6.29%
19	15,177,057	61,144,259	(33,071,641)	43,249,675	23,137,053	10.75%	2,487,233	1,413,497	225,132	4,125,863	9.54%
20	13,965,350	66,897,003	(34,548,953)	46,313,400	21,678,456	10.75%	2,330,434	2,124,495	0	4,454,929	9.62%
21	12,432,500	72,265,961	(35,891,964)	48,806,497	29,373,690	10.75%	3,157,672	1,180,546	314,294	4,652,512	9.53%
22	21,004,735	68,040,288	(37,100,674)	51,944,349	27,649,237	10.75%	2,972,293	1,934,621	378,278	5,285,192	10.17%
23	19,488,927	73,170,627	(38,175,083)	54,484,472	26,401,449	10.75%	2,838,156	932,833	80,999	3,851,988	7.07%
24	17,594,369	77,911,133	(39,115,190)	56,390,313	33,860,379	10.75%	3,639,991	1,638,631	219,854	5,498,475	9.75%
25	16,189,669	83,583,688	(39,920,997)	59,852,360	33,154,881	10.75%	3,564,150	2,462,872	0	6,027,021	10.07%
26	14,412,675	88,811,330	(40,592,502)	62,631,503	41,309,678	10.75%	4,440,790	1,368,576	305,426	6,114,793	9.76%
27	24,350,245	82,916,164	(41,129,706)	66,136,703	38,496,081	10.75%	4,138,329	2,242,756	367,523	6,748,608	10.20%
28	22,593,008	87,867,182	(41,532,610)	68,927,580	37,884,320	10.75%	4,072,564	1,081,409	77,814	5,231,788	7.59%
29	20,396,696	92,366,275	(41,801,212)	70,961,760	45,629,499	10.75%	4,905,171	1,899,622	211,210	7,016,003	9.89%
30	18,768,263	97,945,868	(41,935,513)	74,778,619	45,732,289	10.75%	4,916,221	2,855,143	0	7,771,364	10.39%
			AVG	37,069,350					AVG	3,307,831	8.92%
			NPV	186,041,183		NPV	6,708,917	7,944,290	788,292	15,441,499	8.30%

REVISED

MODEL WATER UTILITY
Key Results
Scenario: Water Treatment Plant - 60 month increments / 18 month MR / CIAC Imputed

(1) Average Cost per ERC / year:

	Rates	Service Availability	AFPI	Total
Five Years	$158	$107	$113	$378
Ten Years	145	54	127	325
Fifteen Years	144	36	134	315
Twenty Years	147	27	139	313
Twenty-five Years	151	21	140	313

Total cost per ERC over twenty-five years $7,829

(2) Net Present Value of Revenue Requirement:

Rates	$3,412,068
CIAC	1,580,416
AFPI	389,568
Total	$5,382,053

(3) Net Present Value of Return to the Utility

Rates	$722,897
AFPI	389,568
Total	$1,112,465

(4) Average Rate of Return on Investment Earned 9.86%

REVISED Schedule I

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED RETURN ON NET INVESTMENT

a YEAR	b CWIP	c Net Plant	d Net CIAC	e Net Investment	f Rate Base	g Allowed Rate of Return	h Net Income at Allowed Rate of Rtn	i AFUDC	j AFPI	k Total	l Overall Rate of Return
1	50,053	0	0	50,053	0	10.75%	0	5,106	0	5,106	10.20%
2	255,372	0	0	255,372	0	10.75%	0	25,531	0	25,531	10.00%
3	697,345	0	0	697,345	0	10.75%	0	68,015	0	68,015	9.75%
4	1,298,927	0	0	1,298,927	0	10.75%	0	122,448	0	122,448	9.43%
5	1,984,955	0	0	1,984,955	0	10.75%	0	179,942	0	179,942	9.07%
6	1,326,077	2,252,122	(150,420)	3,427,779	299,169	10.75%	32,161	17,759	37,031	86,951	2.54%
7	552,230	2,160,198	(445,120)	2,267,308	399,739	10.75%	42,972	54,223	107,179	204,374	9.01%
8	1,157,113	2,068,275	(727,542)	2,497,846	475,818	10.75%	51,150	110,399	177,671	339,221	13.58%
9	1,886,642	1,976,352	(997,684)	2,865,310	527,408	10.75%	56,696	173,561	0	230,257	8.04%
10	1,167,370	3,220,028	(1,255,546)	3,131,851	225,210	10.75%	24,210	224,408	0	248,618	7.94%
11	205,233	4,408,054	(1,501,130)	3,112,157	1,133,248	10.75%	121,824	20,587	26,483	168,894	5.43%
12	640,186	4,204,831	(1,734,435)	3,110,582	1,178,170	10.75%	126,653	62,859	76,331	265,844	8.55%
13	1,341,411	4,001,608	(1,955,460)	3,387,559	1,194,727	10.75%	128,433	127,983	125,826	382,243	11.28%
14	2,187,136	3,798,384	(2,164,206)	3,821,314	1,182,918	10.75%	127,164	201,205	173,176	501,545	13.12%
15	1,353,302	5,143,487	(2,360,673)	4,136,116	959,958	10.75%	103,195	260,150	0	363,346	8.78%
16	237,921	6,424,076	(2,544,861)	4,117,136	2,143,140	10.75%	230,388	23,866	28,191	282,445	6.86%
17	742,151	6,091,826	(2,716,769)	4,117,207	2,111,553	10.75%	226,992	72,871	81,334	381,197	9.26%
18	1,555,063	5,759,575	(2,876,399)	4,438,240	2,047,945	10.75%	220,154	148,368	134,242	502,764	11.33%
19	2,535,490	5,427,325	(3,023,749)	4,939,065	1,952,316	10.75%	209,874	233,251	185,006	628,131	12.72%
20	1,568,848	6,890,008	(3,158,820)	5,300,036	1,901,927	10.75%	204,457	301,585	0	506,042	9.55%
21	275,816	8,277,903	(3,281,612)	5,272,107	3,303,346	10.75%	355,110	27,667	28,340	411,117	7.80%
22	860,356	7,796,075	(3,392,124)	5,264,307	3,173,083	10.75%	341,106	84,478	81,750	507,334	9.64%
23	1,802,744	7,314,247	(3,490,358)	5,626,633	3,006,916	10.75%	323,244	171,999	134,920	630,162	11.20%
24	2,939,327	6,832,418	(3,576,312)	6,195,434	2,804,846	10.75%	301,521	270,402	185,945	757,868	12.23%
25	1,818,724	8,431,411	(3,649,987)	6,600,148	2,981,138	10.75%	320,472	349,620	0	670,092	10.15%
26	319,746	9,943,702	(3,711,383)	6,552,065	4,587,815	10.75%	493,190	32,074	27,746	553,010	8.44%
27	997,389	9,288,472	(3,760,500)	6,525,361	4,333,635	10.75%	465,866	97,933	80,012	643,810	9.87%
28	2,089,875	8,633,242	(3,797,337)	6,925,780	4,039,315	10.75%	434,226	199,394	131,999	765,619	11.05%
29	3,407,486	7,978,012	(3,821,896)	7,563,602	3,704,856	10.75%	398,272	313,470	181,840	893,583	11.81%
30	2,108,400	9,735,024	(3,834,175)	8,009,249	4,151,585	10.75%	446,295	405,305	0	851,601	10.63%
			AVG	4,116,362					AVG	405,904	9.86%
			NPV	22,228,126		NPV	722,897	911,405	389,568	2,023,871	9.10%

REVISED

MODEL WATER UTILITY
Key Results
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$209	$205	$23	$414
Ten years	197	102	41	300
Fifteen years	201	68	48	269
Twenty years	209	51	51	260
Twenty-five years	218	41	53	259

Total cost per ERC over twenty-five years $6,472

(2) Net Present Value of Revenue Requirement

Rates	$4,776,445
CIAC	3,013,879
AFPI	137,487
Total	$7,927,811

(3) Net Present Value of Return to the Utility

Rates	$1,169,760
AFPI	137,487
Total	$1,307,247

(4) Average Return on Investment to Utility 8.92%

REVISED Schedule I

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED NET INVESTMENT

a	b	c	d	e	f	g	h	i	j	k	l
	Net Investment				Return on Investment						Overall
YEAR	CWIP	Net Plant	Net CIAC	Total (b+c+d)	Rate Base	Allowed Rate of Return	Allowed Return (f * g)	AFUDC	AFPI	Total (h+j)	Rate of Return (j / e)
1	44,784	0	0	44,784	0		0	4,569	0	4,569	10.20%
2	228,491	0	0	228,491	0		0	22,844	0	22,844	10.00%
3	671,452	0	0	671,452	0		0	65,703	0	65,703	9.79%
4	1,404,603	0	0	1,404,603	0		0	133,794	0	133,794	9.53%
5	2,437,950	0	0	2,437,950	0		0	225,563	0	225,563	9.25%
6	2,419,466	2,015,056	(286,853)	4,147,668	464,632	10.75%	49,948	132,120	17,825	199,893	4.82%
7	2,350,732	1,932,809	(848,852)	3,434,689	510,251	10.75%	54,852	216,512	0	271,364	7.90%
8	2,181,091	2,897,634	(1,387,433)	3,691,292	70,114	10.75%	7,537	104,397	12,839	124,774	3.38%
9	1,969,063	3,818,832	(1,902,599)	3,885,296	1,055,673	10.75%	113,485	183,386	34,848	331,720	8.54%
10	1,811,857	4,844,339	(2,394,347)	4,261,848	620,564	10.75%	66,711	275,631	0	342,341	8.03%
11	1,612,986	5,820,053	(2,862,679)	4,570,360	1,708,811	10.75%	183,697	153,163	53,119	389,979	8.53%
12	2,725,143	5,550,966	(3,307,595)	4,968,514	1,669,665	10.75%	179,489	250,997	63,918	494,404	9.95%
13	2,528,483	6,495,723	(3,729,093)	5,295,112	1,256,497	10.75%	135,073	121,025	14,391	270,489	5.11%
14	2,282,684	7,389,902	(4,127,176)	5,545,411	2,402,167	10.75%	258,233	212,595	39,060	509,888	9.19%
15	2,100,439	8,405,006	(4,501,841)	6,003,603	2,034,004	10.75%	218,655	319,532	0	538,187	8.96%
16	1,869,893	9,362,386	(4,853,090)	6,379,189	3,274,241	10.75%	351,981	177,558	55,297	584,837	9.17%
17	3,159,187	8,876,700	(5,180,923)	6,854,965	3,122,071	10.75%	335,623	290,974	66,560	693,156	10.11%
18	2,931,204	9,798,191	(5,485,338)	7,244,057	2,799,080	10.75%	300,901	140,301	14,471	455,674	6.29%
19	2,646,256	10,661,050	(5,766,337)	7,540,969	4,034,153	10.75%	433,671	246,456	39,279	719,407	9.54%
20	2,434,984	11,664,093	(6,023,920)	8,075,157	3,779,833	10.75%	406,332	370,425	0	776,757	9.62%
21	2,167,718	12,600,219	(6,258,086)	8,509,851	5,121,567	10.75%	550,568	205,839	54,814	811,221	9.53%
22	3,662,364	11,863,435	(6,468,835)	9,056,963	4,820,893	10.75%	518,246	337,318	65,973	921,538	10.17%
23	3,398,069	12,757,956	(6,656,168)	9,499,857	4,603,330	10.75%	494,858	162,648	14,132	671,638	7.07%
24	3,067,736	13,584,505	(6,820,084)	9,832,157	5,903,861	10.75%	634,665	285,710	38,358	958,733	9.75%
25	2,822,814	14,573,566	(6,960,584)	10,435,796	5,780,851	10.75%	621,441	429,424	0	1,050,865	10.07%
26	2,512,979	15,485,052	(7,077,667)	10,920,365	7,202,713	10.75%	774,292	238,623	53,267	1,066,182	9.76%
27	4,245,684	14,457,177	(7,171,333)	11,531,528	6,712,137	10.75%	721,555	391,045	64,098	1,176,697	10.20%
28	3,939,294	15,320,432	(7,241,583)	12,018,142	6,605,471	10.75%	710,088	188,553	13,576	912,218	7.59%
29	3,556,347	16,104,889	(7,288,416)	12,372,820	7,955,913	10.75%	855,261	331,216	36,850	1,223,327	9.89%
30	3,272,415	17,077,741	(7,311,833)	13,038,323	7,973,835	10.75%	857,187	497,820	0	1,355,007	10.39%
			AVG	6,463,374					AVG	576,759	8.92%
			NPV	32,437,950		NPV	1,169,760	1,385,158	137,487	2,692,405	8.30%

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MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$194	$185	$21	$378
Ten years	183	92	37	275
Fifteen years	186	62	43	248
Twenty years	193	46	46	240
Twenty-five years	202	37	47	238

Total cost per ERC over twenty-five years $5,962

(2) Net Present Value of Revenue Requirement

Rates	$28,138,655
CIAC	17,285,480
AFPI	788,292
Total	$46,212,428

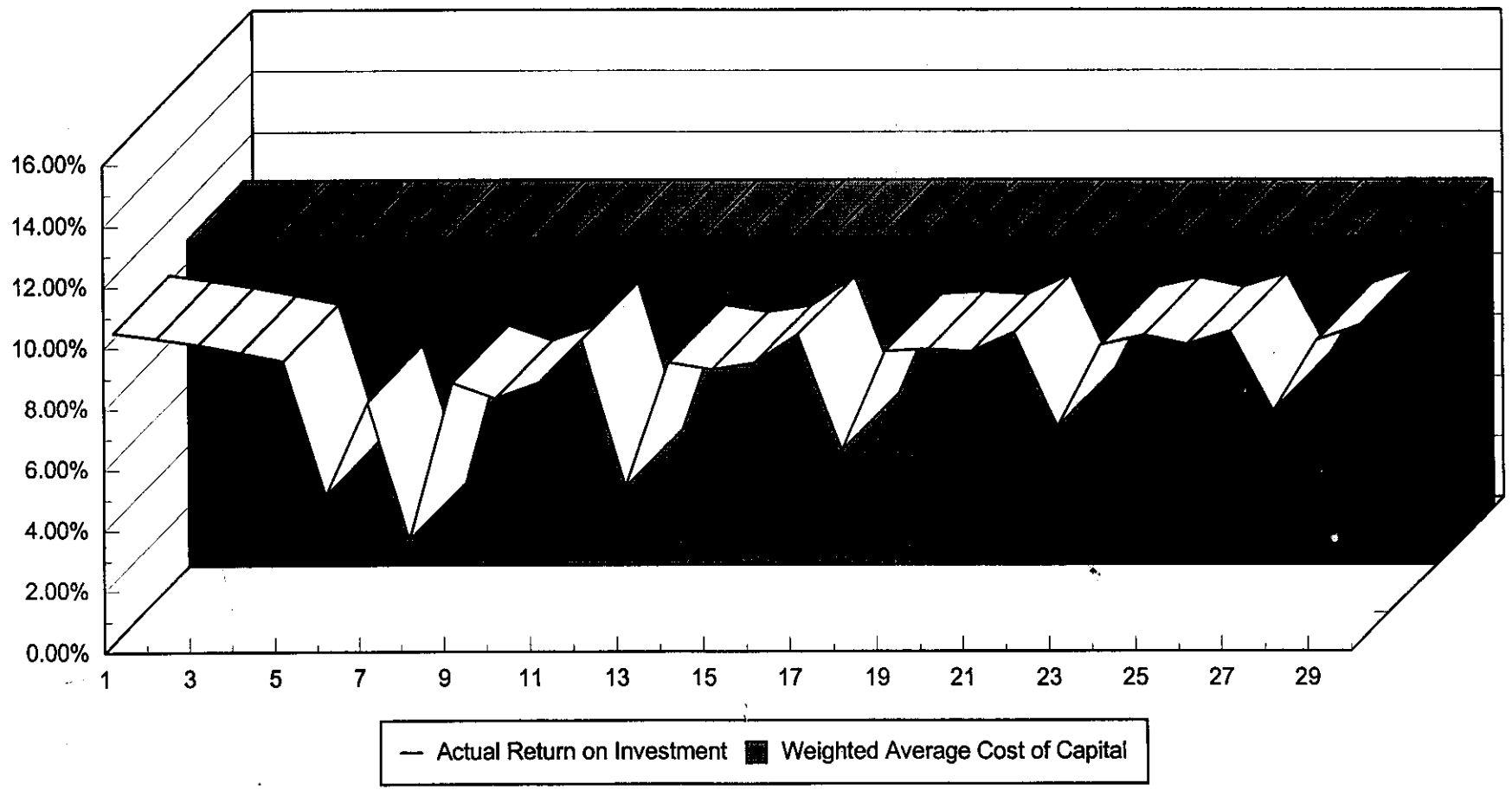
(3) Net Present Value of Return to the Utility

Rates	$6,708,917
AFPI	788,292
Total	$7,497,209

(4) Average Rate of Return on Investment Earned 8.92%

CHART 3.1

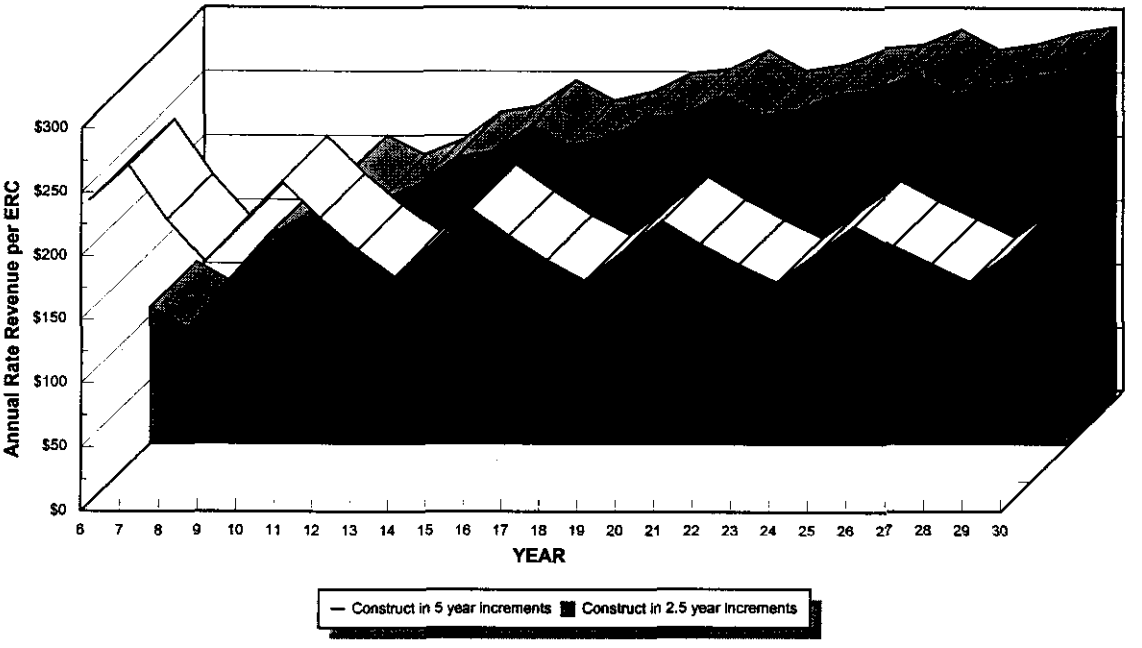
Model Wastewater Utility
Actual Return on Investment vs. Allowed Weighted Average Cost of Capital
Plant Constructed in 30 Month Increments
Staff Recommendation: 18 Months Margin Reserve and Imputed CIAC



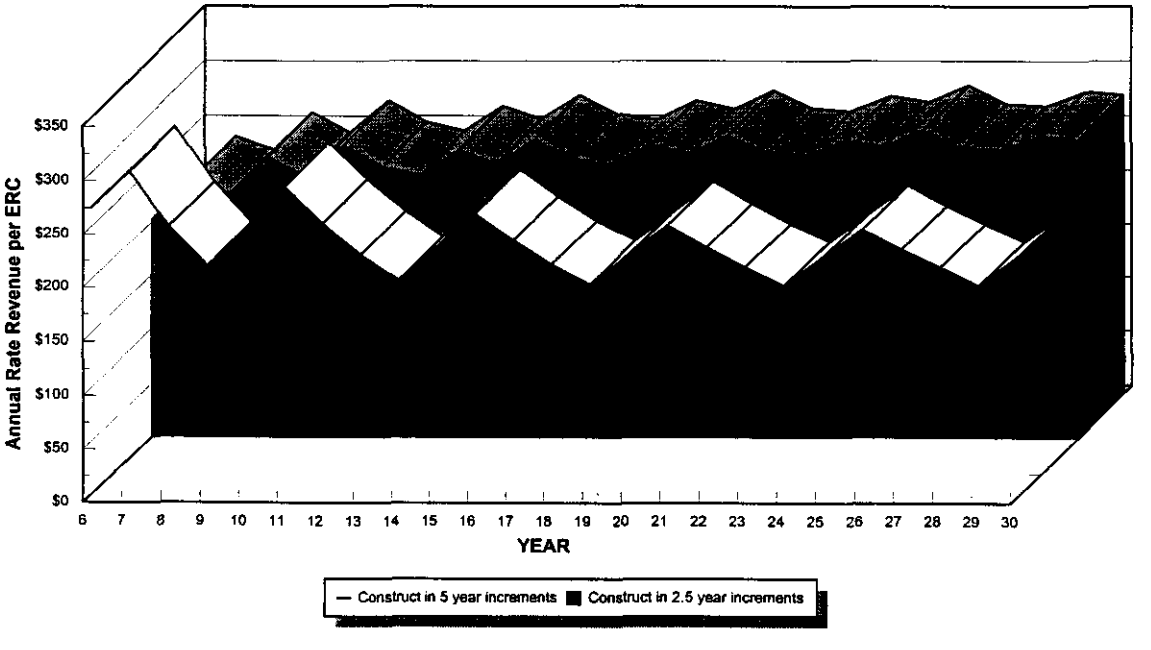
Comparison of Customer Rates
PSC Proposed Rule vs. FWA Proposed Rule

2.5 Year Plant vs. 5 Year Plant

Water



Wastewater



used these cost figures and the following assumptions:

WWTP A construction of facilities in five year increments. Each increment has capacity of 5.0 million gallons per day

WWTP B construction of facilities in two and a half year increments. Each increment has capacity of 2.5 million gallons per day.

Planning, design, permitting and construction takes five years for each increment. Facilities are placed in service six months prior to the time demand would otherwise exceed capacity (as required by DEP rules). Customer growth occurs evenly over a 5 year period beginning in Year 6.

Major assumptions are the same as those presented in Section III. The model presents a "best case" scenario in that it assumes no regulatory lag, full recovery of operation and maintenance expenses and even and predictable customer growth and plant utilization.

A comparison between the two alternatives is presented in the following table:

TABLE 4.1
Comparison of Alternatives for Wastewater Treatment Plant Expansion

	WWTP A	WWTP B
Capacity	5.0 MGD	2.5 MGD
Cost per thousand gallons	$2.86	$3.90
Frequency of expansion	5 years	2.5 years
Net Present Value of Revenue Requirement:		
Rates	$24.3 million	$28.1 million
Service Availability Charges	11.9 million	17.3 million
AFPI	2.9 million	.8 million
Net Present Value of Return to Utility		
Rates	$ 5.4 million	$ 6.7 million
AFPI	2.9 million	.8 million

THE FLORIDA WATERWORKS ASSOCIATION

RULEMAKING: MARGIN RESERVE AND IMPUTATION OF CIAC

FPSC DOCKET NO. 960258-WS

LATE FILED EXHIBIT - DEBORAH D. SWAIN

COMPARISON OF RATES UNDER PSC PROPOSED VS FWA PROPOSED RULE FOR MARGIN RESERVE AND IMPUTATION OF CIAC

Line No.	a	b	c	d	e	f	g	h	i
		If utilities continue to construct in small increments			If utilities construct in larger increments			Avg % increase if there is no change in construction schedule	Avg % increase if utilties start constructing in larger increments
		Construction in 2.5 year increments			Construction in 5 year increments				
		18 mo. MR CIAC imp.	60 mo. MR No CIAC imp.	% Increase in Rates	18 mo. MR CIAC imp.	60 mo. MR No CIAC imp.	% Increase in Rates		
	First year after rule change								
1	Water	$206	$239	16%	$156	$238	53%	34%	15%
2	Wastewater	203	234	16%	172	268	56%	36%	32%
3	Combined	$409	$473	16%	$328	$506	54%	**35%** Note (4)	24%
	Average of first five years after rule change								
4	Water	$243	$282	16%	$179	$225	26%	21%	-7%
5	Wastewater	236	263	11%	200	254	27%	19%	8%
6	Combined	$479	$545	14%	$379	$479	26%	20%	**0%** Note (5)

Notes:

(1) Based upon financial model presented in MSA study and during rulemaking hearing.

(2) Assumes existing plant in service, CIAC and ERC's at the time the rule change is implemented.

(3) The percentage change in rates will vary depending upon the maturity of the system at the time newly constructed facilities are placed in service. The higher the existing balance of plant in service the less impact the rule change will have on rates.

(4) The percentage increase provided during rulemaking hearing was the average rate increase in the first year after implementation of the rule change as proposed by FWA, assuming utilities have not yet changed construction schedules in response to the rule change.

(5) The average increase in combined water and wastewater rates over a five year period after implementation of the rule change, assuming a change in construction schedules from 30 to 60 month increments is 0%.

CONSTRUCTION IN 2.5 YEAR INCREMENTS
PSC PROPOSED POLICY: 18 MONTH MARGIN RESERVE PERIOD
WITH IMPUTATION OF CIAC

MODEL WATER UTILITY
Key Results
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$243	$68	$16	$311
Ten years	260	34	31	294
Fifteen years	269	23	37	292
Twenty years	276	17	40	294
Twenty-five years	282	14	42	296

Total cost per ERC over twenty-five years $7,393

(2) Net Present Value of Revenue Requirement

Rates	$10,107,811
CIAC	1,004,626
AFPI	106,391
Total	$11,218,828

(3) Net Present Value of Return to the Utility

Rates	$3,092,676
AFPI	106,391
Total	$3,199,066

(4) Average Return on Investment to Utility 8.95%

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	647,838	(157,143)	(162,559)	34,601	(43,543)	(29,153)	(94,755)	195,287	(120,273)	75,014	$206	
7	870,450	(185,714)	(174,171)	42,406	(43,543)	(39,170)	(153,631)	316,628	(195,004)	121,624	234	
8	1,012,344	(214,286)	(235,284)	50,212	(65,357)	(45,555)	(164,024)	338,050	(208,197)	129,853	236	$243
9	1,281,368	(242,857)	(261,427)	58,017	(65,357)	(57,662)	(232,633)	479,450	(295,282)	184,168	264	
10	1,396,278	(271,429)	(317,689)	65,823	(90,253)	(62,833)	(235,186)	484,712	(298,523)	186,189	257	
11	1,684,470	(300,000)	(346,570)	73,628	(90,253)	(75,801)	(308,880)	636,594	(392,064)	244,530	281	
12	1,703,057	(328,571)	(361,011)	81,434	(90,253)	(76,638)	(303,177)	624,841	(384,825)	240,016	259	
13	1,850,843	(357,143)	(431,353)	89,239	(115,541)	(83,288)	(311,259)	641,497	(395,084)	246,414	259	$270
14	2,138,120	(385,714)	(462,164)	97,045	(115,541)	(96,215)	(384,038)	791,492	(487,462)	304,030	277	
15	2,263,338	(414,286)	(528,100)	104,851	(144,402)	(101,850)	(385,351)	794,199	(489,129)	305,070	273	
16	2,568,191	(442,857)	(561,107)	112,656	(144,402)	(115,569)	(462,896)	954,016	(587,557)	366,459	290	
17	2,555,905	(471,429)	(577,610)	120,462	(144,402)	(115,016)	(446,887)	921,023	(567,237)	353,786	271	
18	2,721,007	(500,000)	(660,131)	128,267	(173,719)	(122,445)	(455,077)	937,902	(577,633)	360,269	272	$281
19	3,016,570	(528,571)	(694,875)	136,073	(173,719)	(135,746)	(529,156)	1,090,576	(671,661)	418,915	285	
20	3,163,634	(557,143)	(773,460)	143,878	(207,177)	(142,364)	(531,651)	1,095,718	(674,828)	420,890	284	
21	3,477,991	(585,714)	(810,292)	151,684	(207,177)	(156,510)	(610,911)	1,259,071	(775,433)	483,638	297	
22	3,426,243	(614,286)	(828,707)	159,489	(207,177)	(154,181)	(581,966)	1,199,416	(738,693)	460,723	279	
23	3,615,112	(642,857)	(926,064)	167,295	(241,162)	(162,680)	(591,199)	1,218,445	(750,412)	468,032	281	$288
24	3,914,196	(671,429)	(964,649)	175,100	(241,162)	(176,139)	(665,121)	1,370,796	(844,242)	526,554	291	
25	4,090,647	(700,000)	(1,058,718)	182,906	(279,950)	(184,079)	(669,985)	1,380,821	(850,416)	530,405	292	
26	4,410,733	(728,571)	(1,099,438)	190,711	(279,950)	(198,483)	(749,762)	1,545,240	(951,678)	593,562	303	
27	4,310,878	(757,143)	(1,119,798)	198,517	(279,950)	(193,990)	(705,173)	1,453,342	(895,080)	558,262	285	
28	4,528,628	(785,714)	(1,234,813)	206,322	(319,348)	(203,788)	(715,879)	1,475,408	(908,670)	566,738	288	$294
29	4,828,074	(814,286)	(1,277,393)	214,128	(319,348)	(217,263)	(788,609)	1,625,303	(1,000,987)	624,316	296	
30	5,040,309	(842,857)	(1,389,995)	221,934	(364,313)	(226,814)	(796,565)	1,641,699	(1,011,085)	630,614	299	

Net Present Value of Revenue Requirement $10,107,811

Schedule III

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

YEAR	Average Net Plant	Used & Useful %	Rate Base				Allowed Rate of Return	Allowed Return on Rate Base
			Net Plant U & U	Average Net CIAC	Imputed CIAC	Total		
1								
2								
3								
4								
5								
6	$2,825,433	93%	$2,637,071	($770,973)	($286,853)	$1,579,244	10.75%	169,769
7	3,679,352	100%	3,679,352	(927,608)	(191,236)	2,560,509	10.75%	275,255
8	4,552,254	90%	4,097,029	(1,076,437)	(286,853)	2,733,738	10.75%	293,877
9	5,381,528	100%	5,381,528	(1,217,461)	(286,853)	3,877,214	10.75%	416,801
10	6,315,112	88%	5,557,298	(1,350,679)	(286,853)	3,919,766	10.75%	421,375
11	7,198,903	96%	6,910,947	(1,476,092)	(286,853)	5,148,002	10.75%	553,410
12	6,837,893	100%	6,837,893	(1,593,699)	(191,236)	5,052,958	10.75%	543,193
13	7,690,726	93%	7,178,011	(1,703,500)	(286,853)	5,187,657	10.75%	557,673
14	8,492,982	100%	8,492,982	(1,805,497)	(286,853)	6,400,632	10.75%	688,068
15	9,416,162	91%	8,609,063	(1,899,687)	(286,853)	6,422,522	10.75%	690,421
16	10,281,619	97%	9,987,859	(1,986,072)	(286,853)	7,714,933	10.75%	829,355
17	9,704,010	100%	9,704,010	(2,064,652)	(191,236)	7,448,122	10.75%	800,673
18	10,533,578	95%	10,006,899	(2,135,426)	(286,853)	7,584,620	10.75%	815,347
19	11,304,514	100%	11,304,514	(2,198,394)	(286,853)	8,819,266	10.75%	948,071
20	12,215,633	93%	11,401,257	(2,253,557)	(286,853)	8,860,847	10.75%	952,541
21	13,059,836	98%	12,769,617	(2,300,914)	(286,853)	10,181,849	10.75%	1,094,549
22	12,231,128	100%	12,231,128	(2,340,466)	(191,236)	9,699,426	10.75%	1,042,688
23	13,033,726	96%	12,512,377	(2,372,213)	(286,853)	9,853,311	10.75%	1,059,231
24	13,768,352	100%	13,768,352	(2,396,153)	(286,853)	11,085,345	10.75%	1,191,675
25	14,665,489	95%	13,865,554	(2,412,289)	(286,853)	11,166,412	10.75%	1,200,389
26	15,485,052	98%	15,203,506	(2,420,618)	(286,853)	12,496,034	10.75%	1,343,324
27	14,365,254	100%	14,365,254	(2,421,142)	(191,236)	11,752,876	10.75%	1,263,434
28	15,136,585	97%	14,632,032	(2,413,861)	(286,853)	11,931,318	10.75%	1,282,617
29	15,829,119	100%	15,829,119	(2,398,774)	(286,853)	13,143,492	10.75%	1,412,925
30	16,710,048	95%	15,938,815	(2,375,882)	(286,853)	13,276,080	10.75%	1,427,179
AVG								

Schedule V

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 18 month MR / CIAC Imputed
CALCULATION OF USED & USEFUL %

YEAR	Year-end Capacity MGD	Year-end Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	1.000	2,857	571				
2	1.000	2,857	1,143				
3	1.000	2,857	1,714				
4	1.000	2,857	2,286				
5	1.000	2,857	2,857				
6	1.500	4,286	3,429	3,143	857	4,000	93%
7	1.500	4,286	4,000	3,714	571	4,286	100%
8	2.000	5,714	4,571	4,286	857	5,143	90%
9	2.000	5,714	5,143	4,857	857	5,714	100%
10	2.500	7,143	5,714	5,429	857	6,286	88%
11	2.500	7,143	6,286	6,000	857	6,857	96%
12	2.500	7,143	6,857	6,571	571	7,143	100%
13	3.000	8,571	7,429	7,143	857	8,000	93%
14	3.000	8,571	8,000	7,714	857	8,571	100%
15	3.500	10,000	8,571	8,286	857	9,143	91%
16	3.500	10,000	9,143	8,857	857	9,714	97%
17	3.500	10,000	9,714	9,429	571	10,000	100%
18	4.000	11,429	10,286	10,000	857	10,857	95%
19	4.000	11,429	10,857	10,571	857	11,429	100%
20	4.500	12,857	11,429	11,143	857	12,000	93%
21	4.500	12,857	12,000	11,714	857	12,571	98%
22	4.500	12,857	12,571	12,286	571	12,857	100%
23	5.000	14,286	13,143	12,857	857	13,714	96%
24	5.000	14,286	13,714	13,429	857	14,286	100%
25	5.500	15,714	14,286	14,000	857	14,857	95%
26	5.500	15,714	14,857	14,571	857	15,429	98%
27	5.500	15,714	15,429	15,143	571	15,714	100%
28	6.000	17,143	16,000	15,714	857	16,571	97%
29	6.000	17,143	16,571	16,286	857	17,143	100%
30	6.500	18,571	17,143	16,857	857	17,714	95%

MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$236	$62	$16	$298
Ten years	249	31	31	280
Fifteen years	256	21	36	277
Twenty years	261	15	39	277
Twenty-five years	265	12	40	278

Total cost per ERC over twenty-five years $6,945

(2) Net Present Value of Revenue Requirement

Rates	$61,128,519
CIAC	5,761,827
AFPI	652,720
Total	$67,543,066

(3) Net Present Value of Return to the Utility

Rates	$18,768,113
AFPI	652,720
Total	$19,420,833

(4) Average Rate of Return on Investment Earned 9.06%

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	4,052,337	(1,000,000)	(865,853)	253,426	(290,889)	(182,355)	(642,497)	1,324,169	(815,526)	508,643	$203	
7	5,630,764	(1,181,818)	(1,163,556)	298,193	(290,889)	(253,384)	(992,922)	2,046,387	(1,260,323)	786,064	238	
8	6,156,007	(1,363,636)	(1,272,398)	342,960	(415,999)	(277,020)	(1,035,590)	2,134,324	(1,314,481)	819,842	226	$236
9	8,031,035	(1,545,455)	(1,663,995)	387,727	(415,999)	(361,397)	(1,447,878)	2,984,039	(1,837,802)	1,146,237	260	
10	8,364,100	(1,727,273)	(1,715,619)	432,494	(558,785)	(376,385)	(1,443,506)	2,975,027	(1,832,252)	1,142,775	242	
11	10,364,116	(1,909,091)	(2,145,734)	477,261	(558,785)	(466,385)	(1,882,206)	3,879,177	(2,389,097)	1,490,080	271	
12	10,497,597	(2,090,909)	(2,235,139)	522,028	(558,785)	(472,392)	(1,849,869)	3,812,531	(2,348,051)	1,464,480	251	
13	11,041,053	(2,272,727)	(2,356,865)	566,795	(703,821)	(496,847)	(1,887,500)	3,890,087	(2,395,816)	1,494,271	243	$257
14	13,044,019	(2,454,545)	(2,815,286)	611,562	(703,821)	(586,981)	(2,317,873)	4,777,075	(2,942,092)	1,834,983	266	
15	13,415,627	(2,636,364)	(2,876,656)	656,329	(869,350)	(603,703)	(2,314,912)	4,770,972	(2,938,333)	1,832,639	254	
16	15,549,966	(2,818,182)	(3,378,044)	701,096	(869,350)	(699,748)	(2,772,235)	5,713,503	(3,518,817)	2,194,686	276	
17	15,496,937	(3,000,000)	(3,477,399)	745,863	(869,350)	(697,362)	(2,678,458)	5,520,231	(3,399,785)	2,120,446	258	
18	16,106,408	(3,181,818)	(3,622,989)	790,630	(1,037,487)	(724,788)	(2,721,342)	5,608,614	(3,454,218)	2,154,396	253	$264
19	18,199,075	(3,363,636)	(4,149,947)	835,397	(1,037,487)	(818,958)	(3,157,311)	6,507,134	(4,007,596)	2,499,538	271	
20	18,657,717	(3,545,455)	(4,231,483)	880,164	(1,229,379)	(839,597)	(3,166,302)	6,525,665	(4,019,009)	2,506,656	263	
21	20,899,787	(3,727,273)	(4,808,239)	924,931	(1,229,379)	(940,490)	(3,632,615)	7,486,722	(4,610,902)	2,875,820	280	
22	20,615,607	(3,909,091)	(4,917,517)	969,698	(1,229,379)	(927,702)	(3,463,478)	7,138,137	(4,396,217)	2,741,920	264	
23	21,316,359	(4,090,909)	(5,095,057)	1,014,466	(1,424,296)	(959,236)	(3,515,655)	7,245,671	(4,462,444)	2,783,227	261	$270
24	23,484,551	(4,272,727)	(5,697,185)	1,059,233	(1,424,296)	(1,056,805)	(3,950,629)	8,142,141	(5,014,560)	3,127,581	275	
25	24,060,488	(4,454,545)	(5,807,074)	1,104,000	(1,646,752)	(1,082,722)	(3,976,968)	8,196,426	(5,047,993)	3,148,433	270	
26	26,401,089	(4,636,364)	(6,467,246)	1,148,767	(1,646,752)	(1,188,049)	(4,446,770)	9,164,675	(5,644,315)	3,520,359	285	
27	25,838,333	(4,818,182)	(6,587,010)	1,193,534	(1,646,752)	(1,162,725)	(4,187,295)	8,629,903	(5,314,962)	3,314,942	268	
28	26,649,152	(5,000,000)	(6,804,303)	1,238,301	(1,872,715)	(1,199,212)	(4,250,681)	8,760,541	(5,395,419)	3,365,123	266	$275
29	28,886,939	(5,181,818)	(7,490,858)	1,283,068	(1,872,715)	(1,299,912)	(4,679,787)	9,644,916	(5,940,085)	3,704,831	279	
30	29,604,817	(5,363,636)	(7,637,097)	1,327,835	(2,130,602)	(1,332,217)	(4,726,960)	9,742,139	(5,999,963)	3,742,177	276	

Net Present Value of Revenue Requirement $61,128,519

Schedule III

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

a	b	c	d	e	f	g	h	i
			Rate Base					
YEAR	Average Net Plant	Used & Useful %	Net Plant U & U	Average Net CIAC	Imputed CIAC	Total	Allowed Rate of Return	Allowed Return on Rate Base
1								
2								
3								
4								
5								
6	19,269,428	93%	17,984,800	(5,631,332)	(1,645,188)	10,708,280	10.75%	1,151,140
7	24,120,198	100%	24,120,198	(6,474,698)	(1,096,792)	16,548,708	10.75%	1,778,986
8	29,087,021	90%	26,178,319	(7,273,297)	(1,645,188)	17,259,834	10.75%	1,855,432
9	33,803,624	100%	33,803,624	(8,027,129)	(1,645,188)	24,131,307	10.75%	2,594,115
10	39,136,150	88%	34,439,812	(8,736,194)	(1,645,188)	24,058,430	10.75%	2,586,281
11	44,183,104	96%	42,415,780	(9,400,492)	(1,645,188)	31,370,100	10.75%	3,372,286
12	41,947,965	100%	41,947,965	(10,020,023)	(1,096,792)	30,831,149	10.75%	3,314,349
13	46,819,614	93%	43,698,307	(10,594,787)	(1,645,188)	31,458,331	10.75%	3,381,771
14	51,401,191	100%	51,401,191	(11,124,784)	(1,645,188)	38,631,218	10.75%	4,152,856
15	56,696,791	91%	51,837,066	(11,610,014)	(1,645,188)	38,581,864	10.75%	4,147,550
16	61,661,334	97%	59,899,582	(12,050,477)	(1,645,188)	46,203,917	10.75%	4,966,921
17	58,183,935	100%	58,183,935	(12,446,173)	(1,096,792)	44,640,971	10.75%	4,798,904
18	62,945,253	95%	59,797,990	(12,797,101)	(1,645,188)	45,355,701	10.75%	4,875,738
19	67,370,297	100%	67,370,297	(13,103,263)	(1,645,188)	52,621,845	10.75%	5,656,848
20	72,623,089	93%	67,781,550	(13,364,658)	(1,645,188)	52,771,703	10.75%	5,672,958
21	77,492,096	98%	75,770,049	(13,581,286)	(1,645,188)	60,543,575	10.75%	6,508,434
22	72,574,578	100%	72,574,578	(13,753,146)	(1,096,792)	57,724,640	10.75%	6,205,399
23	77,207,991	96%	74,119,672	(13,880,240)	(1,645,188)	58,594,243	10.75%	6,298,881
24	81,451,570	100%	81,451,570	(13,962,567)	(1,645,188)	65,843,815	10.75%	7,078,210
25	86,654,737	95%	81,928,115	(14,000,126)	(1,645,188)	66,282,800	10.75%	7,125,401
26	91,412,991	98%	89,750,936	(13,992,919)	(1,645,188)	74,112,829	10.75%	7,967,129
27	84,825,981	100%	84,825,981	(13,940,945)	(1,096,792)	69,788,244	10.75%	7,502,236
28	89,311,117	97%	86,334,080	(13,844,203)	(1,645,188)	70,844,688	10.75%	7,615,804
29	93,344,329	100%	93,344,329	(13,702,695)	(1,645,188)	77,996,446	10.75%	8,384,618
30	98,489,965	95%	93,944,275	(13,516,419)	(1,645,188)	78,782,667	10.75%	8,469,137
AVG								

Schedule V

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 18 month MR / CIAC Imputed
CALCULATION OF USED & USEFUL %

a	b	c	d	e	f	g	h
	Year-end Capacity						
YEAR	MGD	ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	5.000	3,636					
2	5.000	7,273					
3	5.000	10,909					
4	5.000	14,545					
5	5.000	18,182	18,182				
6	7.500	27,273	21,818	20,000	5,455	25,455	93%
7	7.500	27,273	25,455	23,636	3,636	27,273	100%
8	10.000	36,364	29,091	27,273	5,455	32,727	90%
9	10.000	36,364	32,727	30,909	5,455	36,364	100%
10	12.500	45,455	36,364	34,545	5,455	40,000	88%
11	12.500	45,455	40,000	38,182	5,455	43,636	96%
12	12.500	45,455	43,636	41,818	3,636	45,455	100%
13	15.000	54,545	47,273	45,455	5,455	50,909	93%
14	15.000	54,545	50,909	49,091	5,455	54,545	100%
15	17.500	63,636	54,545	52,727	5,455	58,182	91%
16	17.500	63,636	58,182	56,364	5,455	61,818	97%
17	17.500	63,636	61,818	60,000	3,636	63,636	100%
18	20.000	72,727	65,455	63,636	5,455	69,091	95%
19	20.000	72,727	69,091	67,273	5,455	72,727	100%
20	22.500	81,818	72,727	70,909	5,455	76,364	93%
21	22.500	81,818	76,364	74,545	5,455	80,000	98%
22	22.500	81,818	80,000	78,182	3,636	81,818	100%
23	25.000	90,909	83,636	81,818	5,455	87,273	96%
24	25.000	90,909	87,273	85,455	5,455	90,909	100%
25	27.500	100,000	90,909	89,091	5,455	94,545	95%
26	27.500	100,000	94,545	92,727	5,455	98,182	98%
27	27.500	100,000	98,182	96,364	3,636	100,000	100%
28	30.000	109,091	101,818	100,000	5,455	105,455	97%
29	30.000	109,091	105,455	103,636	5,455	109,091	100%
30	32.500	118,182	109,091	107,273	5,455	112,727	95%

CONSTRUCTION IN 2.5 YEAR INCREMENTS
FWA PROPOSED POLICY: 60 MONTH MARGIN RESERVE PERIOD
WITH NO IMPUTATION OF CIAC

MODEL WATER UTILITY
Key Results
Scenario: WTP - 30 month increments / 60 month MR / CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$272	$68	$0	$340
Ten years	282	34	0	316
Fifteen years	288	23	0	311
Twenty years	292	17	0	309
Twenty-five years	295	14	0	309

Total cost per ERC over twenty-five years $7,728

(2) Net Present Value of Revenue Requirement

Rates	$10,746,278
CIAC	1,004,626
AFPI	0
Total	$11,750,904

(3) Net Present Value of Return to the Utility

Rates	$3,396,566
AFPI	0
Total	$3,396,566

(4) Average Return on Investment to Utility 9.34%

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 60 month MR / CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	751,387	(157,143)	(174,171)	34,601	(43,543)	(33,812)	(123,268)	254,051	(156,464)	97,587	$239	
7	907,227	(185,714)	(174,171)	42,406	(43,543)	(40,825)	(165,105)	340,276	(209,568)	130,708	244	
8	1,182,430	(214,286)	(261,427)	50,212	(65,357)	(53,209)	(208,549)	429,814	(264,713)	165,101	276	$272
9	1,336,533	(242,857)	(261,427)	58,017	(65,357)	(60,144)	(249,844)	514,922	(317,129)	197,793	275	
10	1,642,543	(271,429)	(361,011)	65,823	(90,253)	(73,914)	(297,866)	613,894	(378,083)	235,811	303	
11	1,810,134	(300,000)	(361,011)	73,628	(90,253)	(81,456)	(343,369)	707,674	(435,840)	271,834	302	
12	1,739,834	(328,571)	(361,011)	81,434	(90,253)	(78,293)	(314,652)	648,489	(399,389)	249,099	265	
13	2,036,872	(357,143)	(462,164)	89,239	(115,541)	(91,659)	(359,234)	740,371	(455,978)	284,393	285	$289
14	2,193,286	(385,714)	(462,164)	97,045	(115,541)	(98,698)	(401,249)	826,964	(509,308)	317,656	284	
15	2,525,562	(414,286)	(577,610)	104,851	(144,402)	(113,650)	(450,989)	929,475	(572,443)	357,033	305	
16	2,697,131	(442,857)	(577,610)	112,656	(144,402)	(121,371)	(497,733)	1,025,814	(631,776)	394,038	305	
17	2,592,682	(471,429)	(577,610)	120,462	(144,402)	(116,671)	(458,361)	944,671	(581,801)	362,870	275	
18	2,913,840	(500,000)	(694,875)	128,267	(173,719)	(131,123)	(503,889)	1,038,502	(639,590)	398,912	291	$294
19	3,071,736	(528,571)	(694,875)	136,073	(173,719)	(138,228)	(546,367)	1,126,048	(693,508)	432,541	291	
20	3,433,265	(557,143)	(828,707)	143,878	(207,177)	(154,497)	(597,725)	1,231,894	(758,696)	473,199	308	
21	3,608,253	(585,714)	(828,707)	151,684	(207,177)	(162,371)	(645,535)	1,330,431	(819,382)	511,049	308	
22	3,463,020	(614,286)	(828,707)	159,489	(207,177)	(155,836)	(593,440)	1,223,064	(753,257)	469,806	282	
23	3,810,943	(642,857)	(964,649)	167,295	(241,162)	(171,492)	(639,691)	1,318,386	(811,964)	506,422	296	$299
24	3,969,361	(671,429)	(964,649)	175,100	(241,162)	(178,621)	(682,332)	1,406,268	(866,089)	540,179	296	
25	4,363,608	(700,000)	(1,119,798)	182,906	(279,950)	(196,362)	(735,192)	1,515,211	(933,184)	582,027	312	
26	4,541,363	(728,571)	(1,119,798)	190,711	(279,950)	(204,361)	(783,866)	1,615,527	(994,967)	620,561	312	
27	4,347,655	(757,143)	(1,119,798)	198,517	(279,950)	(195,644)	(716,647)	1,476,990	(909,645)	567,345	287	
28	4,725,411	(785,714)	(1,277,393)	206,322	(319,348)	(212,644)	(763,363)	1,573,272	(968,942)	604,329	301	$303
29	4,883,240	(814,286)	(1,277,393)	214,128	(319,348)	(219,746)	(805,821)	1,660,775	(1,022,834)	637,941	300	
30	5,314,219	(842,857)	(1,457,253)	221,934	(364,313)	(239,140)	(860,050)	1,772,540	(1,091,667)	680,873	315	

Net Present Value of Revenue Requirement $10,746,278

Schedule III

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 60 month MR / CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

YEAR	Average Net Plant	Used & Useful %	Rate Base				Allowed Rate of Return	Allowed Return on Rate Base
			Net Plant U & U	Average Net CIAC	Imputed CIAC	Total		
1								
2								
3								
4								
5								
6	$2,825,433	100%	$2,825,433	($770,973)	$0	$2,054,460	10.75%	220,854
7	3,679,352	100%	3,679,352	(927,608)	0	2,751,745	10.75%	295,813
8	4,552,254	100%	4,552,254	(1,076,437)	0	3,475,817	10.75%	373,650
9	5,381,528	100%	5,381,528	(1,217,461)	0	4,164,067	10.75%	447,637
10	6,315,112	100%	6,315,112	(1,350,679)	0	4,964,433	10.75%	533,677
11	7,198,903	100%	7,198,903	(1,476,092)	0	5,722,812	10.75%	615,202
12	6,837,893	100%	6,837,893	(1,593,699)	0	5,244,194	10.75%	563,751
13	7,690,726	100%	7,690,726	(1,703,500)	0	5,987,225	10.75%	643,627
14	8,492,982	100%	8,492,982	(1,805,497)	0	6,687,486	10.75%	718,905
15	9,416,162	100%	9,416,162	(1,899,687)	0	7,516,475	10.75%	808,021
16	10,281,619	100%	10,281,619	(1,986,072)	0	8,295,547	10.75%	891,771
17	9,704,010	100%	9,704,010	(2,064,652)	0	7,639,358	10.75%	821,231
18	10,533,578	100%	10,533,578	(2,135,426)	0	8,398,152	10.75%	902,801
19	11,304,514	100%	11,304,514	(2,198,394)	0	9,106,119	10.75%	978,908
20	12,215,633	100%	12,215,633	(2,253,557)	0	9,962,076	10.75%	1,070,923
21	13,059,836	100%	13,059,836	(2,300,914)	0	10,758,921	10.75%	1,156,584
22	12,231,128	100%	12,231,128	(2,340,466)	0	9,890,662	10.75%	1,063,246
23	13,033,726	100%	13,033,726	(2,372,213)	0	10,661,513	10.75%	1,146,113
24	13,768,352	100%	13,768,352	(2,396,153)	0	11,372,199	10.75%	1,222,511
25	14,665,489	100%	14,665,489	(2,412,289)	0	12,253,201	10.75%	1,317,219
26	15,485,052	100%	15,485,052	(2,420,618)	0	13,064,434	10.75%	1,404,427
27	14,365,254	100%	14,365,254	(2,421,142)	0	11,944,112	10.75%	1,283,992
28	15,136,585	100%	15,136,585	(2,413,861)	0	12,722,724	10.75%	1,367,693
29	15,829,119	100%	15,829,119	(2,398,774)	0	13,430,345	10.75%	1,443,762
30	16,710,048	100%	16,710,048	(2,375,882)	0	14,334,166	10.75%	1,540,923
AVG								

Schedule V

MODEL WATER UTILITY
Scenario: WTP - 30 month increments / 60 month MR / CIAC Imputed
CALCULATION OF USED & USEFUL %

YEAR	Year-end Capacity MGD	Year-end Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	1.000	2,857	571				
2	1.000	2,857	1,143				
3	1.000	2,857	1,714				
4	1.000	2,857	2,286				
5	1.000	2,857	2,857				
6	1.500	4,286	3,429	3,143	1,143	4,286	100%
7	1.500	4,286	4,000	3,714	571	4,286	100%
8	2.000	5,714	4,571	4,286	1,429	5,714	100%
9	2.000	5,714	5,143	4,857	857	5,714	100%
10	2.500	7,143	5,714	5,429	1,714	7,143	100%
11	2.500	7,143	6,286	6,000	1,143	7,143	100%
12	2.500	7,143	6,857	6,571	571	7,143	100%
13	3.000	8,571	7,429	7,143	1,429	8,571	100%
14	3.000	8,571	8,000	7,714	857	8,571	100%
15	3.500	10,000	8,571	8,286	1,714	10,000	100%
16	3.500	10,000	9,143	8,857	1,143	10,000	100%
17	3.500	10,000	9,714	9,429	571	10,000	100%
18	4.000	11,429	10,286	10,000	1,429	11,429	100%
19	4.000	11,429	10,857	10,571	857	11,429	100%
20	4.500	12,857	11,429	11,143	1,714	12,857	100%
21	4.500	12,857	12,000	11,714	1,143	12,857	100%
22	4.500	12,857	12,571	12,286	571	12,857	100%
23	5.000	14,286	13,143	12,857	1,429	14,286	100%
24	5.000	14,286	13,714	13,429	857	14,286	100%
25	5.500	15,714	14,286	14,000	1,714	15,714	100%
26	5.500	15,714	14,857	14,571	1,143	15,714	100%
27	5.500	15,714	15,429	15,143	571	15,714	100%
28	6.000	17,143	16,000	15,714	1,429	17,143	100%
29	6.000	17,143	16,571	16,286	857	17,143	100%
30	6.500	18,571	17,143	16,857	1,714	18,571	100%

MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 30 month increments / 60 month MR / No CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year:

	Rates	Service Availabilty	AFPI	Total
Five years	$263	$62	$0	$325
Ten years	270	31	0	301
Fifteen years	273	21	0	294
Twenty years	275	15	0	291
Twenty-five years	278	12	0	290

Total cost per ERC over twenty-five years $7,252

(2) Net Present Value of Revenue Requirement

Rates	$64,885,354
CIAC	5,761,827
AFPI	0
Total	$70,647,180

(3) Net Present Value of Return to the Utility

Rates	$20,575,729
AFPI	0
Total	$20,575,729

(4) Average Rate of Return on Investment Earned 9.45%

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 60 month MR / No CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	4,680,538	(1,000,000)	(927,700)	253,426	(290,889)	(210,624)	(818,286)	1,686,465	(1,038,656)	647,810	$234	
7	5,841,690	(1,181,818)	(1,163,556)	298,193	(290,889)	(262,876)	(1,058,730)	2,182,014	(1,343,853)	838,161	247	
8	7,179,816	(1,363,636)	(1,413,775)	342,960	(415,999)	(323,092)	(1,308,823)	2,697,450	(1,661,299)	1,036,152	263	$263
9	8,347,425	(1,545,455)	(1,663,995)	387,727	(415,999)	(375,634)	(1,546,590)	3,187,480	(1,963,097)	1,224,384	270	
10	9,828,626	(1,727,273)	(1,949,567)	432,494	(558,785)	(442,288)	(1,823,997)	3,759,210	(2,315,212)	1,443,998	285	
11	11,114,003	(1,909,091)	(2,235,139)	477,261	(558,785)	(500,130)	(2,086,957)	4,301,162	(2,648,988)	1,652,174	291	
12	10,708,524	(2,090,909)	(2,235,139)	522,028	(558,785)	(481,884)	(1,915,676)	3,948,158	(2,431,581)	1,516,577	256	
13	12,133,990	(2,272,727)	(2,525,213)	566,795	(703,821)	(546,030)	(2,173,490)	4,479,505	(2,758,825)	1,720,679	267	$274
14	13,360,409	(2,454,545)	(2,815,286)	611,562	(703,821)	(601,218)	(2,416,584)	4,980,516	(3,067,387)	1,913,129	272	
15	14,948,997	(2,636,364)	(3,146,342)	656,329	(869,350)	(672,705)	(2,705,207)	5,575,359	(3,433,737)	2,141,622	284	
16	16,309,199	(2,818,182)	(3,477,399)	701,096	(869,350)	(733,914)	(2,976,651)	6,134,800	(3,778,284)	2,356,516	289	
17	15,707,864	(3,000,000)	(3,477,399)	745,863	(869,350)	(706,854)	(2,744,266)	5,655,859	(3,483,315)	2,172,544	262	
18	17,227,725	(3,181,818)	(3,813,673)	790,630	(1,037,487)	(775,248)	(3,008,889)	6,201,241	(3,819,203)	2,382,037	271	$277
19	18,515,466	(3,363,636)	(4,149,947)	835,397	(1,037,487)	(833,196)	(3,256,022)	6,710,575	(4,132,891)	2,577,684	275	
20	20,221,687	(3,545,455)	(4,533,732)	880,164	(1,229,379)	(909,976)	(3,555,506)	7,327,803	(4,513,028)	2,814,775	285	
21	21,661,776	(3,727,273)	(4,917,517)	924,931	(1,229,379)	(974,780)	(3,834,649)	7,903,109	(4,867,346)	3,035,763	291	
22	20,826,534	(3,909,091)	(4,917,517)	969,698	(1,229,379)	(937,194)	(3,529,286)	7,273,765	(4,479,747)	2,794,018	266	
23	22,448,969	(4,090,909)	(5,307,351)	1,014,466	(1,424,296)	(1,010,204)	(3,799,665)	7,831,009	(4,822,941)	3,008,068	274	$280
24	23,800,942	(4,272,727)	(5,697,185)	1,059,233	(1,424,296)	(1,071,042)	(4,049,340)	8,345,583	(5,139,855)	3,205,728	279	
25	25,636,676	(4,454,545)	(6,142,098)	1,104,000	(1,646,752)	(1,153,650)	(4,359,277)	8,984,354	(5,533,260)	3,451,094	288	
26	27,162,520	(4,636,364)	(6,587,010)	1,148,767	(1,646,752)	(1,222,313)	(4,645,204)	9,573,643	(5,896,190)	3,677,453	293	
27	26,049,260	(4,818,182)	(6,587,010)	1,193,534	(1,646,752)	(1,172,217)	(4,253,102)	8,765,531	(5,398,492)	3,367,039	270	
28	27,783,750	(5,000,000)	(7,038,934)	1,238,301	(1,872,715)	(1,250,269)	(4,528,015)	9,332,119	(5,747,440)	3,584,678	278	$283
29	29,203,329	(5,181,818)	(7,490,858)	1,283,068	(1,872,715)	(1,314,150)	(4,778,498)	9,848,358	(6,065,380)	3,782,978	282	
30	31,182,350	(5,363,636)	(8,006,634)	1,327,835	(2,130,602)	(1,403,206)	(5,098,413)	10,507,694	(6,471,450)	4,036,243	291	

Net Present Value of Revenue Requirement $64,885,354

Schedule III

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 60 month MR / No CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

a	b	c	d	e	f	g	h	i
			Rate Base					
YEAR	Average Net Plant	Used & Useful %	Net Plant U & U	Average Net CIAC	Imputed CIAC	Total	Allowed Rate of Return	Allowed Return on Rate Base
1								
2								
3								
4								
5								
6	19,269,428	100%	19,269,428	(5,631,332)	0	13,638,096	10.75%	1,466,095
7	24,120,198	100%	24,120,198	(6,474,698)	0	17,645,500	10.75%	1,896,891
8	29,087,021	100%	29,087,021	(7,273,297)	0	21,813,724	10.75%	2,344,975
9	33,803,624	100%	33,803,624	(8,027,129)	0	25,776,495	10.75%	2,770,973
10	39,136,150	100%	39,136,150	(8,736,194)	0	30,399,956	10.75%	3,267,995
11	44,183,104	100%	44,183,104	(9,400,492)	0	34,782,612	10.75%	3,739,131
12	41,947,965	100%	41,947,965	(10,020,023)	0	31,927,942	10.75%	3,432,254
13	46,819,614	100%	46,819,614	(10,594,787)	0	36,224,827	10.75%	3,894,169
14	51,401,191	100%	51,401,191	(11,124,784)	0	40,276,407	10.75%	4,329,714
15	56,696,791	100%	56,696,791	(11,610,014)	0	45,086,777	10.75%	4,846,828
16	61,661,334	100%	61,661,334	(12,050,477)	0	49,610,857	10.75%	5,333,167
17	58,183,935	100%	58,183,935	(12,446,173)	0	45,737,763	10.75%	4,916,809
18	62,945,253	100%	62,945,253	(12,797,101)	0	50,148,152	10.75%	5,390,926
19	67,370,297	100%	67,370,297	(13,103,263)	0	54,267,033	10.75%	5,833,706
20	72,623,089	100%	72,623,089	(13,364,658)	0	59,258,431	10.75%	6,370,281
21	77,492,096	100%	77,492,096	(13,581,286)	0	63,910,810	10.75%	6,870,412
22	72,574,578	100%	72,574,578	(13,753,146)	0	58,821,432	10.75%	6,323,304
23	77,207,991	100%	77,207,991	(13,880,240)	0	63,327,751	10.75%	6,807,733
24	81,451,570	100%	81,451,570	(13,962,567)	0	67,489,003	10.75%	7,255,068
25	86,654,737	100%	86,654,737	(14,000,126)	0	72,654,610	10.75%	7,810,371
26	91,412,991	100%	91,412,991	(13,992,919)	0	77,420,072	10.75%	8,322,658
27	84,825,981	100%	84,825,981	(13,940,945)	0	70,885,036	10.75%	7,620,141
28	89,311,117	100%	89,311,117	(13,844,203)	0	75,466,914	10.75%	8,112,693
29	93,344,329	100%	93,344,329	(13,702,695)	0	79,641,634	10.75%	8,561,476
30	98,489,965	100%	98,489,965	(13,516,419)	0	84,973,546	10.75%	9,134,656
AVG								

Schedule V

MODEL WASTEWATER UTILITY
Scenario: WWTP - 30 month increments / 60 month MR / No CIAC Imputed
CALCULATION OF USED & USEFUL %

a	b	c	d	e	f	g	h
YEAR	Year-end Capacity MGD	Year-end Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	5.000	3,636					
2	5.000	7,273					
3	5.000	10,909					
4	5.000	14,545					
5	5.000	18,182	18,182				
6	7.500	27,273	21,818	20,000	7,273	27,273	100%
7	7.500	27,273	25,455	23,636	3,636	27,273	100%
8	10.000	36,364	29,091	27,273	9,091	36,364	100%
9	10.000	36,364	32,727	30,909	5,455	36,364	100%
10	12.500	45,455	36,364	34,545	10,909	45,455	100%
11	12.500	45,455	40,000	38,182	7,273	45,455	100%
12	12.500	45,455	43,636	41,818	3,636	45,455	100%
13	15.000	54,545	47,273	45,455	9,091	54,545	100%
14	15.000	54,545	50,909	49,091	5,455	54,545	100%
15	17.500	63,636	54,545	52,727	10,909	63,636	100%
16	17.500	63,636	58,182	56,364	7,273	63,636	100%
17	17.500	63,636	61,818	60,000	3,636	63,636	100%
18	20.000	72,727	65,455	63,636	9,091	72,727	100%
19	20.000	72,727	69,091	67,273	5,455	72,727	100%
20	22.500	81,818	72,727	70,909	10,909	81,818	100%
21	22.500	81,818	76,364	74,545	7,273	81,818	100%
22	22.500	81,818	80,000	78,182	3,636	81,818	100%
23	25.000	90,909	83,636	81,818	9,091	90,909	100%
24	25.000	90,909	87,273	85,455	5,455	90,909	100%
25	27.500	100,000	90,909	89,091	10,909	100,000	100%
26	27.500	100,000	94,545	92,727	7,273	100,000	100%
27	27.500	100,000	98,182	96,364	3,636	100,000	100%
28	30.000	109,091	101,818	100,000	9,091	109,091	100%
29	30.000	109,091	105,455	103,636	5,455	109,091	100%
30	32.500	118,182	109,091	107,273	10,909	118,182	100%

CONSTRUCTION IN 5 YEAR INCREMENTS
PSC PROPOSED POLICY: 18 MONTH MARGIN RESERVE PERIOD
WITH IMPUTATION OF CIAC

MODEL WATER UTILITY
Key Results
Scenario: Water Treatment Plant - 60 month increments / 18 month MR / CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year:

	Rates	Service Availability	AFPI	Total
Five Years	$179	$54	$74	$306
Ten Years	179	27	107	314
Fifteen Years	179	18	118	315
Twenty Years	180	13	122	315
Twenty-five Years	180	11	124	315

Total cost per ERC over twenty-five years $7,867

(2) Net Present Value of Revenue Requirement:

Rates	$6,749,596
CIAC	882,329
AFPI	325,371
Total	$7,957,297

(3) Net Present Value of Return to the Utility

Rates	$1,794,170
AFPI	325,371
Total	$2,119,541

(4) Average Rate of Return on Investment Earned 9.22%

Schedule II

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	489,730	(157,143)	(96,519)	33,768	(45,962)	(22,038)	(65,938)	135,897	(83,696)	52,201	$156	
7	752,768	(185,714)	(147,077)	39,907	(45,962)	(33,875)	(124,159)	255,888	(157,596)	98,292	203	
8	818,449	(214,286)	(165,462)	46,047	(45,962)	(36,830)	(131,317)	270,640	(166,681)	103,959	191	$179
9	878,241	(242,857)	(183,847)	52,187	(45,962)	(39,521)	(136,637)	281,604	(173,434)	108,171	181	
10	885,875	(271,429)	(175,631)	58,326	(73,787)	(39,864)	(125,284)	258,207	(159,024)	99,183	163	
11	1,188,992	(300,000)	(236,117)	64,466	(73,787)	(53,505)	(192,765)	397,284	(244,678)	152,606	198	
12	1,242,858	(328,571)	(255,794)	70,605	(73,787)	(55,929)	(195,814)	403,568	(248,548)	155,020	189	
13	1,290,336	(357,143)	(275,470)	76,745	(73,787)	(58,065)	(196,871)	405,745	(249,889)	155,856	181	$180
14	1,331,427	(385,714)	(295,147)	82,884	(73,787)	(59,914)	(195,934)	403,815	(248,701)	155,115	173	
15	1,373,270	(414,286)	(287,728)	89,024	(106,043)	(61,797)	(193,546)	398,894	(245,669)	153,224	166	
16	1,721,249	(442,857)	(360,548)	95,164	(106,043)	(77,456)	(270,995)	558,514	(343,976)	214,538	194	
17	1,755,111	(471,429)	(381,756)	101,303	(106,043)	(78,980)	(267,303)	550,903	(339,289)	211,615	186	
18	1,781,996	(500,000)	(402,965)	107,443	(106,043)	(80,190)	(261,433)	538,807	(331,839)	206,968	178	$179
19	1,801,905	(528,571)	(424,174)	113,582	(106,043)	(81,086)	(253,388)	522,225	(321,627)	200,599	170	
20	1,887,750	(557,143)	(419,129)	119,722	(143,438)	(84,949)	(262,274)	540,540	(332,906)	207,634	169	
21	2,279,611	(585,714)	(504,901)	125,862	(143,438)	(102,583)	(349,182)	719,655	(443,219)	276,436	195	
22	2,289,963	(614,286)	(527,852)	132,001	(143,438)	(103,048)	(337,586)	695,755	(428,500)	267,255	186	
23	2,292,668	(642,857)	(550,802)	138,141	(143,438)	(103,170)	(323,604)	666,939	(410,752)	256,186	178	$180
24	2,287,727	(671,429)	(573,752)	144,280	(143,438)	(102,948)	(307,236)	633,205	(389,977)	243,229	170	
25	2,426,328	(700,000)	(572,392)	150,420	(186,788)	(109,185)	(329,432)	678,951	(418,150)	260,800	173	
26	2,864,380	(728,571)	(672,438)	156,560	(186,788)	(128,897)	(426,088)	878,156	(540,837)	337,320	197	
27	2,846,863	(757,143)	(697,343)	162,699	(186,788)	(128,109)	(405,159)	835,021	(514,270)	320,750	188	
28	2,820,949	(785,714)	(722,248)	168,839	(186,788)	(126,943)	(381,609)	786,485	(484,379)	302,107	180	$182
29	2,786,636	(814,286)	(747,153)	174,978	(186,788)	(125,399)	(355,439)	732,550	(451,161)	281,389	171	
30	2,986,973	(842,857)	(750,788)	181,118	(237,043)	(134,414)	(393,008)	809,980	(498,848)	311,132	177	

Net Present Value of Revenue Requirement $6,749,596

Schedule III

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

YEAR	Average Net Plant	Used & Useful %	Rate Base				Allowed Rate of Return	Allowed Return on Rate Base
			Net Plant U & U	Average Net CIAC	Imputed CIAC	Total		
1								
2								
3								
4								
5								
6	$2,964,527	70%	$2,075,169	($750,565)	($225,630)	$1,098,974	10.75%	118,140
7	3,952,703	80%	3,162,163	(867,217)	(225,630)	2,069,315	10.75%	222,451
8	3,768,857	90%	3,391,971	(977,730)	(225,630)	2,188,611	10.75%	235,276
9	3,585,010	100%	3,585,010	(1,082,103)	(225,630)	2,277,277	10.75%	244,807
10	4,764,588	73%	3,494,031	(1,180,336)	(225,630)	2,088,065	10.75%	224,467
11	5,888,516	80%	4,710,813	(1,272,430)	(225,630)	3,212,752	10.75%	345,371
12	5,593,369	87%	4,847,587	(1,358,385)	(225,630)	3,263,572	10.75%	350,834
13	5,298,223	93%	4,945,008	(1,438,199)	(225,630)	3,281,178	10.75%	352,727
14	5,003,076	100%	5,003,076	(1,511,874)	(225,630)	3,265,571	10.75%	351,049
15	6,288,512	80%	5,030,810	(1,579,410)	(225,630)	3,225,770	10.75%	346,770
16	7,509,435	85%	6,383,019	(1,640,806)	(225,630)	4,516,584	10.75%	485,533
17	7,085,261	90%	6,376,735	(1,696,062)	(225,630)	4,455,043	10.75%	478,917
18	6,661,087	95%	6,328,033	(1,745,179)	(225,630)	4,357,224	10.75%	468,402
19	6,236,913	100%	6,236,913	(1,788,156)	(225,630)	4,223,127	10.75%	453,986
20	7,645,068	84%	6,421,857	(1,824,994)	(225,630)	4,371,234	10.75%	469,908
21	8,978,434	88%	7,901,022	(1,855,692)	(225,630)	5,819,700	10.75%	625,618
22	8,404,682	92%	7,732,308	(1,880,250)	(225,630)	5,626,428	10.75%	604,841
23	7,830,931	96%	7,517,694	(1,898,669)	(225,630)	5,393,395	10.75%	579,790
24	7,257,179	100%	7,257,179	(1,910,948)	(225,630)	5,120,601	10.75%	550,465
25	8,807,599	87%	7,633,252	(1,917,087)	(225,630)	5,490,535	10.75%	590,232
26	10,271,317	90%	9,244,185	(1,917,087)	(225,630)	7,101,468	10.75%	763,408
27	9,524,164	93%	8,889,220	(1,910,948)	(225,630)	6,752,642	10.75%	725,909
28	8,777,010	97%	8,484,443	(1,898,669)	(225,630)	6,360,145	10.75%	683,716
29	8,029,857	100%	8,029,857	(1,880,250)	(225,630)	5,923,977	10.75%	636,828
30	9,745,200	89%	8,631,463	(1,855,692)	(225,630)	6,550,142	10.75%	704,140
AVG								

Schedule V

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month Increments / 18 month MR / CIAC Imputed
CALCULATION OF USED & USEFUL %

YEAR	Capacity MGD	Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	1.000	2,857	571				
2	1.000	2,857	1,143				
3	1.000	2,857	1,714				
4	1.000	2,857	2,286				
5	1.000	2,857	2,857				
6	2.000	5,714	3,429	3,143	857	4,000	70%
7	2.000	5,714	4,000	3,714	857	4,571	80%
8	2.000	5,714	4,571	4,286	857	5,143	90%
9	2.000	5,714	5,143	4,857	857	5,714	100%
10	3.000	8,571	5,714	5,429	857	6,286	73%
11	3.000	8,571	6,286	6,000	857	6,857	80%
12	3.000	8,571	6,857	6,571	857	7,429	87%
13	3.000	8,571	7,429	7,143	857	8,000	93%
14	3.000	8,571	8,000	7,714	857	8,571	100%
15	4.000	11,429	8,571	8,286	857	9,143	80%
16	4.000	11,429	9,143	8,857	857	9,714	85%
17	4.000	11,429	9,714	9,429	857	10,286	90%
18	4.000	11,429	10,286	10,000	857	10,857	95%
19	4.000	11,429	10,857	10,571	857	11,429	100%
20	5.000	14,286	11,429	11,143	857	12,000	84%
21	5.000	14,286	12,000	11,714	857	12,571	88%
22	5.000	14,286	12,571	12,286	857	13,143	92%
23	5.000	14,286	13,143	12,857	857	13,714	96%
24	5.000	14,286	13,714	13,429	857	14,286	100%
25	6.000	17,143	14,286	14,000	857	14,857	87%
26	6.000	17,143	14,857	14,571	857	15,429	90%
27	6.000	17,143	15,429	15,143	857	16,000	93%
28	6.000	17,143	16,000	15,714	857	16,571	97%
29	6.000	17,143	16,571	16,286	857	17,143	100%
30	7.000	20,000	17,143	16,857	857	17,714	89%

MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year

	Rates	Service Availability	AFPI	Total
Five Years	$200	$64	$86	$349
Ten Years	201	32	125	358
Fifteen Years	201	21	138	360
Twenty Years	202	16	143	361
Twenty-five Years	203	13	145	361

Total cost per ERC over twenty-five years $9,013

(2) Net Present Value of Revenue Requirement:

Rates	$48,230,729
CIAC	5,947,355
AFPI	2,424,394
Total	$56,602,478

(3) Net Present Value of Return to the Utility

Rates	$13,337,952
AFPI	2,424,394
Total	$15,762,346

(4) Maximum Rate of Return on Investment Earned 9.24%

Schedule II

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	3,447,979	(1,000,000)	(726,436)	254,147	(345,922)	(155,159)	(481,745)	992,863	(611,482)	381,381	$172	
7	5,386,246	(1,181,818)	(1,106,950)	300,355	(345,922)	(242,381)	(917,855)	1,891,675	(1,165,040)	726,635	228	
8	5,839,151	(1,363,636)	(1,245,319)	346,564	(345,922)	(262,762)	(969,651)	1,998,425	(1,230,784)	767,640	214	$200
9	6,247,722	(1,545,455)	(1,383,688)	392,772	(345,922)	(281,148)	(1,007,615)	2,076,668	(1,278,973)	797,695	202	
10	6,288,135	(1,727,273)	(1,321,853)	438,981	(555,342)	(282,966)	(927,705)	1,911,976	(1,177,543)	734,433	182	
11	8,530,268	(1,909,091)	(1,777,093)	485,189	(555,342)	(383,862)	(1,434,207)	2,955,863	(1,820,449)	1,135,414	223	
12	8,896,459	(2,090,909)	(1,925,184)	531,398	(555,342)	(400,341)	(1,455,772)	3,000,308	(1,847,822)	1,152,487	213	
13	9,214,576	(2,272,727)	(2,073,276)	577,606	(555,342)	(414,656)	(1,462,339)	3,013,843	(1,856,157)	1,157,685	203	$202
14	9,484,621	(2,454,545)	(2,221,367)	623,815	(555,342)	(426,808)	(1,453,908)	2,996,466	(1,845,455)	1,151,011	193	
15	9,778,066	(2,636,364)	(2,165,533)	670,023	(798,116)	(440,013)	(1,440,085)	2,967,978	(1,827,910)	1,140,068	185	
16	12,358,957	(2,818,182)	(2,713,596)	716,232	(798,116)	(556,153)	(2,021,952)	4,167,190	(2,566,478)	1,600,712	219	
17	12,575,701	(3,000,000)	(2,873,219)	762,440	(798,116)	(565,907)	(1,993,124)	4,107,775	(2,529,885)	1,577,890	210	
18	12,739,936	(3,181,818)	(3,032,843)	808,649	(798,116)	(573,297)	(1,947,913)	4,014,597	(2,472,499)	1,542,098	200	$201
19	12,851,662	(3,363,636)	(3,192,466)	854,857	(798,116)	(578,325)	(1,886,320)	3,887,656	(2,394,319)	1,493,337	191	
20	13,473,619	(3,545,455)	(3,154,495)	901,066	(1,079,559)	(606,313)	(1,956,523)	4,032,341	(2,483,428)	1,548,914	190	
21	16,385,447	(3,727,273)	(3,800,048)	947,274	(1,079,559)	(737,345)	(2,609,790)	5,378,707	(3,312,624)	2,066,083	220	
22	16,425,910	(3,909,091)	(3,972,777)	993,483	(1,079,559)	(739,166)	(2,521,681)	5,197,119	(3,200,788)	1,996,331	210	
23	16,408,825	(4,090,909)	(4,145,507)	1,039,691	(1,079,559)	(738,397)	(2,415,618)	4,978,526	(3,066,161)	1,912,365	201	$203
24	16,334,189	(4,272,727)	(4,318,236)	1,085,900	(1,079,559)	(735,039)	(2,291,600)	4,722,928	(2,908,744)	1,814,184	191	
25	17,351,431	(4,454,545)	(4,308,004)	1,132,108	(1,405,828)	(780,814)	(2,461,422)	5,072,925	(3,124,300)	1,948,626	195	
26	20,611,342	(4,636,364)	(5,060,981)	1,178,317	(1,405,828)	(927,510)	(3,188,194)	6,570,783	(4,046,796)	2,523,987	222	
27	20,442,508	(4,818,182)	(5,248,425)	1,224,525	(1,405,828)	(919,913)	(3,029,979)	6,244,707	(3,845,973)	2,398,734	212	
28	20,210,465	(5,000,000)	(5,435,868)	1,270,734	(1,405,828)	(909,471)	(2,852,044)	5,877,987	(3,620,119)	2,257,868	202	$205
29	19,915,212	(5,181,818)	(5,623,312)	1,316,942	(1,405,828)	(896,185)	(2,654,388)	5,470,623	(3,369,233)	2,101,391	192	
30	21,395,827	(5,363,636)	(5,650,665)	1,363,151	(1,784,063)	(962,812)	(2,939,523)	6,058,278	(3,731,156)	2,327,122	199	

Net Present Value of Revenue Requirement $48,230,729

Schedule III

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

a	b	c	d	e	f	g	h	i
			Rate Base					
YEAR	Average Net Plant	Used & Useful %	Net Plant U & U	Average Net CIAC	Imputed CIAC	Total	Allowed Rate of Return	Allowed Return on Rate Base
1								
2								
3								
4								
5								
6	$21,966,047	70%	$15,376,233	($5,648,990)	($1,698,163)	$8,029,081	10.75%	863,126
7	29,403,370	80%	23,522,696	(6,526,951)	(1,698,163)	15,297,582	10.75%	1,644,490
8	28,019,682	90%	25,217,714	(7,358,704)	(1,698,163)	16,160,847	10.75%	1,737,291
9	26,635,994	100%	26,635,994	(8,144,249)	(1,698,163)	16,793,583	10.75%	1,805,310
10	35,513,871	73%	26,043,505	(8,883,585)	(1,698,163)	15,461,757	10.75%	1,662,139
11	43,972,907	80%	35,178,326	(9,576,713)	(1,698,163)	23,903,451	10.75%	2,569,621
12	41,751,541	87%	36,184,668	(10,223,632)	(1,698,163)	24,262,874	10.75%	2,608,259
13	39,530,174	93%	36,894,829	(10,824,342)	(1,698,163)	24,372,324	10.75%	2,620,025
14	37,308,807	100%	37,308,807	(11,378,844)	(1,698,163)	24,231,800	10.75%	2,604,919
15	46,983,406	80%	37,586,725	(11,887,138)	(1,698,163)	24,001,424	10.75%	2,580,153
16	56,172,455	85%	47,746,586	(12,349,223)	(1,698,163)	33,699,201	10.75%	3,622,664
17	52,979,989	90%	47,681,990	(12,765,100)	(1,698,163)	33,218,728	10.75%	3,571,013
18	49,787,523	95%	47,298,147	(13,134,768)	(1,698,163)	32,465,216	10.75%	3,490,011
19	46,595,057	100%	46,595,057	(13,458,227)	(1,698,163)	31,438,667	10.75%	3,379,657
20	57,193,275	84%	48,042,351	(13,735,478)	(1,698,163)	32,608,710	10.75%	3,505,436
21	67,228,608	88%	59,161,175	(13,966,521)	(1,698,163)	43,496,492	10.75%	4,675,873
22	62,910,372	92%	57,877,542	(14,151,355)	(1,698,163)	42,028,025	10.75%	4,518,013
23	58,592,136	96%	56,248,451	(14,289,980)	(1,698,163)	40,260,308	10.75%	4,327,983
24	54,273,900	100%	54,273,900	(14,382,397)	(1,698,163)	38,193,340	10.75%	4,105,784
25	65,942,846	87%	57,150,467	(14,428,606)	(1,698,163)	41,023,699	10.75%	4,410,048
26	76,959,255	90%	69,263,329	(14,428,606)	(1,698,163)	53,136,561	10.75%	5,712,180
27	71,335,943	93%	66,580,213	(14,382,397)	(1,698,163)	50,499,653	10.75%	5,428,713
28	65,712,631	97%	63,522,210	(14,289,980)	(1,698,163)	47,534,067	10.75%	5,109,912
29	60,089,318	100%	60,089,318	(14,151,355)	(1,698,163)	44,239,801	10.75%	4,755,779
30	72,999,532	89%	64,656,729	(13,966,521)	(1,698,163)	48,992,045	10.75%	5,266,645
AVG								

Schedule V

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 18 month MR / CIAC Imputed
CALCULATION OF USED & USEFUL %

a	b	c	d	e	f	g	h
	Capacity						
YEAR	MGD	ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	5.000	18,182	3,636				
2	5.000	18,182	7,273				
3	5.000	18,182	10,909				
4	5.000	18,182	14,545				
5	5.000	18,182	18,182				
6	10.000	36,364	21,818	20,000	5,455	25,455	70%
7	10.000	36,364	25,455	23,636	5,455	29,091	80%
8	10.000	36,364	29,091	27,273	5,455	32,727	90%
9	10.000	36,364	32,727	30,909	5,455	36,364	100%
10	15.000	54,545	36,364	34,545	5,455	40,000	73%
11	15.000	54,545	40,000	38,182	5,455	43,636	80%
12	15.000	54,545	43,636	41,818	5,455	47,273	87%
13	15.000	54,545	47,273	45,455	5,455	50,909	93%
14	15.000	54,545	50,909	49,091	5,455	54,545	100%
15	20.000	72,727	54,545	52,727	5,455	58,182	80%
16	20.000	72,727	58,182	56,364	5,455	61,818	85%
17	20.000	72,727	61,818	60,000	5,455	65,455	90%
18	20.000	72,727	65,455	63,636	5,455	69,091	95%
19	20.000	72,727	69,091	67,273	5,455	72,727	100%
20	25.000	90,909	72,727	70,909	5,455	76,364	84%
21	25.000	90,909	76,364	74,545	5,455	80,000	88%
22	25.000	90,909	80,000	78,182	5,455	83,636	92%
23	25.000	90,909	83,636	81,818	5,455	87,273	96%
24	25.000	90,909	87,273	85,455	5,455	90,909	100%
25	30.000	109,091	90,909	89,091	5,455	94,545	87%
26	30.000	109,091	94,545	92,727	5,455	98,182	90%
27	30.000	109,091	98,182	96,364	5,455	101,818	93%
28	30.000	109,091	101,818	100,000	5,455	105,455	97%
29	30.000	109,091	105,455	103,636	5,455	109,091	100%
30	35.000	127,273	109,091	107,273	5,455	112,727	89%

CONSTRUCTION IN 5 YEAR INCREMENTS
FWA PROPOSED POLICY: 60 MONTH MARGIN RESERVE PERIOD
WITH NO IMPUTATION OF CIAC

MODEL WATER UTILITY
Key Results
Scenario: Water Treatment Plant - 60 month increments / 60 month MR / No CIAC Imputed

(1) Average Cost per ERC / year:

	Rates	Service Availability	AFPI	Total
Five Years	$225	$54	$0	$278
Ten Years	215	27	72	314
Fifteen Years	208	18	95	321
Twenty Years	204	13	106	323
Twenty-five Years	201	11	111	323

Total cost per ERC over twenty-five years $8,075

(2) Net Present Value of Revenue Requirement:

Rates	$7,818,831
CIAC	882,329
AFPI	230,976
Total	$8,932,136

(3) Net Present Value of Return to the Utility

Rates	$2,283,280
AFPI	230,976
Total	$2,514,255

(4) Average Rate of Return on Investment Earned 10.69%

Schedule II

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 60 month MR / No CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	747,471	(157,143)	(137,885)	33,768	(45,962)	(33,636)	(132,838)	273,775	(168,612)	105,163	$238	
7	986,692	(185,714)	(183,847)	39,907	(45,962)	(44,401)	(185,129)	381,546	(234,986)	146,561	266	
8	953,572	(214,286)	(183,847)	46,047	(45,962)	(42,911)	(167,468)	345,146	(212,568)	132,579	223	$225
9	921,632	(242,857)	(183,847)	52,187	(45,962)	(41,473)	(150,174)	309,505	(190,617)	118,888	190	
10	1,201,583	(271,429)	(231,513)	58,326	(73,787)	(54,071)	(205,526)	423,583	(260,875)	162,708	221	
11	1,520,681	(300,000)	(295,147)	64,466	(73,787)	(68,431)	(276,965)	570,818	(351,554)	219,264	253	
12	1,470,880	(328,571)	(295,147)	70,605	(73,787)	(66,190)	(254,099)	523,691	(322,530)	201,162	224	
13	1,422,259	(357,143)	(295,147)	76,745	(73,787)	(64,002)	(231,601)	477,324	(293,973)	183,351	199	$210
14	1,374,818	(385,714)	(295,147)	82,884	(73,787)	(61,867)	(209,472)	431,716	(265,884)	165,832	178	
15	1,694,206	(414,286)	(350,669)	89,024	(106,043)	(76,239)	(273,113)	562,879	(346,665)	216,215	204	
16	2,047,889	(442,857)	(424,174)	95,164	(106,043)	(92,155)	(352,118)	725,705	(446,945)	278,760	231	
17	1,979,177	(471,429)	(424,174)	101,303	(106,043)	(89,063)	(323,352)	666,420	(410,433)	255,987	210	
18	1,911,646	(500,000)	(424,174)	107,443	(106,043)	(86,024)	(294,954)	607,893	(374,388)	233,506	191	$200
19	1,845,296	(528,571)	(424,174)	113,582	(106,043)	(83,038)	(266,925)	550,126	(338,810)	211,316	175	
20	2,210,122	(557,143)	(488,983)	119,722	(143,438)	(99,455)	(340,030)	700,794	(431,603)	269,191	198	
21	2,602,297	(585,714)	(573,752)	125,862	(143,438)	(117,103)	(427,365)	880,787	(542,457)	338,330	222	
22	2,510,724	(614,286)	(573,752)	132,001	(143,438)	(112,983)	(391,466)	806,801	(496,890)	309,911	204	
23	2,420,331	(642,857)	(573,752)	138,141	(143,438)	(108,915)	(355,936)	733,574	(451,792)	281,782	188	$196
24	2,331,118	(671,429)	(573,752)	144,280	(143,438)	(104,900)	(320,774)	661,106	(407,160)	253,946	174	
25	2,748,014	(700,000)	(649,445)	150,420	(186,788)	(123,661)	(404,623)	833,917	(513,591)	320,327	196	
26	3,183,537	(728,571)	(747,153)	156,560	(186,788)	(143,259)	(501,254)	1,033,071	(636,245)	396,826	218	
27	3,064,520	(757,143)	(747,153)	162,699	(186,788)	(137,903)	(456,793)	941,438	(579,810)	361,628	202	
28	2,946,683	(785,714)	(747,153)	168,839	(186,788)	(132,601)	(412,701)	850,565	(523,844)	326,721	188	$195
29	2,830,027	(814,286)	(747,153)	174,978	(186,788)	(127,351)	(368,976)	760,451	(468,344)	292,106	174	
30	3,306,537	(842,857)	(835,554)	181,118	(237,043)	(148,794)	(465,017)	958,389	(590,250)	368,139	196	

Net Present Value of Revenue Requirement $7,818,831

Schedule III

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 60 month MR / No CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

YEAR	Average Net Plant	Used & Useful %	Rate Base				Allowed Rate of Return	Allowed Return on Rate Base
			Net Plant U & U	Average Net CIAC	Imputed CIAC	Total		
1								
2								
3								
4								
5								
6	$2,964,527	100%	$2,964,527	($750,565)	$0	$2,213,962	10.75%	238,001
7	3,952,703	100%	3,952,703	(867,217)	0	3,085,486	10.75%	331,690
8	3,768,857	100%	3,768,857	(977,730)	0	2,791,127	10.75%	300,046
9	3,585,010	100%	3,585,010	(1,082,103)	0	2,502,907	10.75%	269,062
10	4,764,588	97%	4,605,768	(1,180,336)	0	3,425,432	10.75%	368,234
11	5,888,516	100%	5,888,516	(1,272,430)	0	4,616,085	10.75%	496,229
12	5,593,369	100%	5,593,369	(1,358,385)	0	4,234,985	10.75%	455,261
13	5,298,223	100%	5,298,223	(1,438,199)	0	3,860,023	10.75%	414,952
14	5,003,076	100%	5,003,076	(1,511,874)	0	3,491,201	10.75%	375,304
15	6,288,512	98%	6,131,299	(1,579,410)	0	4,551,889	10.75%	489,328
16	7,509,435	100%	7,509,435	(1,640,806)	0	5,868,629	10.75%	630,878
17	7,085,261	100%	7,085,261	(1,696,062)	0	5,389,199	10.75%	579,339
18	6,661,087	100%	6,661,087	(1,745,179)	0	4,915,908	10.75%	528,460
19	6,236,913	100%	6,236,913	(1,788,156)	0	4,448,757	10.75%	478,241
20	7,645,068	98%	7,492,167	(1,824,994)	0	5,667,173	10.75%	609,221
21	8,978,434	100%	8,978,434	(1,855,692)	0	7,122,743	10.75%	765,695
22	8,404,682	100%	8,404,682	(1,880,250)	0	6,524,432	10.75%	701,376
23	7,830,931	100%	7,830,931	(1,898,669)	0	5,932,262	10.75%	637,718
24	7,257,179	100%	7,257,179	(1,910,948)	0	5,346,231	10.75%	574,720
25	8,807,599	98%	8,660,805	(1,917,087)	0	6,743,718	10.75%	724,950
26	10,271,317	100%	10,271,317	(1,917,087)	0	8,354,230	10.75%	898,080
27	9,524,164	100%	9,524,164	(1,910,948)	0	7,613,216	10.75%	818,421
28	8,777,010	100%	8,777,010	(1,898,669)	0	6,878,342	10.75%	739,422
29	8,029,857	100%	8,029,857	(1,880,250)	0	6,149,607	10.75%	661,083
30	9,745,200	99%	9,605,983	(1,855,692)	0	7,750,292	10.75%	833,156
AVG								

Schedule V

MODEL WATER UTILITY
Scenario: Water Treatment Plant - 60 month increments / 60 month MR / No CIAC Imputed
CALCULATION OF USED & USEFUL %

YEAR	Capacity MGD	Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	1.000	2,857	571				
2	1.000	2,857	1,143				
3	1.000	2,857	1,714				
4	1.000	2,857	2,286				
5	1.000	2,857	2,857				
6	2.000	5,714	3,429	3,143	2,571	5,714	100%
7	2.000	5,714	4,000	3,714	2,000	5,714	100%
8	2.000	5,714	4,571	4,286	1,429	5,714	100%
9	2.000	5,714	5,143	4,857	857	5,714	100%
10	3.000	8,571	5,714	5,429	2,857	8,286	97%
11	3.000	8,571	6,286	6,000	2,571	8,571	100%
12	3.000	8,571	6,857	6,571	2,000	8,571	100%
13	3.000	8,571	7,429	7,143	1,429	8,571	100%
14	3.000	8,571	8,000	7,714	857	8,571	100%
15	4.000	11,429	8,571	8,286	2,857	11,143	98%
16	4.000	11,429	9,143	8,857	2,571	11,429	100%
17	4.000	11,429	9,714	9,429	2,000	11,429	100%
18	4.000	11,429	10,286	10,000	1,429	11,429	100%
19	4.000	11,429	10,857	10,571	857	11,429	100%
20	5.000	14,286	11,429	11,143	2,857	14,000	98%
21	5.000	14,286	12,000	11,714	2,571	14,286	100%
22	5.000	14,286	12,571	12,286	2,000	14,286	100%
23	5.000	14,286	13,143	12,857	1,429	14,286	100%
24	5.000	14,286	13,714	13,429	857	14,286	100%
25	6.000	17,143	14,286	14,000	2,857	16,857	98%
26	6.000	17,143	14,857	14,571	2,571	17,143	100%
27	6.000	17,143	15,429	15,143	2,000	17,143	100%
28	6.000	17,143	16,000	15,714	1,429	17,143	100%
29	6.000	17,143	16,571	16,286	857	17,143	100%
30	7.000	20,000	17,143	16,857	2,857	19,714	99%

MODEL WASTEWATER UTILITY
Key Results
Scenario: WWTP - 60 month increments / 60 month MR / No CIAC Imputed
Existing plant, CIAC & ERC's at the beginning of Year 6

(1) Average Cost per ERC / year

	Rates	Service Availability	AFPI	Total
Five Years	$254	$64	$0	$317
Ten Years	243	32	84	359
Fifteen Years	235	21	112	368
Twenty Years	230	16	125	370
Twenty-five Years	227	13	131	371

Total cost per ERC over twenty-five years $9,267

(2) Net Present Value of Revenue Requirement:

Rates	$56,233,246
CIAC	5,947,355
AFPI	1,726,903
Total	$63,907,504

(3) Net Present Value of Return to the Utility

Rates	$16,994,054
AFPI	1,726,903
Total	$18,720,957

(4) Average Rate of Return on Investment Earned 10.67%

Schedule II

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 60 month MR / No CIAC Imputed
PROJECTED REGULATORY INCOME

a YEAR	b Revenue From Rates	c O&M Expense	d Allowed Depreciation Expense	e Allowed Amortization Expense	f Property Taxes	g Gross Receipts Tax	h Allowed Interest Expense	i Allowed Pretax Profit	j Income Tax	k Allowed Net Profit	l Revenue Per ERC	m Avg 5 Year Revenue Per ERC
1												
2												
3												
4												
5												
6	5,367,860	(1,000,000)	(1,037,766)	254,147	(345,922)	(241,554)	(979,023)	2,017,741	(1,242,681)	775,060	$268	
7	7,133,528	(1,181,818)	(1,383,688)	300,355	(345,922)	(321,009)	(1,372,585)	2,828,862	(1,742,232)	1,086,630	302	
8	6,849,471	(1,363,636)	(1,383,688)	346,564	(345,922)	(308,226)	(1,239,659)	2,554,904	(1,573,507)	981,396	251	$254
9	6,574,300	(1,545,455)	(1,383,688)	392,772	(345,922)	(295,844)	(1,109,505)	2,286,660	(1,408,302)	878,358	213	
10	8,648,731	(1,727,273)	(1,742,443)	438,981	(555,342)	(389,193)	(1,526,789)	3,146,672	(1,937,964)	1,208,708	250	
11	11,013,362	(1,909,091)	(2,221,367)	485,189	(555,342)	(495,601)	(2,063,772)	4,253,379	(2,619,559)	1,633,819	288	
12	10,603,754	(2,090,909)	(2,221,367)	531,398	(555,342)	(477,169)	(1,891,675)	3,898,691	(2,401,115)	1,497,576	254	
13	10,203,033	(2,272,727)	(2,221,367)	577,606	(555,342)	(459,136)	(1,722,350)	3,549,717	(2,186,190)	1,363,527	224	$237
14	9,811,199	(2,454,545)	(2,221,367)	623,815	(555,342)	(441,504)	(1,555,798)	3,206,458	(1,974,785)	1,231,673	200	
15	12,181,887	(2,636,364)	(2,639,243)	670,023	(798,116)	(548,185)	(2,035,301)	4,194,701	(2,583,421)	1,611,280	231	
16	14,807,369	(2,818,182)	(3,192,466)	716,232	(798,116)	(666,332)	(2,629,394)	5,419,111	(3,337,508)	2,081,603	263	
17	14,255,439	(3,000,000)	(3,192,466)	762,440	(798,116)	(641,495)	(2,412,893)	4,972,909	(3,062,702)	1,910,207	238	
18	13,712,396	(3,181,818)	(3,192,466)	808,649	(798,116)	(617,058)	(2,199,165)	4,532,421	(2,791,416)	1,741,006	215	$226
19	13,178,240	(3,363,636)	(3,192,466)	854,857	(798,116)	(593,021)	(1,988,210)	4,097,648	(2,523,648)	1,573,999	196	
20	15,890,577	(3,545,455)	(3,680,244)	901,066	(1,079,559)	(715,076)	(2,538,836)	5,232,473	(3,222,562)	2,009,912	224	
21	18,806,098	(3,727,273)	(4,318,236)	947,274	(1,079,559)	(846,274)	(3,195,725)	6,586,305	(4,056,356)	2,529,949	252	
22	18,082,101	(3,909,091)	(4,318,236)	993,483	(1,079,559)	(813,695)	(2,925,541)	6,029,463	(3,713,409)	2,316,053	231	
23	17,366,991	(4,090,909)	(4,318,236)	1,039,691	(1,079,559)	(781,515)	(2,658,129)	5,478,334	(3,373,982)	2,104,352	212	$222
24	16,660,767	(4,272,727)	(4,318,236)	1,085,900	(1,079,559)	(749,735)	(2,393,490)	4,932,920	(3,038,073)	1,894,846	195	
25	19,764,782	(4,454,545)	(4,887,928)	1,132,108	(1,405,828)	(889,415)	(3,024,912)	6,234,263	(3,839,541)	2,394,722	222	
26	23,006,771	(4,636,364)	(5,623,312)	1,178,317	(1,405,828)	(1,035,305)	(3,751,839)	7,732,441	(4,762,235)	2,970,206	248	
27	22,076,224	(4,818,182)	(5,623,312)	1,224,525	(1,405,828)	(993,430)	(3,417,213)	7,042,785	(4,337,491)	2,705,293	229	
28	21,154,564	(5,000,000)	(5,623,312)	1,270,734	(1,405,828)	(951,955)	(3,085,359)	6,358,843	(3,916,267)	2,442,576	212	$221
29	20,241,790	(5,181,818)	(5,623,312)	1,316,942	(1,405,828)	(910,881)	(2,756,278)	5,680,616	(3,498,562)	2,182,053	195	
30	23,794,317	(5,363,636)	(6,288,643)	1,363,151	(1,784,063)	(1,070,744)	(3,479,410)	7,170,971	(4,416,438)	2,754,533	222	

Net Present Value of Revenue Requirement $56,233,246

Schedule III

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 60 month MR / No CIAC Imputed
PROJECTED RATE BASE & ALLOWED RETURN

a	b	c	d	e	f	g	h	i
			Rate Base					
YEAR	Average Net Plant	Used & Useful %	Net Plant U & U	Average Net CIAC	Imputed CIAC	Total	Allowed Rate of Return	Allowed Return on Rate Base
1								
2								
3								
4								
5								
6	$21,966,047	100%	$21,966,047	($5,648,990)	$0	$16,317,058	10.75%	1,754,084
7	29,403,370	100%	29,403,370	(6,526,951)	0	22,876,419	10.75%	2,459,215
8	28,019,682	100%	28,019,682	(7,358,704)	0	20,660,978	10.75%	2,221,055
9	26,635,994	100%	26,635,994	(8,144,249)	0	18,491,745	10.75%	1,987,863
10	35,513,871	97%	34,330,075	(8,883,585)	0	25,446,490	10.75%	2,735,498
11	43,972,907	100%	43,972,907	(9,576,713)	0	34,396,195	10.75%	3,697,591
12	41,751,541	100%	41,751,541	(10,223,632)	0	31,527,909	10.75%	3,389,250
13	39,530,174	100%	39,530,174	(10,824,342)	0	28,705,831	10.75%	3,085,877
14	37,308,807	100%	37,308,807	(11,378,844)	0	25,929,963	10.75%	2,787,471
15	46,983,406	98%	45,808,821	(11,887,138)	0	33,921,683	10.75%	3,646,581
16	56,172,455	100%	56,172,455	(12,349,223)	0	43,823,232	10.75%	4,710,997
17	52,979,989	100%	52,979,989	(12,765,100)	0	40,214,889	10.75%	4,323,101
18	49,787,523	100%	49,787,523	(13,134,768)	0	36,652,755	10.75%	3,940,171
19	46,595,057	100%	46,595,057	(13,458,227)	0	33,136,830	10.75%	3,562,209
20	57,193,275	98%	56,049,410	(13,735,478)	0	42,313,931	10.75%	4,548,748
21	67,228,608	100%	67,228,608	(13,966,521)	0	53,262,087	10.75%	5,725,674
22	62,910,372	100%	62,910,372	(14,151,355)	0	48,759,017	10.75%	5,241,594
23	58,592,136	100%	58,592,136	(14,289,980)	0	44,302,156	10.75%	4,762,482
24	54,273,900	100%	54,273,900	(14,382,397)	0	39,891,503	10.75%	4,288,337
25	65,942,846	98%	64,843,799	(14,428,606)	0	50,415,193	10.75%	5,419,633
26	76,959,255	100%	76,959,255	(14,428,606)	0	62,530,649	10.75%	6,722,045
27	71,335,943	100%	71,335,943	(14,382,397)	0	56,953,545	10.75%	6,122,506
28	65,712,631	100%	65,712,631	(14,289,980)	0	51,422,650	10.75%	5,527,935
29	60,089,318	100%	60,089,318	(14,151,355)	0	45,937,964	10.75%	4,938,331
30	72,999,532	99%	71,956,682	(13,966,521)	0	57,990,161	10.75%	6,233,942
AVG								

Schedule V

MODEL WASTEWATER UTILITY
Scenario: WWTP - 60 month increments / 60 month MR / No CIAC Imputed
CALCULATION OF USED & USEFUL %

a	b	c	d	e	f	g	h
YEAR	Capacity MGD	Capacity ERC's	Year-end Connections (ERCs)	Average Connections (ERCs)	Margin Reserve (ERCs)	Total ERCs in Rate Base	Used & Useful %
1	5.000	18,182	3,636				
2	5.000	18,182	7,273				
3	5.000	18,182	10,909				
4	5.000	18,182	14,545				
5	5.000	18,182	18,182				
6	10.000	36,364	21,818	20,000	16,364	36,364	100%
7	10.000	36,364	25,455	23,636	12,727	36,364	100%
8	10.000	36,364	29,091	27,273	9,091	36,364	100%
9	10.000	36,364	32,727	30,909	5,455	36,364	100%
10	15.000	54,545	36,364	34,545	18,182	52,727	97%
11	15.000	54,545	40,000	38,182	16,364	54,545	100%
12	15.000	54,545	43,636	41,818	12,727	54,545	100%
13	15.000	54,545	47,273	45,455	9,091	54,545	100%
14	15.000	54,545	50,909	49,091	5,455	54,545	100%
15	20.000	72,727	54,545	52,727	18,182	70,909	98%
16	20.000	72,727	58,182	56,364	16,364	72,727	100%
17	20.000	72,727	61,818	60,000	12,727	72,727	100%
18	20.000	72,727	65,455	63,636	9,091	72,727	100%
19	20.000	72,727	69,091	67,273	5,455	72,727	100%
20	25.000	90,909	72,727	70,909	18,182	89,091	98%
21	25.000	90,909	76,364	74,545	16,364	90,909	100%
22	25.000	90,909	80,000	78,182	12,727	90,909	100%
23	25.000	90,909	83,636	81,818	9,091	90,909	100%
24	25.000	90,909	87,273	85,455	5,455	90,909	100%
25	30.000	109,091	90,909	89,091	18,182	107,273	98%
26	30.000	109,091	94,545	92,727	16,364	109,091	100%
27	30.000	109,091	98,182	96,364	12,727	109,091	100%
28	30.000	109,091	101,818	100,000	9,091	109,091	100%
29	30.000	109,091	105,455	103,636	5,455	109,091	100%
30	35.000	127,273	109,091	107,273	18,182	125,455	99%

Docket Number 960258-WS

Proposed Rule 25-30.431, Margin Reserve, FAC

Comments from St. Johns River Water Management District

December 10, 1996

In addition to amendments proposed by the Department of Environmental Protection concerning a five year margin reserve period for water supply and treatment facilitates and wastewater treatment and disposal facilities, and a new subsection concerning reuse, the following amendment is recommended:

25-30.431 Margin Reserve

(1) through (3) No change.

(4) "Alternative water supplies" are supplies of water that have been reclaimed after one or more public supply, municipal, industrial, commercial, or agricultural uses, or are supplies of stormwater, or brackish or saltwater, that have been treated in accordance with applicable rules and standards sufficient to supply the intended use. [source: para. 373.1961(2)(h), F.S.]

(5) Unless otherwise justified, the margin reserve period for water source and wastewater treatment and effluent disposal facilities will be 18 months. Unless otherwise justified, the margin reserve period for water transmission and distribution lines and the wastewater collection system will be 12 months. In determining whether another margin reserve period is justified, the

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 960258-WS EXHIBIT NO. 5
COMPANY/ 1
WITNESS:
DATE: 12-10-96

Exc 5

Commission shall consider the rate of growth in the number of equivalent residential connections (ERC's); the time needed to meet the guidelines of the Department of Environmental Protection (DEP) for planning, designing, and constructing of plant expansion; the time needed to implement alternative water supplies or other remedial or preventative actions necessary as part of water management district required water supply plans within Water Resource Caution Areas; and the technical and economic options available for sizing increments of plant expansion.

Note: The underlining and strike-throughs denote changes from the draft language which was published in the FAW.

Docket No. 960258-WS
Exhibit _____

SSU's Proposed Amendments to Portions of Proposed Rule 25-30.431

- Amend proposed section 25-30.431(1) as follows:

25-30.431(1) "Margin reserve" is defined as the amount of plant capacity needed to ~~meet the expected demand due to customer growth~~ preserve and protect the ability of utility facilities to provide service to existing and future customers in an economically feasible manner that will preclude a deterioration in quality of service and prevent adverse environmental and health effects.

With the above change, SSU supports the amendments to proposed Rule 25-30.431 proposed by the FWWA and attached as Exhibit ____ (FS-1) to the direct testimony and exhibits of Frank Seidman.

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 960258-WS EXHIBIT NO 6
COMPANY/
WITNESS:
DATE: 12-10-96

EX 6

ANALYSIS OF MARGIN RESERVE, USED-AND-USEFUL ADJUSTMENTS, AND ALLOWANCE FOR FUNDS PRUDENTLY INVESTED

Florida Public Service Commission
Tallahassee, Florida
March 1990

ANALYSIS OF MARGIN RESERVE, USED-AND-USEFUL ADJUSTMENTS, AND ALLOWANCE FOR FUNDS PRUDENTLY INVESTED

by

R. Lynn Adams
Regulatory Analyst IV

Division of Research

Mary Andrews Bane, Director
M. Patricia Clifford, Public Utilities Supervisor

Florida Public Service Commission
Tallahassee, Florida
March 1990

TABLE OF CONTENTS

CHAPTER 1: DESCRIPTION OF THE PROBLEMS 1-1

1.0 Introduction to the Concepts 1-1
1.1 Purpose of the Report 1-4
1.2 Outline of the Report 1-4
Footnotes 1-5

CHAPTER 2: HOW RATE BASE IS CURRENTLY CALCULATED IN FLORIDA . . . 2-1

2.0 Introduction 2-1
2.1 Used-and-Useful Plant 2-1
2.2 Computing Margin Reserve 2-8
2.3 Allowance for Funds Prudently Invested 2-11
2.4 Confusing Concepts: Margin Reserve and Reserve Margin; AFUDC and AFPI 2-14
2.5 Summary 2-16
Footnotes 2-17

CHAPTER 3: INTERRELATIONSHIPS BETWEEN THE CONCEPTS 3-1

3.0 Statutory Requirements and Other Ratemaking Criteria 3-1
3.1 FPSC Ratemaking Methodologies 3-2
3.1.1 Methodology 1 - Used-and-Useful Plus Margin Reserve 3-4
3.1.2 Methodology 2 - Used-and-Useful Plus Margin Reserve in Addition to AFPI . . . 3-6
3.1.3 Methodology 3 - Used-and-Useful Plus AFPI 3-10
3.2 Summary 3-14
Footnotes 3-17

CHAPTER 4: SURVEY RESULTS: ALTERNATIVES TO CURRENT DEFINITION OF USED-AND-USEFUL RATE BASE FOR RATEMAKING 4-1

4.0 Responses to the Survey of Florida Water and Wastewater Utilities 4-1
4.1 Responses to Survey of Other State Regulatory Commissions 4-5
4.2 Summary 4-11
Footnotes 4-13

CHAPTER 5: SUMMARY AND CONCLUSIONS 5-1

APPENDIX A: Survey of Florida Water and Wastewater Utilities . . A-1
APPENDIX B: Survey Responses on Ratemaking Practices from Florida Water and Wastewater Utilities B-1
APPENDIX C: Survey of Other State Regulatory Commissions C-1
APPENDIX D: Survey Responses Regarding Ratemaking Practices for Water and Wastewater Utilities in Other States . . D-1

INDEX OF TABLES

Table 2.1: Allowance for Funds Prudently Invested: Elements Used in the Calculation of AFPI 2-19

Table 2.2: Allowance for Funds Prudently Invested: Calculation of Carrying Costs for Each ERC 2-20

Table 2.3: Allowance for Funds Prudently Invested: Calculation of Carrying Costs per ERC per Year 2-21

Table 2.4: Allowance for Funds Prudently Invested: Conversion of Annual Carrying Costs into Carrying Costs per ERC per Month 2-22

Table 3.1: Calculation of Rate Base for Methodology 1 on December 31, 1988 3-18

Table 3.2: Calculation of Annual Revenue Requirement per ERC (Methodology 1) 3-19

Table 3.3: Calculation of Annual Revenues from Rates in Year 1 Through Year 3 (Methodology 1) 3-19

Table 3.4: Expenses of Nonused-and-Useful Plant Absorbed by the Utility Under Methodology 1 (No AFPI Is Collected) 3-20

Table 3.4a: Calculation of Interest on Expenses Absorbed by Utility When No AFPI Is Collected (Methodology 1) 3-21

Table 3.5: Calculation of Cost of Qualifying Asset for AFPI Charge (Methodology 2) 3-21

Table 3.6: Annual Unfunded Depreciation Expense and Unfunded Return on Nonused-and-Useful Plant (Methodology 2) 3-22

Table 3.7: Calculation of Carrying Costs per ERC per Year (Methodology 2) 3-22

Table 3.8: Conversion of Annual Carrying Costs per ERC into Monthly AFPI Charges (Methodology 2) 3-23

Table 3.9: Calculation of Revenues from AFPI in Year 1 Through Year 3 (Methodology 2) 3-23

Table 3.10: Calculation of Total Revenues Using Both Margin Reserve and AFPI (Methodology 2) 3-24

Table 3.11: Expenses of Nonused-and-Useful Plant Absorbed by the Utility When AFPI Collections Are Begun in Year 3 (Methodology 2) 3-25

Table 3.11a: Calculation of Interest on Expenses Absorbed by Utility When AFPI Is Collected Beginning in Year 3 (Methodology 2) 3-26

Table 3.11b: Annual Unfunded Depreciation Expense and Unfunded Return on Nonused-and-Useful Plant Balance at January 1, 1987 (Methodology 2 with AFPI Calculated from Plant In-Service Date) 3-26

Table 3.11c: Calculation of Carrying Costs per ERC per Year (Methodology 2 with AFPI Calculated from Plant In-Service Date) 3-27

Table 3.11d: Conversion of Annual Carrying Costs per ERC Into Monthly AFPI Charges (Methodology 2 with AFPI Calculated from Plant In-Service Date) 3-28

Table 3.11e: Calculation of Revenues from AFPI in Year 1 Through Year 5 (Methodology 2 with AFPI Collected Beginning with Plant's First Year of Operations) 3-28

Table 3.11f: Calculation of Total Revenues Under Methodology 2 had AFPI Been Collected from Plant In-Service Date . 3-29

Table 3.11g: Expenses of Nonused-and-Useful Plant Absorbed by the Utility Under Methodology 2 When AFPI Is Collected Beginning in Year 1 3-30

Table 3.11h: Calculation of Interest on Expenses Absorbed by Utility When AFPI Is Collected from Year 1 3-31

Table 3.12: Calculation of Used-and-Useful Rate Base on December 31, 1988 (Excludes Margin Reserve) (Methodology 3) 3-31

Table 3.13: Calculation of Annual Revenue Requirement per ERC (Methodology 3) 3-32

Table 3.14: Calculation of Total Rate Revenues in Year 1 Through Year 3 (Methodology 3) 3-32

Table 3.15: Calculation of Cost of Qualifying Asset for AFPI Charge (Methodology 3) 3-33

Table 3.16: Annual Unfunded Depreciation Expense and Unfunded Return on Nonused-and-Useful Plant (Methodology 3 - AFPI Replaces Margin Reserve) 3-33

Table 3.17: Calculation of Carrying Costs per ERC per Year (Methodology 3) 3-34

Table 3.18: Conversion of Annual Carrying Costs per ERC into Monthly AFPI Charges (Methodology 3) 3-35

Table 3.19: Calculation of Revenues from AFPI in Year 1 Through Year 3 (Methodology 3) 3-35

Table 3.20: Calculation of Total Revenues from Rates and AFPI (Methodology 3) 3-36

Table 3.21: Summary of Total Revenues under Methodologies 1, 2, and 3 3-36

CHAPTER 1
DESCRIPTION OF THE PROBLEMS

1.0 Introduction to the Concepts

Rates for privately owned utilities under the jurisdiction of state regulatory commissions are derived from utility revenue requirements. Generally speaking, revenue requirements consist of legitimate or prudent utility expenses plus a return on the owners' investment in property devoted to public service (rate base). Items usually found in rate base include the cost of utility plant, net of accumulated depreciation and contributions-in-aid-of-construction (CIAC), and a working capital allowance. Utility plant costs usually constitute the largest portion of rate base with higher plant costs meaning higher rate bases and higher rates.

In the water and wastewater industry, when new plant is created to serve future customers in a new development, there is a lag between the time the plant is put into service and the time the plant is operating at capacity. In designing initial rates, it may not be practical to place costs of the entire plant in rate base if the plant's size is very large relative to the size of the typical early customer base since the resultant rates could be unaffordably high for the first homeowners. The adjustment to exclude from rate base any "excess" plant capacity not needed to serve current customers is called a used-and-useful adjustment. Costs of plant not currently used-and-useful are not recoverable through current rates to current customers.

Absorbing currently unrecoverable costs imposes hardships on utilities since a certain amount of unused capacity must be maintained if the utility is to be able to add additional customers. Recognizing the need for some excess capacity to facilitate prompt service to new customers, the Florida Public Service Commission (FPSC) includes an allowance for growth, or margin reserve, in used-and-useful plant.[1] The margin reserve is usually limited to the amount of plant needed to serve anticipated growth over the next twelve to eighteen months or the amount of plant needed to serve 20 percent of current customers, whichever is less.[2] To fulfill its obligation to serve new customers within a reasonable time, a utility must anticipate and build for such demands approximately one to one and a half years in advance of the plant being needed.

While twelve to eighteen months may be the minimum time required to add new capacity, it is not necessarily the optimum planning horizon between capacity additions. Some of the very large systems, such as those that serve metropolitan areas, require at least five years for planning, design, and construction of additional plant. Therefore, Commission staff generally agree that it is reasonable to build enough capacity to meet growth up to five years into the future. For this reason, even in a prudently constructed plant there are likely to be investment dollars associated with nonused-and-useful plant that are earning no return. Utility investors can choose to build smaller plants to minimize the total capital at risk at any one time. However, utilities and regulators agree that increasing capacity through many small additions usually costs more in the long run than building one

large plant in the beginning.

To avoid penalizing utilities for building larger plants when larger plants may minimize total long-term costs to customers and to avoid unduly burdening current customers with costs of excess capacity, the FPSC developed a concept in 1983 called an allowance for funds prudently invested (AFPI). AFPI allows a utility to recover from new customers accumulated carrying costs on nonused-and-useful plant in the form of a one-time charge collected at the time of initial connection. To put it another way, AFPI allows growth to pay for itself. Without AFPI, prospective carrying costs on excess plant, such as depreciation, capital costs, and insurance, would drive utility companies to avoid building the larger, more cost-efficient plants. AFPI is intended to remove disincentives to build larger facilities by allowing recovery of costs of idle plant from future customers when they connect to the system.

Summarizing the three concepts, "used-and-useful plant" is that percentage of a plant's capacity which is necessary to serve current customers. Used-and-useful plant is increased by a component called the "margin reserve" for plant which is expected to become used-and-useful in the near future. An estimate of used-and-useful plus margin reserve plant is made to determine the proportion of plant costs to include in rate base at a given point in time, thereby determining the amount of carrying costs recovered through current rates. The carrying costs associated with the remaining nonused-and-useful plant are accumulated in the form of AFPI charges and collected from future customers when they connect to the system.

Chapter 1-4

1.1 Purpose of the Report

Since 1983, AFPI has been available to provide a means for utilities to recover previously unrecoverable carrying costs associated with nonused-and-useful plant. This report addresses whether used-and-useful adjustments, margin reserve, and AFPI are compatible when used collectively. More specifically, do the concepts overlap and recover too many dollars from ratepayers or do the concepts produce rates which accurately assign costs of the system to the ratepayers who impose those costs? Finally, do the concepts recover all appropriate costs for utility investors?

1.2 Outline of the Report

Chapter 2 clarifies the three concepts by illustrating how they are calculated in Florida, and examines the costs each concept recovers. Chapter 3 then analyzes the interrelationships among the concepts by showing how different applications of the concepts affect revenues. Chapter 4 presents the results of a survey of Florida's utilities that solicited industry opinions of the concepts and recommendations on alternatives. Chapter 4 also reports the results of a survey of other state regulatory commissions to compare their rate base used-and-useful concepts to Florida's. Finally, Chapter 5 summarizes the report's findings.

FOOTNOTES

1. At the Florida Commission, the term "used-and-useful" usually refers to the combination of used-and-useful plant plus margin reserve. For purposes of this report, the concepts will be separately addressed.

2 According to Water and Wastewater Division staff, the time required to construct new plant capacity varies from one and a half years to five years depending on the size of the system. It is estimated that most of the investor-owned systems in Florida would require an average of one to one and a half years. Therefore, Florida utility growth allowances are usually limited to one year's construction time for distribution and collection lines and one and a half years' construction time for treatment plant.

CHAPTER 2
HOW RATE BASE IS CURRENTLY CALCULATED IN FLORIDA

2.0 Introduction

On March 26, 1987, a Florida Commission workshop was held to discuss the treatment of margin reserve in rate base calculations. This workshop featured presentations by both Commission staff and industry spokesmen relating to the desirability of eliminating margin reserve from used-and-useful calculations. As an alternative, plant that is currently treated as a margin reserve could be included in the allowance for funds prudently invested calculation.

The workshop failed to resolve conflicts over the appropriate treatment of nonused-and-useful plant, apparently, in part, because of confusion over the definition of margin reserve.[1] To eliminate confusion caused by different interpretations of the three concepts, used-and-useful, margin reserve, and AFPI as they are used in Florida, this chapter discusses the Florida Public Service Commission's calculation and justification of each concept.

2.1 Used-and-Useful Plant

New Plants: Setting Initial Rates. Used-and-useful adjustments are not made in the case of initial ratesetting for a new facility which is about to be put into operation. Used-and-useful adjustments usually involve an analysis of historical flows relative to a facility's rated capacity to determine the proportion of capacity dedicated to serving

existing customers. Such data will not exist for a new facility that is not yet in service. Instead, rates are initially established by projecting what future expenses and plant account balances will be at the point in time when total customer demand is expected to have reached 80 percent of the utility's capacity, the point at which most utilities would begin to expand existing capacity. These estimated plant account balances become components of rate base upon which carrying costs are based. Estimated carrying costs plus other expenses are divided by estimated customers at the projected 80 percent capacity to determine the unit costs or rates to be charged initial customers. These procedures are similar to used-and-useful adjustments except that computations for initial rates use projected numbers and the process is referred to as an initial rates procedure.

Additions to Existing Plant: Used and Useful Adjustments. Used-and-useful adjustments are usually made when an existing company petitions for a rate increase. Such increases are often warranted because the utility has expanded or improved existing plant and that additional investment is not reflected in its current rate base. Used-and-useful adjustments to rate base are necessary to ensure existing customers do not pay a disproportionate share of costs associated with expanded or improved plant. Additionally, used-and-useful adjustments are eventually necessary to determine rate base for utilities that have been transferred from county to state regulatory jurisdiction.[2]

Used-and-useful plant is based on an engineering estimate of the proportion of plant capacity actually dedicated to serving current customers. Capital costs and depreciation expense on used-and-useful

plant are added to actual operating and maintenance expenses and tax expense to determine the utility's revenue requirement and resultant rates. Due to their complexity, used-and-useful calculations are not usually made except as part of a rate case.

Computing and Applying Used-and-Useful Adjustments. When estimating used-and-useful percentages, the staff engineer attempts to answer the question: What portion of plant costs should be borne by current customers and what portion should be borne by future customers? The FPSC Standard Operating Procedures manual supplies guidelines to assist in distinguishing used-and-useful from nonused-and-useful plant. Some of these guidelines were incorporated into the Division of Water and Wastewater's Standard Operating Procedures several years ago as formulas that measure currently served customers and their requirements against design criteria. The formulas calculate used-and-useful plant separately for treatment plant and for distribution and collection facilities.

Used-and-useful adjustments are made to each of the plant subaccounts under each major functional area: treatment plant, distribution system, and collection system. That is, the balance in each plant subaccount is multiplied by the used-and-useful percentage derived from the appropriate formula. The used-and-useful portion of each plant subaccount is then totaled to derive the value of total plant in rate base. For example, a distribution system might be considered 100 percent used-and-useful and 100 percent of its cost added to rate base while only 50 percent of the cost of treatment plant equipment operating at one-half capacity might be added to rate base.

Treatment Plant Used-and-Useful Formulas. Treatment plant

used-and-useful formula components are as follows:[3]

1. Rated plant capacity in gallons per day (GPD). This means the maximum daily gallons the plant can treat, as rated by the manufacturer.

2. Maximum GPD during the test year measured as the average of the five days with the highest GPD from the month with the highest GPD during the test year.

3. Average daily sewage flow in the peak month of the test year measured as gallons of sewage per day. This would be the total gallons of sewage treated during the peak month of the test year divided by the number of days in that month.

4. Fire flow water requirements in the test year measured in GPD. The minimum standards for residential fire protection are 500 gallons per minute for two hours or 60,000 GPD.

5. Margin reserve in gallons of water or sewage per day.[4] Margin reserve is considered part of used-and-useful plant in rate base since the utility is required to maintain capacity to meet new service requests within a reasonable time.

6. Excessive infiltration or excessive unaccounted for water in GPD. In a water system, unaccounted for water is source water which enters the distribution system but is not delivered to customers. In a sewer system, excessive infiltration is ground water that seeps into the collection system.[5]

Citing these components by their designated numbers 1-6, used-and-useful formulas are given by:

Used-and-useful percentage for water treatment plant: $\frac{2 + 5 + 4 - 6}{1}$ (2.1)

Used-and-useful percentage for sewage treatment plant: $\frac{3 + 5 - 6}{1}$ (2.2)

Used-and-useful formula (2.1) for water treatment plant begins with the peak daily flow (item 2); adds margin reserve (5) and fire flow capacity (4); subtracts excessive water losses (6); and divides the

result by total designed system capacity (1). The resulting percentage of current use to system capacity represents the proportion of the treatment plant's total capacity dedicated to serving current customers. This percentage is then multiplied by the cost of the treatment plant to obtain the cost to be recovered from current customers through rates. For example, on any given day, current customers may require and current rates must pay for enough water, despite losses of up to 10 percent of the water treated, to fight a local fire, meet new service requests for up to 20 percent more customers, and supply demands equal to peak demands registered during a recent test year.

Used-and-useful formula (2.2) for sewage treatment plant uses average daily flow rather than peak daily flow. The formula combines average daily flow (3) with margin reserve (5), subtracts excessive infiltration (6), and divides the result by total designed plant capacity (1). In other words, current customers are expected to pay for capacity to treat the current average flow of sewage plus the capacity needed to serve up to a 20 percent increase over current customers' flows. In addition, customers must pay for treatment of any water leaking into the collection system except for leakage exceeding 10 percent of the original sewage collected.

By including maximum daily flows (item 2 above) in the numerator, the water treatment plant used-and-useful formula (2.1) automatically includes that portion of capacity used to meet excessive or peak demands of current customers. While average daily flows are used in the numerator of the used-and-useful sewage treatment plant formula (2.2), sewage plant flows may vary, for example, due to decreased flows from

tourism during a recession year or increased flows during a hurricane. If sewage plant flows over the test year are atypical, flow data may be drawn from a different time period to obtain a representative picture of current demands on a plant.

Distribution System and Collection System Used-and-Useful Formulas. Commission rules require water and wastewater utilities to collect, as a minimum, CIAC equal to the cost of the distribution and collection systems. Utilities that comply with FPSC CIAC requirements should have no uncontributed distribution or collection plant to include in used-and-useful rate base.

Costs incurred for distribution and collection systems are more closely related to number of customers than to gallons treated so equivalent residential connections (ERCs) are used rather than gallons of water per day (GPD). Additionally, water distribution or sewage collection systems may be constructed in phases which more closely coincide with the growth of the customer base. Water transmission or sewage collection system used-and-useful components are as follows:

1. Capacity of the system measured in equivalent residential connections (ERCs). Generally, one ERC is equal to 350 gallons of water used per day or 250 GPD of water returned through the sewer system.)
2. Number of ERCs during the test year.
3. Margin reserve measured in ERCs.[6]

Citing these components as 1, 2, and 3, the formula for the water distribution system and the sewage collection system used-and-useful percentages is given by:

Used-and-useful percentage for a water distribution or a wastewater collection system: $\frac{2 + 3}{1}$ (2.3)

Formula (2.3) yields a ratio of current customers' usage and soon-to-be current customers' usage to total possible customers' usage.

Adjustments to Used-and-Useful Formulas. Used-and-useful calculations for treatment plant and for collection and distribution systems must be adjusted to accommodate facility requirements imposed by other governmental bodies and to account for the effects of other factors. Examples of such requirements or factors include the following.

1. Design criteria imposed by state, local, and federal regulatory agencies.

2. Community requirements to meet public needs for safe, adequate, sufficient, responsive, and economic service for all those that apply. Examples would include minimum fire flow capabilities and ability to meet certain pollution control standards.

3. Regulatory requirements for standby wells, emergency power, and other standby facilities or any other installations required by regulatory agencies.

4. The absence of actual operating data. A utility may lack adequate records thus requiring the engineer to estimate an appropriate used-and-useful percentage.

5. The need to determine margin reserve on a case-by-case basis after considering individual variations in factors such as community needs, lead time for managerial decisions, engineering, construction, and regulatory approvals. The used-and-useful formulas usually allow one to one and a half years' construction time in margin reserve. However, certain large systems may require longer construction periods than the formulas allow.

6. Individual utility need for capacity sufficient to allow downtime for maintenance of portions of its plant. Such a need would be a function of service area demand, plant type, etc.

7. Seasonal variations in population, occupancy rates, infiltration, or usage. Consideration is given to whether usage data from a particular period are an accurate predictor of expected usage patterns over upcoming years.

8. Safe withdrawal levels from water wells for prevention of salt water intrusion and all other safe well levels of operation. Utilities in coastal areas may need to drill additional wells to ensure an adequate supply of potable water.

9. The difficulty of applying a formula approach for very small systems. For example, some community fire flow requirements, when inserted into the numerator of the used-and-useful formula for a very small water system, could overstate the used-and-useful percentage.

The effects of each of the preceding requirements/factors on used-and-useful calculations in a specific case depend upon the judgment of the engineer involved and the uniqueness of the system under consideration. Therefore, a flexible, case-by-case approach to determining used-and-useful plant is required.

2.2 Computing Margin Reserve

Recall that margin reserve is a component of used-and-useful plant appearing in the numerator of the used-and-useful formulas (2.1), (2.2), and (2.3).

Margin reserve is calculated as follows:

1. Average yearly customer growth in ERCs for the most recent five years including the test year.

2. Construction time for additional plant capacity (generally one year for distribution and collection lines and one and one-half years for treatment plant).

3. Average test year customers in ERCs. Average customers are the beginning customers plus the customers at end of year divided by 2.

4. Maximum daily flow in GPD. (Sewage systems would use average daily flow in GPD.)

Citing these components by their designated letters 1 through 4, margin reserve formulas are given by:

Treatment plant: $1 \times 2 \times \frac{4}{3}$ = GPD in margin reserve (2.4)

"or"

1×2 = ERCs in margin reserve (2.4a)

Distribution and collection plant:[7] 1×2 = ERCs in margin reserve (2.5)

Margin reserve is justified as being an allowance for prudently sized plants larger than are immediately needed to serve existing customers when justified by anticipated population growth. In other words, if it takes twelve to eighteen months to build new plant, the utility must have excess capacity available today if it is to provide timely service to new customers. Existing customers are said to benefit from lower rates made possible by economies of scale in the larger plant. If the area's growth rate is very strong or if the existing customer base is very small, margin reserve can significantly increase current rates. To limit the burden to be borne by current customers for future use, the Commission has determined that margin reserve shall not be permitted to exceed 20 percent of the capacity actually required to serve current customers at the time of the rate adjustment.

Formula (2.4) multiplies the number of future customers expected in the next year and a half times the average GPD used per current customer to determine the treatment capacity in GPD needed to accommodate new customers over the next year and a half. GPD in margin reserve are

inserted into the numerator of the used-and-useful formula (2.1) or formula (2.2) described in Section 2.1, thereby increasing the percentage of used-and-useful plant allowed into rate base for ratemaking purposes. Margin reserve causes existing customers to pay both their share of current costs plus capacity costs for up to 20 percent more customers.

Imputation of CIAC Against Margin Reserve. The FPSC requires that CIAC be imputed against margin reserve. The amount imputed would be the utility's established service availability charge per connection times the number of expected connections included in the margin reserve. For example, assume a plant costing $200,000 is 50 percent used-and-useful for a preliminary total of $100,000 to be included in rate base. Further assume that a margin reserve of $20,000 is allowed, of which 75 percent will be collected from future customers in CIAC fees. The FPSC requires that the margin reserve be reduced to $5,000 ($20,000 less 75 percent of $20,000) for a total of $105,000 used-and-useful plant to be included in rate base. Imputation of CIAC avoids inflating rate base with assets which will be contributed by new customers.[8]

The practice of imputing CIAC against margin reserve has been criticized because a utility does, in fact, incur certain interest, tax, insurance, and other expenses on all plant, even though a portion of that plant is not currently used-and-useful and eventually will be at least partially contributed. A question that has not been addressed, however, is whether the investment represented by imputed CIAC should be eligible for AFPI treatment if it is excluded from margin reserve. This is addressed in Chapter 3.

2.3 Allowance for Funds Prudently Invested

Around 1983, the FPSC began using a new concept called the allowance for funds prudently invested (AFPI). AFPI is intended to recover those plant costs that are not recovered through current rates because a portion of existing plant is not considered used-and-useful. Under AFPI, the costs of nonused-and-useful plant are identified and collected from future customers as they connect to the system. Some regulators argue that all plant to serve future customers should be classified together as AFPI rather than classifying part as AFPI and part as margin reserve. If this were true, margin reserve would cease to exist as a separate rate base component and the affected plant would become instead a part of the nonused-and-useful plant included in AFPI calculations. The result would be lower rates for current customers than when margin reserve is added to used-and-useful plant. The following example illustrates the impact of AFPI versus margin reserve on a utility's rate base.

Assume a $200,000 plant able to serve 2,000 ERCs (700,000 GPD) is estimated to be 50 percent used-and-useful because it is serving 1,000 ERCs (350,000 GPD). Assume it is estimated that another 200 ERCs (70,000 GPD) will connect to the system in the next year resulting in a margin reserve of 70,000 GPD for an addition of $20,000 to rate base (70,000 GPD/700,000 GPD x $200,000). Defining used-and-useful rate base to include margin reserve, the rate base will be $120,000 (50 percent x $200,000 + $20,000) with $80,000 of nonused-and-useful plant remaining on which to compute AFPI charges.[9] If margin reserve is not considered part of used-and-useful calculations, the used-and-useful rate base would

be $100,000 and AFPI would be computed on nonused-and-useful plant of $100,000. The crucial difference would be when the dollars are collected and whether current or future customers pay the cost. Chapter 3 features an example illustrating the impact of AFPI vs. margin reserve on a utility's revenue requirement, and, therefore, on customer rates.

Calculating AFPI Charges. Generally, plant-related carrying costs associated with plant that will serve future customers may be included in AFPI charges. Typical components of AFPI are annual expenses on nonused-and-useful plant including:

1. Depreciation expense. The plant investment is reduced by advance collections of CIAC prior to computation of depreciation expense.
2. Return on investment in nonused-and-useful plant.
3. Income taxes on return on investment.
4. Property taxes associated with nonused-and-useful plant.
5. Other operating and maintenance expenses not allocated to present customers.
6. Return on capital temporarily "invested" in unreimbursed expenses.
7. Compounded earnings on prior year's return on plant investment.

Once all components have been identified, the first year's AFPI charges are calculated by dividing the sum of individual components by the number of anticipated future customers. The resulting annual charge represents the amount of unreimbursed expenses per customer incurred by the utility. One-twelfth of the annual charge will be collected from new customers connecting in the first month of the year. Two-twelfths will be collected if service is begun in the second month of the year, etc.

In year two, the AFPI charge is composed of two years' unreimbursed expenses plus a return on capital invested in the unreimbursed expenses from year one. In year three, the AFPI charge is composed of three years' unreimbursed expenses plus a return on capital invested in unreimbursed expenses from years one and two.

The calculation is repeated to include expenses projected through the end of five years.[10] Additionally, Water and Wastewater Division staff indicated that design and construction periods exceeding five years would only be appropriate for systems such as the very large municipal systems.[11] AFPI may include expenses projected beyond five years if the utility can demonstrate the prudency of such a period. For example, land prices in some south Florida coastal cities have increased at incredible rates. Under these circumstances, utilities may have acted wisely to buy enough land for their ultimate needs while land values were still low. However, growth projections beyond five years are usually thought to carry excessive risks and high carrying costs relative to long-run cost savings possible through investments in larger plants. AFPI fees are then collected from new customers as they connect to the system. If slow growth means customers continue to connect after five years, AFPI may still be collected. However, the amount of the AFPI charge is capped at the level needed to recover the carrying costs for only the first five years. While regulatory assessment fees are collected on AFPI, such revenues are treated as nonoperating revenue when utility earnings are monitored to avoid distorting utility revenues from rates.

Due to the complexity of the calculations, Tables 2.1 through 2.4

are presented to illustrate how AFPI charges are computed. The specific example shown was taken from a Florida Cities Water Company rate case (Docket No. 840419, Order No. 17169).

2.4 Confusing Concepts: Margin Reserve and Reserve Margin; AFUDC and AFPI

Margin reserve has been defined by utilities in a variety of ways, most of which confuse margin reserve with reserve margin, a completely different concept. Common misinterpretations of margin reserve include: (1) additional capacity required to serve unexpected demand from existing customers, (2) difference between design requirements imposed by other governmental agencies and actual daily demand per ERC, and (3) capacity that will never be utilized, or is unutilized when the DER requires design and construction of additional capacity. All of these definitions confuse margin reserve with reserve capacity to meet peak demands, outages, and maintenance.

It is very important to understand the distinction between these concepts. Reserve margin refers to capacity which is available to meet peak needs of current customers and is, therefore, not intended to function as a growth allowance. Margin reserve refers to the amount of plant needed to serve new or future customers over the actual construction period necessary to add new capacity. Usually, the actual construction period averages twelve months for a treatment plant and eighteen months for collection and distribution systems. To eliminate the confusion of margin reserve with peak demand capacity (reserve margin), margin reserve could be renamed "new customer capacity allowance."

Confusion has also been caused by similarities between the concept of AFPI and the concept known as allowance for funds used during construction (AFUDC). Conceptually, both AFUDC and AFPI provide for recovery from future ratepayers of carrying costs associated with construction. However, AFUDC recovers the carrying costs from the general body of future ratepayers through base rates while AFPI recovers the carrying costs through a fee imposed on incremental future customers who connect to the utility's system.

AFUDC accumulates construction financing costs for future recovery by establishing a weighted average cost-of-financing rate consisting of both debt and equity components. The applicable average construction work in progress (CWIP) amount for a given period is multiplied by this rate to determine the AFUDC amount to be capitalized. The company is afforded an opportunity to recover these costs when the plant is placed in service and both the AFUDC and plant balances are placed in rate base. This, in effect, shifts all financing costs associated with the new plant to the entire body of future ratepayers through increased base rates.

The AFPI calculation is a full-cost approach that provides for future recovery of a rate of return and other carrying costs associated with the portion of current capacity that will serve future customers, including fixed operating and maintenance expenses associated with the additional capacity. However, the AFPI charge to future customers is a one-time charge that coincides with the new customer's payment of the service availability charge or connection charge and base rates are not affected.

2.5 Summary

Florida regulators have long treated margin reserve as an addition to used-and-useful plant in the rate base. Now, with the introduction of AFPI as a means of recovering costs associated with nonused-and-useful plant, a question has been raised as to whether margin reserve should continue to be part of used-and-useful plant. Alternatively, should margin reserve be absorbed into nonused-and-useful plant upon which AFPI charges are calculated? Chapter 2 has discussed the calculation of each of the concepts but has not prepared the reader to evaluate the impacts of alternative applications of the concepts on utility revenues and customers' rates. Chapter 3 attempts to impart an understanding of the way the concepts interrelate to produce rates and charges.

FOOTNOTES

1. Commission staff define margin reserve as the amount of plant that is needed to serve customers who will be connecting to the system during the eighteen-month period following a test year. This definition distinguishes "margin reserve" from the "reserve margin" which is needed to meet peak demands of current customers. See Section 2.4 for additional discussion.

2. Counties in Florida have the option of retaining jurisdiction over water and wastewater utilities or relinquishing such jurisdiction to the state. When a county relinquishes jurisdiction, the state suddenly acquires regulatory responsibility over a number of utilities for which rate base has never been established. Usually utilities are permitted to continue charging existing rates until rate increases are requested. At that time, used-and-useful rate base is established.

3. Florida Public Service Commission, Water and Wastewater Division Standard Operating Procedure Number 4011.

4. See Section 2.2.

5. Infiltration increases the amount of sewage to be treated without an increase in services received by customers. The percentage of water loss or infiltration is largely a function of system age. Generally, the Commission accepts 10 percent as normal for a newer system. Higher percentages are often justified for older systems. Percentages in excess of normal reduce the numerator of the used-and-useful formula.

6. See Section 2.2.

7. Since Commission rules call for the entire value of distribution and collection systems to be contributed, theoretically, margin reserve for these systems should also be entirely offset by imputed CIAC. The margin reserve formula for distribution and collection systems (equation 2.5) applies to utilities for whom the Commission feels collection of the full amount of CIAC would pose undue hardships. See the discussion of used-and-useful formulas for distribution and collection systems. For example, past undercollections of CIAC could burden future customers with a disproportionately large share of the cost of plant.

8. Prior to the passage of the 1986 Tax Reform Act, another reason for imputing CIAC was to retain the nontaxable status of CIAC. There was concern that earnings on that portion of margin reserve included

in the rate base which would later be offset by future CIAC would cause future CIAC to be taxable. With the passage of the 1986 Tax Reform Act, CIAC became taxable.

9. CIAC and depreciation are ignored in this example.

10. Five years is generally used in the calculation because it is the standard time frame that has been established by industry practice for designing and building additional capacity (Nall, Daryl W., "Initial Rates for a New Water Utility," FPSC Research Division, January 1984, p. 6).

11. "Rate Case Treatment of Water and Sewer Plant Excess Capacity," FPSC Water and Wastewater Division staff.

TABLE 2.1
FLORIDA CITIES WATER COMPANY - SOUTH
DOCKET NO. 840419-SU - ORDER NO. 17169

Allowance for Funds Prudently Invested
Elements Used in the Calculation of AFPI

Cost of Qualifying Assets (Nonused-and-useful plant)	$9,295,999	
Capacity of Qualifying Assets	3,638,241	GPD
Number of Future Customers	14,784	ERCs
Annual Depreciation Expense	$ 408,591	
Rate of Return	11.98%	
Weighted Cost of Equity:		
Common Equity	6.24%	
Investment Tax Credits	0.55%	
Total	6.79%	
Federal Income Tax Rate	30.68%	(35.92% Less: Parent Debt Adjustment, ITC Amortization and Deferred Income Tax Writedown)
State Income Tax Rate	5.11%	(5.5% Less: Parent Debt Adjustment)
Annual Property Tax	$ 81,386	
Other Costs	$ 6,145	
Depreciation Rate of Assets	4.24%	
Test Year	1985	

These items are used to compute the per customer amount of carrying costs which consist of unfunded expenses (depreciation, property tax, and other expenses), return on investment, and income taxes. Per customer carrying costs are calculated on Table 2.2.

TABLE 2.2
FLORIDA CITIES WATER COMPANY - SOUTH
DOCKET NO. 840419-SU - ORDER NO. 17169

Allowance for Funds Prudently Invested
Calculation of Carrying Costs for Each ERC

(A)	(B)	(C)	(D)
Cost of Qualifying Assets	$9,295,999.00	Annual Depreciation Expense	$ 408,591.00
Divided by Future ERCs	14,784.00	Divided by Future ERCs	14,784.00
Cost/ERC	$ 628.79	Annual Depreciation Cost per ERC	$ 27.64
Multiply by Rate of Return	11.98%		
Annual Return per ERC	$ 75.34	Annual Property Tax Expense	$ 81,386.00
		Divided by Future ERCs	14,784.00
Annual Reduction in Return (Annual Depreciation Expense per ERC Times Rate of Return)	$ 3.31	Annual Property Tax per ERC	$ 5.51
Federal Tax Rate	30.68%	Weighted Cost of Equity	6.79%
Effective State Tax Rate	3.54%	Divided by Rate of Return	11.98%
Total Tax Rate	34.22%	Percentage of Equity in Return	56.68%
Effective Tax on Return (Equity Percentage Times Tax Rate)	19.40%	Other Costs	$ 6,145.00
		Divided by Future ERCs	14,784.00
Provision for Tax (Tax on Return/(1-Total Tax Rate))	29.49%	Cost per ERC	$ 0.42

Each of the per customer carrying charges above is used to derive the annual carrying cost per customer. Calculations to derive the return on unfunded carrying costs appear on Table 2.3.

TABLE 2.3
FLORIDA CITIES WATER COMPANY - SOUTH
DOCKET NO. 840419-SU - ORDER NO. 17169

Allowance for Funds Prudently Invested
Calculation of Carrying Costs per ERC per Year

	1985	1986	1987	1988	1989	1990	1991	1992
Unfunded Other Costs	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42
Unfunded Annual Depreciation	27.64	27.64	27.64	27.64	27.64	27.64	27.64	27.64
Unfunded Property Tax	5.51	5.51	5.51	5.51	5.51	5.51	5.51	5.51
Subtotal Unfunded Annual Expense	$ 33.56	$ 33.56	$ 33.56	$ 33.56	$ 33.56	$ 33.56	$ 33.56	$ 33.56
Unfunded Expenses Prior Year	0.00	33.56	67.12	100.67	134.23	167.79	201.35	234.91
Total Unfunded Expenses	$ 33.56	$ 67.12	$100.67	$134.23	$167.79	$ 201.35	$ 234.91	$ 268.46
Return on Expenses Current Year	$ 4.02	$ 4.02	$ 4.02	$ 4.02	$ 4.02	$ 4.02	$ 4.02	$ 4.02
Return on Expenses Prior Year	0.00	4.02	8.04	12.06	16.08	20.10	24.13	28.15
Return on Plant Current Year	75.34	72.03	68.72	65.41	62.10	58.78	55.47	52.16
Earnings Prior Year	0.00	75.34	160.42	256.41	364.60	486.47	623.65	777.97
Compound Earnings from Prior Year	0.00	9.03	19.22	30.72	43.69	58.29	74.73	93.22
Total Compounded Earnings	$ 75.34	$160.42	$256.41	$364.60	$486.47	$ 623.65	$ 777.97	$ 951.50
Earnings Expansion Factor for Tax	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
Revenue Required to Fund Earnings	$ 97.56	$207.73	$332.02	$472.12	$629.92	$ 807.55	$1,007.39	$1,232.09
Revenue Required to Fund Expenses	33.56	67.12	100.67	134.23	167.79	201.35	234.91	268.46
Subtotal	$131.12	$274.85	$432.69	$606.35	$797.71	$1,000.90	$1,242.30	$1,500.55
Divided by Factor for Gross Receipts Tax	0.975	0.975	0.975	0.975	0.975	0.975	0.975	0.975
ERC Carrying Cost for One Year	$134.48	$281.89	$443.79	$621.90	$818.17	$1,034.77	$1,274.15	$1,539.03

This table computes the unfunded carrying costs plus a return on those costs for each of the next eight years. For example, if a customer connects to the system at the end of 1992, then he must reimburse the utility for carrying costs incurred from 1984 through 1992 or $1,539.03. The exact charge depends on when in 1992 he connects as shown on Table 2.4.

TABLE 2.4
FLORIDA CITIES WATER COMPANY - SOUTH
DOCKET NO. 840419-SU - ORDER NO. 17169

Allowance for Funds Prudently Invested
Conversion of Annual Carrying Costs into
Carrying Costs per ERC per Month

	1985	1986	1987	1988	1989	1990	1991	1992
October	$ 11.21	$146.76	$295.38	$458.63	$638.25	$ 836.22	$1,054.72	$1,296.22
November	22.41	159.05	308.87	473.47	654.61	854.27	1,074.67	1,318.30
December	33.62	171.33	322.37	488.31	670.96	872.32	1,094.62	1,340.37
January	44.83	183.62	335.86	503.16	687.32	890.37	1,114.56	1,362.44
February	56.03	195.90	349.35	518.00	703.68	908.42	1,134.51	1,384.51
March	67.24	208.19	362.84	532.84	720.03	926.47	1,154.46	1,406.59
April	78.45	220.47	376.33	547.68	736.39	944.52	1,174.41	1,428.66
May	89.65	232.76	389.82	562.53	752.74	962.57	1,194.36	1,450.73
June	100.86	245.04	403.31	577.37	769.10	980.62	1,214.30	1,472.81
July	112.07	257.32	416.80	592.21	785.45	998.67	1,234.25	1,494.88
August	123.27	269.61	430.30	607.05	801.81	1,016.72	1,254.20	1,516.95
September	134.48	281.89	443.79	621.90	818.17	1,034.77	1,274.15	1,539.03

A new customer who connects in October 1985, will pay an AFPI charge of $11.21. The AFPI charge in August 1992 is $1,516.95 for all customers connecting in that month. Generally, if growth is unexpectedly slow and new customers are still being added after September 1992, they will pay the maximum AFPI charge of $1,539.03. However, they will not be expected to pay carrying costs incurred beyond the initially projected growth period for which the plant was constructed.

Note: This specific example is shown for illustrative purposes only. It is a coincidence that the utility in this case was able to justify AFPI charges compounded for a period in excess of five years.

CHAPTER 3
INTERRELATIONSHIPS BETWEEN THE CONCEPTS

Chapter 2 described the calculation of used-and-useful plant, margin reserve, and AFPI. It remains to discuss the different ways these concepts can interrelate to produce rates and charges. This is the purpose of Chapter 3. Additionally, Chapter 3 examines the impact of different combinations of the concepts on resulting rates and charges in light of statutory requirements and ratemaking criteria.

3.0 Statutory Requirements and Other Ratemaking Criteria

Section 367.081(2), Florida Statutes, requires that in fixing rates:

> The Commission shall consider the value and quality of the service and the cost of providing the service, which shall include . . . maintenance, depreciation, tax, and operating expenses incurred in the operation of all property used and useful in the public service; and a fair return on the investment of the utility in property used and useful in the public service.

In other words, rates should compensate utility investors for carrying costs and return on investment in used-and-useful plant. This requirement appears simple enough until it is noted that "used-and-useful" is a subjective term which could be construed to mean just about anything. Therefore, evaluation of alternative ratemaking methodologies requires additional ratemaking criteria.

Discussions with Division of Water and Wastewater staff led to the development of three other evaluative criteria for rates and charges.

These are that rates and charges should:

1. Promote rate stability by allowing a utility to operate for a reasonable period before needing another rate increase. It is not practical to set rates at the lowest possible level if it forces a utility to file more frequently for rate increases. This is because of the magnitude of rate case expenses which are recovered through rates. Additionally, rate stability is regarded as preferable to frequent rate increases.

2. Encourage utilities to minimize customer costs. One of the criticisms of rate base/rate of return regulation has long been that utilities have no incentive to operate efficiently when they are limited to recovery of costs, whatever they may be, plus a return on invested capital. How does a utility justify added cost or effort to achieve cost efficiencies when all the gains go to customers? Ideally, rates and charges would allow everyone to benefit from improved utility performance.

3. Recover the costs to serve from those who cause the costs. It is equitable that costs should be borne by cost causers. Thus, the distinction between current and future customers' shares of costs has been made.

The above criteria will be used as a basis for comparing the impacts on rates and charges from alternative applications of the three regulatory concepts. That is, each concept will be evaluated on its ability to promote rate stability, encourage cost minimization, and recover costs from "cost causers."

3.1 FPSC Ratemaking Methodologies

The Florida Public Service Commission currently uses two methodologies in determining rates and other charges for water and wastewater utilities. One method, which predates AFPI, incorporates used-and-useful plant and a margin reserve in rate base.[1] Expenses of

owning and operating the portion of plant deemed to be nonused-and-useful are absorbed by utility investors.

The second methodology is identical to the first except, in addition to establishing rates, AFPI is calculated on nonused-and-useful plant and recovered as a one-time charge from future customers.[2]

A third methodology, proposed by Division of Water and Wastewater staff, would exclude margin reserve from the calculation of rates when AFPI is utilized. This and the two preceding methodologies are explored in greater detail in the examples which follow.

Each example illustrates the impact of alternative combinations of the ratemaking concepts of used-and-useful, margin reserve, and AFPI, on the utility's cash flows throughout its growth years. All of the examples use the following data and assumptions:

End of Test Year	December 31, 1988
Total Cost of Utility Plant Completed on January 1, 1987	$30,000
Plant Capacity	
Total	100 ERCs
Current Customers	40 ERCs
Future Customers	60 ERCs
(A customer is defined as one household that uses about 350 GPD which is equivalent to one ERC.)	
Annual Growth Rate	20 ERCs per year
Plant Depreciation Rate	4 percent
Utility's Overall Allowed Rate of Return	12 percent

Used-and-useful percentages using formulas in Chapter 2:

40 ERCs/100 ERCs = 40 percent
40 percent x $30,000 = $12,000 in used-and-useful plant
8 percent x $30,000 = $2,400 in margin reserve

Margin reserve percentage using formula (2.4a) in Chapter 2:

1 year x average annual growth in ERCs = ERCs in margin reserve
1 x 20 ERCs/year = 20 ERCs in margin reserve

However, since margin reserve is limited to no more than 20 percent of the plant needed to serve existing customers, or 20 percent x 40 ERCs, the margin reserve can be no more than 8 ERCs, or 8 percent of total plant cost: $2,400.

CIAC Fee per ERC = $200
(provides for a 73.33 percent contribution level at capacity after taking depreciation and amortization into account)

Taxes and regulatory assessment fees are ignored in all three examples since this simplifies the analysis without distorting the results.

Each example calculates the revenues anticipated over each of the next three years, at which time the customer base reaches capacity. Except for bad debts, which are ignored in these examples, revenues would be synonymous with cash flows.

To simplify calculations, it is assumed that new customers are added evenly throughout the year and the average number of customers for the year is used in the calculations.

To simplify calculations, a year-end rather than a 13-month average rate base is used. This should not affect the difference between the revenue requirements produced under different rate base methodologies.

To simplify calculations, all customers are assumed to be residential customers with similar usage patterns. Otherwise, it would be necessary to convert different customer classes to equivalent residential units before proceeding with the examples.

3.1.1 Methodology 1 - Used-and-Useful Plus Margin Reserve. This method is the one most commonly used at the Florida Commission. All cost recovery is accomplished through rates alone. The central step is calculation of rate base which consists of a used-and-useful portion and margin reserve, as shown in Table 3.1.

Rates are derived from a revenue requirement consisting only of depreciation expense on plant in the rate base, net of amortization of CIAC, and a return on the investment. The revenue requirement based on December 31, 1988, rate base balances is calculated in Table 3.2.

To convert the annual revenue requirement into anticipated cash flows over the next three years, the $687.36 derived in Table 3.2 is divided by current ERCs on December 31, 1988, to obtain an average revenue per ERC of $17.18. An average number of customers for each year is derived using the assumption that 20 new ERCs are added evenly throughout each year. The average revenue per ERC and the average number of customers for each year are used to estimate utility cash flows over the next three years as shown in Table 3.3.

Impact on Rate Stability

Since Methodology 1 forces a utility to absorb costs associated with nonused-and-useful plant, Methodology 1 may leave a utility more susceptible to financial problems caused by unforeseen repairs and improvements or increases in costs. Inability to perform routine maintenance or comply with Department of Environmental Regulation's requirements may lead to major repairs or fines and rate shock to future customers.

Impact on Minimization of Customer Costs

Although margin reserve inflates rates for all customers, it does not fully address the problem of unrecovered costs related to nonused-and-useful plant. Table 3.4 shows the capital costs and

depreciation expense, net of CIAC amortization, less revenues from rates for years 1 through 5 of the plant in Methodology 1. Unrecovered costs of $12,730.84 on an initial $30,000 investment from the plant's in-service date to the end of its growth period suggest that the plant in Methodology 1 would not be built without some mechanism for recovering nonused-and-useful plant carrying costs.

Impact on Incidence of Cost Recovery

Margin reserve has been criticized because it causes current customers to pay for a portion of plant built to serve future customers. This is illustrated in Table 3.1 by the $608 addition to rate base. As a result of the margin reserve in this example, current customers, and future customers when they connect, pay an average of $2.62 more per year (about 18 percent) over each customer's proportionate share of what total costs would have been had the full customer base been in place at December 31, 1988.

It appears that used-and-useful plant plus margin reserve is, by itself, an inadequate ratemaking methodology. Customers pay higher rates due to margin reserve while utilities fail to recover all prudent costs due to excess capacity adjustments.

3.1.2 Methodology 2 - Used-and-Useful Plus Margin Reserve in Addition to AFPI. Rates in Methodology 2 are calculated in exactly the same way as they were calculated in Methodology 1 except that, in addition to rates, the utility is allowed to collect an AFPI charge from each new customer who connects after the end of the test year. Table 3.5 shows the calculation of the cost of nonused-and-useful plant used to derive AFPI charges.

It is unclear whether the $1,600 of imputed CIAC netted against the margin reserve in Table 3.1 should be added to the cost of the qualifying asset underlying the AFPI charge. If the $1,600 is not added into nonused-and-useful plant and a return permitted through AFPI, the utility will never recover carrying costs on this portion of plant even though they are incurred prior to collecting CIAC. From a theoretical point of view, there is no reason to treat the $1,600 in this example differently from the rest of nonused-and-useful plant for which CIAC may be received in the future. The utility is entitled to a return on its investment in nonused-and-useful plant until CIAC is received. The utility incurs capital costs for which it is entitled to recovery. The customer benefits from availability of service at a lower long-run cost. Therefore, Table 3.5 shows that anticipated future receipts of CIAC that were used to reduce the margin reserve were included in the calculation of AFPI.

Table 3.6 shows the calculation of annual depreciation expense and return on investment that will accrue on the asset calculated in Table 3.5. Additionally, it is assumed that unfunded depreciation and capital costs, had they been recovered through rates, would have been available to be reinvested at the utility's cost of capital.[3] Table 3.7 combines these unfunded costs with the additional capital charges to derive the total carrying costs per ERC per year for excess plant.

A customer who comes on line in the middle of the year should not be responsible for the entire year's carrying costs. Table 3.8 calculates the monthly amount of annual carrying charges to be collected in such a case. The level of the AFPI charge increases with the length

of time the unfunded investment is outstanding. Assuming new customers connect evenly throughout the year, the average AFPI charge collected will probably approximate the fee for June, midpoint of the year. Table 3.9 uses June's AFPI fees from Table 3.8 to compute the total expected cash recovery from AFPI in years 1 through 3.

Finally, Table 3.10 shows the cash flow from rates shown in Table 3.3 added to the cash flow from AFPI in Table 3.9. The result is the total amount of revenues or cash flows that would be produced in the present example when margin reserve and AFPI are used in concert with used-and-useful plant in ratemaking. Revenues collected via monthly rates are identical under Methodologies 1 and 2, Methodology 2 simply shifts the added carrying costs of future use plant from the utility to future customers by also collecting AFPI fees.

Impact on Rate Stability

Methodology 2 promotes rate stability since, by maximizing utility revenues, it puts a utility in a better financial condition to meet increasing costs of service without postponing maintenance expenditures or requiring an immediate rate increase.

Impact on Minimization of Customer Costs

Some regulators criticize Methodology 2 primarily because it could, theoretically, produce excessive utility earnings. Margin reserve gives utilities some relief from the losses suffered on plant held for future use and, when recovery is also available through AFPI, these regulators argue that use of margin reserve is no longer justified.

Comparing total costs incurred by the utility to total revenues collected, Table 3.11 shows total return on investment and depreciation costs on plant beginning with its in-service date through the end of its fifth year of operations. Also shown in Table 3.11 is the revenue recovered in years 1 and 2 from initial rate procedures and in years 3 through 5 from rates and AFPI under Methodology 2. The final column of Table 3.11 shows that total expenses absorbed by the utility exceed amounts recovered through both rates, with their margin reserve components, and AFPI. The utility has not only failed to overearn, but has lost $9,294.45 on its initial $30,000 investment in plant by the end of year 5 by waiting until the end of the second year of operations to seek a rate increase. Note, however, that had the utility obtained authority to collect AFPI charges beginning in year 1, its total revenues for years 1 through 5 would have been $15,161.80 or about $132.83 in excess of actual costs. This excess is calculated in Tables 3.11b through 3.11h.

The large difference between revenues of $7,335.80 in Table 3.11 and $15,161.80 in Table 3.11g stems from the two additional years of expenses with compounding incorporated in the AFPI fee calculation. The $132.83 excess of AFPI revenues over actual costs of $15,028.97 shown on Table 3.11g is primarily due to the presence of margin reserve in the rate base on December 31, 1988.

Although Methodology 2 produces the greatest amount of revenues of the three methods discussed in this chapter, these revenues are not necessarily excessive. The level of earnings produced by simultaneous use of the concepts would depend upon various circumstances, such as when

the utility files for rate relief (as shown under the illustration of Methodology 3 which follows), and the size of plant held for future use relative to the utility's total capital investment.

Impact on Incidence of Cost Recovery

Rates set in Methodology 2 are subject to the same criticism as rates in Methodology 1: that is, margin reserve causes existing customers to pay for a portion of plant that exists to serve future customers. For this reason, methodologies that incorporate margin reserve adjustments do not satisfy the criterion of matching costs with cost causers.

3.1.3 Methodology 3 - Used-and-Useful Plus AFPI. Methodology 3 eliminates the margin reserve adjustment. Used-and-useful rate base is calculated as shown in Table 3.12.

Rates charged to current customers would then consist of a return on the $3,520 rate base investment and net depreciation expense on used-and-useful plant. The annual revenue requirement per ERC on which rates are based is calculated in Table 3.13. Table 3.14 incorporates the annual revenue requirement per ERC into total estimated revenues from rates over the utility's remaining growth period.

The balance of Methodology 3 is concerned with calculating AFPI charges on nonused-and-useful plant. As was done in Methodology 2, nonused-and-useful plant consists of those costs that were not included in used-and-useful plant as shown in Table 3.15. Using the cost of the qualifying asset in Table 3.15, Table 3.16 shows the calculation of unfunded expenses underlying AFPI charges.[4] Having derived unfunded

annual expenses on excess plant, Table 3.17 calculates the accrual of unfunded expenses and carrying costs over the utility's growth period. Table 3.18 divides annual amounts from Table 3.17 into month-to-date accruals. Table 3.19 then estimates total AFPI revenues based on estimated new customer growth, assuming growth occurs evenly throughout each year. Finally, Table 3.20 shows combined revenues from AFPI and rates (computed earlier) yield total revenues over three years of $6,541.40.

Impact on Rate Stability

Of the three methodologies, the revenues of Methodology 2 would best facilitate stable rates. However, comparing Methodology 2 to Methodology 3 shows that revenues attributable to margin reserve alone would not usually create a significant difference between revenues produced using either methodology. One reason is the 20 percent limitation imposed on margin reserve. A second reason is that 75 percent of the margin reserve is offset by imputed CIAC. Consequently, a margin reserve will, at best, amount to 5 percent (20 percent x 25 percent) of the balance of booked plant investment allowed in rate base. For allowable returns of less than 20 percent, the earnings on an additional 5 percent of rate base is not likely to cause a water and wastewater utility to overearn unless the company is already earning above the midpoint of its allowable range of return.[5] Since margin reserve, under current rules, does not ordinarily have a big impact on rates, its use could be eliminated on a routine basis while AFPI could be granted for nonused-and-useful plant. The margin reserve concept could be

retained for use with utilities that are able to justify a need for higher rates and lower AFPI fees.[6]

An area for regulatory concern could be the timing of cash flows under Methodology 3. If, for example, all of the first year's new customers in Methodology 1 connected on the last day of year 1, the utility would still receive $104.80 in revenues throughout the year from margin reserve. In contrast, had margin reserve been replaced by AFPI as in Methodology 3, no cash would be received until the last day of the year. However, the examples indicate that when growth occurs evenly throughout the year, the rate of cash collection is not that different regardless of whether collection is through AFPI or margin reserve. In fact, the utility in the previous examples needs to connect only six out of the anticipated twenty new customers in the first year to realize approximately the same cash flows as margin reserve would produce in the whole year.

A comparison of revenues produced under each of the three methods is shown in Table 3.21. Table 3.21 shows that margin reserve and AFPI together produce more revenues than when AFPI replaces margin reserve. However, these results are reached only when the CIAC that was previously imputed against margin reserve is added back to qualifying nonused-and-useful plant when computing the return on investment component of the AFPI fee. If CIAC that is imputed and deducted from margin reserve is not later considered in the AFPI charge, then Methodology 3 with AFPI only would have shown greater revenues than Methodology 2 with both AFPI and margin reserve.

It is true that replacing margin reserve with AFPI may increase

cash flow problems experienced by some utility companies where growth fails to occur or occurs late. Yet AFPI plus rates may also improve cash flows over rates alone for some companies.

Impact on Minimization of Customer Costs

Methodology 3 is inferior to Methodology 2 with its margin reserve adjustment for encouraging construction of larger plants. However, it seems unlikely that the availability of margin reserve alone is the critical factor between a utility's building an undersized or an efficiently sized plant.

For some utilities, plant investment decisions are not affected by FPSC ratemaking policy. Florida has many small, developer-owned utilities built to serve specific developments. Often, such developers build only the facilities that are necessary to meet the Department of Environmental Regulation's requirements for a specific area. It is likely that the building of a certain number of small utility plants with higher construction and operating costs will continue, unaffected by regulatory policy relating to used-and-useful rate base, margin reserve, and AFPI.[7]

Impact on Incidence of Cost Recovery

Methodology 3 shifts all costs associated with margin reserve to future customers while current customers do benefit from cost savings of larger plants. However, future customers eventually pay more in combined rates using margin reserve and AFPI charges (Methodology 2) than is true with AFPI alone (Methodology 3). When margin reserve is included in

rates that are in effect when future customers finally come on line, such future customers are, in effect, paying for excess capacity which no longer exists.

From a future customer's point of view, AFPI is justifiable only if rate savings from the larger plant exceed the AFPI charge. For example, per customer capital costs would be lower for a 1,000,000 GPD plant costing $700,000 than those for two 500,000 GPD plants costing $500,000 each. Assuming rates are 30 percent lower with the larger plant and that AFPI charges for the last customer connecting are $500, the question is whether the future customer would be better off if the utility builds two smaller plants as needed rather than one larger plant initially. It is important to ensure that future customers as well as current customers benefit from larger plants. Otherwise, AFPI would indeed discriminate against future customers.

3.2 Summary

The following is a summary of important points made in Chapter 3:

1. The ratemaking methodology that allows utilities to recover only costs associated with used-and-useful plant and with margin reserve is inadequate because it overcharges current customers for their share of costs while it underrecovers costs incurred by utilities in providing service. Since costs must either be paid by the customer or borne by the utility, the options are to increase costs to current customers (which is unacceptable because they already pay too much) or increase costs to future customers, which is what AFPI does.

2. The potential for overearnings caused by simultaneous use of AFPI and margin reserve depends on various factors, such as the cost of new plant relative to the total cost of plant in rate base; when the utility files for rate relief relative to

when a plant is put into service; whether the company diligently pursues price index increases; etc. Since Commission rules and policies effectively limit margin reserve to 5 percent of the cost of used-and-useful plant after imputing CIAC charges against the allowed 20 percent margin reserve (0.20 x 0.25), the impact of margin reserve in rate base on the return on investment is less than 100 basis points for rates of return less than 20 percent: 0.05 x (X < 0.20). Therefore, margin reserve is not likely to cause a company to overearn unless that company is already earning above the midpoint of its allowable range of return.[8]

3. If margin reserve is retained as a separate ratemaking concept, then clarification is needed of the handling of amounts imputed against the margin reserve to adjust for future CIAC collections. Clarification is needed as to whether those amounts should earn a return collectible through AFPI charges until the CIAC is actually collected. If no return is permitted through AFPI, then Methodology 3, which replaces margin reserve with AFPI, would produce the greatest utility revenues of the three methods reviewed in Chapter 3.

4. Under most circumstances, current Commission rules would limit margin reserve in rate base to less than 5 percent. Therefore, most companies would suffer little detriment if AFPI were calculated on all nonused-and-useful plant and margin reserve was granted only in cases of special need.

5. If growth occurs as anticipated, total cash flows using AFPI are potentially much greater than they are using used-and-useful plant and margin reserve alone.

6. Where growth projections are accurate, AFPI may significantly increase a utility's revenues. Therefore, earnings of those companies that receive AFPI may need to be reviewed on a regular basis. Furthermore, AFPI charges should be reviewed after any expenditures affecting plant life or capacity.

7. Costs versus benefits of AFPI charges should be evaluated from the perspective of different groups of future customers expected to connect to the system. The present prudency test compares the total costs and benefits of alternative sizes of plants. However, under AFPI, the last customers to

connect bear the greatest carrying costs. If rate savings from the larger plant do not offset carrying costs on excess capacity for all customers, then AFPI may discriminate against some future customers.

FOOTNOTES

1. Recall that for purposes of this report, used-and-useful and margin reserve are addressed separately

2. According to Division of Water and Wastewater staff, AFPI is granted only when it is specifically requested and the utility has undergone a recent rate base determination. Rate base is usually determined in a rate case. As of May 1989, only 29 separately certificated utilities had been granted AFPI charges in their tariffs.

3. Another approach is to assume that additional loans would have to be secured to pay loan principal and interest payments maturing on plant investment in periods prior to receipt of AFPI. Such "secondary" loans would also bear interest.

4. Unfunded means not recovered through rates or charges.

5. 0.1999 x 0.05 = 0.009995, which is less than 100 basis points. This assumes the range is equal to the midpoint plus or minus 100 basis points, the range typically used for Florida's water and wastewater utilities.

6. AFPI is presently granted only upon specific request by a utility.

7. The proliferation of new, small utilities affiliated with land development is a well documented problem in Florida and other high growth states such as California and Arizona.

8. Usually the FPSC allows a spread of 100 basis points plus or minus the authorized rate of return in the authorized range of return.

TABLE 3.1
CALCULATION OF RATE BASE FOR METHODOLOGY 1
ON DECEMBER 31, 1988

	Total	Nonused-and-Useful	Used-and-Useful
Plant at Cost	$30,000	$(18,000)	$12,000
Accumulated Depreciation (2 years x 4 percent of cost)	(2,400)	1,440	(960)
CIAC Collected from Current Customers	(8,000)	0	(8,000)
Accumulated Amortization of CIAC	480	0	480
Used-and Useful Portion			$ 3,520

Margin Reserve:

(20 percent cap x 40 ERCs = 8 ERCs / 100 ERCs for an additional 8 percent)

Plant (8 percent x $30,000)	=	$ 2,400	
Accumulated Depreciation (8 percent x $2,400)	=	(192)	
Imputation of CIAC ($200 x 8 ERCs)	=	(1,600)	
Margin Reserve Portion	=	$ 608	+ 608
Rate Base for Calculating Return on Investment		=	$ 4,128

TABLE 3.2
CALCULATION OF ANNUAL REVENUE REQUIREMENT PER ERC
(METHODOLOGY 1)

Return on Investment:			
Rate base of $4,128[a] x rate of return of 12 percent		=	$495.36
Depreciation Expense:			
Plant in rate base of $14,400[b] x 4 percent	= $576		
Less CIAC amortization of $9,600[c] x 4 percent	= (384)		
	$192	=	192.00
Annual Revenue Requirement Based on Current Customers			$687.36
Annual Revenue Requirement per ERC ($687.36 / 40)			$ 17.18

a. From Table 3.1.
b. $12,000 Used-and-Useful
+ 2,400 Margin Reserve
$14,400
c. $ 8,000 CIAC Associated with Used-and-Useful Plant
+ 1,600 CIAC Associated with Margin Reserve
$ 9,600

TABLE 3.3
CALCULATION OF ANNUAL REVENUES FROM RATES
IN YEAR 1 THROUGH YEAR 3
(METHODOLOGY 1)

Year	Average Number of ERCs for Each Year	Average Revenue per ERC per Year[a]	Total Revenues
Year 1 ending 12/31/89	50	$17.18	$ 859.00
Year 2 ending 12/31/90	70	17.18	1,202.60
Year 3 ending 12/31/91	90	17.18	1,546.20
Total Revenues over Three Years			$3,607.80

a. From Table 3.2.

TABLE 3.4
EXPENSES OF NONUSED-AND-USEFUL PLANT ABSORBED BY THE UTILITY UNDER METHODOLOGY 1 (NO AFPI IS COLLECTED)

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91	Total
Rate Base						
Plant	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	
Acc. Depr.	(1,200.00)	(2,400.00)	(3,600.00)	(4,800.00)	(6,000.00)	
CIAC	(4,000.00)	(8,000.00)	(12,000.00)	(16,000.00)	(20,000.00)	
Acc. Amort.	160.00	480.00	960.00	1,600.00	2,400.00	
Total Rate Base	$24,960.00	$20,080.00	$15,360.00	$10,800.00	$ 6,400.00	
	0.12	0.12	0.12	0.12	0.12	
ROR	$ 2,995.20	$ 2,409.60	$ 1,843.20	$ 1,296.00	$ 768.00	
Depr. Exp.	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	
Amort. Exp.	(160.00)	(320.00)	(480.00)	(640.00)	(800.00)	
Subtotal Costs	$ 4,035.20	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00	$12,912.00
Plus Interest[a]	—	469.06	874.59	1,184.05	1,404.54	3,932.24
Total Costs	$ 4,035.20	$ 3,758.66	$ 3,437.79	$ 3,040.05	$ 2,572.54	$16,844.24
Recovered through Rates on Used-and-Useful Plant	(126.40)[b]	(379.20)[b]	(859.00)[c]	(1,202.60)[c]	(1,546.20)[c]	(4,113.40)
Total Costs Absorbed by Utility Including Interest	$ 3,908.80	$ 3,379.46	$ 2,578.79	$ 1,837.45	$ 1,026.34	$12,730.84

a. See Table 3.4a.

b. Assumes utility has existing rates in effect of $12.64 from initial rates procedures before requesting a rate increase at the end of Year 2. See discussion of initial rates in Section 2.1 of Chapter 2. Initial rates were computed as follows:

Plant	$30,000	Return on Investment per ERC at 12% = $ 8.64
Accumulated Depreciation at 12/31/90	(4,800)	Annual Depreciation Expense per ERC = 12.00
Net Plant at 12/31/90	$25,200	Annual Amortization of CIAC per ERC = (8.00)
Percent used-and-useful at 12/31/90	x 80%	Annual Revenue per ERC from Initial Rates = $12.64
	$20,160	
CIAC at 12/31/90	(16,000)	
Accumulated Amortization at 12/31/90	1,600	
Rate Base at 12/31/90	$ 5,760	

c. From Table 3.3.

TABLE 3.4a
CALCULATION OF INTEREST ON EXPENSES ABSORBED BY UTILITY WHEN NO AFPI IS COLLECTED
(METHODOLOGY 1)

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91
Subtotal of Costs[a]	$ 4,035.20	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00
Less: Amounts Recovered in Rates	(126.40)	(379.20)	(859.00)	(1,202.60)	(1,546.20)
Costs Absorbed by Utility	$ 3,908.80	$ 2,910.40	$ 1,704.20	$ 653.40	$ (378.20)
Unreimbursed Costs from Previous Year	—	3,908.80	7,288.26	9,867.05	11,704.50
Interest on Loans to Meet Unreimbursed Costs (at 12 percent)	—	469.06	874.59	1,184.05	1,404.54

a. From Table 3.4.

TABLE 3.5
CALCULATION OF COST OF QUALIFYING ASSET FOR AFPI CHARGE
(METHODOLOGY 2)

Total Plant	$30,000	
Less: Used-and-useful portion (12,000 + 2,400)	(14,400)	
Nonused-and-Useful Plant		$15,600
Accumulated Depreciation - Total	$(2,400)	
Less: Portion Associated with Used-and-Useful Plant (960 + 192)	1,152	
Nonused-and-Useful Accumulated Depreciation		(1,248)
Plant Included in Margin Reserve but Offset Against Imputed CIAC		1,600
Total Nonused-and-Useful Plant to Calculate ROI		$15,952

TABLE 3.6
ANNUAL UNFUNDED DEPRECIATION EXPENSE AND UNFUNDED RETURN
ON NONUSED-AND-USEFUL PLANT (METHODOLOGY 2)

Number of Future ERCs = 60
Unfunded Annual Depreciation Expense:
4% x 3,600[a] = $144 / 60 ERCs = $2.40 per ERC
Unfunded ROI:
0.12 x 15,952[b] = $1,914.24 / 60 ERCs = $31.90 per ERC

a. Nonused-and-Useful Plant $15,600
Future CIAC: 60 x $200 = (12,000)
Depreciable Balance $ 3,600
b. From Table 3.5.

TABLE 3.7
CALCULATION OF CARRYING COSTS PER ERC PER YEAR (METHODOLOGY 2)

	Year 1 1989	Year 2 1990	Year 3 1991
Unfunded Expenses:			
Unfunded Annual Depreciation[a]	$ 2.40	$ 2.40	$ 2.40
Total Unfunded Expense	2.40	4.80	7.20
Unfunded Returns:			
1. Return on Expense of Current Year[b]	0.14[c]	0.29	0.29
2. Return on Expenses of Prior Year	0.00	0.14	0.43
3. Return on Qualifying Asset Current Year[a]	31.90	30.53	29.15
4. Earnings from Prior Year[d]	0.00	31.90	66.40
5. Compound Earnings from Prior Year[e]	0.00	3.83	7.97
Revenue Required to Fund Earnings and Interest[f]	$ 31.90	$ 66.40	$103.95
Revenue Required to Fund Expenses	2.40	4.80	7.20
Total Revenue Required	$ 34.30	$ 71.20	$111.15

a. From Table 3.6.
b. Calculated at company's 12 percent rate of return.
c. In Year 1, only 1/2 year's return is taken.
d. Includes prior year amounts from lines 2 through 5.
e. Equals prior year's earnings from line 4 times the company's 12 percent rate of return.
f. Equals lines 2 through 5 above.

TABLE 3.8
CONVERSION OF ANNUAL CARRYING COSTS PER ERC INTO
MONTHLY AFPI CHARGES
(METHODOLOGY 2)

	Year 1 - 1989 $34.30 / 12 = $2.86 per Month	Year 2 - 1990 $71.20-$34.30 / 12 = $3.08 per Month	Year 3 - 1991 $111.15-$71.20 / 12 = $3.33 per Month
JAN	$ 2.86	$ 37.38	$ 74.53
FEB	5.72	40.46	77.86
MAR	8.58	43.54	81.19
APR	11.44	46.62	84.52
MAY	14.30	49.70	87.85
JUN	17.16	52.78	91.18
JUL	20.02	55.86	94.51
AUG	22.88	58.94	97.84
SEP	25.74	62.02	101.17
OCT	28.60	65.10	104.50
NOV	31.46	68.08	107.83
DEC	34.30[a]	71.20[a]	111.15[a]

a. Columns do not total due to rounding. Source of December charges is Table 3.7.

TABLE 3.9
CALCULATION OF REVENUES FROM AFPI
IN YEAR 1 THROUGH YEAR 3
(METHODOLOGY 2)

Year	New ERCs per Year		Average AFPI Fee for the Year[a]		Total AFPI Revenues
Year 1 ending 12/31/89	20	x	$ 17.16	=	$ 343.20
Year 2 ending 12/31/90	20	x	52.78	=	1,055.60
Year 3 ending 12/31/91	20	x	91.18	=	1,823.60
					$3,222.40

a. From Table 3.8: June Fee.

TABLE 3.10
CALCULATION OF TOTAL REVENUES USING BOTH
MARGIN RESERVE AND AFPI
(METHODOLOGY 2)

Year	Total Revenues from Rates[a] (Table 3.3)	Total Revenues from AFPI (Table 3.9)	Total Revenues from All Sources
Year 1 ending 12/31/89	$ 859.00	$ 343.20	$ 1,202.20
Year 2 ending 12/31/90	1,202.60	1,055.60	2,258.20
Year 3 ending 12/31/91	1,546.20	1,823.60	3,369.80
Totals	$3,607.80	$3,222.40	$6,830.20

a. Based on a rate base composed of used-and-useful property and margin reserves.

TABLE 3.11
EXPENSES OF NONUSED-AND-USEFUL PLANT ABSORBED BY THE UTILITY WHEN AFPI COLLECTIONS ARE BEGUN IN YEAR 3 (METHODOLOGY 2)

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91	Total
Rate Base						
Plant	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	
Acc. Depr.	(1,200.00)	(2,400.00)	(3,600.00)	(4,800.00)	(6,000.00)	
CIAC	(4,000.00)	(8,000.00)	(12,000.00)	(16,000.00)	(20,000.00)	
Acc. Amort.	160.00	480.00	960.00	1,600.00	2,400.00	
Total Rate Base	$24,960.00	$20,080.00	$15,360.00	$10,800.00	$ 6,400.00	
	0.12	0.12	0.12	0.12	0.12	
ROR	$ 2,995.20	$ 2,409.60	$ 1,843.20	$ 1,296.00	$ 768.00	
Depr. Exp.	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	
Amort. Exp.	(160.00)	(320.00)	(480.00)	(640.00)	(800.00)	
Subtotal Costs	$ 4,035.20	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00	$12,912.00
Plus Interest[a]	—	469.06	874.59	1,142.86	1,231.74	3,718.25
Total Costs	$ 4,035.20	$ 3,758.66	$ 3,437.79	$ 2,998.86	$ 2,399.74	$16,630.25
Recovered through Rates on Used-and-Useful Plant and AFPI	(126.40)[b]	(379.20)[b]	(1,202.20)[c]	(2,258.20)[c]	(3,369.80)[c]	(7,335.80)
Total Costs Absorbed by Utility Including Interest	$ 3,908.80	$ 3,379.46	$ 2,235.59	$ 740.66	$ (970.06)	$ 9,294.45

a. See Table 3.11a.

b. Assumes utility has existing rates in effect of $12.64 from initial rates procedures before requesting a rate increase at the end of Year 2. See discussion of initial rates in Section 2.1 of Chapter 2. Initial rates were computed as follows:

Plant	$30,000	Return on Investment per ERC at 12% = $ 8.64
Accumulated Depreciation at 12/31/90	(4,800)	Annual Depreciation Expense per ERC = 12.00
Net Plant at 12/31/90	$25,200	Annual Amortization of CIAC per ERC = (8.00)
Percent used-and-useful at 12/31/90	x 80%	Annual Revenue per ERC from Initial Rates = $12.64
	$20,160	
CIAC at 12/31/90	(16,000)	
Accumulated Amortization at 12/31/90	1,600	
Rate Base at 12/31/90	$ 5,760	

c. From Table 3.10.

TABLE 3.11a
CALCULATION OF INTEREST ON EXPENSES ABSORBED BY UTILITY
WHEN AFPI IS COLLECTED BEGINNING IN YEAR 3
(METHODOLOGY 2)

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91
Subtotal of Costs[a]	$ 4,035.00	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00
Less: Amounts Recovered in Rates[b]	(126.40)	(379.20)	(1,202.20)	(2,258.20)	(3,369.80)
Costs Absorbed by Utility	$ 3,908.80	$ 2,910.40	$ 1,361.00	$ (402.20)	$(2,201.80)
Unreimbursed Costs from Previous Year	—	3,908.80	7,288.26	9,523.85	10,264.51
Interest on Loans to Meet Unreimbursed Costs (at 12 percent)	—	469.06	874.59	1,142.86	1,231.74

a. From Table 3.4.
b. From Table 3.11.

TABLE 3.11b
ANNUAL UNFUNDED DEPRECIATION EXPENSE AND UNFUNDED RETURN
ON NONUSED-AND-USEFUL PLANT BALANCE AT JANUARY 1, 1987
(METHODOLOGY 2 WITH AFPI CALCULATED FROM PLANT IN-SERVICE DATE)

Number of ERCs 60
Unfunded Annual Depreciation:
4% x $10,000[a] = $400.00 / 100 ERCs = $ 4.00 per ERC
Annual Return on Investment
$30,000 x 12% = $3,600.00 / 100 ERCs = $36.00 per ERC

a. Depreciation Expense Portion:

Total Plant	$30,000
Less: CIAC from Future Customers	(20,000)
Total Depreciable Plant for Computing Depreciation Expense	$10,000

TABLE 3.11c
CALCULATION OF CARRYING COSTS PER ERC PER YEAR (METHODOLOGY 2 WITH AFPI CALCULATED FROM PLANT IN-SERVICE DATE)

	Year 1 1987	Year 2 1988	Year 3 1989	Year 4 1990	Year 5 1991
Unfunded Expenses:					
Unfunded Annual Depreciation[a]	$ 4.00	$ 4.00	$ 4.00	$ 4.00	$ 4.00
Total Unfunded Expense	4.00	8.00	12.00	16.00	20.00
Unfunded Returns:					
1. Return on Expense of Current Year[b]	0.24[c]	0.48	0.48	0.48	0.48
2. Return on Expenses of Prior Year	0.00	0.24	0.72	1.20	1.68
3. Return on Qualifying Asset Current Year[a]	36.00	34.56	33.12	31.68	30.24
4. Earnings from Prior Year[d]	0.00	36.00	75.12	117.97	165.01
5. Compound Earnings from Prior Year[e]	0.00	4.32	9.01	14.16	19.80
Revenue Required to Fund Earnings[f]	$ 36.00	$ 75.12	$117.97	$165.01	$216.73
Revenue Required to Fund Expenses	4.00	8.00	12.00	16.00	20.00
Total Revenue Required	$ 40.00	$ 83.12	$129.97	$181.01	$236.73

a. From Table 3.11b.
b. Calculated at company's 12 percent rate of return.
c. In Year 1, only 1/2 year's return is taken.
d. Includes prior year amounts from lines 2 through 5.
e. Equals prior year's earnings from line 4 times the company's 12 percent rate of return.
f. Equals lines 2 through 5 above.

TABLE 3.11d
CONVERSION OF ANNUAL CARRYING COSTS PER ERC INTO MONTHLY AFPI CHARGES (METHODOLOGY 2 WITH AFPI CALCULATED FROM PLANT IN-SERVICE DATE)

	Year 1 - 1987 $40.00 / 12 = $3.33 per Month	Year 2 - 1988 $83.12-$40.00 / 12 = $3.59 per Month	Year 3 - 1989 $129.97-$83.12 / 12 = $3.90 per Month	Year 4 - 1990 $181.01-$129.97 / 12 = $4.25 per Month	Year 5 - 1991 $236.73-$181.01 / 12 = $4.65 per Month
JAN	$ 3.33	$ 43.59	$ 87.02	$134.22	$185.66
FEB	6.66	47.18	90.92	138.47	190.31
MAR	9.99	50.77	94.82	142.72	194.96
APR	13.32	54.36	98.72	146.97	199.61
MAY	16.65	57.95	102.62	151.22	204.26
JUN	19.98	61.54	106.52	155.47	208.91
JUL	23.31	65.13	110.42	159.72	213.56
AUG	26.64	68.72	114.32	163.97	218.21
SEP	29.97	72.31	118.22	168.22	222.86
OCT	33.30	75.90	122.12	172.47	227.51
NOV	36.63	79.49	126.02	176.72	232.16
DEC	40.00[a]	183.12[a]	129.97[a]	181.01[a]	236.73[a]

a. Columns do not total due to rounding. Source of December charges is Table 3.11c

TABLE 3.11e
CALCULATION OF REVENUES FROM AFPI IN YEAR 1 THROUGH YEAR 5 (METHODOLOGY 2 WITH AFPI COLLECTED BEGINNING WITH PLANT'S FIRST YEAR OF OPERATIONS)

Year	New ERCs per Year		Average AFPI Fee for the Year[a]		Total AFPI Revenues
Year 1 ending 12/31/87	20	x	$ 19.98	=	$ 399.60
Year 2 ending 12/31/88	20	x	61.54	=	1,230.80
Year 3 ending 12/31/89	20	x	106.52	=	2,130.40
Year 4 ending 12/31/90	20	x	155.47	=	3,109.40
Year 5 ending 12/31/91	20	x	208.91	=	4,178.20
					$11,048.40

a. From Table 3.11d: June Fee.

TABLE 3.11f
CALCULATION OF TOTAL REVENUES UNDER METHODOLOGY 2 HAD AFPI BEEN COLLECTED FROM PLANT IN-SERVICE DATE

Year	Revenues from Initial Rates[a]	Revenues from Rates in 12/31/88 Rate Case[b]	Revenues from AFPI[c]	Totals
Year 1 ending 12/31/87	$126.40		$ 399.60	$ 526.00
Year 2 ending 12/31/88	379.20		1,230.80	1,610.00
Year 3 ending 12/31/89		$ 859.00	2,130.40	2,989.40
Year 4 ending 12/31/90		1,202.60	3,109.40	4,312.00
Year 5 ending 12/31/91		1,546.20	4,178.20	5,724.40
	$505.60	$3,607.80	$11,048.40	$15,161.80

a. From Table 3.11.
b. From Table 3.3.
c. From Table 3.11e.

TABLE 3.11g
EXPENSES OF NONUSED-AND-USEFUL PLANT ABSORBED BY THE UTILITY UNDER METHDOLOGY 2 WHEN AFPI IS COLLECTED BEGINNING IN YEAR 1

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91	Total
Rate Base						
Plant	$30,000.00	$30,000.00	$30,000.00	$30,000.00	$30,000.00	
Acc. Depr.	(1,200.00)	(2,400.00)	(3,600.00)	(4,800.00)	(6,000.00)	
CIAC	(4,000.00)	(8,000.00)	(12,000.00)	(16,000.00)	(20,000.00)	
Acc. Amort.	160.00	480.00	960.00	1,600.00	2,400.00	
Total Rate Base	$24,960.00	$20,080.00	$15,360.00	$10,800.00	$ 6,400.00	
	0.12	0.12	0.12	0.12	0.12	
ROR	$ 2,995.20	$ 2,409.60	$ 1,843.20	$ 1,296.00	$ 768.00	
Depr. Exp.	1,200.00	1,200.00	1,200.00	1,200.00	1,200.00	
Amort. Exp.	(160.00)	(320.00)	(480.00)	(640.00)	(800.00)	
Subtotal Costs	$ 4,035.20	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00	$12,912.00
Plus Interest[a]	—	421.10	622.04	645.54	428.29	2,116.97
Total Costs	$ 4,035.20	$ 3,710.70	$ 3,185.24	$ 2,501.54	$ 1,596.29	$15,028.97
Recovered through Rates on Used-and-Useful Plant[b]	(526.00)[c]	(1,610.00)[c]	(2,989.40)	(4,312.00)	(5,724.40)	(15,161.80)
Total Costs Absorbed by Utility Including Interest	$ 3,509.20	$ 2,100.70	$ 195.84	$(1,810.46)	$(4,128.11)	$ (132.83)

a. See Table 3.11h.
b. From Table 3.11f.
c. Assumes utility has existing rates in effect of $12.64 from initial rates procedures before requesting a rate increase at the end of Year 2. See discussion of initial rates in Section 2.1 of Chapter 2. Initial rates were computed as follows:

Plant	$30,000
Accumulated Depreciation at 12/31/90	(4,800)
Net Plant at 12/31/90	$25,200
Percent used-and-useful at 12/31/90	x 80%
	$20,160
CIAC at 12/31/90	(16,000)
Accumulated Amortization at 12/31/90	1,600
Rate Base at 12/31/90	$ 5,760

Return on Investment per ERC at 12% = $ 8.64
Annual Depreciation Expense per ERC = 12.00
Annual Amortization of CIAC per ERC = (8.00)
Annual Revenue per ERC from Initial Rates = $12.64

TABLE 3.11h
CALCULATION OF INTEREST ON EXPENSES ABSORBED BY UTILITY WHEN AFPI IS COLLECTED FROM YEAR 1

	Year 1 12-31-87	Year 2 12-31-88	Year 3 12-31-89	Year 4 12-31-90	Year 5 12-31-91
Subtotal of Costs[a]	$ 4,035.20	$ 3,289.60	$ 2,563.20	$ 1,856.00	$ 1,168.00
Less: Amounts Recovered in Rates and AFPI[b]	(526.00)	(1,610.00)	(2,989.40)	(4,312.00)	(5,724.40)
Costs Absorbed by Utility	$ 3,509.20	$ 1,679.60	$ (426.20)	$(2,456.00)	$(4,689.23)
Unreimbursed Costs from Previous Year	—	3,509.20	5,183.70	5,379.54	3,569.08
Interest on Loans to Meet Unreimbursed Costs (at 12 percent)	—	421.10	622.04	645.54	428.29

a. From Table 3.4.
b. From Table 3.11g.

TABLE 3.12
CALCULATION OF USED-AND-USEFUL RATE BASE ON DECEMBER 31, 1988 (EXCLUDES MARGIN RESERVE) (METHODOLOGY 3)

	Total	Nonused-and-Useful	Used-and-Useful
Plant	$ 30,000	$(18,000)	$ 12,000
Accumulated Depreciation	(2,400)	1,440	(960)
CIAC	(8,000)	0	(8,000)
Accumulated Amortization	480	0	480
Total Used-and-Useful Rate Base			$ 3,520

TABLE 3.13
CALCULATION OF ANNUAL REVENUE REQUIREMENT PER ERC
(METHODOLOGY 3)

Return on Investment:

Rate Base of $3,520[a] x ROR of 12% = $422.40 / 40 ERCs = $10.56 per ERC

Depreciation Expense:

$12,000 x 4% = $480 Depreciation Expense
8,000 x 4% = (320) Amortization Expense

$160 Net Depreciation Expense / 40 ERCs = $ 4.00 per ERC

Total Revenue Requirement per ERC $14.56

a. From Table 3.12.

TABLE 3.14
CALCULATION OF TOTAL RATE REVENUES
IN YEAR 1 THROUGH YEAR 3
(METHODOLOGY 3)

	Average Number of Current ERCS		Annual Rate Revenue per ERC per Year[a]		Total Revenue from Rates
Year 1 ending 12/31/89	50	x	14.56	=	$ 728.00
Year 2 ending 12/31/90	70	x	14.56	=	1,019.20
Year 3 ending 12/31/91	90	x	14.56	=	1,310.40
Total Rate Revenues				=	$3,057.60

a. From Table 3.13.

TABLE 3.15
CALCULATION OF COST OF QUALIFYING ASSET
FOR AFPI CHARGE
(METHODOLOGY 3)

ROI Portion:	
Total Plant	$ 30,000
Less: Used-and-Useful Portion[a]	(12,000)
Nonused-and-Useful Portion	$ 18,000
Less: Nonused-and-Useful Accumulated Depreciation	1,440
Cost of Qualifying Asset	$ 16,560
Depreciation Expense Portion:	
Total Nonused-and-Useful Portion	$ 18,000
Less: CIAC Collectible from Future Customers (60 x 200)	(12,000)
Depreciable Portion of Plant Held for Future Use	$ 6,000

a. From Table 3.12.

TABLE 3.16
ANNUAL UNFUNDED DEPRECIATION EXPENSE AND
UNFUNDED RETURN ON NONUSED-AND-USEFUL PLANT
(METHODOLOGY 3 - AFPI REPLACES MARGIN RESERVE)

Number of ERCs 60

Unfunded Annual Depreciation:

4% x $6,000[a] = $240.00 / 60 ERCs = $ 4.00 per ERC

Annual Return on Investment

$16,560[a] x 12% = $1,987.20 / 60 ERCs = $33.12 per ERC

a. From Table 3.15.

TABLE 3.17
CALCULATION OF CARRYING COSTS
PER ERC PER YEAR
(METHODOLOGY 3)

	Year 1 12/31/89	Year 2 12/31/90	Year 3 12/31/91
Unfunded Expenses:			
Unfunded Annual Depreciation[a]	$ 4.00	$ 4.00	$ 4.00
Total Unfunded Expense	4.00	8.00	12.00
Unfunded Returns:			
1. Return on Expense of Current Year[b]	0.24[c]	0.48	0.48
2. Return on Expenses of Prior Year	0.00	0.24	0.72
3. Return on Qualifying Asset Current Year[a]	33.12	31.68	30.24
4. Earnings from Prior Year[d]	0.00	33.12	69.01
5. Compound Earnings from Prior Year[e]	0.00	3.97	8.28
Revenue Required to Fund Earnings[f]	$ 33.12	$ 69.01	$108.25
Revenue Required to Fund Expenses	4.00	8.00	12.00
Total Revenue Required	$ 37.12	$ 77.01	$120.25

a. From Table 3.16.
b. Calculated at company's 12 percent rate of return.
c. In Year 1, only 1/2 year's return is taken.
d. Includes prior year amounts from lines 2 through 5.
e. Equals prior year's earnings from line 4 times the company's 12 percent rate of return.
f. Equals lines 2 through 5 above.

TABLE 3.18
CONVERSION OF ANNUAL CARRYING COSTS PER ERC INTO
MONTHLY AFPI CHARGES
(METHODOLOGY 3)

	Year 1 1989 $37.12 / 12 = $3.09 per month	Year 2 1990 $77.01 - $37.12 / 12 = $3.32 per month	Year 3 1991 $120.25 - $77.01 / 12 = $3.60 per month
JAN	$ 3.09	$ 40.44	$ 80.61
FEB	6.18	43.76	84.21
MAR	9.27	47.08	87.81
APR	12.36	50.40	91.41
MAY	15.45	53.72	95.01
JUN	18.54	57.04	98.61
JUL	21.63	60.36	102.21
AUG	24.72	63.68	105.81
SEP	27.81	67.00	109.41
OCT	30.90	70.32	113.01
NOV	33.99	73.64	116.61
DEC	37.12[a]	77.01[a]	120.25[a]

a. Source of December charges is Table 3.17.

TABLE 3.19
CALCULATION OF REVENUES FROM AFPI
IN YEAR 1 THROUGH YEAR 3
(METHODOLOGY 3)

Year	New ERCs		AFPI Fee[a]		Total AFPI Revenues
Year 1 ending 12/31/89	20	x	$ 18.54	=	$ 370.80
Year 2 ending 12/31/90	20	x	57.04	=	1,140.80
Year 3 ending 12/31/91	20	x	98.61	=	1,972.20
					$3,483.80

a. Assuming new customers connect evenly throughout the year, the average AFPI charge would be approximated by June's figures from Table 3.18 of $18.54 for Year 1, $57.04 for Year 2, and $98.61 for Year 3.

TABLE 3.20
CALCULATION OF TOTAL REVENUES FROM RATES AND AFPI
(METHODOLOGY 3)

Year	Total Revenues from Rates[a,b]	Total Revenues from AFPI[c]	Total Revenues from All Sources
Year 1 ending 12/31/89	$ 728.00	$ 370.80	$1,098.80
Year 2 ending 12/31/90	1,019.20	1,140.80	2,160.00
Year 3 ending 12/31/91	1,310.40	1,972.20	3,282.60
Totals	$3,057.60	$3,483.80	$6,541.40

a. Based on used-and-useful property excluding margin reserve.
b. Total Revenues from Rates: See Table 3.14.
c. Total Revenues from AFPI: See Table 3.19.

TABLE 3.21
SUMMARY OF TOTAL REVENUES UNDER
METHODOLOGIES 1, 2, AND 3

Year	Used-and-Useful Plus Margin Reserve Methodology 1[a]	Used-and-Useful Plus Margin Reserve and AFPI Methodology 2[b]	Used-and-Useful Plus AFPI Methodology 3[c]
Year 1 ending 12/31/89	$ 859.00	$1,202.20	$1,098.80
Year 2 ending 12/31/90	1,202.60	2,258.20	2,160.00
Year 3 ending 12/31/91	1,546.20	3,369.80	3,282.60
Totals	$3,607.80	$6,830.20	$6,541.40

a. See Table 3.3.
b. See Table 3.10.
c. See Table 3.20.

CHAPTER 4
SURVEY RESULTS: ALTERNATIVES TO CURRENT DEFINITION OF USED-AND-USEFUL RATE BASE FOR RATEMAKING

This chapter summarizes responses to two surveys regarding alternatives to Florida's current definition of used-and-useful rate base. Selected Florida water and wastewater utilities were surveyed regarding the FPSC's current treatment of nonused-and-useful plant and the three concepts which are employed in providing for recovery of carrying costs on nonused-and-useful plant. Twenty other state regulatory agencies were also surveyed to determine if alternatives to used-and-useful rate base are being used for ratemaking in other states.

4.0 Responses to the Survey of Florida Water and Wastewater Utilities

Surveys were sent to a sample of forty-six of the water and wastewater utilities in the state to assess industry reactions regarding FPSC treatment of nonused-and-useful plant. Seventeen utilities responded to the survey.[1] Survey responses included suggested revisions to current FPSC ratemaking treatments and suggested alternatives to existing FPSC procedures. Four utility suggestions are summarized and discussed in this section.

1. Margin reserve should be increased. Ten out of seventeen utilities responding to the survey thought that margin reserve should be increased. Some utilities suggested it should be increased by increasing the allowed twelve-month growth period to eighteen months. The longer

the growth period, the more customers there will be to serve and the larger the margin reserve needed to serve those customers.

Another way suggested to increase margin reserve was to add a "design margin," in addition to margin reserve, to used-and-useful plant to meet peak demands. However, a design margin is already built into the used-and-useful calculation via the reserve margin.

Still another suggestion by utilities was to remove the 20 percent cap currently imposed on margin reserve when it is justified by a utility's unusually strong demand growth rate.[2] There is nothing sacred about the 20 percent limitation on margin reserve. It could be 30 percent or 40 percent, and rates would increase accordingly. If rates could be increased and still remain comparable to those of neighboring utilities, a larger margin reserve might be acceptable to ratepayers. More likely though, increasing the cap on margin reserve would lead to rate shock in some cases, particularly where growth was strong. Consider an example of a utility that is 40 percent used-and-useful and has a 25 percent growth rate. Absent the margin reserve cap, rate base would include 50 percent of plant costs.[3] Furthermore, fast growth implies a short time between initial operations and provision of service to a capacity customer base which means the utility would experience smaller losses during its start-up period.

Finally, it was suggested that imputed future CIAC should not offset margin reserve since the utility incurs interest or equity costs on plant investment until CIAC is collected.

Each of these suggestions would have the same result: each would increase the amount of future use plant in rate base, thereby increasing

utility revenues from current customers.

2. The period of time used to compute AFPI should be lengthened. AFPI is composed of carrying costs on nonused-and-useful plant and associated interest compounded over the subsequent five years after a plant begins operation. One utility suggested that the calculation of AFPI for plants with excess capacity should include a growth period of longer than five years. Commission staff had no objection to this recommendation provided the utility could show that a longer growth period and larger plant would minimize customer costs. However, staff added that, to date, no one has convincingly demonstrated that a planning period beyond five years is optimal.

3. The amount of plant cost considered used-and-useful should be no less than the cost of the smallest plant that could reasonably be expected to serve the existing customer population. Six utilities suggested this or a similar alternative to current used-and-useful adjustments. Under this version, if a 100,000 gallons-per-day plant costing $400,000 could be built to serve an existing demand of 100,000 gallons-per-day and a 200,000 gallons-per-day plant could be built for $600,000, then $400,000 of the cost of the larger plant, if constructed, would be considered used-and-useful. This proposal would give savings from economies of scale to utility investors. Early customers would pay the same rates for a large plant, with a lower per unit cost because of economies of scale, that they would have paid for a smaller plant having a higher per unit cost. However, rates set in rate proceedings after the customer base has reached capacity would be lower for the larger plant than would be possible with the smaller plant.

We agree that this alternative has merit in that it provides utilities with incentives to build for long-run cost minimization. However, it also increases rates of current customers above the level which would occur if the larger plant was constructed but customers were charged on a cost per unit basis with adjustment for margin reserve. FPSC staff are open to alternative regulatory treatments in which both customers and utilities share benefits from cost-efficient plants. An acceptable alternative would result in rates somewhere between rates under current used-and-useful ratemaking methodologies and rates applicable to an alternative, smaller plant under current used-and-useful ratemaking methodologies. Assuming it had been determined that a larger plant was the more prudent option, it would then be possible to determine the annual revenue requirement differential between the smaller plant and the used-and-useful portion of the larger plant and divide these savings between customers and utilities. This option would reward utilities for part of the costs of initially building more capacity. At the same time, customers would enjoy lower rates than would be possible with a smaller plant.

One problem with the above approach would be potential overearnings. While margin reserve under established policies and procedures is not likely to constitute a very significant portion of rate base, an alternative similar to that discussed above could result in significant additions to rate base. The associated increases in rates, coupled with AFPI charges, could result in utility overearnings.

4. The Commission should adopt procedures to determine in advance the kind of ratemaking treatment to be given a proposed plant. To say in

advance of construction how specific utility plant costs would be treated for ratemaking purposes would be inappropriate. Although a new water or wastewater utility must obtain a certificate to operate from the Commission, the certification process does not involve a review of the propriety of the type or size of the plant the utility has built or plans to build. Instead, Commission staff usually focus on preventing duplication of service provided by an existing utility while accepting the accuracy of growth and projected usage figures supplied by the applicant for a certificate. Furthermore, in the event that the utility's initial construction cost estimates were not accurate and cost overruns occurred, the Commission would exercise its authority to disallow from rate base imprudently incurred costs.

4.1 Responses to Survey of Other State Regulatory Commissions

To compare Florida's rate base methodologies with those of other states, questionnaires were sent to a sample of twenty state regulatory commissions to determine how each commission establishes rate base for its investor-owned water and wastewater companies.[4] Sixteen (80 percent) of the twenty states contacted responded to the survey. The following discussion summarizes these responses and compares their methodologies to Florida policies.

1. Used-and-Useful Adjustments in Other States. Section 367.081 (2), Florida Statutes, states that rates are to be based on a fair return on the investment in property that is used-and-useful in the public service. Although Florida has no specific legal definition for used-and-useful plant, the general definition described in Chapter 2 has

evolved on a case-by-case basis.[5] The survey of state commissions attempted to determine if rate base methodologies had developed differently in other states, in what way they were different, and why. The objective was to see if Florida could draw from practices of other states to improve its ratemaking practices.

Twelve out of sixteen respondent states indicated that, like Florida, they do make some form of used-and-useful adjustments to plant allowed in rate base when such plant is in excess of the needs of current customers. Methodologies for determining current needs of existing customers varied.

For example, California sometimes considers current needs to include a minimum of the cost of the smallest size plant capable of serving current customers. As noted earlier, a similar alternative to the existing used-and-useful methodology was suggested by Florida utilities. Using this method, all scale savings of the larger plant could accrue to the utility's stockholders because the initial customers would pay the same rates they would have paid with a smaller plant. Although initial customers would pay higher rates associated with a smaller plant, subsequent rate proceedings with the full customer base in place would result in lower rates than would have been the case had a second smaller plant been built due to the lower per customer capital costs of the larger plant. The option has merit and could be a useful tool for plants in new developments. When utilities are expanding in existing areas, AFPI may be a more useful option to avoid rate shock to existing customers.

As another example of used-and-useful adjustments, Mississippi

determines used-and-useful plant by multiplying the percentage utilization, the ratio of customers actually served to the potential number of customers that can be served, by the cost of plant in service. Yet another state, Pennsylvania, imputes revenues from future customers against the total revenue requirement to arrive at revenues collectible from current customers. Pennsylvania has also, on one occasion, used an industry average plant investment per customer to derive an excess capacity adjustment.

While specific calculations for used-and-useful plant vary between states, most of the methods produce a percentage utilization figure such as current customers to total customer capacity, current flows to capacity flows, or current revenues to total revenues at capacity. The concept of what constitutes used-and-useful plant appears to be very consistent from state to state: a portion of plant, the cost of which should be recovered from current customers. Also, though armed with a general methodology, most of the states surveyed approach used-and-useful adjustments on a case-by-case basis, as does Florida.

Some differences were noted in growth allowances for used-and-useful plant in other states. For example, Pennsylvania's calculation of used-and-useful plant includes a margin for growth of up to six months beyond the test year end. In contrast, recall Florida's growth margin (or margin reserve) extends up to eighteen months beyond the test year end. Texas, on the other hand, sometimes considers two years' growth potential as acceptable. Although the New York Department of Public Service does not recognize the concept of margin reserve, its inclusion of future use plant in rate base would result in more plant in

rate base than would be allowed in Florida using margin reserve.[6] Due to diverse regulatory environments, it is difficult to establish definitive explanations for apparent differences between applications of growth allowances in other states.

Six respondents said they do not commonly make used-and-useful adjustments, primarily because the need for such adjustments was rare. West Virginia reported that all of its investor-owned water and wastewater utilities are fairly mature with established customer bases, and New Jersey also claimed to have mostly mature utilities and thus no need for used-and-useful adjustments.[7] Louisiana said that many of its investor-owned water and wastewater companies are small and there is often little rate base left to allocate between present and future customers.[8] The growth of Illinois' water and wastewater industry has peaked. Consequently, new and expanding utilities are rarely encountered. New York indicated that it does not make used-and-useful adjustments for additions to existing systems since future use plant is allowed in rate base. Its use of forecast test years and forecast customer bases, however, achieves an effect similar to initial ratesetting procedures. Finally, South Carolina has so few water and wastewater utilities with a rate base that rates are now calculated using an operating margin.[9]

Thus, the survey revealed that most other states surveyed are making used-and-useful adjustments similar to those made in Florida where such adjustments are necessary to avoid excessive rates to current customers. These adjustments usually include a margin for growth which is expected to occur in the period immediately following the test year

end. New York was an exception in that it does not define used-and-useful to take into account the degree to which plant is utilized. However, its use of forecast test year costs and forecast customer populations would achieve results similar to the used-and-useful practices of other states. Other states that do not make used-and-useful adjustments appear to have different water and wastewater industry profiles rather than different regulatory philosophies. Specifically, these states have no new and growing utilities with significant amounts of nonused-and-useful plant.

2. AFPI in Other States. None of the respondents permit accumulation of current costs associated with nonused-and-useful plant for recovery from future customers when they connect to the system. The most frequently cited reason for not using AFPI was that the concept had never been suggested. For those states who reported little need for excess capacity adjustments, AFPI would not be an issue because any future use plant included in rate base would have only a minimal impact on rates. Other states in the survey said that municipalities in their states have taken a more active role in providing water and wastewater service than is true in Florida. Consequently, they have considerably fewer investor-owned water and wastewater utilities to regulate and fewer reasons to delve into associated regulatory issues.

Additional comments on AFPI were offered by some states. New York said that Florida's AFPI charge may fail to provide the cash flow necessary to meet current debt service requirements since growth may fail to materialize or growth may occur too late. Thus, New York did not consider AFPI an adequate means to provide cost recovery to water and

wastewater utilities. Yet, unless no growth occurs, the cash flow from AFPI and rates could exceed that of the cash flow recovered through rates alone. Texas indicated that developer-controlled utilities often do not request full recovery on utility plant in order to keep rates down and encourage sales in the development. These utilities would probably not be interested in collecting an AFPI charge from new customers, since their immediate objective is to make water and wastewater services appear to be inexpensive to facilitate lot sales. Specifically, AFPI increases the initial dollar outlay required to obtain new service and may make new development lot prices appear unattractive. FPSC staff suggested this as a possible reason some of Florida's utilities have reacted negatively to AFPI fees.

3. Alternatives to Used-and-Useful Concepts. Two states, North Carolina and South Carolina, use an alternative ratemaking technique that calculates a return on operating expenses rather than a return on used-and-useful rate base. Both of these states have numerous companies with small rate bases remaining after CIAC collections and net operating losses. A return on rate base would yield little income for company owners so the operating margin method was adopted to provide these companies with sufficient funds to operate.

Under the operating margin method, the revenue requirement consists of operating expenses and a return on operating expenses increased to include applicable taxes. The operating margin method would be inappropriate for new company ratesetting unless operating expenses, such as depreciation and property taxes on excess plant, were adjusted out of the revenue requirement. Since a determination of

percentage utilization of plant is inevitable under the operating margin method as well as the used-and-useful rate base method, the operating margin method is not an alternative to used-and-useful rate base concepts.

The operating margin method also ignores the fact that a utility should not continue to have debt service obligations, interest expense, or an equity balance when it has no rate base. Presumably, past CIAC collections, which reduce rate base to near zero, were used to retire debt and equity.

4.2 Summary

The utilities surveyed suggested a number of revisions to current FPSC ratemaking treatments and suggested alternatives to existing FPSC procedures. Larger growth allowances in rate base was the most frequently recommended revision. Yet increasing rate base means placing a larger share of the costs of future use plant on current customers.

Some utilities proposed an approach in which cost savings from larger plants would not flow directly to initial customers since initial rates would be based on the costs which would have been incurred had a smaller plant been constructed. Provided the proposal is modified to distribute cost savings equally to utilities and initial customers, the approach has some merit.

Other state regulatory commissions generally use rate base methodologies which employ used-and-useful concepts that are similar to Florida's. The exceptions are those states where utility growth has peaked and there are few utilities with significant amounts of nonused-and-useful plant. No alternatives were suggested to used-and-

useful rate base that would avoid the allocation of costs to initial customers based on some form of percentage utilization of current to total customers. Florida appears to be the only state which has developed a concept like AFPI. However, only four other states had a comparable volume of new and growing water and wastewater utilities.

FOOTNOTES

1. The survey is described and findings are summarized in Appendix A. Individual utility responses are detailed in Appendix B.

2. In Chapter 2 it was noted that margin reserve was limited to 20 percent of the current ERCs being served.

3. 40 percent used-and-useful plus 25 percent x 40 percent for growth = 50 percent versus 40 percent used-and-useful + 8 percent (20 percent cap x 40 percent) = 48 percent.

4. The survey is described and survey findings are summarized in Appendix C. Individual state responses are detailed in Appendix D.

5. Per memorandum to James Collier from Gregory Krasovsky dated February 7, 1983, and incorporated into the Division of Water and Wastewater Standard Operating Procedures No. 4011.

6. Despite New York's liberal application of the used-and-useful concept, most of the water utilities under its jurisdiction are small and poorly financed. Land speculation rather than regulatory policy appears primarily responsible for shaping that state's industry.

7. New Jersey did state that it has set initial rates for new systems very much like they are set in Florida. Specifically, that means they are based upon projections of capital and operating expenses once a utility reaches full development.

8. Most of these utilities were received as 100 percent contributions from developers.

9. This is discussed further under the section entitled "Alternatives to Used-and-Useful Concepts" later in this chapter.

CHAPTER 5
SUMMARY AND CONCLUSIONS

As was stated in Chapter 1, the objective of this report was to determine whether the concepts of AFPI, used-and-useful plant, and margin reserve are compatible when used collectively. Chapter 2 explained the framework used by Water and Wastewater Division engineers in arriving at an estimate of used-and-useful plant to be included in rate base. There was a separate discussion of how margin reserve is calculated and how it fits into used-and-useful plant. An alternative name for margin reserve was suggested: "New Customer Capacity Allowance." In addition, Chapter 2 showed how AFPI charges are calculated. The variety of circumstances encountered in different water and wastewater systems necessitates flexibility and judgment in making used-and-useful determinations to ensure that initial customers bear no more than a fair share of new plant costs before the full customer base is in place.

Chapter 3 showed how three alternative applications of the concepts, used-and-useful, margin reserve, and AFPI, affect a hypothetical utility's revenue requirements. The adequacy of the revenue requirements produced under each alternative was evaluated in terms of how well each facilitated rate stability, encouraged prudent plant sizing, and contributed to the recovery of all costs of service from those who caused the costs. The results indicated that rates based only on used-and-useful plant plus margin reserve adjustments may place an unfair portion of new plant costs on utilities. Since the already high

cost of utility rates generally precludes increasing rates of current customers, AFPI remains the only other option for recovery of carrying costs on temporary excess capacity.

The concept of AFPI, combined with the concept of used-and-useful plant, was found to produce revenues that closely track total costs, assuming costs remain stable over time. Additionally, since margin reserve, under current Commission practices, only slightly increases rate base, revenues produced using the three concepts simultaneously are not substantially different. Since the effect is so small, margin reserve adjustment may be eliminated from routine rate proceedings and used only when justified by special circumstances. It is suggested that, for eligible utilities, AFPI be considered as a matter of routine rather than only upon special request. Presently, many utilities do not know to ask for AFPI although its use could help alleviate some of the financial difficulties and early years' losses of these utilities.

Addressing the concern that simultaneous use of margin reserve and AFPI could cause overearnings, Chapter 3 concluded that the potential for overearnings depended on factors such as how soon a company filed for rate relief after a plant was completed and the value of new plant relative to total plant in service.

Chapter 3 further concluded that AFPI would not eliminate the building of small, higher cost plants by many land developers who view provision of utilities as necessary to attract buyers. However, larger, profit-motivated utilities are more likely to build for future capacity needs if AFPI could be collected.

Chapter 4 discussed utility suggestions for revisions and

alternatives to Florida's current application of used-and-useful rate base concepts. The most common suggestion was to increase the margin reserve component of rate base. However, increasing margin reserve would increase the amount of excess capacity costs borne by current customers.

Another utility suggestion would require that used-and-useful plant in rate base be no less than the cost of the smallest sized plant facilities that could be built to serve the existing customer base. This approach would cause initial customers in the growth years to pay higher rates than would be expected based on the lower cost per unit of capacity associated with a larger plant, but not higher rates than would have been required for a smaller plant. However, long-term rates for all customers would be lower due to lower per unit costs of the larger plant.

Chapter 4 also presented the results of a survey of other state regulatory commissions aimed primarily at learning if alternatives to Florida's used-and-useful concepts were in use and how well they functioned. Ratemaking in the states surveyed was, as in Florida, generally tied to determination of used-and-useful rate base. Exceptions were found only in those states where water and wastewater industry growth had peaked and there were few new and growing utilities. Total departure from rates based on a return on rate base plus costs was found in only two states where most of the utilities, due to contributions from customers and developers, lacked an adequate rate base.

California provided the most detailed description of its used-and-useful methodology which included the alternative proposed by Florida's utilities that used-and-useful plant should be no less than the cost of the smallest plant sized to serve the existing customer base.

Florida's regulatory staff indicated a willingness to apply a similar used-and-useful methodology where to do so would produce long-run customer savings.

No other state surveyed uses a concept such as AFPI. Only seven other states, of which six were survey respondents, regulate a comparable number of investor-owned water or wastewater utilities. Therefore, it is no surprise that Florida would be the first to propose such a concept.

In summary, the concepts of used-and-useful plant, margin reserve, and AFPI are compatible when used collectively. However, questions such as whether AFPI will adversely affect an area's growth or whether AFPI cash flows will meet a utility's needs must await further observations of the concept's use in Florida.

APPENDIX A
SURVEY OF FLORIDA WATER AND WASTEWATER UTILITIES

Purpose

1. To ask utilities if the FPSC's current treatment of nonused-and-useful plant has or will have a large impact on the size of new capacity additions.

2. To solicit industry reactions to AFPI as a means of recovering carrying costs on nonused-and-useful plant.

3. To solicit industry suggestions for alternatives to Florida's current applications of used-and-useful rate base concepts.

Sample Selection Procedure

The Division of Research of the FPSC maintains a list of selected water and wastewater utilities known for their consistent and informed responses to questions affecting Florida's water and wastewater industry. The first twenty-eight survey participants consisted of members of the Research Division's list. An additional eighteen utilities were chosen at random from the remaining population of water and wastewater utilities regulated by the FPSC at March 1988. Since there was no intention to subject responses to statistical analysis, a judgmental sample was deemed adequate.

Forty-six surveys were mailed and responses were received from seventeen companies. Due to the small number of survey participants, percentage tabulation of responses to each question could be misleading.

Appendix A-2

Survey Questions and Responses

See Appendix B.

Survey Findings

1. Factors Influencing Plant Size. All respondents listed current and projected population as the primary factor affecting plant size decisions. Increasing the surface area of treatment and storage tanks results in disproportionately greater increases in volume. Consequently, capital costs per unit of volume or capacity are minimized when plant size is maximized.

Utility responses consistently supported the position that economies of scale of larger water and wastewater plants mean "bigger" is always "better" because it minimizes costs. Therefore it is not surprising that fifteen out of seventeen respondents criticized FPSC treatment of nonused-and-useful plant for penalizing utilities that built capacity to meet long-term projected growth.

The consensus was that FPSC regulatory policy will decrease the size and increase the frequency of capacity additions, thereby increasing capacity unit costs passed through to customers.

One respondent said that DER regulations and service area demand rather than FPSC rate base policies had the biggest impact on its sizing decisions. DER may establish the minimum plant required to serve an existing population. Additionally, DER might approve proposed designs to serve a maximum number of customers. However, DER would not be involved in the decision to build for future customers today.

One respondent said it built capacity to meet total projected needs of its service area. The utility did not address the relationship between regulatory policies and its decision to build all of its capacity needs up front. However, the omission is understandable since, built by a land developer in 1969, the utility did not come under FPSC jurisdiction until 1982. Incidentally, this utility operates at 35 percent of capacity since residents in a portion of its anticipated service area voted for septic tanks rather than service by the utility. This is a concrete example that bigger is not better.

2. Industry Reactions to AFPI. Fourteen out of seventeen utilities said margin reserve should continue to be part of used-and-useful computations as opposed to replacing margin reserve with AFPI. The most commonly cited reason was that current recovery should be provided to meet current costs associated with growth capacity.

Another expressed concern was the unpredictable nature of AFPI cash flows. One utility felt both margin reserve and AFPI lacked the flexibility that utilities needed to prudently plan capacity additions. An example was given concerning regulatory treatment of land purchased in advance of need in an area where development threatened the future affordability and availability of such land. The utility felt margin reserve and AFPI would limit recovery of land costs in a situation where foresight and early purchase ultimately saved customers some costs. One utility out of seventeen believed AFPI to be superior to margin reserve mainly due to the regulatory practice of offsetting margin reserve with

imputed CIAC. Finally, one utility out of seventeen did not address regulatory treatment of rate base items.

3. Alternatives. Alternatives that were suggested by survey participants are discussed in Chapter 4.

APPENDIX B
SURVEY RESPONSES ON RATEMAKING PRACTICES FROM FLORIDA WATER AND WASTEWATER UTILITIES

Question 1: Describe the factors which influence the decision to build a certain size utility plant.

Question 2: In what way do you feel that the Florida Public Service Commission influences the size plants which are built through its ratemaking practices?

Utility	(1) Factors Influencing Size	(2) Influence of Regulation
Decca Utilities	The primary factors are current and projected service area population, projected return on investment, and operating cost efficiencies.	Utilities will build smaller plants to minimize the amount of capital investment tied up in nonused-and-useful plant to earn a reasonable return on investment.
Florida Cities Water Company	The primary factors are projected population growth in the service area. Plants are limited to population size projected five years into the future to ensure recovery of the entire investment either through rates or AFPI charges.	Utility investors are not motivated to build a larger plant which experiences economies of scale in construction costs if a return on investment is not allowed on the entire plant. Thus, utility customers may be unable to benefit from lower rates which would be due to economies of scale in construction costs.
Florida Public Utilities Company	Primary factors are historical and projected population growth in the service area, raw water source and quality, capital costs and ability to earn a return on investment, and operating efficiencies and costs.	Utilities will avoid building larger plants capable of minimizing long-run costs to avoid having excess plant on which the utility is not allowed to earn a return.
General Development Utilities	Primary factors are estimated population growth, economies of scale, expected return on investment, engineering factors such as usage per residential unit and degree of treatment required, and environmental factors.	FPSC policies are inconsistent with optimal cost of service planning. A utility may not build the most economical plant for the area's long-range needs because the FPSC will not permit the recovery of capital costs on nonused-and-useful plant from current customers.

Appendix B-2

Utility	(1) Factors Influencing Size	(2) Influence of Regulation
Kingsley Service Company	Primary factors are the size of the current population plus population growth in the immediate future.	The FPSC's used-and-useful policies make it difficult to size plants to meet long-range growth needs. Utilities avoid building plant capacity beyond the needs of current customers.
Lake Placid Utilities	Anticipated customer base in service area.	No response.
Lehigh Utilities	Immediate and future growth needs are the primary factors influencing size of plant constructed.	Used-and-useful ratemaking practices discourage investors from building plants in sizes larger than are needed to meet current needs.
Lindrick Service Corporation	Primary factors influencing plant size are customer base (over a minimum 15-year period), usage characteristics of customers, and location relative to other utilities and bodies of water.	Investments in large plants to accommodate long-term growth are avoided since utility builders receive no return on investment on unused capacity.
Meadowbrook Utility Systems	Primary factors are the minimum plant size which meets immediate and short-term population needs of service area and potential savings per unit possible with a larger plant.	Commission policy inhibits choice of larger plant which would create economies of scale.
Mid-Clay Service Corporation	See Kingsley Service Company response.	(The same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company. However, these are not affiliated companies and all responses were included here.)
Ocala Oaks Utilities	Primary factors are the immediate capacity needs of the service area and potential future population growth.	Plants with capacity for future population growth will not be built if no return is allowed on the nonused-and-useful investment.

Utility	(1) Factors Influencing Size	(2) Influence of Regulation
Ortega Utility Company	See Kingsley Service Company response.	(The same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company. However, these are not affiliated companies and all responses were included here.)
Regency Utilities	Water treatment plant expansion is part of an overall master plan for the service needs of the area based on a certified engineer's study. Consideration is given to fire protection needs as well as future population growth projected over a three- to five-year period, existing facilities, and existing municipal sources.	Commission used-and-useful adjustments destroy investor incentives to build cost-effective plants. "Cost-effective" in this case refers to larger plants that have lower construction costs per gallon of water or sewage treated.
Rolling Oaks Utilities	Primary factors are: (1) Growth rate and type of growth (residential, commercial, or industrial); (2) Type of treatment; (3) Cost of capacity to meet current needs, and the level of incremental costs to build larger plants and achieve economies of scale.	DER requirements take precedence over ratemaking considerations in the decision to build or expand utility plant. FPSC regulatory influence is felt after the effect of plant construction. In other words, Commission regulation does not influence the size of the plant which is built.
Sanlando Utilities	The primary factors influencing plant size are current and anticipated demands (population size and type).	Utilities must be allowed rates which are high enough to attract capital and maintain financial viability. If no return is allowed for nonused-and-useful plant, then smaller plants will be built.
Southside Utilities	Plant size is primarily influenced by present and projected needs and by the amount of financing the company can	Margin reserve and AFPI do not allow utilities adequate compensation to justify long-term investment in larger

Utility	(1) Factors Influencing Size	(2) Influence of Regulation
Southside Utilities (continued)	afford. Future needs are difficult to project when the future use of property within the service area is unknown: multifamily, commercial, light industrial, or retail shopping centers all require different degrees of service and fire reserve protection.	facilities. Consequently, utilities build capacity in smaller increments more frequently.
Southern States Utilities	Primary factors are the needs of present and future customers in the service area.	Commission used-and-useful adjustments would cause an investor to build a small plant which minimizes the investment in unused plant. Building a small plant today will mean that new capacity will soon be needed. Construction costs of several small capacity additions will probably exceed those of initially building one large plant.

Question 3: What do you think is the purpose of a margin reserve and would you continue to include a margin reserve as a component of used-and-useful property as opposed to adding it to AFPI?

Utility	(3) Purpose of Margin Reserve?
Decca Utilities	Margin reserve allows investors to recover a return on the investment necessary to ensure that new customer requests for service are met within a reasonable time. In other words, margin reserve allows for plant which must be available to promptly serve new customers. Margin reserve should continue to be part of used-and-useful plant paid by current customers since it is a current cost to utility investors.
Florida Cities Water Company	The purpose of margin reserve is to entice utility investors to design and construct facilities that will serve projected populations approximately 18 months in the future. However, imputing CIAC against margin reserve usually eliminates margin reserve and any advantages they may have gained. Margin reserve should be replaced by AFPI where costs associated with nonused-and-useful plant will be recovered in the future.
Florida Public Utilities Company	The purpose of margin reserve is to allow the utility to maintain service through major component or facility breakdowns or when such equipment is out of service for routine maintenance. Since water utilities are usually independent systems, they do not have the ability to call upon outside utilities when outages occur. Thus, reserve requirements of water utilities must be greater than would be encountered in, for example, an electric utility. Margin reserve is a necessary component of used-and-useful property if a utility is to meet its obligation to provide adequate service at all times.
General Development Utilities	Margin reserve is to provide a utility an adequate return on investment in plant required to provide continuous service taking into account design margin to meet increases in peak flows and the time required to construct additional facilities (the current 18-month margin). Utilities cannot assure safe and adequate service to existing customers on a continuous basis if they do not have margin reserve capacity beyond the capacity needed for immediate demands. Imputing CIAC against margin reserve is inappropriate since the costs associated with reserve capacity are a cost of serving current as well as future customers. Shifting margin reserve costs to future customers by including it as a component of AFPI charges would be discriminatory because margin reserve benefits current customers.

Appendix B-6

Utility	(3) Purpose of Margin Reserve?
Kingsley Service Company	The purpose of margin reserve is to allow a utility to have available plant capacity to provide service to new customers when the need arises. Current rules and regulations place this responsibility on the utility. Therefore, margin reserve is a proper cost to be borne by existing customers. Margin reserve should continue to be a component of used-and-useful plant.
Lake Placid Utilities	No response.
Lehigh Utilities	Margin reserve allows a utility to fulfill its statutory obligation under Section 367.011(1), Florida Statutes, which requires a utility to provide service within its certificated territory within a reasonable time. Without margin reserve, new customers who move into the area and request service would have to wait until new facilities could be constructed to serve them. Margin reserve is a proper part of used-and-useful property.
Lindrick Service Corporation	Margin reserve serves to ensure that current customers pay enough to allow the utility to earn a reasonable return on its investment.
Meadowbrook Utility Systems	Margin reserve allows for construction period growth and is a proper part of used-and-useful property.
Mid-Clay Service Corporation	See Kingsley Service Company response. (A copy of the same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company.)
Ocala Oaks Utilities	Margin reserve allows investors a return on a small portion of nonused-and-useful plant.
Ortega Utility Company	See Kingsley Service Company response. (A copy of the same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company.)
Regency Utilities	Margin reserve allows a portion of existing nonused plant to be included as used-and-useful property for rate base purposes. Margin reserve should be part of used-and-useful property.

Utility	(3) Purpose of Margin Reserve?
Rolling Oaks Utilities	Margin reserve allows a utility to fulfill its statutory duty to provide service to any customer within a reasonable time. Margin reserve also provides a cushion for unexpected demand from existing customers. It should be a part of used-and-useful property.
Sanlando Utilities	Margin reserve is a term which describes part of the capital costs to be included in rate base for ratemaking purposes. Margin reserve is necessary for the utility to provide service to all of its customers today and tomorrow. Margin reserve should be included in the determination of used-and-useful property.
Southside Utilities	Margin reserve (and used-and-useful adjustments) is a means of controlling the size of utility system that is built, thereby controlling costs to customers. Neither margin reserve nor used-and-useful adjustments are appropriate regulatory practices (see suggested alternative).
Southern States Utilities	Margin reserve was developed by the Commission approximately eight years ago to adjust determinations of used-and-useful for test year conditions to provide for continuity of service. Subsequently, the margin reserve concept has been eroded by the practice of offsetting margin reserve by imputed CIAC.

Appendix B-8

Question 4: Can you suggest any alternatives to the Florida Public Service Commission's practice of adjusting rate base to include only used-and-useful plant which would not unfairly burden existing customers with costs of plant which will serve future customers?

Utility	(4) Alternatives?
Decca Utilities	The growth period used in margin reserve should be increased to at least three years.
Florida Cities Water Company	FPSC should develop a method to evaluate whether the burden of excess plant on current customers is offset by lower per customer operating costs available with large plants.
Florida Public Utilities Company	The 18-month growth allowance (margin reserve) is too short and forces utilities to always be adding plant on a "just in time" basis. A reasonable alternative would be to allow utilities to recover carrying costs (interest and taxes) on nonused-and-useful plant from current customers.
General Development Utilities	One alternative would be to include a design margin in addition to a margin reserve in used-and-useful plant to assure adequate plant to meet possible increases in peak flows and unanticipated growth. Ten percent was suggested as an example of a design margin but other percentages may be appropriate depending on the utility.
Kingsley Service Company	Margin reserve should be expanded for small utilities in high growth areas so that initial phases of plant construction in these areas can be more prudently sized. The Commission, in conjunction with the industry, could conduct a study on the economy of size based on various different treatment processes and establish the relationship of cost of small plants to optimum sized plants. Based on this study, existing plant costs could be allowed to the extent of the investment that a smaller plant would have required had the smaller plant been built.
Lake Placid Utilities	No response.

Utility	(4) Alternatives?
Lehigh Utilities	(1) Utility plant should be considered used-and-useful to the extent of the cost of the smallest plant which would serve the existing population. (2) The Commission should adopt procedures to give advance approval to a utility's choice of plant size. (3) Margin reserve should not be offset by imputed CIAC. (4) Existing methods of determining used-and-useful plant should be reduced to a rule.
Lindrick Service Corporation	A return should be allowed on all capital invested in a prudent sized plant.
Meadowbrook Utility Systems	Margin reserve should be increased to allow a moderate period of long-range planning and design of future plant needs. The AFPI period should also be expanded. Small margins cause small, high growth utilities to be constantly building to accommodate growth.
Mid-Clay Service Corporation	See Kingsley Service Company response. (The same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company. However, these are not affiliated companies and all responses were included here.)
Ocala Oaks Utilities	None.
Ortega Utility Company	See Kingsley Service Company response. (The same response was submitted by Kingsley Service Company, Mid-Clay Service Corporation, and Ortega Utility Company. However, these are not affiliated companies and all responses were included here.)
Regency Utilities	Margin reserve should be increased when justified by the historical growth in an individual utility's service area.
Rolling Oaks Utilities	Allow a 15 percent to 20 percent margin reserve that is not reduced by future CIAC.

Utility	(4) Alternatives?
Sanlando Utilities	The overall question of ratesetting principles should be reviewed so that utility stockholders who are developers are not expected to subsidize a utility operation any more than stockholders who are not developers.
Southside Utilities	Eliminate used-and-useful adjustments. Set charges to cover costs. To the extent an overbuilt system causes operating costs to be excessively high, adjust the amount of return permitted in rates.
Southern States Utilities	Used-and-useful percentages should be developed for each of a plant's major components. Used-and-useful adjustments should not penalize a utility for excess plant if the larger facility results in lower unit costs over the long run.

APPENDIX C
SURVEY OF OTHER STATE REGULATORY COMMISSIONS

Purpose

To determine if alternatives to used-and-useful rate base are being used for ratemaking in other states and, if so, to determine if those alternatives are superior to Florida's current rate base/rate of return methodology in setting revenue requirements.

Sample Selection Procedure

Twenty state regulatory agencies were selected. Selection was made from Table 130, "Number of Regulated Water and Sewer Utilities," from the NARUC Annual Report, and was based on the states having the greatest number of regulated, investor-owned water and wastewater utilities.

Survey Questions and Responses

See Appendix D.

Survey Findings

Sixteen out of twenty states responded to the survey. The variety of responses on most questions made a simple percentage tabulation of answers into categories meaningless.

Used-and-Useful Rate Base in Other States. Those surveyed were

asked if their used-and-useful rate base included adjustments to exclude capacity beyond the needs of current customers. Eight out of sixteen respondents said excess capacity adjustments are made when necessary to avoid placing an excessively high portion of new plant burden on current customers. Four respondents said excess capacity adjustments were not made primarily because water and wastewater utility growth had peaked and their utilities were fairly mature. These four states added that excess capacity adjustments had been made in the past. Three states said excess capacity adjustments were not made since their utilities were mostly small, developer-contributed systems with insignificant rate bases. One state said that although excess capacity adjustments are not made, rates for a new or growing utility would be based on costs and customers from a projected test year. The use of projected customers in setting rates produces an effect similar to adjusting capacity costs assignable to current customers.

Growth Allowances Added to Used-and-Useful Rate Base. Other states were asked if a growth allowance was included as part of used-and-useful plant. Six out of sixteen states said they do include a growth allowance in used-and-useful plant. Three of these six had no specific policy limiting the size of the growth allowance. The three remaining states limited growth allowances to growth occurring in six months, one year, and two years. One of the sixteen states said it did not formally address growth allowances, although it had, on occasion, allowed an entire plant in rate base before the customer base was fully developed. The same four states that reported no new and growing

utilities also found growth allowances unnecessary as all plant was already included in rate base. Another three out of sixteen states found the absence of rate bases made growth allowances as well as excess capacity adjustments unnecessary. One out of sixteen states said a separate growth allowance was not added to used-and-useful plant. However, the individual who completed the survey did not recall growth allowances being raised as an issue in a water rate case. A remaining one out of sixteen states, the same state that set rates using projected costs and projected customers, said it did not recognize a growth allowance concept since used-and-useful adjustments were not made.

In seven out of the ten states that do not make growth allowances, such allowances were simply inapplicable due to the absence of expanding utilities or utilities with appreciable rate bases. Two of ten achieve similar rate results as growth allowances would achieve through liberal rate base treatment of most plant in service, although neither of these states separately recognizes growth allowances as a rate base concept. The tenth state in this group said the issue of growth allowances as a separate rate base concept had never been raised.

AFPI Type Charges. The questionnaire asked if any other states allowed utilities to collect AFPI or similar charges. None of the sixteen respondents answered yes. Answers indicated that the concept had never been considered. For states where excess capacity adjustments were not issues, recovery of excess capacity costs through AFPI charges was not an issue either.

Earnings Surveillance. Eleven out of sixteen respondents said utilities submit annual reports which are reviewed. One state requires monthly earnings reports only for size A (more than 10,000 connections) utilities. One state requires annual reports only from its largest utilities (more than $1,000,000 in revenues), but added that most of its water and wastewater utilities had no rate base. Three states said they had no ongoing procedures to monitor water and wastewater utility earnings but that staff audits were made in connection with rate cases.

Several states commented that utility annual reports are usually inaccurate. However, most states felt the benefits of improved accuracy would not justify the additional costs of improving report accuracy. Generally, the reason was that most utilities were underearning, not overearning. Thus, despite the different industry profiles and ratemaking ideologies of other states, no progress appears to have been made on the problem of adequately recovering utility costs of service while holding rates down.

Recommendations, Alternatives, Comments. Two states use an operating margin rather than rate base methodology to establish utility revenue requirements. Under the operating margin method, the utility is allowed a return proportional to the amount of its operating expenses. South Carolina said only three utilities in its jurisdiction have an appreciable rate base. North Carolina said utilities can opt for either method but most choose the operating margin.

Arizona Corporation Commission staff suggested setting rates based on utility cash flow needs but added that, like Florida, Arizona was

required by statute to use a rate base/rate of return methodology.

Though the operating margin method and the cash flow method may be suitable ratemaking alternatives when a utility has no rate base, neither method avoids the problem of excessive rates when the entire costs of new plant are recovered from initial customers.

APPENDIX D
SURVEY RESPONSES REGARDING RATEMAKING PRACTICES FOR WATER AND WASTEWATER UTILITIES IN OTHER STATES

SURVEY RESPONSES REGARDING RATEMAKING PRACTICES FOR WATER AND WASTEWATER UTILITIES IN OTHER STATES

Question 1: Does your agency define used-and-useful plant to include the undivided cost of any plant in service? Alternatively, is the cost of plant in service in rate base adjusted to exclude capacity beyond the needs of current customers? (Column 1/ Used-and-Useful)

Question 2: Is margin reserve or growth allowance part of used-and-useful plant? (Column 2/Margin Reserve)

Question 3: Are AFPI charges allowed from future customers on nonused-and-useful plant? (Column 3/AFPI)

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
Arizona	Yes, Arizona has made adjustments to rate base to exclude the cost of plant capacity in excess of current customer's needs. There is no precise definition of how these adjustments are calculated. Each analysis is the product of an individual engineer's judgment of the portion of a system's components that are essential to provide service to current customers.	Yes. Growth allowances are not formalized into a separate concept. However, depending on the individual engineer, used-and-useful adjustments may be large enough to accommodate some growth.	No. The issue has never been considered.
California	Yes, excess plant capacity is adjusted out of rate base. These "saturation" adjustments are a combination of percentage of development and engineering judgment. Used-and-useful would include a minimum of the cost of smaller sized plant facilities necessary to serve current customers.	Yes. The additional margin of capacity that would result in economies of scale is allowed in rate base. MRs are computed on a case-by-case basis.	No.
Connecticut	Yes, excess capacity adjustments are sometimes made. If a plant appears to be prudently sized, the department may allow the entire plant in rate base even though the customer base is not yet fully developed. Excess capacity adjustments are not made as a matter of policy, and no clear-cut distinction is made between plant components such as margin reserve, used-and-useful, and plant available to	No. Margin reserve is not formally recognized.	Although the concept is not formally recognized, one small water company was allowed to collect a similar charge from all new developer/ applicants for service. Other companies have since sought similar treatment, but decisions have not yet been reached.

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
Connecticut (continued)	serve future customers. However, the amount of plant in rate base depends on the individual circumstance as the Department is not likely to allow new and expanding utilities to place an excessively high portion of new plant burden on current customers.		
Illinois	No, excess capacity adjustments are rarely needed. Where plant capacity has exceeded the needs of current customers due to unmet growth projections, the Illinois Commission has made adjustments reducing the amount of plant allowed in rate base. The growth of Illinois' water and wastewater industry has peaked. Consequently, new and expanding utilities are rarely encountered. Instead the number of separate utility companies has decreased as smaller systems are purchased and consolidated into the operations of larger utility companies.	No. However, reasonable excess capacity necessary to handle peak loading and provide for growth has been allowed in rate base in the past.	No. Large investments in nonused-and-useful plant are not a problem in Illinois.
Louisiana	No, the need for excess capacity adjustments is rare. Most of the investor-owned water and wastewater companies in Louisiana are relatively small. Building smaller systems tends to minimize the amount of capital invested in nonused-and-useful plant because the total investment is small and because the time required to reach capacity loads is usually short. Additionally, many small utilities received their plants as contributions-in-aid-of-construction from developers. Therefore, there is often little or no plant cost left to be included in rate base. The Commission does not routinely prorate the investment in utility plant between current and future customers, because the impact of remaining rate bases on rates is usually minimal.	No. Such a concept would not have much application in cases where nonused-and-useful plant was negligible.	No. Large investments in nonused-and-useful plant are not a problem in Louisiana.

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
Louisiana (continued)	However, there was at least one case where the Commission, recognizing an overcapacity problem, refused to allow full recovery on rate base through rates. Generally, the Louisiana Commission's approach to settling water and wastewater rates is to provide for recovery of all known expenses as long as the resulting rates remain within a level the public will tolerate.		
Massachusetts	Yes, the investment in plant in service is prorated between current and future customers with the portion available for future customers classified as nonused-and-useful. Used-and-useful plant also includes standby capacity required by the Department of Environmental Quality Engineering. Recent examples of exclusions from used-and-useful plant include the following: Land held for future use as a pumping plant; fire hydrants disabled for nonpayment of hydrant charges; and an overbuilt distribution system designed to meet current and future customer demand. The distribution plant was subjected to a "resizing adjustment" to remove surplus transmission and distribution plant from the rate base.	No provision is added to used-and-useful plant for short-term growth.	No. The issue of AFPI has never been raised in a utility rate case.
Mississippi	Yes, plant in service is prorated between current and future customers such that current customers pay only for the portion necessary to serve them. The used-and-useful adjustment is determined by dividing the number of customers the system is serving by the ratio of all customers the system will serve.	Yes. Plant needed to serve customers expected to connect over the upcoming year is allowed in rate base.	No. The issue has not been raised.
New Jersey	No, excess capacity adjustments are rarely needed. Rate base includes plant which is in use and providing adequate service. Initial rates are	No. Margin reserve is not included in rate base.	No. AFPI has never been considered by the New Jersey Board of Public Utilities.

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
New Jersey (continued)	set using an estimate of plant in service and customer base at full development. For existing utilities which are not yet serving a fully developed customer base, excess capacity adjustments are made when necessary but the need for them is rare since most of the state's developments are in a fairly mature stage.		
New York	No, excess capacity costs are not adjusted out of rate base. Initial rates for new water systems are based on projections of per customer capital and operating expenses of the utility once the entire customer base is being served. If a utility is not new but has capacity to serve additional customers, the New York Department of Public Service would not usually adjust rate base to exclude costs of future use plant. The effect of such a practice is to increase costs to current customers beyond what costs would be upon full development. However, such an effect is mitigated to some extent by the use of forecast test years. Using a forecast test year, rates would be based upon the number of customers anticipated over a future period. (The investment in central treatment plant for water utilities with relatively pure source water may be so low that rate impacts of excess treatment plant capacity may be minimal. New York does not regulate investor-owned wastewater utilities.)	No, margin reserve would not be applicable if the entire cost of utility plant was already included in rate base.	AFPI would not apply where future use plant was already included in rate base.
North Carolina	Yes, the cost of plant in service included in rate base is sometimes adjusted to exclude capacity beyond the needs of current customers. Usually excess capacity adjustments in water companies are limited to mains. For	Yes, margin reserve is used in rate base calculations. Usually, 10 percent is allowed for mains. On other portions of plant, the growth allowance is determined on a case-by-case basis.	AFPI has never been requested by water and wastewater companies in North Carolina. Many of the systems were contributed by developers and have little or no rate base. Also, many of the systems are

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
North Carolina (continued)	wastewater utilities, engineers look at the prudency of a utility's size relative to the existing and anticipated customer base.		small which minimizes the amount of plant held for future customers.
Pennsylvania	Yes, Pennsylvania does exclude excessive capacity from rate base. For some systems, revenue was imputed from unsold lots, decreasing the revenue requirement to be recovered from existing customers. On one occasion, an excess capacity adjustment was developed using an industry average plant investment per customer.	Yes. Allowances are made for increases in customers six months beyond the test year end.	No.
South Carolina	No. See response to Question 4, Table 4.2b.	No.	
Texas	Yes, used-and-useful plant is based on the minimum design requirements of the Texas Department of Health.	Yes, 20 percent of excess capacity or two years of growth potential is usually considered an acceptable part of used-and-useful plant.	No. AFPI has never been considered by the Texas Water Commission.
Virginia	No, since excess capacity adjustments are rarely needed. Most of the investor-owned water and wastewater utilities in Virginia are small and achieve capacity loads within, at most, five years after initial construction. The Virginia Commission has had little occasion to develop used-and-useful policy such as is used in Florida, because the amount of excess plant they encounter has a minimal impact on rates when included in rate base. Many of the water and wastewater utilities have no rate base due to customer and developer contributions. If the impact of excess capacity in rate base was significant, the Commission	No, not applicable. The entire plant cost is already included in rate base.	Not applicable. The entire plant cost is already included in rate base.

State	(1) Used-and-Useful	(2) Margin Reserve	(3) AFPI
Virginia (continued)	would consider some sort of adjustment to avoid overburdening current customers with plant to serve future customers.		
Washington	No, excess capacity adjustments are not usually made. Most of Washington's water utilities are very small and have very low rates. Used-and-useful plant is all plant that is in service and providing service including plant capacity that is available to serve future customers. Many of the utilities have little or no rate base.	No, not applicable. All plant is already in rate base.	Not applicable. All plant is already in rate base.
West Virginia	No, excess capacity adjustments are not made in determining used-and-useful plant. Most of the state's utilities are small and include no growing communities. The rate impact of excess plant is usually small.	No, not applicable. All plant is already in rate base.	AFPI has never been considered by West Virginia's Commission. Additionally, all plant is already included in rate base.

SURVEY RESPONSES REGARDING RATEMAKING PRACTICES FOR
WATER AND WASTEWATER UTILITIES IN OTHER STATES

Question 4: Other comments?

Question 5: Recommendations/alternatives?

Question 6: Monitoring of earnings?

State	(4) Other Comments	(5) Recommendations/Alternatives	(6) Monitoring of Earnings
Arizona	A precise definition of used-and-useful plant cannot be given. Used-and-useful is a separate engineering problem for each utility system.	Rates should be calculated on a utility's cash flow requirements rather than revenue requirements derived from ROI plus expenses.	There is no ongoing policy in place to monitor water and wastewater company earnings.
California	Sometimes unused capacity may be the fault of homeowners who buy several lots and build homes in the center lot. Therefore, saturation adjustments should be based on realistic estimates from existing types of development rather than initially proposed developments.	None.	Class A water and wastewater utilities (more than 10,000 connections) are required to file an earnings report monthly.
Connecticut	None.	None.	Staff review annual reports in addition to periodic rate case reviews and audits.
Illinois	None.	None.	Annual reviews of earnings are made through analyses of annual reports. Review procedures appear adequate since earnings appear to decline rather than increase.
Louisiana	Concepts such as AFPI may often be a problem for small utilities because of their unsophisticated record-keeping systems.	None.	As resources permit, staff conduct special audits to monitor earnings.

State	(4) Other Comments	(5) Recommendations/Alternatives	(6) Monitoring of Earnings
Massachusetts	None.	None.	Information from annual reports is entered on a spreadsheet and analyzed. Additionally, the Department has the authority to investigate utility rates upon the motion of at least 20 customers.
Mississippi	None.	None.	Annual reports are filed by utilities but are not usually reviewed. Earnings are usually monitored only when the company files for a rate increase.
New Jersey	None.	None.	Data from annual reports is analyzed and the average return on common equity is checked.
New York	Most water companies in New York have difficulty obtaining financing for expansion and capital improvements. Financing, when it is obtained, is usually debt financing requiring monthly payments of principal and interest. New York feels it is a regulatory responsibility to ensure that rates provide utility companies with the cash flow necessary to meet debt service requirements. The adequacy of AFPI when cash flow is essential was criticized.	None.	Utilities file annual reports with the Department of Public Service. However, these reports are of limited value in determining overearnings because of expenses charged per books which may not be allowable for ratemaking purposes. Also, revenues in the annual reports are not normalized and may appear to be excessive when they are not. Although there is no formal procedure for monitoring water company earnings, high inflation rates over the last 15 to 20 years have eliminated the opportunity for most utilities to overearn.
North Carolina	None.	For companies with little or no rate base, a return on rate base provides little or no net operating income for company owners. Since rate base/rate of return regulation is inappropriate for some utilities, North Carolina offers two methods of setting	Annual reports are reviewed.

State	(4) Other Comments	(5) Recommendations/Alternatives	(6) Monitoring of Earnings
North Carolina (continued)		rates: the rate base method and the operating ratio method. The utility may use the method that is more beneficial.	
Pennsylvania	Pennsylvania has had a problem with development companies subsidizing utilities while lots are being sold. When the final lots are sold, subsidization ceases and customers suffer rate shock.	None.	If the caseload permits, cursory reviews are made of utilities' quarterly and annual reports.
South Carolina	The South Carolina Commission rarely uses rate base/rate of return ratemaking for water or wastewater utilities anymore. The rate bases of many water and wastewater utilities were substantially reduced by customer contributions so the Commission began using operating margins as guides to determine just and reasonable rates. Operating margin is determined by dividing net operating income plus interest expense and return on equity by operating revenues computed using the proposed rates. (Most companies use a flat rate.) The margin percentage is then evaluated for reasonableness. (Only about three water and wastewater utilities have a rate base. The majority are wholly contributed.)	None.	Annual reports are required but the compliance rate is only about 90 percent. There is no formal procedure to monitor water and wastewater company earnings.
Texas	As long as the developer controls a utility system, the utility will often avoid requesting full recovery on rate base in order to keep rates down and encourage development.	None.	Annual reports are filed by the utilities. However, if rates are reasonable when they are set, the Commission is not likely to monitor earnings for the purpose of lowering rates.

State	(4) Other Comments	(5) Recommendations/Alternatives	(6) Monitoring of Earnings
Virginia	None.	None.	Companies that earn over $10,000 in revenues for at least three consecutive years must file an annual report. Companies earning over $1,000,000 in revenues (there is only one in Virginia) must also file an annual informational filing. Monitoring for overearnings isn't usually necessary since most utilities have no rate base and no net earnings.
Washington	None.	Use of the operating ratio method to calculate revenue requirements should be considered where there is a zero rate base due to contributions.	Utilities file annual reports. These reports are not adequate to monitor utilities' earnings. However, additional reporting requirements would impose a great financial burden on small utilities.
West Virginia	None.	None.	Utilities file annual reports with the Commission.

USED AND USEFUL

What a PSC Engineer looks for when determining the Used and Useful percentage for a regulated utility:

- **WATER SYSTEMS**

  1) Permitted or Firm Reliable Capacity
  2) Maximum Day Flows
  3) Growth Potential of Customer Base (Margin Reserve)
  4) Excessive Unaccounted for Water

  [(2)+(3)-(4)]/(1)=U&U %

- **WASTEWATER SYSTEMS**

  1) Permitted Capacity
  2) Average Daily Flows in Maximum Month
  3) Growth Potential of Customer Base (Margin Reserve)
  4) Excessive Inflow & Infiltration

  [(2)+(3)-(4)]/(1)=U&U %

- **REUSE SYSTEMS**

  1) Capacity of Reuse System
  2) Effluent Flow to be treated for Reuse
  3) Growth Potential of Customer Base (Margin Reserve)

  [(2)+(3)]/(1)=U&U %

source: Bob Crouch
Reuse Coordinating Committee Meeting
Nov. 19, 1996

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 960358-WS EXHIBIT NO. 8
COMPANY/
WITNESS:
DATE: 12-10-96

- **MARGIN RESERVE**

1) Average of last 5 years growth in ERCs or Projection based upon Linear Regression
2) Multiply (1) by appropriate # of years
3) Convert to gallons based upon average ERC use in the Test Year

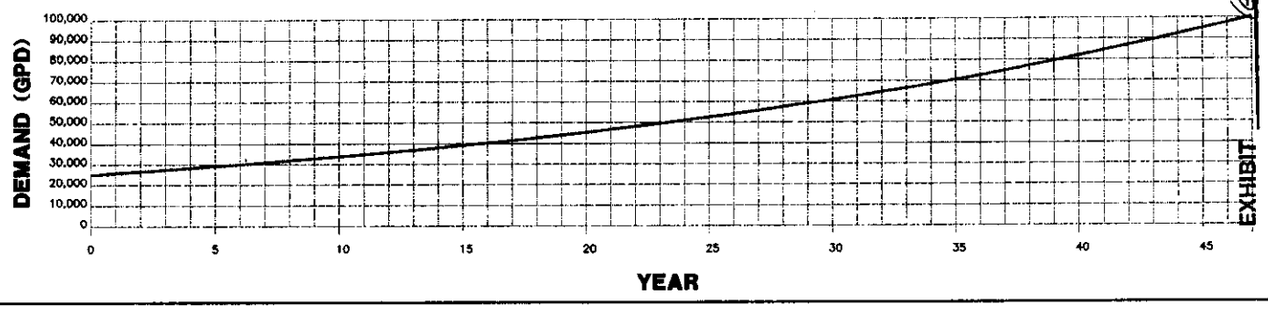
(1)*(2)*(3)=MR

- **SPECIAL CONSIDERATIONS**

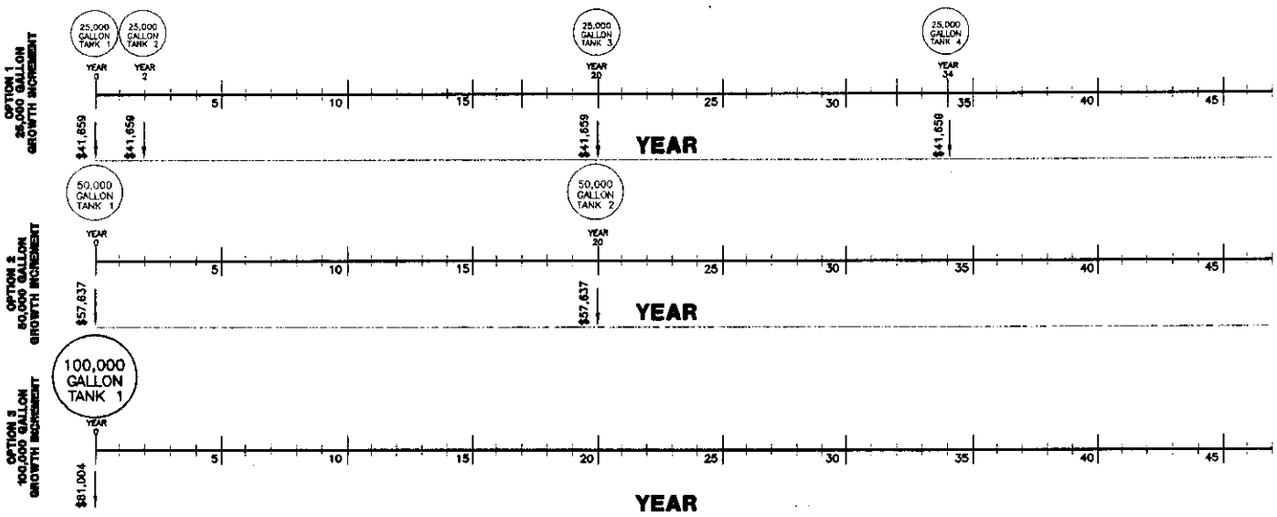
1) How many wells
2) How much storage
3) What is the limiting factor (weak link) which determined permitted capacity
4) Economies of Scale
5) Unique Growth Factors
6) Anomalies which affect flows
7) Regulatory Mandates

FLORIDA PUBLIC SERVICE COMMISSION
DOCKET NO. 960258 Comp.
COMPANY/ EXHIBIT NO 2
WITNESS:
DATE: 12-10-96

DEMAND (GPD)



FACILITY PHASING SCHEDULE AND CASH FLOW



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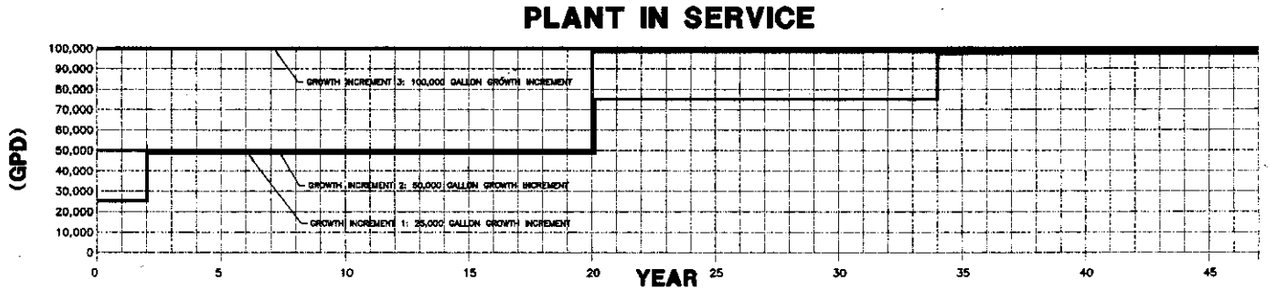
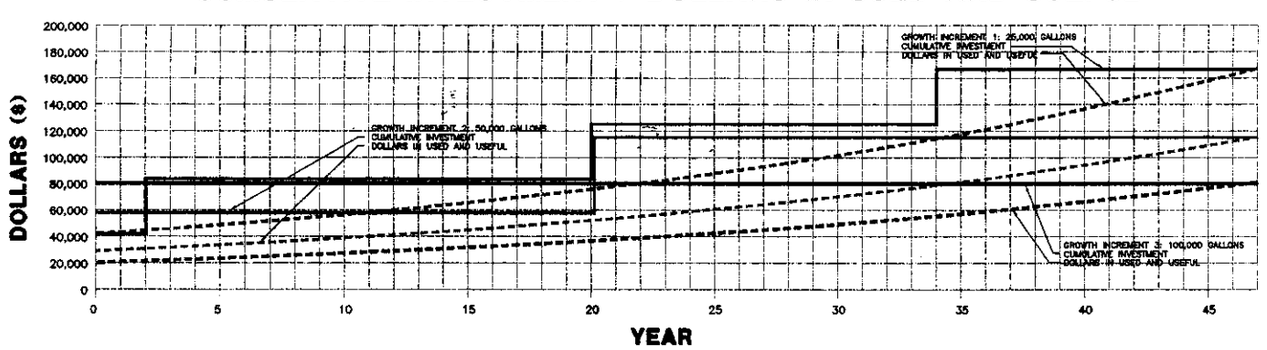


CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



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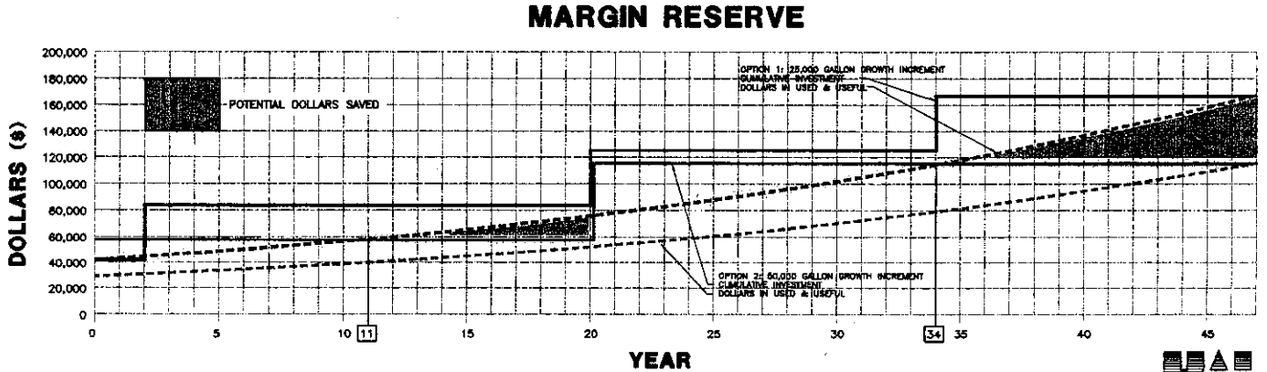
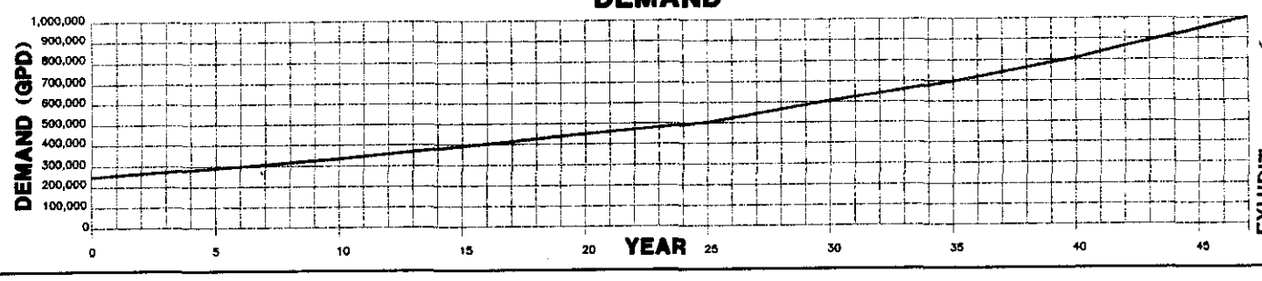


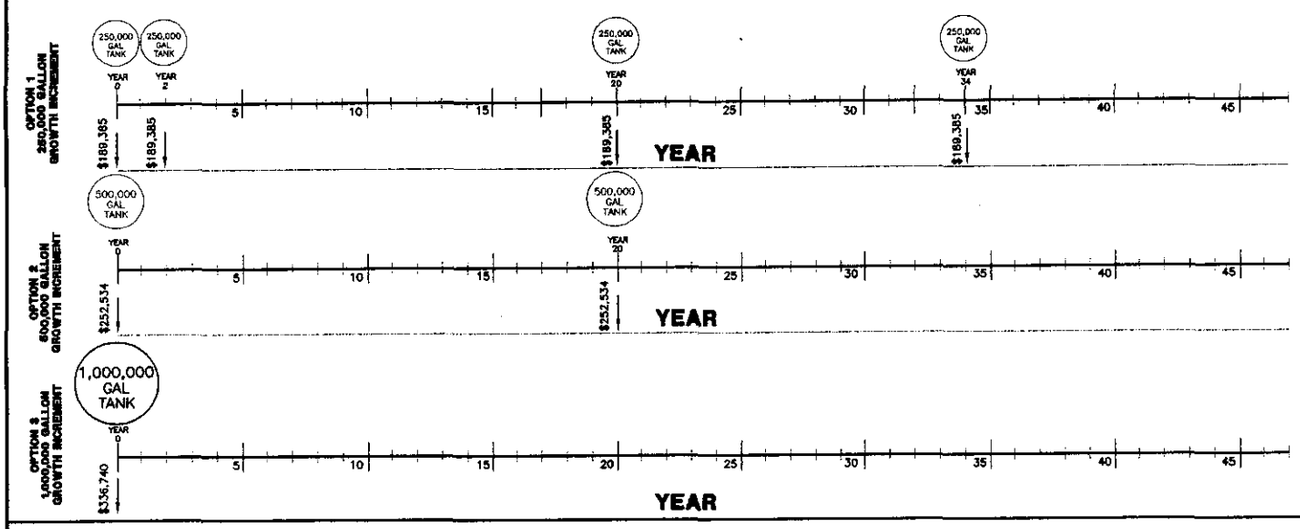
STEEL GROUND STORAGE TANKS - 25,000-100,000 GALLONS

96/45B30F06

DEMAND



FACILITY PHASING SCHEDULE AND CASH FLOW



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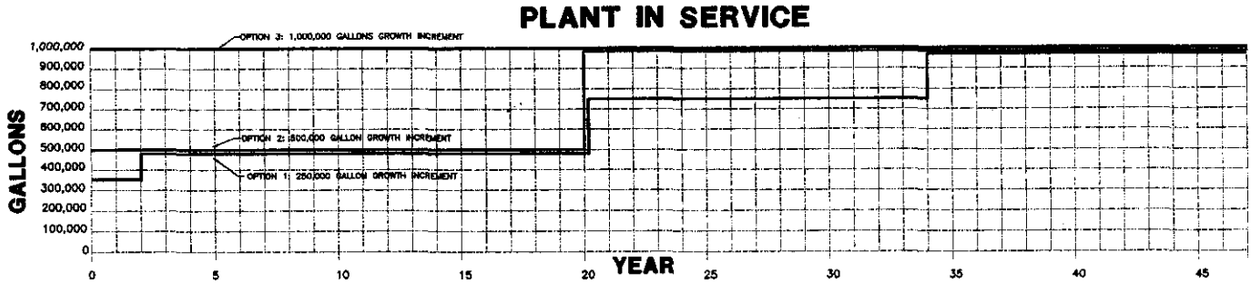

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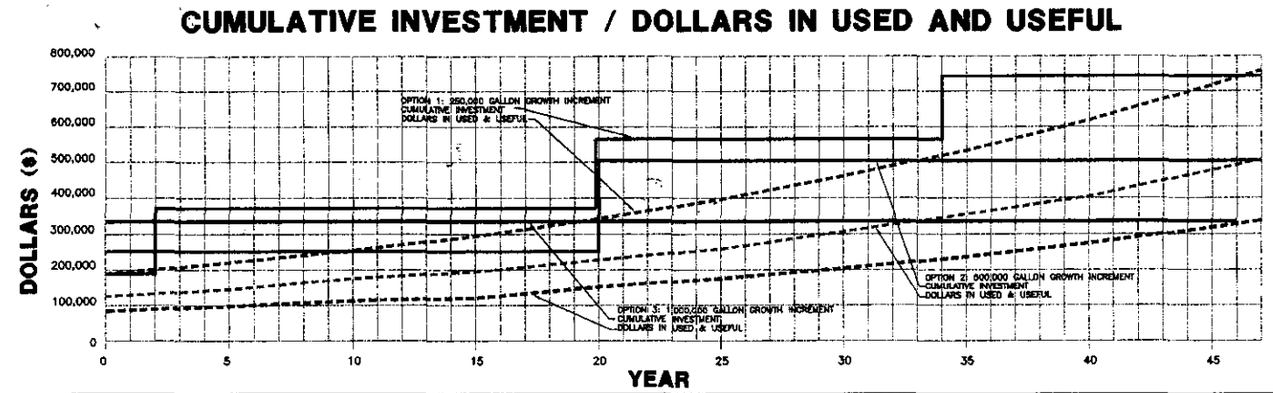

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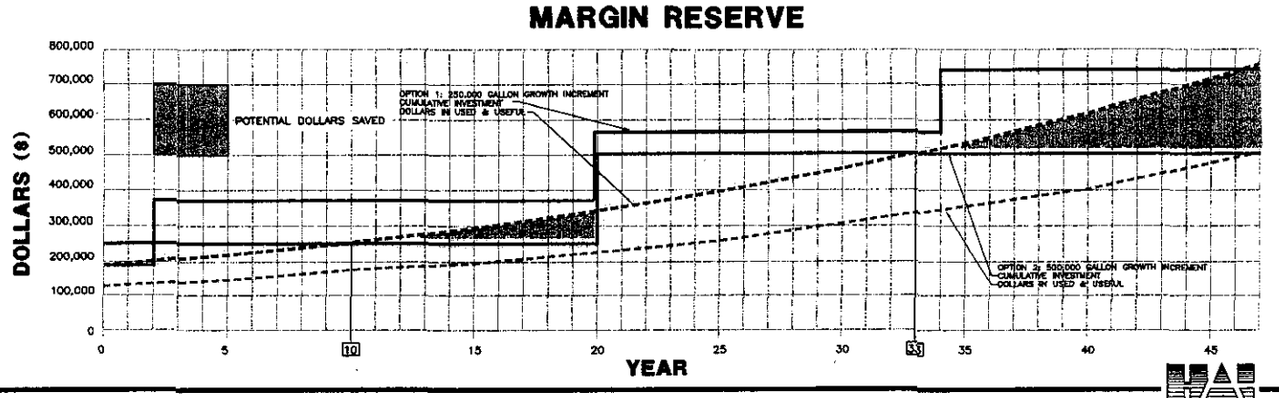


PRE-STRESSED CONCRETE GROUND STORAGE TANK - 250,000-1,000,000 GALLONS

96/45800002

DEMAND (GPD) 100,000 GPD TO 300,000 GPD

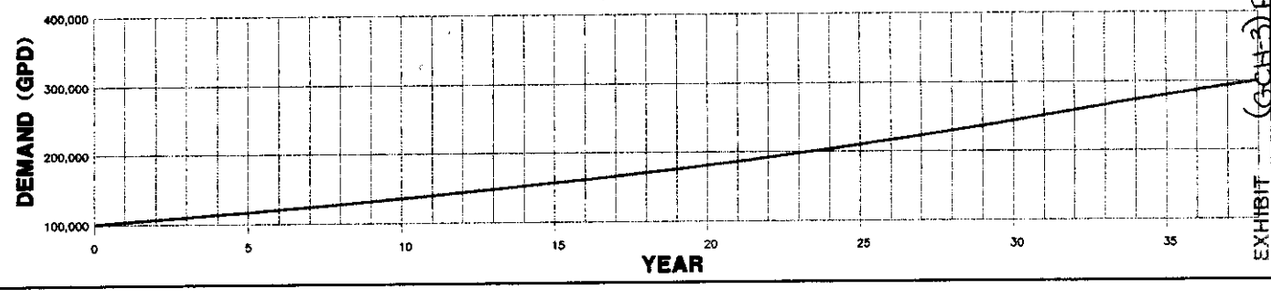
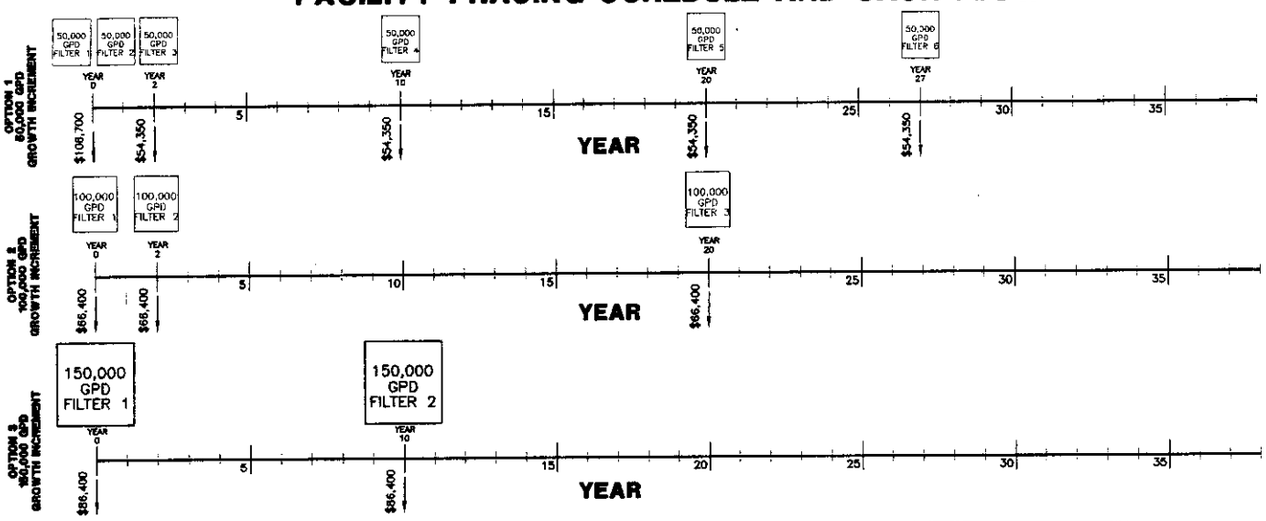
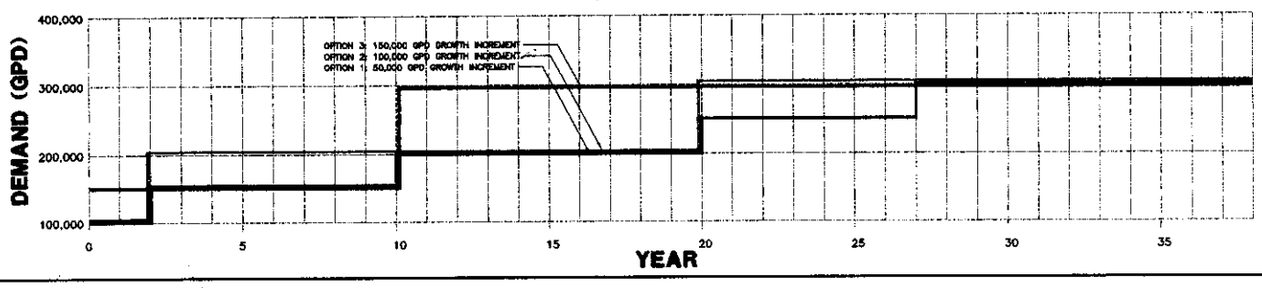


EXHIBIT (GCH-3) Rev
PAGE 2 OF 12

FACILITY PHASING SCHEDULE AND CASH FLOW



DEMAND (GPD) 100,000 GPD TO 300,000 GPD



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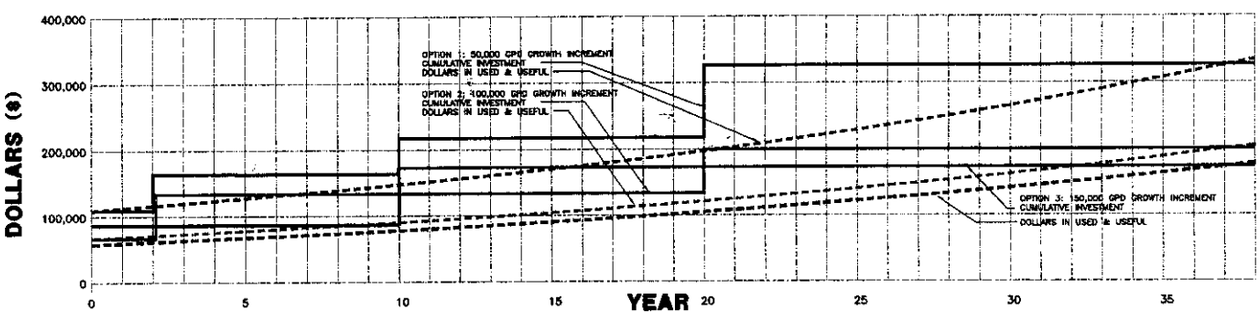

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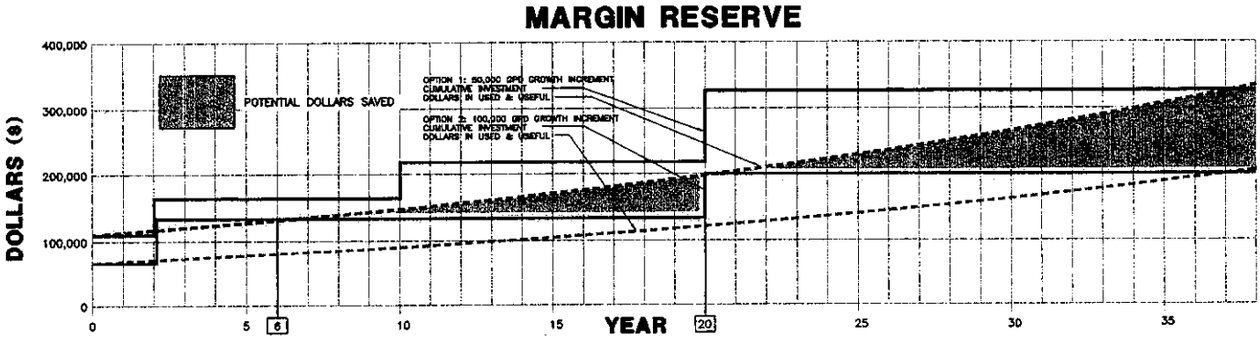


TERTIARY GRAVITY FILTERS - 100,000-300,000 GPD

DEMAND (GPD) 100,000 GPD TO 300,000 GPD

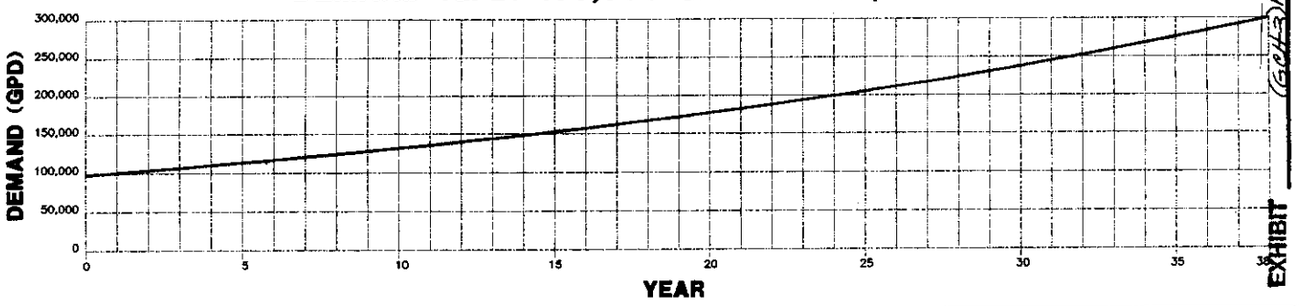
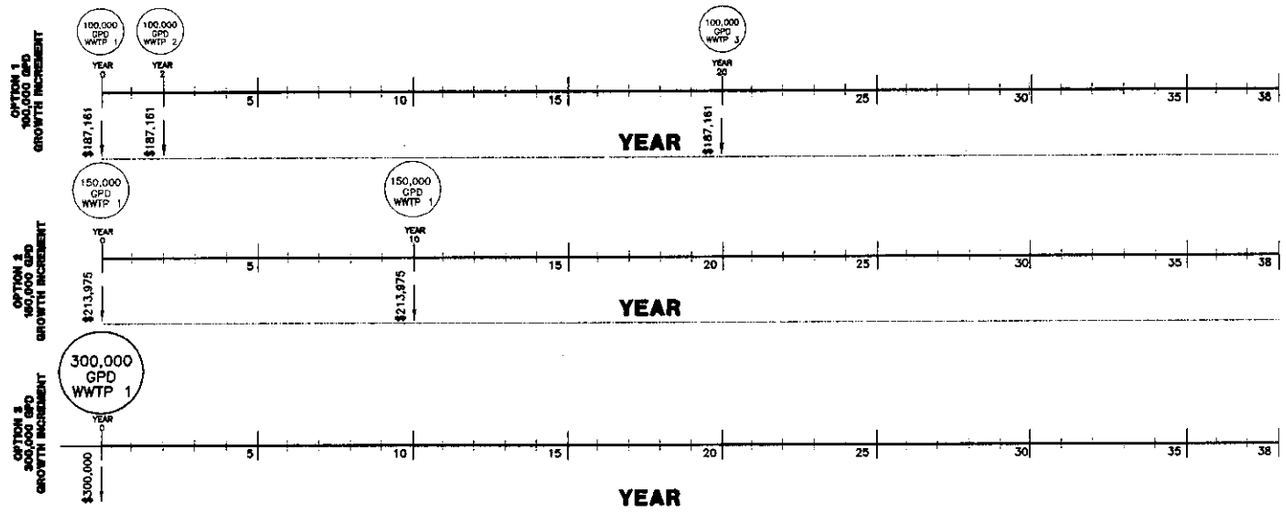


EXHIBIT 4 (GPH3Rev.)

PAGE 4 OF 12

FACILITY PHASING SCHEDULE AND CASH FLOW



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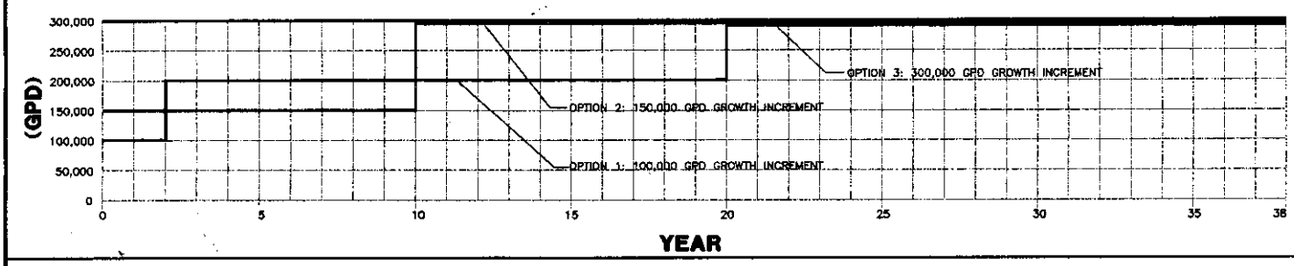

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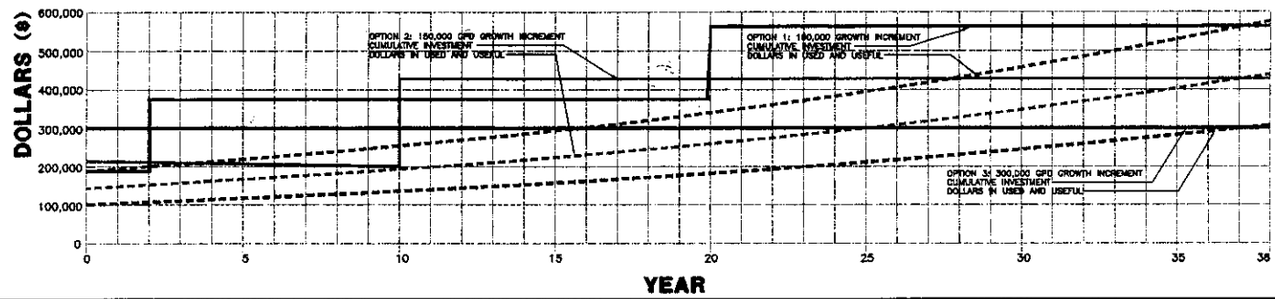
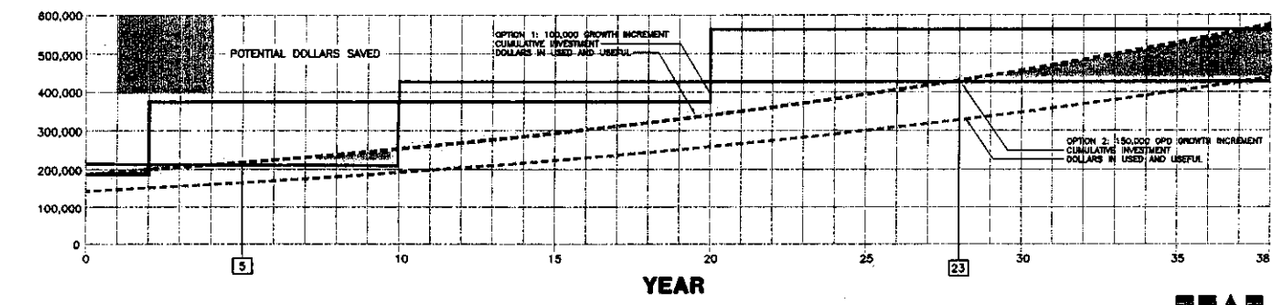
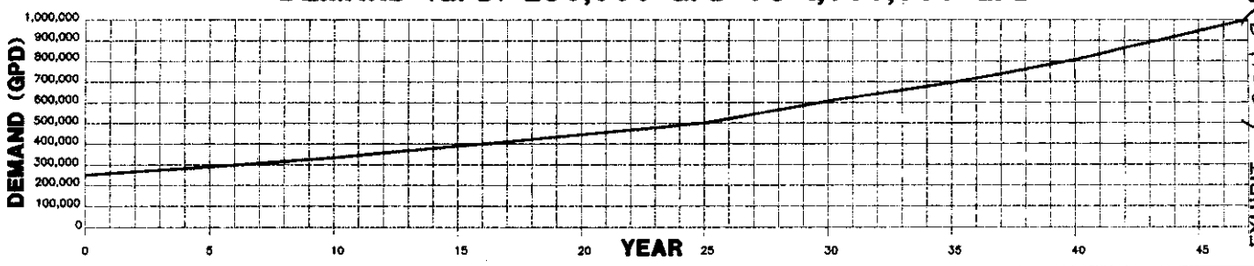


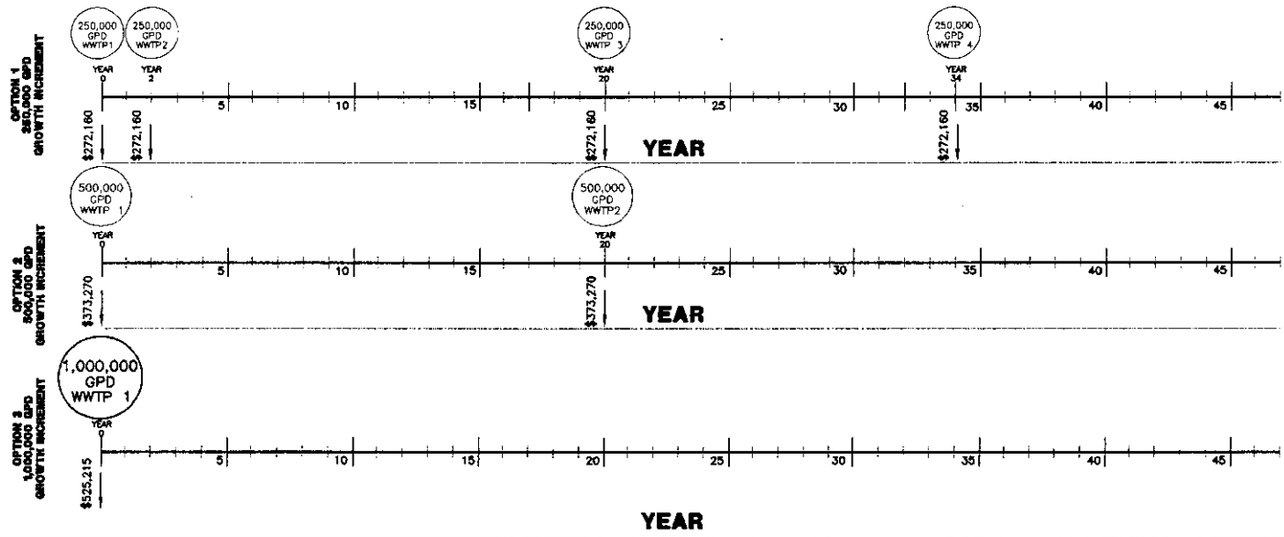
MARGIN RESERVE



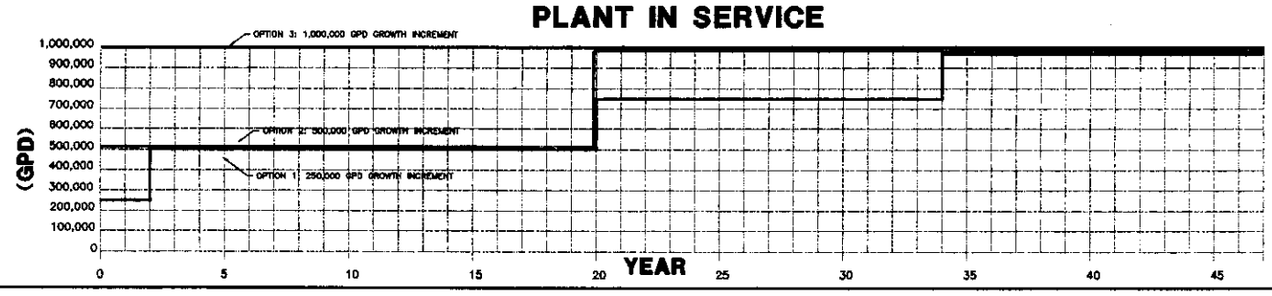
DEMAND (GPD) 250,000 GPD TO 1,000,000 GPD



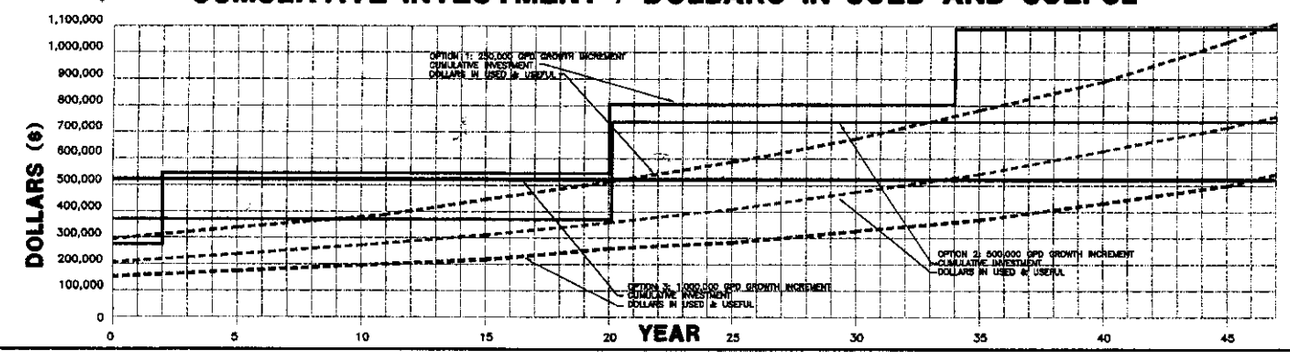
FACILITY PHASING SCHEDULE AND CASH FLOW



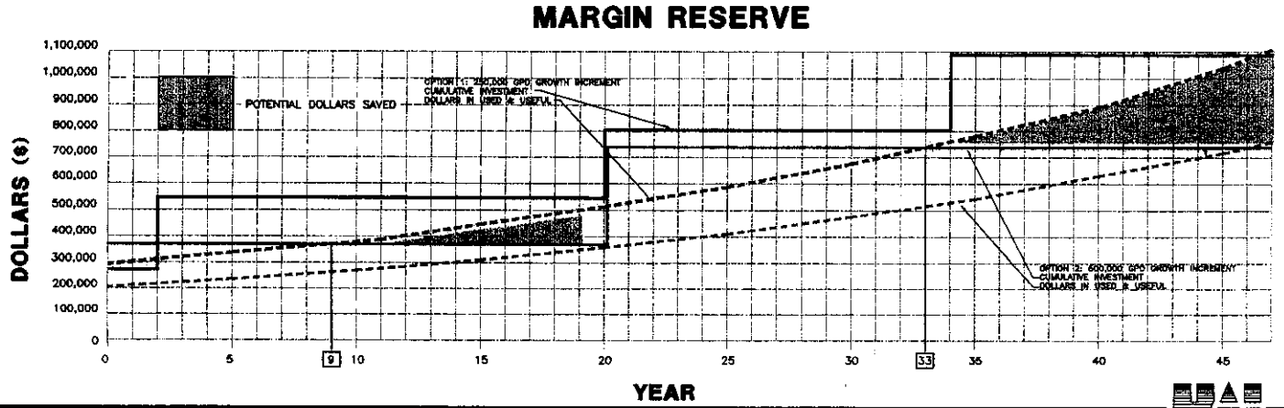
PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL

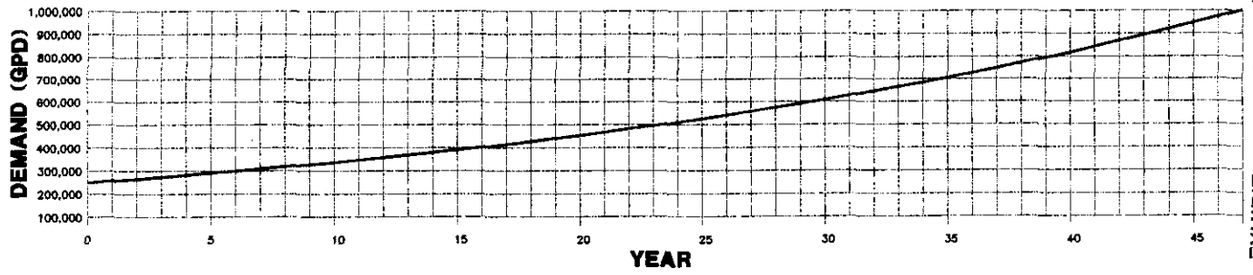


MARGIN RESERVE

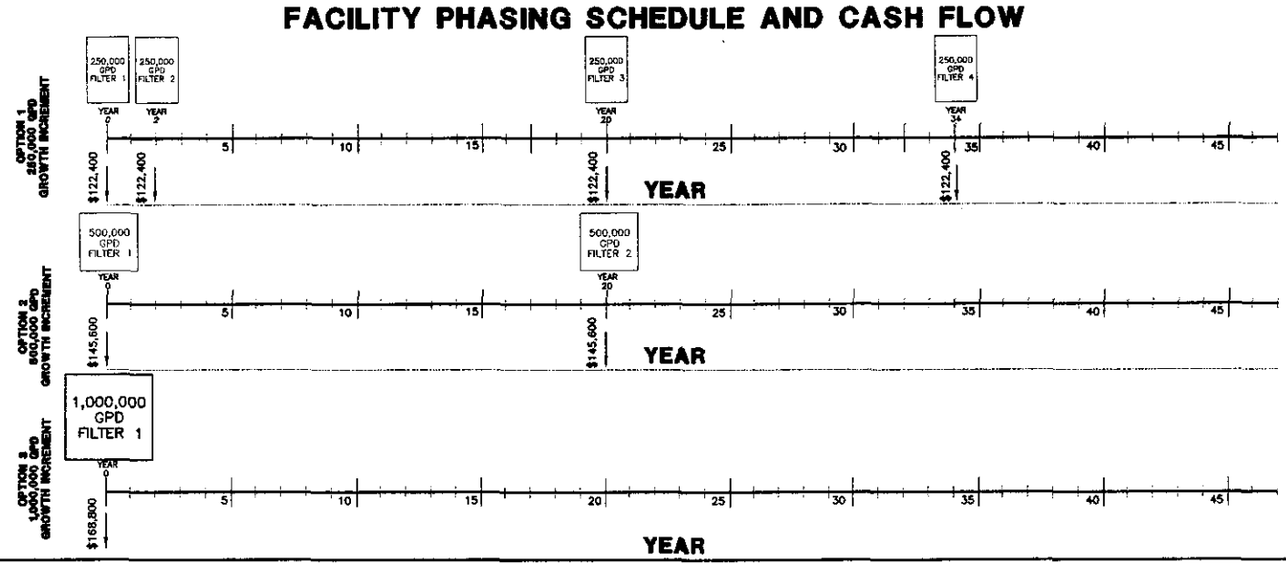


CONTACT STABILIZATION PACKAGE WWTP - 250,000-1,000,000 GPD

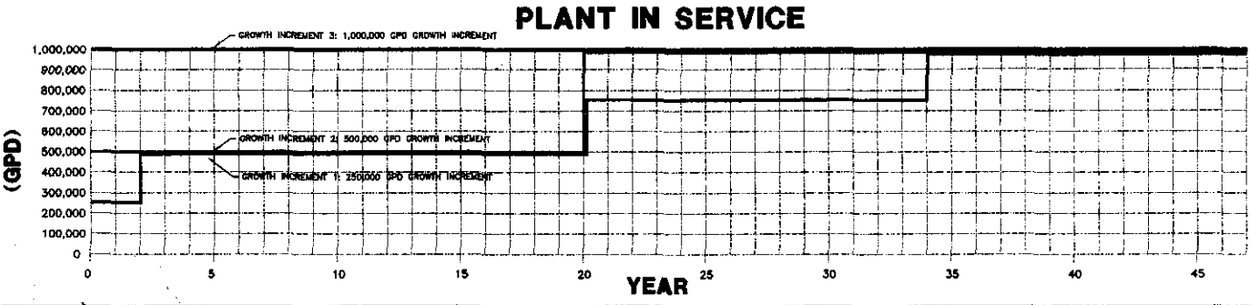
DEMAND (GPD) 250,000 GPD TO 1,000,000 GPD



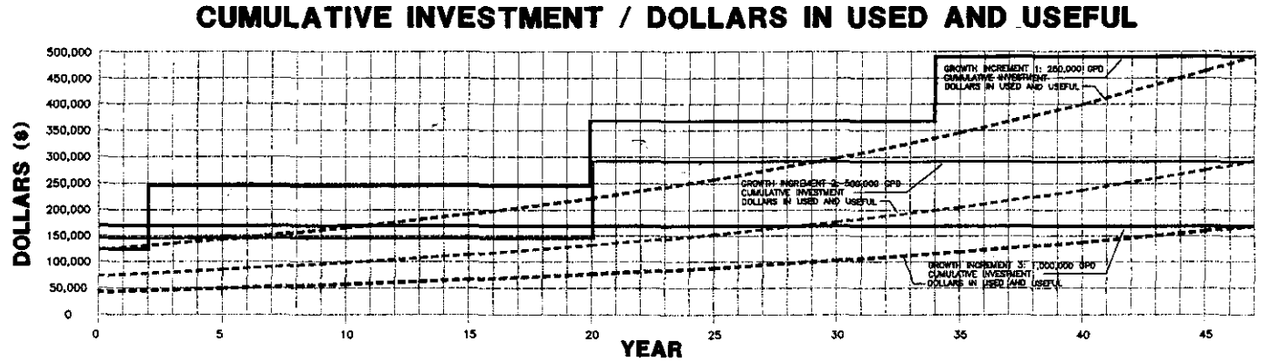
FACILITY PHASING SCHEDULE AND CASH FLOW



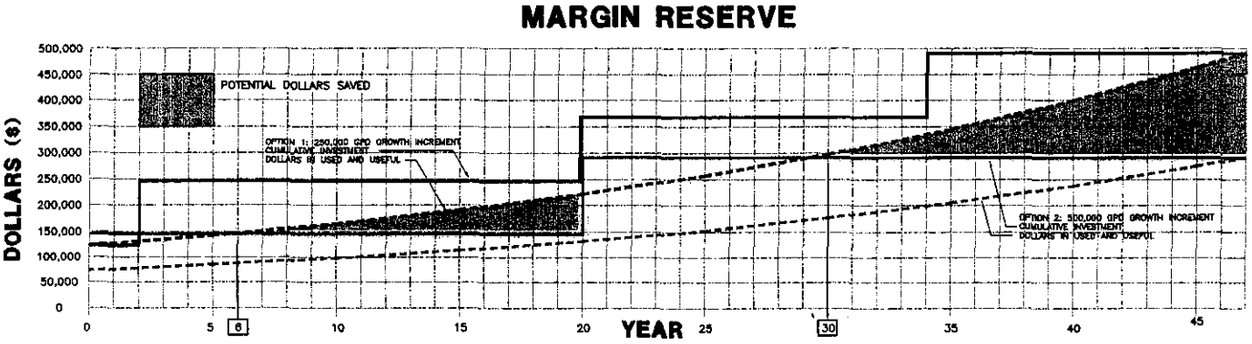
PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE



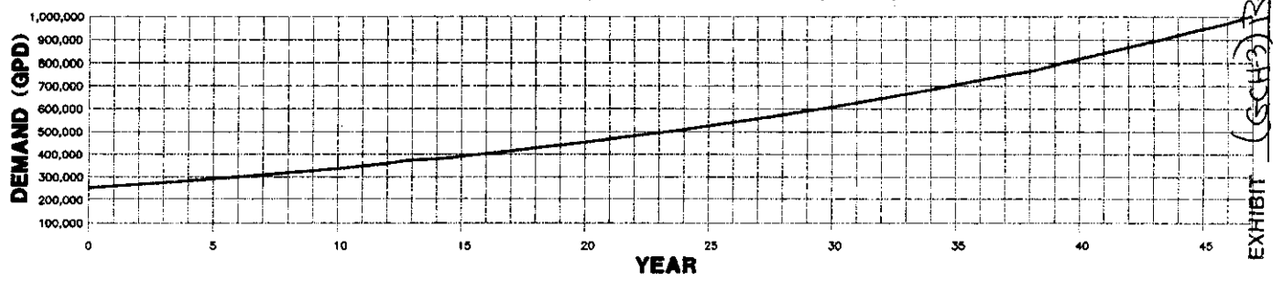
TERTIARY FILTERS - TRAVELING BRIDGE

96/45800F1A

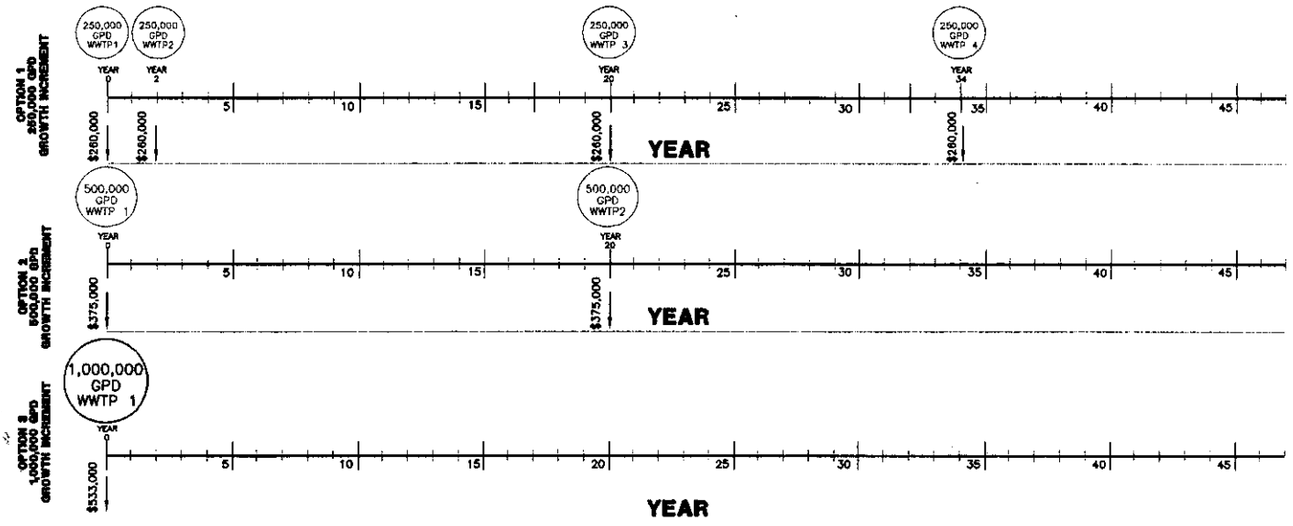
EXHIBIT (SCH 3) Rev

PAGE 7 OF 12

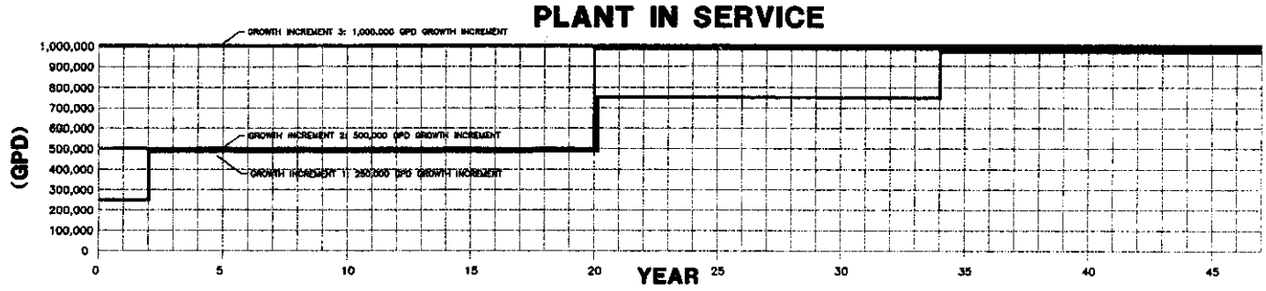
DEMAND (GPD) 250,000 GPD TO 1,000,000 GPD



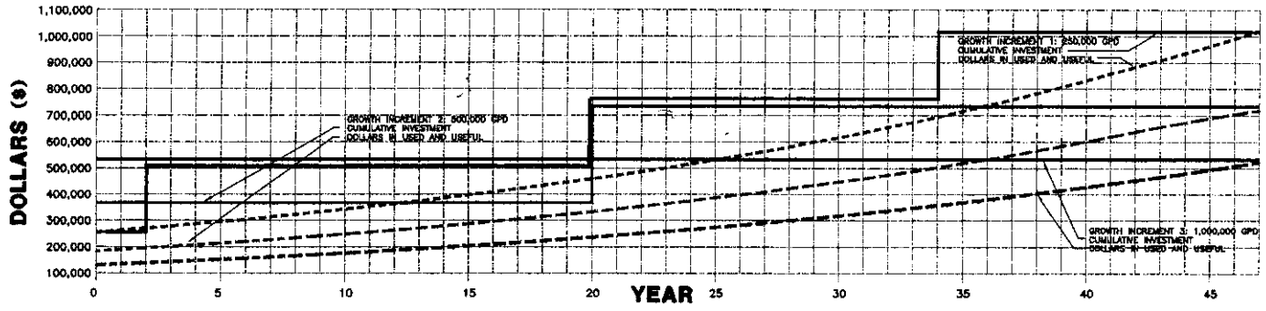
FACILITY PHASING SCHEDULE AND CASH FLOW



PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE

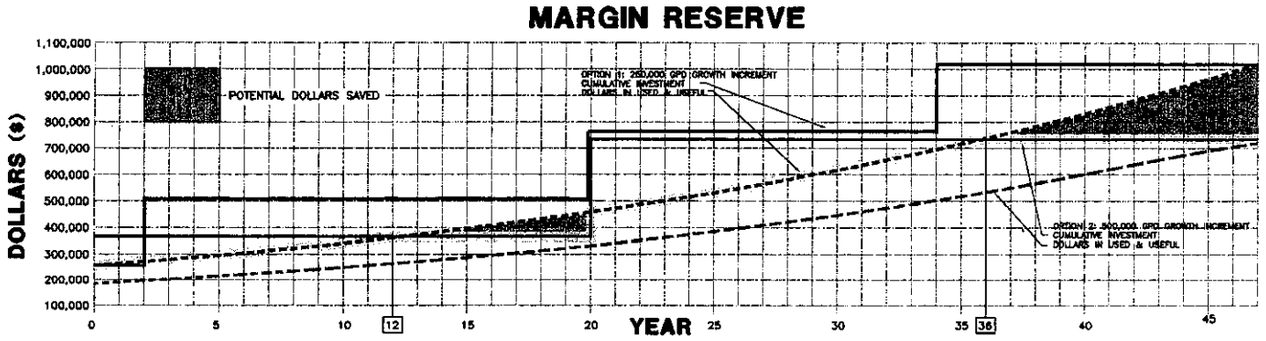


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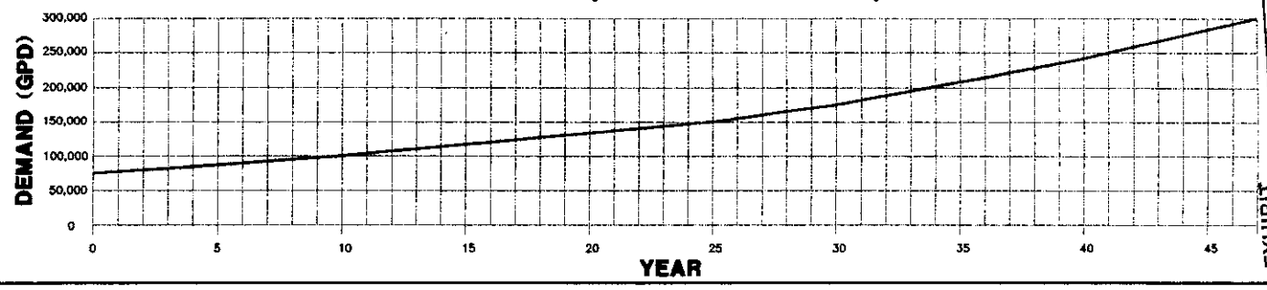
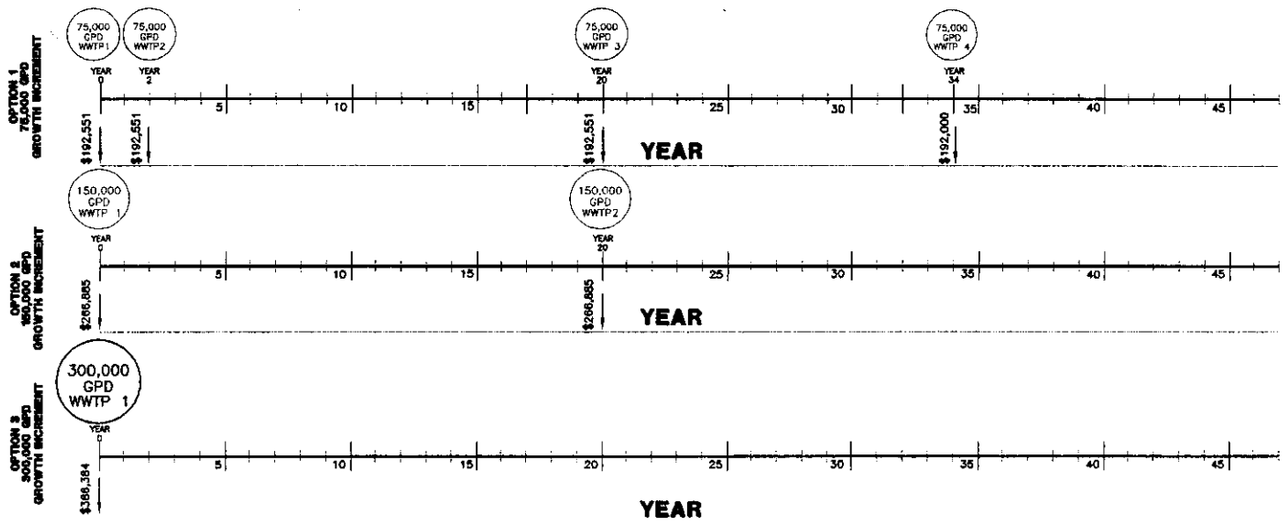
EXHIBIT (GH-3)Rev

PAGE 8 OF 18

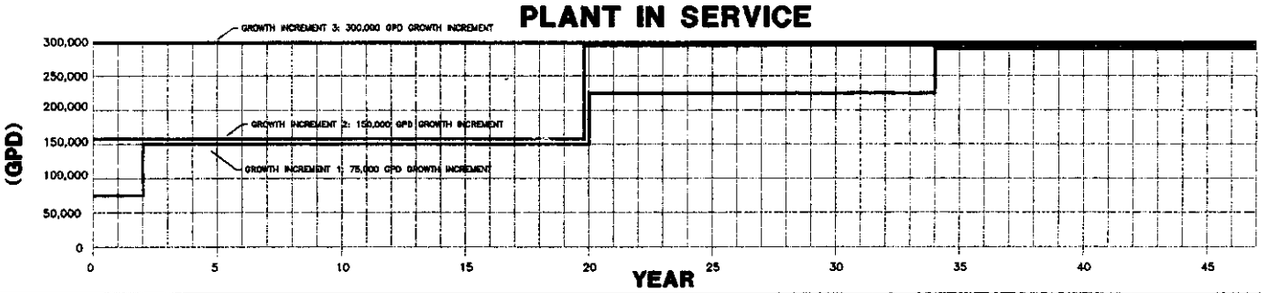
DEMAND (GPD) 75,000 GPD TO 300,000 GPD



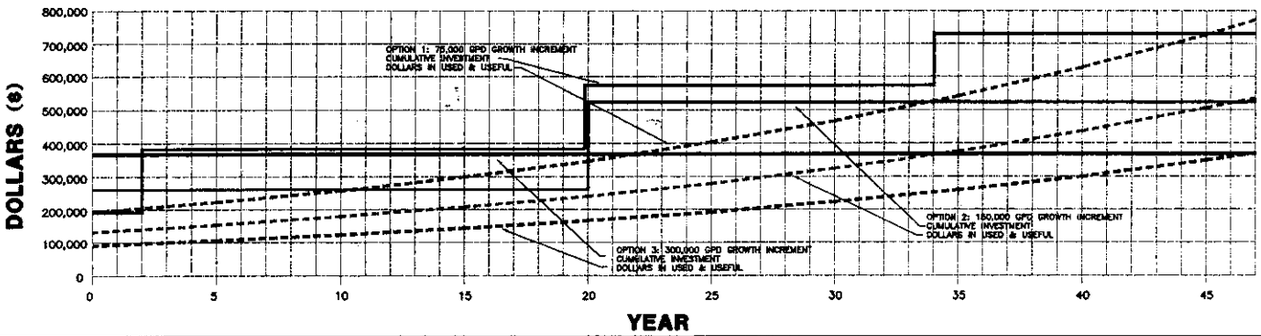
FACILITY PHASING SCHEDULE AND CASH FLOW



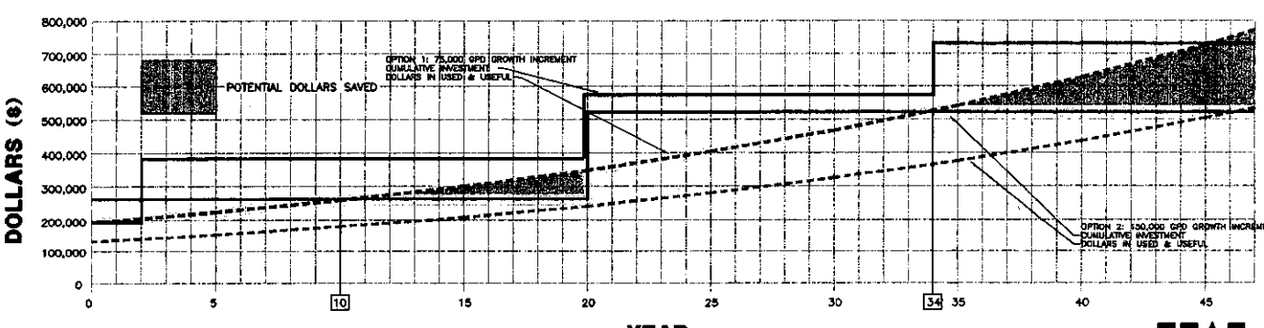
PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL

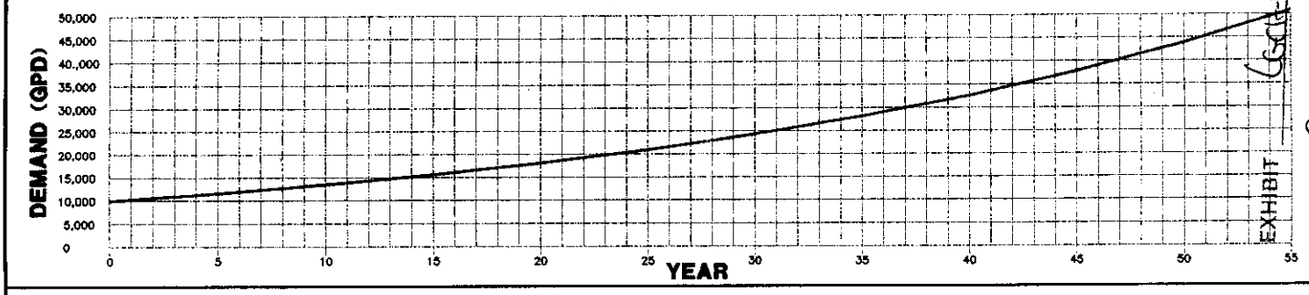


MARGIN RESERVE

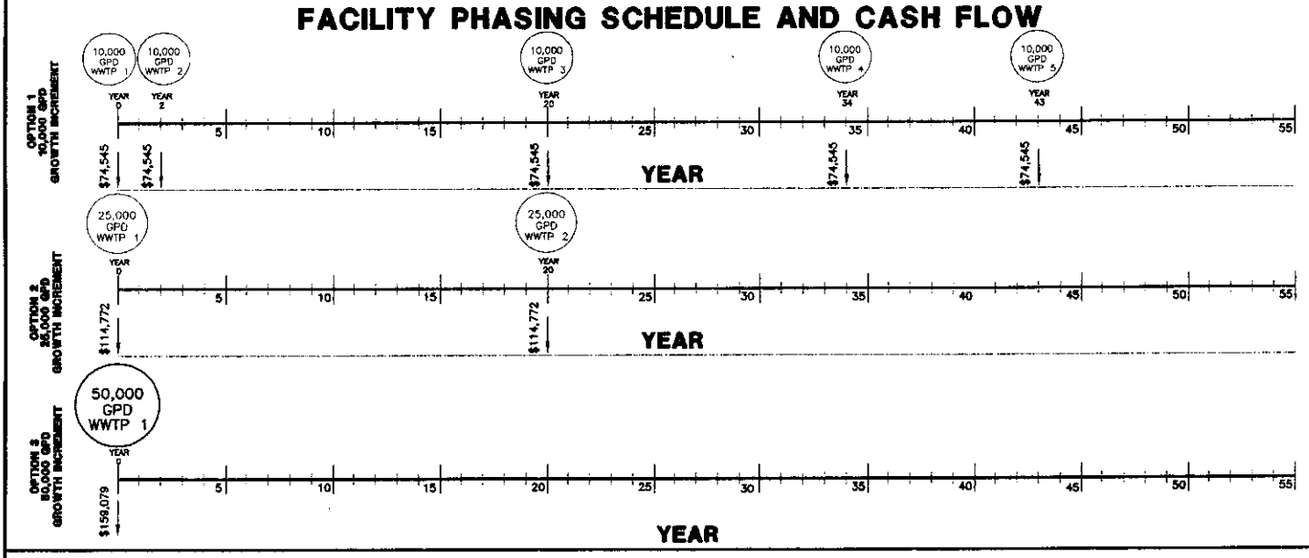


EXTENDED AERATION PACKAGE WWTP - 75,000-300,000 GPD

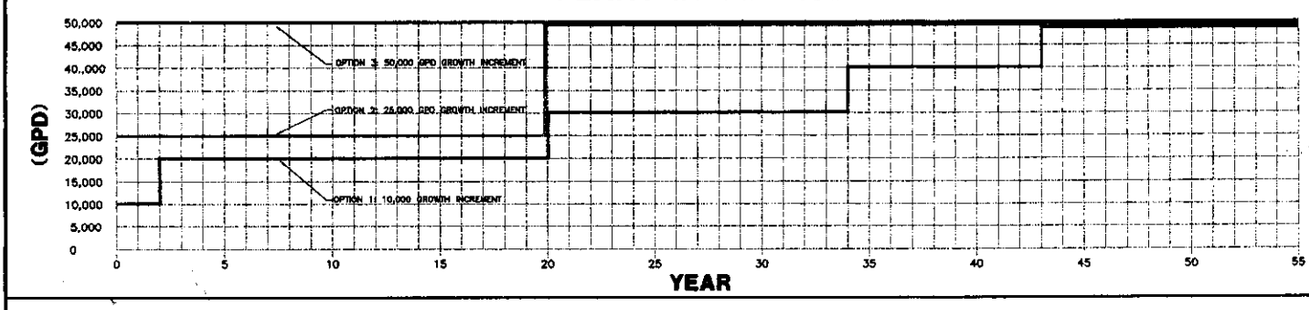
DEMAND (GPD) 10,000 GPD TO 50,000 GPD



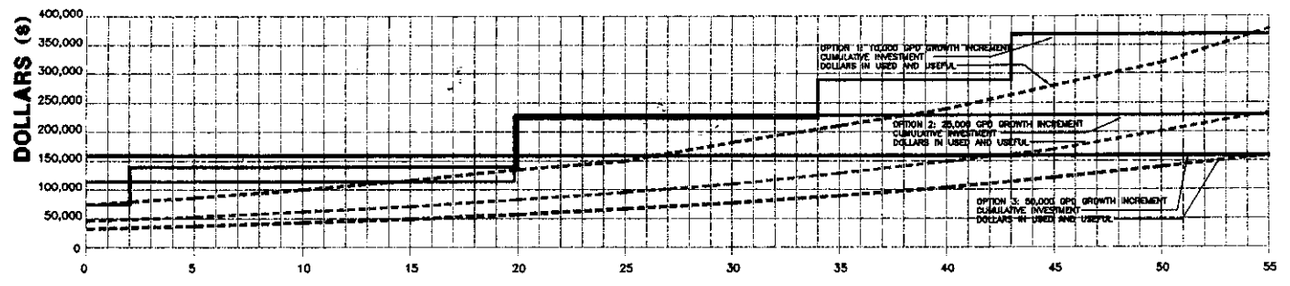
FACILITY PHASING SCHEDULE AND CASH FLOW



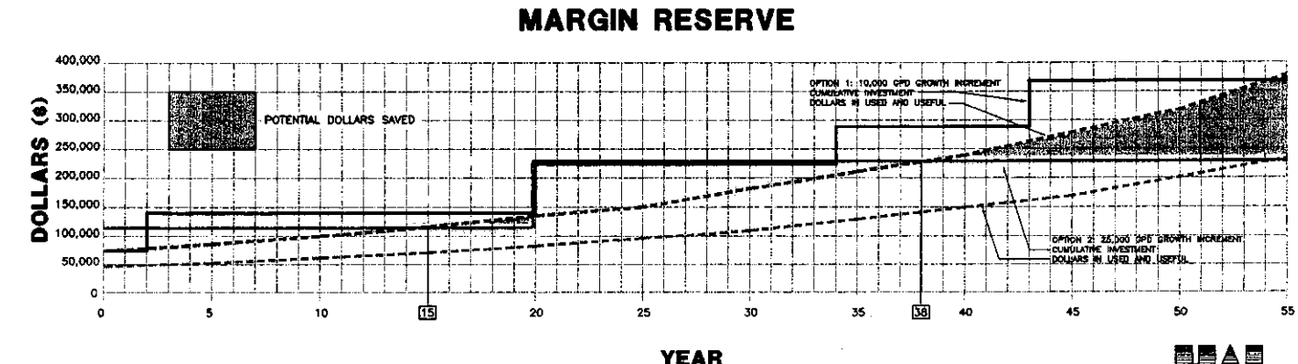
PLANT IN SERVICE



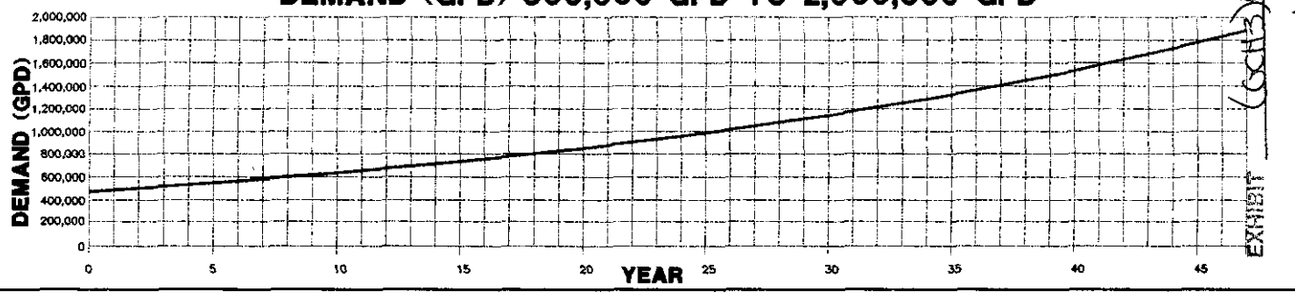
CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



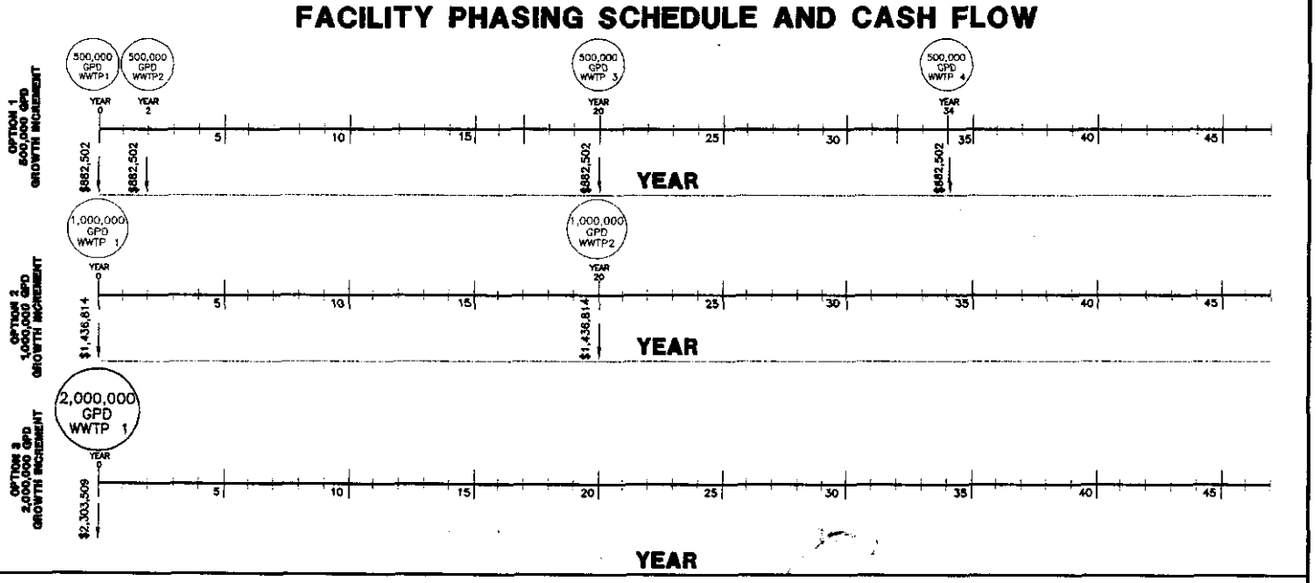
MARGIN RESERVE



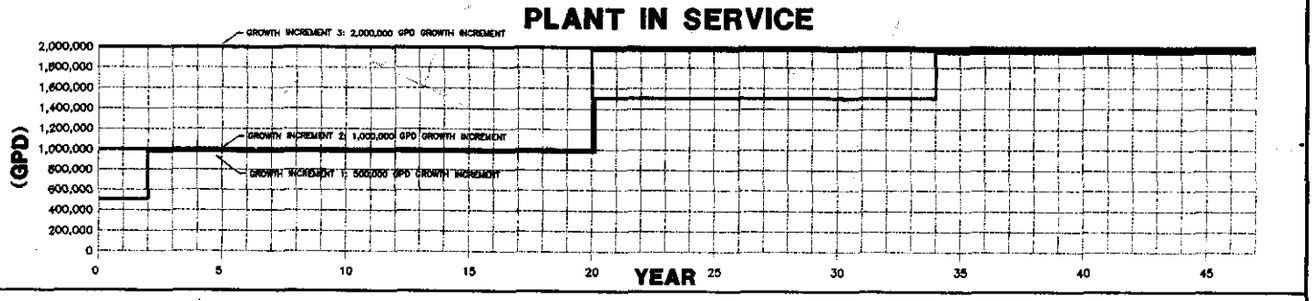
DEMAND (GPD) 500,000 GPD TO 2,000,000 GPD



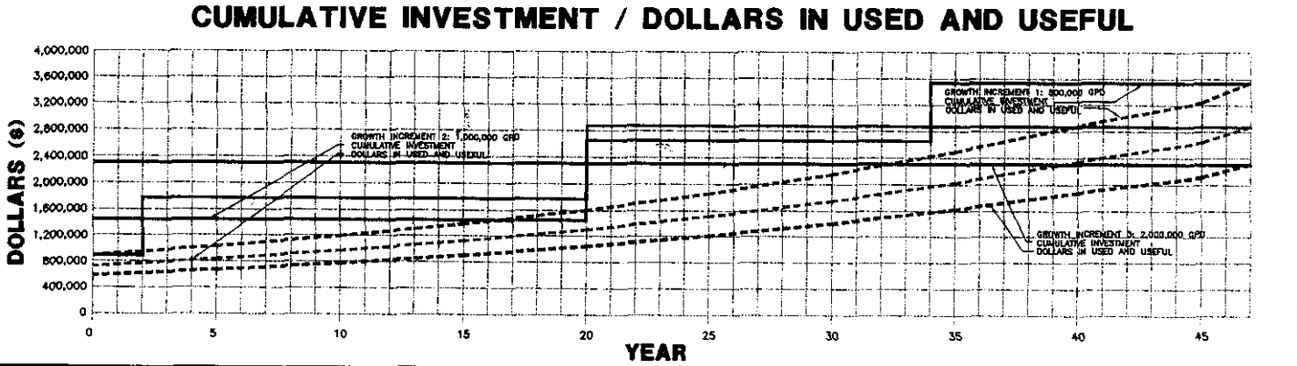
FACILITY PHASING SCHEDULE AND CASH FLOW



PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE

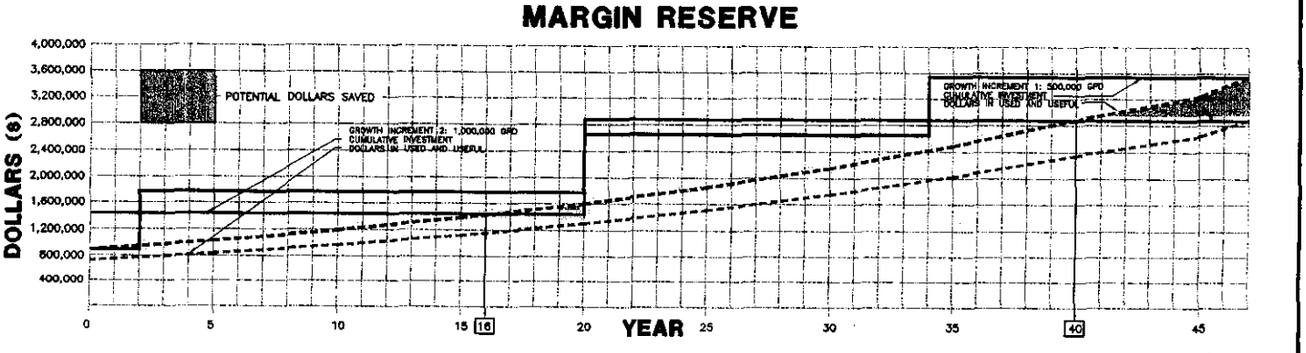
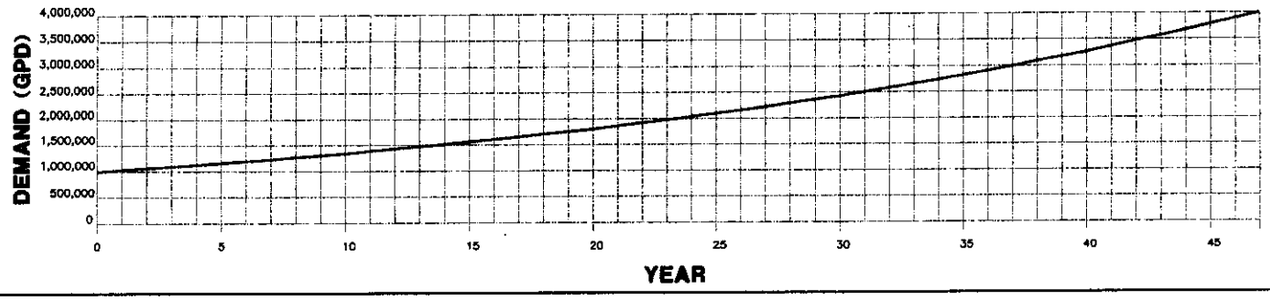
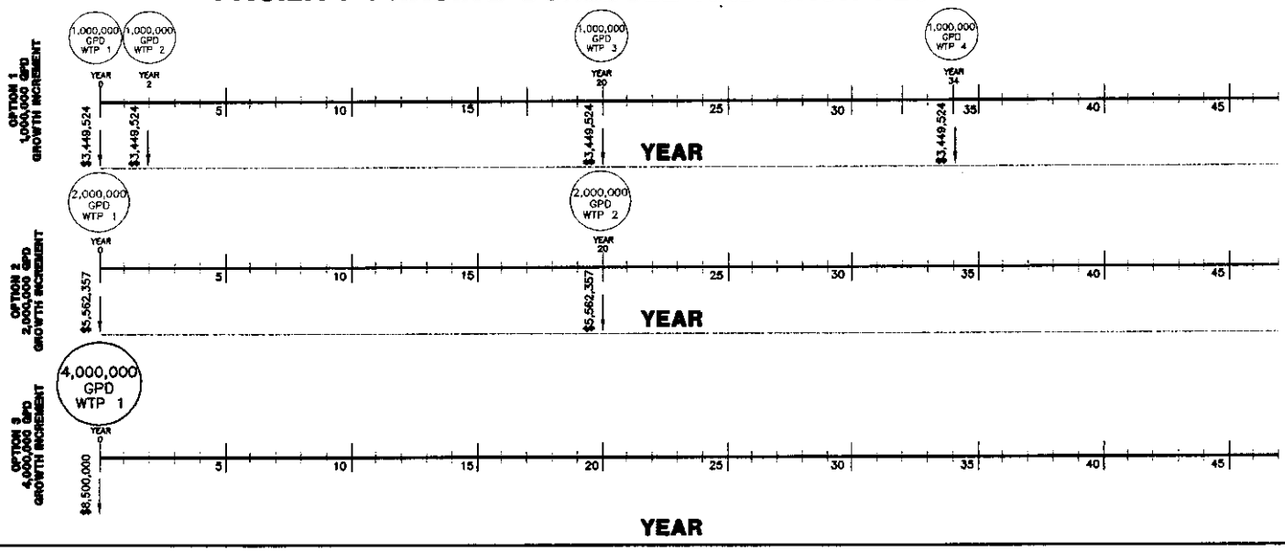


EXHIBIT (GCH-3) Rev, PAGE 11 OF 12

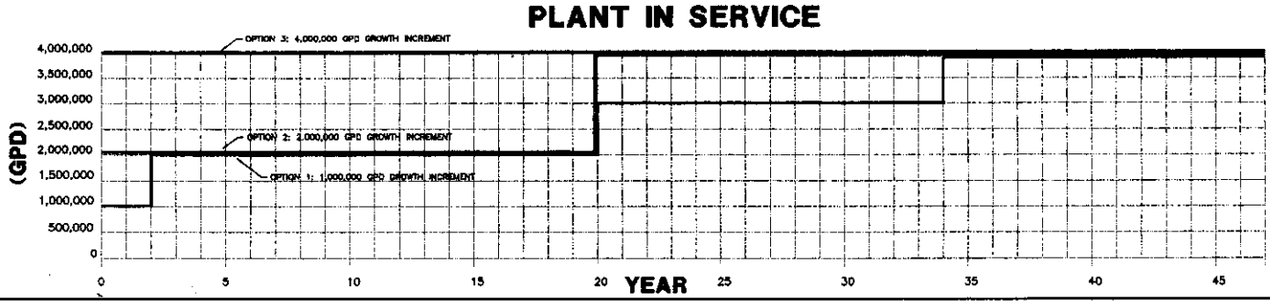
DEMAND (GPD) 1 MGD TO 4 MGD



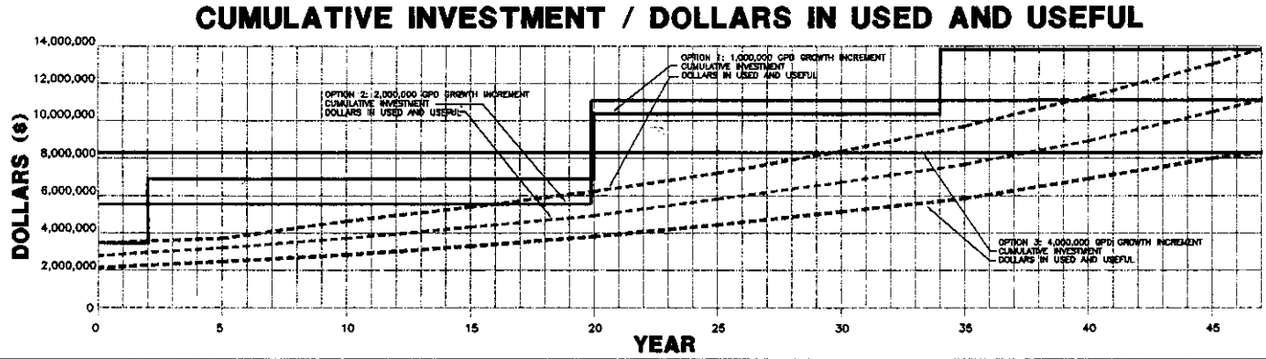
FACILITY PHASING SCHEDULE AND CASH FLOW



PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE

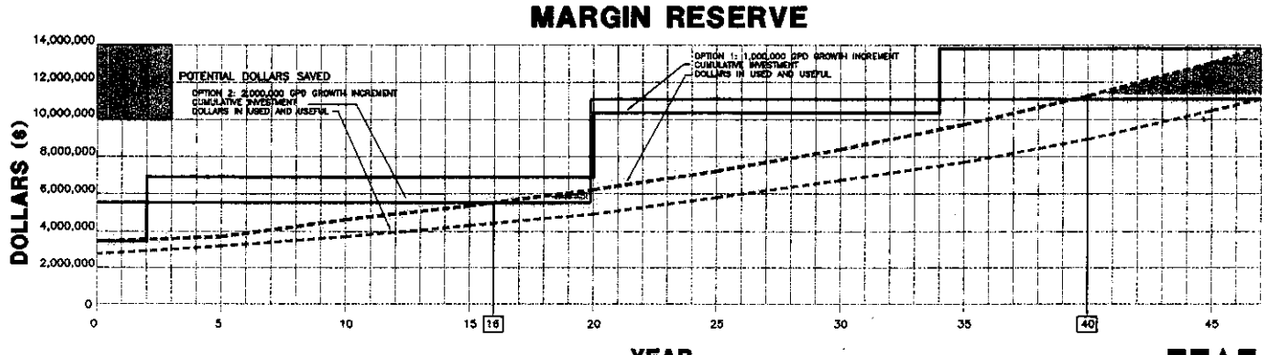


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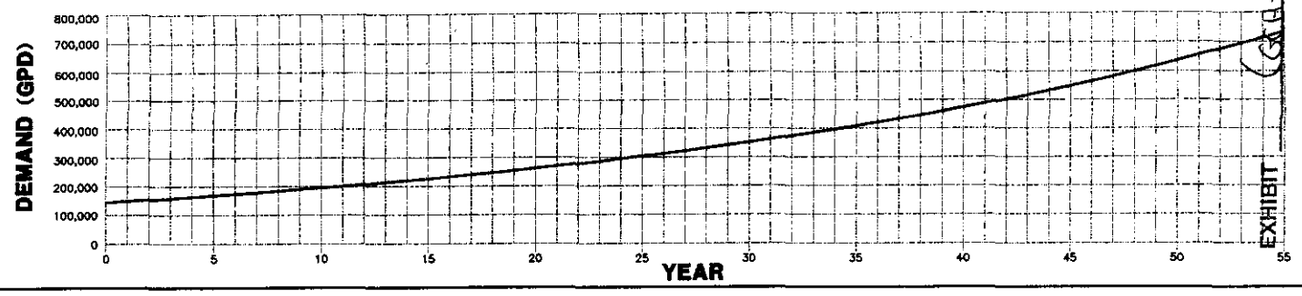
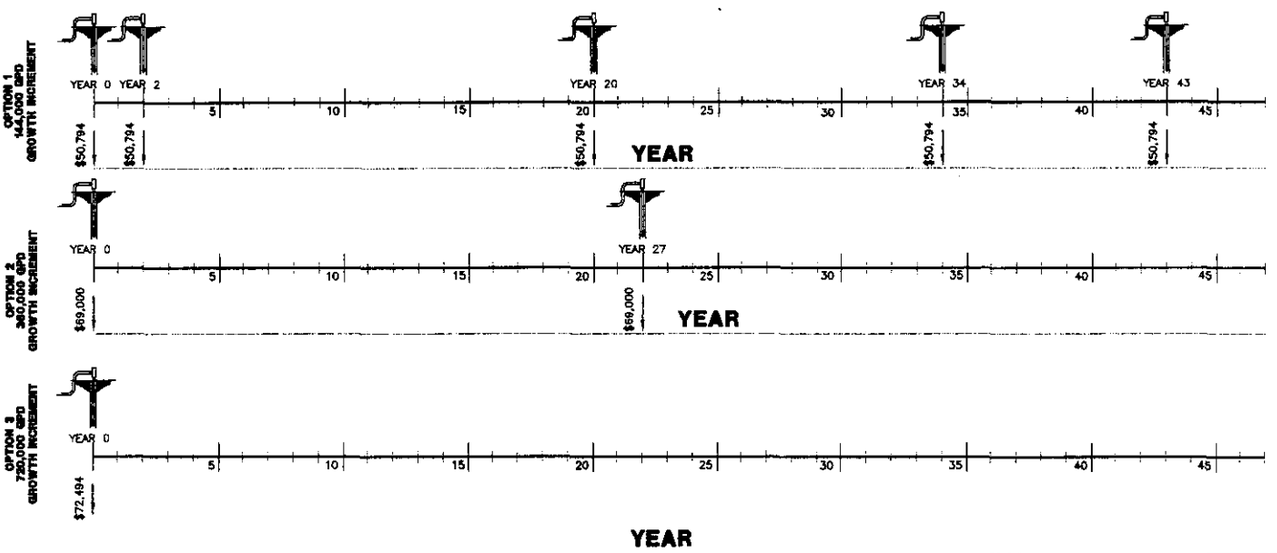
EXHIBIT (GA-3)R1

PAGE 12 OF 12

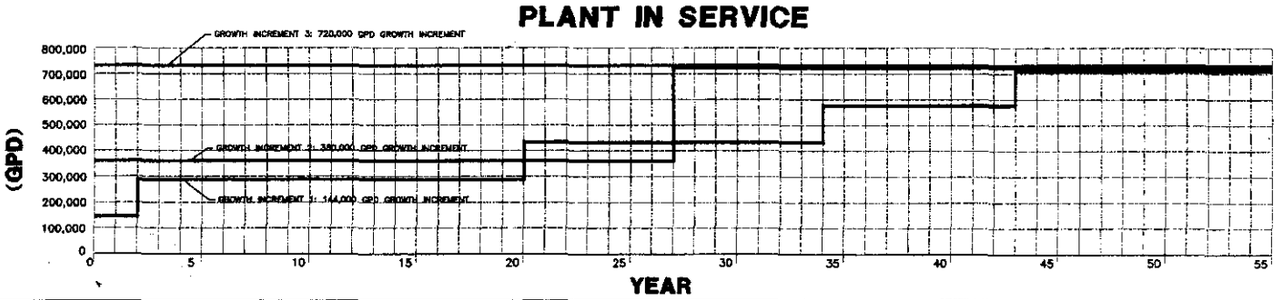
DEMAND (GPD) 144,000 GPD TO 720,000 GPD



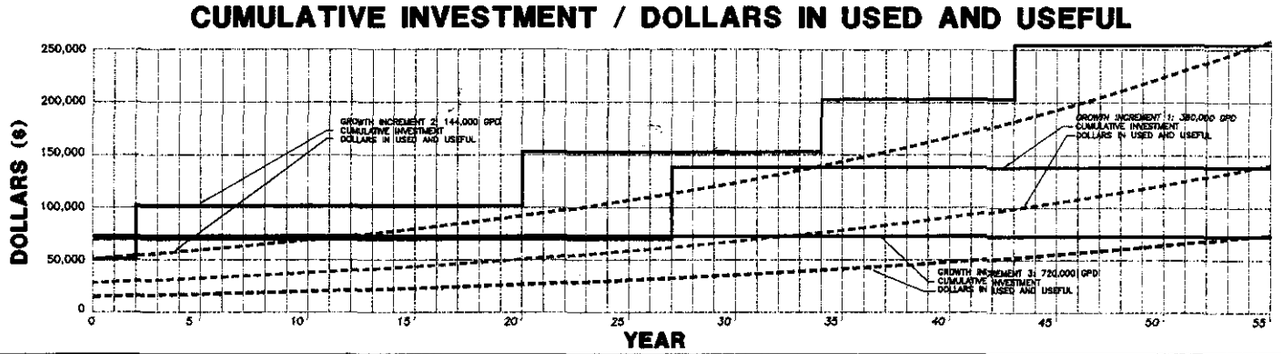
FACILITY PHASING SCHEDULE AND CASH FLOW



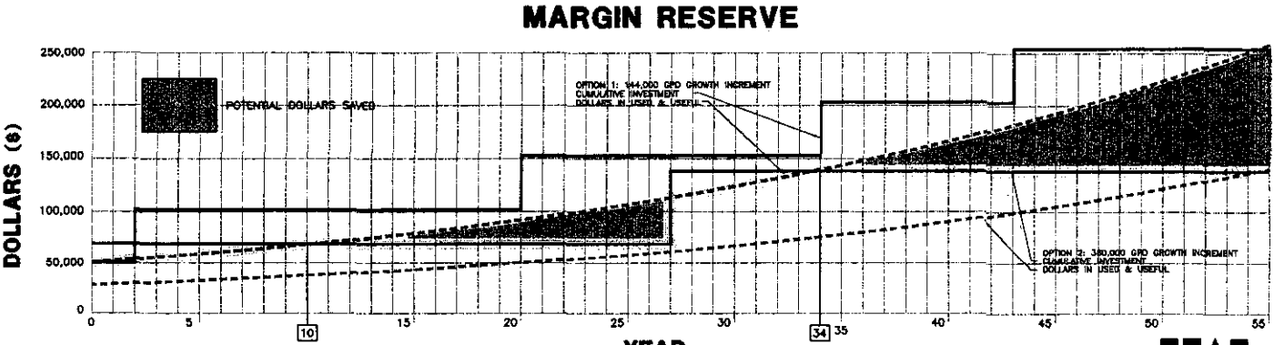
PLANT IN SERVICE



CUMULATIVE INVESTMENT / DOLLARS IN USED AND USEFUL



MARGIN RESERVE



POTABLE WATER SUPPLY WELLS (250' DEEP) - 144,000-720,000 GPD