

KENT COUNTY WATER AUTHORITY

BOARD MEETING MINUTES

January 17, 2007

The Board of Directors of the Kent County Water Authority held its monthly meeting in the Joseph D. Richard Board Room at the office of the Authority on January 17, 2007.

Chairman, Robert B. Boyer opened the meeting at 3:30 p.m. Board Members, Mr. Gallucci, Mrs. Graham, Mr. Masterson and Mr. Inman were present together with the General Manager Timothy J. Brown, Technical Service Director John Duchesneau, System Engineer, Kevin J. Fitta, Arthur Williams, Finance Director, Legal Counsel, Joseph J. McGair, and other interested parties.

The minutes of the Board meetings of December 14, 2006 were moved for approval by Board Member Graham and seconded by Board Member Gallucci and were unanimously approved.

Guests:

High Service Requests:

Chairman Boyer read aloud for the benefit of the attendees all of the Kent County Water Authority revised standard conditions in lieu of a moratorium from regulations 1.14.1, et seq.

The General Manager gave a presentation and discussion and distributed a memoranda dated January 17, 2007 regarding High Service which is incorporated in "A" and a program memoranda dated January 16, 2007 which is attached as "B". The General Manager stated that if all projects that were previously approved were built and that there could be approximately 172,000 gallons of surplus based upon the latest calculations from the model engineering data. The Chairman stated and it is the sense of the Board that the Board must review the reports very carefully.

Villas on the Green, East Greenwich – Continued

Scott Moorehead, P.E., Greg Contardo and Michael Krajian owners of East Greenwich Golf Course appeared before the Board. Scott Moorehead stated that the project has changed in that they would now propose to extend the 16" pipe to Signal Ridge instead of the previous 2,000 ft. which is an important element for the Kent County Water Authority system. Board Member Masterson stated it was a major change especially since the Town of East Greenwich has made it a top priority to re-

service Signal Ridge. The Chairman stated that the Board needs to digest the reports of C & E Engineering (model engineering) as discussed earlier by the General Manager.

Shipwreck Falls Lodge – DiPrete Engineering

The applicant did not appear but did meet with Legal Counsel and the General Manager to discuss mutual assistance in aid-in-construction and contributions by other interested parties.

This matter was continued and is discussed in Legal Matters infra.

New London Turnpike, West Greenwich – DiPrete Engineering

This matter was continued.

Rocky Hill Commons Office Park – James Malm

John Brunero, Esq. and Scott Moorehead, P.E. appeared with the owner, James Malm who stated that Brooks Drugs project is no longer viable because of the sale of the company. Mr. Brunero stated that the Supreme Court upheld the zoning designation and assumes that the water necessary for the project is in the Kent County Water Authority calculations. The General Manager countered that the hotel was approved under low service and now the developers want high service. Mr. Brunero stated that the project is a multi-faceted project including hotel, restaurant, condos, low income housing and assisted living units. The General Manager will review water usage figures. Mr. Brunero stated that the owner is amenable to aid-in-construction and will meet with the staff and the matter was continued to the next meeting.

West Greenwich Hotel & Restaurant, America East Engineers

Tim Behan, P.E. was present, only, to introduce the project since no formal application has been filed. He stated that it is next to Route 95 and contains 3 acres with the plan to build 160 room hotel and a 250 seat restaurant and water and fire service into 20" waterline off Hopkins Hill Road. He stated that the average day usage would be 25,000/day. The Chairman reminded all that the main concern is high service. The General Manager reiterated that this is strictly preliminary and there is no application pending.

Legal Matters

Relocation of Tank Site – Read School House Road

On January 8, 2007, the Coventry Town Council authorized the Town Manager to enter into agreement with Kent County Water Authority as to the Read School House Road land swap for location of the tank. Title research for the new site has been

completed. Legal Counsel prepared the application for the special use permit required from the Zoning Board of Review and will obtain a hearing date for the matter.

Facility Access – Amgen

Easement rights of Kent County Water Authority are impeded due to Amgen's security protocol. The General Manager forwarded correspondence to the Berglund, P.E. setting forth easement rights and to contact to discuss the matter and there has been no formal reply and the General Manager stated that there is a conflict and there will be a need to discuss further.

Wakefield Street, West Warwick Tank Site

The General Manager stated that the appraisal of the site has been obtained by Kent County Water Authority and that the Town of West Warwick owns most of the land and this matter will be reviewed further by Kent County Water Authority.

Department of Health follow up private systems

Legal Counsel sent a general matrix to Kent County Water Authority the week of June 13, 2006 and the staff of Kent County Water Authority and Legal Counsel will work on the matrix together and will then present it to the Department of Health. The General Manager stated that they will write comprehensive regulations rather than just an outline and that the General Manager and Kevin Fitta will be meeting to review this matter and then will meet with Legal Counsel.

Town of Coventry Sewer Easement

Coventry requested from Kent County Water Authority a sewer easement over land owned by Kent County Water Authority and designated as Assessor's Plat 20 Lot 9. Kent County Water Authority acquired the land subject to a restriction that it be used only for water conservation purposes. Given this restriction, Legal Counsel inquired on August 5, 2006 of legal counsel for Department of Environmental Management as to whether or not Kent County Water Authority is permitted to grant an easement. The Water Resources Board approved the grant of easement and the form of easement deed has been forwarded to the Town for review.

Kent Hospital/Tollgate/Emergency Interconnection

This will be addressed by Legal Counsel and Kent County Water Authority and is in review.

Shipwreck Falls

Legal Counsel and the General Manager met with the parties including Mr. Resnick, Esq. regarding the project and will meet again upon the request of the Developer and his attorney.

Director of Finance Report:

Arthur Williams, Finance Director, explained and submitted the financial report and comparative balance sheets, statements of revenues, expenditures, and cash receipts, disbursements through December, 2006 and closing documents which is attached as "C", and after discussion, Board Member Gallucci moved and seconded by Board Member Masterson to accept the reports and attach the same as an exhibit and that the same be incorporated by reference and be made a part of these minutes and it was unanimously,

VOTED: That the financial report, comparative balance sheet statement of revenues, expenditure, cash receipts and disbursements through December, 2006 and closing documents, be approved as presented and be incorporated herein and are made a part hereof as "C".

Point of Personal Privilege and Communications

Board Member Graham was called by the Economic Development Commission of West Warwick to encourage dialogue and she will be attending that meeting along with Board Member Masterson.

Board Member Masterson stated that the previous Kent County Water Authority Chairman Perry is still in Kent Hospital and would appreciate thoughts and prayers.

The General Manager e-mail will be used for the member mail commencing this month.

GENERAL MANAGER/CHIEF ENGINEER'S REPORT **OLD BUSINESS:**

Supplemental Water Supply for Discussion

The General Manager distributed a memorandum dated January 16, 2007 which is attached hereto as "A" and was previously discussed infra.

S-2681 Sub A – 39-3-43 Action by Board

The General Manager stated that this legislation did not take into account any maintenance problems which could arise as in off line issues. The General Manager spoke of liability force majeure and if tank has to be out of service for maintenance it could be problematic. If there was a major fire it could affect water delivery.

Tank Maintenance

This matter will be discussed at the next Board meeting.

New Business

Cross Connection Control Program (Phased Program Approval Hold Warwick Input)

The General Manager presented this issue to the Board in December and the City of Warwick is concurrent with this program. This program was previously discussed at the Board meeting on December 14, 2006 and the program is attached as “D”. He stated that the State of Rhode Island/Department of Health has been equivocating as to the statewide implementation which is essential to the success of this program. The General Manager stated it is a long term project. Board Member Masterson moved to approve the Cross Connection Control Program as attached as “D” and it was seconded by Board Member Graham and it was unanimously,

VOTED: To approve the Cross Connection Control Program as attached as “D”.

Updated Conservation Water Plan Approval

The General Manager stated this was previously presented to the Board and it was moved by Board Member Graham and seconded by Board Member Masterson to approve the Updated Conservation Water Plan as attached as “E” and it was unanimously,

VOTED: To approve the Updated Conservation Water Plan as attached as “E”.

Cost of Service Rate Discussion

The General Manager stated that rate filing may become necessary for the CIP in Fall of 2007 which would mean additional bonds (new water meters for implementing seasonal rates). It will require financial advisors, rate consultants and a new rate redesign since last one was done in 1993 and the Board should be thinking about this probability. The Chairman and all the Board Members commented on the necessity of

the same. The General Manager stated there are other issues such as to the possible legislative action as to statewide issues.

2007 Proposed Programs

A memo dated January 16, 2007 attached hereto as "B" was discussed infra in High Service. Board Member Masterson inquired as to the EDC/Quonset issues regarding the EDC/Quonset Water Supply System Management Plan which is in default. The General Manager stated that Hunt River water production will continue to be a problem and with possible court challenges as to grandfather rights will be considered. The General Manager said a multi-user treatment plan could be a possible solution.

Fire Alarm System No Budget

The General Manager stated that this is necessary and will have it sent out for RFP.

CAPITAL PROJECTS:

CIP 7b Read School House Road Tank (Extension of Service or RFP Engineering

The General Manager stated that Pare Engineering charged \$50,000 but only provided 35% of the drawings and went up on its hourly rates and that negotiation did not seem to work. The General Manager said this item must wait until the zoning is completed. He recently spoke with George Palmisciano of Pare Engineering and now may be willing to negotiate an increase, however, the General Manager stated if it went out to RFP it may be a diminimus issue.

Board Member Graham added that she was aware that Pare was on hold because of the Coventry zoning issues. The General Manager stated that the job was stopped and a study of old site and lower site were done and a report was compiled and appraised. Both parcels were similar in value and the plan was accepted by the Town of Coventry.

The General Manager stated that extenuating circumstances might justify the Pare increase. The Chairman stated he would be comfortable with further negotiation of the amount.

It was moved by Board Member Graham and seconded by Board Member Inman to extend the contract subject to negotiation with the General Manager and to have the contract reviewed by Legal Counsel and it was unanimously,

VOTED: To extend the contract subject to negotiation with the General Manager and to have the contract reviewed by Legal Counsel.

INFRASTRUCTURE PROJECTS :

Quaker Lane Pumping Station Evaluation, Preliminary Design (Approval to Acquire Land)

The General Manager stated there will be need approval to negotiate a purchase of land for the station. Board Member Masterson and Board Member Graham stated that they are in favor of the purchase of the land.

All other Capital Projects and Infrastructure Projects are addressed in an exhibit attached as "F" as prepared and described to the Board by the General Manager with general discussion following.

Board Member Graham made a Motion to adjourn, seconded by Board Member Gallucci and it was unanimously,

VOTED: To adjourn the meeting at 5:45 p.m.

Secretary Pro Tempore

EXHIBIT A

JANUARY 17, 2007

OFFICE MEMO

To: Board
From: Timothy J. Brown
Subject: Board Meeting January 18, 2007
Date: January 17, 2007

Prior to the Board's action on high service requests for the January Board Meeting, I would like to review the most recent calculations from Amgen and Technical Memo 3A of the most recent hydraulic tank study evaluation. This has been provided to you in a mailing yesterday along with the attachments to this memo. For quite some time now, I have stated for the record my objection to any additional water service approvals being granted for the high service gradient and of course in particular for irrigation of residential or commercial properties. As you know the Board has been approving the additional supplies even with the perceived shortfall in water based upon previous modeling and the analysis of the total ability to supply the high service from our low service gradient through booster stations. We have continued to use the engineering firm C & E Engineering Partners to do our analysis for hydraulic since they have prepared the hydraulic model and have recently updated it as of February of 2006. It has certainly been invaluable to us in our review of our demands and of course our engineering work to date. During this most recent update for the hydraulic tank study we needed to review demands on our system as well as the growth of our system for the next 20 years. That was attached in Task 3A that was provided yesterday to you for review by C & E Engineering Partners. We are reviewing that and will provide comments to the engineers concerning that, but did not want to hold up the memo and the information for the Board's review as it has ramifications for the high service approvals. The approved high service projects to date are attached in the chart which is both printed in red for completed projects and black for non-completed projects. Based upon the new calculation and the diurnal flow curve of Amgen which was provided to us in January of 2007 you will see that the change in the maximum day and average day flows for their 2008 projections has caused a welcome surplus in supply. Currently the surplus is 427,000 GPD taking into consideration all approved projects to date. It is not a lot, but we feel very comfortable that it is accurate and correct and would allow the Board the ability to approve high service projects not exceeding 427,000 GPD additional supply than what have already been approved. I also must state for the record that I do not recommend irrigation for any project from this point forward; in particular, high service gradient as we must control outside irrigation demand.

If this Board accepts the most recent modification to supply "surplus" then the Board would have an opportunity to continue to provide water in the high service gradient. It must be limited to the calculated surplus based on the actual conditions of the KCWA demand and the consideration of the approved projects. As a reminder, this stems from the modeling and calculated capacity of our system by the engineers based on actual conditions and our supply capacities. A word of caution; prior to the most recent rapid build-out of the high service gradient, we have issued moratoriums on outside water use due to the inability to supply both high and low service gradients. Not to sound like a broken record, but outside water use is the culprit and must be

controlled. No matter what the average day demand is, we cannot supply the maximum day demand with the excessive use of water for outside uses (landscaping watering and alike).

The Board has explored many different options in the past and must again explore options to control excessive use. The use of moratoriums is effective, but takes a number of days to implement and may not be advantageous to this company or to our customers. It certainly is not welcomed. We still await response from the Water Resources Board of our request for consideration of a statewide conservation program. We have certainly addressed this repeatedly to the political representatives as well as to the Commission that is investigating the Authority. To this day we still have no response, nor action concerning our request. In the interim, we must be ever vigilant and we must institute moratoriums if a dry season is upon us and must keep those moratoriums in place until all danger to system capacity has passed. It will require additional policing and will require a major emphasis on press releases and coverage by the news media.

My last comment is concerning the programs to be implemented to increase supply to the high service gradient as well as stabilize supply to the low service gradient. All programs have been initiated and we are working towards increasing supply at Warwick's connection, both high and low service. We have already increased low service supply from Clinton Avenue pumping station and wait activation of the high service booster pumps upon completion of the Read School House tank and water transmission main. We will also be moving into our preliminary and final design phases of the Mishnock well field and of course the East Greenwich well field. A number of questions will need to be answered by the Board over the next few months concerning capacity of East Greenwich well production, design services for the Read School House tank, study to review pressure conditions within the Read School House current pressure zone, funding for the Bald Hill high service transmission main and ultimately the revised Capital Improvement Program with the potential of a new connection to the PWSB aqueduct.

- Based on the anticipated increase in service population by community previously developed, the water demand will be proportionally increased by this amount. For example, the (service) population is expected to increase by 4.6% in West Warwick for the planning period. Therefore, demands are projected to increase in West Warwick by an equal amount within this area of the service territory. A similar approach was applied to the remaining communities with the Authority service territory.
- Due to the fact that the specific area of future development and growth is unknown, the future anticipated consumer demands would be distributed globally across the particular community in which they are projected to occur.
- In order to account for unanticipated growth (i.e. growth that would result in water demand increase), a conservative estimate of a 10% increase in water demand was allocated across the entire service territory for the planning period. This 10% increase in water demand also included the communities of Cranston, North Kingstown and Scituate for which the Authority has no immediate plans for expansion as a measure to account for "infill" development.
- The future demands for Amgen and ON Semiconductor were also considered in this study and both of which have been significantly reduced. The demands for each of these facilities were readjusted in the model database as follows.
 - An average day demand of 10.42 gpm (5,000 gallons per day) was utilized for ON-Semiconductor. This demand has decreased from 299.34 gpm (431,050 gallons per day) or by over 95% in the Low Service Gradient.
 - Based upon recent correspondence from Amgen dated January 4, 2007, detailing forecasted water use through year 2008 overall water demands have decreased for all demand scenarios. June 2008 is the projected point at full grow out for the facility. These adjusted demands will have an impact on the operation of the water system in the High Service Pressure Gradient. The demands are significantly lower than those provided in 2002 as can be seen below.

MODEL SCENARIO	2002 AMGEN DEMANDS	2008 AMGEN DEMANDS	OVERALL DECREASE IN FORECAST
Average Day	833 gpm (1.2 MGD)	556 gpm (0.80 MGD)	277 gpm (0.40 MGD)
Maximum Day	1,500 gpm (2.16 MGD)	833 gpm (1.20 MGD)	667 gpm (0.96 MGD)
Peak Hour	1,500 gpm (2.16 MGD)	1,084 gpm (1.56 GPM)	416 gpm (0.60 MGD)

- The future water demands were calculated for the entire system based on the aforementioned data and were proportionately applied to each of the various junction nodes within each of the service communities.

Significant changes / modifications to system operations:

- The existing Tiogue Tank (350') Gradient will be served and become part of the High Service (500') Gradient.

John: I have attached a Powerpoint presentation that shows our current forecast for water consumption for our facility at 40 Technology Way. This forecast is based upon our existing facilities and our current master plan. It is not representative of the maximum water demand for the site should additional expansions occur. At this time we do not have plans for expansion beyond what has been included in our current forecast.

If you have any questions please contact me.

Mark Berglund
Director Maintenance
Amgen Inc.
492-4459

Amgen Rhode Island Water Usage

Mark Berglund

James Vogel

04 January 2007

Amgen Rhode Island Water Consumption Forecast

(Preliminary estimates based on 2006 Forecasts of planned projects)

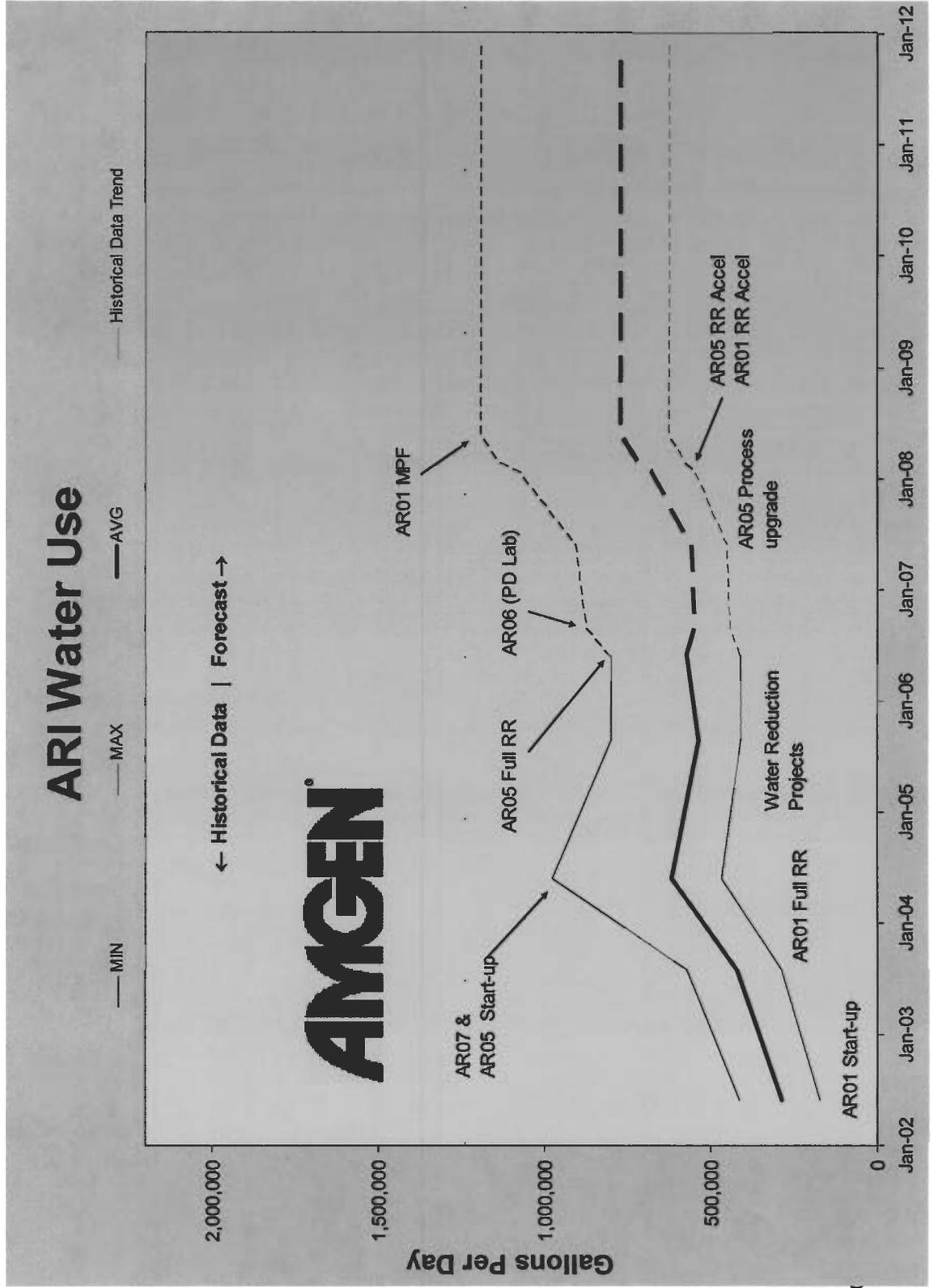
Start Date*	Event	Water Consumption**		
		MIN	AVG	MAX
06/01/02	AR1 Start-up	173,536	287,672	414,168
08/01/03	AR1 Full Run Rate	287,980	424,923	572,220
06/01/04	AR7 and AR5 Start-up	468,996	618,339	976,140
09/01/05	Water Reduction Projects	412,023	537,997	800,924
06/01/06	AR5 Full Run Rate	410,514	573,148	800,924
09/01/06	AR06 (PD Lab)	444,145	550,690	872,907
06/01/07	AR5 2007 Process Upgrade	449,146	556,890	902,907
02/01/08	AR5 Run Rate Acceleration	546,460	677,549	1,073,994
03/01/08	AR1 Run Rate Acceleration	577,427	715,944	1,134,854
06/01/08	AR1 Multi-Product Facility	621,517	770,611	1,189,521

* Approximate date change goes into effect.

** Data taken from representative periods after implementation.

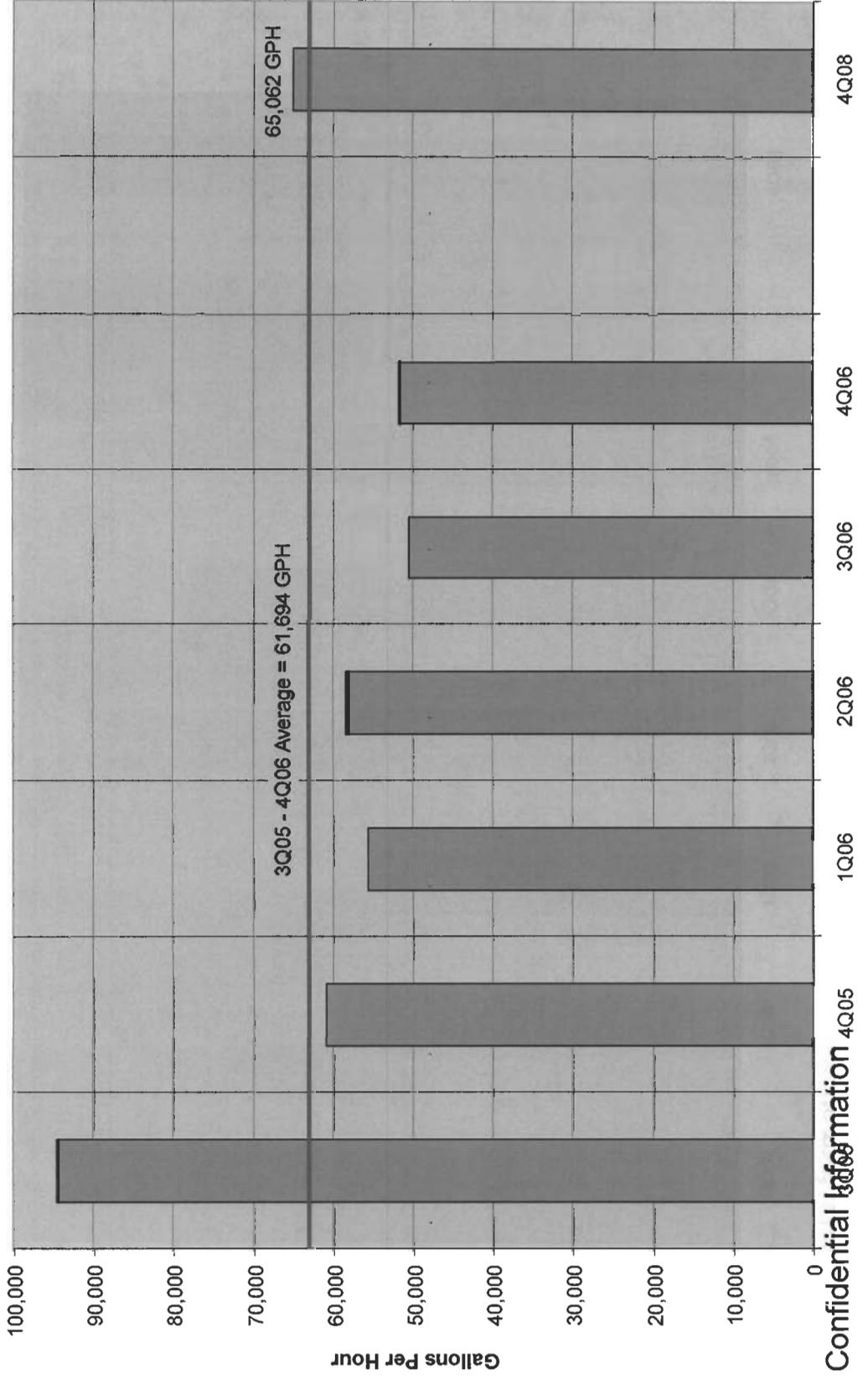
Confidential Information

Amgen Rhode Island Water Usage



Maximum Hourly Flow Rate

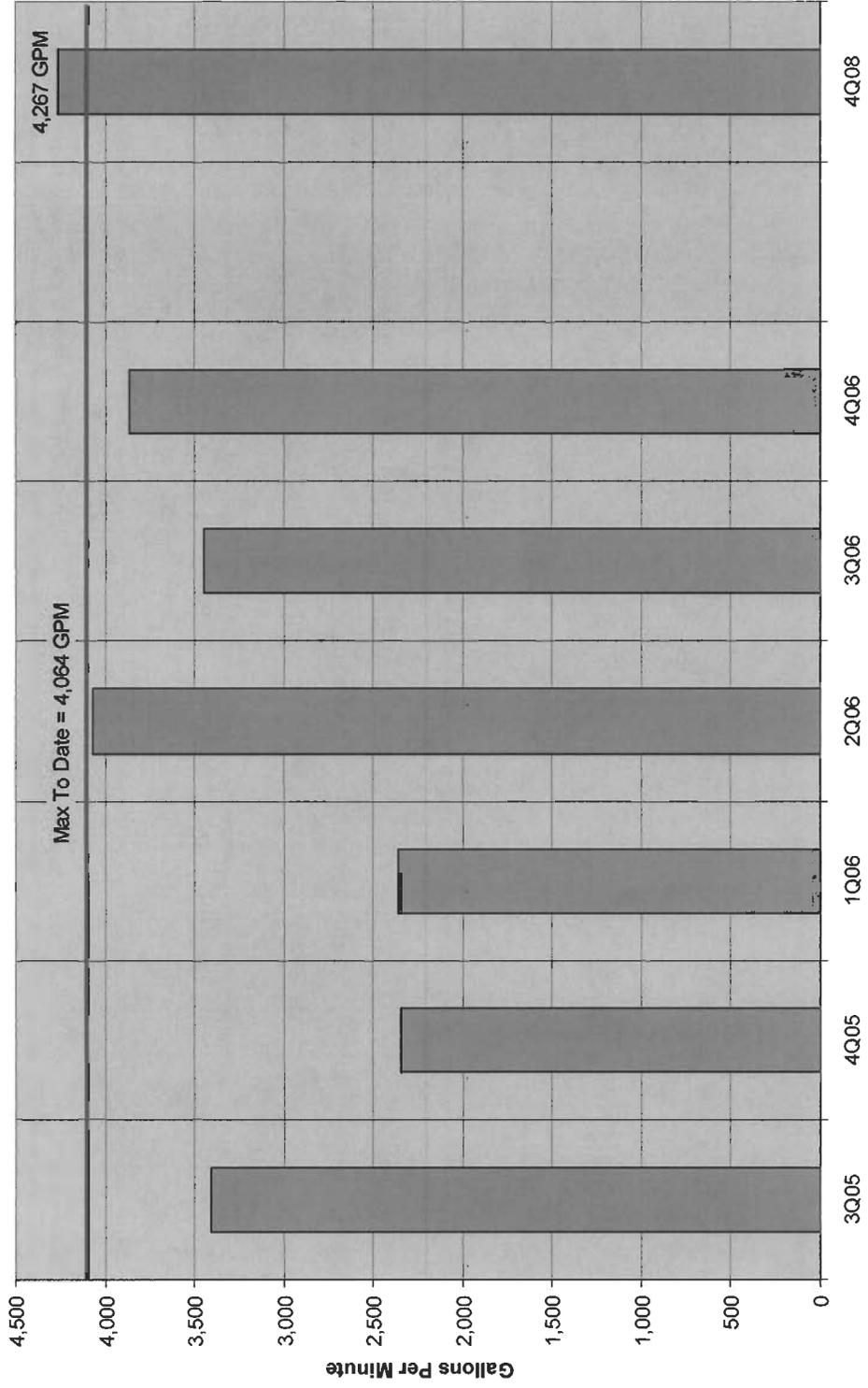
Data Not Available prior to 3Q05



Confidential Information 4Q05

Maximum Instantaneous Flow Rate

Data Not Available prior to 3Q05



Confidential Information



40 Technology Way
West Greenwich, Rhode Island 02817
401.392.1180/Telephone
401.392.1971/Fax

15 January 2002

Mr. Timothy J. Brown, P.E.
Kent County Water Authority
1072 Main Street
P.O. Box 192
West Warwick, RI 02893-0192

Re: The Immunex Greenwich Project/BioNext Project
West Greenwich, Rhode Island
PARE Project No. 01047.00

Mr. Brown:

Please confirm that Kent County Water Authority can provide water for the manufacturing facility located at 40 Technology Way, West Greenwich, Rhode Island owned by Immunex. We anticipate the demands to be as follows:

- The additional service will be needed, on or about 1 July 2002, and require a total of 700,000 Gallons per Day (GPD) for the entire site.
- The requirements may grow to a maximum daily consumption of 1,400,000 GPD, for the entire site, on or about 1 July 2003, during the start-up of the plant.
- The steady state annual average daily consumption will be 895,000 GPD, for the entire site, on or about 1 October 2004. This number is an average of the seasonal ranges for the facility, which are estimated to range between 700,000 and 1,250,000 GPD.
- The maximum instantaneous flow rate on a maximum demand day is expected to be 1500 Gallons per Minute (GPM).

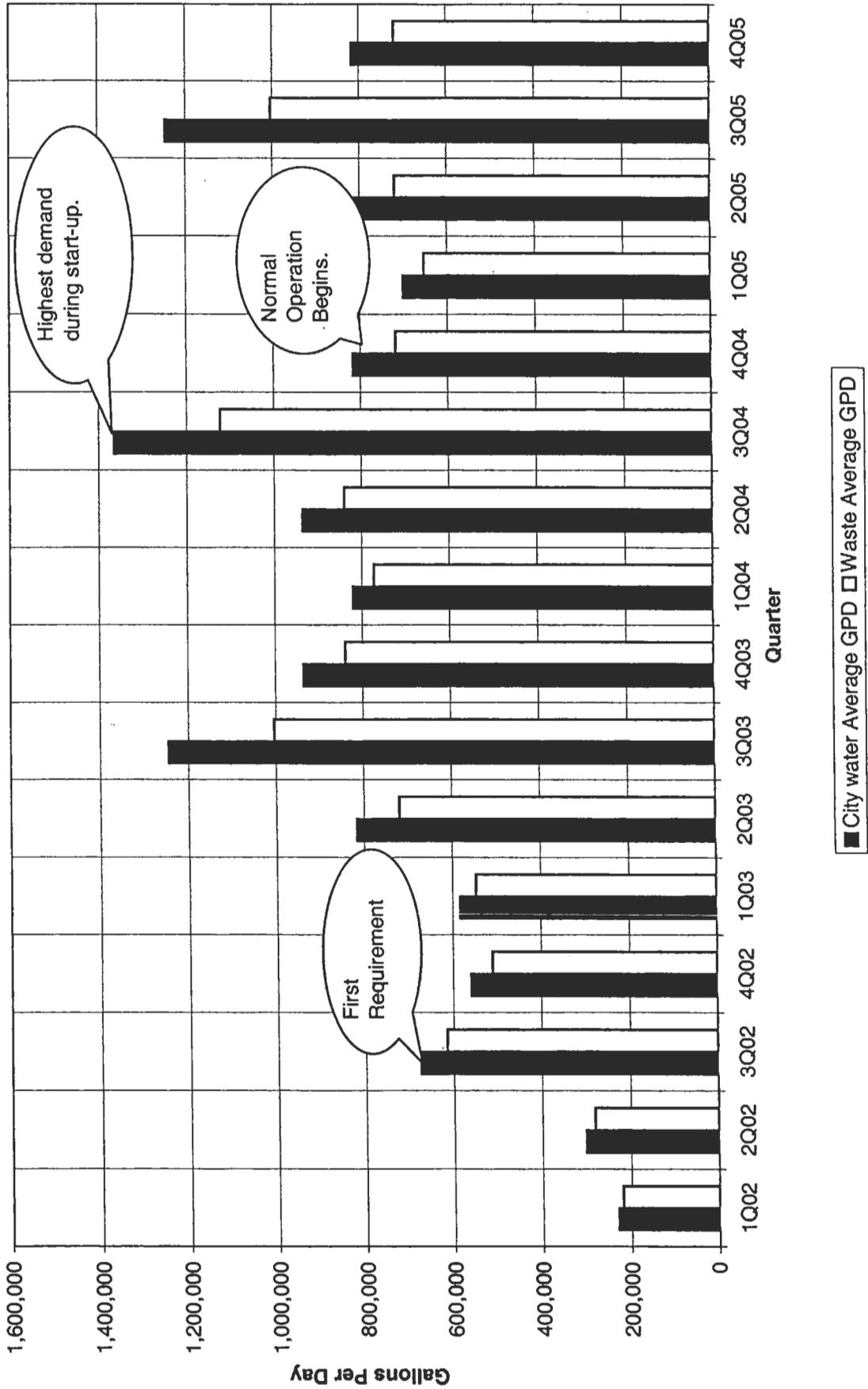
Please refer to the attached chart: Immunex, BioNext Project Average Water usage estimate, J.Vogel (16 Jan 2001), for details.

Best Regards,

James D. Vogel, P.E.

cc: Atty. Stephen Lichatin, III, Nixon Peabody, LLP
Mr. Russell B. Parry, PCM, Inc.
Mr. Albert G. Bisacky, P.E., Pare Engineering Corporation

ImmuneX, BioNext Project Average Water and Waste estimate
J. Vogel (16 Jan 2002)



Immunex Water Consumption Estimate

Average Flowrates (Gallons per minute)					
Season	Current (Phase A)	Future (Phase B)	Total (A+B)		
Summer Start-up	337	611	948		
Summer Average	337	528	865		
Fall and Spring Average	209	358	567		
Winter Average	159	328	487		
Peak Flow	337	1168	1505		
Average Flowrates	228.5	393	621.5		
Average Flowrates (Gallons per day)					
Season	Current (Phase A)	Future (Phase B)	Total (A+B)		
Summer Start-up	485,280	879,840	1,365,120		
Summer Average	485,280	760,320	1,245,600		
Fall and Spring Average	300,960	515,520	816,480		
Winter Average	228,960	472,320	701,280		
Peak Flow	Not Applicable				
Average Flowrates	329,040	565,920	894,960		
Date	City water Average GPD	Waste Average GPD	Description		
1Q02	228,960	218,880	Phase A Winter		
2Q02	300,960	280,800	Phase A Spring		
3Q02	675,360	614,880	Phase A Summer +25% B Sum		
4Q02	558,720	510,336	Phase A Fall + 50% B Fall		
1Q03	583,200	546,912	Phase A Winter +75% B Winter		
2Q03	816,480	719,712	Phase A and B Spring		
3Q03	1,245,600	1,003,680	Phase A and B Summer		
4Q03	936,000	839,232	Phase A Fall and B Fall Start-up		
1Q04	820,800	772,416	Phase A Winter and B Winter S		
2Q04	936,000	839,232	Phase A Spring and B Spring S		
3Q04	1,365,120	1,123,200	Phase A Summer and B Summ		
4Q04	816,480	719,712	Phase A and B Fall		
1Q05	701,280	652,896	Phase A and B Winter		
2Q05	816,480	719,712	Phase A and B Spring		
3Q05	1,245,600	1,003,680	Phase A and B Summer		
4Q05	816,480	719,712	Phase A and B Fall		
	241,920		summer evaporative loss per design day		
	48384		winter evaporative loss per design day		
	96768		fall/spring evaporative loss per design day		

APPROVED HIGH SERVICE

(1/17/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved	Date Approved	Letter Returned	Letter Sent To
1	Signal Ridge	EG Re-service	Homes	141.1	2.3	324.5	1/1/2001				
2	Rose Farm	Frenchtown Rd., EG	Homes	1.11	2.3	2.6	5/4/2001				
3	Birchwood Glen	Kulus Rd., WW	Homes	2.78	2.3	6.4	11/20/2001				
4	Middle Woods	Middle Rd., EG	Homes	27.8	2.3	63.9	11/27/2001				
5	Shippeetown Road Sub.	Shippeetown Rd., EG	Homes	6.67	2.3	15.3	12/10/2001				
6	Amgen *	Technology Way, WG	Industrial	556	*	833.0	2/8/2002				Revised January 2007
7	Sandra Court	Reservoir Rd., COV	Homes	1.81	2.3	4.2	5/20/2002				
8	Chole Court	Clark Rd., COV	Homes	2.08	2.3	4.8	7/19/2002				
9	Hawk Crest Est.	Hill Farm Rd., COV	Homes	12.2	2.3	28.1	4/4/2003				
10	Crystal Creek	Middle Rd., EG	Homes	9.58	2.3	22.0	4/10/2003				
11	Long Meadow	Frenchtown Rd., EG	Homes	8.33	2.3	19.2	4/10/2003				
12	Middle Hollow	Middle Rd., EG	Homes	2.78	2.3	6.4	5/14/2003				
13	Blueberry Hill	Shippeetown Rd., EG	Homes	7.78	2.3	17.9	8/26/2003				
14	Hidden Ridge	Shippeetown Rd., EG	Homes	8.89	2.3	20.4	10/29/2003				
15	Green Farm	Squirrel Ln./Tillinghast Rd., EG	Homes	6.67	2.0	13.3	1/12/2004				
16	Dunkin Donuts	New London Turnpike	Commercial	1.3	1.5	2.0	2/9/2004				Peter Nizwantowski and Steven Cabral
17	Chiropractic Center	Nooseneck Hill Rd., WG	Commercial	0.63	1.5	0.9	7/24/2004				
18	Keith White	Lot 22, AP50 Lot A Reservoir Rd	1 House	0.4	2.3	0.9	10/21/2004				Keith White
19	Keith White	136 Reservoir Road, Cov	1 House	0.4	2.3	0.9	10/21/2004				Keith White
20	Randolph Bank	Center of New England, COV	Commercial	1	1.5	1.5	11/11/2004				
21	Leisure Condo	Nooseneck Hill Rd., COV	Condos	13.9	2.0	27.8	11/12/2004				
22	Coventry Lumber	Nooseneck Hill Rd., COV	Commercial	1	1.5	1.5	11/16/2004				
23	Santo Lombardi	Sharon Drive, COV	1 House	0.4	2.3	0.9	11/18/2004				
24	Home Depot	Center of New England, COV	Commercial	1.7	1.5	2.6	12/6/2004				
25	Debra Zarella	Frenchtown Rd., EG	1 House	0.4	2.3	0.9	3/16/2005			YES	Debra Zarella
26	Arlington RV	Division Road, WG	Commercial	3.5	1.5	5.3	4/7/2005			YES	Sandy Oleary
27	Brooks Drugs	Division Road, EG	Commercial	10.4	1.5	15.6	4/8/2005			YES	Steven Cabral
28	Pine Ridge	Hopkins Hill, COV	69 Homes	28.8	2.3	66.2	3/16/2005			YES	Christopher Duhamel
29	Westwood Apartments	Reservoir Rd., COV	No Application	4.9	2.0	9.8	3/16/2005				John Assalone
30	Dawn Santilli	68 Surrey Lane, W. WAR	1 House	0.4	2.3	0.9	3/22/2005			YES	Massimo and Dawn Santilli

APPROVED HIGH SERVICE

(1/17/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved	Date Approved Letter Mailed Sent Out	Letter Returned	Letter Sent To
31	Maurice Cooney	949 Tillinghast Road, EG	1 House	0.4	2.3	0.9	4/21/2005	4/21/2005	4/21/2005	YES	Maurice Cooney
32	Wingate Hotel	CNE Universal Boulevard, Cov	Hotel	2	2.0	4.0	5/2/2005	5/2/2005	5/24/2005		Jeff Hanson and Robert Rapoza
33	Wal-Mart	CNE Boulevard, Cov	Commercial	1.7	1.5	2.6	5/2/2005	5/24/2005	5/24/2005		John Kucich, Robert Rapoza & Tom Richards
34	Paul & Tanya Rossi	53 Mohawk Trail, WG	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	5/20/2005		Paul & Tanya Rossi
35	George Olney	22 Marion Drive, Cov	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	5/20/2005	YES	George Olney
36	Mojtaba Rajaei	1627 Middle Road, E.G.	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	5/20/2005	YES	Mojtaba Rajaei
37	John Assalone	Valerie Drive, Parcel 1 (a)	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	5/20/2005	YES	John Assalone
38	John Assalone	Valerie Drive, Parcel 1 (b)	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	5/20/2005	YES	John Assalone
39	Peter Suorsa	12 Island Drive, Coventry (1")	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	6/22/2005	YES	Peter Suorsa (Ken Goodwin)
40	Peter Suorsa	13 Island Drive, Coventry (2")	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	6/22/2005	YES	Peter Suorsa (Ken Goodwin)
41	Dana Carlow	Rejane Street, Coventry	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	6/22/2005	YES	Dana Carlow
42	Jeff Butler	Dunkin Donuts Hopkins Hill Rd, WG	Commercial	1.3	1.5	2.0	6/15/2005	6/22/2005	6/22/2005	YES	Jeff Butler, Kevin Morin
43	Andrew Potvin	Hopkins Hill, COV	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	7/1/2005	YES	Andrew Potvin
44	Matthew L. Tucci	59 Club House Road	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	7/1/2005	YES	Matthew L. Tucci
45	Caren Bourque	Veronica Court, Plat 34, Lot19	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	7/1/2005	YES	Caren Bourque
46	Peter Rosiello	Pond View Court, Lot 102	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	7/1/2005	YES	Peter Rosiello, Mike Duckett
47	Albert/Barbara LaPlume	307 Shippeetown Road, EG	1 House	0.4	2.3	0.9	7/20/2005	7/21/2005	7/21/2005	YES	Albert & Barbara LaPlume
48	Arthur L. Larsson	298 Shippeetown Road, EG	1 House	0.4	2.3	0.9	7/20/2005	7/20/2005	7/20/2005	YES	Arthur L. Larsson
49	Frederick Schultz	58 Crompton Road, EG	1 House	0.4	2.3	0.9	8/11/2005	8/11/2005	8/11/2005	YES	Frederick Schultz
50	Richard Todisco	61 Island Drive, Coventry	1 House	0.4	2.3	0.9	8/17/2005	8/17/2005	8/18/2005		Richard Todisco
51	Maple Root Center	2435 Nooseneck Hill Rd, Cov	Commercial	1.7	1.5	2.6	8/17/2005	8/17/2005	8/18/2005	YES	Edward J. Overton, Jr, Patricia Walker (Installed Well)
52	Deer Run	Deer Run Estates, WG	24 Homes	13	2.3	29.9	8/17/2005	8/18/2005	8/18/2005		Gary Johnson, Joseph Casali
53	Gentry Glen Condos	Crompton Road, WW	62 Units	13	2.0	25.8	9/21/2005	9/30/2005	9/30/2005		Mike Duckett, Kevin Morin
54	Carriage House Condos	Reservoir Road, Coventry	12 Condos	3.3	2.0	6.7	9/21/2005	9/30/2005	9/30/2005	YES	Brian Bamford, Joseph Casali
55	Retail Pad A	Center of New England, Cov	Commercial	1.3	1.5	2.0	9/21/2005	9/21/2005	9/30/2005		Robert Rapoza, Jeffrey Hanson
56	GrandVile @ Greenwich	Center of New England, WG	300 Apts/Condos	31.1	2.5	77.8	9/21/2005	9/21/2005	9/30/2005		Roney Malafronte, John Caito

APPROVED HIGH SERVICE

(1/17/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved Letter Mailed Sent Out	Letter Returned	Letter Sent To
57	Kenneth Hendrickson	335 Shippeetown Road, EG	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005	YES	Kenneth Hendrickson
58	Jane Revkin	385 Moosehorn Road, EG	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Jane Revkin
59	Howard M. Dulude	20 Marion Drive, Coventry	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Howard Dulude
60	Larry Lachance	58 Robin Lane	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Larry Lachance, John Brunero
61	KCWA Project	Maude Avenue, Coventry	184 Houses	19.7	2.3	45.3	9/21/2005			Board Approved Re-Service
62	Karen Carlow	7 Rejane Street	1 House	0.4	2.3	0.9	10/19/2005	11/1/2005		Karen Carlow
63	Scott Tierney	Spencer's Grant Drive & Stone Carry Way Residence	12 Homes	4.8	2.3	11.0	10/19/2005	11/9/2005		Scott P. Tierney
64	Jeffrey Hanson	Center of New England, Cov Retail Pad B	Commercial	1.3	1.5	2.0	10/19/2006	11/9/2006		Jeffrey Hanson
65	Sarah Wye	129 East Greenwich Avenue, 315 East Greenwich Avenue, Plat 12-2, Lot 241	1 House	0.4	2.3	0.9	11/16/2005	11/23/2005		Sarah Wye, MA, LMHC
66	Gertrude M. Izbicki		2 Houses	0.8	2.3	1.8	11/16/2005	11/23/2005		Gertrude M. Izbicki, John S. Brunero, Jr.
67	Ronald Padula	199 East Greenwich Avenue	1 House	0.4	2.3	0.9	11/16/2005	11/23/2005		Ronald Padula, John S. Brunero, Jr.
68	Arthur Brown	183 Greenbush Road	1 House	0.4	2.3	0.9	12/15/2005	12/15/2005		Mr. Arthur Brown
69	Clark R. Smith	2594 Division Road, EG	1 House	0.4	2.3	0.9	4/19/2006	4/20/2006		Clark Smith
70	Scott and Maria Brown	47 Clark Mill Road, Coventry	1 House	0.4	2.3	0.9	6/21/2006	6/26/2006		Scott and Maria Brown, Town of Coventry - Building & Zoning Office
71	Peter Nolan	5 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
72	Peter Nolan	35 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
73	Peter Nolan	45 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
74	Kenneth Parris and Janet Hillier	65 Clark Mill Road, Coventry	1 House	0.4	2.3	0.8	6/21/2006	6/26/2006		Kenneth Parris and Janet Hillier, Town of Coventry - Building & Zoning Office
75	Peter Nolan	40 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan
76	Peter Nolan	55 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan
77	Peter Nolan	5 Secret Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan

APPROVED HIGH SERVICE

(1/17/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved Letter Mailed Sent Out	Letter Returned	Letter Sent To
78	Charles Hawkins	368 Hopkins Hill Road	1 House	0.4	2.3	0.8	7/21/2006	7/21/2006		Mr. Charles Hawkins, Town of Cov. Building and Zoning Office
77	Matthew & Yadira Gilchrest	420 East Greenwich Avenue, WW	1 House	0.4	2.3	0.8	8/16/2006	8/17/2006		Matthew & Yadira Gilchrest
78	K. Joseph Shekarchi	Herb Chambers - RT 2	Commercial	0.4	1.5	0.6	8/16/2006	8/17/2006		K. Joseph Shekarchi, Paul Brand
79	Alfred & Linda Colucci	2271 Middle Road, EG	1 House	0.4	2.3	0.8	10/18/2006	10/23/2006		Alfred & Linda Colucci
80	Stacy B. Ferrara, P. C.	21 Sharon Drive, Coventry	1 House	0.4	2.3	0.8	10/18/2006	10/23/2006		Stacy B. Ferrara
81	Robert T. Chito	42 Deer Run, WG	1 House	0.4	2.3	0.8	11/16/2006	11/21/2006		Robert T. Chito
82	Brian Ascoli	17 Cambio Court, WG	1 House	0.4	2.3	0.8	11/16/2006	11/21/2006		Brian Ascoli
83	Oak Haven Tiogue Reduced			60		123.0	11/16/2006			
84	Robert Mellor	74 Tiffany Road, Coventry	2 Houses	0.8	4.6	1.6	12/14/2006	12/15/2006		Robert Mellor
85	Francis Belanger	45 Deer Run, West Greenwich	1 House	0.4	2.3	0.8	12/14/2006	12/15/2006		Francis Belanger
86	Charles Hirsch	30 Deer Run, West Greenwich	1 House	0.4	2.3	0.8	12/14/2006	12/15/2006		Charles Hirsch
		TOTALS GPM		1049.71		1904.30				
		MGD		1.51		2.74				

* Maximum day flow demand based on correspondence received from Immunex (Amgen) To KCWA dated 4 January 2007

Supply/Pumping Capacity (MGD) (-) Current Demand MGD (-) Future Demand = Surplus

6.34 (-) 3.17 (-) 2.74 (-) 427808 gal/day

EXHIBIT B

JANUARY 17, 2007

OFFICE MEMO

To: The Board
From: Tim Brown
Subject: Programs 2007
Date: January 16, 2007

We have hit the New Year running on our 2007 programs. I thought this would be of help to the board to review all programs that are or will be ongoing in 2007. I think you will agree when you've had a chance to review this that our plate is full. I am prepared to discuss this at the board meeting in January, but believe this will assist the board in review of the work planned.

General

1. The Cross Connection Control Program was presented to the board in December, and scheduled for approval in the January meeting. The program will start for the very large customers to ensure that cross connection is being followed, tested or implemented as needed. We do expect this year that Cross Connection Control Legislation will, again be introduced into the house and senate. It should be supported by Kent County Water Authority for passage (See briefing memo attached).
2. Conservation Action Plan - This is a revision to our existing plan. It should ratchet up our efforts in conservation with the assumption that this may be a drier summer than we have seen in the last few years. We will implement the aspects of this action plan to be ready for the demand season.
3. Drought Management Plan - This will of course be implemented as needed if there is a drought, and we will closely follow the drought advisories both by NOAA and the state.
4. This year we are required to complete our five year update of the Water Supply System Management Plan. We have already engaged the engineer for that with a due date of summer of 2007. The Hunt River controversy may have an affect upon our water supply management

plan, as it has with the Quonset Development Commission WSSWP (See briefing memo from Kevin Fitta on the Hunt River).

5. We are required by the new fire code to alarm this building we will be advertising a bid shortly for that work. There is no budget for this item, but will need to be covered, as it is necessary and required by the fire code.

Maintenance and IFR Program

1. Technology Park Tank maintenance painting - this is one of the more difficult maintenance tasks we have to embark upon this period. It is already out to bid for a contractor, but the coordination of this will be critical, as it must be done during the low flow periods of our system, and when the coating system can be applied to the tank. It will require lowering of the tank to the bottom of the bowl, to alleviate sweating, and it will require notice to our customers to control any outside use of water and our need to implement mandatory conservation measures. We will operate the high service system off of Carr Pond Tank, and adjust our pumping as necessary to accommodate it. As we are all aware, maintenance issues were not covered in the state law passage, Senate Bill 2681, Sub A, 39-3-43. Why it was not covered should be questioned, but unfortunately, tank maintenance is required and it “may” affect Amgen during this time. We have tested our system for approximately six hours and found that we can run off the existing Carr Pond Tank without any notice of a change in gradient operation. We will be watching this very closely during the painting contract, but is of great concern to us. We will notify and work with Amgen to facilitate this maintenance.
2. Completion of the 2005 IFR Program will be ongoing with the addition to the Tiogue area with the reduced high pressure zone. This was discussed at the December meeting with the board and action has been taken to move that project along to the design stage. It is critical that the tank come off line and be re-serviced with reduced higher pressure this year.
3. IFR 2006A – bid and award for construction is eminent. This is a critical element of the

Providence Water Supply Board's 78-inch valve installation at Clinton Avenue. We are committed to move forward with this project as an infrastructure replacement, which will interface with their proposed project of a temporary booster station, so that in the future, Clinton Avenue can come off line. At a recent meeting, we looked at the hope of this being an emergency interconnection and permanent facility with the potential of seeking funding from the Water Resources Board. We can utilize it as an emergency interconnection and in turn they can also use it as an emergency interconnection from our gradient. The critical portions for this bypassing of the Clinton Avenue Station must be done by the fall of this year. It is of great concern to us, and there may be some issues dealing with pressure within our system during that three to four week period that the bypassing will occur. We will be reporting this to the board as time goes on, and as we continue to run our model and understand the ramifications of this bypassing. However, I must state that this is imperative that we work with Providence Water, and that this valve be installed so that the 78-inch aqueduct from the plant can be inspected. We have been involved many years with Providence Water on the various planning issues to accomplish this.

4. IFR Program 2006B and 2007 will continue with programming and with funding availability as these are designed, and will be ready to bid once the collections have been secured.
5. Greenwich Avenue replacement has now gone from cleaning and lining to a replacement project. This too must be completed this year; and must be bid and awarded late winter/spring for completion of construction in the fall. We must interface this with the state contract at the north end of the Greenwich Avenue, as they are completing their work in September of 2007. There is a culvert crossing that will need additional work and the potential of easements once the design has been completed and we have the site survey.
6. Quaker Lane Pump Station refurbishment - this is in the preliminary design phase and is a refurbishment of the existing station. The transmission main cannot be funded by the infrastructure program, as it is not a renewal or replacement. We are working with a number of parties concerning the extension of this main and will continue to do so. We will move forward with the completion of the preliminary design station refurbishment, RFP's for the

final design, and of course, the re-construction of the station. There is a need for additional land, and that can be seen by the attached diagram of the existing station, which we will discuss at the board meeting. Also, I believe the twenty five year lease for the site is coming to closure and negotiations of the site will have to occur. As we all know, this is critical to increasing our low service supply for high service usage and installing high service supply directly to our high service gradient. I have already reviewed the preliminary design material to date, and it is feasible to work within the existing foot print of the building for the pump replacement.

Capital Improvement Program

1. The hydraulic tank study will be completed shortly and will be the stepping stone for the Capital Improvement Program. The hydraulic analysis will also re-calculate water demands for the high service gradient. The high service shortage and the effects of On Semiconductor and Amgen will be re-evaluated. This will be presented for the board's discussion and action.
2. A new Capital Improvement Program will be issued for RFP for engineering services, and it will look at the remaining Capital Improvement Programs and future Capital Improvement Programs needed for our system. Again, the Capital Improvement Programs are bond financed long term in nature spreading the costs between existing and future customers. It is the program that deals with supply, storage and transmission projects, and this time will include security issues and technology upgrades.
3. Read School House Tank replacement - we are coming close to completing the necessary land swap. We still have a zoning issue that deals with the Read School House Tank, but it looks promising that we have overcome the hurdle of the land. The council has approved the town manager executing an agreement for that. We need the board's direction to engage the engineer that was working on the "higher site" or RFP for engineering services for a new engineer. I will be discussing this at the January board meeting.

MEMORANDUM

To: File
From: Kevin Fitta
Subject: Hunt River Safe Yield/Stream Flow
Date: January 11, 2007

Some notes on Safe Yield of Hunt River Aquifer

1. The Hunt River Aquifer is actually connected with the Annaquatucket and the Pettaquamscutt basins. Data is sometimes reported for the Hunt alone and other times reported for the three basins combined.
2. The 1968 USGS Report (Paper 1775) indicates that the “reservoir” can sustain a yield of 8 MGD (except) during exceptionally dry years. The “reservoir” is defined as the principal ground-water reservoir underlying the Potowomut River Basin – the reservoir that U.S. Navy (now Quonset) and KCWA utilizes. The Town of North Kingstown also has wells in this basin.
3. The Coalition for Water Security, in their October 20, 2006 review of the Quonset Development Corporation’s Draft Water Supply System Management Plan indicated that “much more current USGS studies put the safe yield of the Hunt somewhere between 2.3 MGD and 4.8 MGD”. There does not appear to be any reference to these figures in any recent USGS report/paper.
4. USGS has done recent reports on Water Availability (Scientific Investigations Report 2005-5256) and Numerical-Simulation and Conjunctive Management (Professional Paper 1636). Neither of these reports state specific safe yield numbers. Rather there is a range of numbers depending on a particular scenario. In the Water Availability Report the water availability is estimated with consideration to two different streamflow standards.

4. Transmission to the Read School House Tank has been designed and will be modified as necessary, and completed for we hope a spring construction project. This is necessary for the re-feed of the Read School House Tank, and ultimately, the severing of the existing tank at the 430' gradient. The reactivation of that high service booster will take considerable man power during the activation phase and will require us to review the Knotty Oak Road service gradient for pressure reduction in the individual homes. We will be looking at an engineering study for that in the future to detail the activation, and of course the needs if necessary for pressure reducing valves.
5. Clinton Avenue Pumping Station, still has not been substantially completed, but is getting close. Of course, it will need to be completed this year. It is fully operational with only minor items needed for completion. The high service portion of the Clinton Avenue Pumping Station has not been activated, as it requires the completion of the Read School House Tank prior to activation of that system.
6. Well field treatment plant designs - both well fields need treatment in order to produce a quality product. The water will be usable to us once it is treated and would certainly be valuable both to the low service and high service gradients. An RFP will be necessary now that the piloting work has been completed for preliminary and final design and issuance of a construction contract. The first would be the Mishnock well fields and the second would be East Greenwich. The concern with the East Greenwich well field and the linchpin is what flow we will design the facility for. The aquifer is under scrutiny by environmental groups and the Water Resources Board. We believe our capacity is 2 million gallons and have the rights to access 2 million gallons from that aquifer. Whether we design it for that or not is questionable and will ultimately be discussed with the board in future to determine what the design capacity.
7. The potential of a rate filing is ever present and will be reviewed again at mid-year. Many options will need to be discussed and decided prior to a filing. This will be discussed at future meetings.

8. CIP-6 – The 2nd connection to Read School House is back for discussion. The developer is close to a settlement with the town or a Supreme Court decision. If it does move forward, CIP-6 can be started with design and securing the bond funds for allocation.

MEMORANDUM

To: File
From: Kevin Fitta
Subject: Hunt River Safe Yield/Stream Flow
Date: January 11, 2007

Some notes on Safe Yield of Hunt River Aquifer

1. The Hunt River Aquifer is actually connected with the Annaquatucket and the Pettaquamscutt basins. Data is sometimes reported for the Hunt alone and other times reported for the three basins combined.
2. The 1968 USGS Report (Paper 1775) indicates that the “reservoir” can sustain a yield of 8 MGD (except) during exceptionally dry years. The “reservoir” is defined as the principal ground-water reservoir underlying the Potowomut River Basin – the reservoir that U.S. Navy (now Quonset) and KCWA utilizes. The Town of North Kingstown also has wells in this basin.
3. The Coalition for Water Security, in their October 20, 2006 review of the Quonset Development Corporation’s Draft Water Supply System Management Plan indicated that “much more current USGS studies put the safe yield of the Hunt somewhere between 2.3 MGD and 4.8 MGD”. There does not appear to be any reference to these figures in any recent USGS report/paper.
4. USGS has done recent reports on Water Availability (Scientific Investigations Report 2005-5256) and Numerical-Simulation and Conjunctive Management (Professional Paper 1636). Neither of these reports state specific safe yield numbers. Rather there is a range of numbers depending on a particular scenario. In the Water Availability Report the water availability is estimated with consideration to two different streamflow standards.

In the Conjunctive Management Paper they examine different withdrawal scenarios and the effect on streamflow-depletion.

5. Stream flow standards - Safe yield can not be estimated unless stream flow standards are in place. In other words, the minimum stream flow requirements must be known in order to estimate safe yield. The yield will vary depending on the streamflow requirements. The same is true for wetland requirements. Currently, there are no standards in place in Rhode Island.

6. Water Availability – This study was published in 2006. As noted above streamflow standards have not been established in RI. USGS Report 2005-5256 examines water availability with consideration to 7Q10 and ABF (aquatic base flow). However, neither of these standards may be appropriate. A previous USGS report (2004-5301) suggest that 7Q10 may allow for stream flows to be reduced too much while ABF may be too restrictive during the spring. The results summary table below appears to validate this. This further supports the notion that streamflow standards must be developed in order to define the safe yield of the aquifer, as the estimated safe yield will vary greatly depending on the standard used.

**Estimated Water Availability (MGD)
 of**

Hunt-Annaquatucket-Pettaquamscutt stream-aquifer system

Month	Estimated Gross Yield, 50th percentile	Estimated Gross Yield minus 7Q10, 50th percentile	Estimated Gross Yield minus ABF, 50th percentile
June	63.014	51.115	31.332
July	35.770	23.872	4.086
August	29.316	17.419	0
September	24.035	12.137	0

7. USGS Paper 1636 – Paper examines conjunctive management of Hunt-Annaquatucket-Pettaquamscutt stream-aquifer system. Modeled several withdrawal scenarios and examined effects on streamflow depletion. Study was published in 2001 and thus data is not current. Most recent data on withdrawals was from 1998. All of the scenarios show KCWA water withdrawal (based on averages for 1993-1998) considerably lower than current withdrawal rates and the withdrawal rates in 1998.

This period of time appears to have several years when the well was not used as much as it had been historically or after 1998. Therefore, the paper “locks” KCWA into an artificial definition of “current withdrawals”. KCWA should clarify this with appropriate parties as we would not want our water “rights” to be based on these published numbers. In addition, any future analyses should be based on data more representative of actual pumping conditions (i.e. averages should not include periods of time when the well was not pumping as this lowers the average and does not accurately reflect normal pumping conditions).

**East Greenwich Well Pumping
 Average Monthly Pumping Rate (MGD)**

Scenario	J	F	M	A	M	J	J	A	S	O	N	D
USGS Model	0.27	0.08	0.08	0.16	0.32	0.80	0.94	0.80	0.53	0.28	0.32	0.54
1998	0.04	0.35	0.44	0.92	1.37	1.71	1.88	1.76	1.70	1.23	1.01	1.04
2004	0.48	0.35	0.36	0.38	0.78	1.04	0.80	0.72	0.61	0.79	0.74	0.76
2005	0.82	0.76	0.78	1.05	0.84	1.28	0.84	1.11	0.81	0.68	0.51	0.47
2006	0.40	0.70	0.83	0.92	1.03	1.44	1.58	1.57	1.46	1.31	1.17	1.05

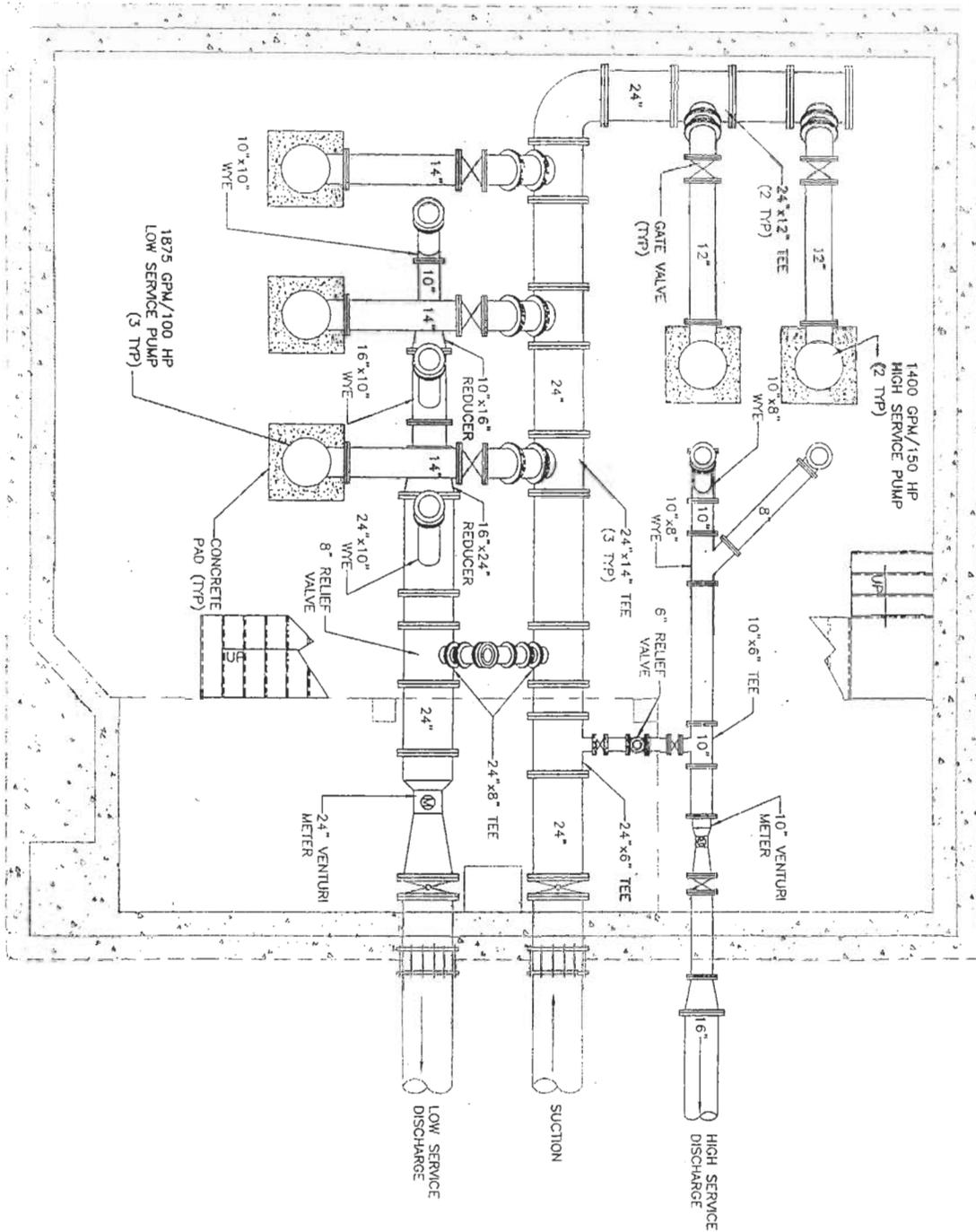
8. Water Supply Analysis for the State of Rhode Island, Arthur D. Little, 1990: An estimate of safe yield from the Hunt, Pettaquamscutt, and Annaquatucket aquifers was presented in this study and summarized in the table below:

Summary of Arthur D. Little Analysis, 1990

Aquifer	Safe Yield (MGD)	Average Year Yield (MGD)
Hunt	2.0 – 3.5	3.5 – 6.5
Annaquatucket	1.0 – 1.5	1.5 – 2.5
Pettaquamscutt	0.2 – 0.4	0.4 – 0.8
Total	3.2 – 5.4	5.4 – 9.8

Safe yield is equated to the perennial yield, as defined by the American Society of Civil Engineers as “the practical rate of withdrawing water from it (the aquifer) perennially for human use”. They also indicate that the safe yields are “yields which can be maintained during critical drought periods while avoiding excessive surface water impacts.”

The average year yield is the estimated yield during a year with average amounts of rainfall. They estimate that it is between 5.4 and 9.8 MGD. The average of these two numbers is 7.6 MGD, which is comparable to the 8.0 MGD USGS estimate from 1968.



C-2

QUAKER LANE PUMP STATION
PRE DESIGN
SECOND FLOOR

KENT COUNTY WATER AUTHORITY
WEST WARWICK, RHODE ISLAND

DESIGNED BY: J.S.C.	DATE: 12/2006	CHECKED BY: R.L.H.	DATE: 12/2006
DRAWN BY: M.J.W.	DATE: 12/2006	CHECKED BY:	DATE:

Civil & Environmental Engineering Partners, Inc.
342 Park Avenue Woonsocket, RI 02895
401.762.1711
Fax: 401.235.9088

DRAFT

REVISIONS:	
APPROVED:	

SCALE: 3/16"=1'-0"

OFFICE MEMO

To: Board
From: Timothy J. Brown
Subject: Briefing Memo – Cross Connection Control Legislation
Date: January 16, 2007

Kent County Water Authority has embarked upon a Cross Connection Control Program which has been active and promoted for the last five years. We have been a member of the original committee that wrote the Legislation with the Department of Health, have supported the Legislation in the past, and have assisted the Department of Health in introducing the Legislation for consideration. Over the years it has languished first by lack of support from the state, second by the inability to introduce the Legislation and third lack of support from the water works professionals along with the Rhode Island local chapter of the Backflow Preventers Association. The Legislation languished and did not even make a hearing in front of the committee. It is our understanding that this year it will again be introduced through the Department of Health and the Governor's office and in the same format that was agreed to previously. In order for us to continue our Cross Connection Control Program and ultimately expand it to the remainder of our system, it is important that we support and work for the passage of this Legislation for the betterment of our system and our customers. It will also allow us to finalize and implement our Cross Connection Control Program. The ultimate goal of cross connection control is, of course, protection of the customers and the quality of water service to those customers. This Legislation is necessary and I recommend passage this legislative year.

Kent County Water Authority Distribution Storage Tank Hydraulic Evaluation

Technical Memorandum No. 3A Existing and Future System Demands December 2006

1.0 Purpose and Scope

The project has been divided into various sub tasks and each of which will be further detailed in a specific technical memorandum. The purpose of this technical memorandum is to describe the efforts and results associated with the task related to determining and establishing the existing (current) and future (20 year planning period) water demands for use in the evaluation. Also, to provide the diurnal flow curves for the various pressure zones that would be utilized in the model and specifically for use during extended period model simulations. It is intended that the information gathered as part of this task will be the basis for evaluation and analysis as part of this study and ultimately for development of recommendations in subsequent portions of this study. The following are the specific efforts associated with this task.

1. Establish water demands for the current (2006) and future (2026) planning period. These will be provided for the following demand scenarios.
 - Average Day Demand
 - Maximum Day Demand
 - Peak Hour Demands (during Maximum Day)

Demands will be segregated and tabulated by Town / City and also by pressure zone. The future demands shall be entered into the model on a global basis. That is, the demand shall be proportionately assigned to the various junction nodes in the pressure zone in which the demand is projected to occur.

2. System Wide Diurnal Flow Curves – The diurnal water use graphs for each pressure zone that were developed as part of the original model shall be reviewed for use in this evaluation. The graphs are utilized to calculate a series of multipliers (peaking factors) that the model uses to adjust demands for each hour in a day.

These diurnal flow patterns will then be available for use in the model for use in simulations for extended period simulation (EPS) analysis. It is critical that these diurnal flow curves are developed and that extended period simulations be completed in order to gauge how the overall water system responds to periods of increased demand especially during peak hour periods and under fire flow conditions. Most critical are their importance in evaluating the recovery rates of tanks as well as the existing pumping capability to adequately replenish distribution system storage tanks.

2.0 Current and Future Population

The data previously developed in Technical Memorandum 1 (TM 1) regarding current and future population projections for the various communities in the Authority's service territory were utilized for purposes of developing and allocating future water demands. These previously developed tables are repeated for reference in developing this TM 3A.

The current and projected changes in population vary from community to community throughout the service territory. The following tables represent the anticipated change in population up to the year 2020 from year 2000 Census data and projections of changes in population as prepared by Rhode Island Statewide Planning (RISWP). The City of Cranston and Town of Scituate were not included in this table, as the Authority has no designs on increasing its service area in these communities.

PROJECTED POPULATION CHANGE BY COMMUNITY 2000 - 2005

COMMUNITY	2000 (CENSUS) POPULATION	2005 (RISWP) POPULATION	CHANGE (VALUE) AND %
Warwick	85,808	85,803	(-5) - 0.0%
West Warwick	29,581	29,759	(+178) +0.6%
Coventry	33,668	34,590	(+922) +2.7%
West Greenwich	5,085	5,413	(+328) +6.5%
East Greenwich	12,948	13,340	(+392) +3.0%
TOTALS	167,090	168,905	(+1,815) 1.1%

PROJECTED POPULATION CHANGE BY COMMUNITY 2000 - 2020

COMMUNITY	2000 (CENSUS) POPULATION	2020 (RISWP) POPULATION	CHANGE (VALUE) AND %
Warwick	85,808	85,235	(-573) -0.7%
West Warwick	29,581	30,928	(+1,347) +4.6%
Coventry	33,668	37,789	(+4,121) +12.2%
West Greenwich	5,085	6,550	(+1,465) +28.8%
East Greenwich	12,948	14,656	(+1,708) +13.2%
TOTALS	167,090	175,158	(+8,068) 4.8%

A review of the Town and City Community Comprehensive Plans and consultation with the various Planning Directors was also completed as part of TM 1. The information provided in the Plans and available from Planning Directors was generally non-specific with regard to areas of expected growth for the twenty-year planning period. The general consensus was that the Statewide Planning projections were likely a “reasonable” projection of population change. The population projections as developed by Statewide Planning were therefore utilized as part of this evaluation.

The most recent Water Supply System Management Plan (WSSMP) of 2001 provided indication of service population by community premised upon year 2000 data. For the purpose of this evaluation, it will be assumed that any increase or decrease in the overall projected population for each community for the next twenty-year period in the service population will increase or decrease proportionately. For example, data for year 2000 indicates that approximately 59% (19,941 of 33,668) of the total population are served by the Authority. It is projected that the total population in Coventry will increase over the next twenty years by 4,121 persons. The service population would therefore be expected to increase by a proportional rate. Therefore, assuming 59% of the 4,121 increase would be served by the Authority, the projected service population of Coventry for 2020 would equate to 22,382 or an increase of 2,441 persons. A similar approach was applied to the remaining service communities.

KENT COUNTY WATER SERVICE POPULATION 2000 -2020

COMMUNITY	2000 SERVICE POPULATION	2020 SERVICE POPULATION	CHANGE (VALUE) AND %
Warwick	8,578	8,521	(-57) -0.7%
West Warwick	18,083	18,906	(+823) +4.6%
Coventry	19,941	22,382	(+2,441) +12.2%
West Greenwich	824	1,062	(+238) +28.8%
East Greenwich	9,262	10,484	(+1,222) +13.2%
Cranston	2,005	2,005	(0) +0.0%
North Kingstown	28	28	(0) +0.0%
Scituate	1,170	1,170	(0) +0.0%
TOTALS	59,891	64,558	(+4,667) +7.8%

The total system wide service population is therefore anticipated to increase by 7.8% based on the population projections.

The table indicates that the municipalities such as Coventry, East Greenwich and West Greenwich are expected to grow at a moderate pace with the greatest increase in the number of persons identified in Coventry. West Greenwich is anticipated to grow at the fastest pace however the relative number of the increase in actual population is not as great as Coventry. Warwick and West Warwick are anticipated to experience a no change to a slight increase in population. None of the planning departments / planning officials made reference or had knowledge of any specific commercial or industrial project(s) that may have a substantial direct impact to future water use. They did however indicate that there is always a

possibility of such development occurring however it is near impossible to project the volume of water that may be required.

It should be noted that the above are based on projections which can be subject to various factors including but not limited to the following: zoning and demographic changes, economic conditions, industrial development (most notably those employing wet processes which can utilize large volumes of water), conversion from single family to multifamily or commercial use, increase in fire service requirements, etc. The unpredictability of these various factors can serve to singly or in combination serve to increase or possibly decrease the future water volume requirements.

3.0 Current (2006) Water Demands

The following Tables represent the current (year 2006) water demands for each of the various demand scenarios as developed in the most recent hydraulic model update of March 2006. These are provided by both community and pressure zone.

CONSUMER DEMAND BY PRESSURE ZONE (2006)

PRESSURE ZONE	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Low Service (334') Gradient	5.418	10.241	11.760
Tiogue Tank (350') Gradient	0.086	0.176	0.200
Intermediate High (430') Gradient (RSHR)	0.397	0.811	0.924
High Service (500') Gradient	2.154	4.061	5.214
Low Service Reduced (334') Gradient	1.871	3.727	4.320
High Service (500') Reduced Gradient	0.528	1.035	1.274
Warwick Wholesale Interconnection (232') Gradient	0.006	0.010	0.011
Hope Road (510') Gradient	0.006	0.013	0.014
Oaklawn (231') Gradient	0.361	0.736	0.847
TOTALS	10.8 MGD	20.8 MGD	24.6 MGD

CONSUMER DEMAND BY COMMUNITY (2006)

COMMUNITY	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Warwick	1.866	3.594	4.153
West Warwick	2.796	5.530	6.382
Coventry	2.735	5.232	6.152
West Greenwich	1.064	1.765	2.361
East Greenwich	1.943	3.896	4.693
Cranston	0.303	0.592	0.686
Scituate	0.096	0.195	0.222
TOTALS	10.8 MGD	20.8 MGD	24.6 MGD

Note:

1. The maximum day and peak hour demands represented in the table above are premised upon an historical period (July 2002) when the system experienced its largest water use. Although the system does not experience a similar magnitude in water demand every year, it is prudent for planning purposes to consider that this peak demand can occur in the future.
2. The demands presented in the two tables above reflect the recent water reduction in water use by ON – Semiconductor (Low Service) and Amgen (High Service). The magnitude of these reductions is documented in Section 4.0.

4.0 Future Projected (2026) Water Demands

Water demands for the 20-year planning period were predicated upon a projection of population change to the year 2026 (20 years from current 2006). Due to the fact that population projection data was only available up to the year 2020 and there is an inherent “uncertainty” in the accuracy of these numbers, this evaluation inferred that the 2020 population projections would be used up through the planning period of 2026.

The following summarizes the significant assertions and basis as to the method by which future demands were developed and allocated in the model. This also includes significant changes in system operation, which are anticipated to occur within the planning period.

Demand Calculation and Allocation in Model

- The High Service “Board Approved” developments have already been incorporated into the most recent 2006 model update. These were not reconsidered as part of future projections and have already been allocated to specific areas in the system in which they are expected to occur.
- All “known” development projects in the High Service Gradient which have yet to be approved (but have been modeled) will be added to the model demand database as these would likely be approved and constructed once sufficient supply exists to service this area.

- Based on the anticipated increase in service population by community previously developed, the water demand will be proportionally increased by this amount. For example, the (service) population is expected to increase by 4.6% in West Warwick for the planning period. Therefore, demands are projected to increase in West Warwick by an equal amount within this area of the service territory. A similar approach was applied to the remaining communities with the Authority service territory.
- Due to the fact that the specific area of future development and growth is unknown, the future anticipated consumer demands would be distributed globally across the particular community in which they are projected to occur.
- In order to account for unanticipated growth (i.e. growth that would result in water demand increase), a conservative estimate of a 10% increase in water demand was allocated across the entire service territory for the planning period. This 10% increase in water demand also included the communities of Cranston, North Kingstown and Scituate for which the Authority has no immediate plans for expansion as a measure to account for “infill” development.
- The future demands for Amgen and ON Semiconductor were also considered in this study and both of which have been significantly reduced. The demands for each of these facilities were readjusted in the model database as follows.
 - An average day demand of 10.42 gpm (5,000 gallons per day) was utilized for ON-Semiconductor. This demand has decreased from 299.34 gpm (431,050 gallons per day) or by over 95% in the Low Service Gradient.
 - Based upon recent correspondence from Amgen dated January 4, 2007, detailing forecasted water use through year 2008 overall water demands have decreased for all demand scenarios. June 2008 is the projected point at full grow out for the facility. These adjusted demands will have an impact on the operation of the water system in the High Service Pressure Gradient. The demands are significantly lower than those provided in 2002 as can be seen below.

MODEL SCENARIO	2002 AMGEN DEMANDS	2008 AMGEN DEMANDS	OVERALL DECREASE IN FORECAST
Average Day	833 gpm (1.2 MGD)	556 gpm (0.80 MGD)	277 gpm (0.40 MGD)
Maximum Day	1,500 gpm (2.16 MGD)	833 gpm (1.20 MGD)	667 gpm (0.96 MGD)
Peak Hour	1,500 gpm (2.16 MGD)	1,084 gpm (1.56 GPM)	416 gpm (0.60 MGD)

- The future water demands were calculated for the entire system based on the aforementioned data and were proportionately applied to each of the various junction nodes within each of the service communities.

Significant changes / modifications to system operations:

- The existing Tiogue Tank (350') Gradient will be served and become part of the High Service (500') Gradient.

- The Bald Hill Booster Pump Station will be upgraded in capacity to 10.0 MGD. This will include installation of significant water main infrastructure such that the pump station will have the ability to pump directly to the High Service 500 Foot Gradient. The breakdown is anticipated as follows: 2.0 MGD to High Service Gradient and 8.0 MGD to Low Service Gradient
- The new Read School House Road Tank will be in service and the pressure zone increased from 430 feet to 500 feet. This will include the activation of the 3.0 MGD High Service Pumps at Clinton Avenue Pump Station.
- The new Read School House Gradient and the existing High Service Gradient will be interconnected by new water main infrastructure and will operate as one Gradient.
- The Mishnock Well Field and treatment facility will be activated with a total production capacity of approximately 3.0 MGD with the ability to pump into either the Low or High Service Gradient.
- East Greenwich and Spring Lake Well upgrade in pumping capacity.
- Installation of a new interconnection to Providence Water in vicinity to Wakefield Street with the ability to pump up to 6 MGD into the Low Service Gradient and 2 MGD into the High Service Gradient.

CONSUMER DEMAND BY PRESSURE ZONE (2026)

PRESSURE ZONE	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Low Service (334') Gradient	6.272	11.896	13.766
New (500') Read School House Gradient	0.485	0.990	1.129
High Service (500') Gradient*	2.554	4.905	6.290
Low Service Reduced (334') Gradient	2.211	4.404	5.107
High Service (500') Reduced Gradient	0.659	1.292	1.588
Warwick Wholesale Interconnection (232') Gradient	0.006	0.011	0.013
Hope Road (510') Gradient	0.007	0.014	0.016
Oaklawn (231') Gradient	0.402	0.821	0.944
TOTALS	12.6 MGD	24.3 MGD	28.9 MGD

*In the future, the Tiogue Tank (350') Gradient will become part of the High Service (500') Gradient.

CONSUMER DEMAND BY COMMUNITY (2026)

COMMUNITY	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Warwick	2.052	3.954	4.569
West Warwick	3.204	6.337	7.313
Coventry	3.343	6.394	7.517
West Greenwich	1.165	1.983	2.672
East Greenwich	2.394	4.800	5.782
Cranston	0.333	0.651	0.755
Scituate	0.105	0.215	0.245
TOTALS	12.6 MGD	24.3 MGD	28.9 MGD

In summary, the total system demand for the planning period for all three demand scenarios is anticipated to increase by approximately 20%. The most significant increase is expected to occur within the existing 500 Foot High Service Gradient (34%). The communities with the greatest increase in demand by percentage include Coventry (22%), West Greenwich (39%) and East Greenwich (23%). In terms of overall greatest volume increase, the Low Service is anticipated to increase by approximately 0.9 MGD or roughly 16%.

4.0 System-Wide Diurnal Flow Curves

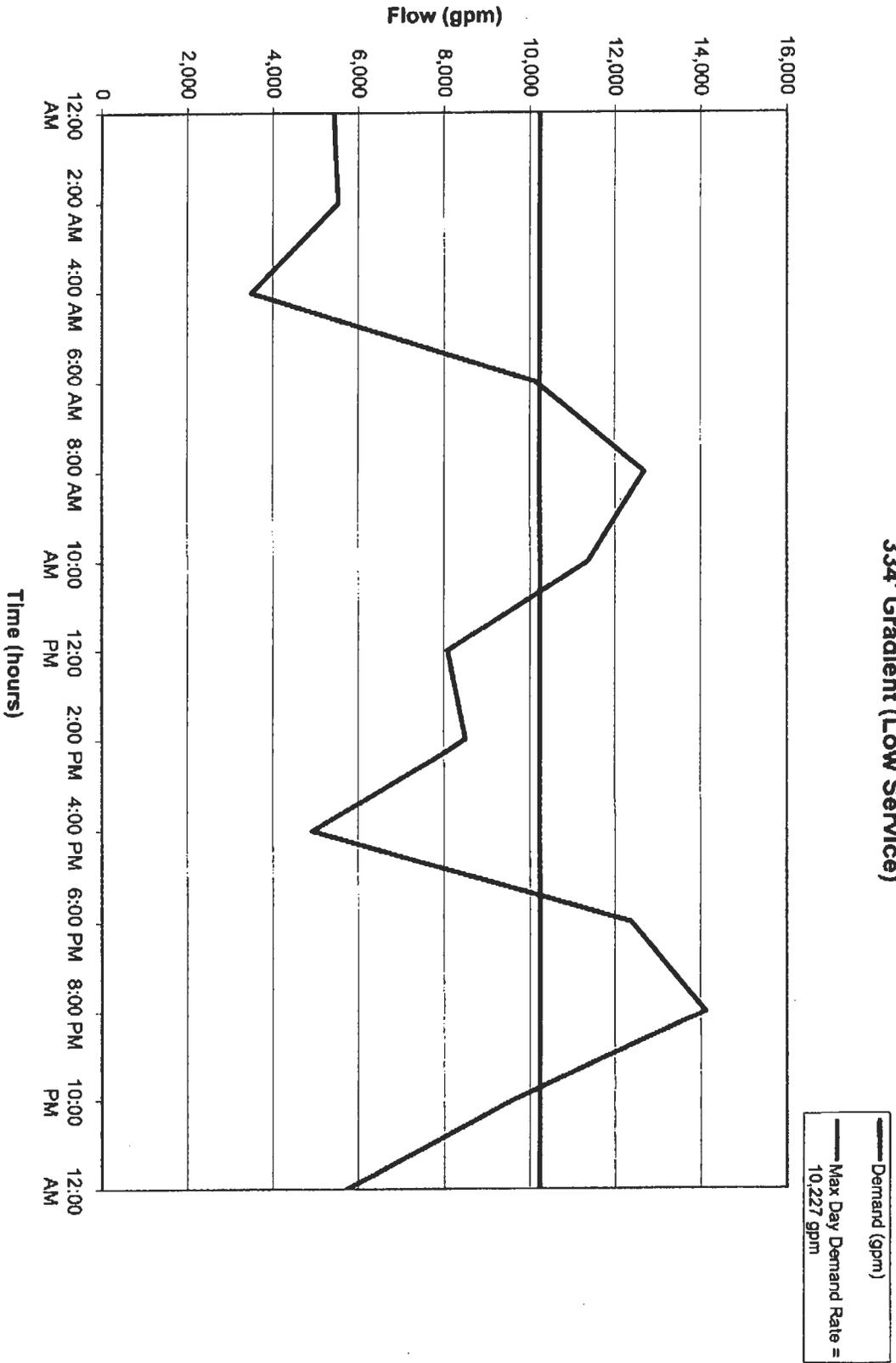
The system-wide diurnal flow curves were developed from hourly water production and tank level data that is representative of the maximum day water use patterns of the pressure zones of the Authority system. A review of past records indicated that the maximum water demand period occurred during July 2, 2002. Although this demand has not been experienced since, it is considered to be representative of a time period of maximum water use and when the system has been most “stressed”.

Due to the fact that Amgen has such a significant water demand in the High Service Pressure Gradient accounting for over 30% of the total demand, an individual diurnal flow curve was created for this facility. The recent information supplied by Amgen was utilized to develop this curve.

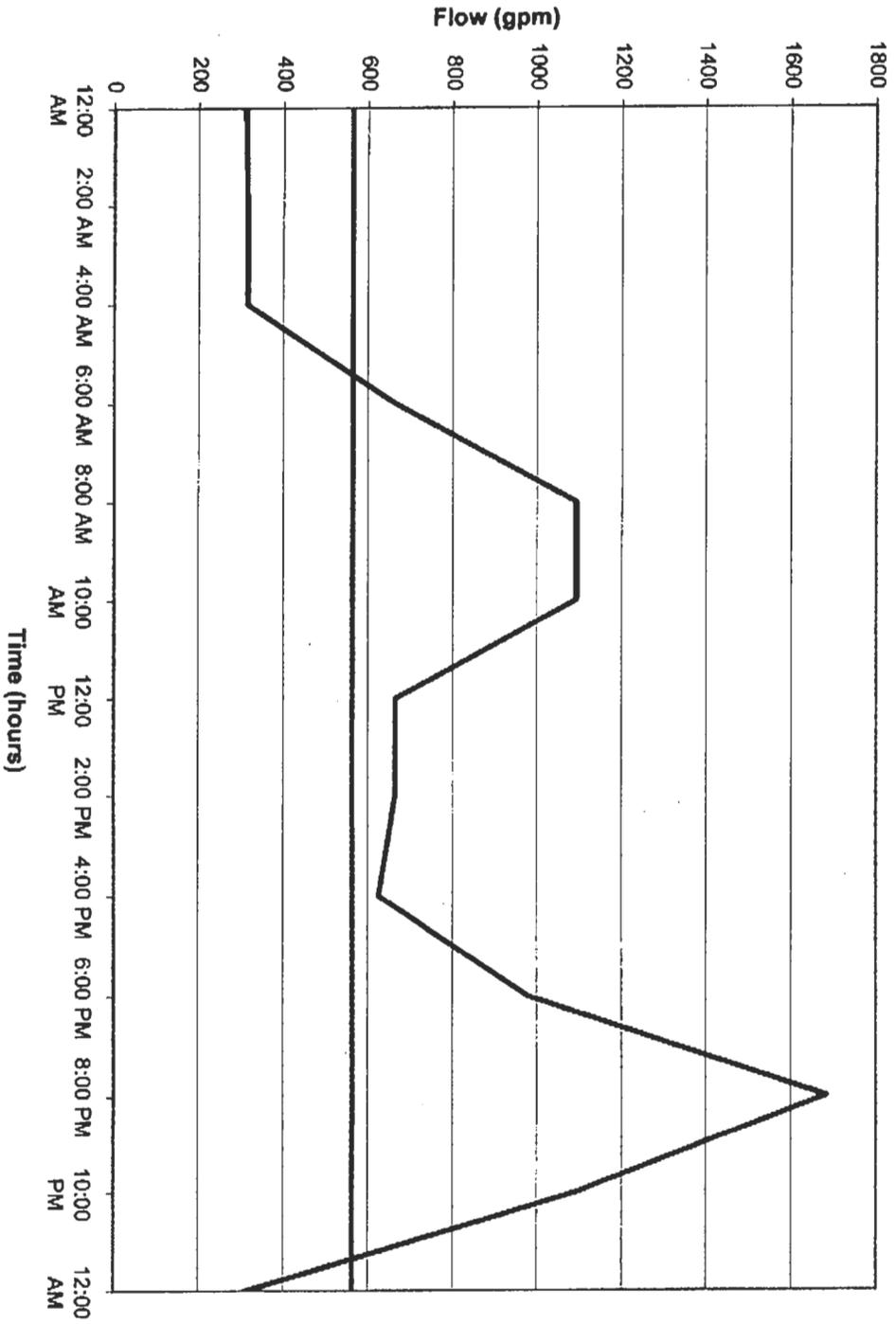
These diurnal flow curves are still considered to be most accurate with regard to extreme maximum day conditions and would be utilized during the evaluation through the planning period. The various diurnal patterns were entered into the model and assigned to all the junction demand nodes. The diurnal flow curves for the various Pressure Gradients of the system are provided as Attachment No. 1.

Attachment No. 1 – Water System Diurnal Flow Curves

Maximum Day - Diurnal Flow Curve 334' Gradient (Low Service)

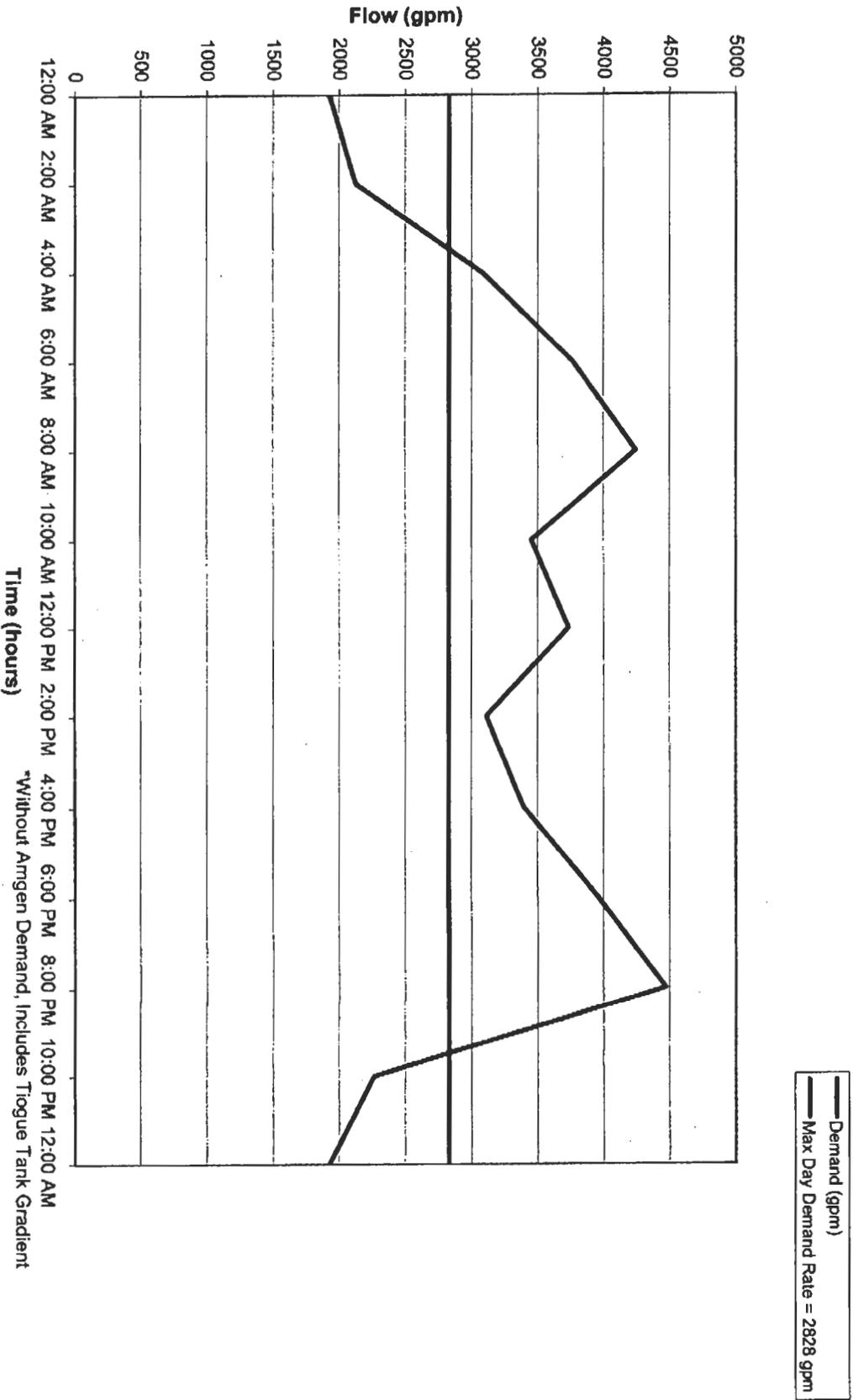


Maximum Day - Diurnal Flow Curve 430' Gradient (Read School House Road)



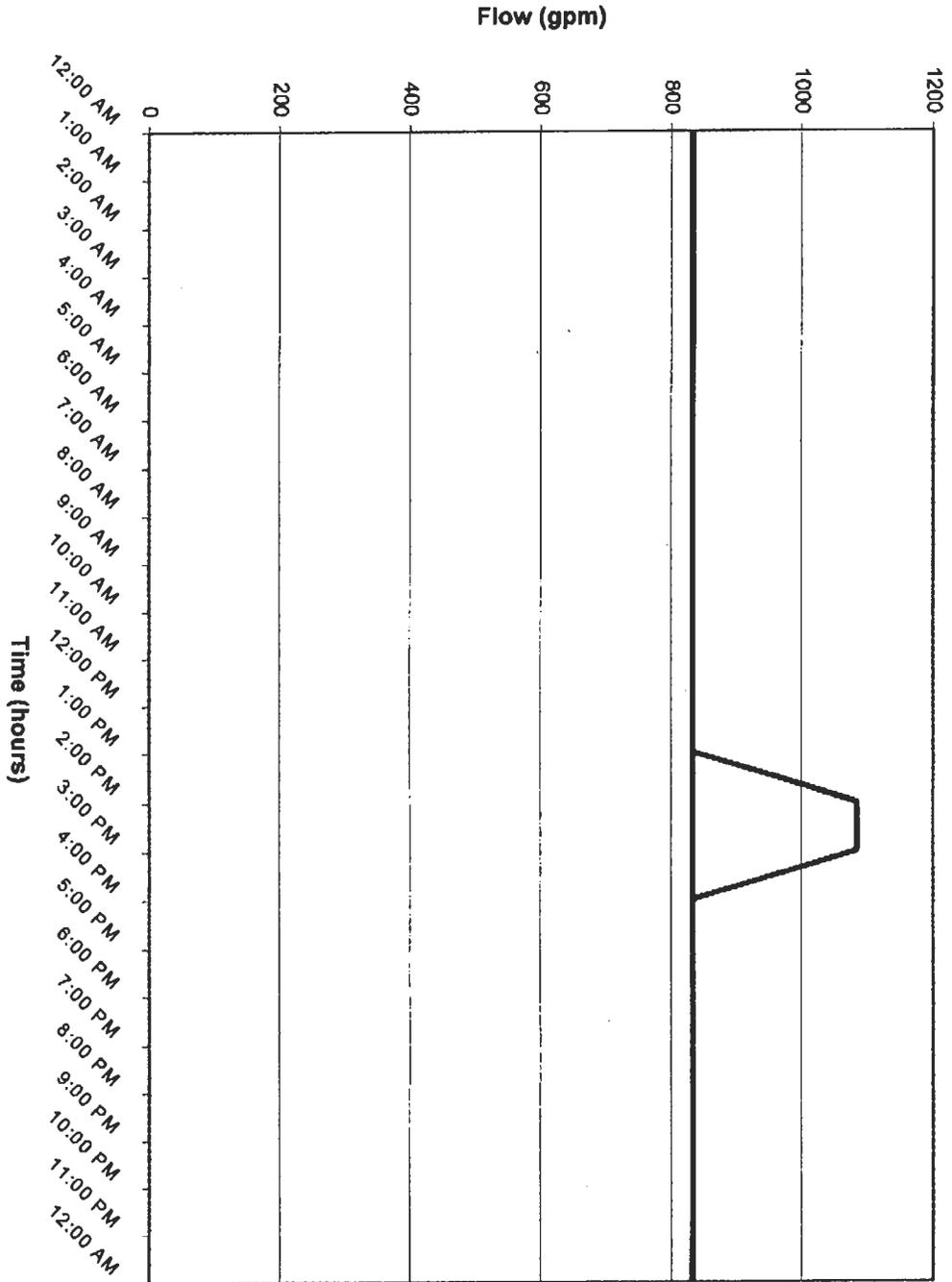
— Demand (gpm)
— Max Day Demand Rate = 563 gpm

Maximum Day - Diurnal Flow Curve 500' Gradient (High Service)



Maximum Day - Diurnal Flow Curve Amgen

Max Day Demand Rate = 833 gpm
Demand (gpm)



OFFICE MEMO

To: Board
From: Timothy J. Brown
Subject: Memorandum 3A Reference Memos January 16 & 17, 2007 to the Board
Date: January 18, 2007

Attached please find revisions to Task Order 3A for the distribution storage tank hydraulic evaluation dated December of 2006 (Finalized January 18, 2007) which was attached to the memo of January 16, 2007 and excerpted January 17, 2007 to the Board. I stated in the memo of January 17, 2007 that we were reviewing this and in contact with the engineers to provide comments to them, but did not wish to hold up the memo and the information the Board needed to review. Some of the questions that were raised during our review was a modification from the December 2004 Technical Memo No. 3 which used 20% for unanticipated growth. Under this analysis, 10% is being used because of additional information, review with the planning boards of each of the communities and a better feeling by our engineers for growth. It seems reasonable to consider 10% verses 20% since they have had an opportunity to review with the planning directors of the communities what the anticipated growth and projects are. Also, of course, Amgen's flow has been modified, On-SemiConductor's flow has been reduced to the potential of the new office building verses the manufacturer's facility. There is no longer consideration for a casino at the West Warwick Industrial Park. The Center of New England is providing a private water system and a private water company. The presented projected demand for high service including the Read School House Road System is reduced from the December 2004 memo of 11.68 million gallons per day to the current projections of 7.187 million gallons per day. This would yield then a change in the total system wide maximum day capacity from 30.72 million gallons per day in the December 2004, Technical Memo No. 3 to 24.3 million gallons per day of this revised hydraulic analysis again for the year 2026 projection.

The question now for the Board is to determine the affect based on a private water system at Center of New England and the potential demands. Demands were previously provided directly to our engineers from Center of New England's engineer in 2004 for inclusion in the modeling runs. Since that time, private wells have been installed and a private water system is proposed which would negate the need for water to that development. Therefore, prior to the Board's decision and if the Board accepts these modifications, the Board must determine what will the surplus be? If you do accept the modifications and the assumption that the private water system will be operational at the Center of New England as being installed then no affect upon our system or changes and modifications are needed. Therefore, the surplus exists and can be utilized for other projects within the high service gradient. If that is not the case then that water should be allocated and no surplus exists. This is a very big question for the Board to answer and I believe must be answered prior to the high service approvals and requests of this meeting.

which would negate the need for water to that development. Therefore, prior to the Board's decision and if the Board accepts these modifications, the Board must determine what will the surplus be? If you do accept the modifications and the assumption that the private water system will be operational at the Center of New England as being installed then no affect upon our system or changes and modifications are needed. Therefore, the surplus exists and can be utilized for other projects within the high service gradient. If that is not the case then that water should be allocated and no surplus exists. This is a very big question for the Board to answer and I believe must be answered prior to the high service approvals and requests of this meeting.

Kent County Water Authority Distribution Storage Tank Hydraulic Evaluation

Technical Memorandum No. 3A Existing and Future System Demands December 2006 (Finalized January 18, 2007)

1.0 Purpose and Scope

The project has been divided into various sub tasks and each of which will be further detailed in a specific technical memorandum. The purpose of this technical memorandum is to describe the efforts and results associated with the task related to determining and establishing the existing (current) and future (20 year planning period) water demands for use in the evaluation. Also, to provide the diurnal flow curves for the various pressure zones that would be utilized in the model and specifically for use during extended period model simulations. It is intended that the information gathered as part of this task will be the basis for evaluation and analysis as part of this study and ultimately for development of recommendations in subsequent portions of this study. The following are the specific efforts associated with this task.

1. Establish water demands for the current (2006) and future (2026) planning period. These will be provided for the following demand scenarios.
 - Average Day Demand
 - Maximum Day Demand
 - Peak Hour Demands (during Maximum Day)

Demands will be segregated and tabulated by Town / City and also by pressure zone. The future demands shall be entered into the model on a global basis. That is, the demand shall be proportionately assigned to the various junction nodes in the pressure zone in which the demand is projected to occur.

2. System Wide Diurnal Flow Curves – The diurnal water use graphs for each pressure zone that were developed as part of the original model shall be reviewed for use in this evaluation. The graphs are utilized to calculate a series of multipliers (peaking factors) that the model uses to adjust demands for each hour in a day.

These diurnal flow patterns will then be available for use in the model for use in simulations for extended period simulation (EPS) analysis. It is critical that these diurnal flow curves are developed and that extended period simulations be completed in order to gauge how the overall water system responds to periods of increased demand especially during peak hour periods and under fire flow conditions. Most critical are their importance in evaluating the recovery rates of tanks as well as the existing pumping capability to adequately replenish distribution system storage tanks.

2.0 Current and Future Population

The data previously developed in Technical Memorandum 1 (TM 1) regarding current and future population projections for the various communities in the Authority's service territory were utilized for purposes of developing and allocating future water demands. These previously developed tables are repeated for reference in developing this TM 3A.

The current and projected changes in population vary from community to community throughout the service territory. The following tables represent the anticipated change in population up to the year 2020 from year 2000 Census data and projections of changes in population as prepared by Rhode Island Statewide Planning (RISWP). The City of Cranston and Town of Scituate were not included in this table, as the Authority has no designs on increasing its service area in these communities.

PROJECTED POPULATION CHANGE BY COMMUNITY 2000 - 2005

COMMUNITY	2000 (CENSUS) POPULATION	2005 (RISWP) POPULATION	CHANGE (VALUE) AND %
Warwick	85,808	85,803	(-5) - 0.0%
West Warwick	29,581	29,759	(+178) +0.6%
Coventry	33,668	34,590	(+922) +2.7%
West Greenwich	5,085	5,413	(+328) +6.5%
East Greenwich	12,948	13,340	(+392) +3.0%
TOTALS	167,090	168,905	(+1,815) 1.1%

PROJECTED POPULATION CHANGE BY COMMUNITY 2000 - 2020

COMMUNITY	2000 (CENSUS) POPULATION	2020 (RISWP) POPULATION	CHANGE (VALUE) AND %
Warwick	85,808	85,235	(-573) -0.7%
West Warwick	29,581	30,928	(+1,347) +4.6%
Coventry	33,668	37,789	(+4,121) +12.2%
West Greenwich	5,085	6,550	(+1,465) +28.8%
East Greenwich	12,948	14,656	(+1,708) +13.2%
TOTALS	167,090	175,158	(+8,068) 4.8%

A review of the Town and City Community Comprehensive Plans and consultation with the various Planning Directors was also completed as part of TM 1. The information provided in the Plans and available from Planning Directors was generally non-specific with regard to areas of expected growth for the twenty-year planning period. The general consensus was that the Statewide Planning projections were likely a “reasonable” projection of population change. The population projections as developed by Statewide Planning were therefore utilized as part of this evaluation.

The most recent Water Supply System Management Plan (WSSMP) of 2001 provided indication of service population by community premised upon year 2000 data. For the purpose of this evaluation, it will be assumed that any increase or decrease in the overall projected population for each community for the next twenty-year period in the service population will increase or decrease proportionately. For example, data for year 2000 indicates that approximately 59% (19,941 of 33,668) of the total population are served by the Authority. It is projected that the total population in Coventry will increase over the next twenty years by 4,121 persons. The service population would therefore be expected to increase by a proportional rate. Therefore, assuming 59% of the 4,121 increase would be served by the Authority, the projected service population of Coventry for 2020 would equate to 22,382 or an increase of 2,441 persons. A similar approach was applied to the remaining service communities.

KENT COUNTY WATER SERVICE POPULATION 2000 -2020

COMMUNITY	2000 SERVICE POPULATION	2020 SERVICE POPULATION	CHANGE (VALUE) AND %
Warwick	8,578	8,521	(-57) -0.7%
West Warwick	18,083	18,906	(+823) +4.6%
Coventry	19,941	22,382	(+2,441) +12.2%
West Greenwich	824	1,062	(+238) +28.8%
East Greenwich	9,262	10,484	(+1,222) +13.2%
Cranston	2,005	2,005	(0) +0.0%
North Kingstown	28	28	(0) +0.0%
Scituate	1,170	1,170	(0) +0.0%
TOTALS	59,891	64,558	(+4,667) +7.8%

The total system wide service population is therefore anticipated to increase by 7.8% based on the population projections.

The table indicates that the municipalities such as Coventry, East Greenwich and West Greenwich are expected to grow at a moderate pace with the greatest increase in the number of persons identified in Coventry. West Greenwich is anticipated to grow at the fastest pace however the relative number of the increase in actual population is not as great as Coventry. Warwick and West Warwick are anticipated to experience a no change to a slight increase in population. None of the planning departments / planning officials made reference or had knowledge of any specific commercial or industrial project(s) that may

have a substantial direct impact to future water use. They did however indicate that there is always a possibility of such development occurring however it is near impossible to project the volume of water that may be required.

It should be noted that the above are based on projections which can be subject to various factors including but not limited to the following: zoning and demographic changes, economic conditions, industrial development (most notably those employing wet processes which can utilize large volumes of water), conversion from single family to multifamily or commercial use, increase in fire service requirements, etc. The unpredictability of these various factors can serve to singly or in combination serve to increase or possibly decrease the future water volume requirements.

3.0 Current (2006) Water Demands

The following Tables represent the current (year 2006) water demands for each of the various demand scenarios as developed in the most recent hydraulic model update of March 2006. These are provided by both community and pressure zone.

CONSUMER DEMAND BY PRESSURE ZONE (2006)

PRESSURE ZONE	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Low Service (334') Gradient	5.418	10.241	11.760
Tiogue Tank (350') Gradient	0.086	0.176	0.200
Intermediate High (430') Gradient (RSHR)	0.397	0.811	0.924
High Service (500') Gradient	2.154	4.061	5.214
Low Service Reduced (334') Gradient	1.871	3.727	4.320
High Service (500') Reduced Gradient	0.528	1.035	1.274
Warwick Wholesale Interconnection (232') Gradient	0.006	0.010	0.011
Hope Road (510') Gradient	0.006	0.013	0.014
Oaklawn (231') Gradient	0.361	0.736	0.847
TOTALS	10.8 MGD	20.8 MGD	24.6 MGD

CONSUMER DEMAND BY COMMUNITY (2006)

COMMUNITY	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Warwick	1.866	3.594	4.153
West Warwick	2.796	5.530	6.382
Coventry	2.735	5.232	6.152
West Greenwich	1.064	1.765	2.361
East Greenwich	1.943	3.896	4.693
Cranston	0.303	0.592	0.686
Scituate	0.096	0.195	0.222
TOTALS	10.8 MGD	20.8 MGD	24.6 MGD

Note:

1. The maximum day and peak hour demands represented in the table above are premised upon an historical period (July 2002) when the system experienced its largest water use. Although the system does not experience a similar magnitude in water demand every year, it is prudent for planning purposes to consider that this peak demand can occur in the future.
2. The demands presented in the two tables above reflect the recent water reduction in water use by ON – Semiconductor (Low Service) and Amgen (High Service). The magnitude of these reductions is documented in Section 4.0.

4.0 Future Projected (2026) Water Demands

Water demands for the 20-year planning period were predicated upon a projection of population change to the year 2026 (20 years from current 2006). Due to the fact that population projection data was only available up to the year 2020 and there is an inherent “uncertainty” in the accuracy of these numbers, this evaluation inferred that the 2020 population projections would be used up through the planning period of 2026.

The following summarizes the significant assertions and basis as to the method by which future demands were developed and allocated in the model. This also includes significant changes in system operation, which are anticipated to occur within the planning period.

Demand Calculation and Allocation in Model

- The High Service “Board Approved” developments have already been incorporated into the most recent 2006 model update. These were not reconsidered as part of future projections and have already been allocated to specific areas in the system in which they are expected to occur.

- All "known" development projects in the High Service Gradient which have yet to be approved (but have been modeled) will be added to the model demand database as these would likely be approved and constructed once sufficient supply exists to service this area.

- A spreadsheet, which provides specific development projects, which are "Board Approved" and Known But Not Approved, is provided as Attachment No. 1. This spreadsheet was developed as part of Task Order No. 3 – High Pressure Gradient Model Evaluation, December 2004 and updated through January 18, 2007. Of particular note to the adjustments are the reduction in flow from Amgen and the elimination of the casino project. These adjustments serve to increase the available water supply in the High Service. Currently, with all developments, both approved and not approved there exists a surplus maximum day capacity of 172,712 gallons per day (120 gpm). It should also be noted that the Task Order 3 Technical Memorandum included potential demands in the High Service Gradient that were associated with substantial future development that was projected to occur (commercial and residential) in the Center of New England. A tabular summary of these developments is provided as Attachment No. 2. The cumulative demands from the development at full grow out would total 2.62 MGD.

Since preparation of Task Order 3, it has become known that there are plans currently in place to construct a private water system to service these aforementioned developments at Center of New England. If so, and if it is designed to accommodate all projected flows, then these projected demands would not necessarily need to be considered in this evaluation. At this time, the demands have been removed from the projected future demands in the High Service Gradient hence the reduction of projected flows previously presented in Task Order 3 and those presented herein. In the event that additional information becomes available regarding the disposition of this private water system, it may be necessary to adjust projected flows accordingly.

- Based on the anticipated increase in service population by community previously developed, the water demand will be proportionally increased by this amount. For example, the (service) population is expected to increase by 4.6% in West Warwick for the planning period. Therefore, demands are projected to increase in West Warwick by an equal amount within this area of the service territory. A similar approach was applied to the remaining communities with the Authority service territory.
- Due to the fact that the specific area of future development and growth is unknown, the future anticipated consumer demands would be distributed globally across the particular community in which they are projected to occur.

- In order to account for unanticipated growth (i.e. growth that would result in water demand increase), a conservative estimate of a 10% increase in water demand was allocated across the entire service territory for the planning period. This 10% increase in water demand also included the communities of Cranston, North Kingstown and Scituate for which the Authority has no immediate plans for expansion as a measure to account for "infill" development.

- This 10% factor for unanticipated growth has been reduced from the 20% factor that was previously factored into the calculations for maximum day demand as presented in Task Order 3. The rational behind this approach is such that a comprehensive evaluation was completed for each City and Town in the service area as part of this study to account for projected increases in population for the next twenty years. These population projections were unknown at the time of preparation of Task Order 3. As such, the water demands that would be associated with the population increases were added to the projected flows in this study. It was concluded that a 10%

factor for unknown anticipated growth is a reasonable conservative estimate given the available information that has been derived and accounted for through projected planning population numbers.

- It should also be noted that the various factors and recent available information as discussed herein have had the overall effect of reducing the maximum day projected demand of 30.72 MGD as presented in Task Order to 24.3 MGD as provided in this study. The most significant cause of the reduction is attributed to the following.

Reduced flows from Amgen (0.9 MGD) and ON-Semiconductor (0.425 MGD)
Removal of Center of New England Development (2.6 MGD) and Casino (0.4 MGD)
Decrease in the unanticipated growth factor from 20 to 10 percent

- The future demands for Amgen and ON Semiconductor were also considered in this study and both of which have been significantly reduced. The demands for each of these facilities were readjusted in the model database as follows.
 - An average day demand of 10.42 gpm (5,000 gallons per day) was utilized for ON-Semiconductor. This demand has decreased from 299.34 gpm (431,050 gallons per day) or by over 95% in the Low Service Gradient.
 - Based upon recent correspondence from Amgen dated January 4, 2007, detailing forecasted water use through year 2008 overall water demands have decreased for all demand scenarios. June 2008 is the projected point at full grow out for the facility. These adjusted demands will have an impact on the operation of the water system in the High Service Pressure Gradient. The demands are significantly lower than those provided in 2002 as can be seen below.

MODEL SCENARIO	2002 AMGEN DEMANDS	2008 AMGEN DEMANDS	OVERALL DECREASE IN FORECAST
Average Day	833 gpm (1.2 MGD)	556 gpm (0.80 MGD)	277 gpm (0.40 MGD)
Maximum Day	1,500 gpm (2.16 MGD)	833 gpm (1.20 MGD)	667 gpm (0.96 MGD)
Peak Hour	1,500 gpm (2.16 MGD)	1,084 gpm (1.56 MGD)	416 gpm (0.60 MGD)

- The future water demands were calculated for the entire system based on the aforementioned data and were proportionately applied to each of the various junction nodes within each of the service communities.

Significant changes / modifications to system operations:

- The existing Tiogue Tank (350') Gradient will be served and become part of the High Service (500') Gradient.
- The Bald Hill Booster Pump Station will be upgraded in capacity to 10.0 MGD. This will include installation of significant water main infrastructure such that the pump station will have the ability to

pump directly to the High Service 500 Foot Gradient. The breakdown is anticipated as follows: 2.0 MGD to High Service Gradient and 8.0 MGD to Low Service Gradient

- The new Read School House Road Tank will be in service and the pressure zone increased from 430 feet to 500 feet. This will include the activation of the 3.0 MGD High Service Pumps at Clinton Avenue Pump Station.
- The new Read School House Gradient and the existing High Service Gradient will be interconnected by new water main infrastructure and will operate as one Gradient.
- The Mishnock Well Field and treatment facility will be activated with a total production capacity of approximately 3.0 MGD with the ability to pump into either the Low or High Service Gradient.
- East Greenwich and Spring Lake Well upgrade in pumping capacity.
- Installation of a new interconnection to Providence Water in vicinity to Wakefield Street with the ability to pump up to 6 MGD into the Low Service Gradient and 2 MGD into the High Service Gradient.

CONSUMER DEMAND BY PRESSURE ZONE (2026)

PRESSURE ZONE	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Low Service (334') Gradient	6.272	11.896	13.766
New (500') Read School House Gradient	0.485	0.990	1.129
High Service (500') Gradient*	2.554	4.905	6.290
Low Service Reduced (334') Gradient	2.211	4.404	5.107
High Service (500') Reduced Gradient	0.659	1.292	1.588
Warwick Wholesale Interconnection (232') Gradient	0.006	0.011	0.013
Hope Road (510') Gradient	0.007	0.014	0.016
Oaklawn (231') Gradient	0.402	0.821	0.944
TOTALS	12.6 MGD	24.3 MGD	28.9 MGD

*In the future, the Tiogue Tank (350') Gradient will become part of the High Service (500') Gradient.

CONSUMER DEMAND BY COMMUNITY (2026)

COMMUNITY	AVERAGE DAY DEMAND (MGD)	MAXIMUM DAY DEMAND (MGD)	PEAK HOUR DEMAND (MGD)
Warwick	2.052	3.954	4.569
West Warwick	3.204	6.337	7.313
Coventry	3.343	6.394	7.517
West Greenwich	1.165	1.983	2.672
East Greenwich	2.394	4.800	5.782
Cranston	0.333	0.651	0.755
Scituate	0.105	0.215	0.245
TOTALS	12.6 MGD	24.3 MGD	28.9 MGD

In summary, the total system demand for the planning period for all three demand scenarios is anticipated to increase by approximately 20%. The most significant increase is expected to occur within the existing 500 Foot High Service Gradient (34%). The communities with the greatest increase in demand by percentage include Coventry (22%), West Greenwich (39%) and East Greenwich (23%). In terms of overall greatest volume increase, the Low Service is anticipated to increase by approximately 0.9 MGD or roughly 16%.

4.0 System-Wide Diurnal Flow Curves

The system-wide diurnal flow curves were developed from hourly water production and tank level data that is representative of the maximum day water use patterns of the pressure zones of the Authority system. A review of past records indicated that the maximum water demand period occurred during July 2, 2002. Although this demand has not been experienced since, it is considered to be representative of a time period of maximum water use and when the system has been most “stressed”.

Due to the fact that Amgen has such a significant water demand in the High Service Pressure Gradient accounting for over 30% of the total demand, an individual diurnal flow curve was created for this facility. The recent information supplied by Amgen was utilized to develop this curve.

These diurnal flow curves are still considered to be most accurate with regard to extreme maximum day conditions and would be utilized during the evaluation through the planning period. The various diurnal patterns were entered into the model and assigned to all the junction demand nodes. The diurnal flow curves for the various Pressure Gradients of the system are provided as Attachment No. 3.

Attachment No. 1 – High Service Pressure Gradient Demand Worksheet

HIGH SERVICE DEVELOPMENTS AS OF JANUARY 18, 2007

BOARD APPROVED & KNOWN BUT NOT BOARD APPROVED

Item #	Address	Description	Area (sq. ft.)	Height (ft.)	Use	Start Date
1	Signal Ridge	EG Re-service	141.1	2.3	Residential	1/1/2001
2	Rose Farm	Frenchtown Rd., EG	1.11	2.3	Residential	5/4/2001
3	Birchwood Glen	Kulus Rd., WW	2.78	2.3	Residential	11/20/2001
4	Middle Woods	Middle Rd., EG	27.8	2.3	Residential	11/27/2001
5	Shippeetown Road Sub.	Shippeetown Rd., EG	6.67	2.3	Residential	12/10/2001
6	Amgen	Technology Way, WG	556.0	*	Industrial	2/8/2002
7	Sandra Court	Reservoir Rd., COV	1.81	2.3	Residential	5/20/2002
8	Chole Court	Clark Rd., COV	2.08	2.3	Residential	7/19/2002
9	Hawk Crest Est.	Hill Farm Rd., COV	12.2	2.3	Residential	4/4/2003
10	Crystal Creek	Middle Rd., EG	9.58	2.3	Residential	4/10/2003
11	Long Meadow	Frenchtown Rd., EG	8.33	2.3	Residential	4/10/2003
12	Middle Hollow	Middle Rd., EG	2.78	2.3	Residential	5/14/2003
13	Blueberry Hill	Shippeetown Rd., EG	7.78	2.3	Residential	8/26/2003
14	Hidden Ridge	Shippeetown Rd., EG	8.89	2.3	Residential	10/29/2003
15	Green Farm	Squirrel Ln./Tillinghast Rd., EG	6.67	2.0	Residential	1/12/2004
16	Dunkin Donuts	New London Turnpike	1.3	1.5	Commercial	2/9/2004
17	Chiropractic Center	Nooseneck Hill Rd., WG	0.63	1.5	Commercial	7/24/2004
18	Randolph Bank	Center of New England, COV	1.0	1.5	Commercial	11/1/2004
19	Leisure Condo	Nooseneck Hill Rd., COV	13.9	2.0	Condominiums	11/12/2004
20	Coventry Lumber	Nooseneck Hill Rd., COV	1.0	1.5	Commercial	11/16/2004
21	Santo Lombardi	Sharon Dr., COV	0.4	2.3	1 Residence	11/18/2004
22	Home Depot	Center of New England, COV	1.7	1.5	Commercial	12/6/2004
23	Debra Zarella	Frenchtown Rd., EG	0.4	2.3	1 Residence	3/16/2005
24	Arlington RV	Division Rd., WG	3.5	1.5	Commercial	3/16/2005
25	Brooks Pharmacy	Division Rd., EG	10.4	1.5	Commercial	3/16/2005
26	Pine Ridge	Hopkins Hill Rd., COV	28.8	2.3	Residential	3/16/2005
27	Westwood Apartments	Reservoir Rd., COV	4.9	2.0	Apartments	3/16/2005
28	Dawn Santilli	68 Surrey Ln., WW	0.4	2.3	1 Residence	3/22/2005
29	Maurice Cooney	949 Tillinghast Rd., EG	0.4	2.3	1 Residence	4/21/2005
30	Wingate Hotel	CNE Universal Blvd., COV	2.0	2.0	Hotel	5/2/2005
31	Wal-Mart	CNE Boulevard, COV	1.7	1.5	Commercial	5/2/2005
32	Paul & Tanya Rossi	53 Mohawk Tr., WG	0.4	2.3	1 Residence	5/18/2005
33	George Olney	22 Marlon Dr., COV	0.4	2.3	1 Residence	5/18/2005
34	Mojtaba Rajeeb	1627 Middle Rd., EG	0.4	2.3	1 Residence	5/18/2005
35	John Assalone	Valerie Dr., Parcel 1(a), WG	0.4	2.3	1 Residence	5/18/2005
36	John Assalone	Valerie Dr., Parcel 1(b), WG	0.4	2.3	1 Residence	5/18/2005
37	Peter Suorsa	12 Island Dr., COV	0.4	2.3	1 Residence	6/15/2005
38	Dana Carlow	Rejane St., COV	0.4	2.3	1 Residence	6/15/2005
39	Dunkin Donuts	Hopkins Hill Rd., WG	1.3	1.5	Commercial	6/15/2005
40	Andrew Potvin	Hopkins Hill Rd., COV	0.4	2.3	1 Residence	7/1/2005
41	Matthew L. Tucci	59 Club House Rd., WG	0.4	2.3	1 Residence	7/1/2005
42	Caren Bourque	Veronica Ct., COV	0.4	2.3	1 Residence	7/1/2005

HIGH SERVICE DEVELOPMENTS AS OF JANUARY 18, 2007

BOARD APPROVED & KNOWN BUT NOT BOARD APPROVED

Development	Street	Development	Area	Acres	Units	Start	
43	Peter Rosiello	Pond View Ct., WG	1 Residence	0.4	2.3	0.9	7/1/2005
44	Albert/Barbara LaPlume	307 Shippettown Rd., EG	1 Residence	0.4	2.3	0.9	7/20/2005
45	Arthur L. Larsson	298 Shippettown Rd., EG	1 Residence	0.4	2.3	0.9	7/20/2005
46	Frederick Schultz	58 Crompton Rd., EG	1 Residence	0.4	2.3	0.9	8/1/2005
47	Richard Todisco	61 Island Dr., COV	1 Residence	0.4	2.3	0.9	8/17/2005
48	Maple Root Center	Nooseneck Hill Rd., COV	Commercial	1.7	1.5	2.6	8/17/2005
49	Deer Run	Carr Pond Rd., WG	Residential	13.0	2.3	29.9	8/17/2005
50	Gentry Glen Condos	Crompton Rd., WW	Condominiums	13.0	2.0	25.8	9/21/2005
51	Carriage House Condos	Reservoir Rd., COV	Condominiums	3.3	2.0	6.7	9/21/2005
52	Retail Pad A	Center of New England, COV	Commercial	1.3	1.5	2.0	9/21/2005
53	GrandVile @ Greenwich	Center of New England, WG	300 Apts/Condos	31.1	2.5	77.8	9/21/2005
54	Kenneth Hendrickson	335 Shippettown Rd., EG	1 Residence	0.4	2.3	0.9	9/21/2005
55	Jane Revkin	385 Moosehorn Rd., EG	1 Residence	0.4	2.3	0.9	9/21/2005
56	Howard M. Duluide	20 Marion Dr., COV	1 Residence	0.4	2.3	0.9	9/21/2005
57	Larry Lachance	58 Robin Ln., WW	1 Residence	0.4	2.3	0.9	9/21/2005
58	184 Homes	Maude Ave., COV	Residential	19.7	2.3	45.3	9/21/2005
59	Karen Carlow	7 Rejane St., COV	1 Residence	0.4	2.3	0.9	10/19/2005
60	Scott Tierney	Spencer's Grant Dr. & Stone Carry Way	Residential	4.8	2.3	11.0	10/19/2005
61	Sarah Wye	129 East Greenwich Ave.	1 Residence	0.4	2.3	0.9	11/16/2005
62	John Brunero	East Greenwich Ave., AP 12-2, Lot 241	2 Residences	0.8	2.3	1.8	11/16/2005
63	John Brunero	199 East Greenwich Ave.	1 Residence	0.4	2.3	0.9	11/16/2005
64	Retail Pad B	Center of New England, COV	Commercial	1.3	1.5	2.0	10/19/2006
65	Arthur Brown	183 Greenbush Rd.	1 Residence	0.4	2.3	0.9	12/15/2005
66	Clark R. Smith	2594 Division Rd., EG	1 Residence	0.4	2.3	0.9	4/19/2006
67	Scott and Maria Brown	47 Clark Mill Rd., COV	1 Residence	0.4	2.3	0.9	6/26/2006
68	Peter Nolan	5 Hidden Ln., EG	Irrigation	2.4	1.0	2.4	6/21/2006
69	Peter Nolan	35 Hidden Ln., EG	Irrigation	2.4	1.0	2.4	6/21/2006
70	Peter Nolan	45 Hidden Ln., EG	Irrigation	2.4	1.0	2.4	6/21/2006
71	Kenneth Parris and Janet Hillier	65 Clark Mill Rd., COV	1 Residence	0.4	2.3	0.9	6/21/2006
72	Peter Nolan	40 Hidden Ln., EG	Irrigation	2.4	1.0	2.4	7/19/2006
73	Peter Nolan	55 Hidden Ln., EG	Irrigation	2.4	1.0	2.4	7/19/2006
74	Peter Nolan	5 Secret Ln., EG	Irrigation	2.4	1.0	2.4	7/19/2006
75	Charles Hawkins	368 Hopkins Hill Rd.	1 Residence	0.4	2.3	0.9	7/21/2006
76	Matthew and Yadira Gilchrist	420 East Greenwich Ave., WW	1 Residence	0.4	2.3	0.9	8/16/2006
77	K. Joseph Shekarchi	Herb Chambers, Rte. 2	Commercial	0.4	1.5	0.6	8/16/2006
78	Alfred & Linda Colucci	2271 Middle Rd., EG	1 Residence	0.4	2.3	0.9	10/18/2006
79	Stacy B. Ferrara, P.C.	21 Sharon Dr., COV	1 Residence	0.4	2.3	0.9	10/18/2006
80	Robert T. Chilo	42 Deer Run, WG	1 Residence	0.4	2.3	0.9	11/16/2006
81	Brian Ascoli	17 Cambio Ct., WG	1 Residence	0.4	2.3	0.9	11/16/2006
82	Robert Mellor	74 Tiffany Rd., COV	2 Residences	0.8	2.3	1.8	12/14/2006

**Attachment No. 2 – Center of New England Projected Flows for 2005 -
2009, as Prepared 3/16/04**

Projected Flows - Task Order 3,
Dec. 2004.

Center of New England Proposed Development Scenario

Number	Development	Year	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day (gpm)
24	CNE	2005	Retail / Comm. - 400,000 sf	27.8	1.5	41.7
			Restaurant	12.7	2.3	29.21
			Hotel	9.1	2.0	18.2
			300 Homes	87.5	2.3	201.25
			337 Apartments	91.3	2.0	182.6
			120 Age Rest. Apts	26.7	2.0	53.4
			Subtotal	255.1		526.36
		2006	Retail / Comm. - 400,000 sf	27.8	1.5	41.7
			Restaurant	12.7	2.3	29.21
			Hotel	8.3	2.0	16.6
			300 Homes	87.5	2.3	201.25
			Subtotal	136.3		288.76
		2007	300 Homes	87.5	2.3	201.25
			Subtotal	87.5		201.25
		2008	300 Homes	87.5	2.3	201.25
			900 Asst. Living Units	100.0	2.0	200
			Subtotal	187.5		401.25
		2009	300 Homes	87.5	2.3	201.25
			900 Asst. Living Units	100.0	2.0	200
			Subtotal	187.5		401.25

Note: All flows and development time tables premised upon information contained in data supplied by John P. Catio Corporation (dated 3/16/04).

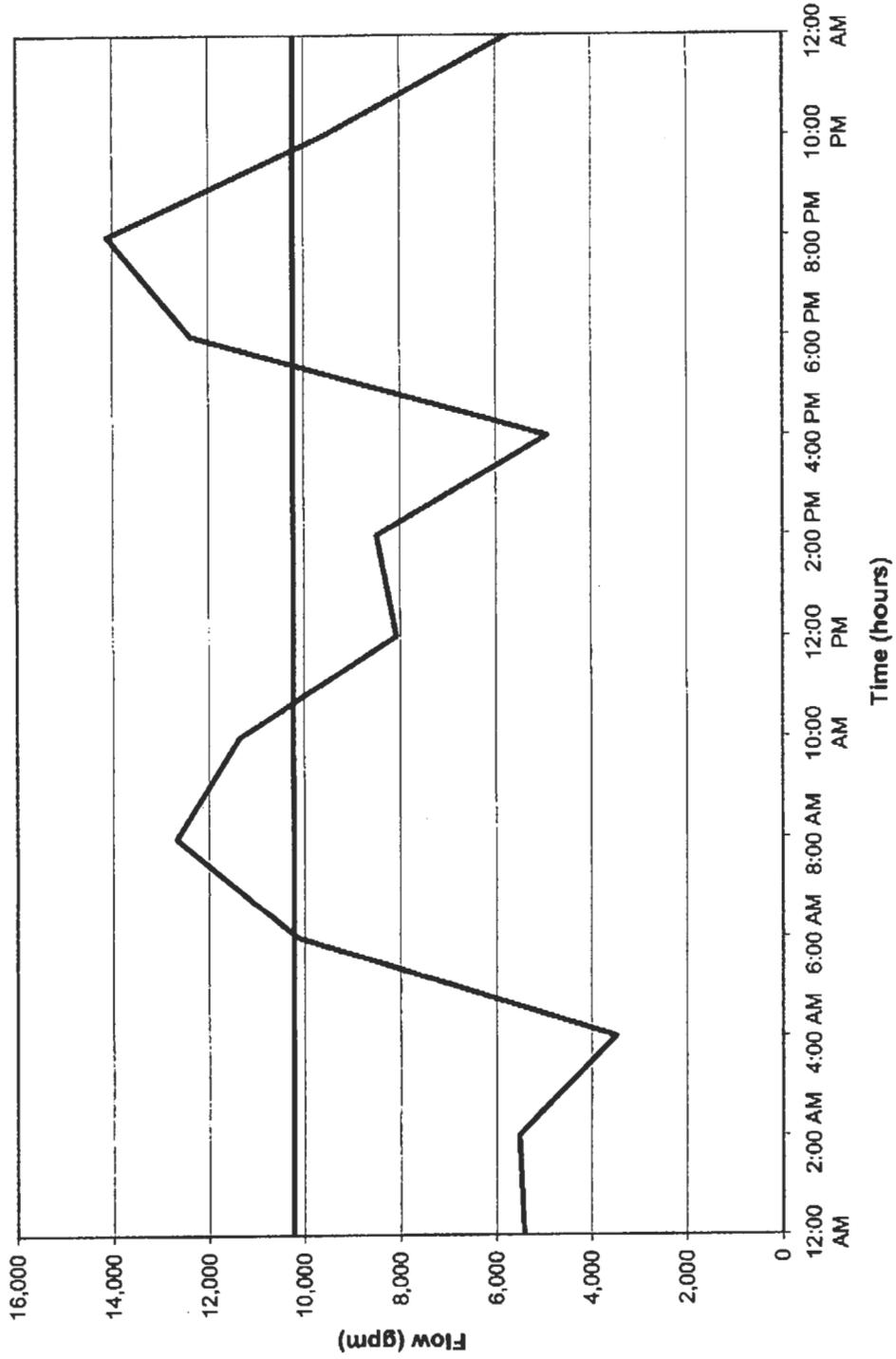
<u>Year</u>	<u>demand - max day</u>
2005	526.36
2006	288.76
2007	201.25
2008	401.25
2009	401.25
	<u>1818.87 gpm</u>

(2.62 MGD)
}

Attachment No. 3 - Water System Diurnal Flow Curves

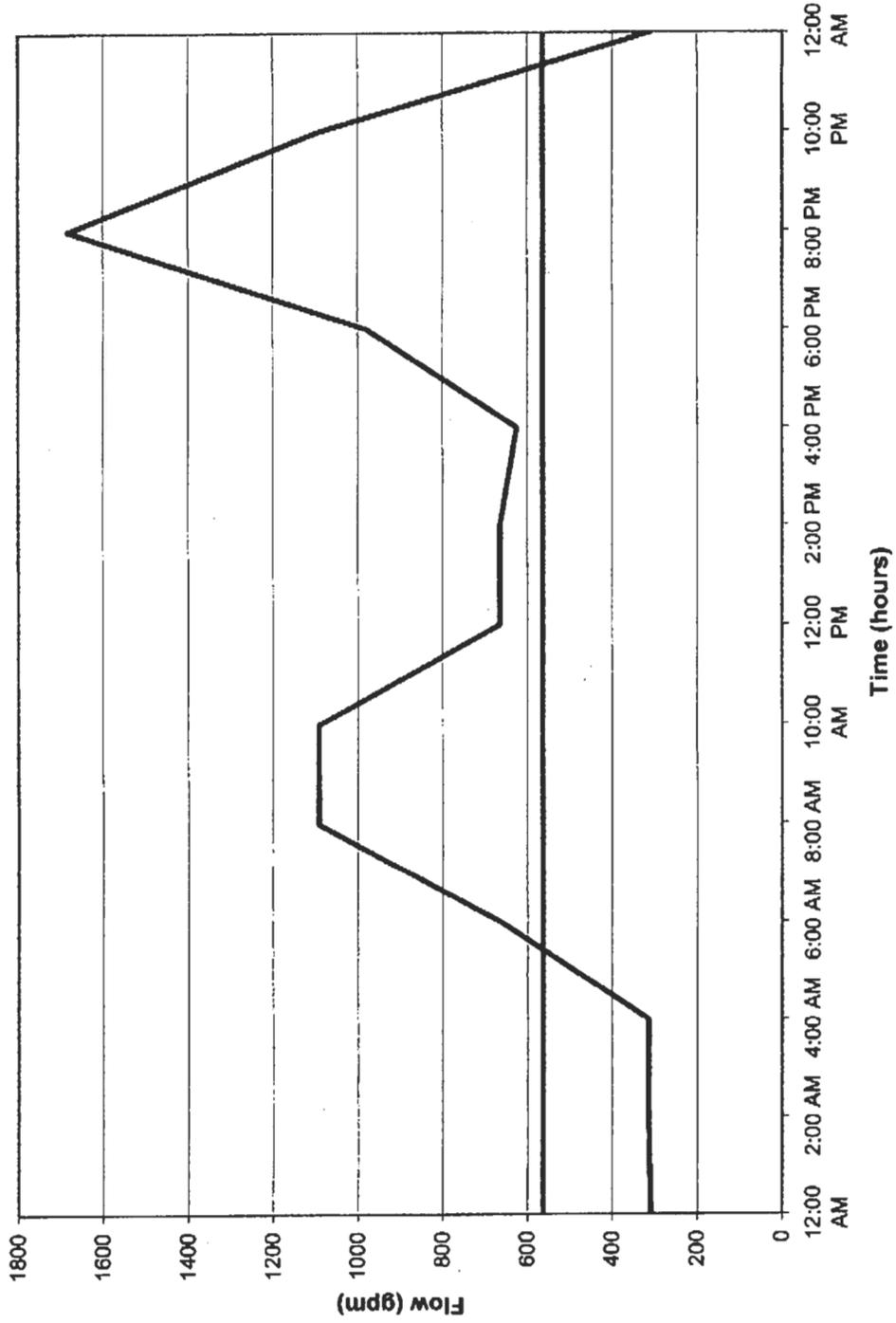
Maximum Day - Diurnal Flow Curve 334' Gradient (Low Service)

— Demand (gpm)
— Max Day Demand Rate =
10,227 gpm

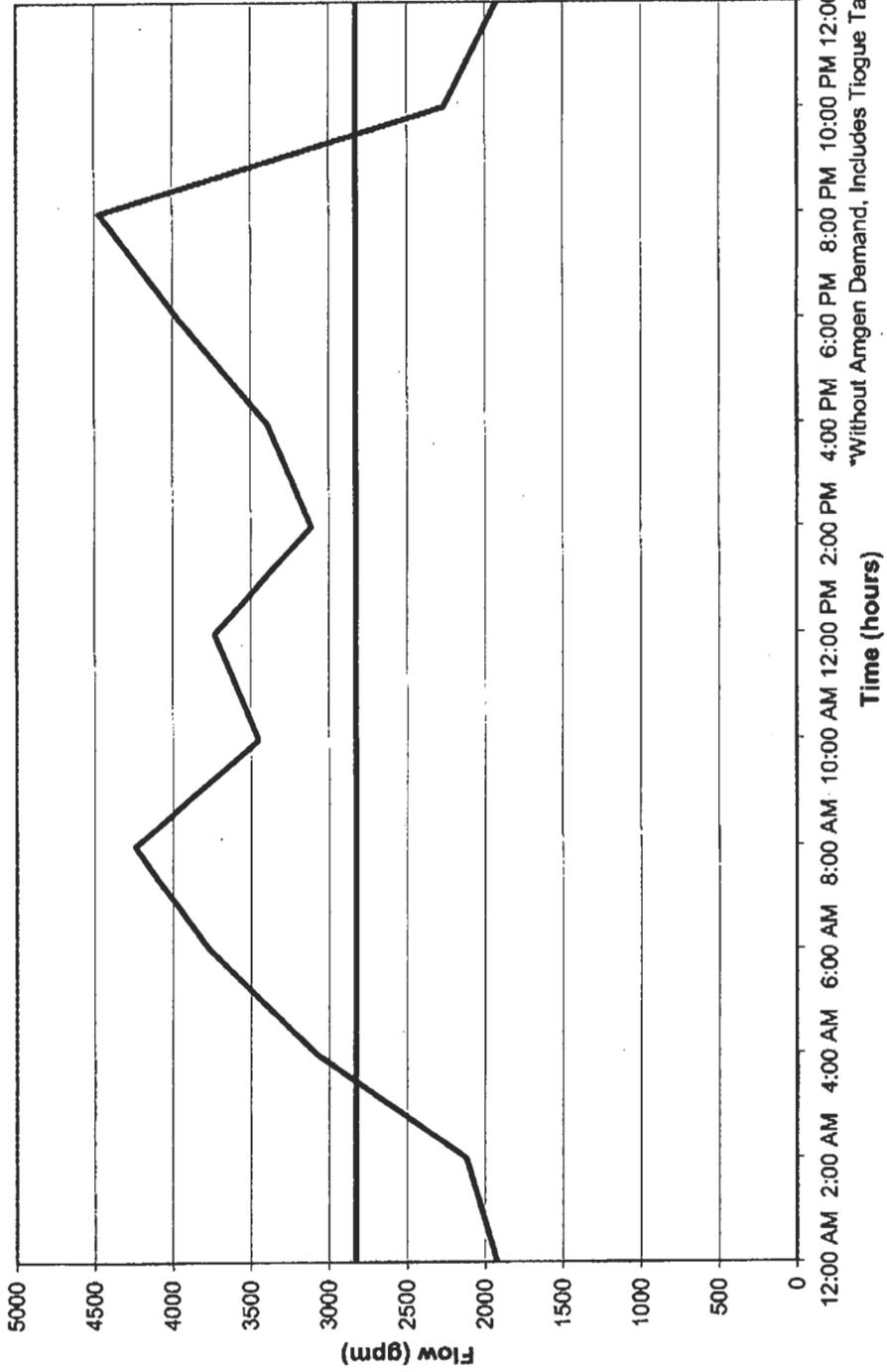
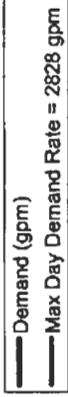


Maximum Day - Diurnal Flow Curve 430' Gradient (Read School House Road)

— Demand (gpm)
— Max Day Demand Rate = 563 gpm



Maximum Day - Diurnal Flow Curve 500' Gradient (High Service)

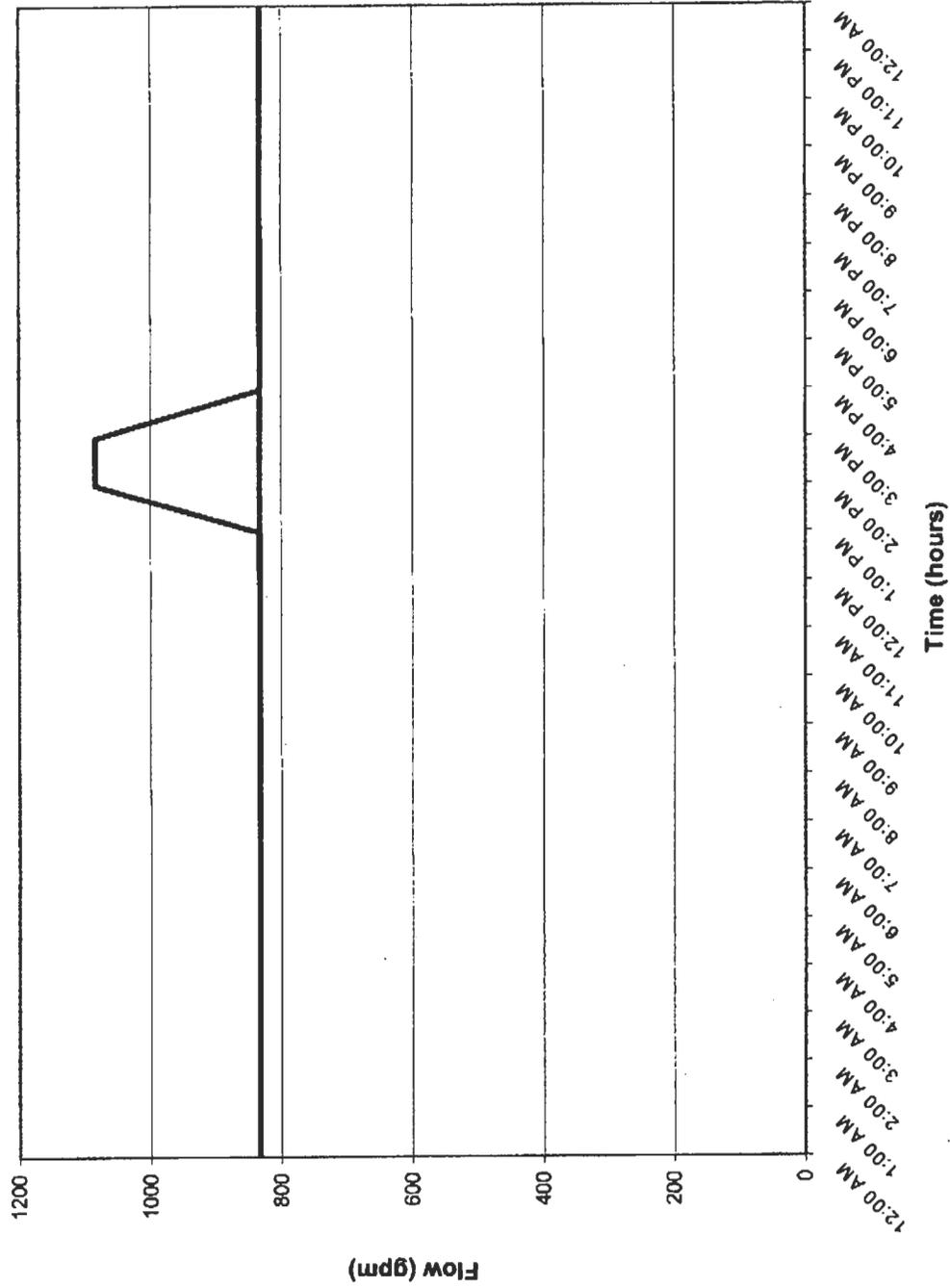


12:00 AM 2:00 AM 4:00 AM 6:00 AM 8:00 AM 10:00 AM 12:00 PM 2:00 PM 4:00 PM 6:00 PM 8:00 PM 10:00 PM 12:00 AM

*Without Amgen Demand, Includes Tiogue Tank Gradient

Maximum Day - Diurnal Flow Curve Amgen

Max Day Demand Rate = 833 gpm
Demand (gpm)



APPROVED HIGH SERVICE

(1/18/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved	Date Approved Letter Mailed Sent Out	Letter Returned	Letter Sent To
1	Signal Ridge	EG Re-service	Homes	141.1	2.3	324.5	1/1/2001				
2	Rose Farm	Frenchtown Rd., EG	Homes	1.11	2.3	2.6	5/4/2001				
3	Birchwood Glen	Kulus Rd., WW	Homes	2.78	2.3	6.4	11/20/2001				
4	Middle Woods	Middle Rd., EG	Homes	27.8	2.3	63.9	11/27/2001				
5	Shippeetown Road Sub.	Shippeetown Rd., EG	Homes	6.67	2.3	15.3	12/10/2001				
6	Amgen *	Technology Way, WG	Industrial	556	*	833.0	2/8/2002				Revised January 2007
7	Sandra Court	Reservoir Rd., COV	Homes	1.81	2.3	4.2	5/20/2002				
8	Chole Court	Clark Rd., COV	Homes	2.08	2.3	4.8	7/19/2002				
9	Hawk Crest Est.	Hill Farm Rd., COV	Homes	12.2	2.3	28.1	4/4/2003				
10	Crystal Creek	Middle Rd., EG	Homes	9.58	2.3	22.0	4/10/2003				
11	Long Meadow	Frenchtown Rd., EG	Homes	8.33	2.3	19.2	4/10/2003				
12	Middle Hollow	Middle Rd., EG	Homes	2.78	2.3	6.4	5/14/2003				
13	Blueberry Hill	Shippeetown Rd., EG	Homes	7.78	2.3	17.9	8/26/2003				
14	Hidden Ridge	Shippeetown Rd., EG	Homes	8.89	2.3	20.4	10/29/2003				
15	Green Farm	Squirrel Ln./Tillinghast Rd., EG	Homes	6.67	2.0	13.3	1/12/2004				
16	Dunkin Donuts	New London Turnpike	Commercial	1.3	1.5	2.0	2/9/2004		4/25/2005		Peter Nizwantowski and Steven Cabral
17	Chiropractic Center	Nooseneck Hill Rd., WG	Commercial	0.63	1.5	0.9	7/24/2004				
18	Keith White	Lot 22, AP50 Lot A Reservoir Rd	1 House	0.4	2.3	0.9	10/21/2004				Keith White
19	Keith White	136 Reservoir Road, Cov	1 House	0.4	2.3	0.9	10/21/2004				Keith White
20	Randolph Bank	Center of New England, COV	Commercial	1	1.5	1.5	11/11/2004				
21	Leisure Condo	Nooseneck Hill Rd., COV	Condos	13.9	2.0	27.8	11/12/2004				
22	Coventry Lumber	Nooseneck Hill Rd., COV	Commercial	1	1.5	1.5	11/16/2004				
23	Santo Lombardi	Sharon Drive, COV	1 House	0.4	2.3	0.9	11/18/2004				
24	Home Depot	Center of New England, COV	Commercial	1.7	1.5	2.6	12/6/2004				
25	Debra Zarella	Frenchtown Rd., EG	1 House	0.4	2.3	0.9	3/16/2005		4/8/2005	YES	Debra Zarella
26	Arlington RV	Division Road, WG	Commercial	3.5	1.5	5.3	3/16/2005		4/7/2005	YES	Sandy Oleary
27	Brooks Drugs	Division Road, EG	Commercial	10.4	1.5	15.6	3/16/2005		4/8/2005	YES	Steven Cabral
28	Pine Ridge	Hopkins Hill, COV	69 Homes	28.8	2.3	66.2	3/16/2005		4/8/2005	YES	Christopher Duhamel
29	Westwood Apartments	Reservoir Rd., COV	No Application	4.9	2.0	9.8	3/16/2005		4/8/2005		John Assalone
30	Dawn Santilli	68 Surrey Lane, W. WAR	1 House	0.4	2.3	0.9	3/22/2005		4/8/2005	YES	Massimo and Dawn Santilli

APPROVED HIGH SERVICE

(1/18/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved Mailed Sent Out	Letter Returned	Letter Sent To
31	Maurice Cooney	949 Tillinghast Road, EG	1 House	0.4	2.3	0.9	4/21/2005	4/21/2005	YES	Maurice Cooney
32	Wingate Hotel	CNE Universal Boulevard, Cov	Hotel	2	2.0	4.0	5/2/2005	5/24/2005		Jeff Hanson and Robert Rapoza
33	Wal-Mart	CNE Boulevard, Cov	Commercial	1.7	1.5	2.6	5/2/2005	5/24/2005		John Kucich, Robert Rapoza & Tom Richards
34	Paul & Tanya Rossi	53 Mohawk Trail, WG	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005		Paul & Tanya Rossi
35	George Olney	22 Marion Drive, Cov	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	YES	George Olney
36	Mojtaba Rajaei	1627 Middle Road, E.G.	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	YES	Mojtaba Rajaei
37	John Assalone	Valerie Drive, Parcel 1 (a)	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	YES	John Assalone
38	John Assalone	Valerie Drive, Parcel 1 (b)	1 House	0.4	2.3	0.9	5/18/2005	5/20/2005	YES	John Assalone
39	Peter Suorsa	12 Island Drive, Coventry (1")	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	YES	Peter Suorsa (Ken Goodwin)
40	Peter Suorsa	13 Island Drive, Coventry (2")	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	YES	Peter Suorsa (Ken Goodwin)
41	Dana Carlow	Rejane Street, Coventry	1 House	0.4	2.3	0.9	6/15/2005	6/22/2005	YES	Dana Carlow
42	Jeff Butler	Dunkin Donuts Hopkins Hill Rd, WG	Commercial	1.3	1.5	2.0	6/15/2005	6/22/2005	YES	Jeff Butler, Kevin Morin
43	Andrew Potvin	Hopkins Hill, COV	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	YES	Andrew Potvin
44	Matthew L. Tucci	59 Club House Road	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	YES	Matthew L. Tucci
45	Caren Bourque	Veronica Court, Plat 34, Lot 19	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	YES	Caren Bourque
46	Peter Rosiello	Pond View Court, Lot 102	1 House	0.4	2.3	0.9	7/1/2005	7/1/2005	YES	Peter Rosiello, Mike Duckett
47	Albert/Barbara LaPlume	307 Shippeetown Road, EG	1 House	0.4	2.3	0.9	7/20/2005	7/21/2005	YES	Albert & Barbara LaPlume
48	Arthur L. Larsson	298 Shippeetown Road, EG	1 House	0.4	2.3	0.9	7/20/2005	7/20/2005	YES	Arthur L. Larsson
49	Frederick Schultz	58 Crompton Road, EG	1 House	0.4	2.3	0.9	8/11/2005	8/11/2005	YES	Frederick Schultz
50	Richard Todisco	61 Island Drive, Coventry	1 House	0.4	2.3	0.9	8/17/2005	8/18/2005		Richard Todisco
51	Maple Root Center	2435 Nooseneck Hill Rd, Cov	Commercial	1.7	1.5	2.6	8/17/2005	8/18/2005	YES	Edward J. Overton, Jr, Patricia Walker (Installed Well)
52	Deer Run	Deer Run Estates, WG	24 Homes	13	2.3	29.9	8/17/2005	8/18/2005		Gary Johnson, Joseph Casali
53	Gentry Glen Condos	Crompton Road, WW	62 Units	13	2.0	25.8	9/21/2005	9/30/2005		Mike Duckett, Kevin Morin
54	Carriage House Condos	Reservoir Road, Coventry	12 Condos	3.3	2.0	6.7	9/21/2005	9/30/2005	YES	Brian Bamford, Joseph Casali
55	Retail Pad A	Center of New England, Cov	Commercial	1.3	1.5	2.0	9/21/2005	9/30/2005		Robert Rapoza, Jeffrey Hanson
56	Grandville @ Greenwich	Center of New England, WG	300 Apts/Condos	31.1	2.5	77.8	9/21/2005	9/30/2005		Roney Malafronte, John Caito

APPROVED HIGH SERVICE

(1/18/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Letter Mailed Sent Out	Letter Returned	Letter Sent To
57	Kenneth Hendrickson	335 Shippeetown Road, EG	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005	YES	Kenneth Hendrickson
58	Jane Revkin	385 Moosehorn Road, EG	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Jane Revkin
59	Howard M. Dulude	20 Marion Drive, Coventry	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Howard Dulude
60	Larry Lachance	58 Robin Lane	1 House	0.4	2.3	0.9	9/21/2005	9/30/2005		Larry Lachance, John Brunero
61	KCWA Project	Maude Avenue, Coventry	184 Houses	19.7	2.3	45.3	9/21/2005			Board Approved Re-Service
62	Karen Carlow	7 Rejane Street	1 House	0.4	2.3	0.9	10/19/2005	11/1/2005		Karen Carlow
63	Scott Tierney	Spencer's Grant Drive & Stone Carry Way Residence	12 Homes	4.8	2.3	11.0	10/19/2005	11/9/2005		Scott P. Tierney
64	Jeffrey Hanson	Center of New England, Cov Retail Pad B	Commercial	1.3	1.5	2.0	10/19/2006	11/9/2006		Jeffrey Hanson
65	Sarah Wye	129 East Greenwich Avenue, 315 East Greenwich Avenue, Plat 12-2, Lot 241	1 House	0.4	2.3	0.9	11/16/2005	11/23/2005		Sarah Wye, MA, LMHC
66	Gertrude M. Izbicki		2 Houses	0.8	2.3	1.8	11/16/2005	11/23/2005		Gertrude M. Izbicki, John S. Brunero, Jr.
67	Ronald Padula	199 East Greenwich Avenue	1 House	0.4	2.3	0.9	11/16/2005	11/23/2005		Ronald Padula, John S. Brunero, Jr.
68	Arthur Brown	183 Greenbush Road	1 House	0.4	2.3	0.9	12/15/2005	12/15/2005		Mr. Arthur Brown
69	Clark R. Smith	2594 Division Road, EG	1 House	0.4	2.3	0.9	4/19/2006	4/20/2006		Clark Smith
70	Scott and Maria Brown	47 Clark Mill Road, Coventry	1 House	0.4	2.3	0.9	6/21/2006	6/26/2006		Scott and Maria Brown, Town of Coventry - Building & Zoning Office
71	Peter Nolan	5 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
72	Peter Nolan	35 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
73	Peter Nolan	45 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	6/21/2006	6/26/2006		Peter Nolan
74	Kenneth Parris and Janet Hillier	65 Clark Mill Road, Coventry	1 House	0.4	2.3	0.9	6/21/2006	6/26/2006		Kenneth Parris and Janet Hillier, Town of Coventry - Building & Zoning Office
75	Peter Nolan	40 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan
76	Peter Nolan	55 Hidden Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan
77	Peter Nolan	5 Secret Lane, E. G.	Irrigation	2.4	1.0	2.4	7/19/2006	7/26/2006		Peter Nolan

APPROVED HIGH SERVICE

(1/18/2007)

Number	Development	Street	Description	Avg. Day (gpm)	Max Day Multiplier	Max Day Approved (gpm)	Date Approved	Date Approved Mailed Sent Out	Letter Returned	Letter Sent To
78	Charles Hawkins Matthew & Yadira Gilchrest	368 Hopkins Hill Road 420 East Greenwich Avenue, WW	1 House	0.4	2.3	0.9	7/21/2006	7/21/2006		Mr. Charles Hawkins, Town of Cov. Building and Zoning Office
77			1 House	0.4	2.3	0.9	8/16/2006	8/17/2006		Matthew & Yadira Gilchrest
78	K. Joseph Shekarchi	Herb Chambers - RT 2	Commercial	0.4	1.5	0.6	8/16/2006	8/17/2006		K. Joseph Shekarchi, Paul Brand
79	Alfred & Linda Colucci	2271 Middle Road, EG	1 House	0.4	2.3	0.9	10/18/2006	10/23/2006		Alfred & Linda Colucci
80	Stacy B. Ferrara, P. C.	21 Sharon Drive, Coventry	1 House	0.4	2.3	0.9	10/18/2006	10/23/2006		Stacy B. Ferrara
81	Robert T. Chito	42 Deer Run, WG	1 House	0.4	2.3	0.9	11/16/2006	11/21/2006		Robert T. Chito
82	Brian Ascoli	17 Cambrio Court, WG	1 House	0.4	2.3	0.9	11/16/2006	11/21/2006		Brian Ascoli
83	Oak Haven Tiogue Reduced			60		123.0	11/16/2006			
84	Robert Mellor	74 Tiffany Road, Coventry	2 Houses	0.8	2.3	1.8	12/14/2006	12/15/2006		Robert Mellor
85	Francis Belanger	45 Deer Run, West Greenwich	1 House	0.4	2.3	0.9	12/14/2006	12/15/2006		Francis Belanger
86	Charles Hirsch	30 Deer Run, West Greenwich	1 House	0.4	2.3	0.9	12/14/2006	12/15/2006		Charles Hirsch
		TOTALS GPM		1049.71		1905.40				
		MGD		1.51		2.74				

* Maximum day flow demand based on correspondence received from Immunex (Amgen) To KCWA dated 4 January 2007
 Supply/Pumping Capacity (MGD) 6.34 (-) Current Demand MGD (-) Future Demand = Surplus 426224 gal/day
 (-) 3.17 (-) 2.74

EXHIBIT C

JANUARY 17, 2007

KENT COUNTY WATER AUTHORITY
CASH RECEIPTS & DISBURSEMENTS
FY 2006 - 2007

DESCRIPTION ACCOUNT BALANCE	AUGUST 2006	SEPTEMBER 2006	OCTOBER 2006	NOVEMBER 2006	DECEMBER 2006	JANUARY 2007	FEBRUARY 2007	MARCH 2007	APRIL 2007	MAY 2007	JUNE 2007	RATE REVENUE FY 06-07	RATE REVENUE FY 07-08
CASH RECEIPTS:													
Water Collection	1,570,901	1,760,477	1,707,084	2,549,086	1,723,935	1,121,974						\$ 1,225,472.63	\$ 1,204,826.86
Interest Earned	133,239	61,482	55,144	54,260	492,441	1,111,996						\$ 2,630,984.60	\$ 3,067,439.49
Inspection Fees	13,845	680	660	17,130	2,700	200						\$ 1,235,628.04	\$ 1,494,122.19
Contributions by Other Governments												\$ 955,661.49	\$ 1,055,204.53
TOTAL CASH RECEIPTS	36,496,640	36,901,790	36,134,543	37,556,286	38,534,907	38,682,476							
CASH DISBURSEMENTS:													
Plant and Water	284,609	418,379	405,974	313,835	255,009	239,102							
Electric Power	56,735	56,495	68,474	23,850	56,654	45,411							
Payroll	138,818	181,915	133,989	133,443	172,386	142,428							
Operations	89,320	113,528	128,147	110,217	114,196	69,867							
Employee Benefits	47,401	45,699	45,761	45,149	45,489	45,978							
Legal	7,087	4,075	5,577	5,829	5,194	3,598							
Maintenance	12,628	20,583	5,214	8,629	11,900	4,484							
Insurance	2,999	2,999	3,099	133,303	3,499	3,499							
Sales Taxes	22,916	12,463	11,319	32,603	11,958	9,459							
Refunds	317	678	332	58	1,478	957							
Rate Case													
Contingencies													
Pilot	8,344												
Total Disbursements	784,609	1,000,849	834,344	705,127	705,127	500,000							
Cash Balance	35,712,031	35,900,941	35,300,199	36,851,159	37,829,780	38,182,476							

DESCRIPTION	AUGUST 2006	SEPTEMBER 2006	OCTOBER 2006	NOVEMBER 2006	DECEMBER 2006	JANUARY 2007	FEBRUARY 2007	MARCH 2007	APRIL 2007	MAY 2007	JUNE 2007	
Capital Expenditures (Water)	569	5,395	2,491	14,244	11,344	15,125						
2004 Infrastructure	17,672	332,027	242,886	229,613	173,474	140,537						
Middlebrook Well Storage/Pump/Tra		144,678		36,229	31,690							
Clinton Avenue Pump Station	405,364	256,735	20,134	11,497	121,103	237,914						
E. Ct. Well Upgrade												
GHS Development Mapping	11,660											
Blackrock Road - 24"	156,770	1,798										
Read Schoolhouse Road												
Read Schoolhouse Road Tank					430							
Mishnock Well - Pilot												
Greenbrook Avenue - Pipe Lining	724	636	1,095									
Veterans Memorial Drive												
System Storage Evaluation		12,565	8,276	2,880	2,240	2,976						
Fuel Storage Tank Replacement			807		11,576							
2006A Infrastructure				800		163						
Quaker Lane Pump Station					6,209	4,875						
U. S. Bank - Debt Service (P. & I)	3,070,559	12,387	115,158	37,268	151,282	13,512						
Water Protection	83,657											
TOTAL DISBURSEMENTS	4,417,560	1,628,035	1,108,733	1,140,455	1,186,601	979,915						
Balance End of Month	35,079,271	34,873,735	34,935,810	36,415,831	37,448,306	37,702,561						
FLUOR LEAK	36,022,640	35,582,079	36,245,232	37,873,723	38,014,975	38,869,307	38,066,404	38,482,355	38,626,460	39,668,648	38,714,788	37,928,745

EXHIBIT D

JANUARY 17, 2007

KCWA
Phased Cross Connection Control Program
December 2006

Cross Connection Control/Backflow Prevention is a critical element in preventing contaminants or pollutants from entering the KCWA water distribution system. KCWA rules and regulations require that backflow preventers be installed on all new service connections. The rules and regulations also stipulate that KCWA customers must install a backflow preventer upon written notification from KCWA (Section 3.1 & 6.1).

RI State Law 46-15.3-14 indicates that “It is the responsibility of all suppliers of public drinking water to protect the potable water system from contamination or pollution due to cross-connection by requiring the installation of an approved backflow device after the service meter”.

Currently, KCWA’s program focuses on new customers. This program modification enhances the existing program by also focusing on existing customers.

As KCWA has over 26,000 service connections it would take many years to bring all customers into compliance. For this reason, it is proposed that we prepare a phased program and initially focus on the customers that pose the greatest potential threat to the water supply. This program is described below.

KCWA
Phased Cross Connection Control Program
December 2006

Phase I

Backflow Preventer Installation

- Initiate program January 1, 2007
- Require all high hazard commercial/industrial customers to install backflow preventers
- High hazard categories are identified on attached list (estimated approximately 400 such customers). The KCWA regulations define high hazard customers as “all commercial occupancies and/or potential threats”. For the purpose of this phased program, we have sub-divided this category in “high” and “low” hazard.
- Require all multi-unit residential (apartment buildings, condominiums) customers to install backflow preventers (estimate 75 - 100 customers).
- Require installation of backflow preventer on all non-metered fire lines (est. 125 customers).
- Allow 120 days from receipt of letter for installation.

Backflow Preventer Testing

KCWA Rules & Regulations require annual testing on RPZ and Double-check valve backflow preventers. Only about 20 customers have supplied test results to KCWA in the past couple of years (with the exception of new installations).

- Prepare database of existing RPZ (reduced pressure principle) backflow preventers installed in system.
- Send letter requesting existing commercial/industrial, as well as multi-unit residential (master meter) backflow preventers be tested annually.

KCWA

Phased Cross Connection Control Program

December 2006

- Although the State does not have regulations for certified testers, certification is provided by New England Water Works and the American Backflow Prevention Association. These certifications are recognized by other water suppliers.
- Estimate approximately 250-500 customers currently have RPZ or double-check valve backflow preventers at this time.

Phase II

Backflow Preventer Installation

- Require all low hazard commercial/industrial customers to install backflow preventers (estimated 1200 customers).
- All commercial/industrial customers who were not previously identified as “high-hazard” will be considered “low hazard”.

Backflow Preventer Testing

- Maintain database of backflow preventer installations
- Continue annual testing program

KCWA

Phased Cross Connection Control Program

December 2006

Phase III (*Hold for State Law Passage*)

Backflow Preventer Installation for Remaining Customers

- Require all residential customers to install backflow preventers (approximately 24,000). As a first priority require all residential customers with in-ground sprinkler systems to install backflow preventers or vacuum breakers. As backflow prevention is part of the plumbing code it is believed that many of these in-ground sprinkler systems already have a backflow preventer or vacuum breaker.

Backflow Preventer Testing

- Continue annual testing program for RPZ (reduced pressure principle) backflow preventers. This includes all commercial/industrial and multi-unit residential (i.e. master meter).
- Remaining residential customers do not have to test. The regulations require their backflow preventers to be replaced every 10 years.

KCWA
Phased Cross Connection Control Program
December 2006

Program Management

Program will be managed by System Engineer. Customer Service Representatives will be involved in data entry, correspondence, and phone calls. Field Representatives from the meter department will be required to make site visits to verify installations, take photographs, and develop and complete data sheets for database entry.

KCWA will purchase specialized software to keep track of installations and testing. Software was included in this fiscal year's budget.

RI State Law 46-15.3-14 allows for suppliers to "charge reasonable fees for the administration of the cross-connection program". Accordingly, consideration should be made to charging users with backflow preventers a separate annual administrative fee.

It is estimated that the cost to administer the program during year one would be approximately \$30,000 (see attached worksheet). Assuming 750 backflow preventers and approximately 16 hrs./week of staff time this is equivalent to approximately \$40.00/backflow preventer (not including software cost which is assumed to be a one time cost). The effort (and cost) to administer the program would increase over time as the number of backflow preventers in the program increases.

Year 1 could be used as a pilot program and an opportunity to develop better estimates regarding the level of effort and costs to administer the program.

High-Hazard Customers

AWWA Recommendation:

- Radioactive material processing plants or nuclear reactors;
- Sewer treatment plants, sewage pump stations, or waste dump stations;
- Hospitals; medical centers; medical, dental, and veterinary clinics; and plasma centers;
- Mortuaries;
- Laboratories;
- Metal-plating facilities;
- Food-processing and beverage-bottling facilities;
- Car washes;
- Premises with an auxiliary water supply;
- Premises where access is restricted;
- Piers and docks, graving docks, boat marinas, dry docks, and pump stations;
- Premises with fire sprinkler systems and/or private fire hydrants (includes shopping centers, master meter such as condominiums, apartment complexes, mobile home parks).
- Premises with Irrigation systems.

Others based on categorization by other water utilities and professional judgment:

- Laundromats & cleaners
- Restaurants & bars
- Supermarkets
- Schools
- Fitness Facilities with swimming pools
- Dye Works
- Film Laboratories
- Nursery, Botanical, & Greenhouses
- Printing companies
- Animal shelters/hospitals

**Backflow Preventer Program
Estimated Administrative Cost of Program**

11/16/2006

In accordance with RI Chapter 46-15.3, Section 46-15.3-14, KCWA has the authority to charge reasonable fees for the administration of a cross connection control program. This worksheet provides a rough estimate for Phase I activities. As the program expands, the level of effort to manage the program would also increase but it may not be proportional to the number of backflow preventers. Therefore, the \$/backflow would need to be evaluated periodically.

Installation & Testing Program Elements:

- Sending letters for installation, testing, and repairs
- Phone calls
- Site visits
- Maintaining database

Assumed # of backflow assemblies = **750**

Labor Estimate

	hourly rate	hrs/week	hrs/year	\$/year	45% fringe	Total
Manager	\$40	4	208	\$8,320	\$3,744	\$12,064
Customer Service Rep.	\$20	6	312	\$6,240	\$2,808	\$9,048
Field Rep.	\$20	6	312	\$6,240	\$2,808	\$9,048
TOTAL		16	832	\$20,800	\$9,360	\$30,160

Estimated \$/backflow assembly = **\$40.21**

Note: This does not include the specialized software that KCWA will purchase. The cost is estimated to be approx. \$4000-5000.

EXHIBIT E

JANUARY 17, 2007

OFFICE MEMO

To: Board
From: Timothy Brown
Subject: Update Water Conservation Action Plan
Date: December 14, 2006

Even though winter hasn't yet arrived, we are beginning to think about our demand season of next year of 2007. With the potential of El-Niño forming in the Pacific again there is an expectation that the summer coming will be drier than the past. This will have an affect upon our ability to supply and will be a test of the system improvements that have been installed. In the January meeting, we will be reviewing the attached revisions to the water Conservation Action Plan for the Board's action. We can implement any changes that the Board members have concerning this revision. I have also attached a one page Water Conservation Plan for the winter and spring of 2007 as to what our focus will be.

KCWA Water Conservation Plan – Winter 2006/2007 and Spring 2007

Primary Focus – Strive to reduce outdoor water usage for Summer through education. The goal will be to encourage customers to water less outdoors, install “smart” controllers for sprinkler systems, as well as reduce turf areas and plant drought-tolerant plantings. It is proposed that we do the following:

- Add a water conservation area to KCWA Website
- Send water conservation brochure(s) to all customers
- Include message(s) in water bill
- Prepare press releases for local newspapers with tips for watering wisely
- Identify irrigation system installers in KCWA service area and through letters, phone calls, or meetings request that they be proactive in installing conservation-based systems, as well as provide some basic water conservation tips to homeowners with installation.

Note: KCWA will continue to promote other aspects of water conservation. However, it is intended that the above stay focused on the reducing outdoor water use as maximum day demand is of greatest concern to KCWA.

KENT COUNTY WATER AUTHORITY

WATER CONSERVATION ACTION PLAN



JANUARY 2007

*1072 Main Street
P.O. Box 192
West Warwick, Rhode Island 02893*

KCWA Water Conservation Action Plan

1.0 Introduction

~~This action plan is intended to outline opportunities for the future development of a comprehensive water conservation program to reduce the inefficient use of water throughout our system. The intent is to utilize existing techniques and technologies that are cost effective and readily available for customer implementation. A second element of the plan is an aggressive Public Awareness Program that will educate and encourage wise use of both public and private water supplies within each community commitment and support from the cities and towns we serve which are instrumental components to the success of this endeavor~~

Several potential conservation programs are presented in this plan. Some of them are designed to encourage conservation on a year round basis while others focus on the high demand period (summer). KCWA will conduct some initial research in order to better define the overall water conservation goals. This is necessary to select and implement those programs that would best allow KCWA to meet envisioned goals.

2.0 Goals

Water is a finite natural resource that must be protected and used wisely. KCWA Regulations encourage conservation. KCWA must develop quantifiable goals for this program (i.e. water use reduction) to present to its customers and governing bodies of the cities and towns served. These goals will be based on real time consumption figures along with the research and analyses tasks described below. One of the primary areas of focus will be the reduction of outdoor water use to reduce overall twofold seasonal demand experienced each summer. This influence is particularly important as overall demand is projected to increase significantly due to both economic and residential growth.

3.0 Water-Use Profile

An annual water use profile will be developed by analyzing water use by customer category (residential, commercial/industrial, government). Based on historical water billing records, approximately 69% of water use is residential, 26.5% is commercial/industrial, and 3.5% is governmental.

Seasonal production records demonstrate that outdoor water usage has the most impact on overall demand. A preliminary examination of seasonal demands over the past several years indicates that an estimated 3-5 Million Gallons per Day (MGD) is used for outdoor water use on a typical summer day. On days of maximum demand, the estimated outdoor water use increases to 6-9 MGD. Therefore, it is clear that a program(s) that results in outdoor water use reduction would reduce waste and maximum day demands.

A closer examination of the above along with research activities discussed in the following section will allow us to develop realistic water conservation goals and Community Action Plans for both indoor and outdoor water use.

4.0 Research

KCWA will review State Guide Plans and Conservation Programs that other water suppliers have implemented for guidance and examples of successful and unsuccessful programs. This research will allow us to learn from others and focus our efforts in areas that have the greatest potential for success. This will also aid in making recommendations for statewide implementation and setting realistic goals for our own program. We will also examine the water conservation policies of local and regional water suppliers to aid us in developing programs that are consistent with industry practices. Cohesive implementation of a Conservation Plan with state and local officials is key to overall success. It is anticipated that the research would include phone inquiries, meetings and document research.

5.0 Existing Conservation Programs

KCWA currently has several water conservation programs, including ongoing leak detection, a residential retrofit program and a year round odd/even outdoor water use policy. These programs will be reviewed as part of this action plan. We will assess their effectiveness and determine whether the programs should continue, be modified, or be replaced with other programs.

Leak Detection – Conservation program must address continuous leak detection efforts in the KCWA system. Currently KCWA conducts leak detection on one quarter of the system annually using in-house forces. We will review what type of program progress has historically been accomplished and measure the successes that can be quantified. Based on these efforts and a review of unaccounted-for water use, we will develop a plan for future efforts.

Residential Retrofit Program – Complete system mailing of conservation kits was done in 1999. These fixtures are reaching their life expectancy and newer technology is available to further our conservation goals. At this point, a complete system mailing would be beneficial. Another mailing would provide customers an opportunity to replace existing fixtures with the latest technology. The kits would include a response card that we could use as a method to assess program.

Odd/Even Outdoor Water Use Program – To the extent possible, review water use patterns before and after this program was implemented to determine if there was any impact on water usage. Some research has shown that odd/even policies employed by other water suppliers without enforcement elements have not been effective in conserving water, but do help with equalizing peak demands. Consider modifying with more effective program if required.

6.0 Proposed Water Conservation Programs

Several water conservation programs will be considered in this plan. The programs are designed to reduce both indoor water usage (year round) and outdoor water usage (high demand season). Some programs may have the potential for greater water use reduction than others. In addition, the time to implement each program varies. Public participation is a key element to any successful program.

Primary Water Conservation Programs

1. *Water Conserving Plumbing Devices* – Implement a system-wide mailing and encourage KCWA customers to make plumbing retrofits, in accordance with the current building code requirements. Essentially, KCWA would be encouraging customers to make the same type of improvements that are part of the Residential Retrofit Program. These retrofits include:
 - a) Low-flow Shower Heads
 - b) Low-flow Toilets
 - c) Low-flow Faucet Aerators
 - d) Pressure Reducers for High Pressure Areas-KCWA to identify target group and send letter suggesting installation of device. Also, suggest as part of new developments.
2. *Outdoor Water User Restriction Program* – As discussed above, the effectiveness of the current Odd/Even program will be assessed. We will also review other outdoor water use restriction programs to determine if there is one that may be more effective. For example, other water suppliers have implemented programs that allow for watering every 4 or 5 days. Other communities limit outdoor water usage to certain times of day (i.e. before 9 a.m. and after 5 p.m.). Once a program is selected, it will be promoted through press releases and information printed on bills. An enforcement strategy must be developed as a part of this program.
3. *Outdoor Water Use Devices* – Some devices exist that have been shown to reduce outdoor water use considerably. KCWA will review these devices and encourage/require their use. Some of these devices include:
 - a) Automatic shutoff nozzle on hand-held hose.
 - b) Shutoff device activated by rainfall on automatic irrigation systems – *Already required on new irrigation systems.*
 - c) Soil moisture probes and sensors used to adjust irrigation schedules on automatic irrigation systems – *Already required on new irrigation systems.*
 - d) “SMART” controllers (i.e. ET Controllers)
 - e) Rain Gauge
4. *Major Appliances* – Encourage KCWA customers to install state-of-the-art water conserving and energy-wise appliances (i.e. clothes washer, dishwasher, water

heaters). KCWA will provide some general guidance regarding available technologies through the KCWA website and a conservation brochure. We will also review any incentive programs that may be available from National Grid and inform customers of these programs if applicable.

5. *Rainwater Harvesting* – KCWA will review the viability of a Rain Barrel and Directional Down Spout Program to reduce reliance on public water supply for outdoor water use by encouraging natural rainfall reuse and storage. It is envisioned that, at a minimum, KCWA would provide information on the KCWA website and in a conservation brochure regarding the use of rain barrels and retail stores or websites where the barrels could be purchased. If funding was available, we could consider a more complete program.
6. *Landscaping/Plants* – KCWA to promote the use of drought tolerant native low water-use plantings to be included in all city and town comprehensive plan and subdivision regulations. In addition, encourage customers and town planning officials to restrict turf areas, enhance soil and replace with landscaping that does not require as much water (i.e. Xeriscape, native plantings). As turf requires more water than most other plant materials it is the most obvious and important target for water conservation landscape efforts.

These changes represent a departure from current landscaping practice and thus a change in philosophy. Therefore, it is anticipated that change in this area will be slow and that city/town ordinances and/or plumbing/zoning requirements would be a significant factor in the program's ultimate success. Assistance from educational institutions will also be sought (student projects, etc.)

Some or all of the following may be incorporated into this program as practical and/or as appropriate:

- a) Promotion tools – There are a number of ways to promote this type of landscaping so that it becomes a more accepted way of landscaping.
 - i. Demonstration Garden – Designed through contests, contracts or other means.
 - ii. Education Demonstration Garden – Located at public place (i.e. city halls, schools, libraries, parks).
 - iii. Real-Life Gardens – In residential, commercial or park landscapes.
 - iv. Model Home – could require developers to install one Xeriscape model home in each new development.
 - v. Government should lead by example – Use Xeriscape where turf does not provide essential service to public (i.e. parks, ball fields).
- b) Workshops – Workshops could be held with general public and the green industry (landscape architects, contractors, maintenance people, nurseries,

horticulturists, irrigation experts, sod/seed producers, government and university experts).

- c) Buyers Guides – Prepare buyers guides with information on native low maintenance plants that are suitable for this geographic region and complete a system-wide mailing to all customers. This information is already available through the Master Gardeners Association at URI cooperative extension and would be included with KCWA public information materials.
- d) New Developments – one way to implement conservation is to have zoning and planning officials implement requirements for new developments regarding irrigation systems, maintenance/water schedules, plant list that must be followed, model xeriscape home required for each development. As discussed above, city/town requirements that support our efforts are a key element in this type of initiative.
- e) Resources – URI has a Cooperative Extension that could serve as a resource for us in this program. Working through them is the Master Gardener Association. They have a speaker's bureau, newsletters and bulletins. In addition, they have a booklet with a sustainable plant list for this area, as mentioned above.

7. *Customer Self Audit* – KCWA to promote a self water audit once or twice each year. Program components to include:

- a) Meter Check – Customer to check meter to determine if there may be a household leak.
- b) Leak Detection – Provide simple approach for customers to check toilets for leaks (i.e. toilet leak tablets).
- c) Audit List – KCWA to develop an audit “checklist” and distribute to customers for their use.

8. *Water Rates* – Implementation of conservation water rates is a measure that is used to promote more efficient use of water. We will review rate structures being used in other utilities to determine if KCWA could potentially reduce water demand by switching to another rate structure. In addition, we will review the cost and possible major operational issues related to making a switch.

A summary of the proposed water conservation programs under consideration is presented in the table below. A preliminary assessment of the conservation potential has been made. In addition, the time to implement each program has been classified as either short-term (1 to 3 years) or long-term (greater than 3 years).

Conservation Programs to be Reviewed

Program	Conservation Potential	Target Conservation Period	Time to Implement and Realize Benefits
Water Conserving Plumbing Devices	Major	Year Round	Short-term
Outdoor Water Restrictions	Major	High Demand Season	Short-term
Outdoor Water Use Devices	Major	High Demand Season	Short-term
Major Appliance Replacement	Difficult to quantify	Year Round	Long-term
Rainwater Harvesting	Minor	High Demand Season	Short-term
Landscaping/Plants	Major	High Demand Season	Long-term (exist homes)/Short-term (new developments)
Customer Self Audit	Minor	Year round	Short-term
Water Rate Structure Change	Major	High Demand Season	Long-Term

Program Support Elements

The above conservation programs will benefit significantly from the following support programs:

- Public Education/Awareness
- Revision of KCWA Regulations
- City/Town Involvement
- State/Legislative Action

Public Education/Awareness – The success of water conservation is largely dependent on customers understanding the need and value of water conservation. Therefore, it is imperative that public education/awareness efforts be included in any water conservation efforts. These efforts will include some or all of the following:

- Web Page – Keep KCWA web page maintained and up-to-date and provide water conservation tips (must bring in house).
- School System – Promote water conservation through school programs, reactivate education program.
- Brochure – Develop our own water conservation pamphlet(s).
- Demonstration – Review value of demonstration garden(s) in cooperation with communities to demonstrate planting using soil preparation, Xeriscape and drip irrigation techniques.
-
- Speaker’s Bureau – Representatives of KCWA and potentially other volunteers could speak at public events, neighborhood groups, etc.

Revision of KCWA Regulations – Elements of KCWA’s Rules and Regulations will need to be reviewed and revised to address the following:

- Permit Outdoor Water Use – KCWA’s current Rules and Regulations require that all new irrigation systems be approved by KCWA prior to installation (Rule 2.7). KCWA to review need and approach for approval of all (including existing) in-ground sprinkler systems. It is anticipated that existing systems may need to be retrofitted with shutoff device and soil moisture probes. In addition, additional education will need to be provided on programming sprinkler systems, as well as appropriate amounts of watering required to maintain a healthy lawn/garden. In order for this program to be effective, Kent County Water Authority would also need to work closely with local authorities to incorporate KCWA requirements into plumbing permit.
- Moratorium Protocol – There may be times when KCWA will need to prohibit outdoor water use because of drought conditions, high demands or a system emergency. The moratorium must be implemented smoothly and effectively. KCWA to develop an enforcement program to fit policy.

City/Town Involvement – Coordinate with Town Councils and/or Town Planning Boards to obtain recognition and support of KCWA Regulations regarding outdoor water use. Engage assistance as needed on other programs. Support from key community officials will be important. KCWA will meet with representatives of each city or town in our service area and discuss potential ways the communities can lend support to our programs.

State/Legislative Action – Review need for new or amended legislation. The objective would be to have certain water conservation programs required on a statewide basis. It is anticipated that requirements at the state level would help in the acceptance of conservation measures.

KCWA could lead by example and use our program as a statewide model. Alternatively, we may want to contact all of the major water suppliers (i.e. 10 largest) in the state and form a Water Conservation Committee. This committee, under KCWA’s leadership, could develop a policy to be brought to the state for consideration.

7.0 Analyze Benefits & Costs

To the extent possible, estimate the short-term and long-term water savings that can be achieved by each program function under consideration. Estimate conservation benefits, as well as program costs such as administration, marketing, education, revenue reductions, etc.

8.0 Prioritize Conservation Programs

Prioritize the various water conservation programs. Identify programs that are anticipated to be more beneficial in helping us reach our goals. Identify programs that

may be prohibitive. Consider the time to implement programs and their ranked priority. Identify any legal issues that must be addressed prior to implementing a particular measure. We know that our primary goal is to reduce demand during the summer season. Therefore, programs that effectively reduce outdoor water use will help to reduce seasonal peaks and therefore, will likely be higher priority.

9.0 Develop a Program Schedule

Develop a Program schedule for implementation.

10.0 Funding

Identify potential funding sources for this program. Funding may be needed for brochures, demonstration gardens, educational materials, conservation kits, mailing, etc.

11.0 Create Partnerships

KCWA should explore the possibility of developing partnerships in our efforts. This could include organizations such as Rhode Island Water Resources Board, U.S. EPA, University of Rhode Island (or other schools), community organizations, New England Water Works Association, Master Gardener Association and others.

These partnerships could help us in promoting our programs and demonstrating the impacts of conservation, as well as showing that KCWA policies are consistent with and/or supported by others in the state and the industry.

12.0 Enforcement

Enforcement is a significant issue related to outdoor water use restrictions. KCWA will need to be creative in this area, given our relatively small staff. We do not have crews available to be dedicated to enforcement efforts. KCWA should explore ways to involve the public, cities/towns, and local police in these efforts. Consider imposing penalties for violation of outdoor water use policies. Penalties could increase with each occurrence.

13.0 Revenues/Rates

Reduction in water use due to conservation efforts may reduce revenues. KCWA will need to assess lost revenue with added customer base. This issue can only be reviewed when it occurs as rate setting does not rely on potential unknown rate effects.

EXHIBIT F

JANUARY 17, 2007

PLANNING DOCUMENT \$25,000/YEAR ALLOCATION

PROJECT	STATUS
Water Supply System Management Plan WSSMP	5 year update due 2007 Engineer Engaged Hunt River Issues
Clean Water Infrastructure Plan	Approval June 13, 2003. 5 year update due 2008

UPDATED CIP PROJECTS BOND FUNDING

PROJECT	STATUS
Mishnock Well Field (new wells) CIP - 1A	Project closed out.
Mishnock Transmission Mains CIP - 1B	Project closed out.
Mishnock Treatment Plant CIP - 1C	Project closed out.
East Greenwich Well Treatment Plant – CIP-2	Pilot Program Results Mishnock
Clinton Avenue Pump Station Rehabilitation CIP - 7A	Completion & Close-out
Read School House Road Tank CIP - 7B	Design Services R. F. P./Zoning Petition
Read School House Road Main CIP 7c, 7d, 8a	Move to Finalization, Add Drainage

IFR FUNDED PROJECTS

PROJECT	STATUS
IFR 2005	Winter Shutdown
IFR 2006 A	Reconfiguration & Design Underway Winter 2007
IFR 2006 B	Reconfiguration of Design Bid 2007
IFR 2007	On Hold, Additional Funding Required
PWSB 78" / Johnson Blvd. P.S. Modification	Ames Street & Main Street Rehabilitation Design Proceeding Under 2006 A.
Color Study Mishnock Wells	Pilot Program Reviewed/Preliminary Design
Greenwich Avenue Replacement	Design on Replacement Required Winter Design
Hydraulic Tank Evaluation	Status Memo 3A
Quaker P. S. Evaluation/Preliminary Design	Preliminary Feasibility Study Ongoing