



GDS Associates, Inc.

Engineers and Consultants

DRAFT

WATER CONSERVATION PLAN

**CREEDMOOR-MAHA WATER SUPPLY
CORPORATION**

CCN# 11029

PWS# 2270008

DECEMBER 12, 2017

Prepared for:

Creedmoor-Maha Water Supply Corporation
12100 Laws Road
Buda, Texas 78610

Prepared by:

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ATTACHMENTS

NUMBER	DESCRIPTION
A	WATER CONSERVATION UTILITY PROFILE (TWDB-1965)

1.0 INTRODUCTION

This Water Conservation Plan has been prepared by GDS Associates, Inc. (GDS) on behalf of our client, Creedmoor-Maha Water Supply Corporation (CMWSC). The Water Conservation Plan was prepared in accordance with 31 TAC §363.15. Finally, a completed Water Conservation Utility Profile (TWDB-1965) is provided as Attachment A to this WCP. A Drought Contingency Plan has been prepared under separate cover.

2.0 WATER CONSERVATION PLAN

The goal of the Water Conservation Plan is to cause a reduction in water use in response to emergency conditions so that the water availability can be preserved. Since emergency conditions can occur rapidly, responses must also be enacted quickly. This plan has been prepared in advance considering conditions that will initiate and terminate the rationing program.

A Conservation Committee consisting of two Board Members and the System Manager will monitor usage patterns, public education efforts and make recommendations to CMWSC's Board on future conservation efforts. The Conservation Committee will review and evaluate any needed amendments or major changes due to changes in CMWSC's service area population, distribution system or supply. This review and evaluation will be done on a regular basis of five years unless conditions necessitate more frequent amendments.

CMWSC has adopted the following priorities in the distribution of available water resources:

- 1) Domestic indoor water usage only for drinking, bathing, cooking, hygiene, etc.
- 2) The above (domestic indoor water usage) plus livestock, domesticated animals, and irrigated agricultural fields/tree farms.
- 3) The above plus a reasonable amount of outdoor usage, such as car washing, water house foundations, and drip or leaky pipe irrigation systems.
- 4) The above plus spray irrigation of lawns and residential yards not to exceed one-third acre.
- 5) The above plus spray irrigation of commercial properties, ball fields, parks, and residential yards exceeding one-third acre.

CMWSC has established 5 and 10 year goals for water conservation in accordance with 31 TAC §363.15(B):

**CMWSC WATER CONSERVATION PLAN
5 AND 10 YEAR GOALS FOR WATER SAVINGS**

	Historic 5 Year Average	Baseline	5 Year Goal for Year 2023	10 Year Goal for Year 2028
Total GPCD	126	126	124	122
Residential GPCD	88	88	87	86
Water Loss (GPCD)	27	27	24	22
Water Loss (%)	21%	21%	19%	17%

Notes: GPCD = Gallons per capita per day

Historic 5 Year Average based on calendar years 2012-2016

2.1 METHODS FOR WATER SAVINGS GOAL IMPLEMENTATION

CMWSC has implemented the following procedures to achieve the 5 and 10 year goals listed above:

- 1) Monitor operational flushing.
- 2) Control of unaccounted for water, including:
 - a. Monitoring the distribution system through CMWSC's SCADA system.
 - b. Annual accuracy tests of each water well meter (each of CMWSC's production wells is metered).
- 3) Implementation of a Leak Detection System, including:
 - a. Regular visual inspections along distribution lines.
 - b. Regularly monitoring the SCADA system for changes in tank levels.
 - c. Prioritizing leak response work orders.
 - d. Incentivizing leak reports.
 - e. Notifying customers when leaks discovered by CMWSC are on the customer supply line.
- 4) Universal metering:
 - a. Production meters measure water supply.
 - b. CMWSC meters 100% of the connections to the distribution system.
 - c. CMWSC regularly replaces and/or tests meters to ensure they are accurate.

- d. CMWSC's goal is to maintain all meters within an accuracy of plus or minus 5%.
 - e. Residential meters are generally replaced after 5 years of use.
 - f. Large and compound meters are tested regularly and replaced on an as needed basis.
- 5) The record management system will track annual water use and provide information used to evaluate the implementation of conservation measures. Water sales are grouped into user classes: Single-family residential, commercial, institutional, and industrial. Monthly and annual data of water pumped, water deliveries, and water losses are used to develop an annual water audit for the distribution system.
- a. Electronic meter system software is integrated with the utility customer information and billing system.
 - b. Monthly electronic meter reports are generated and used to detect illegal connections, abandoned services, inaccuracies in billing, and meters in need of replacement.
 - c. The utility customer information and billing system provides functions such as customer support, account management, billing, and collections.
 - d. Account usage adjustments are tracked and reflected in unaccounted water loss.

2.2 MEASUREMENT OF PROGRESS

CMWSC will use the Alliance for Water Efficiency Conservation Tracking Tool to track and document conservation activities. The Alliance for Water Efficiency Conservation Tracking Tool provides a standardized methodology for water savings and benefit-cost accounting. It also provides a library of pre-defined conservation activities. The Tool will be used to assist CMWSC with the following:

- 1) Develop long range conservation plans and goals.
- 2) Track over time water savings, costs, and benefits of specific conservation measures.
- 3) Compare conservation measures for water savings, impact on costs, and potential benefits to the membership.

2.3 COORDINATION OF EFFORT

CMWSC will provide a copy of this Water Conservation Plan to the Region K Water Planning Group to ensure consistency with the appropriate approved regional water plans.

3.0 COMMUNITY OUTREACH/PUBLIC EDUCATION

CMWSC will implement Community Outreach and Public Education programs. These programs will raise awareness of water supply resources, water supply availability, treatment, and distribution issues. Information will be provided on efficient use of the water supply, methods to reduce wasteful water use, and how conservation is important for managing the water for everyone's future.

CMWSC may use the following methods to communicate and educate the public:

- 1) Presentations to community and civic organizations, businesses, and HOAs.
- 2) Water efficiency classes at CMWSC.
- 3) Public information program utilizing social media.
- 4) Billing inserts for specific water conservation events.
- 5) A Quarterly Newsletter highlighting seasonal water conservation, new technology, and water industry issues and current events.
- 6) Messaging through CMWSC's website, including drought status; present level of water restrictions; seasonal messaging; EPA Water Sense program materials promoting water efficiency; and Best Management Practices for indoor and outdoor water usage.

4.0 LANDSCAPE CONSERVATION

CMWSC will provide literature for members on how to operate and maintain an efficient irrigation system in order to conserve water. CMWSC will also provide information on client-appropriate landscape design.

In addition, in the future CMWSC may offer landscape irrigation audits. All audits will be performed by a Texas licensed irrigator. Site conditions, system improvements, and a seasonal irrigation schedule will be provided to audited members. The schedule shows the water savings utilizing the new water efficient schedule.

CMWSC will track progress in landscape conservations by measuring the difference between seasonal water uses from year to year. Effectiveness will take into consideration weather conditions.

5.0 CMWSC RATE STRUCTURE

CMWSC has and will maintain non-promotional cost based water rates which do not encourage excessive use of water. Also, as discussed in their Tariff, CMWSC can assess penalties for violations of water conservation practices.

6.0 WHOLESALE WATER SALES BY CMWSC CUSTOMERS

CMWSC currently does not have any customers or members who purchase water at wholesale rates, or who resell the water provided by CMWSC. However, if either occurs in the future, CMWSC will require that each wholesale or reselling customer or member develop their own Water Conservation Plan that will be designed to work in conjunction with this plan.

ATTACHMENT A
WATER CONSERVATION UTILITY PROFILE (TWDB-1965)

UTILITY PROFILE FOR RETAIL WATER SUPPLIER

Fill out this form as completely as possible.
If a field does not apply to your entity, leave it blank.

CONTACT INFORMATION

Name of Utility: Creedmoor-Maha Water Supply Corporation

Public Water Supply Identification Number (PWS ID): 2270008

Certificate of Convenience and Necessity (CCN) Number: 11029

Surface Water Right ID Number: _____

Wastewater ID Number: _____

Completed By: Richard Varnell Title: Project Manager, GDS Asso

Address: 919 Congress, Suite 1110 City: Austin Zip Code: 78701

Email: richard.varnell@gdsassociates.com Telephone Number: 512-494-0369

Date: 12/12/2017

Regional Water Planning Group: K Map

Groundwater Conservation District: BSEACD Map

Check all that apply:

- Received financial assistance of \$500,000 or more from TWDB
- Have 3,300 or more retail connections
- Have a surface water right with TCEQ

Section I: Utility Data

A. Population and Service Area Data

1. Current service area size in square miles: 56
 (Attach or email a copy of the service area map.)

2. Provide historical service area population for the previous five years, starting with the most current year.

Year	Historical Population Served By Retail Water Service	Historical Population Served By Wholesale Water Service	Historical Population Served By Wastewater Service
2017	6,509	0	0
2016	6,387	0	0
2015	6,265	0	0
2014	6,143	0	0
2013	6,021	0	0

3. Provide the projected service area population for the following decades.

Year	Projected Population Served By Retail Water Service	Projected Population Served By Wholesale Water Service	Projected Population Served By Wastewater Service
2020	6,904	0	0
2030	8,097	0	0
2040	9,261	0	0
2050	10,548	0	0
2060	11,775	0	0

4. Describe the source(s)/method(s) for estimating current and projected populations.

Current & historical population based on census information.

Projected populations obtained from Water User Group Population Projections from Region K and Region L Water Plans. (Creedmoor-Maha's service area is located in both regions, but all of their water supply originates in Region K).

Historical populations inferred from Water User Group Population Projections. Calculations attached.

B. System Input

Provide system input data for the previous five years.

Total System Input = Self-supplied + Imported – Exported

Year	Self-supplied Water in Gallons	Purchased/Imported Water in Gallons	Exported Water in Gallons	Total System Input	Total GPCD
2017	145,464,726	87,993,403	0	233,458,129	98
2016	119,191,284	110,626,416	0	229,817,700	99
2015	119,981,200	106,045,200	0	226,026,400	99
2014	120,843,200	112,354,800	0	233,198,000	104
2013	124,288,600	102,509,900	0	226,798,500	103
Historic 5-year Average	125,953,802	103,905,944	0	229,859,746	101

C. Water Supply System (Attach description of water system)

1. Designed daily capacity of system _____ 2,520,000 gallons per day.
2. Storage Capacity:
 Elevated _____ 630,000 gallons
 Ground _____ 1,392,000 gallons
3. List all current water supply sources in gallons.

Water Supply Source	Source Type*	Total Gallons
Water Wells in BSEACD	Ground	237,000,000
City of Austin	Contract	274,060,800
Aqua WSC	Contract	60,257,000
	Choose One	
	Choose One	
	Choose One	

*Select one of the following source types: *Surface water, Groundwater, or Contract*

4. If surface water is a source type, do you recycle backwash to the head of the plant?
 Yes _____ estimated gallons per day
 No

D. Projected Demands

1. Estimate the water supply requirements for the next ten years using population trends, historical water use, economic growth, etc.

Year	Population	Water Demands (gallons)
2018	6,631	238,223,463
2019	6,754	241,794,795
2020	6,876	245,366,127
2021	6,998	248,937,458
2022	7,120	252,508,790
2023	7,242	256,080,122
2024	7,364	259,651,453
2025	7,486	263,222,785
2026	7,608	266,794,117
2027	7,731	270,365,448

2. Describe sources of data and how projected water demands were determined. Attach additional sheets if necessary.

See Attached Sheets. Projected population and water demand determined from Regions K and L Water Plans.

System input for 2017 consists of water supplied January 2017 through October 2017.

City of Austin Contract amount based on contract amount of 520 gpm and total number of minutes in 365.25 days.

E. High Volume Customers

- List the annual water use, in gallons, for the five highest volume **RETAIL** customers. Select one of the following water use categories to describe the customer; choose Residential, Industrial, Commercial, Institutional, or Agricultural.

Retail Customer	Water Use Category*	Annual Water Use	Treated or Raw
Texas Disposal Systems	Industrial	8,800,000	Treated
Tex-Mix Concrete	Industrial	3,200,000	Treated
Capital Pumping, LP	Industrial	1,600,000	Treated
J.D. Abrams, Inc.	Commercial	940,000	Treated
Austin Recovery	Commercial	900,000	Treated

*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

- If applicable, list the annual water use for the five highest volume **WHOLESALE** customers. Select one of the following water use categories to describe the customer; choose Municipal, Industrial, Commercial, Institutional, or Agricultural.

Wholesale Customer	Water Use Category*	Annual Water Use	Treated or Raw
N/A	Choose One	0	Choose One
N/A	Choose One	0	Choose One
N/A	Choose One	0	Choose One
N/A	Choose One	0	Choose One
N/A	Choose One	0	Choose One

*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

F. Utility Data Comment Section

Provide additional comments about utility data below.

High Volume Customer data based on 2016 data.

Section II: System Data

A. Retail Connections

1. List the active retail connections by major water use category.

Water Use Category*	Active Retail Connections			
	Metered	Unmetered	Total Connections	Percent of Total Connections
Residential – Single Family	2,355	0	2,355	96%
Residential – Multi-family (units)	0	0	0	0%
Industrial	10	0	10	0%
Commercial	80	0	80	3%
Institutional	0	0	0	0%
Agricultural	5	0	5	0%
TOTAL	2,450	0	2,450	

*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

2. List the net number of new retail connections by water use category for the previous five years.

Water Use Category*	Net Number of New Retail Connections				
	2017	2016	2015	2014	2013
Residential – Single Family	2,355	2,320	2,306	2,280	2,259
Residential – Multi-family (units)	0	0	0	0	0
Industrial	10	10	9	9	9
Commercial	80	75	70	65	60
Institutional	0	0	0	0	0
Agricultural	5	5	5	5	5
TOTAL	2,450	2,410	2,390	2,359	2,333

*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

B. Accounting Data

For the previous five years, enter the number of gallons of RETAIL water provided in each major water use category.

Water Use Category*	Total Gallons of Retail Water				
	2017	2016	2015	2014	2013
Residential - Single Family	146,828,318	159,967,171	173,501,328	166,808,005	168,722,736
Residential – Multi-family	0	0	0	0	0
Industrial	13,400,000	14,500,000	14,000,000	14,000,000	13,500,000
Commercial	6,270,000	5,540,000	5,750,000	5,110,000	4,810,000
Institutional	0	0	0	0	0
Agricultural	1,180,000	1,110,000	1,210,000	1,180,000	1,200,000
TOTAL	167,678,318	181,117,171	194,461,328	187,098,005	188,232,736

*For definitions on recommended customer categories for classifying customer water use, refer to the online [Guidance and Methodology for Reporting on Water Conservation and Water Use](#).

C. Residential Water Use

For the previous five years, enter the residential GPCD for single family and multi-family units.

Water Use Category*	Residential GPCD				
	2017	2016	2015	2014	2013
Residential - Single Family	74	69	76	74	77
Residential – Multi-family	0	0	0	0	0

D. Annual and Seasonal Water Use

1. For the previous five years, enter the gallons of treated water provided to RETAIL customers.

Month	Total Gallons of Treated Retail Water				
	2017	2016	2015	2014	2013
January	13,894,335	12,440,792	13,604,227	13,212,017	14,237,678
February	12,540,437	11,855,935	12,344,605	13,465,179	11,805,157
March	10,805,067	13,016,913	10,830,820	11,206,377	12,400,479
April	12,172,433	12,904,710	11,725,987	11,852,568	12,424,685
May	12,502,399	10,592,309	12,696,866	12,362,623	12,491,115
June	14,099,176	13,256,789	11,778,585	13,663,468	14,876,953
July	15,771,574	13,653,913	14,076,335	14,788,774	16,150,953
August	21,146,398	17,232,488	19,237,218	15,013,453	16,979,417
September	17,750,460	14,370,447	18,936,918	17,750,824	18,798,962
October	16,146,039	13,059,865	17,412,941	15,261,519	13,301,197
November	0	15,876,679	17,070,053	15,296,099	14,062,594
December	0	11,706,331	13,786,773	12,935,104	11,193,546
TOTAL	146,828,318	159,967,171	173,501,328	166,808,005	168,722,736

2. For the previous five years, enter the gallons of raw water provided to RETAIL customers.

Month	Total Gallons of Raw Retail Water				
	2017	2016	2015	2014	2013
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	0	0	0	0	0
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
TOTAL	0	0	0	0	0

3. Summary of seasonal and annual water use.

Water Use	Seasonal and Annual Water Use					Average in Gallons
	2017	2016	2015	2014	2013	
Summer Retail (Treated + Raw)	51,017,148	44,143,190	45,092,138	43,465,695	48,007,323	46,345,099 5yr Average
TOTAL Retail (Treated + Raw)	146,828,318	159,967,171	173,501,328	166,808,005	168,722,736	163,165,512 5yr Average

E. Water Loss

Provide Water Loss data for the previous five years.

Water Loss GPCD = [Total Water Loss in Gallons ÷ Permanent Population Served] ÷ 365

Water Loss Percentage = [Total Water Loss ÷ Total System Input] x 100

Year	Total Water Loss in Gallons	Water Loss in GPCD	Water Loss as a Percentage
2017	72,108,329	30	31%
2016	54,029,600	23	24%
2015	35,365,600	15	16%
2014	49,892,500	22	21%
2013	41,388,900	19	18%
5-year average	50,556,986	22	22%

F. Peak Water Use

Provide the Average Daily Water Use and Peak Day Water Use for the previous five years.

Year	Average Daily Use (gal)	Peak Day Use (gal)	Ratio (peak/avg)
2017	530,756	749,606	1.41
2016	480,295	610,865	1.27
2015	522,358	693,660	1.33
2014	502,207	650,213	1.29
2013	507,972	688,607	1.36

G. Summary of Historic Water Use

Water Use Category	Historic 5-year Average	Percent of Connections	Percent of Water Use
Residential SF	163,165,512	96%	0%
Residential MF	0	0%	0%
Industrial	13,880,000	0%	0%
Commercial	5,496,000	3%	0%
Institutional	0	0%	0%
Agricultural	1,176,000	0%	0%

H. System Data Comment Section

Provide additional comments about system data below.

Volumes of water provided in Accounting Data; Residential Water Use; and Annual and Seasonal Water Use are based on water sold, not the overall water inputs to the system.

It appears that the formulas the "Percent of Water Use" column of Table G, Summary of Historic Water Use, are not working.

Section III: Wastewater System Data

If you do not provide wastewater system services then you have completed the Utility Profile. Save and Print this form to submit with your Plan. Continue with the Water Conservation Plan Checklist to complete your Water Conservation Plan.

A. Wastewater System Data (Attach a description of your wastewater system.)

1. Design capacity of wastewater treatment plant(s): _____ gallons per day.
2. List the active wastewater connections by major water use category.

Water Use Category*	Active Wastewater Connections			
	Metered	Unmetered	Total Connections	Percent of Total Connections
Municipal			0	0%
Industrial			0	0%
Commercial			0	0%
Institutional			0	0%
Agricultural			0	0%
TOTAL	0	0	0	

2. What percent of water is serviced by the wastewater system? ____%
3. For the previous five years, enter the number of gallons of wastewater that was treated by the utility.

Month	Total Gallons of Treated Wastewater				
	2017	2016	2015	2014	2013
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
TOTAL	0	0	0	0	0

4. Can treated wastewater be substituted for potable water?
 Yes No

B. Reuse Data

1. Provide data on the types of recycling and reuse activities implemented during the current reporting period.

Type of Reuse	Total Annual Volume (in gallons)
On-site irrigation	
Plant wash down	
Chlorination/de-chlorination	
Industrial	
Landscape irrigation (parks, golf courses)	
Agricultural	
Discharge to surface water	
Evaporation pond	
Other	
TOTAL	0

C. Wastewater System Data Comment

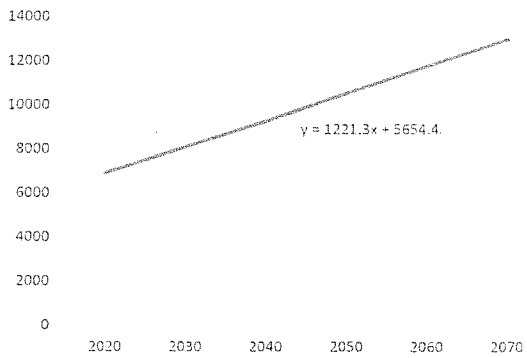
Provide additional comments about wastewater system data below.

You have completed the Utility Profile. Save and Print this form to submit with your Plan. Continue with the [Water Conservation Plan Checklist](#) to complete your Water Conservation Plan.

Projected Water User Group (WUG) Population By Year							
Area	Region	2020	2030	2040	2050	2060	2070
Bastrop County-Colorado River Basin	K	208	262	333	429	559	732
Travis County-Colorado River Basin	K	5093	5881	6624	7456	8190	8873
Travis County-Guadalupe River Basin	K	240	277	312	351	386	418
Caldwell County-Colorado River Basin	L	1021	1249	1476	1699	1926	2144
Caldwell County-Guadalupe River Basin	L	260	320	377	434	491	548
Hays County-Guadalupe River Basin	L	82	108	139	179	223	274
Totals		6904	8097	9261	10548	11775	12989

Source: Region K and L Water Plans

Projected Population Over Time From State Water Plan Data

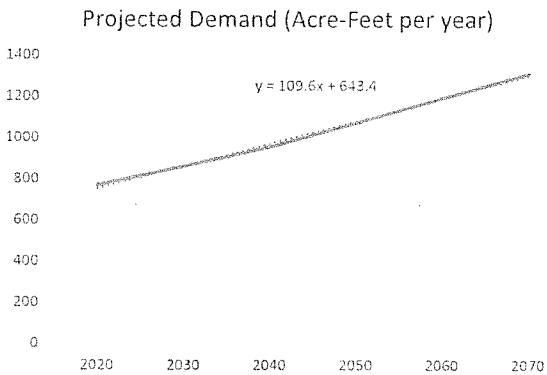


Slope Formula = $Y=mx+b$
 Slope Per Excel = $Y=(1221.3)x+5654.4$

Variables	Values	Year	Population	Rounded Population
m =	1221.3			
b =	5654.4			
x1 =	0	2010	5654.4	5654
x2 =	0.1	2011	5776.53	5777
x3 =	0.2	2012	5898.66	5899
x4 =	0.3	2013	6020.79	6021
x5 =	0.4	2014	6142.92	6143
x6 =	0.5	2015	6265.05	6265
x7 =	0.6	2016	6387.18	6387
x8 =	0.7	2017	6509.31	6509
x9 =	0.8	2018	6631.44	6631
x10 =	0.9	2019	6753.57	6754
x11 =	1	2020	6875.7	6876
x12 =	1.1	2021	6997.83	6998
x13 =	1.2	2022	7119.96	7120
x14 =	1.3	2023	7242.09	7242
x15 =	1.4	2024	7364.22	7364
x16 =	1.5	2025	7486.35	7486
x17 =	1.6	2026	7608.48	7608
x18 =	1.7	2027	7730.61	7731

Area	Region	WUG Demand (Acre-Feet per year)					
		2020	2030	2040	2050	2060	2070
Bastrop County-Colorado River Basin	K	24	28	35	44	57	74
Travis County-Colorado River Basin	K	565	623	681	756	828	896
Travis County-Guadalupe River Basin	K	27	30	33	36	40	43
Caldwell County-Colorado River Basin	L	114	133	152	172	195	216
Caldwell County-Guadalupe River Basin	L	29	34	39	45	50	56
Hays County-Guadalupe River Basin	L	10	12	15	19	23	28
Totals		769	860	955	1072	1193	1313

Source: Region K and L Water Plans



Slope Formula = $Y=mx+b$
Slope Per Excel = $Y=(109.6)x+643.4$

Variables	Values	Year	Water Use (Acre-Ft/Yr)	Conversion Factor	Water Use (Gallons/Yr)
m =	109.6				
b =	643.4				
x1 =	0	2010	643.4	325851.43	209,652,810
x2 =	0.1	2011	654.36	325851.43	213,224,142
x3 =	0.2	2012	665.32	325851.43	216,795,473
x4 =	0.3	2013	676.28	325851.43	220,366,805
x5 =	0.4	2014	687.24	325851.43	223,938,137
x6 =	0.5	2015	698.2	325851.43	227,509,468
x7 =	0.6	2016	709.16	325851.43	231,080,800
x8 =	0.7	2017	720.12	325851.43	234,652,132
x9 =	0.8	2018	731.08	325851.43	238,223,463
x10 =	0.9	2019	742.04	325851.43	241,794,795
x11 =	1	2020	753	325851.43	245,366,127
x12 =	1.1	2021	763.96	325851.43	248,937,458
x13 =	1.2	2022	774.92	325851.43	252,508,790
x14 =	1.3	2023	785.88	325851.43	256,080,122
x15 =	1.4	2024	796.84	325851.43	259,651,453
x16 =	1.5	2025	807.8	325851.43	263,222,785
x17 =	1.6	2026	818.76	325851.43	266,794,117
x18 =	1.7	2027	829.72	325851.43	270,365,448