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The Association of Professional Engineers, Geologists and Geophysicists of the NWT / NU

**Nipissar Lake Volume Study and Environmental Variable Study**

**Rankin Inlet, NU**

GN Project # 09-3009
FSC Project # 2009-1310

April 20, 2010

**Prepared for:**

The Office of the Regional Director
Kivalliq Region
Dept. of Community and Government Services
Government of Nunavut
Delivered to Project Management/O&M Building
P.O. Bag #002, Rankin Inlet, Nunavut X0C 0G0
Attn: Dawn Brigham, Project Officer

**Prepared by:**

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FSC File: 2009-1310
April 20, 2010

**Government of Nunavut**
**Dept. of Community & Government Services**
Public Works Building, PO Bag 002
Rankin Inlet, Nunavut X0C 0G0

***Attn: Dawn Brigham, Project Officer***

**Re: Water Supply Capacity, Consumption & Conservation Study**

Dear Ms. Brigham,

Please find attached our Final Report on the volume calculation of Nipissar Lake and the affecting climatic variables.

You asked the following questions of an earlier draft; our answers follow your questions.

When will Nipissar Lake fail to be an adequate water source for Rankin Inlet? *Ans: As early as 2015*

What is the maximum consumption rate per day Nipissar Lake can provide? *Ans: 854,000 litres/day*

When do you estimate Rankin will reach the maximum consumption rate? *Ans: It has been reached now.*

Please contact us should you have any questions regarding this report.

Sincerely,

**FSC ARCHITECTS & ENGINEERS**

Kevin Hodgins, P. Eng., Principal
Civil Engineering

## Table of Contents

# 1 Definitions

| | |
|---|---|
| LCPD | Litres per capita per day, the total daily volume of water supplied to the community divided by the population of the community. |
| Evapotranspiration | Discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces and by transpiration from plants. |
| ILI | Infrastructure Leakage Index, ratio of CARL/UARL. |
| Apparent Losses | Volume of water from unauthorised consumption (theft) and metering inaccuracies (calibration and accounting errors). |
| CARL | Current Annual Real Losses, the water supplied and deducting the calculated authorized consumption and apparent losses. |
| UARL | Unavoidable Annual Real Losses, volume of leakage within the CARL that includes small leaks and weeps that is either undetectable in practice, or not economic to find and repair. |
| Minimum Pumping Volume | Volume of Nipissar Lake required to submerge pumping equipment for withdrawal. |
| Maximum Annual Withdrawal Rate | Estimated recharge rate to Nipissar Lake from inputs such as precipitation, and is therefore the restricting volume of water that can be withdrawn without forcing the overall annual Lake volume to decrease. |

## 2 Understanding of Project

In this report FSC has three important tasks that were asked for in the RFP. These were:

1. Determine the volume of Nipissar Lake and calculate any losses compared to the Bathymetry and Topographical survey that was completed in 1995 by Vista Engineering.

2. Complete an environmental assessment of climate variables affecting the Nipissar Lake watershed capacity and report on how these might be affecting the long-term storage potential of the reserve.

3. Complete a review of historical precipitation and evapo-transpiration rates to establish if the current volume reduction of Nipissar Lake is a result of climatic variables or municipal consumption/wastage.

# 3 Volume Calculations

To accurately calculate the current volume of Nipissar Lake, a survey was completed of the water level on September 26, 2009. This information was used to determine the volume of Nipissar Lake.

To make sure that the volume calculation in 2009 was consistent with the Vista survey done in 1995, the two drawings were compared to each other. Vista's original reference point could not be located at the time of FSC's 2009 survey. FSC's reference point (TBM 1) was generated from Canada Control Markers (CCMs) established for the fuel project.

A scan of the mapping from the Vista 1995 survey was inserted into the current base drawing as provided by the Government of Nunavut and scaled to match existing features such as roadways and lake outlines. However, Vista's mapping is from 1994 and this older technology now shows as very pixilated, rather than as smooth line.

The shoreline from the FSC 2009 survey fit neatly into the outline of the lake from the earlier Vista mapping. The reference point (TBM 1) established in the FSC 2009 survey was noted to fall slightly above a contour line from the Vista survey mapping.

The elevation of the reference point was 12.72 m and the contour line from the Vista survey map was approximately 15.00 m.

As the elevations did not match exactly, a correction factor of 2.36 m (i.e. + 0.08 m) was selected to consider the pixilated nature of the mapping and the slightly elevated location of FSC TBM 1.

The correction factor was then applied to the bathymetric survey elevations and several major contours were traced from the scanned mapping. These major contours were used to estimate the total volume of the lake.

The current volume of the Lake is 2,809,259.60 cubic meters. Appendix A contains drawings for more detail.

**Table 3.1: Nipissar Lake Volume**

| Survey | Volume |
|---|---|
| 1995 survey | 3,469,780.00 $m^3$ |
| 2009 survey | 2,809,259.60 $m^3$ |
| Difference | - 660,520.40 $m^3$ |

# 4 Climate Variables

Rankin Inlet is located in the continuous permafrost mid-Arctic region of the Canadian Shield, on the west coast of Hudson Bay. Topographic relief is low. The regional terrain consists of a high proportion of bedrock, glacial till, clay, outwash gravels and peat forming the scattered soil in the region. Vegetation is of the tundra type.

Climatic data in the Rankin Inlet area is characterized, in the terms of long-term normals, by the published data from Environment Canada between the year of 1981 and 2008. A summary of this data as well as information from the 1996 Stanley Report is provided below.

**Table 4.1: Climatic Data**

| Climatic Parameter | Average Value | |
|---|---|---|
| | **2009 Report** | **1996 Report** |
| Annual Rainfall | 180.39643 mm | 146 mm |
| Annual Snowfall | 128.7393 cm | 113 cm |
| Annual Precipitation | 305.425 mm | 259 mm [1] |
| | | |
| Days with Snow | 77.8 | 66 |
| Days with Rain | 46.9 | 36 |
| | | |
| Daily Average Temperature | -11 C °C | - 11.6 °C |
| Daily Maximum Temperature | -7.3 °C | - 7.9 °C |
| Daily Minimum Temperature | -14.7 °C | - 15.2 °C°C |
| | | |
| Start Date of Snowcover | mid October | mid October |
| Finish Date of Snowcover | mid June | mid June |
| Average Snow Depth | 16 cm | No data |
| | | |
| Lake freeze over Date | mid October | mid October |
| Lake Ice-Free Date | mid July | mid July |
| Lake Ice Thickness | Approx 200 cm | 200 cm |

Based on the comparison between the climatic parameters of the 1996 report and the 2009 report, there is a slight difference between the two sets of data. The 2009 data shows an 18 % increase in days with snow. This same data shows an increase of 30 % of days with rain. This information is constant with the annual rainfall and snowfall being greater then in the 1996 Report. Because the rainfall and snowfall have increased from the earlier report, an increase into the potential input into Nipissar Lake may occur.

The temperature difference between the 2009 report and the 1996 report vary on an average of 5% between the Daily Average, Daily Maximum and the Daily Minimum. The 2009 report temperatures are

[1] The Stanley report of 1996 used mean annual precipitation from Chesterfield Inlet for their data. This report used mean annual precipitation from Rankin Inlet. Rankin inlet and Chesterfield Inlet are only 80 km apart and for the basis for this report the geographic difference will be considered irrelevant. The 1996 Report chose Chesterfield Inlet because of the similarity to Rankin Inlet.

all warmer then the 1996 report temperatures. The slight increase could lead to move evaporation in the warmer months and thus more water loss.

Because of the short time span that this report looks at temperature, the difference could be based on the lack of data for the area. To see a 5% increase in temperature in 27 years appears to be very dramatic. Global climate change has seen only a fraction of a degree increase over the last century.

The start and finish dates of snowcover are the same from the 2009 report to the 1996 report. Although this date varies from year to year, snowcover can be generally expected in mid October. This has not changed from the earlier Stanley report. The same can be said about the lake freezing dates.

## 4.1 PRECIPITATION

Based on the information shown below in Table 4.2, and the Original Stanley data from 1996, the average precipitation shows an increase from the 1996 numbers. The percentage of increase is shown in the table below.

**Table 4.2: Precipitation Increases**

| Item | Percent Increase |
|---|---|
| **Rainfall** | + 24 % |
| **Snowfall** | + 14% |
| **Precipitation** | + 18 % |

The amount of rainfall in Rankin Inlet has increased from an average of 146 mm annually to an average of 180 mm annually. This average would mean an increase of available input into Nipissar Lake. The amount of snowfall has also increased 14%, which would mean more snow to be deposited into the watershed area and into the lake in the spring when it melts.

The Stanley Report acquired their parameters for Rankin Inlet from Weather data from 1981 to 1994, a period of only 14 years. For this report, Environment Canada provided information from 1981 to 2008, a period of 28 years. Because of the increased amount of weather data the 2009 parameters will be more historically accurate. Having twice the data set may help to explain why there is such an apparent increase in Rainfall, Snowfall and Precipitation. Additionally, if data from Environment Canada was chosen for years 1981–1994, and compared to that for years 1995-2008, very little difference would be noticed. This is summarized in the table 4.3 below.

**Table 4.3: Overall Precipitation Amounts**

| Years | 1981-1994 | 1995-2008 |
|---|---|---|
| Rainfall | 181.5 mm | 179.2 mm |
| Snowfall | 126.6 cm | 130.8 cm |
| Precipitation | 302.7 mm | 308.1 mm |

**Table 4.4: Ranking Inlet Annual Precipitation**

| Year | Total Rain (mm) | Total Snow (cm) | Total Precip. (mm) |
|---|---|---|---|
| 1981 | 199 | 101.1 | 297.8 |
| 1982 | 171 | 108.7 | 277.3 |
| 1983 | 233.9 | 97.2 | 323.4 |
| 1984 | 174.9 | 102.5 | 262.2 |
| 1985 | 255.7 | 209.5 | 449.2 |
| 1986 | 168.8 | 103.5 | 270.1 |
| 1987 | 161.4 | 189.4 | 352.5 |
| 1988 | 110.3 | 117.4 | 221.4 |
| 1989 | 133.4 | 68.5 | 198.1 |
| 1990 | 253.4 | 162.6 | 399.9 |
| 1991 | 228.6 | 165.8 | 387.8 |
| 1992 | 139.8 | 113.7 | 253.2 |
| 1993 | 191.4 | 121.8 | 313.2 |
| 1994 | 120 | 111.1 | 231.5 |
| 1995 | 197.8 | 73.6 | 271.2 |
| 1996 | 159.2 | 96.2 | 254.6 |
| 1997 | 139.9 | 99.6 | 240.6 |
| 1998 | 189.8 | 102.6 | 289.8 |
| 1999 | 268.4 | 120.6 | 388 |
| 2000 | 133.3 | 108 | 241.7 |
| 2001 | 230.4 | 145.8 | 371.8 |
| 2002 | 174.2 | 115 | 287.8 |
| 2003 | 158.4 | 146.8 | 303.6 |
| 2004 | 156.8 | 180.4 | 337.2 |
| 2005 | 163 | 257.8 | 417 |
| 2006 | 222.6 | 152.6 | 373.6 |
| 2007 | 161.9 | 92.5 | 243.2 |
| 2008 | 153.8 | 140.4 | 294.2 |
| | | | |
| **Average** | **180.4** | **128.7** | **305.4** |

Looking at the historical precipitation rates from 1981 to 2008 we see dry years and wet years with an average of 180 mm. There are no obvious trends that state historical precipitation is on the increase or decrease. So we must conclude that it is relatively stable. The increased percentage from the 1996 Stanley Report can be explained by the lack of climatic data and the fact that the 1996 report.

## 4.2 EVAPOTRANSPIRATION

Evapotranspiration is based on evaporation and vegetation. The vegetation in the watershed area has remained constant since 1996 so there would be no difference between then and now.

The rate of evaporation is primarily a function of temperature, pressure, wind speed and direction, relative humidity and surface area. All of these factors interplay.

For the purpose of this study, we will assume that for now and in the future, inflow to the lake and losses from the lake remains stable and evapotranspiration is not a factor in the analysis.

# 5 AWWA - IWA Water Audit

The Government of Nunavut completed an American Water Works Association (AWWA) / International Water Association (IWA) Water Audit and Water Balance for the Hamlet of Rankin Inlet Water System.

The information determined from the audit was previously used in the Rankin Inlet, Water Consumption and Conservation Study, Draft Report, December 4, 2009 completed by FSC Architects & Engineers and Resource Management Strategies Inc.

The study explained that the World Bank Target Matrix provides performance categories according to a Infrastructure Leakage Index (ILI) shown in Table 5.1. The ILI is based on the ratio of Unavoidable Annual Real Losses (UARL) and Current Annual Real Losses (CARL).[2]

The CARL is the volume of water remaining after the calculated authorized consumption and apparent losses are subtracted from the total water supplied to the community.

An apparent loss is any volume of water from unauthorized consumption (ex. theft) and metering inaccuracies (ex. calibration and accounting errors).

The UARL is volume of leakage within the CARL that includes small leaks and weeps that is either undetectable in practice, or not economic to find and repair.

**Table 5.1: ILI Performance Categories**

| ILI Range | Performance Category | Real Loss Management |
|---|---|---|
| 1 – 2 | A | Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost effective improvement |
| 2 – 4 | B | Potential for marked improvements; consider pressure management, better active leakage control practices, and better network management |
| 4 – 8 | C | Poor leakage record, tolerable only if water is plentiful and cheap; even then, analyze level and nature of leakage and intensify leakage reduction efforts |
| >8 | D | Very inefficient use of resources; leakage reduction programs imperative and high priority. |

[2] *Rankin Inlet, Water Consumption and Conservation Study, Draft Report, December 4, 2009, FSC Architects & Engineers, Resource Management Strategies Inc.*

# 6 Results and Discussion

## 6.1 COMPARISON WITH AWWA - IWA WATER AUDIT

The volume of Nipissar Lake has approximately decreased by 660,520 cubic meters over the past 15 years. As we are not considering climate to be a factor in this exercise, then an increase in population and water usage is the primary cause for the drop in Nipissar Lake.

The Town of Rankin Inlet is currently drawing more water from Nipissar Lake then water is recharged through natural precipitation and other sources. Using the two known water volumes of Nipissar Lake for 1994 and 2009, an average lake decrease of 44,035 $m^3$/year of water was determined. The same procedure was completed in determining an annual water usage of 355,824 $m^3$/year for Rankin Inlet.

The difference between the annual lake decrease and annual water usage is the estimated annual volume of water from recharge to the lake. This volume of water is approximately 311,789 $m^3$/year, and is therefore the maximum rate Rankin Inlet can withdrawal without forcing the lake to continue to deplete.

The second column in Table 6.1 represents the total water supplied to Rankin Inlet, which corresponds to an ILI of 12.62, placing them in performance D category. As stated in the RMSi/FSC Study, being in this category means the Hamlet of Rankin Inlet water system is operating with a very inefficient use of resources; making leakage reduction programs imperative and a high priority.[2]

Table 6.1 also shows the required management and reduction of the Unaccounted for Water in order to meet performance categories A, B, and C. The reduction of the Unaccounted for Water is not simply the reassigning of the water volume to a different water use sector; rather it is the elimination of that loss. Determining how to eliminate the Unaccounted for Water in Rankin Inlet's water system is beyond the scope of this project.

**Table 6.1: Water Consumption Data for 2009 Population of 2499**

| Item | Current Water Use Sector[3] ($m^3$) | Category C Performance ($m^3$) | Category B Performance ($m^3$) | Category A Performance ($m^3$) |
|---|---|---|---|---|
| **Total Billed Consumption** | 155,173 | 155,173 | 155,173 | 155,173 |
| **IWA Accounted For Water** | 90,956 | 90,956 | 90,956 | 90,956 |
| **Unaccounted for Water** | 181,640 | *112,000* | *56,000* | *28,000* |
| **Total Water Supplied** | 427,770 | 358,129 | 302,129 | 274,129 |
| **LCPD** | **469** | **393** | **331** | **301** |

Table 6.1 further shows that Rankin Inlet has already surpassed the maximum withdrawal rate Nipissar Lake can provide without continuing to decrease in volume. If the Unaccounted for Water were reduced to meet category B performance or better, Rankin Inlet could meet the maximum withdrawal rate of Nipissar Lake with its current population in 2009.

[3] *Rankin Inlet, Water Consumption and Conservation Study, Draft Report, December 4, 2009, FSC Architects & Engineers, Resource Management Strategies Inc.*

However, as the population increases, water use increases correspondingly. Therefore, there will come a point where the Unaccounted for Water cannot be decreased any further and Rankin Inlet's water consumption rate will once again be greater than the Nipissar Lake maximum annual withdrawal rate of 311,789 $m^3$/year.

Figures 6.1 to 6.3 depict the projected water volume decrease in Nipissar Lake corresponding to population increases and the management of the Unaccounted for Water. All data and calculations are found in spreadsheets in Appendix B.

The objective of this exercise was to portray visually the effect of:

- Managing the Unaccounted for Water loss;
- When the lake would continue to be depleted; and
- When it will fail completely.

The projected year when Nipissar Lake will fall below the current volume can be estimated when each line intersects the Current Lake Volume line. The years at which this occurs is summarized in Table 6.2.

**Table 6.2: Projected Year of Lake Depletion Below Current Volume**

| Population Increase | Category D Performance (Current) | Category C Performance | Category B Performance | Category A Performance |
|---|---|---|---|---|
| 2.04% | Immediate | Immediate | 2011 | 2019 |
| 2.5% | Immediate | Immediate | 2011 | 2017 |
| 3.0% | Immediate | Immediate | 2011 | 2016 |

The projected year when Nipissar Lake will completely fail to be an adequate source of water for Rankin Inlet can be estimated as the location when each line intersects the Minimum Pumping Volume line. The years at which this occurs is summarized in Table 6.3.

**Table 6.3: Projected Year of Failure of Nipissar Lake as Adequate Water Source**

| Population Increase | Category D Performance (Current) | Category C Performance | Category B Performance | Category A Performance |
|---|---|---|---|---|
| 2.04% | 2022 | 2027 | 2033 | 2038 |
| 2.5% | 2021 | 2025 | 2031 | 2033 |
| 3.0% | 2020 | 2024 | 2028 | 2031 |

For example, if the current consumption of water continues as is (Category D), and a population increase of 2.04% is realized, Figure 6.1 suggests that Nipissar Lake will fail to be an adequate source of water as early as 2022. However, water quality and the ability to pump water from under the ice will have impacted production at least 5 years before that in 2017.

**Figure 6.1: Lake Volume with 2.04% Population Increase**

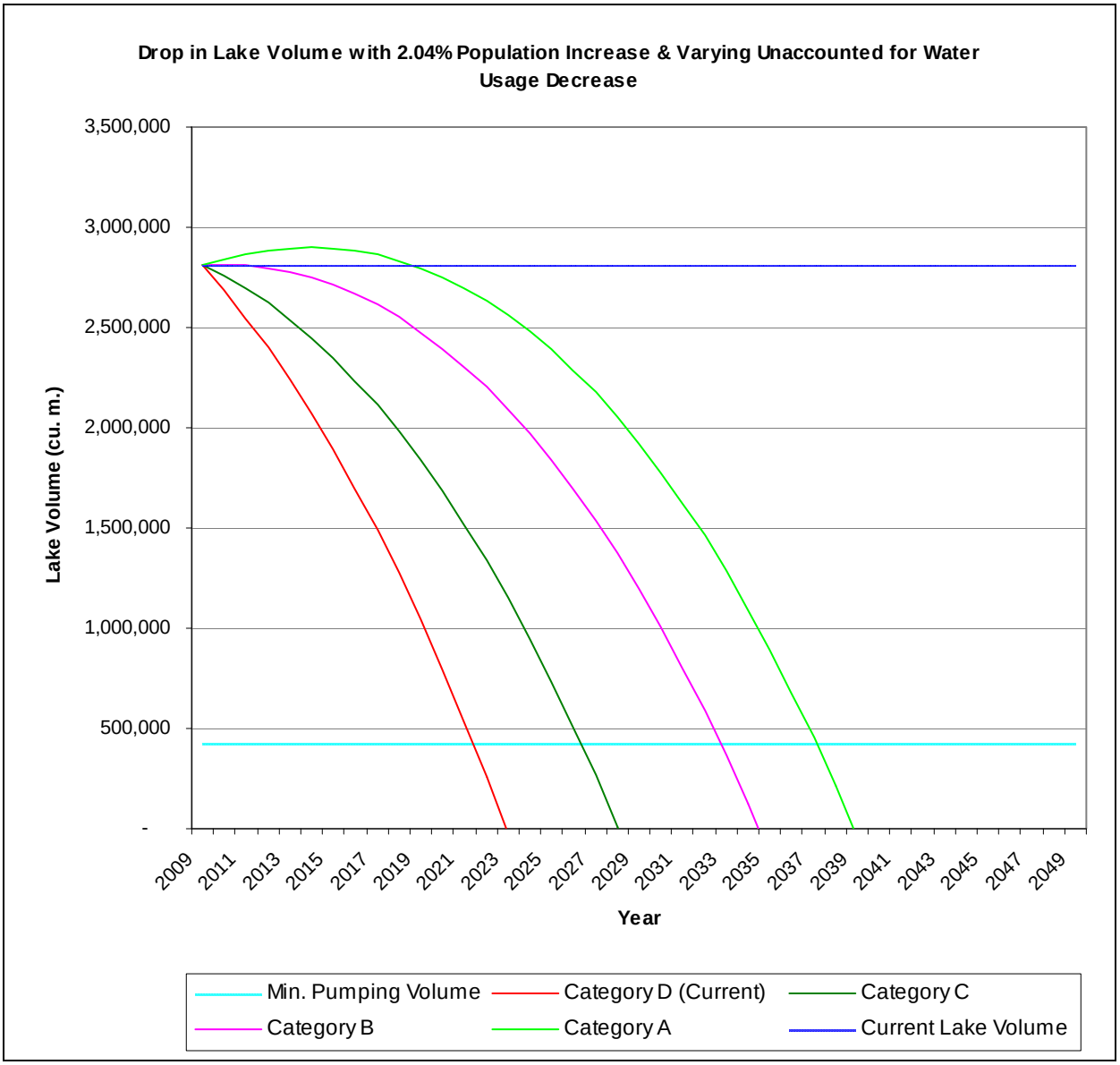


**Figure 6.2: Lake Volume with 2.5% Population Increase**

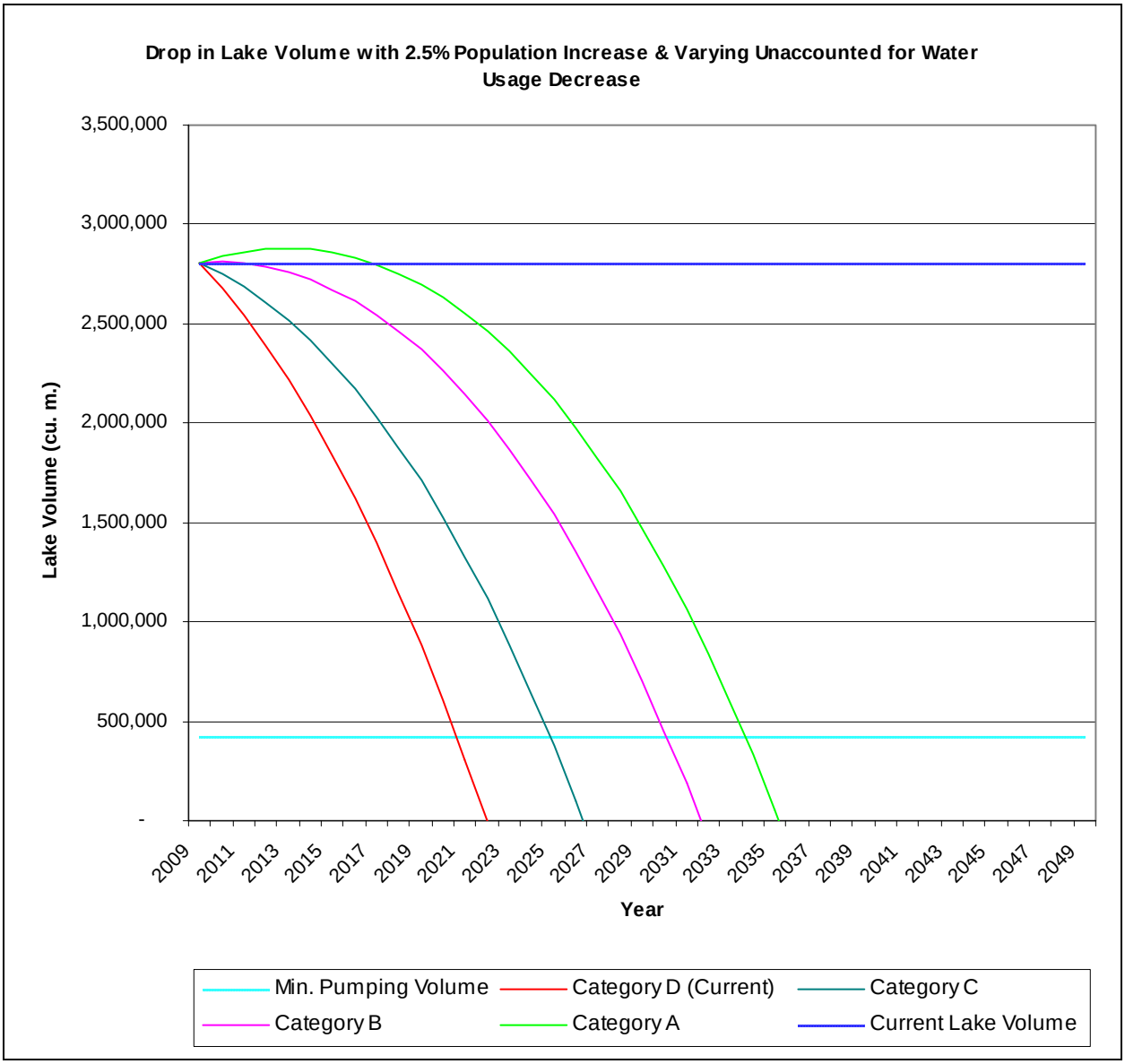
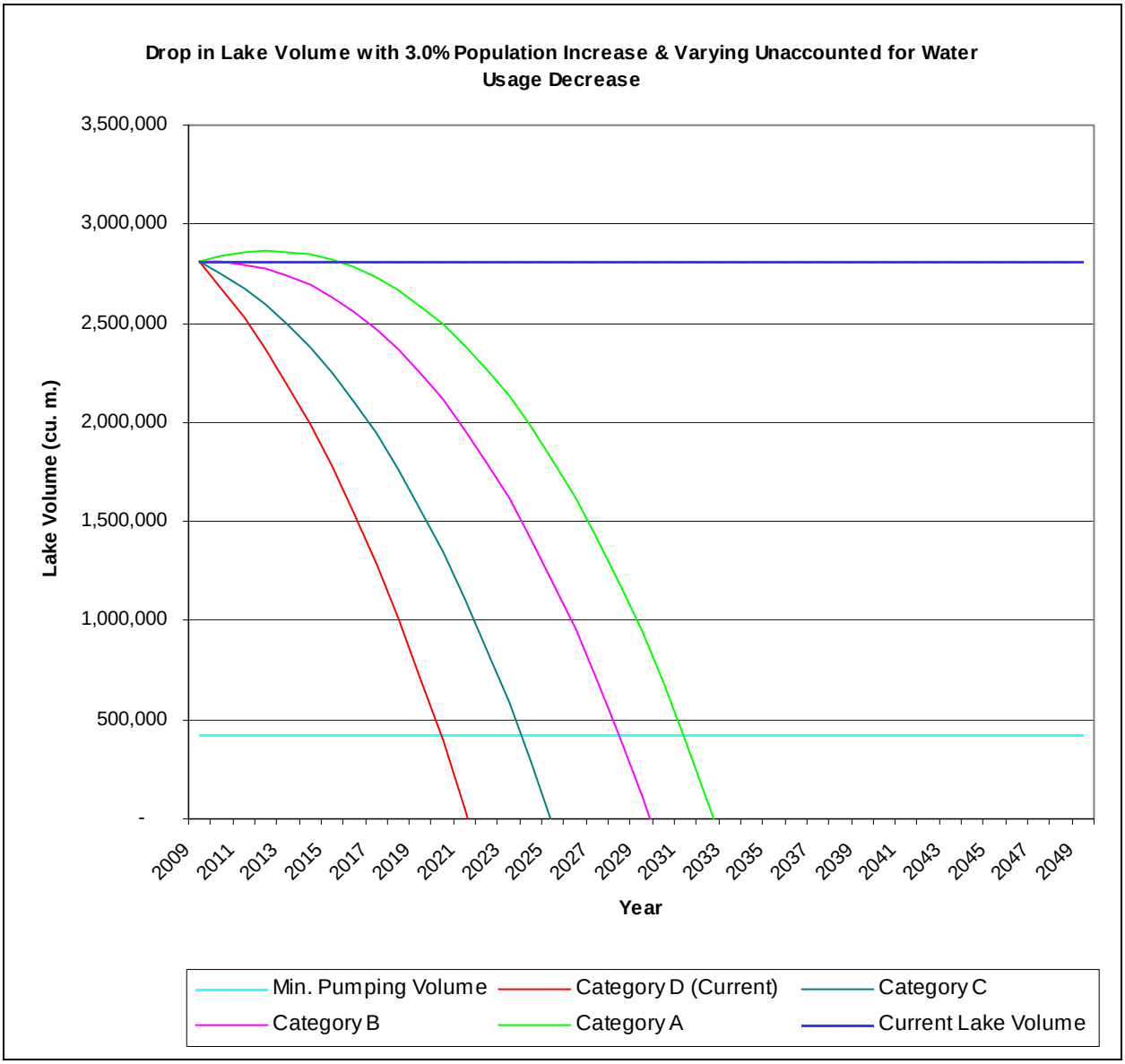


**Figure 6.3: Lake Volume with 3.0% Population Increase**



## 6.2 COMPARISON TO MACA PLANNING STANDARDS

MACA developed design usage rates for specific populations that have stood the test of time for planning purposes; the MACA usage rate for Rankin Inlet at its current 2009 population is found to be 344 LCPD.

Comparing the MACA planning rate (344 LCPD) to the proposed Category B Performance usage rate (331 LCPD) for the year 2009 suggests that continuing population increases will continue to deplete the water storage in Nipissar Lake regardless of conservation and the further elimination of the Unaccounted for Water.

This then suggests that meeting the Category B Performance or better will delay but not eliminate the need to recharge Nipissar Lake artificially.

# 7 Conclusions

1. The maximum rate that Nipissar Lake can provide without forcing the Lake to continue to deplete is estimated to be 311,789 $m^3$/year (854,000 litres/day).

2. Rankin Inlet has already surpassed the maximum withdrawal rate Nipissar Lake can provide without forcing the Lake to continue to deplete. The following table summarizes the projected year Nipissar Lake will begin to decrease from its current volume:

| Population Increase | Category D Performance (Current) | Category C Performance | Category B Performance | Category A Performance |
|---|---|---|---|---|
| 2.04% | Immediate | Immediate | 2011 | 2019 |
| 2.5% | Immediate | Immediate | 2011 | 2017 |
| 3.0% | Immediate | Immediate | 2011 | 2016 |

3. The projected year when Nipissar Lake will fail completely can be estimated as the location when each line intersects the Minimum Pumping Volume line in Figures 6.1 to 6.3.

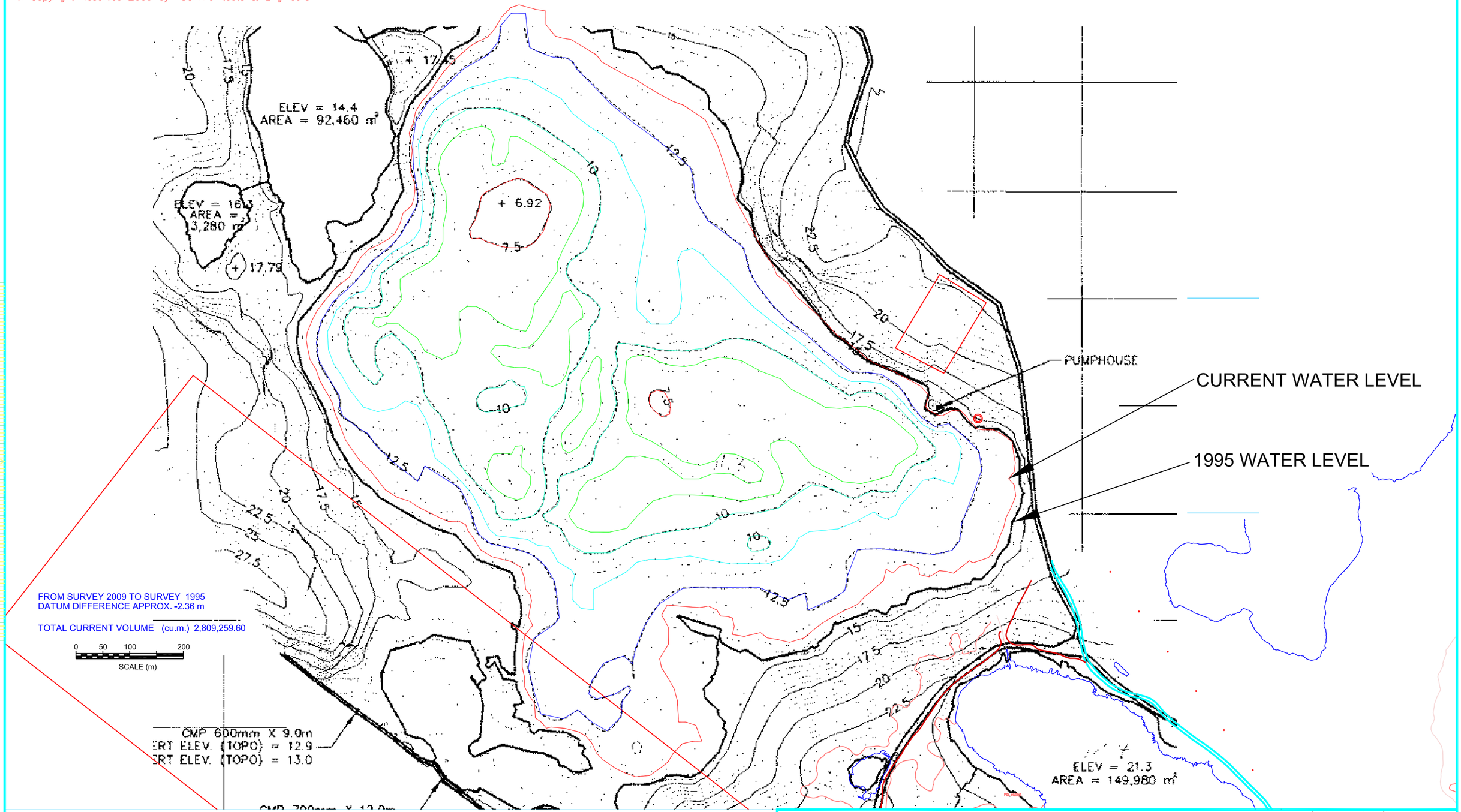
4. With the current consumption of water, and with a population increase of 2.04% realized, Figure 6.1 suggests that Nipissar Lake will fail completely as early as 2022. However, water quality and the ability to pump water from under the ice will have impacted production at least 5 years before that in 2017. The worst-case scenario for a 3.0% population increase is the year 2015, at which time water quality is expected to degrade.

5. If the Unaccounted for Water were reduced to meet Category B performance or better (≤ 331 LCPD), Rankin Inlet could meet the maximum withdrawal rate of Nipissar Lake with its current 2009 population.

6. According to MACA design usage rates, Rankin Inlet requires 344 LCPD using its current 2009 population. This is a higher usage rate then that of Category B Performance, and therefore suggests that reducing the Unaccounted for Water to meet Category B Performance may be moot.

7. Continuing population increases will continue to deplete the water storage in Nipissar Lake regardless of conservation and the further elimination of unaccounted water. This then suggests that meeting the Category B Performance or better will delay but not eliminate the need to recharge Nipissar Lake artificially within the next five years.

# Appendix A: Drawings




**PROJECT TITLE**
# NIPISSAR LAKE VOLUME STUDY

| | | |
|---|---|---|
| CLIENT PROJECT NO. | FSC PROJECT NO. | |
| - | 2009--1310 | |
| LOCATION | DRAWN BY | CHECKED BY |
| RANKIN INLET, NU | IGM | CP |
| DRAWING TITLE | SCALE | DATE |
| NIPISSAR LAKE BATHYMETRIC AND VOLUME | 2009--1310 | 2010 JAN |
| | DRAWING NO. | |
| | | OF __ |

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# Appendix B: Spreadsheet Data & Calculations

Population Increase Rate 2.04%
Water Management Category A
Water Use (LPCD) 196

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,749 | 2,809,260 |
| 2010 | 2550 | 301 | 279,716 | 2,841,333 |
| 2011 | 2602 | 302 | 286,685 | 2,866,437 |
| 2012 | 2655 | 303 | 293,783 | 2,884,443 |
| 2013 | 2709 | 304 | 301,051 | 2,895,181 |
| 2014 | 2765 | 306 | 308,494 | 2,898,476 |
| 2015 | 2821 | 307 | 316,115 | 2,894,151 |
| 2016 | 2879 | 308 | 323,918 | 2,882,022 |
| 2017 | 2938 | 310 | 331,909 | 2,861,902 |
| 2018 | 2998 | 311 | 340,091 | 2,833,600 |
| 2019 | 3059 | 312 | 348,468 | 2,796,921 |
| 2020 | 3121 | 313 | 357,046 | 2,751,664 |
| 2021 | 3185 | 315 | 365,829 | 2,697,624 |
| 2022 | 3250 | 316 | 374,822 | 2,634,591 |
| 2023 | 3317 | 317 | 384,030 | 2,562,351 |
| 2024 | 3384 | 319 | 393,457 | 2,480,683 |
| 2025 | 3454 | 320 | 403,109 | 2,389,363 |
| 2026 | 3524 | 321 | 412,992 | 2,288,160 |
| 2027 | 3596 | 322 | 423,110 | 2,176,839 |
| 2028 | 3670 | 324 | 433,469 | 2,055,160 |
| 2029 | 3745 | 325 | 444,074 | 1,922,874 |
| 2030 | 3821 | 326 | 454,933 | 1,779,730 |
| 2031 | 3899 | 327 | 466,049 | 1,625,470 |
| 2032 | 3979 | 329 | 477,430 | 1,459,829 |
| 2033 | 4060 | 330 | 489,081 | 1,282,537 |
| 2034 | 4143 | 331 | 501,009 | 1,093,317 |
| 2035 | 4228 | 333 | 513,221 | 891,885 |
| 2036 | 4314 | 334 | 525,722 | 677,952 |
| 2037 | 4402 | 335 | 538,520 | 451,221 |
| 2038 | 4492 | 336 | 551,621 | 211,389 |
| 2039 | 4584 | 338 | 565,033 | - 41,855 |
| 2040 | 4678 | 339 | 578,762 | - 308,828 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 4773 | 340 | 592,817 | - | 589,856 |
| 2042 | 4871 | 342 | 607,205 | - | 885,272 |
| 2043 | 4970 | 343 | 621,933 | - | 1,195,415 |
| 2044 | 5072 | 344 | 637,009 | - | 1,520,635 |
| 2045 | 5175 | 345 | 652,441 | - | 1,861,287 |
| 2046 | 5281 | 347 | 668,239 | - | 2,217,737 |
| 2047 | 5389 | 348 | 684,409 | - | 2,590,358 |
| 2048 | 5499 | 349 | 700,962 | - | 2,979,530 |
| 2049 | 5611 | 351 | 717,905 | - | 3,385,646 |

Population Increase Rate 2.04%
Water Management Category B
Water Use (LPCD) 216

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,749 | 2,809,260 |
| 2010 | 2550 | 331 | 308,286 | 2,812,762 |
| 2011 | 2602 | 333 | 315,939 | 2,808,613 |
| 2012 | 2655 | 334 | 323,761 | 2,796,641 |
| 2013 | 2709 | 335 | 331,771 | 2,776,660 |
| 2014 | 2765 | 337 | 339,973 | 2,748,476 |
| 2015 | 2821 | 338 | 348,371 | 2,711,894 |
| 2016 | 2879 | 340 | 356,971 | 2,666,712 |
| 2017 | 2938 | 341 | 365,777 | 2,612,724 |
| 2018 | 2998 | 343 | 374,794 | 2,549,719 |
| 2019 | 3059 | 344 | 384,026 | 2,477,482 |
| 2020 | 3121 | 345 | 393,479 | 2,395,792 |
| 2021 | 3185 | 347 | 403,159 | 2,304,422 |
| 2022 | 3250 | 348 | 413,069 | 2,203,142 |
| 2023 | 3317 | 350 | 423,216 | 2,091,715 |
| 2024 | 3384 | 351 | 433,606 | 1,969,898 |
| 2025 | 3454 | 352 | 444,243 | 1,837,445 |
| 2026 | 3524 | 354 | 455,134 | 1,694,100 |
| 2027 | 3596 | 355 | 466,284 | 1,539,605 |
| 2028 | 3670 | 357 | 477,700 | 1,373,693 |
| 2029 | 3745 | 358 | 489,388 | 1,196,094 |
| 2030 | 3821 | 359 | 501,354 | 1,006,529 |
| 2031 | 3899 | 361 | 513,605 | 804,713 |
| 2032 | 3979 | 362 | 526,147 | 590,354 |
| 2033 | 4060 | 364 | 538,988 | 363,156 |
| 2034 | 4143 | 365 | 552,133 | 122,812 |
| 2035 | 4228 | 367 | 565,590 | - 130,989 |
| 2036 | 4314 | 368 | 579,367 | - 398,567 |
| 2037 | 4402 | 369 | 593,471 | - 680,249 |
| 2038 | 4492 | 371 | 607,909 | - 976,369 |
| 2039 | 4584 | 372 | 622,689 | - 1,287,269 |
| 2040 | 4678 | 374 | 637,820 | - 1,613,300 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 4773 | 375 | 653,309 | - | 1,954,819 |
| 2042 | 4871 | 376 | 669,164 | - | 2,312,195 |
| 2043 | 4970 | 378 | 685,395 | - | 2,685,801 |
| 2044 | 5072 | 379 | 702,010 | - | 3,076,021 |
| 2045 | 5175 | 381 | 719,017 | - | 3,483,249 |
| 2046 | 5281 | 382 | 736,426 | - | 3,907,887 |
| 2047 | 5389 | 383 | 754,247 | - | 4,350,345 |
| 2048 | 5499 | 385 | 772,488 | - | 4,811,044 |
| 2049 | 5611 | 386 | 791,160 | - | 5,290,416 |

Population Increase Rate 2.04%
Water Management Category C
Water Use (LPCD) 256

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,749 | 2,809,260 |
| 2010 | 2550 | 393 | 365,427 | 2,755,621 |
| 2011 | 2602 | 394 | 374,446 | 2,692,964 |
| 2012 | 2655 | 396 | 383,716 | 2,621,037 |
| 2013 | 2709 | 398 | 393,210 | 2,539,616 |
| 2014 | 2765 | 399 | 402,930 | 2,448,475 |
| 2015 | 2821 | 401 | 412,884 | 2,347,380 |
| 2016 | 2879 | 403 | 423,077 | 2,236,092 |
| 2017 | 2938 | 404 | 433,513 | 2,114,367 |
| 2018 | 2998 | 406 | 444,200 | 1,981,957 |
| 2019 | 3059 | 408 | 455,142 | 1,838,604 |
| 2020 | 3121 | 409 | 466,346 | 1,684,047 |
| 2021 | 3185 | 411 | 477,818 | 1,518,018 |
| 2022 | 3250 | 413 | 489,563 | 1,340,244 |
| 2023 | 3317 | 414 | 501,590 | 1,150,443 |
| 2024 | 3384 | 416 | 513,903 | 948,329 |
| 2025 | 3454 | 418 | 526,510 | 733,608 |
| 2026 | 3524 | 419 | 539,418 | 505,980 |
| 2027 | 3596 | 421 | 552,633 | 265,136 |
| 2028 | 3670 | 423 | 566,163 | 10,761 |
| 2029 | 3745 | 424 | 580,016 | - 257,465 |
| 2030 | 3821 | 426 | 594,198 | - 539,874 |
| 2031 | 3899 | 428 | 608,717 | - 836,802 |
| 2032 | 3979 | 429 | 623,582 | - 1,148,595 |
| 2033 | 4060 | 431 | 638,800 | - 1,475,606 |
| 2034 | 4143 | 433 | 654,380 | - 1,818,197 |
| 2035 | 4228 | 434 | 670,329 | - 2,176,737 |
| 2036 | 4314 | 436 | 686,657 | - 2,551,605 |
| 2037 | 4402 | 438 | 703,373 | - 2,943,189 |
| 2038 | 4492 | 439 | 720,485 | - 3,351,885 |
| 2039 | 4584 | 441 | 738,002 | - 3,778,098 |
| 2040 | 4678 | 443 | 755,935 | - 4,222,243 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 4773 | 444 | 774,292 | - | 4,684,746 |
| 2042 | 4871 | 446 | 793,084 | - | 5,166,041 |
| 2043 | 4970 | 448 | 812,320 | - | 5,666,572 |
| 2044 | 5072 | 449 | 832,011 | - | 6,186,794 |
| 2045 | 5175 | 451 | 852,168 | - | 6,727,173 |
| 2046 | 5281 | 453 | 872,802 | - | 7,288,186 |
| 2047 | 5389 | 454 | 893,922 | - | 7,870,320 |
| 2048 | 5499 | 456 | 915,542 | - | 8,474,072 |
| 2049 | 5611 | 458 | 937,671 | - | 9,099,955 |

Population Increase Rate 2.04%
Water Management Category D (Current)
Water Use (LPCD) 306

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,749 | 2,809,260 |
| 2010 | 2550 | 469 | 436,488 | 2,684,561 |
| 2011 | 2602 | 471 | 447,580 | 2,548,770 |
| 2012 | 2655 | 473 | 458,661 | 2,401,898 |
| 2013 | 2709 | 475 | 470,008 | 2,243,679 |
| 2014 | 2765 | 477 | 481,628 | 2,073,840 |
| 2015 | 2821 | 479 | 493,526 | 1,892,103 |
| 2016 | 2879 | 481 | 505,709 | 1,698,183 |
| 2017 | 2938 | 483 | 518,184 | 1,491,788 |
| 2018 | 2998 | 485 | 530,958 | 1,272,620 |
| 2019 | 3059 | 487 | 544,037 | 1,040,372 |
| 2020 | 3121 | 489 | 557,429 | 794,732 |
| 2021 | 3185 | 491 | 571,141 | 535,379 |
| 2022 | 3250 | 493 | 585,181 | 261,987 |
| 2023 | 3317 | 495 | 599,556 | - 25,780 |
| 2024 | 3384 | 497 | 614,275 | - 328,266 |
| 2025 | 3454 | 499 | 629,344 | - 645,821 |
| 2026 | 3524 | 501 | 644,773 | - 978,804 |
| 2027 | 3596 | 503 | 660,569 | - 1,327,585 |
| 2028 | 3670 | 505 | 676,742 | - 1,692,538 |
| 2029 | 3745 | 507 | 693,300 | - 2,074,049 |
| 2030 | 3821 | 509 | 710,252 | - 2,472,512 |
| 2031 | 3899 | 511 | 727,607 | - 2,888,330 |
| 2032 | 3979 | 513 | 745,375 | - 3,321,916 |
| 2033 | 4060 | 515 | 763,566 | - 3,773,693 |
| 2034 | 4143 | 517 | 782,188 | - 4,244,092 |
| 2035 | 4228 | 519 | 801,253 | - 4,733,556 |
| 2036 | 4314 | 521 | 820,770 | - 5,242,537 |
| 2037 | 4402 | 523 | 840,750 | - 5,771,498 |
| 2038 | 4492 | 525 | 861,204 | - 6,320,913 |
| 2039 | 4584 | 527 | 882,143 | - 6,891,267 |
| 2040 | 4678 | 529 | 903,578 | - 7,483,056 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 4773 | 531 | 925,521 | - | 8,096,788 |
| 2042 | 4871 | 533 | 947,983 | - | 8,732,982 |
| 2043 | 4970 | 535 | 970,976 | - | 9,392,169 |
| 2044 | 5072 | 537 | 994,514 | - | 10,074,894 |
| 2045 | 5175 | 539 | 1,018,608 | - | 10,781,712 |
| 2046 | 5281 | 541 | 1,043,271 | - | 11,513,194 |
| 2047 | 5389 | 543 | 1,068,517 | - | 12,269,922 |
| 2048 | 5499 | 545 | 1,094,359 | - | 13,052,491 |
| 2049 | 5611 | 547 | 1,120,810 | - | 13,861,513 |

| | | | | |
|---|---|---|---|---|
| Population Increase Rate | 2.50% | | | |
| Water Management | Category A | | | |
| Water Use (LPCD) | 196 | | | |
| **Year** | **Population** | **LCPD** | **Cu. M./ Year** | **Volume of Lake** |
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2561 | 301 | 280,982 | 2,840,066 |
| 2011 | 2626 | 302 | 289,818 | 2,862,037 |
| 2012 | 2691 | 304 | 298,599 | 2,875,227 |
| 2013 | 2758 | 306 | 307,638 | 2,879,378 |
| 2014 | 2827 | 307 | 316,942 | 2,874,224 |
| 2015 | 2898 | 309 | 326,520 | 2,859,494 |
| 2016 | 2971 | 310 | 336,377 | 2,834,905 |
| 2017 | 3045 | 312 | 346,524 | 2,800,170 |
| 2018 | 3121 | 313 | 356,968 | 2,754,991 |
| 2019 | 3199 | 315 | 367,717 | 2,699,063 |
| 2020 | 3279 | 316 | 378,781 | 2,632,070 |
| 2021 | 3361 | 318 | 390,168 | 2,553,691 |
| 2022 | 3445 | 320 | 401,888 | 2,463,592 |
| 2023 | 3531 | 321 | 413,950 | 2,361,430 |
| 2024 | 3619 | 323 | 426,364 | 2,246,855 |
| 2025 | 3710 | 324 | 439,140 | 2,119,504 |
| 2026 | 3803 | 326 | 452,288 | 1,979,005 |
| 2027 | 3898 | 327 | 465,819 | 1,824,975 |
| 2028 | 3995 | 329 | 479,744 | 1,657,020 |
| 2029 | 4095 | 331 | 494,074 | 1,474,735 |
| 2030 | 4197 | 332 | 508,821 | 1,277,703 |
| 2031 | 4302 | 334 | 523,996 | 1,065,495 |
| 2032 | 4410 | 335 | 539,612 | 837,672 |
| 2033 | 4520 | 337 | 555,682 | 593,779 |
| 2034 | 4633 | 338 | 572,217 | 333,351 |
| 2035 | 4749 | 340 | 589,232 | 55,908 |
| 2036 | 4868 | 342 | 606,740 | - 239,043 |
| 2037 | 4989 | 343 | 624,756 | - 552,010 |
| 2038 | 5114 | 345 | 643,293 | - 883,514 |
| 2039 | 5242 | 346 | 662,366 | - 1,234,090 |
| 2040 | 5373 | 348 | 681,991 | - 1,604,292 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 5507 | 349 | 702,183 | - | 1,994,685 |
| 2042 | 5645 | 351 | 722,958 | - | 2,405,854 |
| 2043 | 5786 | 352 | 744,333 | - | 2,838,399 |
| 2044 | 5931 | 354 | 766,326 | - | 3,292,935 |
| 2045 | 6079 | 356 | 788,952 | - | 3,770,099 |
| 2046 | 6231 | 357 | 812,231 | - | 4,270,541 |
| 2047 | 6387 | 359 | 836,181 | - | 4,794,933 |
| 2048 | 6546 | 360 | 860,821 | - | 5,343,965 |
| 2049 | 6710 | 362 | 886,170 | - | 5,918,346 |

Population Increase Rate 2.50%
Water Management Category B
Water Use (LPCD) 216

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2561 | 331 | 309,682 | 2,811,366 |
| 2011 | 2626 | 333 | 319,392 | 2,803,764 |
| 2012 | 2691 | 335 | 329,069 | 2,786,484 |
| 2013 | 2758 | 337 | 339,030 | 2,759,243 |
| 2014 | 2827 | 338 | 349,283 | 2,721,749 |
| 2015 | 2898 | 340 | 359,838 | 2,673,700 |
| 2016 | 2971 | 342 | 370,702 | 2,614,788 |
| 2017 | 3045 | 344 | 381,884 | 2,544,693 |
| 2018 | 3121 | 345 | 393,393 | 2,463,088 |
| 2019 | 3199 | 347 | 405,240 | 2,369,638 |
| 2020 | 3279 | 349 | 417,432 | 2,263,994 |
| 2021 | 3361 | 351 | 429,982 | 2,145,802 |
| 2022 | 3445 | 352 | 442,897 | 2,014,693 |
| 2023 | 3531 | 354 | 456,190 | 1,870,292 |
| 2024 | 3619 | 356 | 469,871 | 1,712,211 |
| 2025 | 3710 | 357 | 483,950 | 1,540,050 |
| 2026 | 3803 | 359 | 498,440 | 1,353,399 |
| 2027 | 3898 | 361 | 513,352 | 1,151,836 |
| 2028 | 3995 | 363 | 528,698 | 934,927 |
| 2029 | 4095 | 364 | 544,490 | 702,226 |
| 2030 | 4197 | 366 | 560,741 | 453,274 |
| 2031 | 4302 | 368 | 577,465 | 187,598 |
| 2032 | 4410 | 369 | 594,675 | - 95,288 |
| 2033 | 4520 | 371 | 612,384 | - 395,883 |
| 2034 | 4633 | 373 | 630,607 | - 714,701 |
| 2035 | 4749 | 375 | 649,358 | - 1,052,270 |
| 2036 | 4868 | 376 | 668,653 | - 1,409,134 |
| 2037 | 4989 | 378 | 688,506 | - 1,785,851 |
| 2038 | 5114 | 380 | 708,935 | - 2,182,996 |
| 2039 | 5242 | 382 | 729,954 | - 2,601,161 |
| 2040 | 5373 | 383 | 751,581 | - 3,040,954 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 5507 | 385 | 773,834 | - | 3,502,999 |
| 2042 | 5645 | 387 | 796,729 | - | 3,987,939 |
| 2043 | 5786 | 388 | 820,286 | - | 4,496,436 |
| 2044 | 5931 | 390 | 844,522 | - | 5,029,169 |
| 2045 | 6079 | 392 | 869,458 | - | 5,586,837 |
| 2046 | 6231 | 394 | 895,112 | - | 6,170,161 |
| 2047 | 6387 | 395 | 921,506 | - | 6,779,877 |
| 2048 | 6546 | 397 | 948,660 | - | 7,416,748 |
| 2049 | 6710 | 399 | 976,596 | - | 8,081,555 |

Population Increase Rate 2.50%
Water Management Category C
Water Use (LPCD) 256

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2561 | 393 | 367,082 | 2,753,966 |
| 2011 | 2626 | 395 | 378,538 | 2,687,217 |
| 2012 | 2691 | 397 | 390,007 | 2,608,999 |
| 2013 | 2758 | 399 | 401,813 | 2,518,975 |
| 2014 | 2827 | 401 | 413,966 | 2,416,798 |
| 2015 | 2898 | 403 | 426,474 | 2,302,113 |
| 2016 | 2971 | 405 | 439,350 | 2,174,552 |
| 2017 | 3045 | 407 | 452,603 | 2,033,738 |
| 2018 | 3121 | 409 | 466,244 | 1,879,283 |
| 2019 | 3199 | 411 | 480,284 | 1,710,788 |
| 2020 | 3279 | 413 | 494,735 | 1,527,842 |
| 2021 | 3361 | 415 | 509,608 | 1,330,023 |
| 2022 | 3445 | 417 | 524,915 | 1,116,897 |
| 2023 | 3531 | 420 | 540,670 | 888,016 |
| 2024 | 3619 | 422 | 556,884 | 642,922 |
| 2025 | 3710 | 424 | 573,571 | 381,140 |
| 2026 | 3803 | 426 | 590,744 | 102,185 |
| 2027 | 3898 | 428 | 608,417 | - 194,442 |
| 2028 | 3995 | 430 | 626,605 | - 509,258 |
| 2029 | 4095 | 432 | 645,321 | - 842,791 |
| 2030 | 4197 | 434 | 664,583 | - 1,195,584 |
| 2031 | 4302 | 436 | 684,403 | - 1,568,198 |
| 2032 | 4410 | 438 | 704,800 | - 1,961,209 |
| 2033 | 4520 | 440 | 725,788 | - 2,375,208 |
| 2034 | 4633 | 442 | 747,386 | - 2,810,805 |
| 2035 | 4749 | 444 | 769,609 | - 3,268,626 |
| 2036 | 4868 | 446 | 792,477 | - 3,749,314 |
| 2037 | 4989 | 448 | 816,007 | - 4,253,532 |
| 2038 | 5114 | 450 | 840,219 | - 4,781,962 |
| 2039 | 5242 | 452 | 865,131 | - 5,335,304 |
| 2040 | 5373 | 454 | 890,763 | - 5,914,278 |

| | | | | | |
|---|---|---|---|---|---|
| 2041 | 5507 | 456 | 917,136 | - | 6,519,625 |
| 2042 | 5645 | 458 | 944,272 | - | 7,152,108 |
| 2043 | 5786 | 460 | 972,191 | - | 7,812,510 |
| 2044 | 5931 | 462 | 1,000,915 | - | 8,501,636 |
| 2045 | 6079 | 464 | 1,030,468 | - | 9,220,315 |
| 2046 | 6231 | 466 | 1,060,874 | - | 9,969,400 |
| 2047 | 6387 | 469 | 1,092,155 | - | 10,749,766 |
| 2048 | 6546 | 471 | 1,124,338 | - | 11,562,314 |
| 2049 | 6710 | 473 | 1,157,447 | - | 12,407,972 |

Population Increase Rate 2.50%
Water Management Category D (Current)
Water Use (LPCD) 306

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2561 | 469 | 438,464 | 2,682,584 |
| 2011 | 2626 | 472 | 452,471 | 2,541,902 |
| 2012 | 2691 | 475 | 466,180 | 2,387,511 |
| 2013 | 2758 | 477 | 480,292 | 2,219,007 |
| 2014 | 2827 | 479 | 494,818 | 2,035,978 |
| 2015 | 2898 | 482 | 509,770 | 1,837,997 |
| 2016 | 2971 | 484 | 525,161 | 1,624,625 |
| 2017 | 3045 | 487 | 541,002 | 1,395,412 |
| 2018 | 3121 | 489 | 557,307 | 1,149,894 |
| 2019 | 3199 | 492 | 574,090 | 887,593 |
| 2020 | 3279 | 494 | 591,363 | 608,020 |
| 2021 | 3361 | 497 | 609,141 | 310,668 |
| 2022 | 3445 | 499 | 627,438 | - 4,981 |
| 2023 | 3531 | 501 | 646,269 | - 339,461 |
| 2024 | 3619 | 504 | 665,650 | - 693,322 |
| 2025 | 3710 | 506 | 685,596 | - 1,067,129 |
| 2026 | 3803 | 509 | 706,123 | - 1,461,463 |
| 2027 | 3898 | 511 | 727,248 | - 1,876,922 |
| 2028 | 3995 | 514 | 748,988 | - 2,314,122 |
| 2029 | 4095 | 516 | 771,361 | - 2,773,694 |
| 2030 | 4197 | 519 | 794,384 | - 3,256,288 |
| 2031 | 4302 | 521 | 818,076 | - 3,762,575 |
| 2032 | 4410 | 523 | 842,456 | - 4,293,242 |
| 2033 | 4520 | 526 | 867,544 | - 4,848,997 |
| 2034 | 4633 | 528 | 893,360 | - 5,430,568 |
| 2035 | 4749 | 531 | 919,924 | - 6,038,702 |
| 2036 | 4868 | 533 | 947,258 | - 6,674,171 |
| 2037 | 4989 | 536 | 975,384 | - 7,337,766 |
| 2038 | 5114 | 538 | 1,004,324 | - 8,030,301 |
| 2039 | 5242 | 540 | 1,034,102 | - 8,752,614 |
| 2040 | 5373 | 543 | 1,064,740 | - 9,505,565 |

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|---|---|---|---|---|---|
| 2041 | 5507 | 545 | 1,096,265 | - | 10,290,041 |
| 2042 | 5645 | 548 | 1,128,700 | - | 11,106,952 |
| 2043 | 5786 | 550 | 1,162,071 | - | 11,957,234 |
| 2044 | 5931 | 553 | 1,196,406 | - | 12,841,851 |
| 2045 | 6079 | 555 | 1,231,732 | - | 13,761,794 |
| 2046 | 6231 | 558 | 1,268,075 | - | 14,718,080 |
| 2047 | 6387 | 560 | 1,305,467 | - | 15,711,758 |
| 2048 | 6546 | 562 | 1,343,935 | - | 16,743,904 |
| 2049 | 6710 | 565 | 1,383,510 | - | 17,815,625 |

Population Increase Rate 3.00%
Water Management Category A
Water Use (LPCD) 196

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2574 | 301 | 282,353 | 2,838,696 |
| 2011 | 2651 | 303 | 293,249 | 2,857,236 |
| 2012 | 2731 | 305 | 303,912 | 2,865,113 |
| 2013 | 2813 | 307 | 314,950 | 2,861,952 |
| 2014 | 2897 | 309 | 326,377 | 2,847,364 |
| 2015 | 2984 | 311 | 338,207 | 2,820,946 |
| 2016 | 3073 | 312 | 350,452 | 2,782,283 |
| 2017 | 3166 | 314 | 363,128 | 2,730,944 |
| 2018 | 3261 | 316 | 376,249 | 2,666,485 |
| 2019 | 3358 | 318 | 389,830 | 2,588,443 |
| 2020 | 3459 | 320 | 403,888 | 2,496,344 |
| 2021 | 3563 | 322 | 418,438 | 2,389,695 |
| 2022 | 3670 | 324 | 433,498 | 2,267,986 |
| 2023 | 3780 | 325 | 449,085 | 2,130,691 |
| 2024 | 3893 | 327 | 465,216 | 1,977,263 |
| 2025 | 4010 | 329 | 481,912 | 1,807,140 |
| 2026 | 4130 | 331 | 499,191 | 1,619,739 |
| 2027 | 4254 | 333 | 517,072 | 1,414,456 |
| 2028 | 4382 | 335 | 535,577 | 1,190,667 |
| 2029 | 4513 | 337 | 554,727 | 947,729 |
| 2030 | 4649 | 339 | 574,545 | 684,973 |
| 2031 | 4788 | 340 | 595,052 | 401,711 |
| 2032 | 4932 | 342 | 616,272 | 97,228 |
| 2033 | 5080 | 344 | 638,230 | - 229,213 |
| 2034 | 5232 | 346 | 660,950 | - 578,374 |
| 2035 | 5389 | 348 | 684,460 | - 951,045 |
| 2036 | 5551 | 350 | 708,785 | - 1,348,041 |
| 2037 | 5718 | 352 | 733,954 | - 1,770,206 |
| 2038 | 5889 | 354 | 759,995 | - 2,218,412 |
| 2039 | 6066 | 355 | 786,938 | - 2,693,561 |
| 2040 | 6248 | 357 | 814,813 | - 3,196,586 |

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|---|---|---|---|---|---|
| 2041 | 6435 | 359 | 843,653 | - | 3,728,450 |
| 2042 | 6628 | 361 | 873,490 | - | 4,290,151 |
| 2043 | 6827 | 363 | 904,358 | - | 4,882,720 |
| 2044 | 7032 | 365 | 936,291 | - | 5,507,222 |
| 2045 | 7243 | 367 | 969,327 | - | 6,164,761 |
| 2046 | 7460 | 369 | 1,003,503 | - | 6,856,474 |
| 2047 | 7684 | 370 | 1,038,856 | - | 7,583,541 |
| 2048 | 7914 | 372 | 1,075,427 | - | 8,347,179 |
| 2049 | 8152 | 374 | 1,113,258 | - | 9,148,648 |

Population Increase Rate 3.00%
Water Management Category B
Water Use (LPCD) 216

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2574 | 331 | 311,193 | 2,809,856 |
| 2011 | 2651 | 334 | 323,172 | 2,798,472 |
| 2012 | 2731 | 336 | 334,923 | 2,775,339 |
| 2013 | 2813 | 338 | 347,088 | 2,740,040 |
| 2014 | 2897 | 340 | 359,681 | 2,692,148 |
| 2015 | 2984 | 342 | 372,718 | 2,631,219 |
| 2016 | 3073 | 344 | 386,213 | 2,556,796 |
| 2017 | 3166 | 346 | 400,182 | 2,468,403 |
| 2018 | 3261 | 348 | 414,642 | 2,365,550 |
| 2019 | 3358 | 350 | 429,609 | 2,247,731 |
| 2020 | 3459 | 353 | 445,101 | 2,114,419 |
| 2021 | 3563 | 355 | 461,136 | 1,965,072 |
| 2022 | 3670 | 357 | 477,732 | 1,799,128 |
| 2023 | 3780 | 359 | 494,910 | 1,616,008 |
| 2024 | 3893 | 361 | 512,688 | 1,415,109 |
| 2025 | 4010 | 363 | 531,087 | 1,195,812 |
| 2026 | 4130 | 365 | 550,128 | 957,472 |
| 2027 | 4254 | 367 | 569,835 | 699,427 |
| 2028 | 4382 | 369 | 590,228 | 420,988 |
| 2029 | 4513 | 371 | 611,332 | 121,444 |
| 2030 | 4649 | 373 | 633,172 | - 199,938 |
| 2031 | 4788 | 375 | 655,771 | - 543,920 |
| 2032 | 4932 | 377 | 679,157 | - 911,288 |
| 2033 | 5080 | 379 | 703,355 | - 1,302,854 |
| 2034 | 5232 | 381 | 728,394 | - 1,719,460 |
| 2035 | 5389 | 383 | 754,303 | - 2,161,973 |
| 2036 | 5551 | 386 | 781,110 | - 2,631,295 |
| 2037 | 5718 | 388 | 808,847 | - 3,128,353 |
| 2038 | 5889 | 390 | 837,546 | - 3,654,110 |
| 2039 | 6066 | 392 | 867,238 | - 4,209,558 |
| 2040 | 6248 | 394 | 897,958 | - 4,795,727 |

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|---|---|---|---|---|---|
| 2041 | 6435 | 396 | 929,740 | - | 5,413,678 |
| 2042 | 6628 | 398 | 962,622 | - | 6,064,511 |
| 2043 | 6827 | 400 | 996,639 | - | 6,749,361 |
| 2044 | 7032 | 402 | 1,031,831 | - | 7,469,404 |
| 2045 | 7243 | 404 | 1,068,238 | - | 8,225,853 |
| 2046 | 7460 | 406 | 1,105,901 | - | 9,019,965 |
| 2047 | 7684 | 408 | 1,144,862 | - | 9,853,037 |
| 2048 | 7914 | 410 | 1,185,165 | - | 10,726,413 |
| 2049 | 8152 | 412 | 1,226,856 | - | 11,641,480 |

Population Increase Rate 3.00%
Water Management Category C
Water Use (LPCD) 256

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2574 | 393 | 368,873 | 2,752,176 |
| 2011 | 2651 | 396 | 383,019 | 2,680,946 |
| 2012 | 2731 | 398 | 396,946 | 2,595,789 |
| 2013 | 2813 | 401 | 411,363 | 2,496,215 |
| 2014 | 2897 | 403 | 426,289 | 2,381,715 |
| 2015 | 2984 | 406 | 441,739 | 2,251,765 |
| 2016 | 3073 | 408 | 457,733 | 2,105,821 |
| 2017 | 3166 | 410 | 474,290 | 1,943,320 |
| 2018 | 3261 | 413 | 491,427 | 1,763,682 |
| 2019 | 3358 | 415 | 509,166 | 1,566,305 |
| 2020 | 3459 | 418 | 527,527 | 1,350,567 |
| 2021 | 3563 | 420 | 546,531 | 1,115,825 |
| 2022 | 3670 | 423 | 566,201 | 861,412 |
| 2023 | 3780 | 425 | 586,560 | 586,642 |
| 2024 | 3893 | 428 | 607,630 | 290,801 |
| 2025 | 4010 | 430 | 629,436 | - 26,846 |
| 2026 | 4130 | 432 | 652,004 | - 367,061 |
| 2027 | 4254 | 435 | 675,360 | - 730,631 |
| 2028 | 4382 | 437 | 699,530 | - 1,118,372 |
| 2029 | 4513 | 440 | 724,542 | - 1,531,125 |
| 2030 | 4649 | 442 | 750,426 | - 1,969,762 |
| 2031 | 4788 | 445 | 777,210 | - 2,435,183 |
| 2032 | 4932 | 447 | 804,926 | - 2,928,320 |
| 2033 | 5080 | 450 | 833,606 | - 3,450,137 |
| 2034 | 5232 | 452 | 863,282 | - 4,001,631 |
| 2035 | 5389 | 454 | 893,989 | - 4,583,830 |
| 2036 | 5551 | 457 | 925,760 | - 5,197,801 |
| 2037 | 5718 | 459 | 958,634 | - 5,844,646 |
| 2038 | 5889 | 462 | 992,647 | - 6,525,504 |
| 2039 | 6066 | 464 | 1,027,837 | - 7,241,552 |
| 2040 | 6248 | 467 | 1,064,246 | - 7,994,009 |

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|---|---|---|---|---|---|
| 2041 | 6435 | 469 | 1,101,914 | - | 8,784,135 |
| 2042 | 6628 | 472 | 1,140,885 | - | 9,613,231 |
| 2043 | 6827 | 474 | 1,181,202 | - | 10,482,644 |
| 2044 | 7032 | 476 | 1,222,911 | - | 11,393,766 |
| 2045 | 7243 | 479 | 1,266,060 | - | 12,348,037 |
| 2046 | 7460 | 481 | 1,310,697 | - | 13,346,945 |
| 2047 | 7684 | 484 | 1,356,873 | - | 14,392,029 |
| 2048 | 7914 | 486 | 1,404,640 | - | 15,484,880 |
| 2049 | 8152 | 489 | 1,454,051 | - | 16,627,143 |

Population Increase Rate 3.00%
Water Management Category D (Current)
Water Use (LPCD) 306

| Year | Population | LCPD | Cu. M./ Year | Volume of Lake |
|---|---|---|---|---|
| 1994 | 1845 | 450 | 303,041 | 3,469,780 |
| 1995 | 1883 | 450 | 309,232 | 3,464,452 |
| 1996 | 1921 | 450 | 315,550 | 3,453,688 |
| 1997 | 1960 | 450 | 321,997 | 3,437,376 |
| 1998 | 2000 | 450 | 328,575 | 3,415,403 |
| 1999 | 2041 | 450 | 335,288 | 3,387,653 |
| 2000 | 2083 | 450 | 342,138 | 3,354,008 |
| 2001 | 2126 | 450 | 349,128 | 3,314,349 |
| 2002 | 2169 | 450 | 356,260 | 3,268,551 |
| 2003 | 2213 | 450 | 363,539 | 3,216,490 |
| 2004 | 2259 | 450 | 370,966 | 3,158,037 |
| 2005 | 2305 | 450 | 378,545 | 3,093,063 |
| 2006 | 2352 | 450 | 386,278 | 3,021,433 |
| 2007 | 2400 | 450 | 394,170 | 2,943,012 |
| 2008 | 2449 | 459 | 410,704 | 2,857,661 |
| 2009 | 2499 | 469 | 427,770 | 2,809,260 |
| 2010 | 2574 | 469 | 440,603 | 2,680,446 |
| 2011 | 2651 | 473 | 457,827 | 2,534,407 |
| 2012 | 2731 | 476 | 474,474 | 2,371,722 |
| 2013 | 2813 | 479 | 491,708 | 2,191,803 |
| 2014 | 2897 | 482 | 509,548 | 1,994,044 |
| 2015 | 2984 | 485 | 528,017 | 1,777,817 |
| 2016 | 3073 | 488 | 547,134 | 1,542,471 |
| 2017 | 3166 | 491 | 566,924 | 1,287,336 |
| 2018 | 3261 | 494 | 587,409 | 1,011,716 |
| 2019 | 3358 | 496 | 608,612 | 714,893 |
| 2020 | 3459 | 499 | 630,560 | 396,122 |
| 2021 | 3563 | 502 | 653,276 | 54,635 |
| 2022 | 3670 | 505 | 676,787 | - 310,363 |
| 2023 | 3780 | 508 | 701,122 | - 699,696 |
| 2024 | 3893 | 511 | 726,307 | - 1,114,214 |
| 2025 | 4010 | 514 | 752,373 | - 1,554,798 |
| 2026 | 4130 | 517 | 779,349 | - 2,022,358 |
| 2027 | 4254 | 520 | 807,266 | - 2,517,834 |
| 2028 | 4382 | 523 | 836,156 | - 3,042,202 |
| 2029 | 4513 | 526 | 866,054 | - 3,596,467 |
| 2030 | 4649 | 529 | 896,993 | - 4,181,671 |
| 2031 | 4788 | 532 | 929,009 | - 4,798,891 |
| 2032 | 4932 | 534 | 962,139 | - 5,449,241 |
| 2033 | 5080 | 537 | 996,420 | - 6,133,871 |
| 2034 | 5232 | 540 | 1,031,892 | - 6,853,974 |
| 2035 | 5389 | 543 | 1,068,596 | - 7,610,781 |
| 2036 | 5551 | 546 | 1,106,573 | - 8,405,565 |
| 2037 | 5718 | 549 | 1,145,867 | - 9,239,643 |
| 2038 | 5889 | 552 | 1,186,523 | - 10,114,377 |
| 2039 | 6066 | 555 | 1,228,587 | - 11,031,175 |
| 2040 | 6248 | 558 | 1,272,107 | - 11,991,492 |

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|---|---|---|---|---|---|
| 2041 | 6435 | 561 | 1,317,132 | - | 12,996,835 |
| 2042 | 6628 | 564 | 1,363,714 | - | 14,048,761 |
| 2043 | 6827 | 567 | 1,411,906 | - | 15,148,877 |
| 2044 | 7032 | 570 | 1,461,761 | - | 16,298,849 |
| 2045 | 7243 | 572 | 1,513,337 | - | 17,500,398 |
| 2046 | 7460 | 575 | 1,566,693 | - | 18,755,302 |
| 2047 | 7684 | 578 | 1,621,887 | - | 20,065,400 |
| 2048 | 7914 | 581 | 1,678,983 | - | 21,432,594 |
| 2049 | 8152 | 584 | 1,738,046 | - | 22,858,851 |