



City Council Agenda Bill

20143

Bill Number

Subject: 2013 Water System Plan Update Approval

Summary Statement: In 2012 at the direction of the City Council, the City began work on an update to the Comprehensive Water System Plan. As required by state law, the Water System Plan is required to be updated on a regular basis. The Water System Plan, once approved by the City and appropriate state agencies, is incorporated into the overall City Comprehensive Plan. The draft plan has been reviewed by the public, County and state agencies; all comments have been addressed and a SEPA determination has been issued. The Water System Plan is ready for final, formal approval by the City Council. With this approval, the Water System Plan will be used in managing the system and incorporated as a technical element of the Comprehensive Plan.

Previous Council Action: March 2013 Council approval of draft for submittal and review; December 2012 adoption of service charge revisions; April 2012 Council direction to proceed with Water System Plan update.

Fiscal Impact: Projects and policies contained in the water system set the agenda for future actions by the water utility. The plan includes a financial analysis and rate study to support the recommendations of the plan.

Funding Source: Water Fund

Attachments: Resolution
Executive Summary - Draft 2013 Water System Plan
NOTE: Full Water System Plan Update available on the City's website under Quick Links
<http://www.cob.org/services/utilities/water.aspx>
Public Hearing Notice
Written Comment to City Council

| Meeting Activity | Meeting Date | Staff Recommendation | Presented By | Time |
|--|--------------|----------------------|---|--------|
| Public Hearing Council Vote Requested | 14-Oct-2013 | Pass Resolution | Ted Carlson, PW Director Eric Johnston, Asst. PW Director, Operations | 15 min |

Council Committee:
Public Works / Public Safety
Stan Snapp, Chair
Terry Bornemann; Gene Knutson

Agenda Bill Contact:
Eric Johnston 360-778-7710
ecjohnston@cob.org

| Reviewed By | Initials | Date |
|--------------------------|-----------|---------|
| Ted Carlson, PW Director | <i>TC</i> | 9/24/13 |

Committee Actions:

| | | |
|----------------|-------------------|--------------------|
| Legal Mayor | <i>MTS KL</i> | 9/25/13 9.24.13 |
|----------------|-------------------|--------------------|

Council Action:

RESOLUTION NO. _____

RESOLUTION APPROVING THE CITY OF BELLINGHAM 2013 WATER SYSTEM PLAN

WHEREAS, the City of Bellingham is required to maintain and update a water system plan in accordance with WAC 246-290; and

WHEREAS, the water system plan sets forth the policies, practices and capital projects necessary to maintain and operate the water system and protect the public health and welfare of the citizens of Bellingham; and

WHEREAS, as directed by the City Council, staff with the assistance of the consulting firm CH2M Hill has prepared a Water System Plan conforming to the state requirements; and,

WHEREAS, as directed by the City Council, staff with the assistance of the consulting firm CH2M Hill has prepared a Water System Plan Update conforming to State requirements; and,

WHEREAS, the plan has been reviewed by the Washington State Department of Health and Department of Ecology; and,

WHEREAS, the plan is been reviewed for conformance with the State Environmental Policy Act (SEPA) as required and a determination of non-significance has been issued; and,

WHEREAS, the plan has been available for review by customers inside the City's service area, all adjacent water purveyors and the general public as required; and

WHEREAS, the policies and projects contained in the 2013 City of Bellingham Water System Plan Update are consistent with the goals and objectives of the City and generally conform to the overall comprehensive plan.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF BELLINGHAM THAT:

The City of Bellingham 2013 Water System Plan Update, from which the executive summary is attached and a full version is available through the City of Bellingham website, is hereby approved for use.

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

PASSED by the Council this _____ day of _____, 2013.

Council President

APPROVED by me this _____ day of _____, 2013.

Mayor

ATTEST: _____
Finance Director

APPROVED AS TO FORM:

Office of the City Attorney

City of Bellingham
City Attorney
210 Lottie Street
Bellingham, Washington 98225
360-778-8270

City of Bellingham

2013 Water System Plan Update

January 2013

This document has been prepared under the
direction of a registered professional engineer.



P.O. Box 91600

BELLEVUE, WA 98004

1. Executive Summary

ES-1 Introduction

This update of the City's 2009 Water System Plan was undertaken primarily to incorporate the planned Implementation of Dissolved Air Flotation (DAF) at the Whatcom Falls Water Treatment Plant. This update includes analysis related to this key treatment issue that arose since completion of the 2009 Water System Plan, as well as analysis related to recent modifications to the distribution system related to distribution system water quality. Much of the content of the 2009 Water System Plan remains valid – other than where it is revised herein – and continues to document the City's overall plan for its water system. This document is hereby referred to herein as the Water System Plan Update (WSP Update) and is intended to complement and supplement the 2009 Water System Plan to form the City's overall water system planning approach for the 6-year and 20-year planning horizons – beginning in 2013.

ES-2 Water Use

The WSP Update includes water use data from 2008, 2009, 2010, 2011, and partial data from 2012. The 2009 Water System Plan included historical water use data only through 2007. The additional years of historical water use data, combined with the data presented in the 2009 Water System Plan as well as water use data from the 1990s enables identification of changing trends in water use. The most notable trend in historical water use downward with respect to maximum day demand (MDD) and flat to slightly declining for average day demand (ADD) – despite the fact that population and water service connections have increased. Historical water use is presented in Figure E-1.

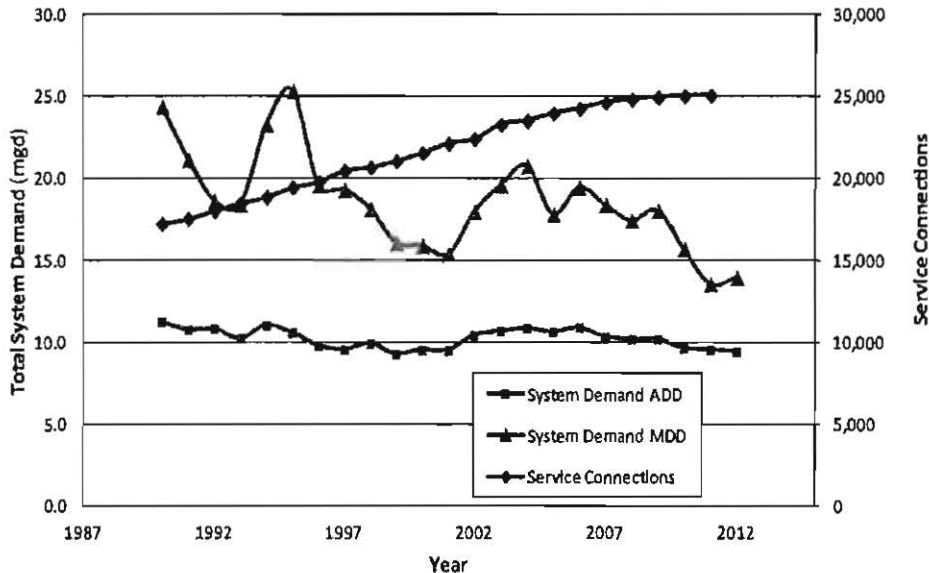


FIGURE E-1
Historical Water Use and Service Connections

Future water use was estimated by escalating the 2012 ADD equivalent to an annual population growth rate of 1.3 percent. This 1.3 percent annual growth rate is just over half as much as the 2.5 percent annual growth rate that was used in the 2009 Water System Plan for estimating future water use, and reflects an updated measure and understanding of local growth trends. Estimated future water use is presented in Table E-1. It is important to estimate future water use as accurately as possible to assess the need for infrastructure improvements. Updated historical and estimated future water use is substantially less than the same from the



2009 Water System Plan. These updates resulted in the deferral distribution system pumping and storage improvements.

TABLE E-1
Estimated Future ADD, MDD, ERUs, and WTP Production

| Year | Total System Demand | | Equivalent Residential Units (ERUs) | WTP Production (mgd) |
|------|---------------------|-----------|-------------------------------------|----------------------|
| | ADD (mgd) | MDD (mgd) | | |
| 2012 | 9.4 | 14.0 | 47,236 | 14.6 |
| 2018 | 10.2 | 16.7 | 51,042 | 17.3 |
| 2022 | 10.8 | 17.5 | 53,749 | 18.2 |
| 2032 | 12.2 | 20.0 | 61,159 | 20.8 |

ES-3 Distribution System Analysis

The major elements that comprise the City's distribution system are storage reservoirs, pump stations, and distribution system pipelines. The City's water storage and pump station facilities were evaluated based on updated actual water use and updated estimates of future water use, which resulted in deferral of improvement needs presented in the 2009 Water System Plan.

The bulk of the City's distribution system storage is contained within its lowest pressure zone – the 276 North Pressure Zone. Water flows into this zone by gravity from the Whatcom Falls Water Treatment Plant. Relatively small storage reservoirs serve higher-elevation pressure zones. Pump stations lift water to these higher-elevation pressure zones. Because most all of the City's pump stations have capacities greater than peak hour demand within the pressure zones they supply, storage from the lower 276 North Pressure Zone can be counted on to serve these upper-elevation pressure zones.

The updated pump station and storage evaluation completed as part of this WSP Update resulted in the improvements presented in Table E-2. However, none of these improvements are planned within the 6-year planning horizon.

TABLE E-2
Summary of Planned Pumping and Storage Improvements

| Improvement | ID Number |
|---|-----------|
| Pumping | |
| Kearney Road Pump Station | PS-1 |
| Balsam Lane Pump Station Capacity Expansion | PS-2 |
| 40 th Street Pump Station | PS-3 |
| 980 Pump Station | PS-4 |
| King Mountain Pump Station | PS-5 |
| Storage | |
| Samlsh Hill Reservoir | ST-1 |
| King Mountain Reservoir | ST-2 |

ES-4 Treatment Analysis

In late July and August of 2009 the filters at the City's WTP began clogging much earlier in filter runs than typical. Filter runs became substantially shorter than normal, requiring more frequent filter backwashing. The result of shorter filter runs and increased filter backwashing was greatly reduced WTP capacity – to the point the City implemented mandatory water restrictions, for the first time, to reduce customer demand. It should



be noted that voluntary water restrictions are implemented each summer as a means of encouraging conservation during this time of typically-high customer water demand. The water restrictions were successful in reducing customer demand to match WTP capacity. Toward the end of August and into September, filter runs gradually began to return to normal and customer demand dropped, as it customarily does at that time of the year.

Filter clogging was attributed to algae in Lake Whatcom. Monitoring revealed higher than typical counts of most algae species. Although the reasons for the intense algae bloom of the summer of 2009 is the subject of varied speculation, historical and on-going algae monitoring shows that summertime algae blooms in Lake Whatcom have been increasing over the past decade. It is speculated that despite efforts to reverse this trend, summertime algae blooms in Lake Whatcom will continue to increase in intensity and duration over the near-term future. Increased Lake Whatcom algae could again result in summertime algae blooms that prevent the WTP from treating sufficient supply to meet customer demand in the future.

In response to the 2009 algae event, the City completed a study that is presented in a report entitled "Filter-Clogging Algae Mitigation Evaluation," dated June 2012 – hereinafter referred to as the Algae Mitigation Report. The Algae Mitigation Report evaluated treatment, intake, and lake management improvements and included a recommendation for the City to implement Dissolved Air Flotation (DAF) to mitigate adverse algae conditions. As presented in the Algae Mitigation Report, DAF was determined to be the technically superior treatment approach with respect to mitigating the algae problem, as well as being one of the lower cost treatment alternatives. DAF was also determined to be technically superior and far less costly than any of the intake alternatives. Lake Management was determined to be inadequate as a stand-alone mitigation approach because of the many years that will pass before improved water quality with respect to algae will be observed.

In general, the schedule for DAF implementation includes preliminary and detailed design beginning in 2014 – including the DOH-required submittals for the Project Report and the Construction Documents. Construction and commissioning would begin in late 2015 and extend into 2017.

ES-5 Improvement Program

The Improvement Program presented in Table E-3 replaces what was developed for the 2009 Water System Plan. The largest capital improvement over the 6-year planning horizon is the implementation of DAF at the Whatcom Falls Water Treatment Plant.

ES-6 Financial Program

The City recently completed a rate study for its water and sewer utilities, entitled "2012 Water and Sewer Rate Update." The study presented a 6-year financial plan from 2013 through 2018. Key findings and recommendations resulting from the study include rate increases of 9.0% in 2013, 8.0% per year from 2014 through 2016, 6.0% for 2017 and 2018. The rate study included accounting for capital investment that matches the quantity presented in the Improvement Program in Table E-3. The rate increases planned for implementation by the City are anticipated to be more than adequate to cover utility expenses, including planned capital improvements.



TABLE E-3
Improvement Program

| Project | ID Number | Total Project Cost | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 – 2032 |
|---|-----------|---------------------|--------------------|--------------------|--------------------|---------------------|--------------------|--------------------|----------------|
| Kearney Road Pump Station | PS-1 | – | – | – | – | – | – | – | X ¹ |
| Balsam Lane Pump Station Capacity Expansion | PS-2 | – | – | – | – | – | – | – | X |
| 40 th Street Pump Station | PS-3 | – | – | – | – | – | – | – | X |
| Future 980 Pump Station | PS-4 | – | – | – | – | – | – | – | X |
| King Mountain Pump Station | PS-5 | – | – | – | – | – | – | – | X |
| Samish Hill Reservoir | ST-1 | – | – | – | – | – | – | – | X |
| King Mountain Reservoir | ST-2 | – | – | – | – | – | – | – | X |
| Dissolved Air Flotation | T-1 | \$11,000,000 | – | \$500,000 | \$1,000,000 | \$6,000,000 | \$3,500,000 | – | – |
| Marietta Re-Chlorination Station | T-2 | – | – | – | – | – | – | – | X |
| Disinfection Improvements | T-3 | \$1,000,000 | – | \$100,000 | \$200,000 | \$700,000 | – | – | – |
| Screening Relocation Improvements | T-4 | \$2,000,000 | – | \$250,000 | \$250,000 | \$1,500,000 | – | – | – |
| Water System Plan Update | PN-1 | \$100,000 | – | – | – | – | – | \$100,000 | – |
| Metering Program | M-6 | \$8,500,000 | – | \$2,500,000 | \$2,500,000 | \$2,500,000 | \$1,000,000 | – | – |
| Annual Water Main Replacement Program | PL-1 | \$12,000,000 | \$2,000,000 | \$2,000,000 | \$2,000,000 | \$2,000,000 | \$2,000,000 | \$2,000,000 | – |
| Total | – | \$34,600,000 | \$2,000,000 | \$5,050,000 | \$4,750,000 | \$12,700,000 | \$6,500,000 | \$2,100,000 | – |

¹ Each of the projects designated with an "X" in the timeframe beyond the 6-year planning horizon were not incorporated into the financial program for the water utility. Therefore, estimated costs were not developed for these improvements.



BELLINGHAM CITY COUNCIL

210 Lottie Street, Bellingham, Washington 98225
Telephone (360) 778-8200 Fax (360)778-8101
Email: cmail@cob.org Website: www.cob.org

BELLINGHAM CITY COUNCIL NOTICE OF PUBLIC HEARING

Notice is hereby given that the Bellingham City Council will hold a public hearing on **October 14, @ 7:00 PM**, or as soon thereafter as possible, in the **City Council Chambers, City Hall, 210 Lottie Street, Bellingham, Washington**, to take public comment on the following:

Final consideration of the City of Bellingham 2013 Water System Plan update.

Detailed information can be found at: <http://www.cob.org/services/utilities/water.aspx>

Staff Contact: Eric Johnston, Assist. Director PW (360) 778-7710 or ecjohnston@cob.org

Anyone wishing to comment on this topic is invited to attend; or if unable to attend, to send your comments, in writing to the Council Office, 210 Lottie Street, or email to cmail@cob.org, or fax to 778-8101, to be received prior to 10:00 a.m., Wednesday, October 9, to be included in the agenda packet. Comment received after that time will be distributed to Council but not included in the published meeting materials.

FOR OUR CITIZENS WITH SPECIAL NEEDS, the Council Chambers is fully accessible. Elevator access to the second floor is available at City Hall's west entrance. Hearing assistance is available and a receiver may be checked out through the clerk prior to the evening session. For additional accommodations, persons are asked to contact the Legislative Assistant at 778-8200 in advance of the meeting. Thank you.

Publication date: Friday, October 4, 2013

JACK WEISS
Council Member
1st Ward
738-2103
JWeiss@cob.org

GENE KNUTSON
Council Member
2nd Ward
734-4686
GKnutson@cob.org

CATHY LEHMAN
Council Member
3rd Ward
224-8877
CLehman@cob.org

STAN SNAPP
Council Member
4th Ward
305-0607
SSnapp@cob.org

TERRY BORNEMANN
Council Member
5th Ward
305-0606
TBornemann@cob.org

MICHAEL LILLIQUIST
Council Member
6th Ward
920-1583
MLilliquist@cob.org

SETH FLEETWOOD
Council Member
At Large
671-3299
SFleetwood@cob.org



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6th Ward
920-1583
MLilliquist@cob.org

SETH FLEETWOOD
Council Member
At Large
671-3299
SFleetwood@cob.org

Walker, J Lynne L.

From: Marian Beddill <marian@noneofthethree.org>
Sent: Monday, October 07, 2013 9:46 AM
To: Fogelsong, Clare G.; Johnston, Eric C.
Cc: CC - Shared Department
Subject: Clarify the annual "water use" numbers

Dear City of Bellingham;

The COB has scheduled a Council thing next week. :
"FINAL CONSIDERATION OF THE CITY OF BELLINGHAM
2013 WATER SYSTEM PLAN UPDATE."

And has just distributed the document:

20061002_water_consumption_and_water_conservation.pdf

This includes a chart of water use from 1990 - 2005. The values are relatively constant. That suggests to me that it does NOT include the water formerly delivered to the now-closed GP mill on the waterfront... but the accompanying text does not mention this.

Please clarify the history of the GP usage, together with the consolidated other uses, from 1990 - 2012 (or as close to 2012 as can be established.)

Marian Beddill

Walker, J Lynne L.

From: Johnston, Eric C.
Sent: Tuesday, October 08, 2013 9:18 AM
To: Marian Beddill
Cc: CC - Shared Department; Fogelsong, Clare G.; Carlson, Ted A.
Subject: RE: Clarify the annual "water use" numbers

Ms. Beddill,

The data in the 2006 document titled "20061002_water_consumption_and_water_conservation" is for water produced and treated through the Whatcom Falls water treatment plant for all treated water customers of the City of Bellingham. Raw, untreated, or industrial water that is currently provided to the PSE energy production facility and historically provided to the GP facility is not included in this report.

Current and historic usage trends through 2012 of treated water from the Whatcom Fall treatment plant are included as part of the water system plan documentation. I've included an image from the document with this email but doubt that it will come through clear enough to read. The link below will take you to the entire document. Chapter 2 is specific to historic and future trends for water use and serve as a basis for much of the utility planning. Note that the reduced per capita consumption trend in Bellingham over the last 2 decades is consistent with patterns throughout the industry and is likely to continue as conservation measures continue. These conservations measure include plumbing code required low flow fixtures, service metering, conservation based rate structures and education.

Please let us know if you have any other questions or if we can be of any further assistance.

Thanks.

<http://www.cob.org/documents/pw/utilities/water-comp-plan-update-agency-review-03-2013.pdf>

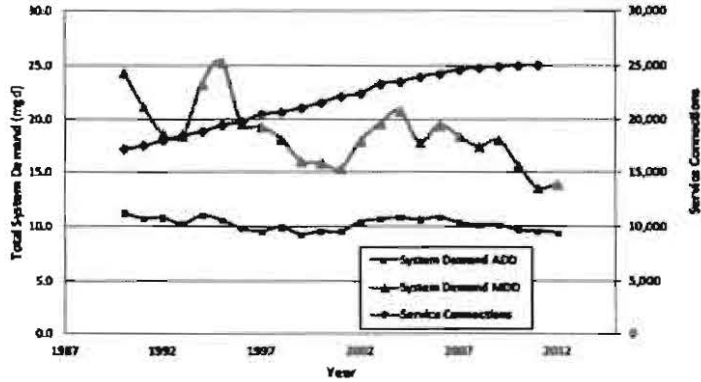


FIGURE 2-1
Historical Water Use and Service Connections

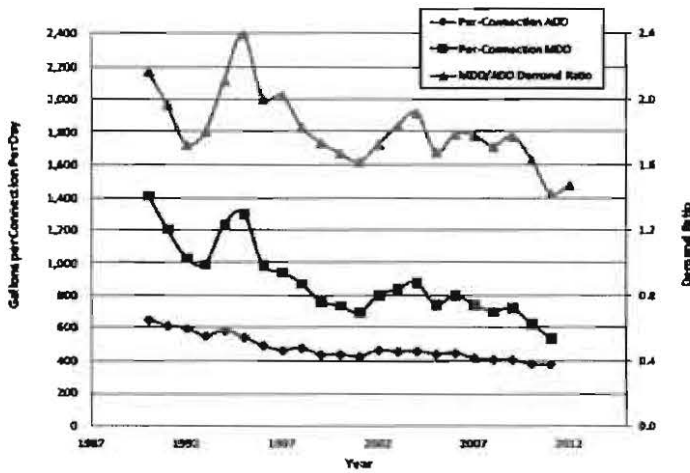


FIGURE 2-2
Historical Per-Connection Water Use and Demand Ratio

Eric Johnston, P.E.
Assistant Public Works Director- Operations
2221 Pacific St. Bellingham, WA 98229
360.778.7700
360.778.7710 (direct)
360.202.2312 (mobile/text)
ecjohnston@cob.org
All incoming/outgoing e-mail messages are subject to public disclosure requirements per RCW 42.56

From: Marian Beddill [mailto:marian@noneofthethree.org]
Sent: Monday, October 7, 2013 9:46 AM
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Marian Beddill

Walker, J Lynne L.

From: Marian Beddill <marian@noneofthethree.org>
Sent: Tuesday, October 08, 2013 11:51 AM
To: Johnston, Eric C.
Cc: CC - Shared Department; Fogelsong, Clare G.; Carlson, Ted A.; Lilliquist, Michael W.
Subject: Re: Clarify the annual "water use" numbers

Mr Johnson;

I appreciate your reply, clarifying one part of what I asked about (that the referenced document does NOT include water delivered to the GP site.

I ask the City to edit that document, to place that statement in the text, for the benefit of all future viewers. (And, hopefully, to make it known that such a change has been made.)

Also, please do the following things:

- * make available to the public similar data of the last dozen or so years, showing the quantification (in a similar manner) of that industrial water;
- * and likewise show data of the diversion quantities on the calendar, from the Middle Fork capture/diversion point, into the basin of the LW Reservoir.
- * it would also be interesting (though perhaps the quantities would be less precise) to know the flows leaving the Reservoir as discharge into Whatcom Falls Creek, at the downstream dam near Bloedel-Donovan Park.

Again, thanks;

Marian Beddill

On 10/8/2013 9:18 AM, Johnston, Eric C. wrote:

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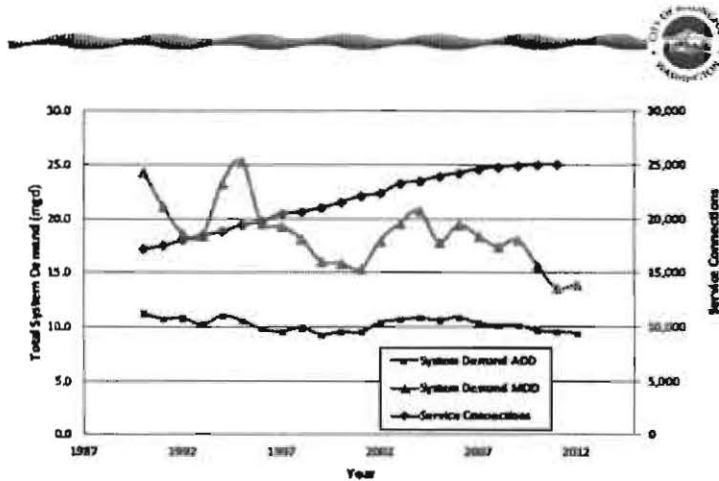


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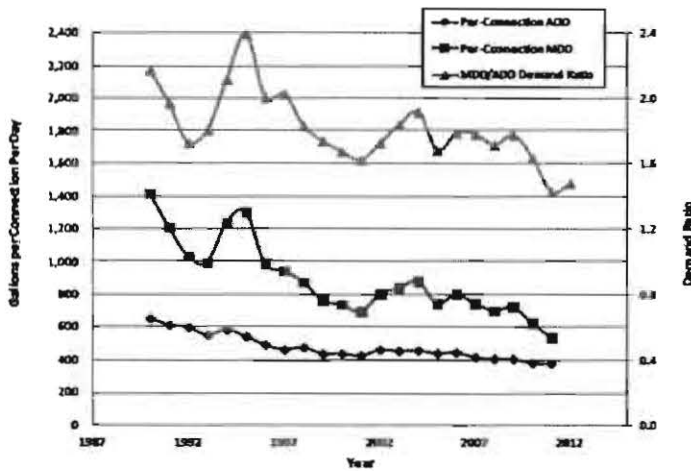


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