

# **CITY OF MERIDIAN IDAHO**



## **2011 WATER CONSERVATION PLAN**

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## **Section 1 – Introduction and Summary**

Meridian Idaho is a community situated in a high desert location that may have been summarily dismissed as uninhabitable by people traveling along the Oregon Trail to greener lands along the west coast. Meridian only receives about 12 inches of precipitation per year. The native landscape is sparse, mostly treeless and the summers are hot and dry.

The federal construction of water storage dams and irrigation canals allowed surface water from the Boise River watershed to be delivered throughout the area, including virtually all land in the past, present and future city limits of Meridian. This surface water supply has enabled the development of agriculture and industry.

Although Meridian land is served by surface water providers for irrigation, the City relies exclusively on groundwater for its municipal water source. This groundwater is present both from the effects of leaking canals, long term flood irrigation and from natural recharge. The City operates and maintains 18 wells that pump approximately 3 billion gallons of groundwater annually. The City has monitored pressures in the aquifer system over the last several years and has not found any statistically significant decline that would indicate water is being used faster than recharge is occurring.

In summary, the City of Meridian has not experienced water supply shortages and future water supplies appear to be assured for many years. So, Why Conserve?

Even if the details of how are complex, the answer to why is simple: Although it is plentiful now, annual water supply for Meridian residents by surface water or groundwater is a finite resource. It is one factor that has the potential to limit growth and industry in the area and in the City itself. Not only can a shortage of clean water limit growth, but there are other negative consequences including the economic burden of increased cost of water on residents and businesses.

In addition to affecting the overall supply of water, conservation can:

- Decrease reliance on development of new sources of water supply
- Delay or reduce capital investments for water and wastewater
- Reduce operation and maintenance costs for water and wastewater
- Improve supply reliability
- Encourage the most beneficial use of available water for residents of Meridian and the surrounding area

### ***Purpose and Scope of the Plan***

The overriding purpose of adopting and implementing a water conservation plan is to ensure an ample supply of clean, safe, affordable water for current and future City residents. Additionally, studying water conservation can help define and adjust limits for our current water supply.

## **Purpose**

The purpose of the conservation plan is to preserve, protect and extend the useful life of the City's current water supplies by reducing per-capita water consumption.

## **Scope**

As part of the 2011 Water Master Plan, the City held a workshop to discuss long-term water supply issues. The workshop was attended by City staff, elected officials, and subject matter experts. As a result of that effort and further direction, the following scope was developed for the Water Conservation Plan:

### ***Plan Term***

The objectives of this plan have a time frame from 1-10 years. Because this is the City's first formal Water Conservation Plan, there are many unknown factors that will influence future versions. Primarily, it is unknown to what extent different conservation actions will influence residents. The overall plan should be re-evaluated in 3-5 years, however, specific conservation actions should take place or be evaluated annually or even on shorter schedules as indicated in the Conservation Actions matrix.

### ***Groundwater Vs Surface Water***

The City of Meridian currently uses groundwater as its only source of potable water for residents. The City currently has no control over the delivery or allocation of surface water to residents. In fact, since residents pay a fixed fee for surface water regardless of the quantity used, there is no fiscal incentive for them to conserve.

This paradigm can result in short-sighted water management. In years with a shortage of surface water supply, additional needs may be met through groundwater pumping, thereby increasing demand on this resource, which is the sole supply for the City's potable water. In years with a surplus of surface water, there is no corresponding benefit to the groundwater supply (other than a potential increase in aquifer recharge). Conservation of surface water and changes in delivery practices during surplus years could lead to a reserve supply in storage to help in shortage years.

Regardless of current delivery practices, the City staff and elected officials realize that the yearly supply of surface water is a variable and finite resource that has a great impact on the economy and quality of life for Meridian residents.

Even if surface water conservation has no immediate benefit or need for residents, population growth, climate change, and other factors will likely change that in the future.

Understanding that the culture of water conservation is developed over time, this plan recognizes that starting the effort before there is a dire need will help ensure future success. For these reasons, this plan encourages the conservation of both groundwater and surface water.

### ***Plan Data***

Much of the data used in this plan was assembled and presented as part of the 2011 Water Master Plan update for the City of Meridian. This plan was developed by Murray, Smith and

Associates and staff from Meridian Public Works Engineering and Water Operations. The Water Master Plan should be consulted for more detailed information or explanation of how data was gathered, assembled and analyzed.

***Plan Development and Public Participation***

The goals, objectives, guidance and determination of appropriate conservation measures for the City have been developed cooperatively by a Water Conservation Plan Working Group composed of citizens, business representatives and City staff. Working Group members were sought out through website advertisement, outreach activities and individual contacts. Staff made specific efforts to ensure that different groups of customers were represented. The City of Meridian is grateful for the time and effort these members provided. Conservation Plan Working Group Members are found in Appendix A.

Specific objectives of this 2010 Water Conservation Plan Working Group:

- Identify goals of the Meridian Water Conservation Plan by 3/30/11.
- Identify objectives of the Meridian Water Conservation Plan by 4/30/11.
- Identify a Water Conservation Coordinator by 3/30/11.
- Examine potential conservation measures and select appropriate measures to recommend for implementation by 6/30/11. These include measures for a water shortage plan.
- Recommend an annual budget for water conservation by 6/30/11.
- Recommend a complete Water Conservation Plan for Council approval by 9/30/11.

## **Conservation Plan Goals**

Meridian Water Conservation Plan Long Term Goals were developed by the working group described above with input over several weeks and workshops. They are:

- **Ensure an adequate, sustainable and reliable supply of water at a reasonable cost for current and future needs of the community.**
- **Promote environmentally and economically sound use of available water resources.**
- **Protect and preserve water resources through leadership, research, cooperation with other stakeholders, and education.**
- **Prepare for drought and water emergencies.**

## **Conservation Plan Objectives**

The Working Group developed some specific objectives that could be used to guide what conservation actions would be recommended.

- **Establish an ongoing water conservation education program for the Meridian community by 2013.**
- **Evaluate and report on the effectiveness of the Water Conservation Plan to the community annually; share experiences, discuss lessons learned, and generate public involvement and get feedback.**
- **Reduce Meridian customer potable water per capita use by 3% by 2015, in addition to the reduction achieved by the addition of more customers who use surface water for irrigation.**
- **Provide leadership by convening stakeholders within the Lower Boise watershed and developing a water conservation partnership by 2015.**
- **Gather hydrogeologic data and develop a realistic working model of aquifer system around Meridian by 2013. Develop fresh water supply projections (sustainable aquifer yield) by 2015.**
- **Reclaim and reuse 80% of Meridian's wastewater by 2030.**
- **Establish cooperative relationships with surface water providers by 2013.**

## ***Plan Elements***

This plan includes four basic elements:

- Study area characteristics
- Analysis of historical and projected water demand
- Water supply
- Past, current and future conservation measures

## ***Resolution and Adopting the Plan***

It is intended that this plan will be reviewed, approved and adopted by the City Council.

## **Section 2 – Area Characteristics**

### ***Physical Setting***

The City of Meridian is located in Southwestern Idaho approximately 32 miles east of the Oregon border and approximately 110 miles north of the Nevada border. The City is named for Idaho's principle meridian used for the initial survey of the state.

Meridian was established in 1893 and incorporated as a village in 1903 with a population of approximately 200.

The elevation of Meridian is about 2600 feet above sea level. The average daily temperature varies from 75 degrees Fahrenheit in the summer to 29 degrees Fahrenheit in the winter. Average annual precipitation is 11.5 inches. Average summer relative humidity at noon is 41 percent. Nights are cool and the growing season is approximately 175 days long. The development of flood irrigation and Meridian's climate made it well suited to a variety of agricultural activities. Dairy farms, dairy product production, fruit growing and fruit packing were the primary industries in Meridian through the first half of the 20<sup>th</sup> century.

Agricultural activity continues today, but is being replaced by urban development and corresponding economic diversification. Land converted from agriculture to other uses is still served by irrigation systems that provide abundant water at low cost.

Since 1994, Meridian has been the fastest growing city in Idaho with the population tripling between 1990 and 2000, and more than doubling between 2000 and 2007. It has become a center of retail and commercial development in southwest Idaho.

### ***Water Systems***

#### **Municipal System**

Meridian's municipal water system is a public system under the direction of the City government. The system has over 400 miles of pipe and approximately 3,500 active fire hydrants. It includes 19 wells that have a combined capacity of about 18,000 gpm, 21 pressure control valves, 2 booster stations and 2.5 million gallons of storage.

Some details regarding current and predicted demand follow in this narrative. Additional information can be found in appendix C.

#### **Surface Water Systems**

Most residents in the City of Meridian are also served by pressurized and non-pressurized irrigation systems that are supplied by surface water that was originally diverted for agricultural use. Delivery of surface water is managed by irrigation districts. Flood irrigation is employed in much of the agricultural areas surrounding the City; however, as urban development occurs on farmland, surface water delivered to that land is provided to City residents through pressurized irrigation systems. These systems are owned and operated either by the irrigation districts or homeowners associations.

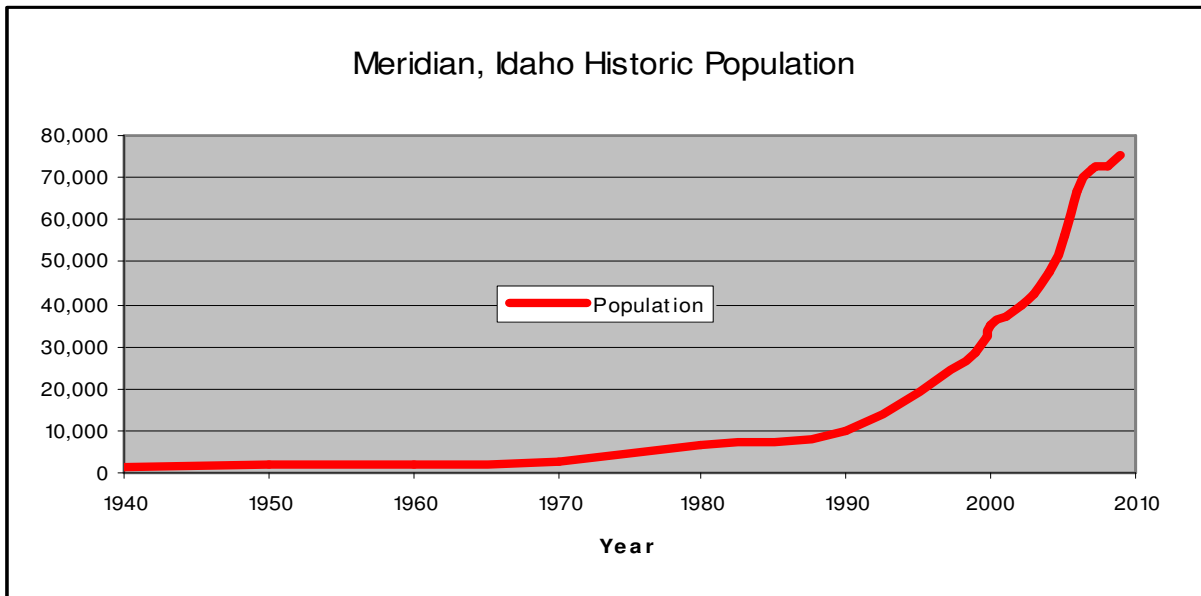


As noted, not all residential properties in the City have surface water irrigation systems. Currently, about 20% of the population uses municipal water for irrigation; however, new developments in the City are required by city code to provide pressurized irrigation systems from surface water if the developing land was previously served by surface water. This city code is in alignment with state law that strongly encourages the use of surface water as the primary source for irrigation (including lawns). Because of this, the population percentage using municipal water for irrigation will continue to shrink with time.

### ***Demographics Forecast***

The population of the City and the surrounding area saw relatively slow growth until 1990. From 1990 through 2007, the population estimates reflect extremely rapid growth. The yearly growth rate from 2000-2007 ranged from 6.5% to 21.8% with an overall yearly average of 12.3%. With the nation-wide economic decline starting in 2008, growth has dramatically decreased. A summary of historical City population according to US Census and COMPASS records is shown in Figure 2-1 and Table 2-1 below.

Figure 2-1 Historic Population Trend



As part of the Water Master Plan Update COMPASS population forecasts by Traffic Analysis Zones (TAZ) were applied to growth areas estimated by City planning staff to estimate future populations for the City impact area.

Table 2-1 Service Area Population Projections

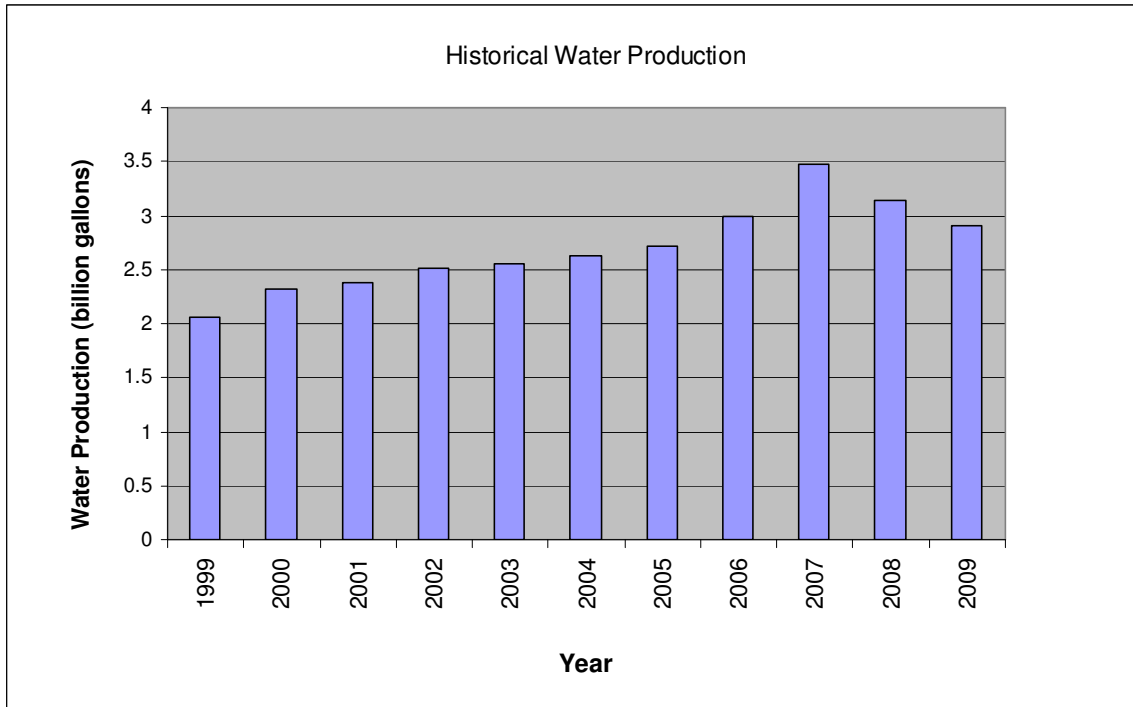
Year	Service Area Population Estimate
2010	66,000
2015	85,000
2020	104,000
2030	140,000
2060	252,000
Build-Out	345,000

## Section 3 – Analysis of Historical and Projected Water Demand

### *Historical Water Use - Potable Water*

In general, total production of potable water, as shown in Figure 3-1 has steadily increased over the last decade although it has fallen off somewhat since 2007.

Figure 3-1 Historical Water Production



An analysis of total production divided by the estimated population at each year showed a clear trend of decreasing per capita consumption. This decrease could be explained by several factors.

- City requirement for new development to use surface water for irrigation where available thereby reducing the percentage of customers using potable water for irrigation.
- Conservation due to rate increases.
- Conservation due to recent economic hardships, even without rate increases.
- Conservation due to building codes and practices that require or encourage more efficient fixtures and appliances.
- Greater public awareness regarding the importance of water conservation.

Table 3-1 Historical Per Capita Demand - Potable Water

Year	Service Area Population <sup>a</sup>	ADD (gpcpd) <sup>b</sup>	MDD (gpcpd)	MMD (gpcpd)
2005	50,449	147	285	307
2006	59,851	137	260	252
2007	64,617	147	295	249
2008	64,969 <sup>c</sup>	132	233	272
2009	65,321 <sup>c</sup>	128	243	227
	Averages	138	263	261

<sup>a</sup> Population figures are based on COMPASS city populations and service area ratios

<sup>b</sup> Gallons per capita per day

<sup>c</sup> Population is linearly interpolated using COMPASS 2010 benchmark population

Because most of the area that will develop and provide new customers for the City's potable water is currently served by surface water for agriculture, it is expected that the trend of decreasing per capita demand for potable water will continue as the city grows. Research completed for the City's Water Master Plan indicated that residents served by surface water for irrigation used about 112 gpcpd of potable water while residents that use potable water for irrigation used about 224 gpcpd of potable water (both figures based on ADD). Since all new customers will be served by surface water for irrigation, the overall per capita demand should continue to drop without any conservation measures. A conservative per capita ADD of 130 gpcpd was used as a base for future demand projections that do not include any additional conservation measures.

### ***Historic Water Use - Surface Water***

It is important to note that, although the demand for potable water for lawn irrigation is reduced by the use of surface water, the overall use of water is not reduced. Surface water is supplied to property owners at historic delivery rates (generally about 4 acre feet per acre during the irrigation season) based on the historic agricultural use of the land. Property owners are assessed a fixed fee and are not charged based on the amount of water used. Consequently, property owners have no incentive to conserve surface water.

Even though surface water delivery is accounted for by providers through weir measurements, the use of that water by customers is not measured, so the per capita demand is unknown.

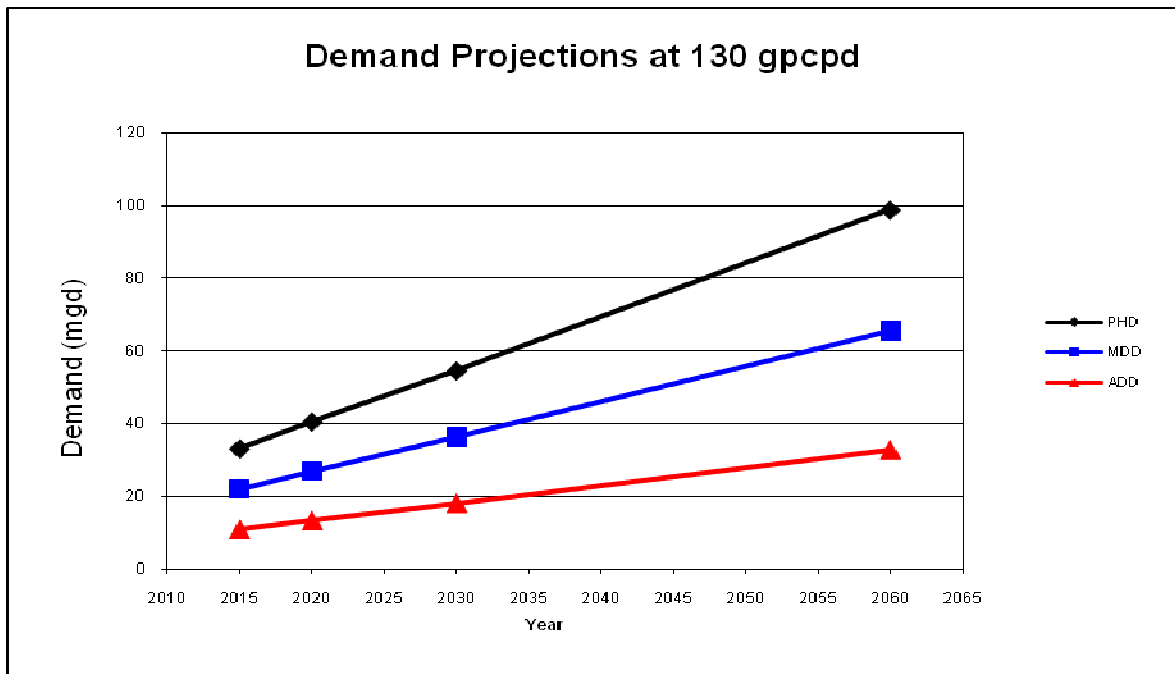
### Summary of Projected Demand - Potable Water

As discussed earlier, a per capita average day demand of 130 gpcpd was applied to the population forecasts discussed in Section 2. The following Table 3-2 and Figure 3-2 summarize the resulting demand forecast.

Table 3-2 Projected Demand without Conservation

Year	Service Area Population Estimate	ADD (mgd)	MDD (mgd)	MMD (mgd)	PHD (mgd)
2015	85,000	11.05	22.10	19.89	33.15
2020	104,000	13.52	27.04	24.34	40.56
2030	140,000	18.20	36.40	32.76	54.60
2060	252,000	32.76	65.52	58.97	98.82

Figure 3-2 Demand Projections to 2060



The 2011 Water Master Plan Update discusses the impact of water conservation on future demand. The data gathered showed that customers using surface water for irrigation had an average per capita potable water consumption of 112 gpcpd. This number can be used as a target for overall per capita consumption with conservation. This is a 13.8 percent difference in per capita consumption (from the proposed planning metric of 130 gpcpd).

The impact of such reduction over time to a water provider would be significant. In 2060, MDD could be reduced by 9 mgd. ADD could be reduced by 4.5 mgd which equates to over 1.6 billion gallons per year. For the utility, this means less infrastructure expense, less operational expense and less impact on the water source.

### **Conservation of Surface Water**

The extensive use of surface water by Meridian residents for irrigation is a benefit because it reduces overall use and peaking factors for potable water, therefore reducing overall cost. However, this conservation plan recognizes that using surface water instead of potable water for purposes such as irrigation does not imply overall water conservation. As previously mentioned, the pricing of surface water (one flat fee for a year regardless of how much is used) does not provide an economic incentive to conserve.

Surface water is not supplied by the City and the City has no control over how it is priced and delivered. Additionally, the actual use of surface water delivered to Meridian residents is not measured, so conservation efforts related to this resource can not be quantified at this time.

This plan recognizes that even though yearly surface water supply is normally more than sufficient for irrigation purposes and inexpensive now, it is likely that conservation of this resource will eventually be critical to the growth and prosperity of the City and the region. Therefore, the plan includes consideration of actions to conserve water whether it is surface water provided by irrigation districts and canal companies or potable water provided by the City.

The Water Conservation Plan Working Group discussed some ideas on how the delivery and use of surface water might be changed to encourage conservation. One recommendation includes establishing working groups with irrigation districts, canal companies and legislators. Current practices for allocating and delivering surface water have been employed for over 100 years and alternatives for the future have not yet been developed.

This plan focuses on education and building a culture of water conservation that is appropriate for the arid climate in which we live that invites anyone to participate. It includes forming partnerships with the Idaho Department of Water Resources (IDWR) and other water suppliers, but does not include any specific actions regarding surface water suppliers. It is envisioned that future revisions of the plan can build on this initial effort and progress can be made towards conservation of the overall water resource.

## **Section 4 – Water Supply**

### ***Sources of Water - Current Capacity and Source of Supply***

Meridian currently relies on groundwater as the single source for all its potable water supply. Although it is the sole source of potable supply, it is a complex resource. Municipal wells tap the groundwater supply from 300 to 800 feet below ground level. Water from these various depths and locations varies in chemical composition and overall quality.

Meridian's Municipal water supply system has the capacity to pump approximately 33,000 gpm for several hours and up to 30,000 gpm for an indefinite time period. The 2010 Water Master Plan Update includes detailed information about Meridian's water supply and distribution infrastructure.

### ***Sustainable Yield***

Changes in static water levels have been observed at wells across Meridian, but they have not been significant and have not necessarily been attributed to municipal pumping. There is very little information on the rate of recharge of the aquifer system and the sustainable pumping volume.

Meridian monitors water levels at several observation wells at various locations throughout the city. Data has been collected for a number of years with some wells dating back to the early 1990s. The City is working to use this data along with drilling logs, to develop a groundwater model and aquifer mapping in order to better understand the characteristics of the aquifer system, including the recharge mechanisms and sustainable yield. The information being gathered and analyzed for Meridian will likely be the best available data that exists and will be invaluable for the City's conservation efforts.

### ***Supply and Demand Balance***

The 2010 Water Master Plan projected demands through ultimate build-out for the City. Total demand projections using a conservative per capital demand of 130 gallons per day were used in Table 3-3. Average demand per day is projected to be about 33 million gallons in 2060. Over a year, that equates to 12 billion gallons of potable water supply needed for Meridian customers alone. Other potable water suppliers surrounding Meridian will increase demands on the shared aquifer system to serve their current and future customers as well.

Experience and available data have shown that the aquifer system that Meridian relies upon for potable water supply is extremely productive; however, as discussed, the ultimate sustainable yield is unknown. Additionally, we may not know when we have exceeded this sustainable yield until after it happens. Again, more data collection and analysis is needed to better understand this issue.

Once again, surface water supply and conservation may become an important issue. The Treasure Valley Comprehensive Aquifer Management Plan (CAMP) effort produced a Treasure Valley Future Water Demand study by WRIME Consultants. The study indicated that the net

water demand (regardless of source) per acre for agricultural land was greater than for urban land. Therefore, the conversion of agricultural use to urban use as population in Meridian and the Treasure Valley grows produces a net decrease in overall water demand.

Although this concept has not been met with agreement from all parties involved in the CAMP, it underlines a recurring theme of this plan; that water conservation should include surface water and groundwater. To encourage the conservation of both resources, which are naturally connected, legislators and regulatory agencies must work towards the most beneficial use of water. If this can be accomplished, it would appear that the overall water resource will support our demands for at least 50 years.



## Section 5 – Reclaimed Water Plan

The conversion of wastewater to reclaimed water, and its use, will be a key component in water conservation in the future. Reclaimed water has a variety of applications which can either replace or reduce the need for other sources of water. It can also replenish groundwater supplies.

The following description is from the draft Reclaimed Water Master Plan developed for the City by HDR Engineering:

### *City's Current and Planned Reclaimed Water Program*

#### OVERVIEW OF RECLAIMED WATER PROGRAM

The City of Meridian (City) is developing a program to produce and distribute reclaimed water for a variety of uses. Reclaimed water is a highly treated water resource generated at the City's municipal wastewater treatment plant that meets standards for reuse established by the Idaho Department of Environmental Quality (DEQ).

This Reclaimed Water Master Plan (Master Plan) presents a long-range vision for the City's reclaimed water program and defines market expectations for reclaimed water sales. Cost opinions for constructing future components of the reclaimed water production and distribution system are also presented, which establishes the foundation from which a framework for financing capital investments has been analyzed. Finally, the Plan identifies policy and implementation issues that will affect development and financing of the reclaimed water program.

The City's reclaimed water program will continue to evolve as the City gains experience with the production and distribution of the resource. Therefore, the policies, assumptions, and findings of this Master Plan are expected to be updated regularly, particularly in the near-term.

#### **Program History**

The City has been producing Class A reclaimed water since 2009, and beneficially reusing the water for turf irrigation at Heroes Park. This demonstration project has offered a highly visible means by which to educate the public about the value of this resource. The Idaho Department of Environmental Quality issued the City a Final Wastewater Reuse Permit (No. LA-000215-02) on April 19, 2010. This permit is effective for five years and allows for the use of reclaimed water in irrigation, dust suppression, toilet flushing, lined surface water features, sanitary sewer flushing, and fire suppression throughout the City. This "City-wide" permit supports the expansion of the program that is presented in the Master Plan.

The Vision for of the Meridian Public Works Department for the year 2030 was developed in 2009. Recycling and reusing wastewater is a primary component of that Vision which foresees recycling and/or reuse of 80% of the waste stream by that time.

## Section 6 – Current Water Conservation Plan

### *Measures Implemented*

Conservation efforts in Meridian have historically been the result of supply and distribution system limitations, rather than a concern for the long term availability of supply. In 1993, the City distributed a flyer to customers and asked them to conserve in a number of different ways so water would be available to everyone for the summer, but after new wells were constructed, the system crises was over and formal conservation plans were not adopted.

Even though a conservation plan has not been formally adopted, Meridian currently practices several important conservation practices that include:

- Metering water to customers and including a component of the bill for usage
- Tracking non-revenue water used for water main flushing and hydrant flows
- Managing tight pressure zones to avoid high service pressures
- Enforcing building codes for low flow toilets and show heads
- Encouraging the use of reclaimed water
- Using automatic irrigation controls for Parks Facilities



1993 Flyer

### *Management of Non-Revenue Water*

The 2010 Water Master Plan Update evaluated production and sales records for 2008 and 2009, and found that non-revenue water is very low, averaging just 3% of water produced. This can be attributed to several factors:

- Much of the City's infrastructure is very new due to the recent explosive growth
- The City has an active meter replacement program
- The City tracks water used for flushing sediment from water mains
- The City tracks water used for fire training

## **Section 7 – Potential Conservation Actions**

This plan is Meridian's first formal water conservation plan. As discussed previously, the City's water supply and distribution infrastructure is more than capable of providing peak demands and emergency flows to customers. In addition, the City is extremely fortunate to be tapping an aquifer system that has shown little to no decline after several years of sustained pumping.

The City understands, however, that annual water supply is a limited resource and is taking measures to better understand the resource.

The Conservation Plan Working Group submitted their ideas for water conservation measures which were consolidated and added to measures found in the AWWA Manual: Water Conservation for Small and Medium-Sized Utilities. The Working Group preferred the term Conservation Actions, rather than measures. These potential actions were organized and discussed by the Working Group in light of the Goals and Objectives they had previously developed. The outcome was a list of recommended actions for the plan.

The Conservation Actions were categorized as follows:

- Utility / City Practices
- Ordinances and Rules
- Outreach
- Incentives
- Reclaimed Water

In developing the Goals, Objectives, and Conservation Actions of this plan, the different perspectives of the Working Group members were apparent. However, it was a consistent opinion among members that the best conservation actions were those that employed education, outreach and setting an example through City leadership rather than developing ordinances or rules to try to force customers to conserve.

Appendix B contains the matrix of Conservation Actions considered including recommendations / notes from the Working Group. Some actions discussed may require additional research to determine potential costs and benefits. In several cases, the group recommended that actions be considered based on future research and analysis.

## Section 8 – Recommended Plan

The initial recommendation is to assign the duties of a Conservation Coordinator to an existing position within the Environmental Division. It is contemplated that a part time position may be added in the future for this function. The Conservation Coordinator will be responsible to implement or facilitate the implementation of the action items below, to measure their effectiveness, and to provide regular reports on conservation efforts to the City Council.

The conservation plan includes objectives that reach to 2015. However, a yearly report to City Council is also an objective and it is anticipated that, as the action items are completed and information is gathered and analyzed, the conservation plan and action items will be updated annually.

The following table includes the actions that have been recommended by the Working Group. As a formal conservation effort is new to the City, many of the recommendations are simply to research or evaluate different actions to analyze their feasibility and efficacy.

Action	Estimated Cost	Estimated Benefit	Lead Staff	Support Staff
<b>City / Utility Practices</b>				
Evaluate costs and benefits of reducing the water from flushing by improving supply water quality through filters	Low	Low	Engineering Division	
Purchase leak detection equipment to reduce wasted water from system leaks	Med	Med	Water Division	
Develop source meter calibration program	Low	High	Water Division	Engineering Division
Create automatic alerts when customer use increases abnormally	Low	High	Utility Billing	Water, Conservation Coordinator
Use utility bills to communicate usage trends or comparisons to normal usage.	Low	High	Conservation Coordinator	Utility Billing, Water
Install Automatic Meter Reading infrastructure	High	High	Engineering Division	Water
Perform audits on top users in customer categories and use info for outreach	Low	Med	Utility Billing	Water, Conservation Coordinator
Develop audit pilot program for landscape irrigation	Low	High	Conservation Coordinator	Environmental Division, Planning, Water Division

Action	Estimated Cost	Estimated Benefit	Lead Staff	Support Staff
Support Parks Department conservation efforts	Low	Low	Conservation Coordinator	
Cooperate with other government or water supplier conservation efforts	Low	Low	Conservation Coordinator	
Perform fixture audit and corrective actions for City buildings	Low	Low	Conservation Coordinator	
Coordinate with Building Services to ensure high efficiency fixtures are included in new construction	Low	Low	Conservation Coordinator	Building Services
Seek conservation program funding from state, county, or federal resources	Low	Low	Conservation Coordinator	Planning Grant Administrator
Request a budget of \$25,000 for water conservation. Funding would support a portion of a position and conservation actions recommended.	High	High	Conservation Coordinator	Finance
Benchmark Meridian's conservation efforts with other similar cities and include in annual report to Council	Low	NA	Conservation Coordinator	
Explore formation of regional water conservation group (or use existing regional group)	Low	NA	Conservation Coordinator	
Meet with IDWR regularly to discuss ground and surface water conservation issues	Low	Med	Conservation Coordinator	
Recognize people or businesses that practice conservation-award program or news posts	Low	Med	Conservation Coordinator	
<b>Ordinances and Rules</b>				
Benchmark other cities regarding individual unit metering to multi-unit buildings	Low	NA	Conservation Coordinator	Building Services
Set aside a portion of rates for conservation efforts			Public Works Business Operations	Engineering Division, Finance
Explore feasibility of tiered rate structure	Low	NA	Conservation Coordinator	Engineering Division, Finance

Action	Estimated Cost	Estimated Benefit	Lead Staff	Support Staff
Develop planning ordinances that encourage and incentivize conservation	Med	High	Planning	Conservation Coordinator
Create design standards for landscaping	Med	High	Planning	Conservation Coordinator
Examine benefits of adopting 2009 plumbing code	Low	NA	Conservation Coordinator	Building Services
<b>Outreach</b>				
Continue efforts with schools	Low	High	Conservation Coordinator	
Distribute educational materials at various locations / events	Low	High	Conservation Coordinator	Water Division, Engineering Division, Planning
Collaborate with professional organizations and HOAs	Low	Med	Conservation Coordinator	
Develop web page dedicated to water conservation, including tips, electronic brochures, innovative technologies, and links to other sites, kid's pages, and games	Low	High	Conservation Coordinator	Information Technology
Include education about peak hour usage to reduce peaking factors	Low	Med	Conservation Coordinator	Engineering Division, Water Division
Provide information on self-audits to customers.	Low	High	Water Division	
Conduct outreach to commercial and industrial customers regarding fixtures, cooling towers, appliances, etc.	Low	Med	Conservation Coordinator	Building Services
<b>Reclaimed Water</b>				
Explore feasibility of reclaimed water fire hydrants and water truck filling stations.	Low	NA	Engineering Division	
Encourage conversion of potable water irrigators to reclaimed water	Low	Low	Engineering Division	
Encourage large potable water users to convert appropriate uses to reclaimed water	Low	Low	Engineering Division	

City of Meridian  
Water Conservation Plan

Cost Estimates (Cost to City):

Low = \$0-5,000

Med = \$5,000-\$20,000

High = Over \$20,000

Benefits: Because the potential benefits from an action item can be actual measurable water conserved, or non-measurable benefits such as customer awareness and education, the High, Medium, and Low levels are a best guess based on group discussion.

## **Section 9 – Water Shortage Plan**

Water shortages are situations when the City is unable to meet the water demands of its customers at the minimum required distribution pressure. Such conditions can be short or long term depending on the causes and can be due to problems with pumping and distribution infrastructure, the water supply, or unusually high demands.

### **Water Infrastructure Problems:**

- Water main breaks
- Well failures
- Booster failures
- Power failures

### **Water Supply Problems:**

- Contaminants in supply
- Extreme drought
- Conjunctive management / curtailment
- Water table decline

### **Unusually High Demands:**

- Multiple simultaneous fires
- Extremely hot weather

The City of Meridian has a very robust supply and distribution system. However, if several of the problems identified above occurred in combination, there may be a need for cooperative community conservation to ensure that water is available for critical uses such as fire fighting and medical needs.

Meridian's water distribution system includes five different pressure zones to ensure water is delivered to customers in a narrow range of pressures- generally between 60 and 80 psi. With one exception (the lowest zone), each pressure zone has wells to supply demand in that zone. Pressure zones are separated by Pressure Reducing Valves (PRVs) that maintain pressure differential, but still allow flow between zones. The highest pressure zone can transfer water down to any zone below it.

Because of the operational nature of these pressure zones, calculations for supply and demand will include a pressure zone and all zones above it to determine if a water shortage situation is pending or exists.

### ***Water Shortage Plan Elements***

Ideally, the City would respond to the threat of a shortage and manage demand to avoid the shortage. The following are three different conditions and the appropriate responses in order to manage demand and maintain system pressure for critical uses. Each condition level includes



the following elements:

1. Triggering Conditions
2. Initiation Procedures
3. Demand Management Response
4. Termination Procedures

Because Meridian's system does not include large storage facilities, it relies on instantaneous pumping capacity from wells to serve peak demands. Therefore, the triggering conditions for determining whether a shortage is pending or exists are based on the Peak Hour Demand in relation to the pumping capacity of the system.

It is important to note that the City will take additional actions to correct or mitigate whatever problems have lead to a water shortage. The responses considered in this plan are only directed to managing demand / encouraging conservation.

Another important note is that the termination of a Supply Condition can mean the condition has improved or gotten worse, so the demand management response selected should be appropriate to the change in condition.

### **Water Supply Condition 1: Possible Water Shortage Predicted**

#### ***Triggering Conditions:***

Forecast Peak Hour Demand plus fire flow through the next 6 months exceeds the current capacity of any pressure zone and the zones above it combined.

#### ***Initiation Procedures:***

Water Division works with Engineering Division to assess current pumping capacity and forecast demands based on current demand patterns, historic trends, and other available data. Water Superintendent makes determination that condition exists and notifies the Public Works Director, who declares the condition to the Mayor's Office. The Mayor officially declares the condition to the public and initiates an appropriate demand management response.

#### ***Demand Management Response:***

Work with the Public Works Director and Public Affairs Officer to organize outreach effort to request voluntary water conservation. Consider the following options:

- Use billing inserts to inform customers of the situation
- Provide press release for Website
- Distribute press release HOAs, businesses, and customers by email

#### ***Termination Procedures:***

Water Division works with Engineering Division to assess pumping capacity and refine demand forecasts. Water Superintendent makes determination that condition no longer exists and notifies the Public Works Director, who informs the Mayor and Council. The Mayor officially declares the change in condition to the public and initiates the appropriate demand management response if any.

## **Water Supply Condition 2: Probable Water Shortage Predicted**

### ***Triggering Conditions:***

Forecast Peak Hour Demand through the next six months exceeds of the current capacity of any pressure zone and the zones above it combined.

### ***Initiation Procedures:***

Water Division works with Engineering Division to assess current pumping capacity and forecast demands based on current demand patterns, historic trends, and other available data. Water Superintendent makes determination that condition exists and notifies the Public Works Director, who declares the condition to the Mayor's Office. The Mayor officially declares the condition to the public and initiates an appropriate demand management response.

### ***Demand Management Response:***

Work with the Public Works Director and Public Affairs Officer to organize outreach effort to request voluntary water conservation. Consider the following options:

- Press release may need to be distributed to media for general release
- Use billing inserts to inform customers of the situation
- Provide press release for Website
- Distribute press release HOAs, businesses, and customers by email

Consider implementing mandatory conservation measures:

- Prohibit outdoor use of City water
- Initiate conservation rate schedule
- Charge emergency conservation fees for residential use over account "winter averages" (average monthly use from January through April)
- Initiate probable water shortage rate schedule - TBD.

### ***Termination Procedures:***

Water Division works with Engineering Division to assess pumping capacity and refine demand forecasts. Water Superintendent makes determination that condition no longer exists and notifies the Public Works Director, who informs the Mayor and Council. The Mayor officially declares the change in condition to the public and initiates the appropriate demand management response if any.

### **Water Supply Condition 3: Water Shortage Emergency**

#### ***Triggering Conditions:***

Current Peak Hour Demand exceeds the current capacity of any pressure zone and the zones above it combined.

#### ***Initiation Procedures:***

Water Division works with Engineering Division to assess current pumping capacity and forecast demands based on current demand patterns, historic trends, and other available data. Water Superintendent makes determination that condition exists and notifies the Public Works Director, who declares the condition to the Mayor's Office. The Mayor officially declares the condition to the public and initiates an appropriate demand management response.

#### ***Demand Management Response:***

Work with the Public Works Director and Public Affairs Officer to organize outreach effort to request voluntary water conservation. Consider the following options:

- Press release may need to be distributed to media for general release
- Use billing inserts to inform customers of the situation
- Provide press release for Website
- Distribute press release HOAs, businesses, and customers by email, or phone alert

Initiate or continue probable water shortage rate schedule.

Consider implementing mandatory conservation measures:

- Prohibit outdoor use of City water
- Continue or initiate conservation rate schedule
- Charge emergency conservation fees for residential use over account "winter averages" (average monthly use from January through April)

#### ***Termination Procedures:***

Water Division works with Engineering Division to assess pumping capacity and refine demand forecasts. Water Superintendent makes determination that condition no longer exists and notifies the Public Works Director, who informs the Mayor and Council. The Mayor officially declares the change in condition to the public and initiates the appropriate demand management response if any.

## Appendix A – Water Conservation Working Group Members

### Meridian Water Conservation Plan Working Group

<b>Member Name</b>	<b>Organization / Connection</b>
Mark Erikson	Saint Lukes Hospital
Frank Morandi	Roaring Springs Water Park
Bill Martin / Derrick Martin	Metro Express Car Wash
John Wiskus	Meridian Resident
Mike Polk	Meridian Resident
Thomas Baker	Boise Resident / Teacher
Mark Fischer	Meridian Resident
Liz Paul	Idaho Rivers United
Pete Friedman	Meridian Planning Deputy Director
Mollie Mangerich	Meridian Environmental Program Manager
Dennis Teller	Meridian Water Superintendent
Andy Roman	Meridian Resident / Idaho Rivers United / HOA Vice-President
Jeff Brooks	Meridian Resident
Steve Eddy	Fast Eddy's

## Appendix B – Conservation Actions Considered

Below is a matrix of the conservation actions considered by the working group. Each concept was discussed.

<b>Water Conservation Actions</b>	<b>Current Practice</b>	<b>Proposed Action</b>
<b>Utility / City Practices</b>		
Reduce water used for flushing City water mains	Water division tracks water used for flushing water mains and for fire hydrant tests. Additional planning and modeling for reducing water needed for flushing will carry some cost.	Water supply filters (such as green sand filters) may reduce need for flushing. What do other cities do? Reuse the flushed water? Portable filters?
Reduce water used for fire training	Fire department tracks water used	Reclaimed water fire hydrants? / truck filling?
Reduce lost water - ensure system leaks are detected and stopped quickly	No leak detection program.	Purchase leak detection equipment and institute a proactive program. Use SCADA to monitor supply vs. WWTP inflow.
Reduce water consumption and lost water - system pressure management	Currently manage pressure zones between 60 and 80 psi	Encourage customers to install pressure reducing valves at houses near higher pressure areas. Could outreach to customers with a map.
Develop reclaimed water system / expand the use of reclaimed water	Reclaimed water master plan currently being developed	Reclaimed water hydrants? Install reclaimed water as opportunities arrive.
Convert potable water irrigators to reclaimed water irrigation	Reclaimed water master plan effort	Convert potable water irrigators to reclaimed water irrigation according to master planning guidance.
Convert large potable water users (other than irrigation) to reclaimed water	Reclaimed water master plan effort	Convert large potable water users (other than irrigation) to reclaimed water according to master plan guidance.
Calibrate source meters	Currently not done regularly	Start up program.

<b>Water Conservation Actions</b>	<b>Current Practice</b>	<b>Proposed Action</b>
Perform indoor water audits for customers	Water leak detection on case-by-case basis for customers or when abnormally high usage is noted. This system is automated. Dennis to provide details of how it works.	Alert automatically when customers' use goes up a given % (TBD). Encourage water audits by customer (self) or by private business through outreach. Attach note to bills regarding usage compared to history or average customers. Look at top users and audit some of them, then use that info for outreach. Partner with home improvement stores - water conservation kiosk. Develop audit pilot program.
Perform landscape irrigation audits (city water) Benchmark and leverage other suppliers' efforts and	No audits	Work with other government offices to cooperate with their conservation efforts.
Perform landscape irrigation audits on City parks and other facilities Perform fixture audit and replacement if needed in current City buildings.	Install weather based smart controllers in City Parks	Support Parks efforts.
Use high efficiency fixtures in all new City building construction	Last building (City Hall) was LEED Silver	Perform fixture audit and replacement if needed in current City buildings. Also make sure efficient fixtures are working as intended (signage, valve direction, etc.) Perform cost effective corrective actions as needed. Coordinate with building services to ensure fixtures in new construction are high efficiency.
Seek conservation program funding from state, county or federal sources.	NA	Seek conservation program funding from state, county, or federal sources.
Identify a Water Conservation Coordinator	No Water Conservation Coordinator	Water Conservation Coordinator recommended to be added to .5 time position duties in Environmental Division.

<b>Water Conservation Actions</b>	<b>Current Practice</b>	<b>Proposed Action</b>
Approve a conservation budget	No budget for conservation	Request a budget of (TBD) for water conservation from City Council.
Benchmark Meridian's conservation efforts with other similar cities - include in annual report to Council.	NA	Benchmark Meridian's conservation efforts with other similar cities - include in annual report to Council.
Form regional water conservation group.	NA	Explore formation of regional water conservation group.
Meet with IDWR regularly to discuss ground and surface water conservation issues	NA	Meet with IDWR regularly to discuss ground and surface water conservation issues. This action compliments the formation of a regional water conservation group.
Low water user awards		Recognize people or businesses that practice conservation, e.g. yard signs.
<b>Ordinances and Rules</b>		
Meter water to customers	Meter water to all customers	Continue to meter water to all customers.
Meter water to individual units in multi-family buildings.		Benchmark other cities to see if any are requiring new multi-family buildings to have individual meters to each unit. Encourage property managers to teach conservation for their own or their tenants' benefit.
Structure rates to emphasize consumption over base	Water rate = \$5.38 + \$1.86 / 1000 gal	Continue. Use a portion of collected rates to fund conservation efforts.
Charge city accounts like other customers	Currently meter usage, but do not charge ourselves	Don't charge, but review usage and make sure City departments are on board and demonstrating conservation methods.
Use a tiered rate structure	NA	Explore feasibility of tiered rate structure.
Collect a Conservation Fee	NA	(Put conservation funding in water rates.)



<b>Water Conservation Actions</b>	<b>Current Practice</b>	<b>Proposed Action</b>
Landscaping	Current ordinance encourages use of surface water for irrigation.	Continue use of surface water for irrigation. Develop planning ordinances that encourage and incentivize conservation in landscaping. Create design standards for landscape features to ensure that they don't waste water (e.g. berms). Grass reduction, xeriscape berms, etc.
Residential activities	Building codes control fixtures	Examine benefits of adopting 2009 plumbing code. Check with Dennis / Brent.
Industrial activities	Building codes control fixtures	Examine benefits of adopting 2009 plumbing code. Check with Building Services Division.
Construction activities	Code requires rental of meters for filling trucks and other activities.	Continue current practice. Build reclaimed water fill points and encourage use of reclaimed water for dust control.
Indoor Water Use - explore opportunities to amend Idaho Plumbing Code to allow reclaimed water for indoor uses. Require upgrades to fixtures as a condition of sale of property		Research / Clarify this issue.  How can we incentivize? What is current account setup fee? Can we have customer contact encourage fixture upgrades for customers' long term benefit? Use real estate community to outreach also.
<b>Outreach</b>		
Discuss / assist schools with conservation measures	Some activity	Continue efforts with schools. Get them to consider more efficient fixtures.
Distribute educational pamphlets on conservation (lawn watering, conversion to low water use landscaping, indoor use practices, etc.)	Pamphlets available at Water Department	Continue and expand.

<b>Water Conservation Actions</b>	<b>Current Practice</b>	<b>Proposed Action</b>
Conduct presentations in collaboration with other organizations - professional, HOA, etc.		Conduct presentations in collaboration with other organizations - professional, HOA, etc. Have HOA contests to see which subdivisions do best.
Develop web page dedicated to water conservation, including tips, electronic brochures, links to other sites, and reports on innovative technologies Educate about peak usage control (amount and time of usage) to reduce peaks.	Some tips in Water Division section of current website - not very extensive	Develop web page dedicated to water conservation, including tips, electronic brochures, links to other sites, and reports on innovative technologies. Links to other sites, kids pages, games, etc. Educate about peak usage control (amount and time of usage) to reduce peaks.
<b>New construction and upgrades- not City owned</b>		
Improve plant facilities maintenance	No outreach program to encourage	Outreach to these customers
Upgrade cooling towers	No outreach program to encourage	
Change to low water use landscaping	No outreach program to encourage	
Upgrade fixtures and appliances - hotels, schools, care facilities, HOA maintained facilities	No outreach program to encourage	
Upgrade fixtures and appliances - older residential buildings	No outreach program to encourage	
<b>Incentives</b>		
Give away faucet aerators	No give away / exchange program	Evaluate cost / benefit.
Give away or exchange low flow shower heads	No give away / exchange program	Evaluate cost / benefit.
Provide rebates for high efficiency toilets	No rebate program	Evaluate which fixtures to provide rebate for and propose a plan. Benchmark other cities.
Provide rebates for efficiency clothes washers	No rebate program	
Provide rebates for irrigation system moisture sensors	No rebate program	

## Appendix C – City Customer Profile- 2010 Records

<u>Category</u>	<u>Number of Accounts</u>	<u>Percent</u>
Church	66	0.3%
City	36	0.1%
Commercial	1046	4.1%
Multi-Unit Residential	188	0.7%
Residential	24056	93.3%
School	404	1.6%

### Residential Building Inventory

<u>Year</u>	<u>Number of Units Built</u>
1970 to 1993	5,500
1994 to Present	20,400 (new building code was adopted in 1994)

## Appendix D – Definitions

**ADD- Average Day Demand:** The total volume of water delivered to the system in a year, divided by 365 days.

**AWWA- American Water Works Association:** An international nonprofit educational association dedicated to safe water. Founded in 1881 as a forum for water professionals to share information and learn from each other for the common good, AWWA is the authoritative resource for knowledge, information, and advocacy for improving the quality and supply of water in North America and beyond.

**COMPASS- Community Planning Association of Southwest Idaho:** An association of local governments working together to plan for the future of the region. The agency conducts this work as the metropolitan planning organization (MPO) for northern Ada County and Canyon County. The federal government requires the formation of an MPO when an urban area reaches 50,000 people.

**DEQ / IDEQ: Idaho Department of Environmental Quality:** The state agency tasked with ensuring clean air, water, and land in the state and protecting Idaho citizens from the adverse health impacts of pollution.

**Groundwater:** Groundwater is water that exists below the land surface.

**Gpcpd: gallons per capita per day:** Amount of water a person uses on average per day.

**HOA: Homeowners Association**

**IDWR: Idaho Department of Water Resources- IDWR** serves the people of Idaho and protects their welfare by making sure water is conserved and available to sustain Idaho's economy, ecosystem and the resulting quality of life.

**MMD: Maximum Month Demand:** The maximum volume of water delivered to the system during any single month, divided by 30 days.

**MDD: Maximum Day Demand:** The maximum volume of water delivered to the system during any single day.

**MPO: Metropolitan Planning Organization:** A federally-mandated and federally-funded transportation policy-making organization in the United States that is made up of representatives from local government and governmental transportation authorities.

**PHD: Peak Hour Demand:** The maximum volume of water delivered to the system during any single hour.

**Potable Water:** Potable water is water that can be consumed in any desired amount without concern of adverse health effects. Water provided by community water systems including public and private utilities is considered potable water.

**Surface Water:** Surface Water is water that is supplied by streams, rivers, and lakes. It is usually stored in man-made reservoirs and transported through canals.