TAP WATER MASTER PLAN

TALENT-ASHLAND-PHOENIX

PREPARED BY RH2 ENGINEERING, INC.

WITH ASSISTANCE FROM

HANSFORD ECONOMIC CONSULTING

SUMMER 2020

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Introduction

The Cities of Talent, Ashland, and Phoenix, Oregon (Partner Cities) engaged the services of RH2 Engineering, Inc., (RH2) to prepare a Water Master Plan (WMP) for the regional Talent, Ashland, and Phoenix (TAP) water supply system (TAP System). This WMP represents the first long-range planning document for the TAP System and includes a summary of current management, operations and maintenance, and recommendations for long-term capacity and future management considerations. Infrastructure improvements are documented in a TAP System Capital Improvement Plan (CIP), which provides recommendations for improvements to meet existing and future needs of the TAP Partner Cities. It is anticipated that the TAP Partner Cities will develop a new Intergovernmental Agreement (IGA) following completion of this WMP to include recommendations for cost sharing and provide long-term guidance to the TAP System management. This Executive Summary provides a brief overview of the WMP findings and results, and recommendations for a new IGA.

Background

In the late 1990s, the TAP Partner Cities collaborated in the development of a new water supply transmission project to provide domestic water from the Medford Water Commission (MWC) to their communities. The City of Talent (Talent) needed to replace its aging source of supply (water treatment facility on Bear Creek); the City of Phoenix (Phoenix) needed to supplement its existing supply from MWC; and the City of Ashland (Ashland) wanted access to a secondary emergency source of supply. In 2000, the TAP Partner Cities entered into an IGA to construct the TAP supply system from the MWC to Talent. Since then, several system improvements have been implemented, resulting in management and cost-sharing decision making. The system initially only supplied water to Phoenix and Talent until 2014, when Ashland installed additional transmission facilities to provide an emergency supply source for its community. Over the last few years, it has become increasingly apparent that an updated WMP for the TAP facilities would be beneficial to the Partner Cities as it is an essential supply for all three communities.

Purpose

This WMP addresses the following goals:

- Documents the existing TAP System facility information.
- Confirms future supply demands for the 40-year planning horizon.
- Assesses the condition and capacity of the existing system for future planning.
- Identifies operational constraints and recommends operational adjustments for improved efficiency.
- Develops options for meeting or revising the MWC Purchase Agreements to achieve compliance.
- Develops a CIP to meet future demands and major facility replacements.

- Evaluates TAP System financing options to guide the allocation of operational, maintenance, and capital costs between the Partner Cities.
- Provides recommendations for developing a new TAP IGA between the Partner Cities.

Summary of WMP Contents

A brief summary of the content of the chapters in this WMP is as follows:

- The **Executive Summary** provides a brief summary of the key elements of this WMP.
- **Chapter 1** presents the water service area and describes the existing water system.
- **Chapter 2** identifies existing water demands and projected future demands.
- **Chapter 3** describes the hydraulic model development and operational analysis.
- **Chapter 4** describes the system capacity evaluation.
- **Chapter 5** discusses the water supply analysis.
- **Chapter 6** presents proposed improvements, estimated costs, and implementation schedule.
- **Appendix 6A** evaluates the financial impacts of the TAP CIP on each Partner City and discusses financing options.

The appendices also provide additional information, including IGA documents, recommendations for updating the MWC wholesale water purchase agreements, and recommendations for a new IGA.

Existing TAP System

The TAP System delivers water from MWC to the Partner Cities through several miles of large diameter transmission pipes and a series of pump stations. The original TAP System included construction of the Regional Booster Pump Station (BPS), the Talent BPS, Phoenix's Eastside Reservoir, Talent's Belmont 2 Reservoir, and transmission piping extending from the MWC meter to these facilities. In 2014, Ashland physically connected to the TAP System by extending transmission piping from Talent to Ashland in Highway 99 and constructing the Ashland TAP BPS. Although these facilities are all related to the TAP System, not all of the original TAP facilities benefit all the Partner Cities. Therefore, the WMP includes clarification of the current TAP facilities (or "assets") and identifies the benefiting city or combination of cities as described in **Chapter 1.** For example, the two storage facilities initially constructed with the TAP infrastructure are no longer considered to be part of the TAP System. Distinguishing TAP System assets from individual city assets is critical in assessing cost sharing for operations and maintenance. **Chapter 1** describes the TAP System transmission, storage, pump station, telemetry, and metering facilities, as well as the general system operation.

Chapter 1 also summarizes the existing IGAs between the Partner Cities, the Rogue Valley Council of Governments (RVCOG), and MWC. Through a series of IGAs over the years, the Partner Cities have established maintenance and management of the TAP System. However, due to several recent changes in operations (including Ashland's use of the TAP System), some of the IGAs are outdated and changes are recommended.

Demands

Chapter 2 presents the demand projections of the TAP System for use in evaluating long-term supply needs and infrastructure capacity. The total system demands are based on the city-wide demand projections developed for Talent and Phoenix in their most recent individual WMPs, and Ashland's expected use of the TAP supply, which is projected to increase from 2.13 million gallons per day (MGD) in 2020 to 3.0 MGD by 2030. **Table ES-1** summarizes the demand projections used for this WMP. It is important to note that these demands represent the average demand projections for Talent and Phoenix; actual demands may vary. By buildout, the TAP demands are anticipated to increase to close to 11 MGD, representing a 65-percent increase.

Table ES-1
TAP Demand Projections

	Phoenix		Talent		Ashland	Tal/Phx	All TAP
Year	ADD (MGD)	MDD (MGD)	ADD (MGD)	MDD (MGD)	ADD (MGD)	MDD (MGD)	MDD (MGD)
2020	0.80	2.26	0.82	2.18	2.13	**4.44**	**6.57**
2030	0.93	2.63	0.92	2.45	3.00	**5.08**	**8.08**
2040	1.10	3.13	1.06	2.82	3.00	**5.95**	**8.95**
2070	1.48	4.22	1.36	3.64	3.00	**7.86**	**10.86**

ADD – Average Day Demand
MDD – Maximum Day Demand

Model Development and Operational Analysis

The TAP System is operated to meet the requirements of each Partner City. However, over the years, three operational issues have arisen that were evaluated in **Chapter 3**. These include: 1) using stored water volume from neighboring cities' reservoirs during peak TAP water use; 2) reaching or exceeding the MWC Water Service Agreement maximum flow rates; and 3) Phoenix's reliance on a secondary supply that requires pumping twice (compared to the TAP supply that only requires pumping once).

To assess these and other operational issues, a hydraulic model of the TAP System was developed that represents the operation of all TAP facilities. The model was used to evaluate several demand conditions and found that adjusting operations to constant-rate pumping (rather than pumping to maintain reservoir levels) resolves several operational issues and allows delay of capital improvements. Talent and Phoenix staff has agreed to adjust pumping operations to constant-rate pumping to avoid impacting each other's storage and to reduce peak flow rates on

the MWC system. **Chapter 3** provides recommendations for implementing constant-rate pumping. The third operational issue of Phoenix's supply system is discussed in **Chapter 5**.

Water System Capacity Analysis

Chapter 4 presents the capacity analysis of the TAP System infrastructure. The ability of each water system component to meet the established reliability and redundancy criteria was analyzed for existing and future demand conditions. The analysis identified several significant capacity limitations of the TAP System to meet anticipated demands. The Talent BPS and piping currently are unable to provide Talent's maximum day demands (MDD) and Ashland's supply concurrently. Additionally, the Regional BPS and transmission piping do not have adequate capacity to provide the anticipated demands by 2030. Several alternatives were evaluated to address these capacity limitations. The final recommendations agreed upon by the Partner Cities are described in the sections that follow and include pump station expansions and securing a new supply from the MWC. This will require significant coordination with the MWC. The identified solutions may require further refinement over time. The two options for addressing capacity of the Talent BPS and meeting Ashland's supply needs are both costly and will require additional decision-making beyond this WMP; for this reason, both options are presented in following sections.

TAP Facilities in Phoenix

System capacity recommendations in Phoenix are as follows:

- **Balance Demand and Timing**: Balance demands and timing of use among all Partner Cities until additional capacity can be achieved.
- **Short-Term Regional BPS Expansion**: Replace one 50 horsepower (hp) pump with a 125 hp pump at the Regional BPS (by approximately 2022).
- **New North Phoenix Road Supply**: Begin development of a new MWC supply in N. Phoenix Road (by approximately 2030).
    - Refer to **Chapter 5** for further details on this new supply.
    - Assumes Phoenix abandons the Experiment Station Road BPS and associated infrastructure by 2040.
- **Transmission Pipe Improvements**: Install pipes recommended in **Table 4-9**.

TAP Facilities in Talent

System capacity recommendations in Talent are as follows:

- **Additional Talent BPS Pump Capacity Testing**: Confirm hydraulic limitations (if any) on existing pumps.
- **Balance Demand and Timing**: Balance demands and timing of use among Talent and Ashland until additional capacity in the Talent BPS can be achieved.
- **Option 1: Expand Talent System to Supply Talent and Ashland**
    - Expand Talent BPS to meet build-out MDD for Talent and Ashland.
    - Install pipes recommended in **Table 4-7**.

- **Option 2: Construct a Dedicated Ashland BPS**
  - Expand Talent BPS to meet Talent MDD.
  - Install a dedicated Ashland BPS in Talent.
  - Install pipes recommended in **Table 4-8**.

Water System Supply Evaluation

Chapter 5 presents the existing supplies and recommended long-term supply strategy for the TAP System. The TAP water supply has three main limiting factors: 1) water rights held by the TAP Partner Cities; 2) MWC wholesale water service agreements; and 3) infrastructure capacity.

The Partner Cities each hold water rights in Lost Creek Reservoir (or the Rogue River) that are delivered through MWC to the TAP System. At the time of this WMP, the Partner Cities are actively participating in a regional water rights strategy and IGA with the MWC and other regional wholesale water purchasers. It is assumed that the resulting IGA will ensure that each TAP Partner City is not limited by water rights; therefore, water rights were not evaluated in this WMP.

MWC prepares wholesale water service agreements with each Partner City that establish the terms of the water supply, including maximum flow rates. These agreements are renewed every 5 years to adjust to growing demands. If all the Partner Cities were to currently use the TAP System to meet peak demands at the same time, the TAP System would exceed the peak flow rates established in the current agreements. However, the Partner Cities have not been operating in this way, and it is assumed that the Partner Cities will negotiate updated maximum flow rates with MWC in the next water service agreement updates (assumed to be in 2021). Recommendations for future MWC water service agreements are included in **Appendix 5B**.

As noted earlier, the TAP System will require more supply capacity as soon as 2030 to meet growing demands. To meet the supply needs for all TAP Partner Cities, the following supply strategy is recommended.

Short-Term (2020 to 2030)

- Expand Regional BPS.
- Update TAP System to allow Ashland to supply Talent and Phoenix during non-peak supply periods.
- Coordinate with MWC for a new MWC Supply in N. Phoenix Road.

Long-Term (2031 to Build-Out)

- Develop a new MWC supply in N. Phoenix Road.
- Abandon Phoenix's Experiment Station Road BPS Supply.

TAP Capital Improvement Plan

The TAP System recommendations identified throughout the WMP are documented in a prioritized CIP presented in **Chapter 6.** The proposed projects were developed from the system analysis and supply analysis, as well as several meetings with Partner Cities staff, to address current and future

water demand conditions and to maintain system reliability. It is important to note that this WMP represents the latest decision-making given current conditions and may likely change in the future as conditions and priorities change.

A summary of the CIP is developed and presented in Table ES-2. This summary provides total probable costs and a brief description, and prioritizes each capital improvement based on recommended year of implementation. Both Options 1 and 2 for addressing the Talent BPS and Ashland supply from Talent are included in the CIP. The total CIP is approximately $15M to $17M depending on the selected option. Project priorities should be considered flexible to accommodate budgetary constraints and other factors that may affect project implementation. Further details about the recommended CIP projects are presented in Chapter 6. Other general recommendations also are provided in Chapter 6.

Financial Analysis

Hansford Economic Consulting, LLC (HEC) performed a financial analysis for implementing the capital improvements and ongoing TAP System operations and maintenance (**Appendix 6B**). RH2 and HEC developed a cost-sharing methodology that assigns costs of all capital projects to the benefitting Partner Cities based on capacity share and common industry methodologies (**Appendix 6A**). The cost-sharing method assumes capital project costs are allocated based on owned capacity of a facility, while depreciation, operations, and maintenance are based on actual usage of facilities in the previous year. Because the TAP System capital improvement costs were not previously known, these costs were not included in the individual city's recent Water Master Plan updates. Similarly, allocating funds to pay for operations, maintenance, and depreciation are mostly new to the Partner Cities. HEC evaluated the impacts of the additional TAP costs on each City for the next 10 years. These significant costs are predicted to impact water rates, particularly for Ashland and Talent. Some costs may be deferred if demand requirements are less than the assumptions used in this WMP. The financial analysis also provides funding strategies to implement the CIP.

IGA Recommendations

With the completion of the first TAP WMP, a new IGA is recommended to improve management of the system and capture the latest understanding between the TAP Partner Cities, the capacity needs of each, and cost allocations to operate and maintain the TAP System. The recommendations stem from a review of the existing IGAs, understanding of the TAP infrastructure and operations, and financial considerations resulting from the TAP WMP. Recommendations (**Appendix 6C**) are provided for clarifying roles and responsibilities, management, and cost sharing of capital expenditures, operations, maintenance, and depreciation. The IGA should reflect the current agreeable relationships between the Partner Cities but also include language and methods so that if future conflicts arise, the IGA provides clear guidance. Additionally, the new IGA should be flexible enough to accommodate changes in the system and city staff without requiring significant amendments. It is assumed that the new IGA will require City Council approval by each Partner City. Through the process of updating the TAP Partner Cities IGA, the need for an updated IGA with RVCOG also may be identified.

Environmental Impacts

The Partner Cities are striving to reduce greenhouse gas (GHG) emissions. Ashland has a Climate Energy Action Plan. Phoenix and Talent both recently submitted Water Management and Conservation Plans which discuss their conservation goals and actions. Water conservation and reduction in GHG emissions were considered when developing the projects proposed in this Plan to align with the goals of the Partner Cities.

Table ES-2
Capital Improvement Plan

PROJ. NO.	PROJECT DESCRIPTION	TOTAL PROJECT COST	PROJECT TIMING SHORT-TERM 2020-2030	MID-TERM 2031-2040	LONG-TERM 2041- Buildout	NOTES
SUPPLY IMPROVEMENTS						
S-1	New MWC Connection in N Phoenix Road					
	MWC Coordination & Hydraulic Study	$ 50,000	$ 50,000	$ -	$ -	Cost to be refined with MWC.
	Pipe Improvements	$ 7,051,000	$ 2,871,000	$ 3,053,000	$ 1,127,000	Some cost sharing with development
	Master Meter Connection	$ 325,000	$ 325,000	$ -	$ -	
S-2	Ashland Non-Peak Supply Connection	$ 163,000	$ 163,000	$ -	$ -	Construct bypass modifications to supply water from Ashland to Talent and Phoenix through existing TAP mains.
BOOSTER PUMP STATION IMPROVEMENTS						
PS-1	Regional BPS Programming Updates	$ 35,000	$ 35,000	$ -	$ -	Requires SCADA (HMI), Phoenix Shop BPS Programming, and Regional PLC Programming. Updates to the operator interface, current local logic, and weak peripheral communication are assumed to be completed prior to this project.
PS-2	Regional BPS Short-Term Expansion	$ 50,000	$ 50,000	$ -	$ -	Replace 50-hp pump with 125-hp pump
PS-3	Talent BPS Small Pump Installation	$ 50,000	$ 50,000	$ -	$ -	Talent already has a pump at the shop. Costs for creating a third bay and installation of pump.
PS-4	Talent BPS Programming Updates	$ 25,000	$ 25,000	$ -	$ -	Requires SCADA (HMI) and Talent BPS Programming. Updates to the existing HMI are assumed to be completed prior to this project.
PS-5	Talent BPS Generator Upgrade (Option 1)	$ 350,000	$ -	$ -	$ 350,000	Provides backup power for Ashland and Talent demands.
	Talent BPS Generator Upgrade (Option 2)	$ 250,000	$ -	$ -	$ 250,000	Provides backup power for Talent demands only.
PS-6	Talent BPS Additional Hydraulic Analysis	$ 12,000	$ 12,000	$ -	$ -	Additional testing and hydraulic analysis to confirm pump station hydraulic limitations.
PS-7	Talent BPS Seismic Upgrades	$ 70,000	$ 10,000	$ 60,000	$ -	Costs from Talent Seismic Plan. Includes further building study and possible structure to protect pumps.
PS-8	Talent BPS Expansion for Talent and Ashland (Option 1)	$ 403,000	$ 225,000	$ 178,000	$ -	
	Talent BPS Expansion for Talent Only (Option 2)	$ 178,000	$ 178,000	$ -	$ -	
PS-9	New Ashland BPS (Option 2 Only)	$ 2,050,000	$ 2,050,000	$ -	$ -	
PIPE IMPROVEMENTS						
P-1	ODOT Bridge Pipe Relocation (Coleman Creek in Phoenix)	$ 300,000	$ 300,000	$ -	$ -	
P-2	24-inch Pipe Seismic Upgrades (Highway 99 Phoenix)	$ 1,221,000	$ -	$ -	$ 1,221,000	E 4th St to Oak St. Pipe may be at risk and is recommended for restrained joint pipe or earthquake pipe.
P-3	Talent to Ashland Pipe Improvements (Option 1)	$ 4,510,000	$ 1,486,000	$ 1,373,000	$ 1,651,000	
	Talent to Ashland Pipe Improvements (Option 2)	$ 4,795,000	$ 4,640,000	$ 155,000		
OTHER IMPROVEMENTS						
O-1	Future Water Master Plan Updates	$ 450,000	$ 150,000	$ 150,000	$ 150,000	
O-2	Telemetry Summary Report	$ 15,000	$ 15,000			Summarize existing telemetry systems and update topology graphics for TAP system.
O-3	IGA Development	$ 50,000	$ 50,000			
TOTAL						
	TOTAL OPTION 1	$ 15,130,000	$ 5,817,000	$ 4,814,000	$ 4,499,000	
	TOTAL OPTION 2	$ 17,140,000	$ 10,974,000	$ 3,418,000	$ 2,748,000	

Note: Option 2 Projects are shown in italics

1 EXISTING SYSTEM

1 | EXISTING SYSTEM

Introduction

In the late 1990s, the Cities of Talent, Ashland, and Phoenix (TAP Partner Cities) collaborated in the development of a new water supply transmission project (TAP System) to provide domestic water from the Medford Water Commission (MWC) to their communities. Since then, several system improvements have been implemented, resulting in management and cost-sharing decision making. Over the last few years, it has become increasingly apparent that an updated Water Master Plan (WMP) for the TAP facilities would be beneficial to all TAP Partner Cities, as it is an essential supply for all three communities.

The WMP addresses several goals:

- Documents the existing TAP System facility information;
- Confirms future supply demands for the next 40-year planning horizon;
- Assesses the condition and capacity of the existing system for future planning;
- Identifies operational constraints and recommends operational adjustments for improved efficiency;
- Develops options for meeting or revising the MWC Water Service Agreements to achieve compliance;
- Develops a Capital Improvement Plan (CIP) to meet future demands and major facility replacements;
- Formalizes the TAP System financing to guide the allocation of operational, maintenance, and capital costs between the TAP Partner Cities; and
- Provides recommendations for developing a new TAP Intergovernmental Agreement (IGA) between the TAP Partner Cities.

While all three TAP Partner Cities have independent WMPs in accordance with Oregon Administrative Rules (OAR) 333-61-060, which satisfies the cities requirements for planning by the Oregon Health Authority (OHA) and touch on their individual needs from the TAP System, this WMP was developed to look at the TAP system as a whole and incorporate the needs of all TAP Partner Cities collectively.

History

A water supply intertie between MWC and the TAP Partner Cities had been discussed for several years but was not thoroughly vetted until a multi-jurisdictional committee (TAP Committee) was formed in 1996. In the same year, the TAP Partner Cities entered into a four-party agreement with the Rogue Valley Council of Governments (RVCOG) to develop the TAP System. The City of Talent (Talent) needed to replace its aging source of supply (water treatment facility on Bear Creek); the City of Phoenix (Phoenix) needed to supplement its existing supply from MWC; and the City of Ashland (Ashland) wanted access to a secondary emergency source of supply.

RVCOG and the TAP Partner Cities solicited engineering services, acquired property, and secured funding for the project. Both Phoenix and Talent were awarded U.S. Department of Agriculture (USDA) grants and other loans; Ashland funded the project with its Public Utility Fund. Construction of the original TAP project was completed in 2001. The system initially only supplied water to Phoenix and Talent until 2014, when Ashland installed additional transmission facilities to provide an emergency source of supply for its community.

At the time of this WMP the TAP System supplies water to serve all of Phoenix and Talent. TAP augments Ashland's domestic water supply on an emergency basis. The TAP Partner Cities have recently resumed meeting on a monthly basis to support management of the system.

TAP Agreements

Several contractual documents were developed for the management and construction of the TAP facilities. The TAP Partner Cities initially entered into an IGA with RVCOG to provide administrative and contracting services for construction of the facilities. In 2000, the three cities entered into a three-party IGA (2000 TAP IGA) for use and management of the TAP System. Since then, the 2000 TAP IGA has been amended twice, and includes an addendum. The documents assumed to continue to be relevant to the TAP System are listed below and described in the following sections:

- 2000 TAP IGA – October 27, 2000 (**Appendix 1A**).
- 2000 TAP IGA Amendment No. 1 – March 20, 2002 (**Appendix 1B**).
- 2000 TAP IGA Amendment No. 2 – Unsigned 2004 (**Appendix 1C**).
- 2000 TAP IGA Addendum No. 1 – May 15, 2007 (**Appendix 1D**).
- 2006 Talent Ashland IGA for Emergency Water Service – April 19, 2006 (**Appendix 1E**).
- MWC IGA TAP Regional Pump Station Maintenance Agreement (October 2000) and Amendment No. 1 (May 7, 2002) (**Appendix 1F**).
- 2016 TAP RVCOG IGA for Billing (**Appendix 1G**).
- TAP Cost Allocation Recommendations – 2017 (**Appendix 1H**).

At the time of this WMP it is assumed that the latest governing documents (that have superseded or amended previous documents) include the 2000 TAP IGA Addendum No. 1, the 2006 Talent Ashland IGA, the 2016 TAP RVCOG IGA, and the MWC IGA TAP Regional Pump Station Amendment No. 1.

2000 TAP IGA

The 2000 TAP IGA includes agreements for engineering services ("Exhibit A" – not included), for construction ("Exhibit B" – not included), and for maintenance of the Regional Booster Pump Station (RBPS)("Exhibit C" MWC IGA TAP Regional Pump Station – **Appendix 1F**). The 2000 TAP IGA established a percentage share of the construction, operations, maintenance costs, and capacity of the system to be allocated to the three parties. **Table 1-1** shows the original allocation from the 2000 TAP IGA. The percentages were established to meet the peak day demand (PDD) for Phoenix and Talent and 25 percent of the average day demand (ADD) for Ashland.

Table 1-1
2000 TAP IGA Cost and Capacity Allocation

City	Flow-Based Percent of Capacity (%)	2050 Capacity Allocation (MGD)[1]	
		ADD	PDD
Talent	58.83%	1.858	3.972
Ashland	19.39%	1.600	1.600
Phoenix	21.78%	1.406	3.012

[1]MGD = Millions gallons per day (MGD)

The 2000 TAP IGA cost allocation was appropriate for the original construction of the TAP System; however, it does not accurately reflect the beneficial use of each facility for each city. For this reason, the 2000 TAP IGA also identified the responsibility and ownership of TAP "Project Components" for future maintenance as listed in **Table 1-2**.

Table 1-2
2000 TAP IGA Breakdown of Capacity Allocation by Pipeline/Facility

Size	Type/Name	City: Allocation
24-inch	MWC to Phoenix Pipeline	All Cities: Flow-based percent of capacity
12-inch	Phoenix Pipeline "A"	Phoenix: 100%
12-inch	Phoenix Pipeline "B"	Phoenix: 100%
16-inch	Talent Pipeline "A"	Talent: 100%
1.0 MG[1]	Phoenix Eastside Reservoir	Phoenix: 100%
1.0 MG	Talent Belmont 2 Reservoir	Talent: 100%
3,500 gpm[2]	Regional BPS	All Cities: Flow-based percent of capacity
	Talent Shop Booster Pump Station (BPS)	Talent: 100%
	Phoenix Shop BPS	Phoenix: 100%

[1]Million Gallons (MG)
[2]Gallons per Minute (GPM)

It is important to note that the flow-based percentage for each City currently differs from the original agreement. Recommended future cost sharing will be discussed in **Chapter 5**.

Lastly, the 2000 TAP IGA allocated management of the TAP system to RVCOG, and several additional agreements were in place between the cities and RVCOG (later superseded by the Addendum to the TAP IGA signed in May 2007 in the following sections).

2000 TAP IGA Amendment No. 1 (March 2002)

Amendment No. 1 (**Appendix 1B**) amends some minor issues and revises the capacity allocation slightly (rounding to whole numbers for PDD allocation: 4.0, 1.6, and 3.0 million gallons per day (MGD) for Talent, Ashland, and Phoenix, respectively). The amendment reduces the role of RVCOG in ongoing management and maintenance. The amendment also adds language allowing for future reallocation of the

respective capacities and adds responsibilities to Ashland when it connects to the TAP System to upsize the pumps at the RBPS unless the pumps require replacement.

2000 TAP IGA Amendment No. 2 (Unsigned)

All copies held by RH2 Engineering, Inc., (RH2) of this amendment (**Appendix 1C**) are unsigned and not dated. The amendment assigns responsibility to Ashland when it connects to the TAP System to contribute funding towards a generator that was purchased for the RBPS.

2000 TAP IGA Addendum No. 1 (May 2007)

The 2007 May Addendum (**Appendix 1D**) modifies the original 2000 TAP IGA and consolidates the duties of the TAP Committee. In this document, the TAP Partner Cities take over coordination of TAP Committee meetings, monitoring of the TAP System, and administrative duties from RVCOG. The document describes the responsibilities of the TAP Committee, membership, voting, meetings, and contract performance, and allocates specific tasks to each city: billing invoiced to Talent with reimbursement from the other cities, and landscaping services at the RBPS to Phoenix. At the time of this addendum, Ashland had not yet connected to the TAP System and had no assigned duties. This addendum lists all documents that it supersedes and those which remained in effect.

2006 Talent Ashland IGA (April 2006)

In 2006, Talent and Ashland entered into a new IGA (**Appendix 1E**) to jointly construct facilities that would support emergency supply for both cities. Initially, this included construction of a 16-inch pipe in Creel Road in Talent. The IGA also describes the future development of a pipe in Highway 99 from Talent to Ashland, an Ashland pump station to deliver TAP water to its customers, and a second Ashland pump station to boost water to higher pressure zones. At the time of this WMP, all this infrastructure (with the exception of a second Ashland pump station) have been constructed.

The IGA includes guidelines on the operation of the system between the two cities after completion of the projects. The guidelines emphasize communication and coordination between the two cities for desired use of the emergency water supply, including reasonable efforts to supply the other city with “basic minimal needs.”

MWC IGA TAP Regional Pump Station Maintenance Agreement (October 2000, Amended May 2002)

This agreement between the TAP Partner Cities and MWC (**Appendix 1F**) was originally Exhibit C of the 2000 TAP IGA. The original MWC IGA assigned responsibilities for operation and maintenance (O&M) of the Regional BPS to MWC. Amendment No. 1 (May 2002) reallocated O&M to Phoenix. It also outlines the financial obligations of Talent and Ashland to Phoenix for O&M based on metered flow amounts to each City to be revised on July 1st of each year. Lastly, it notes that the TAP Partner Cities and MWC will meet quarterly to discuss operational parameters to “insure among other things that conveyance of water is evenly taken from the Regional Booster Pump Station during daily pumping operations.” The IGA is assumed applicable to the use of supply from either City during emergencies only.

2016 TAP RVCOG IGA for Billing

Beginning in 2015, the TAP Partner Cities assigned water use tracking and billing to RVCOG rather than Talent. A 2015 IGA with RVCOG was later superseded by a 2016 IGA with RVCOG

(**Appendix 1G**). RVCOG currently tracks metered water use and prepares billing for each City. The TAP Partner Cities reimburse RVCOG on a monthly basis.

Other TAP Documents

Other TAP documents have been developed but are assumed to not be critical to this WMP, therefore, they are not discussed further. These include (but are not limited to) an original 1995 IGA between the TAP Partner Cities, several previous IGAs with RVCOG, the Agreement and Contract for Mutually Granted Easements at Medford Sports and Community Park, and all documents superseded by the 2000 TAP IGA Addendum.

TAP Cost Allocation Recommendations (2017, RH2)

The original TAP agreements established cost sharing and maintenance responsibilities for the TAP Partner Cities. Over the years, as additional facilities have been constructed, the cost sharing has varied depending on the situation. For example, Ashland was not actively using the facilities from 2001 through 2013 and was not sharing the TAP System maintenance costs, which is inconsistent with the original agreement but was acceptable to Talent and Phoenix at the time. Since Ashland's connection to the TAP System, the TAP Committee agreed to establish cost allocations to ensure all parties are paying an equitable share for their impact on the facilities. In 2017, RH2 prepared a *TAP Cost Allocation Recommendations* (**Appendix 1H**) study to update the cost allocations based on respective use of the facilities. This document was not contractually implemented by the TAP Partner Cities but has been used as guidance for developing a maintenance fund within each TAP Partner City.

Existing TAP Facilities

The original TAP System included construction of the Regional BPS, the Talent Booster Pump Station (Talent BPS), Phoenix's Eastside Reservoir, Talent's Belmont 2 Reservoir, and transmission piping extending from the MWC meter to these facilities. In 2014, Ashland physically connected to the TAP System by extending transmission piping from Talent to Ashland and constructing the Ashland TAP Booster Pump Station (Ashland BPS). The following sections describe the transmission, storage, pump station, telemetry, and metering facilities. Although these facilities are all related to the TAP System, not all facilities benefit all TAP Partner Cities. Therefore, for maintenance, capacity, and cost sharing purposes, each facility has been identified as supporting the appropriate City or combination of TAP Partner Cities as described in **Table 1-1**.

Operation of the facilities is described in the **TAP Operation** section. The TAP water system is depicted in **Figure 1-1** and **Figure 1-2**. The following sections describe the TAP facilities.

Transmission Piping

Pipes assumed as part of the TAP System have been organized into distinct segments for evaluation of condition, capacity, and future cost sharing as presented in **Table 1-3** and **Figure 1-2**. The main TAP transmission line is 24-inch ductile iron (DI) pipe and extends from the connection with MWC at Highway 99 and Garfield Street through the MWC meter and RBPS, through Phoenix, and terminates in Highway 99 at Suncrest Road in Talent (Pipe Segments 1, 2, and 3). These pipes and other city-specific piping are discussed further as follows.

Transmission Pipe Segment 1 Management

Ownership and maintenance of Segment 1 of the transmission main is disputed between the TAP Partner Cities and MWC. Segment 1 only serves TAP customers, but the MWC/TAP meter is located at

the Regional BPS (between Segments 1 and 2). It is common for a water provider to maintain ownership of piping up to a customer meter and not beyond the meter; in this case, MWC would own and maintain all of Segment 1. Article 3 of the 2016 MWC Wholesale Water Service Agreement between Phoenix and MWC (**Appendix 5A**) states that "MWC owns and is responsible for the construction, extension, maintenance, and operation of the MWC system up to the point of and including the master Phoenix meter(s)." It goes on to list the two Phoenix meters at the Regional BPS and at Kings Highway. However, MWC currently views this piping as part of the TAP System and disputes the requirement to maintain it.

TAP Piping in Phoenix

In addition to the 24-inch transmission piping in Highway 99 in Phoenix (Pipe Segment 2), the original TAP project also included construction of 16-inch piping extending from Segment 2 near Oak Street, crossing under Interstate 5, and eventually connecting to the Eastside Reservoir. This pipe is not isolated from the rest of the Phoenix distribution system, and the Phoenix Eastside Reservoir only has a single fill and draw pipe. The original TAP project also included construction of 12-inch piping from the Phoenix Shop Pump Station to South Rose Street.

In 2016, a second connection was made between Phoenix's distribution system and Pipe Segment 2 at Rose Street towards the north end of Phoenix. At this location, the 12-inch pipe in Rose Street taps into the 24-inch Pipe Segment 2 transmission main. It is assumed this connection was made to improve pressures in the west side of Phoenix's distribution system. The pipes discussed above are not included in **Figure 1-2,** as they are no longer considered part of the TAP System (refer to **Current TAP Piping section**).

TAP Piping in Talent

In Talent, the original TAP project included construction of 16-inch piping in Suncrest Road from the end of the 24-inch pipe in Highway 99 to the Talent BPS (Pipe Segment 4). Because the Talent BPS is located at the site of Talent's abandoned water treatment plant, transmission piping from the Talent BPS to the Talent distribution system was already in place and was not modified as part of the original TAP project.

However, the original TAP project included other pipe improvements in Talent to connect to the new Belmont 2 Reservoir. This included 16-inch pipes in Creel Road from Lithia Way to Talent Avenue, in Talent Avenue from Creel Road to Belmont Road, and in Belmont Road eventually connecting to Talent's Belmont 2 Reservoir (as shown in **Figure 1-3**). In 2006, Ashland paid to construct a 16-inch pipe in Creel Road from Highway 99 to Lithia Way in preparation for a future emergency water supply between the two cities (**TAP Agreements**). In 2013, Talent constructed a 16-inch pipe in Highway 99 from Rapp Road to Creel Road (part of Pipe Segment 5) to replace aging undersized piping prior to the Highway 99 improvements adding to TAP transmission.

At some point in time, the plan for Ashland to connect to the TAP system was to extend the TAP transmission piping in Highway 99 at Suncrest Road and continue along Highway 99 all the way to Ashland and constructing a pump station to boost pressure to Ashland's Granite Reservoir. In this way, Ashland's use of the TAP System would draw directly from the TAP transmission piping downstream of the TAP BPS and would not influence the Talent water system or require use of the Talent BPS. However, as an emergency connection, the two cities allowed for Ashland's connection to draw directly from the Talent distribution system.

Talent's 2019 WMP Capital Improvement Plan includes replacing 12-inch piping that extends from the Talent BPS to West Valley View Road and through private property to Highway 99 near Rapp Road. It is possible that this new pipe could support a more direct supply to Ashland and will be evaluated in **Chapter 4**. The new piping will be kept in dedicated city rights-of-way.

TAP Piping to Ashland

To meet summer demands during a severe water shortage in 2014, Ashland quickly extended the 16-inch pipe in Highway 99 from Creel Road to a temporary Ashland BPS near South Valley View Road (Pipe Segment 5). Later that year, the temporary pump station was converted into the permanent Ashland BPS. The 16-inch pipe was also extended from the Ashland TAP BPS to North Main Street, where it ties into Ashland's water distribution system (Pipe Segment 6).

Current TAP Piping

Some piping from the original TAP project is no longer considered jointly used for TAP purposes; other TAP pipelines have been added since the original project. This WMP assumes that the TAP transmission piping includes the transmission mains generally along Highway 99 extending from the MWC meter all the way to Ashland. Even though they were constructed as part of the original TAP project, the piping to and from the reservoirs within Phoenix and Talent are not considered part of the TAP System for the purpose of this master plan (refer to the **Storage Facilities** section). Pipes assumed to be part of the TAP System have been organized into distinct segments for evaluation of condition, capacity, and future cost sharing as presented in **Table 1-3**.

Table 1-3
Transmission Piping

Pipe Segment	Location	Length (ft)	Diameter (inches)	Year Constructed	Beneficial TAP Partner Cities
Segment 1	HWY 99 (MWC connection at Garfield Street to Regional BPS)	6,100	24	2001	All
Segment 2	HWY 99 (Regional BPS to Talent Meter)	12,160	24	2001	All
Segment 3	HWY 99 (Talent Meter to Suncrest Road)	10,575	24	2001	Talent/Ashland
Segment 4	Suncrest Road (HWY 99 to Talent TAP BPS)	1,750	16	2001	Talent/Ashland
Segment 5	HWY 99 (Rapp Road to Creel Road)	3,900	16	2013	Talent/Ashland
Segment 6	HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)	13,400	16	2015	Ashland

Storage Facilities

The original TAP project included two storage reservoirs: the Eastside Reservoir in Phoenix and the Belmont 2 Reservoir in Talent. While these reservoirs were constructed as part of the original TAP supply project, the cities operate and maintain them individually. Their inclusion as part of the current TAP facilities is disputable. Under current operations, the two storage reservoirs are impacted by the operations of the TAP facilities by other cities (refer to the **TAP Operations** section). However, operations likely could be revised to

prevent drawdown of tank water levels so that one City's use of the TAP System does not influence another city's storage volume. This will be evaluated using a hydraulic model of the system and is discussed in **Chapter 3**.

Table 1-4 presents the characteristics of the two original TAP reservoirs.

Table 1-4
TAP Reservoirs

	Eastside Reservoir	Belmont 2 Reservoir
Location	Phoenix East Side	Creel Road
Type	Type 1 Concrete	Type 1 Concrete
Year Built	2001	2001
Volume (MG)	1.0	1.0
Overflow Elevation (ft)	1,681	1,813
Base Elevation (ft)	1,657.5	1,790
Diameter (ft)	80	85
Water Column Height (ft)	23.5	23

Talent is currently constructing a third reservoir in its main service zone to replace the original Belmont 1 Reservoir. The new reservoir is not assumed to be part of the TAP System. Additionally, the Phoenix's 2019 WMP identified the need for additional storage and recommends a new storage facility northeast of Phoenix to support future growth in that area. The new storage facility may be part of a new supply connection with MWC, which could influence the TAP system supply. This is discussed further in **Chapter 5**.

Booster Pump Stations

The TAP System includes three pump stations as presented in **Table 1-5**. As discussed earlier, the original TAP project included construction of the Regional BPS and the Talent TAP BPS. Ashland installed the permanent Ashland TAP BPS in 2015 (a temporary pump station was installed in 2014 and used until the permanent station was constructed.

Regional BPS

The Regional BPS is located on Samike Drive near the intersection of Highway 99 and South Stage Road just on the edge of the Medford city limits. The pump station is housed in a reinforced masonry building with ample space for the four pumps and an adjacent generator with on-site fuel storage. The station is supplied power by Pacific Power via an on-site 480/277 Volt transformer with an 800 Amp service.

The station consists of four vertical turbine pumps. Each pump has a manually operated suction isolation valve, motor operated discharge isolation valve, and check valve. The two largest pumps include variable frequency drive (VFD) motors. A backflow assembly is located in a buried vault upstream of the meter vault on the suction side of the pump station. The station floor elevation is 1,430 feet.

The station is operated and maintained by Phoenix. Phoenix uses a supervisory control and data acquisition (SCADA) system to monitor and control the Regional BPS and all of its water facilities. Operation of the Regional BPS (and Eastside Reservoir water levels) can be viewed by the MWC and the Talent SCADA control systems but cannot be controlled by them.

Phoenix also supplies its system with two other pump stations that operate in series: Experiment Road BPS and Shop BPS. Together, these pump stations boost the other Phoenix supply source (also from MWC) to supplement the TAP supply. These facilities are not considered TAP facilities; however, the water they provide to Phoenix is combined with water from the TAP supply in the Phoenix distribution system prior to supplying Talent or Ashland. Therefore, the total TAP supply is considered the sum of the flow through the Regional BPS and through the Experiment Road BPS and Shop BPS. These supplies are discussed further in **Chapter 5**.

Regional BPS, Samike Drive, Medford, OR

Talent BPS

The Talent BPS is located at the Talent Public Works Operations Center on Suncrest Road. The pumps and equipment are located within a large building that originally housed the former water treatment plant. The rest of the building is currently used for equipment storage. The station is supplied power from Pacific Power with an on-site 480/277 Volt transformer with a 600 Amp service. Auxiliary power can be supplied by a 200-kilowatt (kW) standby generator located outside the building. Talent is planning to replace the existing generator with a larger capacity generator in 2021 or 2022.

The Talent BPS consists of two split case horizontal pumps. Each pump has manually operated suction and discharge isolation valves and check valves. Both pumps have VFD motors. A backflow assembly is located outside of the Talent BPS building in a vault on the suction side of the pump station to prevent Talent

distribution system water from flowing back towards the Phoenix water system. The station floor elevation is 1,583 feet.

The station is operated and maintained by Talent. Talent Public Works staff monitor and control the Talent BPS and all facilities using its SCADA system. Operation of the pump station and tank levels can be viewed by the Phoenix and Ashland SCADA control systems but cannot be controlled by them.

Talent BPS, Suncrest Road, Talent, OR

Ashland TAP BPS

The Ashland TAP BPS is located off Jackson Street, just off of Highway 99 near South Valley View Road. The pump station is a standalone reinforced masonry building with architectural elements to match nearby buildings. The pump station boosts water from the Talent distribution system through the 16-inch TAP Pipe Segments 5 and 6 to meet the pressure required by Ashland's Granite Pressure Zone 1. Power to the pump station is supplied by Pacific Power through an on-site 3-phase 480/277 Volt transformer providing an 800-amp service. Ashland is in the process of adding an on-site backup generator. A backflow preventer assembly is located in a buried vault outside of the pump station.

The Ashland TAP BPS consists of two vertical turbine centrifugal pumps. Each pump has isolation valves, check valves, and standard motors. The pump station was designed for a future addition of a third pump to provide an ultimate capacity of 3.0 MGD (2,083 gallons per minute (GPM)). The station is equipped with a booster chlorine system to increase chlorination levels prior to entering the Ashland distribution system.

The station is operated and maintained by Ashland. Ashland Public Works staff monitor and control the Ashland TAP BPS and all Ashland facilities using a SCADA system. Operation of the pump station can be viewed by the Talent SCADA control system but cannot be controlled by it.

Adjacent to the pump station is a buried valve vault that houses the Ashland TAP BPS Meter, backflow assembly, and valving to allow a small amount of flow back towards Talent to maintain water quality in TAP Pipe Segment 5.

Ashland TAP BPS, Jackson Street, Ashland, OR

Table 1-5
TAP Booster Pump Stations

	Regional BPS	Talent TAP BPS	Ashland TAP BPS
Location	2992 Samike Drive, Medford, OR	200 Suncrest Road, Talent, OR	2073 W. Jackson Road, Ashland, OR
Year Built	2001	2001[1]	2015
Backup Power	Yes	Yes	No – Installation planned in 2022/2023
Horsepower (HP)			
Pump 1	125	125	150
Pump 2	125	125	150
Pump 3	50	N/A	N/A
Pump 4	50	N/A	N/A
Motor Type[2]	VFD[3] – Pumps 1 & 2 Standard – Pumps 3 & 4	Horizontal on VFD	Fixed speed drive
Firm Capacity (gpm)	3,600	1,980	1,458

Total Capacity (gpm)	4,500 (not tested)	2,628 (tested 02/19/2020)	2,083
Beneficial TAP Partner Cities	All	Talent/Ashland	Ashland

[1]Pumps were replaced in 2014.
[2]VFD = variable frequency drive.
[3]Information is the same for all pumps within each station unless otherwise noted.

Metering

The TAP system includes four meters, as shown in **Figure 1-2** and described in **Table 1-6**. Recorded flows through the meters are tracked and documented by RVCOG on a monthly basis. Ashland's water use is measured as the flow through the Ashland meters; two meters are in place to support checking the meters for accuracy. Talent's water use is measured as the flow through the Talent meter minus Ashland's supply when in use. Phoenix's water use is measured as the sum of flow through the TAP Regional Meter and Phoenix's Kings Highway Meter minus flow through the Talent meter. The Kings Highway Meter is not considered a TAP facility as it is part of Phoenix' separate supply system.

The original TAP meters were replaced in 2016 with Rosemount Magmeters following two significant metering issues at both the TAP Regional Meter and the Talent Meter. These issues are discussed in the **Management Issues** section. The two Ashland meters were installed with the extension of the TAP system to Ashland in 2014 and 2015.

Table 1-6
TAP System Meters

Meter	Location	Installation/ Replacement Year	Type
TAP Regional Meter[1]	Regional BPS Samike Drive, (Phoenix)	2000/2016	Rosemount Magmeter
Talent Meter	HWY 99/Oak Street (Phoenix)	2000/2016	Rosemount Magmeter
Ashland Creel Road Meter	HWY 99/Creel Road (Talent)	2015	Siemens Magmeter (High Flow/Low Flow)
Ashland TAP BPS Meter	Ashland TAP BPS W. Jackson Road (Ashland)	2014/2018	Endress-Hauser Magmeter (High Flow/ Low Flow)

[1]Owned and managed by MWC.

Phoenix' Kings Highway Meter is used for measuring TAP Supply but is not considered a TAP System asset.

Monthly water use also is tracked by MWC using the TAP Regional Meter and Phoenix's second MWC meter located on Kings Highway prior to the Experiment Station Road BPS. MWC tracks TAP water use by adding the sum of water use through these two meters. MWC does not have the ability to track individual water use for each TAP Partner City (i.e. they do not have access to the Talent nor Ashland meter data).

Telemetry

The TAP facilities are equipped with telemetry equipment to communicate operational status to the SCADA systems.

Phoenix has radio towers at all facilities. A new radio tower was installed at the RBPS in 2018. The RBPS sends and receives messages to and from the Phoenix service center. Phoenix also can view information for the Talent TAP facilities (Talent BPS and Belmont Reservoirs). Replacement or upgrades of the operator interfaces, BPS controls, and HMI migration is recommended in 1 to 5 years.

Talent recently installed cellular equipment on all facilities in October 2019. Talent is slowly migrating old equipment out. Additional operator interfaces and an upgrade of controllers is recommended in 1 to 5 years. Through the telemetry systems, Talent receives data for the Eastside Reservoir and RBPS. Talent does not receive information from the Ashland TAP BPS.

Ashland recently installed new radios and controls at the Ashland TAP BPS in 2018. There is one antenna for Talent information and a second antenna for communications to Ashland's "Squirrel Ranch" repeater for the water treatment plant. Information received by the Ashland TAP BPS includes Ashland Creel Road Meter flows and Belmont Reservoir levels. Replacement of Ashland TAP BPS telemetry equipment is recommended in 10 to 20 years.

Remaining Useful Life Assessment

The initial TAP infrastructure is approaching 20 years of operation. In general, the TAP facilities are functioning well. The TAP Partner Cities have performed maintenance and upgrades as needed on elements of all facilities. As anticipated, the ductile-iron TAP water system has required no maintenance in this time period. The following provides a high-level remaining useful life assessment of the facilities to support future maintenance and replacement planning. The facilities evaluated include pipes, meters, and pump stations. Reservoirs were not included, as the TAP Partner Cities consider these private facilities and maintain them separate from the TAP facilities.

Pipes

It was assumed that the useful life of the TAP pipelines is approximately 80 years considering that the pipelines are poly-wrapped Class 52 DI pipe with good installation techniques. The pipe integrity is likely high given that the pipes have few penetrations, no hydrants, and limited connections. A portion of the pipe was exposed and accidentally damaged during highway construction in Phoenix in 2014. The undamaged pipe, where exposed, appeared in good condition with no signs of corrosion. **Table 1-7** presents the remaining useful life of the TAP pipelines assuming 80 years of useful life. As seen in **Table 1-7**, the TAP pipeline is likely to last until 2081 and beyond. It is recommended that the pipe condition be inspected if and when possible during construction of other adjacent projects.

Table 1-7
TAP Pipes Remaining Useful Life

Pipe Segment/Diameter	Year Constructed	Remaining Useful Life (years)	Year Recommended for Replacement
Segment 1 - 24-inch	2001	61	2081
Segment 2 - 24-inch	2001	61	2081
Segment 3 - 24-inch	2001	61	2081

Pipe Segment/Diameter	Year Constructed	Remaining Useful Life (years)	Year Recommended for Replacement
Segment 4 - 16-inch	2001	61	2081
Segment 5 - 16-inch	2013	73	2093
Segment 6 - 16-inch	2015	75	2095

Meters

Meters were assumed to have a remaining useful life of 20 years. **Table 1-8** presents the remaining useful life of the TAP meters. All three meters likely will require replacement in the next 15 to 17 years. It is recommended that the condition of the meters be inspected and calibrated annually.

Table 1-8
TAP Meters Remaining Useful Life

Meter	Year Constructed/Replaced	Remaining Useful Life (years)	Year Recommended for Replacement
Talent Meter	2000/2016	16	2036
Ashland Creel Road Meter	2015	15	2035
Ashland TAP BPS Meter	2014/2018	18	2038

Pump Stations

The remaining useful life assessment for the TAP pump stations relies heavily on the *TAP Cost Allocation Recommendations* (2017, RH2, **Appendix 1H**). **Table 1-9** and **Table 1-10** present the remaining useful life of the TAP pump stations.

Remaining useful life was not estimated for other pump station elements such as building structure, external piping, and valving.

RBPS

Motor operated valve actuators (MOV) on pumps at the RBPS with VFDs do not need to be replaced and could be removed all together. The TAP Partner Cities might want to remove MOVs to reduce power consumption. Installation of VFDs on Pumps 110 and 120 is recommended instead of performing maintenance on the MOVs when repair or replacement is required.

Major maintenance is anticipated in 2020 for three of the four pumps. No maintenance is expected on the VFDs, electrical equipment, telemetry system, or generator for the next 10 years, as shown in **Table 1-9**.

Table 1-9
Regional BPS Remaining Useful Life

Facility Element	Year Constructed	Year Replaced	Year Recommended for Major Maintenance	Remaining Useful Life (years)	Year Recommended for Replacement
Pump 110	2000	-	2020	20	2040
Pump 120	2000	-	2020	20	2040
Pump 130	2000	-	2020	20	2040
Pump 140	2000	2014	2034	34	2054
VFD 1 (130)	-	2016	2036	16	2036
VFD 2 (140)	-	2016	2036	16	2036
Electrical	2000	-	2030	10	2030
Telemetry	2000	2016	2036	16	2036
Generator	2003	-	2033	13	2033

Talent BPS

Major maintenance/replacement of VFD 1 is anticipated around 2025. The pumps, VFD No. 2, electrical equipment, telemetry system, and generator are not anticipated to require major maintenance or replacement in the next 10 years, as presented in **Table 1-10**.

Table 1-10
Talent BPS Remaining Useful Life

Facility Element	Year Constructed	Year Replaced	Year Recommended for Major Maintenance	Remaining Useful Life (years)	Year Recommended for Replacement
Pump 1	2000	2015	2035	35	2055
Pump 2	2000	2015	2035	35	2055
VFD 1	2005	-	2025	5	2025
VFD 2	2015	-	2035	15	2035
Electrical	2000	2015	2045	25	2045
Telemetry	2000	2015	2045	25	2045
Generator	2003	-	2033	13	2033

TAP Operation

In general, the TAP System is automatically operated to turn pumps on and off based on the water levels in upstream reservoirs. As customer demands draw down reservoir levels, the TAP supply is turned on to replenish lost storage volume. These operations are described more fully for each city as follows. The TAP Partner Cities adjust the operational setpoints of the pump stations to meet seasonal demands,

to adjust when Ashland is using the TAP System, and to avoid exceeding the maximum allowable pump flow rate established in the Cities' MWC Wholesale Water Supply Agreements (**Appendix 2B**). This is particularly critical during peak summer demand periods. The following sections describe the TAP system operation within each city.

Phoenix Operation

In Phoenix, water supply is provided to TAP Pipe Segment 1 by the MWC transmission system with a static hydraulic grade of 1,592 feet. The RBPS boosts this water and discharges to the TAP Pipe Segments 2, 3, and 4, for which the hydraulic grade is governed by the Phoenix Eastside Reservoir (overflow elevation of 1,681.5 feet and floor elevation of 1,657.5 feet). The RBPS is controlled automatically based on the water level of the Eastside Reservoir. Pumps are started sequentially to increase flows in response to falling reservoir levels and stopped in response to rising reservoir levels at predetermined set points. These setpoints vary based on the seasonal operating condition or if Ashland is using their emergency supply.

As seen in **Figure 1-1**, Phoenix has a second supply source with MWC that includes a meter (Kings Highway Meter) and the Experiment Station Road BPS. This was the original Phoenix supply prior to the TAP system. The Experiment Station Road BPS boosts water through a few miles of pipe and over a hill to fill Phoenix's original two storage tanks (Shop Tanks) located at the operations center. The Shop Tanks are at grade with the pressure zone they serve, therefore, they require a booster pump station (Shop BPS) to meet customer pressures. Even though it requires boosting water twice, Phoenix needs to operate its second supply source to utilize its stored water in the Shop Tanks. The Shop BPS is required to operate to cycle water in the Shop Tanks, otherwise, the water quality in the tanks would not meet potable water quality requirements.

The Shop BPS pumps are turned on based on operation of the RBPS to cycle water in the Shop Tanks. The Experiment Station Road BPS is called on by water levels in the Shop Tanks and typically operates once or twice a day. Phoenix is unable to separate the two MWC supplies in the system; therefore, the sum of supply to the entire TAP system is calculated as the sum of supply through RBPS and Experiment Road BPS.

Talent Operation

The Talent BPS conveys water from TAP Pipe Segment 4 to the Talent distribution system and Belmont Reservoirs. The hydraulic grade on the suction side of the pump station is established by the Phoenix Eastside Reservoir. The discharge hydraulic grade is governed by the water level in the Talent Belmont Reservoirs with an overflow elevation of 1,813 feet, and a floor elevation of 1,790 feet. The station is operated to maintain tank level in the Talent Belmont Reservoirs. Pumps are started sequentially to increase flows in response to falling reservoir levels and stopped in response to rising reservoir levels at designated setpoints. The TAP System is the only supply to Talent, with the exception of the small amount of supply coming from Ashland's water system to maintain water quality in TAP Pipe Segment 5.

Ashland Operation

Ashland only operates the Ashland TAP BPS with prior agreement from the other TAP Partner Cities and only when needed to supplement its own water supply. This typically occurs in the fall when Reeder Reservoir water levels are low, and Ashland needs to meet potable domestic demand. The suction hydraulic grade of the pump station is governed by the water levels in Talent's Belmont Reservoirs (elevations noted in **Talent Operation**). The discharge hydraulic grade is governed by the water level in Ashland's Granite Reservoir (overflow elevation of 2,173 feet, floor elevation of 2,145 feet) and distribution system pressures in Granite Zone 1. A single pump is operated at a time, using the VFD to adjust flows in response to reservoir levels.

Operational Issues

Impacts on Reservoirs

The current configuration and operation of the TAP System, in which TAP pump stations are called on by reservoir levels, impacts downstream reservoir levels. Historically, when the Talent BPS is called on to fill the Belmont Reservoirs, the additional draw on the Phoenix system causes the Eastside Reservoir water level to drop. The drawdown of the Eastside Reservoir initiates calling on the RBPS to refill the reservoir. However, Phoenix has noted occasions where it has been difficult to keep the Eastside Reservoir water level from dropping excessively with three pumps running at the RBPS. In one unusual occasion, the Eastside Reservoir was drained down to a water level of 3 feet, when it was finally noticed by a staff member who quickly turned on the RBPS. This identified the need for alarms to be implemented to notify the appropriate city(ies) of possible impacts on each other's water systems. If not already in place, an alarm should be added to the Talent BPS to shut off pumps if the Eastside Reservoir is too low. Similarly, an alarm at the Ashland TAP BPS could shut off pumps if Talent's Belmont Reservoirs are too low. A related issue is sharing data so that each city can avoid negative impacts to other cities' water systems.

MWC Peak Pumping Rates

The operation of the RBPS to turn on and off based on the Eastside Reservoir water levels results in the pump station operating non-continuously, which impacts the Talent's ability to meet the established MWC peak flow rates per Talent's MWC Water Service Agreement as discussed in **Chapters 3 and 5**. The latest Service Agreements establish peak flow rates slightly higher than each city's Maximum Day Demands (MDDs) and establish lower flow rates during peak water use periods in early morning hours during the summer. To avoid higher water rates associated with pumping from MWC during peak hour periods, Phoenix and Talent have both set their pumps to "off" during peak summer water use periods. The TAP Partner Cities have named this operation as "conservation mode." To recover from the pumps being off for several hours, both cities must pump at a higher flow rate than the Service Agreements allow to refill the storage tanks. The cities have not been penalized by MWC for this operation because MWC does not meter each city individually, and generally, this operation occurs while Ashland is not using its allocated peak flow rate. However, MWC has occasionally expressed concerns of this TAP System operation, including impacts on the MWC pressures downstream of the RBPS. This issue is discussed further in **Chapter 3**.

Phoenix Supply Excessive Pumping

As discussed in **Phoenix Operation**, Phoenix is required to utilize the city's original supply infrastructure through Experiment Station Road to avoid water quality issues with the Shop Tanks. This requires boosting water through two pump stations, which incur operation and maintenance costs. To address this issue and others, Phoenix's 2019 WMP recommends abandoning the original supply infrastructure and constructing a new supply connection with MWC and a new storage reservoir on or near North Phoenix Road east of Phoenix. This new supply connection is discussed in **Chapter 5**.

TAP System Management

For the past several years, each TAP Partner City has individually operated and managed the TAP infrastructure within their respective cities. Though regular TAP meetings were established in prior IGA documents, the TAP Partner Cities have not held regular meetings to discuss operation or management issues until recently as part of this WMP. As noted in the **Metering** section, RVCOG has been managing the flow calculations and billing.

Management Issues

Management of the TAP System could be improved with clearly assigned responsibilities for each city that go beyond the original IGA documents. These include clear roles for each city regarding maintenance of facilities, locating TAP system pipes outside of city limits, insuring the facilities, stockpiling replacement materials, and storage and maintenance of TAP System documents (agreements, design documents, studies, construction as-builts, GIS data, etc.). Additionally, clear guidelines for which cities should have visual rights to see SCADA data from other cities would improve communications during operation of the TAP System.

Regularly Scheduled Water Audits

Though RVCOG documents flow rates and manages billing, RVCOG does not regularly assess water use information for the TAP Partner Cities. Water audits, which compare purchased water volumes against individual city consumption data, can identify water loss trends and potential metering errors. Significant metering errors occurred in the past 10 years at both the TAP Regional Meter and Talent Meter, causing MWC and Talent to backpay large fees to Phoenix. Regularly scheduled water audits likely would have identified these metering errors much sooner. Scheduling water audits on a quarterly or annual basis is recommended.

SOUTH ⟷ NORTH

2000' 1950' 1900' 1850' 1800' 1750' 1700' 1650' 1600' 1550' 1500' 1450' 1400'

Talent 1985 Zone

Anderson Creek BPS
Elev. 1808'

Talent 1880 Zone

Wagner Reservoir
0.5 MG
Overflow Elev. 1880.5'
Base Elev. 1850.5'

To Granite Reservoir
Base Elev. 2145'
2170 Granite Zone 1

Ashland TAP BPS
Elev. 1690'

Ashland Connection

TAP Pipeline

Rapp Road BPS
138 GPM
TDH 54'
Elev. 1690'

Talent 1814 Zone

Belmont Reservoir 1
1.5 MG
Overflow Elev: 1814'
Base Elev: 1795'

Belmont Reservoir 2
1 MG
Overflow Elev: 1814'
Base Elev: 1790'

Proposed Reservoir
2 MG
Overflow 1814'
Base Elev: 1790'

TAP Pipeline

Talent BPS
4.2 MGD
TDH 180'
Elev. 1583'

Phoenix Skyline Zone

Amerman PRV

Skyline BPS
100 GPM

TAP Pipeline

Phoenix 1681 Zone

East Reservoir
1.0 MG
Overflow Elev: 1681.5'
Base Elev: 1657.5'

Shop BPS
1400 GPM

TAP Pipeline

Shop 1 Reservoir
0.35 MG
Overflow Elev: 1565'
Base Elev: 1545.5'

Shop 2 Reservoir
1.5 MG
Overflow Elev: 1565'
Base Elev: 1545.5'

Regional BPS 1
(4000 GPM)
(6000 GPM possible)

Experiment Station Road BPS
1000 GPM

Medford 1430 Zone

Duff Treatment Plant

Figure 1-1
System Hydraulic Profile
Cities of Talent, Ashland, and Phoenix
TAP Water Master Plan

Date:July 17, 2019 Filename: TAP-hydraulic-profile.dwg

Legend

- Medford Zone
- Phoenix Zone
- Talent 1814 Zone
- Talent 1880 Zone
- Talent 1985 Zone
- Granite 2173 Zone
- Facilities at Same Site
- Proposed Removal Reservoir
- Proposed Reservoir
- Booster Pump Station

Connection to MWC
SEGMENT 1
MWC TAP Meter and TAP Regional BPS
SEGMENT 2
Eastside Reservoir
Talent Meter
Skyline BPS
SEGMENT 3
SEGMENT 4
Talent TAP BPS
Talent Distribution System connects TAP System Segments 4 and 5
SEGMENT 5
Ashland Meter 1
Ashland TAP BPS and Ashland Meter 2
SEGMENT 6
Phoenix Shop BPS and Shop Reservoirs
Rapp Road BPS
Future Rapp Rd Reservoir
Anderson Creek BPS
Wagner Reservoir
Belmont 2 Reservoir
Belmont 1 Reservoir
Strawberry BPS
Fallon Reservoir
Terrace St BPS
Park Estates BPS
Granite Reservoir
Future Water Treatment Plant
Crowson Reservoir

Medford
Phoenix
Talent
Ashland

MITCHELLEN PL
COAL MINE RD
INTERSTATE 5 SB
TIMMERLY ST
ANTON DR
N PHOENIX RD
CAMPBELL RD
DAVID LN
VOORHIES RD
MARIGOLD LN
KNOPE RD
PAYNE
HOUSTON RD
CALHOUN RD
CAMP BAKER RD
HUGHES RD
RURAL CREST RD
INTERSTATE 5 NB
PIONEER RD
COLEMAN CREEK RD
HARTLEY RD
S PACIFIC HWY
BIG BUCK RD
ADAMS RD
WALDEN LN
FOSS RD
SUNCREST RD
WILSON RD
BUTLER CREEK RD
TARRY LN
ZEMKE RD
BEESON LN
RAPP LN
E BUTLER LN
E ASHLAND LN
TALENT AV
HIGHWAY 99
ANDERSON CREEK RD
HOLTON
YANK GULCH RD
CREEKSIDE RD
OAK ST
WAGNER CREEK RD
39-1-17.2 RD
39-1-18 RD
39-1-22 RD
39-1-21.3 RD
405 RD
400 RD

Legend
TAP Transmission Mains
City Mains
City Pump Station
TAP Pump Station
TAP Reservoir
City Reservoir
City Limits
Railroad
Streets
Water Body

J:\DATA\TAP\1019-158 WMP\07 GIS\MAPS\FIG1-2_EXIST_WATER_SYS.MXD BY: HFARRIS PLOT DATE: DEC 18, 2019 COORDINATE SYSTEM: NAD 1983 STATEPLANE OREGON SOUTH FIPS 3602 FEET

RH2 NORTH

1 inch = 4,000 feet

0 1,000 2,000 4,000 Feet

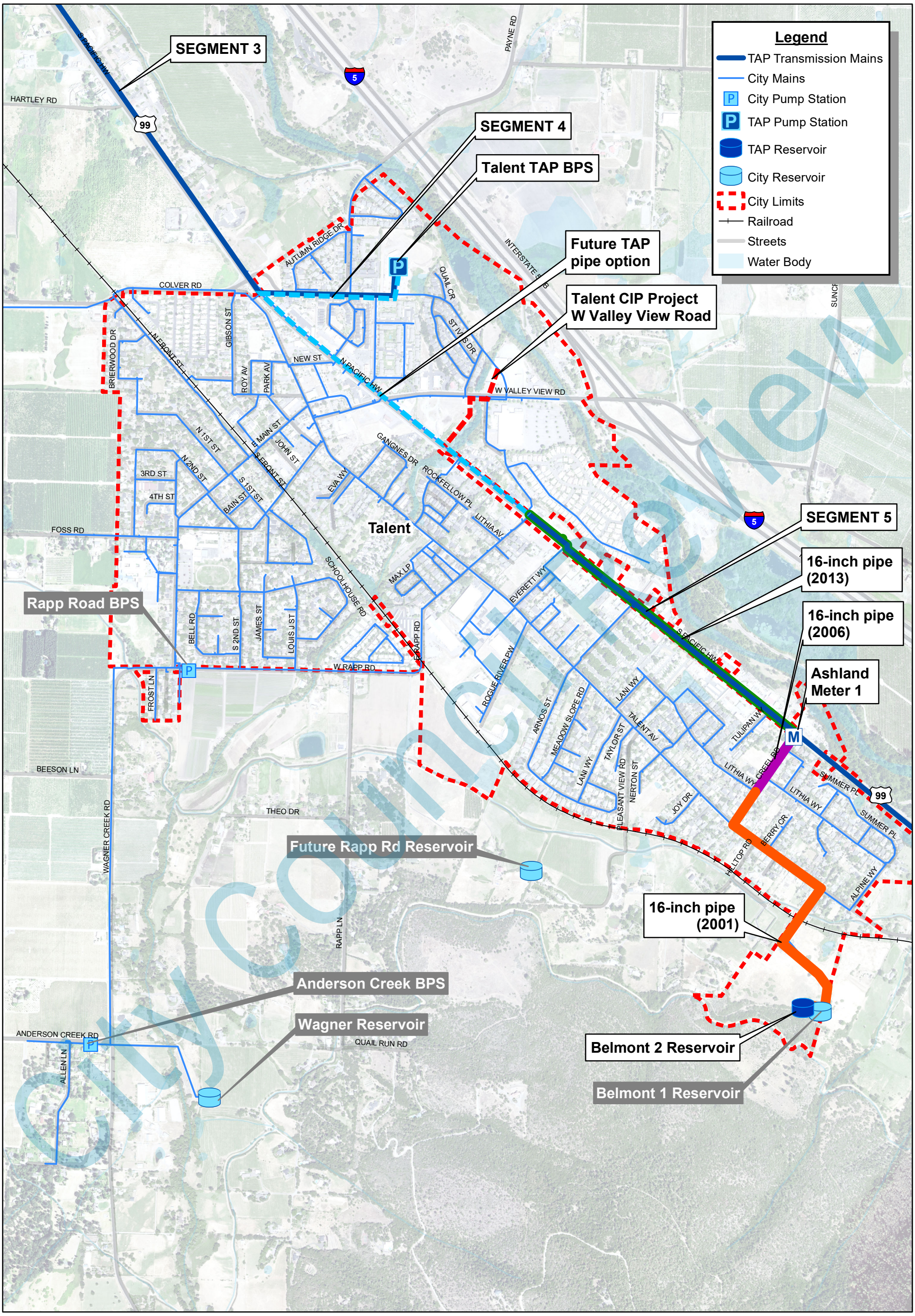
DRAWING IS FULL SCALE WHEN BAR MEASURES 1”

Figure 1-2
Existing Water System

Talent, Ashland, and Phoenix TAP Water Master Plan

Vicinity Map

This map is a graphic representation derived from the Cities' of Talent, Ashland, and Phoenix (Cities') Geographic Information System. It was designed and intended for Cities' staff use only; it is not guaranteed to survey accuracy. This map is based on the best information available on the date shown on this map.



J:\DATA\TAP\1019-158 WMP\07 GIS\MAPS\FIG1-3_HIST_TALENT_PIPES.MXD BY: HFARRIS PLOT DATE: DEC 18, 2019 COORDINATE SYSTEM: NAD 1983 STATEPLANE OREGON SOUTH FIPS 3602 FEET

RH2

NORTH

1 inch = 1,000 feet

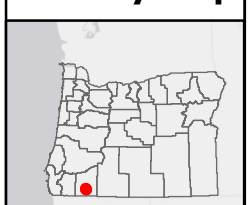
0 260 520 1,040 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1”

Figure 1-3
History of Talent TAP Piping

Talent, Ashland, and Phoenix TAP Water Master Plan

Vicinity Map



2 DEMAND PROJECTIONS

2 | DEMAND PROJECTIONS

Introduction

The Talent-Ashland-Phoenix (TAP) Partner Cities (rely on the TAP System to provide water supply to their customers, whether as a sole source of supply, such as for the City of Talent (Talent), or as an emergency supply, such as for the City of Ashland (Ashland). Supplies to the TAP System have limited capacity and must be evaluated for providing long-term supply to the TAP Partner Cities' growing populations. This chapter presents the demand projections of the TAP System for use in evaluating long-term supply needs and infrastructure capacity in other chapters in this TAP Water Master Plan (WMP).

The following sections summarize the current and future demand projections of the TAP Partner Cities. Each city has recently completed a Water Master Plan, in which detailed demand projections were developed to reflect the unique water use trends and expected growth in each city. These demand projections are summarized as follows and used as the basis for the supply analysis.

Existing Water Demands

A city's water supply, or production, is the total amount of water supplied to the system; therefore, it represents historic system-wide demands. For the Cities of Phoenix and Talent, total production is the water purchased from the Medford Water Commission (MWC). Ashland has an independent water supply system, as described in **Chapter 1**, and only purchases emergency water supply from MWC that is delivered through the TAP System when necessary. **Tables 2-1**, **2-2**, and **2-3** summarize the total amount of water supplied to each of the TAP Partner Cities' systems from 2008 through 2018. Demands are commonly expressed in average day demands (ADD) and maximum day demands (MDD) in terms of million gallons per day (MGD). The following tables present the historic peaking factor, which is the ratio of MDD to ADD. Two metering errors in the TAP System were discovered and rectified in 2013 and 2014; therefore, data from year 2015 and forward is considered the most reliable supply data for the Cities of Phoenix and Talent.

Table 2-1
Talent Historical Water Production/Purchase

Year	Annual MWC Purchase (MG)	ADD (MGD)	MDD (MGD)	Peaking Factor (MDD/ADD)
2008	266	0.73	1.92	2.65
2009	242	0.67	1.76	2.65
2010	251	0.69	1.40	2.03
2011	240	0.66	N/A	N/A
2012	263	0.72	1.27	1.77
2013	248	0.68	1.58	2.32
2014	245	0.67	1.55	2.31
2015	288	0.80	2.17	2.70
2016	268	0.73	1.92	2.63
2017	282	0.77	2.10	2.72
2018	279	0.77	1.55	2.03

Table 2-2
Ashland Historical Water Production

Year	Annual Production (MG)	ADD (MGD)	MDD (MGD)	Peaking Factor (MDD/ADD)
2008	1,196	3.28	6.50	1.98
2009	1,022	2.80	6.74	2.30
2010	950	2.60	5.29	2.04
2011	943	2.58	5.25	2.04
2012	969	2.65	5.40	2.04
2013	1,059	2.90	5.90	2.04
2014	967	2.65	5.39	2.04
2015	989	2.71	5.51	2.04
2016	1,000	2.73	5.57	2.04
2017	1,055	2.88	5.72	1.98
2018	1,057	2.89	5.55	1.92

Table 2-3
Phoenix Historical Water Production/Purchase

Year	Annual Production (MG)	ADD (MGD)	MDD (MGD)	Peaking Factor (MDD/ADD)
2008	296	0.81	1.45	1.79
2009	335	0.92	2.84	3.10
2010	301	0.83	2.06	2.50
2011	296	0.81	N/A	N/A
2012	327	0.89	1.87	2.09
2013	353	0.97	2.26	2.34
2014	310	0.85	1.90	2.24
2015	276	0.76	1.95	2.58
2016	272	0.75	2.17	2.91
2017	275	0.75	2.29	3.04
2018	304	0.83	2.36	2.84

For Phoenix, **Table 2-3** presents the total water purchased from MWC that is supplied through both the TAP System and through Phoenix's second supply source (Kings Highway meter and Experiment Station Road Booster Pump Station).

Future Water Demands

Population

The 2018 population of the TAP Partner Cities was estimated in each City's Water Master Plan using Portland State University (PSU) College of Urban & Public Affairs Population Research Center (PRC) data and is presented in **Table 2-4**. The projected PSU PRC 2068 population also is presented in **Table 2-4** along with average annual growth rates.

Table 2-4
Current and Projected Population

	Estimated Service Population	Projected Service Population		Average Annual Growth Rates		
	2018	2043	2068	(2010-2018)	(2018-2043)	(2043-2068)
Talent	6,380	8,386	10,617	0.6%	1.1%	0.9%
Ashland	21,501	23,625	24,177	0.5%	0.4%	0.1%
Phoenix	4,620	5,967	7,124	0.2%	0.8%	0.7%

Demand Forecast

Demand projections for Talent and Phoenix were estimated in each city's current WMP and are summarized herein. Demand projections for Ashland are limited to Ashland's assumed projected use of the TAP System. Ashland currently holds a volumetric water right (discussed in **Chapter 5**) for 1,000 acre-feet. This water right equates to an ADD of 2.13 MGD during the critical summer planning period (May through September), which is the current capacity of the Ashland TAP Booster Pump Station (BPS), and the supply rate currently assumed by Ashland. However, Ashland has historically planned to rely on a TAP System capacity up to 3.0 MGD, a value agreed upon between Ashland and MWC, although not documented contractually. Therefore, the demand projections herein assume an Ashland ADD of 2.13 MGD until 2030, when Ashland expects up to 3.0 MGD.

Table 2-5 presents demand projections for the TAP System through the year 2070. Due to varying planning conditions, a range of demand projections was developed for each City (except for Ashland) to capture the low and high growth assumptions and other variables that influence demands. For planning purposes, the average demand projections are used for this analysis, with the understanding that demands could be higher or lower, resulting in supply improvements sooner or later, respectively.

Table 2-5
TAP Demand Projections (Millions of Gallons Per Day)

Year	Phoenix ADD (MGD)	Phoenix MDD (MGD)	Talent ADD (MGD)	Talent MDD (MGD)	Ashland ADD (MGD)	Tal/Phx MDD (MGD)	All TAP MDD (MGD)
2020	0.80	2.26	0.82	2.18	2.13	**4.44**	**6.57**
2030	0.93	2.63	0.92	2.45	3.00	**5.08**	**8.08**
2040	1.10	3.13	1.06	2.82	3.00	**5.95**	**8.95**
2070	1.48	4.22	1.36	3.64	3.00	**7.86**	**10.86**

Tables 2-5 and **2-6** present the sum of the TAP Partner Cities' demands in MGD and gallons per minute (gpm), respectively. The TAP System must have adequate capacity to meet the highest demand periods. Because Ashland only uses the TAP System for emergency supply and commonly during the fall season, the sum of Talent, Phoenix, and Ashland ADDs is presented. The most common peak demand scenario is the summer MDD of both Talent and Phoenix. Lastly, the most critical demand that may be experienced by the TAP System is assumed to be the sum of all cities MDDs.

Table 2-6
TAP Demand Projections (Gallons Per Minute)

Year	Phoenix ADD (gpm)	Phoenix MDD (gpm)	Talent ADD (gpm)	Talent MDD (gpm)	Ashland MDD (gpm)	Tal/Phx MDD (gpm)	All TAP MDD (gpm)
2020	556	1,569	570	1,514	1,479	**3,083**	**4,562**
2030	643	1,826	639	1,699	2,083	**3,525**	**5,608**
2040	764	2,173	736	1,958	2,083	**4,132**	**6,215**
2070	1,028	2,930	944	2,528	2,083	**5,458**	**7,541**

3 MODEL DEVELOPMENT & OPERATIONAL ANALYSIS

3 | MODEL DEVELOPMENT AND OPERATIONAL ANALYSIS

Introduction

Hydraulic models are useful tools in evaluating the interaction of the hydraulic components of a water system. Due to the Talent-Ashland-Phoenix (TAP) System operational issues discussed in **Chapter 1**, a hydraulic model of the full TAP System was developed to assess the interaction of each City's water system and the TAP System. This tool was then used to evaluate current operations and to evaluate system capacity (discussed in **Chapter 4**). This chapter summarizes the development and calibration of the TAP System hydraulic model.

This chapter also presents the results of using the hydraulic model to evaluate operational alternatives to the current TAP System operation in order to resolve current operational challenges. Lastly, improvements to the telemetry system are reviewed.

Hydraulic Model

Description

The TAP System hydraulic model is a computer-based model in WaterCAD® CONNECT Edition Update 2 (developed by Bentley Systems, Inc.). The model was developed by combining the modeling elements and data from the TAP Partner Cities' hydraulic models (also developed in WaterCAD®), which were each recently updated and calibrated as part of each Cities' updated Water Master Plans. The combined model includes the Cities' best-known information on distribution system infrastructure geometry and pipe characteristics (diameter, material, and installation year). The model contains active existing system facilities (pump stations, storage facilities, and pressure regulating valves), and upcoming and planned capital improvement plan (CIP) projects recommended in the TAP Partner Cities' Water Master Plans.

To simplify the modeling evaluations, Ashland's facility data is typically "inactive" in the model, except for the Ashland TAP Pump Station and associated piping. The interaction of the TAP Supply within Ashland's water system is not evaluated in this TAP Water Master Plan (WMP).

Demand Data

The hydraulic model of the existing system contains demands based on 2017 and 2018 individual customer meter water demand data provided by the Cities. Demand data for each parcel was distributed to the closest representative junction node of the model based on the recorded usage. These demands were increased to represent 2020, 2030, 2040, and build-out demands. Unique peaking factors for each City were used to develop maximum daily demands (MDD) conditions.

A diurnal pattern was assigned to simulate variations in water usage throughout the day and enable extended period simulation (EPS) modeling.

Extended Period Simulation Calibration

The model was further refined to allow it to run EPS so that the interaction of the TAP facilities and City facilities could be evaluated for a week or more. This was achieved by including each City's estimated setpoints for each pump station for the selected time periods and comparing model results to actual historic data provided by the Cities (considered an EPS calibration). Three time periods were used to calibrate the model:

1. May 2017 (to represent typical ADD.
2. August 2017 (to represent typical MDD for Talent and Phoenix); and,
3. October 2018 (to represent typical conditions while Ashland is using the TAP System).

The Cities provided supervisory control and data acquisition (SCADA) data for pump flow rates, pressures, and reservoir levels for 1 week during these three time periods. For each selected time period, the model results of pump station flow rates and reservoir levels were graphed against the Cities' historical data. Data for the model elements were adjusted until the model results approximately matched the historical data. The following summarizes the adjustments made in the hydraulic model for the EPS calibration.

- Regional Booster Pump Station (BPS)
    - Pump curves for the two 50 horsepower (hp) pumps were reduced to match actual pump flow rates and pressures.
    - Added a variable frequency drive (VFD) to one 150-hp pump.
- Phoenix Shop BPS
    - Added a VFD to reflect actual operation of pump.
    - Reduced pump curve to reflect actual pump flow rates.
- Talent BPS
    - Added VFDs to both pumps and adjusted speeds to match City operation during the selected time periods.
    - Increased discharge piping friction to reflect actual operation of pump station.
- Talent Belmont Reservoirs 1 and 2
    - Added a connecting pipe between these reservoirs to reflect their operation.

After implementing these changes and other minor adjustments, the model results closely matched the historic data for all three time periods and is considered sufficient for evaluating the TAP System operations. The resulting calibration charts are included in **Appendix 3A**.

Key Findings from EPS Model

Running extended period simulations in the model identified three findings not previously known:

1. The Regional BPS 50 hp pumps appear to be operating at a lower flow rate than indicated by their factory pump curves. This may indicate the pumps require servicing,

2. The model predicts head loss between Talent's new reservoir and Belmont Reservoir 2, such that the water levels in the tanks do not "float" together. This is likely due to capacity limitations in the piping between the reservoirs, which includes 6-inch-diameter pipes in some locations. Talent may want to consider replacing aging pipes in Talent Avenue with larger diameter pipe to improve the hydraulic connections of these tanks, and
3. The model predicts more flow through the Talent BPS with both pumps running than Talent has ever measured. This may indicate less head loss predicted by the hydraulic model or possibly closed valves in the real water system. This discrepancy was considered during all hydraulic evaluations. Further hydraulic analysis is recommended in the Capital Improvement Plan (**Chapter 6**) to confirm the hydraulic limitations and possibly reduce the need for additional pumping capacity.

Operational Analysis

According to TAP operations staff, the TAP System has three main operational challenges: 1) using stored water volume from neighboring cities during peak TAP water use (i.e. Talent BPS drawing Eastside Reservoir water levels down and Ashland BPS drawing Belmont Reservoir water levels down); 2) reaching or exceeding the Medford Water Commission (MWC) Water Service Agreement maximum flow rates; and 3) Phoenix's reliance on a secondary supply that requires pumping twice (compared to the TAP Supply which only requires pumping once). These operational issues were evaluated using the hydraulic model and are discussed as follows.

Current Operational Impacts

Historically, the TAP System has been operated by allowing the Regional BPS and Talent BPS to fluctuate flows throughout the day based on the water levels of the Eastside Reservoir and Belmont Reservoirs, respectively. Both Phoenix and Talent prefer to keep their reservoirs as full as possible, especially during summer peak demand periods, and adjust the pump flows to achieve this goal. This type of operation is typical within a city water system; however, when the pump station is a source of supply drawing from a neighboring water system, the variable pump flow rates inevitably impact the neighboring system.

Currently, the Regional BPS is controlled to increase flow with a fairly long delay after the Talent BPS turns on. This combination of controls results in the Talent supply using stored water in Phoenix' Eastside Reservoir. Additionally, operating the Regional BPS to fluctuate with water levels in the Eastside Reservoir likely requires use of stored water in MWC's system (though this data was not reviewed).

Operational Analysis Criteria

The criteria used to assess alternative operations are as follows:

- All City demands should be met with each City's individual operational storage (and not emergency storage);
- Pumps with VFDs should not operate below 85 percent of full speed to maintain an acceptable level of efficiency; and,

- The total pump flow rate of the Regional BPS and Experiment Station Road BPS should not exceed the peak flow rates set by MWC Water Service Agreements.

Constant Speed Pumping Analysis

To reduce the impact on storage of neighboring water systems, the TAP hydraulic model was used to simulate an operational strategy that uses constant pumping at the Regional BPS and Talent BPS. This type of operation reflects typical operations of wholesale water supply facilities because it reduces the impact on the wholesale water supplier. The operational strategy was tested for three operational scenarios, representing unique demand periods, similar to those used for the EPS model calibration. The demand scenarios include:

1. 2020 Winter/Spring/Fall Operation (Talent and Phoenix ADD, no Ashland supply);
2. 2020 Summer Operation (Talent and Phoenix MDD, no Ashland supply); and
3. 2020 Fall Operation with Ashland (Talent and Phoenix ADD with Ashland also using the TAP Supply).

Shop BPS Controls

For all three demand scenarios, Phoenix's secondary supply source (through Kings Highway, the Experiment Station Road BPS, and Shop BPS) is assumed to supplement Phoenix's diurnal demands. To achieve this, the Shop BPS was set to operate only during peak demand hours: 6 AM to 11 AM, and 7 PM to 9 PM. This operation minimizes the use of this supply (and avoid pumping twice) while still using the operational storage in the Shop Reservoirs to meet diurnal demands. It also allows turnover in the reservoirs, which is a critical driver for the operation of this supply.

Regional BPS Controls

For each demand scenario, the pumps at the Regional BPS were set to run at a constant flow rate. The pump flow rates were determined as the sum of the demands of the TAP System minus the supply provided by the Shop BPS. The pump or combination of pumps was selected to meet the required supply. Pumps selected for each of the demand scenarios are presented in **Table 3-1**.

Talent BPS Controls

For each demand scenario, the pumps at the Talent BPS were set to run at a constant flow rate to meet Talent demands and Ashland supply. The pump or combination of pumps was selected to meet the required supply. Pumps selected for each of the demand scenarios are presented in **Table 3-1**. As seen in the table, to meet the 2020 Winter/Spring/Fall demands, a smaller pump is required at the Talent BPS. The existing pumps cannot efficiently operate at this low flow rate.

Table 3-1
Pump Selection for Constant Pumping Demand Scenarios

	2020 Winter/ Spring/Fall	2020 Summer Operation without Ashland	2020 Fall Operation with Ashland
Shop BPS			
Required Flow	~ 500 gpm		
Pumps Selected	Existing Pump (on during peak hours only)		
Regional BPS			
Required Flow	975 gpm	~2,800 gpm	~2,300 gpm
Pumps Selected	50 HP Pump	50 HP Pump (constant flow) 125 HP Pump @ 90% Speed	50 HP Pump (constant flow) 125 HP Pump @ 85% Speed
Talent BPS			
Required Flow	575 gpm	1,500 gpm	~2,050 gpm
Pumps Selected	Install 50 HP Pump	125 HP Pump @ 84% Speed	125 HP Pump @ 95% Speed[1]
Ashland TAP BPS			
Required Flow	0	0	~1,480 gpm
Pumps Selected	N/A	N/A	125 HP Pump

1. May require additional small pump if the 125 HP pump cannot produce this flow rate.

Operational Analysis Results

The constant pumping operation was evaluated using the pumps selected in **Table 3-1** set to constant flow rates in the hydraulic model. For each demand scenario, the reservoir cycling was observed to predict the impacts from the pump station operation. In general, the model predicts no significant issues with constant rate pumping and all criteria for this analysis were met. Under this operation, all diurnal demands are met by each City's individual storage. The Talent and Phoenix reservoirs cycle more than under current operations but are not predicted to cycle too low. The reservoirs' cycle within the water levels that represent their operational storage volume. The pumps all operate at speeds of 85 percent or higher, which is relatively efficient. However, to achieve constant rate pumping during low demand periods, a new small pump is recommended for the Talent BPS. The following results from the hydraulic model will vary under differing demand conditions.

2020 Winter/Spring/Fall Operation

Using the settings presented in **Table 3-1**, the model predicts the following under this scenario:

- The Shop Reservoir cycles 3 to 4 times per week (from 60 to 80 percent; matches current City operation).

- Eastside Reservoir cycles from 85 to 95 percent full.
- Belmont Reservoirs cycle approximately 5 percent, and do not drop below 87.5 percent full.
- The peak flow from the MWC is approximately 2,400 gpm (compared to the Service Agreement amount for October through April of 3,515 gpm).

2020 Summer Operation without Ashland

Using the settings presented in **Table 3-1**, the model predicts the following under this scenario:

- The Shop Reservoir cycles three to four times per week.
- Eastside Reservoir cycles from 75 to 100 percent full.
- Belmont Reservoirs cycle approximately 12 percent, and do not drop below 84 percent full.
- The peak flow from the MWC is approximately 4,100 gpm (compared to the Service Agreement amount for May through September of 4,316 gpm).

2020 Fall Operation with Ashland

Using the settings presented in **Table 3-1**, the model predicts the following conditions under this scenario:

- The Shop Reservoir cycles three to four times per week.
- Eastside Reservoir cycles from 75- to 100-percent full.
- The Belmont Reservoirs cycle approximately 5 percent and do not drop below 87.5-percent full.
- The peak flow from MWC is approximately 4,100 gpm (compared to the Service Agreement amount for May through September of 4,316 gpm).

Benefits to Constant Rate Pumping

Though it will require some effort for reprogramming and field testing and it requires operations staff to become more comfortable with tanks cycling lower than usual, the TAP System will benefit from constant rate pumping in several ways as follows:

- **Delay of facility expansion**. Compared to the current operation where flow rates are high for some hours and low or at zero for other hours, constant rate pumping averages those flows over a day and, therefore, uses less pump station capacity. **Chapter 4** presents a capacity analysis of the Regional BPS and Talent BPS. By changing operations to constant rate pumping, expansion of these pump stations can be delayed.
    - Regional BPS: 15-year delay
    - Talent BPS: 20+ year delay
- **No impact on adjacent City storage**. Under the constant rate pumping operation, Talent and Phoenix are forced to meet their diurnal demands using their own storage volume. This resolves the operational issue of influencing another City's storage.

- **Reduce peaking from MWC**. Constant rate pumping minimizes the peak flow rates from MWC, which are set in the Water Service Agreements. This allows the TAP Partner Cities to avoid possible exceedance of the peak flow rate limitation. In discussions with MWC, any monetary benefits to reducing the peak instantaneous flow rate would require further study to confirm.

Operational Recommendations

Because of the numerous benefits, constant rate pumping is recommended for the TAP System. The modeling results were presented to the TAP Partner Cities. Both Talent and Phoenix operations staff agree to modify the system to operate the Regional and Talent BPS's at constant rates. Additional recommendations are as follows:

- **Pump Selection**. For operations in the next few years, use the combination of pumps provided in **Table 3-1** for the varying seasonal operations. For demand periods not presented in the table, field testing a combination of pumps that operate best at a constant flow rate to meet the demands is recommended. Once these combinations are determined, develop an operational control chart that identifies the optimal combination of pumps at the Regional BPS and Talent BPS for varying demand periods throughout the year. This chart would be useful for updating programming of the pump stations.
- **Pump Combination**. At the Regional BPS, when using a large pump and small pump, hold larger pumps at a constant speed and allow smaller pumps to adjust to slight variations. This may be required during demand periods not listed in **Table 3-1**. In these cases, a smaller pump may be called on/off by reservoir levels or downstream pressure to make up any demand not provided by the large pump.
- **Pump Rotation**. Rotate the operation of pumps per industry standard to avoid overuse of one pump.
- **Notification to other Cities**: Update the telemetry system to improve communication between all Cities such that the Talent BPS and Regional BPS turn on when upstream pump stations turn on. Reduce the delay to as short a period of time as possible. Add notification to ramp down Ashland BPS flow rates if the Talent Reservoirs drop below 85-percent full.
- **Ashland influence on Talent Storage**. Until additional capacity is built to supply Ashland's demand, adjust Ashland's TAP supply flow rate when Talent demands approach approximately 1,140 gpm. This assumes 2,620 gpm of total capacity minus 1,480 gpm for Ashland's demand.
- **Use of Experiment Station Road BPS**. Avoid using Experiment Station Road BPS to refill Phoenix' Shop Reservoirs during 5 AM to 11 AM to avoid the peak time period imposed by the MWC Water Service Agreements.
- **Phoenix Storage Balance**. Consider balancing the Shop Reservoir levels and Eastside Reservoir levels to balance the use of operational storage in both reservoirs. This may require further modeling or field testing beyond the scope of this WMP.

- **Influence of Rapp Road BPS on Talent BPS**. Adjust controls to increase Talent BPS flow rates when Rapp Road BPS turns on (to refill Wagner Reservoir). Add notification to Regional BPS if flow rates at Talent BPS increase.

Telemetry Improvements

The telemetry and SCADA systems controlling the TAP facilities are individually owned and managed by each TAP Partner City for the facilities within those cities. The individual monitoring systems look from one City to another, but one City cannot control the facilities in another City. In light of the operational changes noted above, and based on discussions with TAP Partner City staff, several telemetry improvements are recommended.

Monitoring and Control Recommendations

Table 3-2 summarizes the current and recommended controls. Between Talent and Phoenix, all information is being transferred and no further information sharing is recommended. Additional controls are noted. Depending on the amount of additional data required to be transferred between Ashland and Talent, additional communication modules will need to be added or existing radios should be replaced with licensed-bandwidth radios (currently owned by Talent and Phoenix). The current radios were configured for transferring the minimal amount of data from Talent to Ashland.

Table 3-2
TAP System Monitoring and Control Topology

	Current	Recommended
Ashland to Talent	Creel Road Meter data is transferred through Talent and then transmitted to Ashland. Talent SCADA does not monitor the flow data.	Add ability for Talent to monitor Creel Road Meter flow. Add control to Talent BPS to adjust flows based on Creel Meter flow.
Talent to Ashland	Creel Road Meter: Main Meter Flow, Bypass Flow Meter Flow, UPS Buffering, Battery Charge, Replace Batter, Vault Flood Belmont Reservoir Water Level (triggers an alarm at Ashland BPS if drops below certain level)	Add ability for Ashland to monitor Talent Flow Meter flows (Talent BPS does not have a meter) depending on costs. Add control setpoint to turn off Ashland BPS if Belmont Reservoir Water Level is too low.
Talent to Phoenix	Talent Meter Flow Belmont Reservoir Water Level All other Talent SCADA Data is visible to Phoenix	Adjust controls to automate Regional BPS flow to adjust to Talent Meter flows (and Phoenix demand). Delay time is no longer an issue with constant flow rate pumping. Automate Regional BPS flows using prior day flows and adjust with rate of change calculation to avoid reservoir low points and high points. Allow for minor daily flow fluctuations.
Phoenix to Talent	Regional BPS Flow Eastside Reservoir Water Level All other Phoenix SCADA Data is visible to Talent	No change
Phoenix to MWC	MWC Meter Flows	No change

Given the recommendations in **Table 3-2**, updated TAP System programming, including updated topology graphics to help clarify TAP communications, is recommended as a capital improvement project and included in **Chapter 6**.

Equipment and Software Recommendations

As noted in **Table 3-2**, the monitoring and control equipment and software are individually owned and managed by each City. The processors that communicate data between the Cities are based on the same platform and the required programming for communications can be completed with minimal effort. The following recommendations are guidance for the TAP System but are not intended to be funded or enforced by the TAP Partner Cities.

Short-Term

- Update Talent operator interfaces and human machine interface (HMI) migration.
- Update Phoenix operator interfaces and HMI migration.
- Update Ashland TAP BPS programming to be compatible with Talent and rest of Ashland system.

Long-Term

- Contingent upon short-term tasks, plan for software revisions approximately every five years to keep up with changing software platforms. Costs for this will be included in the TAP Maintenance Costs discussed in **Chapter 7**.
- It is recommended that the monitoring and control software being used by all TAP Partner Cities (particularly Phoenix and Talent) continue to be compatible to reduce efforts needed to manage the sharing of information across different software platforms.

4 | SYSTEM CAPACITY ANALYSIS

4 | SYSTEM CAPACITY ANALYSIS

Introduction

This chapter presents the capacity analysis of the Talent-Ashland-Phoenix (TAP) Water System infrastructure. Individual water system components were analyzed to determine the ability to meet policies and design criteria under existing and future water demand conditions. The analyses address pumping and transmission piping capacities (supplies are discussed in **Chapter 5**). The policies and criteria are summarized below for each analysis. Recommendations are discussed in this chapter and captured in the recommended Capital Improvement Plan (CIP) in **Chapter 6**.

Pump Station Capacity

Pump Station Evaluation Criteria

Table 4-1 summarizes the evaluation criteria used to assess the TAP System pump stations. This chapter focuses on the redundancy criteria for confirming adequate capacity and pump redundancy. The reliability and resilience criteria are captured in the recommended CIP in **Chapter 6**. The Talent and Regional Booster Pump Station (BPS) firm and total capacity are compared to the demand criteria established in **Table 4-1** for the planning years of 2020, 2030, 2040, and 2070 (representing build-out conditions).

Table 4-1
Pump Station Evaluation Criteria

Parameter	Level of Service
Redundancy	Regional BPS: • Supply Phoenix and Talent Maximum Day Demand (MDD) with firm capacity (largest pump offline). • Supply Phoenix, Talent, and Ashland MDD with total capacity (all pumps running). Talent BPS: • Supply Talent MDD with firm capacity (largest pump offline). • Supply Talent and Ashland MDD with total capacity (all pumps running).
Reliability	Emergency power sources will be sized to meet Talent and Phoenix MDD and Ashland's required supply.
Resilience	Pump stations will have built-in resilience to maintain operations post-earthquake to provide Talent and Phoenix minimum (winter) demands.

Ashland maximum day demand (MDD) within this chapter refers to the maximum amount of water that Ashland plans to use from the TAP system. This value is assumed to be 2.13 million gallons per day (MGD) until 2030, at which point it is assumed to increase to 3.0 mgd. This is not the true MDD for Ashland. The term "Full TAP MDD" indicates the MDD for Talent and Phoenix, and Ashland's planned supply from the TAP system.

Talent BPS Capacity Analysis

The Talent BPS supplies all Talent demands and Ashland TAP demands when needed. These projected demands are much higher than originally anticipated for Talent BPS. Talent BPS has a firm capacity of 1,980 gallons per minute (gpm) (2.85 MGD) and total capacity of 2,628 gpm (3.77 MGD) according to recent flow tests.

Tables 4-2 and **4-3** present the firm and total capacity evaluations for Talent BPS, respectively. As seen in **Table 4-2**, Talent BPS has adequate firm capacity through the year 2040 but has inadequate total capacity to meet Talent MDD and Ashland's planned 2.13 MGD (1,479 gpm) (or 3.0 MGD (2,083 gpm) starting in 2030).

Table 4-2
Talent BPS Firm Capacity Evaluation

Year	Talent MDD (gpm)	Firm Capacity (gpm)	Surplus/(Deficit) (gpm)
2020	1,514	1,980	**466**
2030	1,699	1,980	**281**
2040	1,958	1,980	**22**
2070	2,528	1,980	**(548)**

Table 4-3
Talent BPS Total Capacity Evaluation

Year	Talent MDD (gpm)	Ashland MDD (gpm)	Total Demand (gpm)	Total Capacity (gpm)	Surplus/(Deficit) (gpm)
2020	1,514	1,479	2,993	2,628	**(365)**
2030	1,699	2,083	3,782	2,628	**(1,154)**
2040	1,958	2,083	4,042	2,628	**(1,414)**
2070	2,528	2,083	4,611	2,628	**(1,983)**

Talent BPS Improvement Alternatives

The following optional improvements address the Talent BPS capacity issues. These alternatives are evaluated, and a final recommendation is summarized in the **System Capacity Recommendations** section.

Additional Pump Capacity Testing

Performing a more detailed hydraulic analysis of the pump station flows and discharge pressures, along with pipe improvements, is anticipated to help confirm potential capacity of the existing pumps. The TAP hydraulic model indicates that the pump station could operate as high as 3,500 gpm using the pump curves for the pumps. The difference between the field-tested capacity and modeled capacity may be due to capacity limitations in the discharge piping and downstream distribution system that are not captured in the hydraulic model. Additional effort beyond this Water Master Plan (WMP) is needed to confirm the limitations and provide final recommendations. This is assumed to be a short-term measure.

Balance Demand and Timing

Until the TAP System is improved to provide the full flow rate required by Ashland, it is recommended to limit the Ashland supply when Talent demands approach 1,140 gpm. This is calculated as the pump station capacity of 2,620 gpm minus the Ashland demand of 1,480 gpm. This is assumed to be a short-term measure until additional capacity is available.

Expand Talent BPS

Expansion of the Talent BPS involves installation of a new bay and a 50 horsepower (hp) pump in the short-term. This will allow Talent to utilize constant rate pumping and meet its current "low" winter demands without straining a pump. One of the existing 125 hp pumps will need to be replaced with a 150 hp pump. The timing of installing the larger pump depends on improved hydraulics at the Talent BPS but is estimated to be needed by 2030. By 2040, the 50 hp pump will no longer be sufficient to meet "low" winter demands and will need to be replaced with a 75 hp pump.

Dedicated Ashland BPS

As seen in **Table 4-2**, Talent BPS has adequate capacity to serve only Talent demands until beyond 2040. The capacity challenges arise when also trying to supply Ashland's demand. The Ashland connection to the TAP System was at one time conceived as an isolated pump station and pipe in Highway 99 completely separate from the Talent system. However, the Ashland TAP BPS and TAP piping was constructed to connect to Talent's system as part of emergency supply measures during a drought in Ashland's watershed. A dedicated pump station to supply Ashland's TAP BPS would reduce Ashland's impacts on the Talent system, particularly as all TAP demands increase.

A dedicated TAP BPS to supply Ashland's TAP BPS would require adequate head to boost water from the Regional BPS (nominal discharge head of 1,681 feet set by the Eastside Reservoir water level) to the suction head of the Ashland TAP BPS (nominal suction head of 1,814 foot set by the Belmont Reservoirs' water level). The Ashland TAP BPS suction head matches the current operation and pumps of the Ashland TAP BPS; however, it could be as low as 1,700 ft (pump station elevation plus 20 feet of pressure head) with different pumps. The flow for a new Ashland pump station would need to meet Ashland's demands of 2.13 MGD, with an ultimate capacity of 3.0 MGD by 2030. Under these conditions, the dedicated Ashland TAP BPS is assumed to require three 75-hp pumps to provide 3.0 MGD firm capacity.

Regional BPS Capacity Analysis

Regional BPS has a firm capacity of 3,600 gpm (5.18 MGD) and a total capacity of 4,500 gpm (6.48 MGD). Regional BPS supplies Phoenix, Talent, and Ashland TAP demands minus the amount supplied by Phoenix's Experiment Station Road BPS. The average amount of water pumped to Phoenix by Experiment Station Road BPS is 0.25 MGD in ADD conditions and 0.42 MGD (292 gpm) in MDD conditions according to flow meter data. Phoenix's 2019 WMP recommends eventually abandoning Experiment Station Road BPS and associated facilities and developing a new Medford Water Commission (MWC) supply connecting in North Phoenix Road. The analysis below considers Regional BPS capacity with supply from Experiment Station Road BPS until the year 2040.

Tables 4-4 and **4-5** present the firm and total capacity evaluations for the Regional BPS, respectively. As seen in the tables, the Regional BPS has adequate firm capacity through the year 2040 but has inadequate total capacity to meet the full TAP MDD as soon as the year 2022 (timing is interpolated between 2020 and 2030). Therefore, additional capacity is required to meet the supply goals within the next 2 years given the analysis assumptions and criteria.

Table 4-4
Regional BPS Firm Capacity Evaluation

Year	Talent and Phoenix MDD (gpm)	Experiment Station Road BPS Supply (gpm)	Regional BPS Firm Capacity (gpm)	Surplus/(Deficit) (gpm)
2020	3,083	292	3,600	**809**
2030	3,525	292	3,600	**366**
2040	4,132	-	3,600	**(532)**
2070	5,458	-	3,600	**(1,858)**

Table 4-5
Regional BPS Total Capacity Evaluation

Year	Full TAP MDD (gpm)	Experiment Station Road BPS Supply (gpm)	Regional BPS Total Capacity (gpm)	Surplus/(Deficit) (gpm)
2020	4,563	292	4,500	**229**
2030	5,609	292	4,500	**(817)**
2040	6,215	-	4,500	**(1,715)**
2070	6,542	-	4,500	**(3,041)**

Regional BPS Improvement Alternatives

To meet the TAP Partner Cities' goals of total BPS capacity to meet MDD for all three cities requires additional supply capacity in the next few years. The timing of increased capacity can be delayed with decreased demands (such as with implementing conservation measures) or reduced demands for Ashland when Talent and Phoenix demands are at their peak. The following sections describe the alternatives considered in this evaluation. Final recommendations are summarized in the **System Capacity Recommendations** section.

Rely on Experiment Station Road BPS

Experiment Station Road BPS and the associated infrastructure for supplying MWC water to Phoenix has been a reliable system for Phoenix for many decades. The source supplies water to Phoenix's at-grade Shop Reservoirs, from which water is required to be boosted again to supply Phoenix customers using the Shop BPS. However, the City is anticipating abandoning this supply

source in the future for several reasons: 1) the supply requires pumping twice to meet system pressures; 2) the piping system is outside of Phoenix's right-of-way, which makes maintenance difficult; and 3), the system is aging. Experiment Station Road BPS has two 1,000 gpm pumps; however, the transmission system limits supply to 1,000 gpm and is further limited by capacity of the Shop BPS (approximately 500 gpm). No additional capacity is recommended for this supply alternative (due to the need to pump twice), and reliance on this supply is only recommended until Phoenix plans to abandon it (currently planned for 2040).

Short-Term Regional BPS Expansion

Small modifications to Regional BPS' capacity can delay the need for a new supply. By replacing one of the 50 hp pumps with a 125 hp pump to match the other large pumps, the pump station capacity is assumed to increase to approximately 5,300 gpm, which will delay the need for a new supply source until approximately 2030. As-builts for the pump station indicate that all pump shafts were sized equally despite the different motor sizes for the pumps; therefore, a larger motor should not require extensive pump station modifications.

Long-Term Regional BPS Expansion

Expanding the Regional BPS to meet build-out demands for the TAP Partner Cities would require extensive pump station modifications for increasing capacity by approximately 4.4 MGD (3,041 gpm). This likely would require expanding the building to accommodate additional pumps, replacing existing pumps with larger capacity pumps, modifying all mechanical connections, and significant electrical modifications. Additionally, the hydraulic model indicates the existing 24-inch TAP pipes would require upsizing to 36 inches from the MWC connection to the Talent meter. Cost estimates for expanding Regional BPS to meet build-out TAP demands are not provided due to the low likelihood of this alternative. Developing a new MWC supply for Phoenix and the TAP Partners (North Phoenix Road Supply) is assumed to be a much lower cost and is recommended over expanding the Regional BPS, as discussed in the **System Capacity Recommendations** section at the end of this chapter.

New North Phoenix Road Supply

The concept for a new supply from MWC in North Phoenix Road was developed as part of the Phoenix WMP. This supply option is discussed in detail in **Chapter 5** and is recommended for addressing the long-term supply deficiency of the Regional BPS.

Transmission System

This section evaluates the existing TAP transmission system (i.e., larger diameter water mains) to determine if they are adequately sized to provide the necessary flow rates and pressures to meet the existing and future requirements of the system.

Transmission System Analysis Criteria

The criteria used to confirm adequate capacity in the pipes are as follows:

- Pipe velocity should not exceed 5 feet per second (fps).
- Head loss along pipe length should not significantly impact pump station capacities.
- Adequate transmission capacity should be available to balance water levels in storage facilities.

Hydraulic Analysis

The hydraulic model was used to evaluate pipe sizes under current and future demands. For future scenarios, the model assumed all of Talent's and Phoenix's capital improvement projects are in place. Constant rate pumping also was assumed. The evaluations assumed that a new North Phoenix Road supply is in place. The 2040 MDD scenario was used initially to identify capacity deficiencies both with and without the addition of Ashland's demand (2.13 MGD from 2020 to 2029 and 3.0 MGD by 2030).

Table 4-6 summarizes the predicted velocities and head loss under the 2040 MDD model scenario. As seen in the table, the model predicts high head loss, particularly in Pipe Segments 4, 5, and 6 (Suncrest Road to Talent BPS and to Ashland's Creel Road Meter. All other pipe segments were predicted to meet the velocity criteria and did not have significant head loss impacting pump station capacities.

Table 4-6
Model Predicted Pipe Velocity and Head Loss Under 2040 Full TAP MDD

Pipe Location	Diameter (in)	Model Predicted Velocity (fps)	Model Predicted Head Loss (ft)
Pipe Segments 1 and 2 (HWY 99 from MWC Connection at Garfield St to Regional BPS to Talent Meter)	24	3.3	15 to 20
Pipe Segment 3 (HWY 99 from Talent Meter to Suncrest Road)	24	2.9	12
Pipe Segment 4 (Suncrest Road from HWY 99 to Talent BPS)	16	6.5	17
Talent Distribution System and Pipe Segment 5 (Talent BPS to Creel Road)	Varies	NA	43
Pipe Segment 6 (Talent to Ashland)	16	3.3	19

However, other pipes in the Phoenix and Talent distribution system appear to be limiting the ability to balance tank water levels. In Phoenix, the model predicts that the Eastside Reservoir cycles approximately 20 percent lower than the New Phoenix Reservoir during the full TAP MDD. This does not appear to be influenced by the North Phoenix Road supply rate. The model results indicate that the additional demand on the TAP System leaving Phoenix draws down the Eastside Reservoir significantly. Additionally, in Talent the model predicts that the Belmont Reservoir cycles approximately 20 percent below the New Talent Reservoir and drops below 75-percent full during the full TAP MDD. These tank imbalances prevent the Cities from meeting their tank operation goals (maximum tank cycling of 25 percent) and are assumed to be unacceptable for long-term operation of the full TAP MDD.

Transmission System Improvement Alternatives

Improvements to address the pipe capacity limitations to reduce velocities, reduce head loss, and improve reservoir cycling are discussed in the following sections. All recommended pipe improvements are sized to meet the capacity needs under build-out demands; however, the timing of improvements is phased and driven by demand periods prior to build-out.

Talent System

Several improvement alternatives were tested in the model to improve tank cycling in Belmont 2 Reservoir and the new Talent Reservoir.

- **Increase Pipe Capacity in Talent Avenue**: The existing pipe in Talent Avenue, which provides the closest connection between the two Talent tanks, is comprised of 6-, 8-, and 12-inch diameter pipe. Increasing these pipe diameters to 16 inches improved tank cycling but still resulted in Belmont 2 Reservoir levels below Talent's criteria.
- **Increase Pipe Capacity in Numerous Talent Streets**: In addition to the Talent Avenue pipe improvements, several other pipes were upsized to test tank cycling. Pipes for upsizing were selected based on age and size to avoid replacement of newer pipes. To balance the tank cycling, the number of distribution system pipes requiring upsizing was determined to be infeasible.
- **New Reservoir Connection**: Installing a new 16-inch-diameter pipe between the Belmont 2 Reservoir and the new Talent Reservoir along the western side of the Talent Irrigation District (TID) canal significantly improved tank cycling and balancing of water levels.
- **Increase TAP Pipes**: Increasing the diameter of pipes from the Talent BPS to the Ashland Creel Road Meter to 18 inches did not improve the tank cycling enough to meet Talent's criteria (i.e. the Belmont 2 Reservoir water level still drops to 70 percent full). Increasing the same pipes to 24 inches in diameter showed significant improvements to the tank water levels and cycling. However, this pipe size seems large and could indicate the need for a dedicated pipe just for the Ashland TAP demands.
- **Combination of New Reservoir Connection and TAP Pipes**: Combining a new 16-inch pipe that connects the two Talent reservoirs with additional TAP pipe improvements resulted in adequate tank cycling and balancing. The pipe projects are presented in **Figure 4-1** and described in **Table 4-7**. This group of projects is considered Option 1.

Table 4-7
Recommended TAP Pipe Improvements in Talent – Option 1

Pipe/Street	From	To	Existing Diameter (in)	Proposed Diameter (in)	Length (feet)	Timing
Reservoir connection along TID Canal	Belmont Reservoir Piping	New Reservoir Piping (near Lani Street)	NA	16	3,550	2030
Talent BPS Suction Pipe	HWY 99/Suncrest Road	Talent BPS	16	24	1,900	2040
Talent BPS Discharge Pipe	Talent BPS	Winter Sage Road	12	18	370	2040
Winter Sage Road	Talent BPS Discharge Pipe	Anjou Club Pipe	12	18	215	2040
Anjou Club Private Drive	Winter Sage Road	HWY 99	8	16	1,045	2040+
HWY 99	Anjou Club Private Drive	Wagner Creek Crossing	12	16	1,298	2040+
HWY 99	Wagner Creek Crossing	Everett Way	12	18	1,548	2040+

- **Combination of New Reservoir Connection and Dedicated Ashland Pump Station and Piping**: The last alternative looked at combining a new pipe connection between the two Talent Reservoirs with a dedicated Ashland TAP supply from Talent. This dedicated supply system includes a new pump station (**Dedicated Ashland BPS**) and piping in Highway 99 from Suncrest Road to the Ashland Creel Road Meter that essentially provides Ashland its TAP supply without any connections to Talent's distribution system. The model predicted successful operation of this potential infrastructure. Talent's tanks cycle adequately with the existing infrastructure. The proposed pipe connecting Talent's reservoirs is still recommended but can be a 12-inch pipe instead of a 16-inch pipe according to the model. Additionally, increasing the Talent BPS discharge piping is still recommended. The pipe recommendations are shown in **Figure 4-2** and summarized in **Table 4-8**. This group of projects is considered Option 2.

Table 4-8
Recommended TAP Pipe Improvements in Talent – Option 2

Pipe/Street	From	To	Existing Diameter (in)	Proposed Diameter (in)	Length (feet)	Timing
TAP Pipe Extension	Suncrest Road	Creel Road	NA	16	7,800	2025
Reservoir connection along Irrigation Canal	Belmont Reservoir Piping	New Reservoir Piping	NA	12	3,550	2030
Talent BPS Discharge Pipe	Talent BPS	Winter Sage Road	12	16	370	2040

Phoenix System

Several improvement alternatives were tested in the model to improve tank cycling in the Eastside Reservoir and New Phoenix Reservoir.

- **Increase TAP Piping**: Increasing Pipe Segments 1 and 2 to a diameter of 36-inches resulted in higher overall tank water levels, but the tanks still cycle approximately 20 percent apart.
- **Additional Pipe Connections from Regional BPS to East Side**: Creating an additional pipe connection from Pipe Segment 2 to existing pipes in the east side of Phoenix did not improve tank cycling.
- **Increasing North Phoenix Road Supply**: Increasing the supply provided by the North Phoenix Road Supply did not improve tank cycling.
- **Increased Pipe Capacity from North Phoenix Road Supply**: Increasing the pipe diameter from the North Phoenix Road Supply (from 18 inches to 24 inches) did not improve tank cycling.
- **Increased Pipe Capacity Between New Phoenix Reservoir and Eastside Reservoir**: Increasing the pipe diameter and including parallel pipes to represent future development near the new Phoenix Reservoir resulted in significantly improved tank cycling. These projects are presented in **Figure 4-3** and described in **Table 4-9**.

Table 4-9
Recommended TAP Pipe Improvements in Phoenix

Pipe/Street	From	To	Existing Diameter (in)	Proposed Diameter (in)	Length (feet)	Timing
N Phoenix Road	Campbell Road	Grove Road	NA	18	4,532	2025
Grove Road	N Phoenix Road	Fern Valley Road	NA	18	2,081	2025
Phoenix URA	Varies	Varies	NA	18	5,261	2040
Fern Valley Road	Grove Road	Breckenridge Drive	12	18	1,774	2040
Grove Road	Fern Valley Road	Pear Tree Lane	12	24	1,914	Build-out

System Capacity Recommendations

The following actions are recommended as a result of evaluating the alternatives described in this chapter for pump station and transmission system capacity. These recommendations are combined with other recommendations in this WMP in **Chapter 6**. Confirming the responsible parties for each project and establishing cost sharing is discussed in **Chapter 7**.

Talent System

The following actions are recommended to address the upcoming capacity limitations of the TAP infrastructure in and around Talent:

- **Additional Talent BPS Pump Capacity Testing**: Confirm hydraulic limitations (if any) on existing pumps.
- **Balance Demand and Timing**: Balance demands and timing of use among Talent and Ashland until additional capacity in the Talent BPS can be achieved.
- **Option 1: Expand Talent System**
    - Expand Talent BPS to meet build-out MDD for Talent and Ashland:
        - Install 50 hp pump by 2020.
        - Replace 125 hp pump with a 150-hp pump by 2030.
        - Replace 50 hp pump with a 75-hp pump by 2040.
    - Install pipes recommended in **Table 4-7**.
- **Option 2: Dedicated Ashland BPS**
    - Expand Talent BPS to meet Talent MDD:
        - Install 50-hp pump by 2020.
        - Replace 50-hp pump with a 75 hp pump by 2040.
    - Install a dedicated Ashland BPS in Talent:
        - Assumes three 75 hp pumps.
        - Property acquisition.
    - Install pipes recommended in **Table 4-8**.

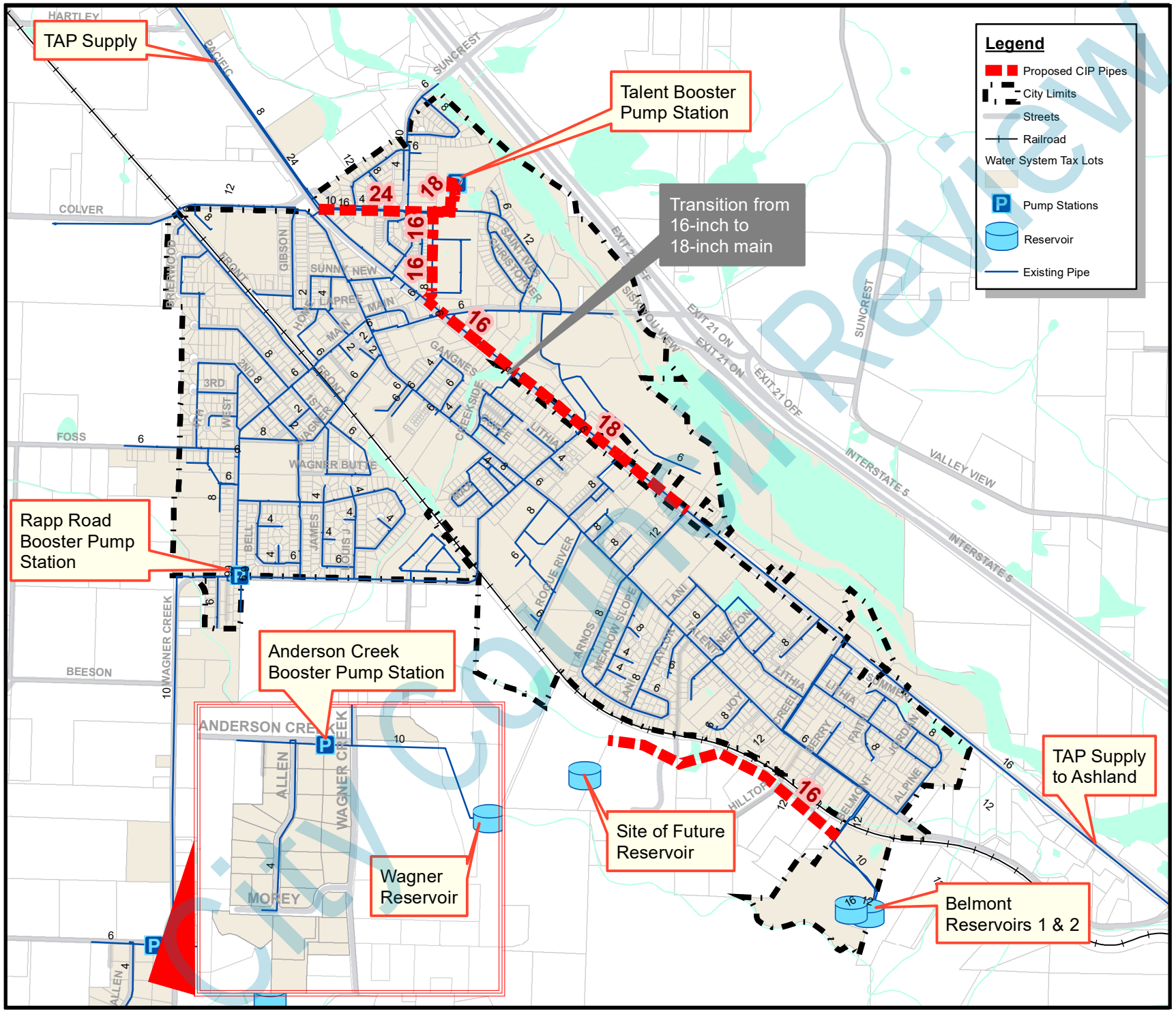
Options 1 and 2 are evaluated for cost considerations in **Chapter 6**.

Phoenix System

The following actions are recommended to address the upcoming capacity limitations of the TAP infrastructure in and around Phoenix:

- **Balance Demand and Timing**: Balance demands and timing of use among all TAP Partner Cities until additional capacity can be achieved.
- **Short-Term Regional BPS Expansion**: Replace one 50 hp pump with a 125 hp pump at the Regional BPS (by approximately 2022).

- **New North Phoenix Road Supply**: Begin development of a new MWC supply in North Phoenix Road (by approximately 2030). A new supply in this location is recommended over expanding the Regional BPS to meet build-out demands for several reasons: 1) Phoenix plans to build a supply in this location to support future development and supply redundancy; 2) a second MWC connection provides improved redundancy to the TAP Partner Cities; and, 3) costs for expanding the Regional BPS and associated piping in existing streets is likely significantly higher than a new supply with no pump.
    - Refer to **Chapter 5** for further details on this new supply.
    - Assume Phoenix abandons the Experiment Station Road BPS and associated infrastructure by 2040.
- **Transmission Pipe Improvements**: Install pipes recommended in **Table 4-9**.



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Vicinity Map

Figure 4-1
Talent to Ashland Supply
Option 1: Expand Talent System
TAP Partner Cities Water Master Plan

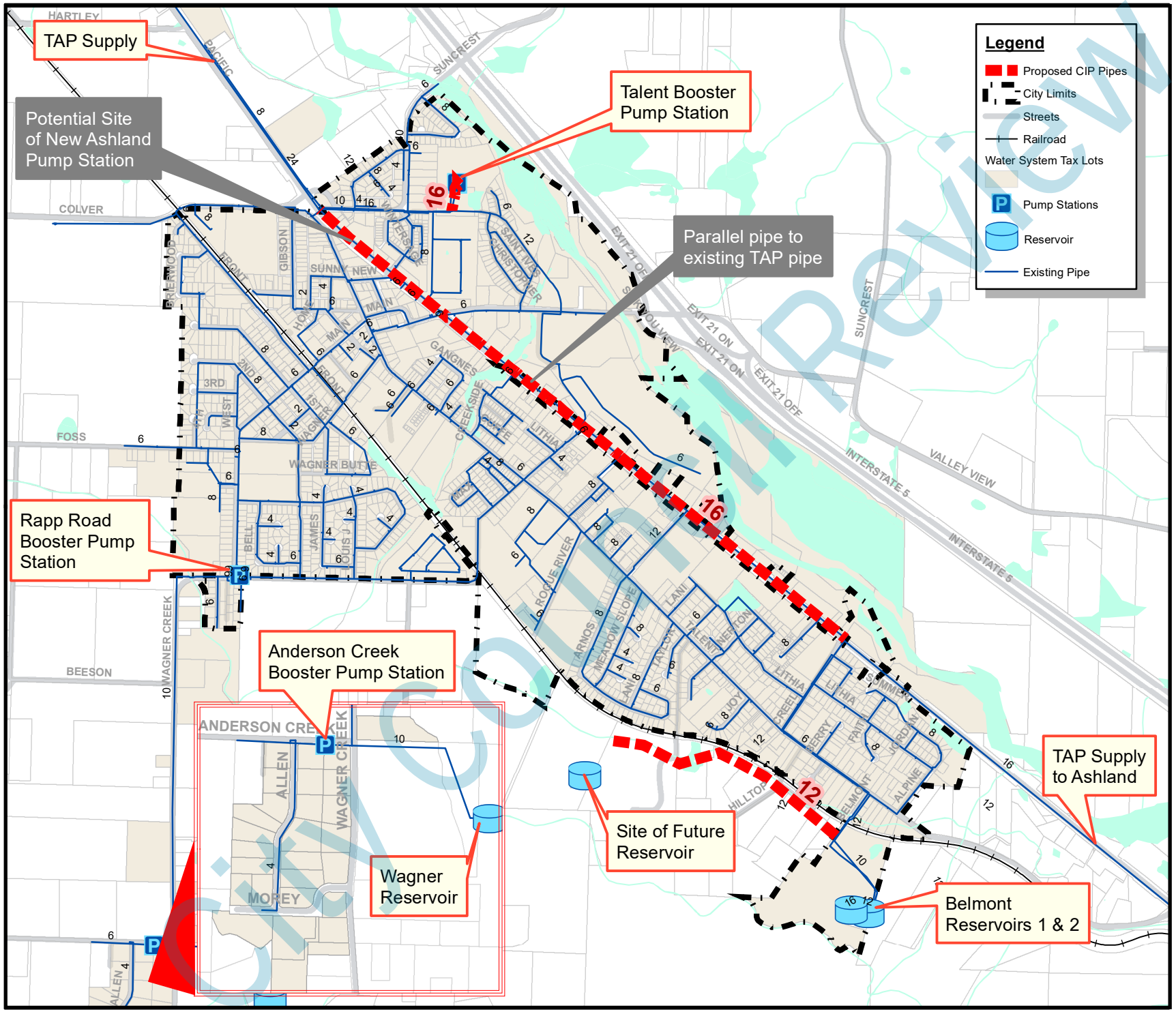
1 inch = 1,500 feet

0 375 750 1,500 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

NORTH

C:\USERS\HFARRIS\DESKTOP\TAP_FIG 4-1 TALENT TO ASHLAND SUPPLY.MXD BY: HFARRIS PLOT DATE: APR 2, 2020 COORDINATE SYSTEM: NAD 1983 STATEPLANE OREGON SOUTH FIPS 3602 FEET



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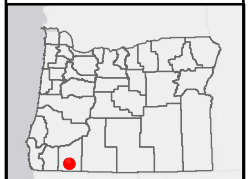
Vicinity Map



ERE, Garmin, (c) StreetMap contributors,

Figure 4-2
Talent to Ashland Supply
Option 2: Dedicated Ashland BPS
TAP Partner Cities Water Master Plan

CITY OF TALENT 1910

1 inch = 1,500 feet

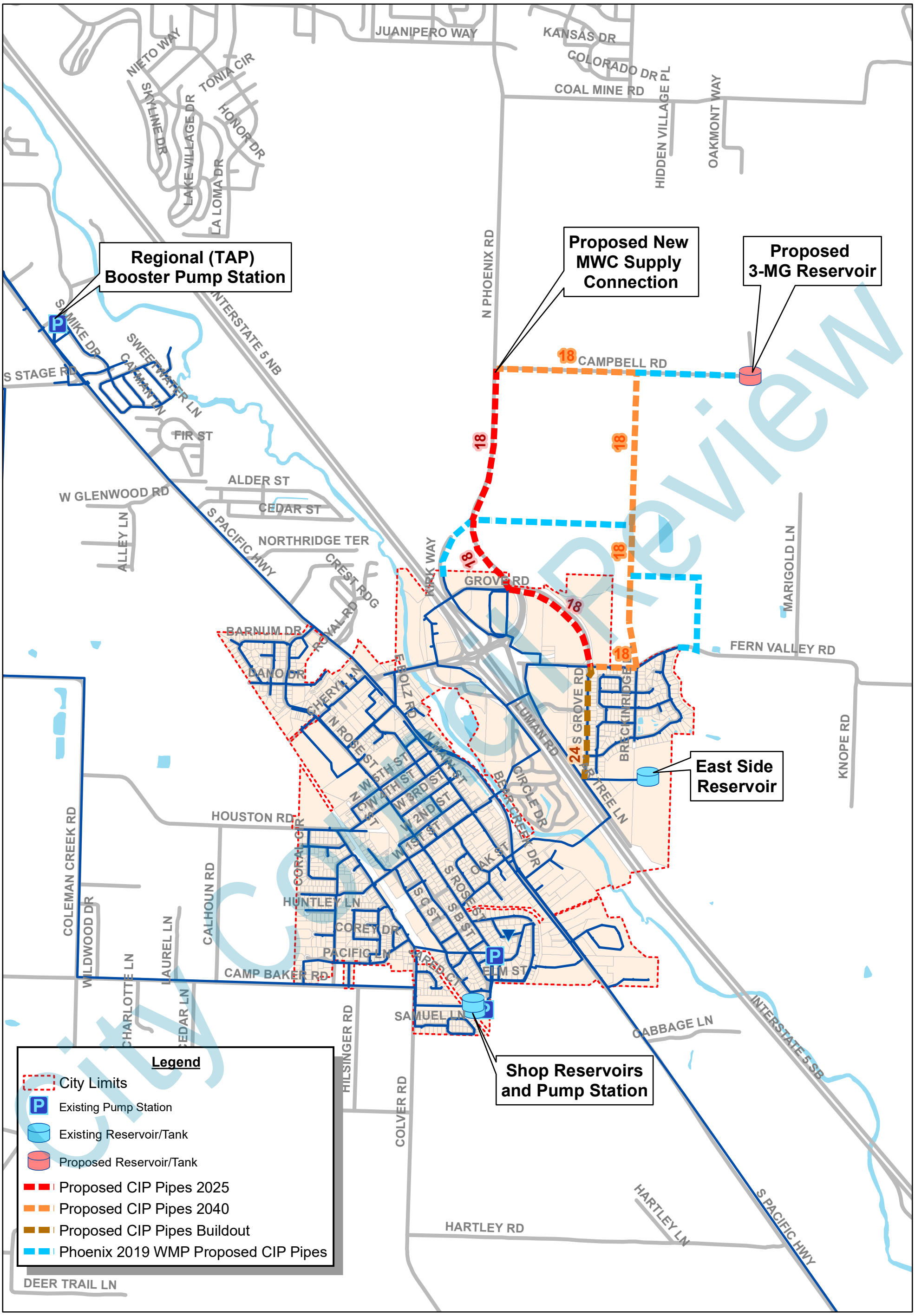
0 375 750 1,500 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

RH2

NORTH

C:\USERS\HFARRIS\DESKTOP\TAP_FIG 4-2 TALENT TO ASHLAND SUPPLY OPTION 2.MXD BY: HFARRIS PLOT DATE: APR 2, 2020 COORDINATE SYSTEM: NAD 1983 STATEPLANE OREGON SOUTH FIPS 36



C:\USERS\HFARRIS\DESKTOP\TAP_FIG 4-3 NEW MWC SUPPLY.MXD BY: HFARRIS PLOT DATE: APR 2, 2020 COORDINATE SYSTEM: NAD 1983 STATEPLANE OREGON SOUTH FIPS 3602 FEET

RH2 NORTH

1 inch = 1,500 feet

0 390 780 1,560 Feet

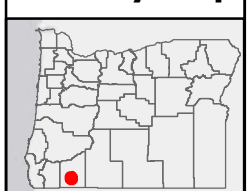
DRAWING IS FULL SCALE WHEN BAR MEASURES 1"

CITY OF PHOENIX O•R•E•G•O•N

Figure 4-3
New MWC Supply

TAP Partner Cities Water Master Plan

Vicinity Map



5 | SUPPLY ANALYSIS

5 | SUPPLY ANALYSIS

Introduction

The TAP Partner Cities rely on the Talent-Ashland-Phoenix (TAP) System to supply water to their customers, either as a sole source of supply, such as for Talent, or as an emergency supply, such as for Ashland. Supplies to the TAP System have limited capacity and must be evaluated for providing long-term supply to the TAP Partner Cities' growing populations. This chapter presents the existing supplies and recommended long-term supply strategy for the TAP System.

Supply Level of Service Goals

Table 5-1 summarizes the level of service goals discussed with the TAP Partner Cities for supply. These goals are used to evaluate supplies in the following sections.

Table 5-1
Supply Level of Service Goals

Parameter	Level of Service
Redundancy	• Maintain adequate supply capacity to meet all demand needs of the TAP Partner Cities. • If the largest supply is offline, maintain the ability to provide Talent and Phoenix average day demands (ADD). • Secure more than one source of supply for the TAP System.
Reliability	Emergency power sources will be sized to meet Talent and Phoenix maximum day demands (MDD) and Ashland's required supply.
Resilience	Maintain operations post-earthquake to provide Talent and Phoenix minimum (winter) demands.

Existing Supplies

The TAP water supply has three main limiting factors: 1) water rights held by the Cities; 2) Medford Water Commission (MWC) wholesale water service agreements; and 3) infrastructure capacity. Current capacity and recommendations to improve long-term capacity of the TAP supply infrastructure is evaluated in **Chapter 4**. The existing water rights and MWC agreements are discussed in this chapter.

Water Rights

The TAP Partner Cities each hold water rights in Lost Creek Reservoir (or the Rogue River) that are delivered through MWC to the TAP System. The water rights are allocated for use during the months of May through September to augment MWC supply during the peak demand months. Throughout the rest of the year, the TAP System is supplied by excess water produced under MWC's water rights.

Table 5-2 presents a summary of the water rights held by the TAP Cities on the Rogue River and Lost Creek Reservoir. The City of Phoenix (Phoenix) holds an annual water right volume of 1,000 acre-feet per year (afy) (0.89 million gallons per day (MGD)), in addition to a 5 cubic feet per second (cfs) flow rate. Of this total, Phoenix is currently authorized to use only 516.27 afy. The City of Talent (Talent) holds an annual water right of 1,292 afy (1.15 MGD), of which only 533 afy is certificated.

Table 5-2
TAP Lost Creek Reservoir and Rogue River Water Rights

Permit	Certificate	Source	Rate (cfs)	Volume (afy)	Priority	Start Season	End Season
City of Talent							
S-53898	91134	Lost Creek Reservoir	No Rate	1,292; only 533 is certificated	12/28/1998	5/1	10/1
City of Phoenix							
S-47672	-	Lost Creek Reservoir	5.0	400	10/9/1980	1/1	12/31
S-52650	-	Lost Creek Reservoir	3.1	600; limited to 516.27	11/15/1991	1/1	12/31
City of Ashland							
S-54337	-	Lost Creek Reservoir	No Rate	1,000	8/11/2003	1/1	12/31

At the time of this Water Master Plan (WMP), the TAP Partner Cities are actively participating in a regional water rights strategy led by MWC that includes other partner cities that purchase water from MWC. As part of this effort, the cities are reviewing options to certificate and perfect water rights in a way that benefits all regional cities. The TAP Partner Cities most recent demand projections have been used to compare to the water rights available. It is assumed that the resulting water rights strategy will ensure that each TAP Partner City is not limited by water rights; therefore, the limitations of water rights on the TAP Partner Cities are not further evaluated in this WMP. The outcome of the water rights strategy, particularly development of intergovernmental agreements, is yet to be determined; therefore, it is not included in this WMP.

MWC Wholesale Water Service Agreements

MWC is a regional water provider that supplies water to the City of Medford and several neighboring communities, including the TAP Partner Cities. MWC has two sources of supply. Its primary source of water originates from Big Butte Springs, which supplies approximately 25.4 MGD of water year-round to the system. When demands exceed this source of supply, the Duff Water Treatment Plant on the Rogue River is operated. The treatment plant normally operates from May through October and currently is being expanded to a capacity of 65 MGD.

MWC prepares wholesale water service agreements with each partner city that establish the terms of the water supply. These agreements are renewed every 5 years to adjust to growing demands. MWC is restricted from entering into agreements for periods exceeding 20 years, but fully intends on supplying water to its partner cities for the foreseeable future as demands continue to increase. Each TAP Partner City's latest MWC Water Service Agreement is included in **Appendix 5A**. A summary of the MWC Agreements, which are in effect until 2021, is presented in **Table 5-3**.

Table 5-3
2016 MWC Wholesale Water Service Agreements

	Maximum Flow Rate (gpm)			
	October – April		May – September	
City	5 AM – 11 AM	Other Hours	5 AM – 11 AM	Other Hours
Ashland[1]	1,480	1,480	1,480	1,480
Phoenix	440	1,300	1,190	1,600
Talent	495	735	1,338	1,338
Total	**2,415**	**3,515**	**4,008**	**4,418**

[1]Ashland's data is from the 2014 Water Service Agreement.

The Phoenix agreement with MWC allows a maximum flow rate of 1,600 gallons per minute (gpm) (2.3 MGD) during summer months, and a maximum of 1,300 gpm (1.87 MGD) during the rest of the year. The agreement further restricts summer and non-summer usage for Phoenix between the hours of 5 AM and 11 AM to 1,190 gpm (1.71 MGD) and 440 gpm (0.63 MGD), respectively.

Talent's water service agreement with MWC allows a maximum flow rate of 1,338 gpm (1.93 MGD) during summer months, and a maximum of 495 gpm (0.71 MGD) during the rest of the year. Language in the agreement allows for 735 gpm (1.06 MGD) to be purchased by Talent during non-summer months outside of the hours 5 AM to 11 AM.

The City of Ashland (Ashland) water service agreement with MWC allows a maximum flow rate of 1,480 gpm (2.13 MGD) with no seasonal or time limitations.

MWC does not track water use for Talent or Ashland; instead, MWC tracks the sum of water used by all TAP Partner Cities as the sum of water through both the Regional TAP supply meter and the Phoenix Kings Highway meter. **Table 5-3** provides the sum of the maximum flow rates for the TAP Partner Cities that MWC uses to compare to actual water use for the TAP System.

The effective maximum flow rate per day for the summer period is 4,314 gpm (6.21 MGD), which is calculated based on the weighted average of maximum flow rates for the specified time periods. Compared to the demands for all TAP Partner Cities presented in **Chapter 2, Table 2-5**, MWC limitations may be exceeded as soon as 2020. However, this assumes that all TAP Partner Cities are at their MDD, Ashland is using its full 2.13 MGD, and the current TAP System does not have adequate capacity to provide the full TAP MDD. It is assumed that the TAP Partner Cities will negotiate updated maximum flow rates with MWC in the next water service agreement updates (assumed to be in 2021). Recommendations for future MWC water service agreements are included in **Appendix 5B**.

Future Supply Options

The TAP System is facing supply limitations in the next few years as all cities demands are growing and as Ashland exercises its use of the TAP System. **Chapter 4** documents capacity limitations at the Regional Booster Pump Station (BPS) and associated piping. The following supply options address these capacity limitations and the other TAP supply level of service (LOS) goals.

Expanding Regional BPS

Chapter 4 identified that the Regional BPS will exceed its total capacity of providing the full TAP System MDD within the next 5 years. Expanding the Regional BPS capacity would involve replacing one of the 50 horsepower (hp) pumps with a 125-hp pump, increasing the pump station capacity by approximately 800 to 1,000 gpm. Expanding the Regional BPS to provide additional pump capacity will delay the need for further supply until after 2030 based on demand projections for the TAP System.

New MWC Supply in North Phoenix Road

Phoenix anticipates significant development northeast of the City as part of its urban growth area that extends along North Phoenix Road to Campbell Road. Additionally, development in the City of Medford is anticipated to occur in its urban growth area adjacent to North Phoenix Road and south to Campbell Road. In its 2019 WMP, Phoenix identified a new supply connection to MWC in this area to replace the Experiment Station Road supply, which is planned to be abandoned in the next 20 years. Phoenix's WMP includes piping from Campbell Road to the existing distribution system and a new reservoir to meet future storage needs. Because all TAP System supply flows through Phoenix, this new supply also impacts the TAP system, creating an opportunity for supply and cost sharing.

MWC Connection

Infrastructure for this potential supply would consist of transmission piping in North Phoenix Road, a master meter, a flow control valve, and a double-check valve for backflow prevention. The required capacity of the new supply is calculated by subtracting the Regional BPS assumed capacity from the total TAP MDD, which is approximately 1,465 gpm (2.1 MGD) by 2040, and 2,800 gpm (4.0 MGD) by build-out. The connection will require connecting to MWC's Pressure Zone 1A or 1B, which will need to be confirmed with MWC. By connecting to these zones, the new supply would be provided at a hydraulic gradient that eliminates the need for pumping to Phoenix. However, it is anticipated that MWC will charge higher water rates for providing water from a boosted zone. These details will need to be assessed in further evaluations and discussions with MWC.

Piping

Chapter 4, Figure 4-3 presents the recommended piping for this new supply. The hydraulic model was used to size the transmission pipes for a supply in North Phoenix Road. Pipes were sized for the ability to meet build-out demands and for reducing impacts on the water levels in Phoenix's Eastside Reservoir and new reservoir. The hydraulic modeling predicts that the water levels in these two reservoirs will vary up to 20 percent when the TAP System is supplying the full TAP MDD, unless additional piping is added between the two reservoirs. (This issue was not identified during modeling of the Phoenix system alone; therefore, the variance is considered an impact from the TAP System). As seen in **Chapter 4, Figure 4-3**, an 18-inch-diameter transmission pipe from Campbell Road to Fern Valley Road provides adequate capacity for delivering the new supply to Phoenix (and the rest of the TAP System) without impacting Phoenix's reservoirs up to the year 2030. By 2040, when the new reservoir is planned for construction, additional 18-inch pipes are recommended for connecting to the new reservoir and looping back to Fern Valley Road. (The locations for these pipes are approximate and will need to be reassessed as street layouts are developed for this area.) To meet build-out demands, additional capacity between Fern Valley Road and Pear Tree Lane is required to avoid impacting reservoir water levels; a 24-inch pipe is recommended for replacing existing pipes in South Grove Road.

Ashland Supply to TAP

To meet LOS goals for supply redundancy, the ability to provide water from Ashland to Talent and Phoenix was reviewed. Water from Ashland could be supplied by gravity to Talent and Phoenix through the existing TAP piping with bypass modifications at the TAP pump stations and meter vaults. The Ashland supply option has the advantage of providing a completely redundant source of supply to Talent and Phoenix. An additional advantage is the avoided use of the TAP pump stations to supply Talent and Phoenix. This would provide an energy and cost savings, as well as avoid greenhouse gas emissions. It is anticipated that Ashland supply water would be available only from October to May (non-summer months) when Ashland has surplus water. Therefore, this supply is called the "Ashland Non-Peak Supply" throughout the remainder of this Plan. It also is anticipated that pressure reducing valves (PRV) would be necessary in some locations to avoid extremely high pressures in Talent and/or Phoenix due to Ashland's system being at a higher hydraulic grade. Refer to **Figure 1-1** for the hydraulic profile of the TAP System.

Infrastructure Modifications

Two options are proposed for bypass pumping to send water from Ashland through the TAP System to Talent and Phoenix (Alternative A and Alternative B). The first option (Alternative A) is an easier solution but does not provide the benefit of being routed back through the existing flow meter. Modifications will be necessary at the Talent BPS and two of the TAP meter vaults. Telemetry and controls also will need to be modified to run the Ashland supply.

Modifications at Ashland TAP BPS – Alternative A

Connect the Ashland TAP BPS suction piping to discharge piping downstream of the backflow prevention vault and flow meter. This option includes a PRV.

Modifications at Ashland TAP BPS – Alternative B

Connect the Ashland TAP BPS suction piping to discharge piping upstream of the backflow prevention vault and flow meter. Demolish one wall of the concrete backflow prevention vault and expand the vault to make room for the new bypass fittings. This option includes a PRV.

Modifications at Talent BPS

Connect the Talent BPS suction piping to the discharge piping by constructing bypass piping and fittings around the pump station. A 10-inch-diameter bypass exists around the double check valve at the Talent BPS that may have capacity to allow ADD flow through the pipe without significant head loss.

Modifications at Meter Vaults

The Creel Road flow meter (in Talent) can operate in both directions; therefore, the existing flow meter can be repurposed to reverse flow back into Talent.

The Oak Street flow meter (in Phoenix) will need to be bypassed. This involves installing a flow meter and valve vault over the existing bypass line and removing the existing check valve. A PRV will be necessary at this location.

Telemetry and Controls

New programming of telemetry and controls will need to be implemented to allow for operators to run the Ashland supply to the TAP System.

Greenhouse Gas Emission Reduction

The US Environmental Protection Agency (EPA) estimates the following greenhouse gas emission rates in the northwest as shown in **Table 5-4**.

Table 5-4
EPA Greenhouse Gas Emission Data for Western Electricity Coordinating Council (WECC) Region

Greenhouse Gas	Average Emission Rate (lbs/MWh)
Nitrogen Oxides	1.0
Sulfur Dioxide	1.0
Carbon Dioxide	843

The greenhouse gas (GHG) emissions for the Talent BPS and the Regional BPS were estimated between October and May based on pump station operation and power requirements. The estimated total emissions (in lbs) that would be avoided if Ashland were to supply winter demands to Talent and Phoenix from October to May is presented in **Table 5-5**.

Table 5-5
Potential Avoided Greenhouse Gas Emissions (Estimated Total October through May)

	Talent BPS	Regional BPS
Reduction in Nitrogen Oxide Emissions (lbs)	200	400
Reduction in Sulfur Dioxide Emissions (lbs)	200	400
Reduction in Carbon Dioxide Emissions (lbs)	197,000	328,000

Charlotte Ann Water District

The Charlotte Ann Water District (CAWD) is between Medford and Phoenix along Highway 99. CAWD consists of 12-inch transmission mains and a pump station with an assumed capacity of 4.0 MGD. There are many unknowns for the CAWD system, such as population, demands, and the age and condition of its water mains and pump station. It is clear from previous experience working with CAWD that there is a very low likelihood of annexation into the City of Phoenix. CAWD would need a compelling reason to dissolve. It is assumed CAWD currently receives all municipal services at relatively low rates. The option to annex CAWD into Phoenix is therefore ranked with the lowest priority in the TAP supply strategy.

Recommended Supply Strategy

To meet the supply needs for all TAP Partner Cities, the following supply strategy has been developed and includes short- and long-term recommendations. Costs for implementing these supply improvements are presented in **Chapter 6**.

Short-Term (2020 to 2030)

Expand Regional BPS

Improve the Regional BPS to provide additional pump capacity, delaying the need for further supply until after 2030 based on demand projections for the TAP System.

Ashland Non-Peak Supply to TAP System

This project is recommended in the short-term to take advantage of greenhouse gas emissions and reduced operating costs.

MWC Coordination for New MWC Supply in North Phoenix Road

To prepare to implement the new MWC supply in North Phoenix Road, coordination with MWC is recommended to begin as soon as possible. It is assumed that this includes confirming feasibility, hydraulic analyses, and rate impacts.

Long-Term (2031 to Build-Out)

New MWC Supply in North Phoenix Road

The recommended infrastructure for this new supply is shown in **Chapter 4, Figure 4-3** and is color coded by recommended timing. The first sections of the North Phoenix Road MWC supply is recommended by 2030; a second section is recommended by 2040; and a third section is recommended by build-out.

Experiment Station Road Supply Abandonment

While not an improvement, it is assumed that the Experiment Station Road BPS and all associated piping will be abandoned by 2040.

Charlotte Ann Water District

Annexing the CAWD is assumed to continue to be a possibility for the TAP System but is not considered an active supply recommendation.

6 | CAPITAL IMPROVEMENT PLAN

6 | CAPITAL IMPROVEMENT PLAN

Introduction

This chapter presents the recommended Capital Improvement Plan (CIP) for meeting each TAP Partner City's (Talent-Ashland-Phoenix) level of service goals for the TAP System. The improvements described herein were developed from the operational improvements, system capacity analysis, and supply recommendations described in **Chapters 3**, **4**, and **5**. It is important to note that this Water Master Plan (WMP) represents the latest decision making given current conditions and may change in the future as conditions change.

The capital improvement projects are categorized as follows:

- Supply Improvements
- Pump Station Improvements
- Pipe Improvements
- Other Improvements

A summary of the TAP WMP CIP is developed and presented at the end of this chapter. This summary provides total probable costs and a brief description and prioritizes each capital improvement based on the recommended year of implementation. Project priorities should be considered flexible to accommodate the needs of each TAP Partner City, budgetary constraints, and other factors that may affect project implementation.

Appendix 6A provides the cost allocation assumptions of the recommendations for each TAP Partner City. **Appendix 6B** presents the financial analysis performed by Hansford Economic Consultants, LLC (HEC). **Appendix 6C** presents recommendations for a new intergovernmental agreement (IGA).

The following sections include the basis for the cost estimates, a brief description of each improvement, and the recommended prioritization and schedule for implementation.

Cost Estimate

Planning-level cost estimates were prepared for the recommended projects following the American Association of Cost Estimators (AACE) Class 5 estimates, which assume 0 to 2 percent of project definition as appropriate for master planning. This level of opinions of cost is assumed to be within the range of plus 50 percent to minus 30 percent of the average of contractors' bids. The estimated costs of the facilities should be expected to change, along with the accuracy of the estimate, as a project proceeds into preliminary and final design. These opinions of probable cost are based on year 2020 dollars and no allowance has been made for inflation in future years.

Since construction costs change periodically, an indexing method to adjust present estimates in the future is useful. The Engineering News Record (ENR) Construction Cost Index (CCI) is a commonly used index for this purpose. The CCI used for this study is 11392, the January 2020 20-Cities Average.

Estimated total project costs for each project are comprised of multiple components: 1) directly estimated construction costs; 2) an allowance for contingencies; and, 3) an allowance for engineering, legal, and administrative costs. These components are described in the following sections.

Construction Costs

Planning-level construction costs were estimated assuming a traditional public works procurement process of design, bidding, award, and construction by a licensed contractor using commonly accepted means and methods. Property easements or land acquisition and maintenance costs are not included.

Table 6-1 presents the unit construction cost assumptions for pipe improvements used in the CIP. These are based on recent, local projects and include mobilization, materials, labor, contractor overhead and profit, and all elements expected to be included in a contractor's bid. Pump station costs were estimated using previous projects and comparing building square footage, total motor power, ultimate capacity, and startup capacity.

Table 6-1
Pipe Installation Unit Costs

Diameter (Inches)	Unit Construction Cost (2020 $/Linear Foot)
6	$190
8	$240
10	$250
12	$250
16	$270
18	$280
20	$300
24	$380
30	$480
36	$570

Contingencies

A contingency of 30 percent was added to estimated construction costs for all projects. The allowance for contingencies covers items such as variations in project configuration, which are developed during preliminary design and final design, unforeseen site conditions encountered during construction, and reasonable project changes during construction. The contingency allowance does not include major project scope additions or additional costs resulting from permit mitigation requirements (such as wetlands enhancement).

Engineering, Legal, and Administration

Total construction costs were increased by 25 percent to achieve the total project cost. This markup accounts for engineering design, construction management, legal, and administrative project costs. Costs shown in the CIP are estimated total project costs.

Project Prioritization & Schedule

The recommended projects were prioritized based solely on the driving need for increased capacity and the associated timing required. The implementation schedule for the proposed improvements is shown in **Table 6-4**. As seen in **Table 6-4**, projects are allocated into Short-Term, Mid-Term, and Long-Term schedules. The Short-Term shows projects allocated annually for the next 10 years (2020 to 2030). Mid-term is from 2031 to 2040, and Long-Term is from 2041 to build out. It is important to note that recommended projects to increase capacity are sized for build-out demands.

Description of Improvements

This section provides a general description of the recommended improvements and the deficiencies they resolve. Costs and timing of the projects are shown in **Table 6-4**.

Supply Improvements

The following supply improvements are recommended for the TAP System.

S-1: New MWC Connection in N. Phoenix Road

To meet the growing demands of the TAP system and provide supply redundancy, it is recommended that a new supply connection to the Medford Water Commission (MWC) be developed as opposed to expanding the Regional Booster Pump Station (RBPS) and associated piping. This project includes extending pipes from the City of Phoenix system along North Phoenix Road to Campbell Road and connecting to new MWC pipes in N. Phoenix Road. The location of this supply coincides with planned urban growth areas (UGAs) for both the City of Medford and the City of Phoenix. The project requires extensive coordination with MWC to confirm the feasibility, infrastructure requirements, rate impacts, and implementation. Water supplied from this part of the MWC system can supply the TAP system by gravity (i.e. no pump station is required) since it is already serving higher elevation customers in the City of Medford. However, adequate capacity of MWC's system will need to be confirmed, and it is likely that MWC will charge a higher rate for water provided at a higher pressure to cover MWC's costs of boosting water.

This potential connection was recently evaluated and recommended for the City of Phoenix (Phoenix) to replace its Experiment Station Road supply (as discussed in **Chapter 4** and **Chapter 5**). Estimated costs (for Phoenix only) and timing for this improvement are in the Phoenix *Water Master Plan* ($2M projected for mid-term: 2024 to 2040). It was assumed that some of the costs would be shared with local development in Phoenix's UGA that would benefit from an extension of Phoenix's water system to the northeast. The proposed connection in N. Phoenix Road to supply the TAP system involves construction of larger diameter pipes than were previously evaluated for

serving Phoenix only; therefore, the overall cost is higher. This project does not include a second Phoenix reservoir located in the vicinity of the new supply; this planned reservoir is for the benefit of Phoenix customers only and is not considered a TAP asset.

By 2030, the TAP Partner Cities will need approximately 820 gallons per minute (gpm) of additional supply. The final CIP recommends replacing one pump at the Regional BPS to meet this requirement (refer to project **PS-1**). To meet supply requirements beyond this, the new MWC supply will need to be in place as soon as possible after 2030 to meet the demands assumed in this WMP. A supply capacity of approximately 800 gpm (1.2 million gallons per day (MGD)) will be needed by 2040, and 2,200 gpm (3.2 MGD) will be needed by buildout from the new MWC connection. The exact timing and capacity will need to be confirmed after expanding Regional BPS.

The following infrastructure is included in this CIP project:

- MWC Coordination and Hydraulic Study. A budget of $50,000 was assumed to fund a feasibility analysis and support MWC hydraulic and rate modeling to confirm the infrastructure requirements and rate impacts of the new connection. Some funds may require payment to MWC and some funds may support further study by the TAP Partner Cities. The study needs to evaluate MWC's transmission system and booster pump station capacities to deliver water to the TAP system at this location, as well as impacts on water rates and system development charges. At the time of this WMP, it is unknown if MWC's system has adequate capacity to provide the supply needed. It is recommended that the TAP Partner Cities begin discussions with MWC as soon as possible to confirm this supply.
- Pipe Improvements. **Chapter 4**, **Figure 4-3**, and **Table 4-9** present the pipe projects assumed for this connection and identify the phasing of the pipes. The assumed pipe layout provides adequate capacity to supply the TAP demand requirements within 10 years, 20 years, and build-out. The final pipe layout and sizes may differ from those identified in this WMP; the locations will be largely driven by the layout of new streets as part of development in the area.
- Master Meter Connection. A master meter located along N. Phoenix Road will require a meter vault, double-check valve assembly, a meter and appurtenances, a possible pressure reducing valve, electrical and control instrumentation, and Supervisory Control and Data Acquisition (SCADA) programming. The cost estimate was prepared from a similar 16-inch master meter assembly cost estimate. The details and sizing of this meter should be confirmed during project planning.

The master meter and first phase of pipe connections are required soon after 2030 to meet the assumed 2030 demands of the TAP Partner Cities. As seen in **Appendix 6A**, the costs of this project will be borne by the Cities of Ashland and Phoenix, as Talent has already invested in the existing TAP facilities to cover its long-term supply needs.

S-2: Ashland Non-Peak Supply Connection

The Ashland Non-Peak Supply project takes advantage of available water production in the City of Ashland (Ashland) during non-peak periods to supply water by gravity to the Cities of Talent and Phoenix. The project involves modifying the current TAP system to allow water to flow backwards through the TAP facilities to Talent and Phoenix. This project is presented in detail in **Chapter 5**.

The cost estimate includes modifying the Ashland TAP BPS bypass piping (including modifying the backflow prevention vault to allow for metering through the existing meter and installation of a pressure reducing valve (PRV)), installing a new vault, meter, and PRV in the bypass piping next to the Talent Meter located in Oak Street in Phoenix, and associated telemetry improvements. No modifications to the Talent BPS bypass piping or Ashland Creel Road meter are necessary.

To take advantage of this low-cost gravity supply, implementation of this project is recommended in the next 10 years.

Pump Station Improvements

The following pump station improvements are recommended for the TAP supply system. Costs and timing of the projects are shown in **Table 6-4**.

PS-1: Regional BPS Programming Updates

Programming updates to the Regional BPS require SCADA Human Machine Interface (HMI), Phoenix Shop BPS programming, and Regional BPS programmable logic controller (PLC) programming. The programming updates are recommended in the short-term.

PS-2: Regional BPS Short-Term Expansion

This short-term expansion project involves installation of a 125 horsepower (hp) pump to replace one of the 50 hp pumps at the Regional BPS. This project is needed to meet increasing TAP demands when all TAP Partner Cities are at maximum day demands (MDD), especially when Ashland increases its TAP supply from 2.13 MGD to 3.0 MGD. It is assumed the project is needed before 2030.

PS-3: Talent BPS Small Pump Installation

A smaller 50 hp pump is recommended to allow Talent to pump at a constant rate to meet its “low” winter demands as discussed in **Chapter 3**. Installation is recommended as soon as possible to resolve the issue of impacting Phoenix’s Eastside Reservoir.

PS-4: Talent BPS Programming Updates

This project includes SCADA (HMI) and the Talent BPS programming to adjust to constant rate pumping and is recommended in the short-term. Refer to **Chapter 3** for further details.

PS-5: Talent BPS Generator Upgrade

The generator upgrade at Talent BPS will provide standby power to run the Talent BPS to provide build-out demands to both Talent and Ashland (Option 1) or just Talent (Option 2). Both options are provided in **Table 6-8**. The generator upgrade is recommended in the long-term for build-out demands. (This project is separate from Talent’s generator project happening in 2020.)

PS-6: Talent BPS Additional Hydraulic Analysis

Additional hydraulic analysis is needed for the Talent BPS to confirm the pump station’s limitations. During the hydraulic modeling evaluations in this WMP, discrepancies were identified between the

pump station flows in the model and field conditions. This WMP did not have adequate budget to resolve this issue, and additional effort is recommended as it may identify small modifications that could result in significant additional capacity from the pump station. This project is recommended in the short-term to support future evaluations for the pump station expansion.

PS-7: Talent BPS Seismic Upgrades

As part of each city's state-required Water Master Plans, the Cities of Phoenix and Talent recently completed Water System Seismic Resilience Assessments and Mitigation Plans (Seismic Plans). The Talent Seismic Plan recommends further study of the Talent BPS building to confirm its performance during an earthquake. This project is recommended in the mid-term.

PS-8 Option 1: Talent BPS Expansion for Talent and Ashland

Chapter 4 identified that the Talent BPS is currently undersized to provide MDD supply for Talent and Ashland's 2.13 MGD at the same time. Two options were developed to address this deficiency. In Option 1, the Talent BPS will continue to be used to provide supply to both Talent and Ashland. The additional 50 hp pump (**PS-3**) will help increase total capacity to support Talent and Ashland demands until 2030. By 2030, replacing one of the 125 hp pumps with a 150 hp pump is recommended. To meet buildout demands, replacing the 50 hp pump with a 75 hp pump is recommended. Other recommendations associated with Option 1 are noted herein.

PS-8 Option 2: Talent BPS Expansion for Talent Only

In Option 2, the Talent BPS would serve only Talent while Ashland constructs a separate pump station (**PS-9**) by 2030. To meet Talent's demands only, replacing the 50 hp pump with a 75 hp pump is recommended by 2040.

PS-9 Option 2 Only: Construct New Ashland BPS

Under Option 2, Ashland would construct a new TAP BPS located in Talent to provide dedicated pumping to meet Ashland's demands from the TAP system. A new pump station with three 75 hp pumps was assumed to meet Ashland's 2.13 and 3.0 MGD requirements. The cost estimate includes assumptions for property acquisition and a generator. This project entails additional piping improvements to isolate Ashland's TAP supply from the Talent water system (**P-3, Option 2**). This pump station alleviates the need for a Talent BPS expansion to supply all of Ashland's TAP system demands.

Pipe Improvements

The following pipe improvements are recommended for the TAP supply system. Costs and timing of the projects are shown in **Table 6-4**.

P-1: ODOT Bridge Pipe Relocation (Coleman Creek in Phoenix)

A planned Oregon Department of Transportation (ODOT) bridge project conflicts with a portion of the 24-inch TAP main at Coleman Creek in Phoenix. This project relocates the TAP main and is planned in the short-term to coordinate with the ODOT project.

P-2: 24-inch Pipe Seismic Upgrades (Highway 99 in Phoenix)

The 24-inch TAP water main in Highway 99 in Phoenix from E. 4th Street to Oak Street may be at risk according to results from the Phoenix Seismic Plan. This project replaces the main with either restrained joint pipe or earthquake pipe and is recommended in the long-term. In the short-term, if an earthquake occurs, Phoenix staff has agreed to prioritize the repair of this pipe over other pipe repairs.

P-3 Option 1: Talent to Ashland Pipe Improvements

As described in **Chapter 4**, if the Talent BPS is expanded to supply build-out demands to both the Cities of Talent and Ashland, a number of pipes would need to be upsized to improve transmission capacity and reduce Ashland's impact on Talent's storage reservoirs. The recommended Option 1 pipe projects are shown in **Figure 4-1** and presented in **Table 6-2**.

P-3 Option 2: Talent to Ashland Pipe Improvements

If the Talent BPS is expanded to supply build-out demands to Talent only, a few pipes would need to be constructed or upsized to improve transmission capacity. This option involves constructing a new dedicated Ashland pump station and piping. All recommended Option 2 pipe projects are shown in **Figure 4-2** and presented in **Table 6-3**.

Table 6-2
Option 1 Talent to Ashland Pipes

Pipe	From	To	Existing Diameter (in)	Proposed Diameter (in)	Length (ft)	Total Project Cost ($)	Timing	Notes
Reservoir Connection along Irrigation Canal	Belmont Reservoir Piping	New Reservoir Piping	NA	16	3,550	$ 1,486,000	2030	Required to reduce Ashland impact on Belmont Reservoirs.
Talent BPS Suction Pipe	HWY 99/Suncrest Road	Talent BPS	16	24	1,900	$ 1,119,000	2040	Velocities exceed 5 fps unless a 24-inch pipe is used.
Talent BPS Discharge Pipe	Talent BPS	Winter Sage Road	12	18	370	$ 161,000	2040	With an 18-inch pipe, velocities are ~5.8 fps, but since this is a short section of pipe, this is not causing excessive headloss during maximum demands (build-out MDD).
Winter Sage Road	Talent BPS Discharge Pipe	Anjou Club pipe	12	18	215	$ 93,000	2040	Redirects TAP Supply and main Talent supply away from Wagner Creek area consistent with Talent Seismic Resilience Plan.
Anjou Club Private Drive	Winter Sage Road	HWY 99	8	16	1,045	$ 437,000	2040+	Not required by 2040 for Talent system hydraulics, but recommended for maintaining velocity less than 5 fps.
HWY 99	Anjou Club Private Drive	Wagner Creek Crossing	12	16	1,298	$ 543,000	2040+	Not required by 2040 for Talent system hydraulics, but recommended for maintaining velocity less than 5 fps.
HWY 99	Wagner Creek Crossing	Everett Way	12	18	1,548	$ 671,000	2040+	Requires a larger size as this section of the Talent system is less networked. If a 16-inch pipe, velocities exceed 5 fps and significant head loss occurs during maximum demands.
				Total	**9,926**	**$ 4,510,000**		

fps: feet per second

Table 6-3
Option 2 Talent to Ashland Pipes

Pipe	From	To	Existing Diameter (in)	Proposed Diameter (in)	Length (ft)	Total Project Cost ($)	Timing	Notes
TAP Pipe Extension	Suncrest Road	Creel Road	NA	16	7,800	$ 3,264,000	2025	
Reservoir Connection along Irrigation Canal	Belmont Reservoir Piping	New Reservoir Piping	NA	12	3,550	$ 1,376,000	2030	
Talent BPS Discharge Pipe	Talent BPS	Winter Sage Road	12	16	370	$ 155,000	2040	Velocities exceed 5 fps unless a 16-inch is used. Timing is suggested concurrent with Talent BPS Expansion.
				Total	**11,720**	**$ 4,795,000**		

Other Improvements

O-1 Future Water Master Plan Updates

Regular water master plan updates are recommended to capture actual demand projections and supply needs and confirm capital planning. Timing of future TAP water master plans is recommended to coordinate with development of the individual master plans for each of the TAP Partner Cities for efficiency, cost savings, and a complete picture of upcoming CIP projects. The CIP table includes one TAP WMP with a cost of $150,000 every 10 years for the next 30 years.

O-2 Telemetry Summary Report

A summary of the existing telemetry systems, including an update to the topology graphics for the TAP system, is recommended in the short-term. A cost of $15,000 is estimated.

O-3 IGA Development

A budget of $50,000 is included in the CIP table to hire a consultant to support the TAP Partner Cities with development of a new IGA. IGA recommendations are included in **Appendix 6C**.

Cost Allocations

Cost allocations to each TAP Partner City were developed for each of the recommended CIP projects (**Appendix 6A**) for use in the financial analysis. For each project, cost allocations were developed by calculating the required capacity needed by each TAP Partner City compared to initial investments in capacity. **Appendix 6A** also includes the demand projections and assumed share of capacity of all TAP assets in the future if the CIP projects are constructed as planned. The share of capacity is presented both in terms of capital investment in the infrastructure, as well as flow-based capacity. The capacity share was presented and reviewed by the TAP Partner Cities and provided to HEC for the financial analysis.

Financial Analysis

HEC prepared a financial analysis of the TAP WMP CIP that is included in **Appendix 6B**. The financial analysis was presented and discussed with the TAP Partner Cities and includes several elements including a review of the cost implications of the TAP WMP CIP for each City; assessment of operations, maintenance, and depreciation costs; evaluation of the 10-year impact on water rates for each City; and recommendations for a new IGA for the TAP Partner Cities. The cost allocations and financial analysis were developed including both Options 1 and 2 for the Talent and Ashland supply alternatives. A cost-benefit analysis is recommended to confirm the best solution for Ashland's ongoing use of the Talent BPS.

The rate impacts focus on the financial impacts in the next 10 years. Costs in the next 10 years range from $6M to $11M, depending on the selected option. These costs were not foreseen during development of the water master plans for each of the TAP Partner Cities and are predicted to impact water rates, particularly for Ashland and Talent. Some costs may be deferred if demand requirements are less than the assumptions used in this WMP. The financial analysis also provides funding strategies to implement the CIP.

Other Recommendations

The following additional considerations for the TAP System are recommended.

Management Recommendations

As noted in **Chapter 1**, management of the TAP System could be improved with clearly assigned responsibilities for each City that go beyond the original IGA documents. These include clear roles for each City regarding maintenance of facilities, locating TAP system pipes outside of City limits, insuring the facilities, stockpiling replacement materials, and storage and maintenance of TAP system documents (agreements, design documents, studies, construction as-builts, GIS data, etc.). Additionally, clear guidelines for which cities should have visual rights to see SCADA data from other cities would improve communications during operation of the TAP System. Addressing these management issues in the new IGA and through ongoing TAP Partner City meetings is recommended. These recommendations are captured in **Appendix 6C**.

Confirm Ownership of Pipe Segment 1

It is recommended that the TAP Partner Cities work with MWC to confirm and finalize a decision on ownership of Pipe Segment 1. Recommendations for this and future water purchase agreements with MWC are in **Appendix 5B**.

Regularly Scheduled Water Audits

Though the Rogue Valley Council of Governments (RVCOG) documents flow rates and manages billing, RVCOG does not regularly assess water use information for the TAP Partner Cities. As noted in **Chapter 1**, scheduling water audits on a quarterly or annual basis is recommended. Confirming the meter type and calibration of Phoenix's Kings Highway Meter is also recommended, as it is crucial, in the MWC supply calculations for the TAP Partner Cities.

Environmental Impacts and Conservation

Recommended maintenance and capital improvement projects should consider the strategies defined by Ashland's Climate and Energy Action Plan (CEAP), which aims to reduce greenhouse gases (GHG) and promote conservation, during design for incorporation into construction. The design phase for capital improvements and maintenance projects should consider appropriate measures to protect water supply and quality with a focus on conservation measures. Designs should also consider renewable energy additions, energy consumption reduction, and focusing on minimizing embedded GHG within materials required for construction improvements.

Table 6-4
Capital Improvement Plan

PROJ. NO.	PROJECT DESCRIPTION	TOTAL PROJECT COST	PROJECT TIMING SHORT-TERM 2020-2030	MID-TERM 2031-2040	LONG-TERM 2041- Buildout	NOTES
SUPPLY IMPROVEMENTS						
S-1	New MWC Connection in N Phoenix Road					
	MWC Coordination & Hydraulic Study	$ 50,000	$ 50,000	$ -	$ -	Cost to be refined with MWC.
	Pipe Improvements	$ 7,051,000	$ 2,871,000	$ 3,053,000	$ 1,127,000	Some cost sharing with development
	Master Meter Connection	$ 325,000	$ 325,000	$ -	$ -	
S-2	Ashland Non-Peak Supply Connection	$ 163,000	$ 163,000	$ -	$ -	Construct bypass modifications to supply water from Ashland to Talent and Phoenix through existing TAP mains.
BOOSTER PUMP STATION IMPROVEMENTS						
PS-1	Regional BPS Programming Updates	$ 35,000	$ 35,000	$ -	$ -	Requires SCADA (HMI), Phoenix Shop BPS Programming, and Regional PLC Programming. Updates to the operator interface, current local logic, and weak peripheral communication are assumed to be completed prior to this project.
PS-2	Regional BPS Short-Term Expansion	$ 50,000	$ 50,000	$ -	$ -	Replace 50-hp pump with 125-hp pump
PS-3	Talent BPS Small Pump Installation	$ 50,000	$ 50,000	$ -	$ -	Talent already has a pump at the shop. Costs for creating a third bay and installation of pump.
PS-4	Talent BPS Programming Updates	$ 25,000	$ 25,000	$ -	$ -	Requires SCADA (HMI) and Talent BPS Programming. Updates to the existing HMI are assumed to be completed prior to this project.
PS-5	Talent BPS Generator Upgrade (Option 1)	$ 350,000	$ -	$ -	$ 350,000	Provides backup power for Ashland and Talent demands.
	Talent BPS Generator Upgrade (Option 2)	$ 250,000	$ -	$ -	$ 250,000	Provides backup power for Talent demands only.
PS-6	Talent BPS Additional Hydraulic Analysis	$ 12,000	$ 12,000	$ -	$ -	Additional testing and hydraulic analysis to confirm pump station hydraulic limitations.
PS-7	Talent BPS Seismic Upgrades	$ 70,000	$ 10,000	$ 60,000	$ -	Costs from Talent Seismic Plan. Includes further building study and possible structure to protect pumps.
PS-8	Talent BPS Expansion for Talent and Ashland (Option 1)	$ 403,000	$ 225,000	$ 178,000	$ -	
	Talent BPS Expansion for Talent Only (Option 2)	$ 178,000	$ 178,000	$ -	$ -	
PS-9	New Ashland BPS (Option 2 Only)	$ 2,050,000	$ 2,050,000	$ -	$ -	
PIPE IMPROVEMENTS						
P-1	ODOT Bridge Pipe Relocation (Coleman Creek in Phoenix)	$ 300,000	$ 300,000	$ -	$ -	
P-2	24-inch Pipe Seismic Upgrades (Highway 99 Phoenix)	$ 1,221,000	$ -	$ -	$ 1,221,000	E 4th St to Oak St. Pipe may be at risk and is recommended for restrained joint pipe or earthquake pipe.
P-3	Talent to Ashland Pipe Improvements (Option 1)	$ 4,510,000	$ 1,486,000	$ 1,373,000	$ 1,651,000	
	Talent to Ashland Pipe Improvements (Option 2)	$ 4,795,000	$ 4,640,000	$ 155,000		
OTHER IMPROVEMENTS						
O-1	Future Water Master Plan Updates	$ 450,000	$ 150,000	$ 150,000	$ 150,000	
O-2	Telemetry Summary Report	$ 15,000	$ 15,000			Summarize existing telemetry systems and update topology graphics for TAP system.
O-3	IGA Development	$ 50,000	$ 50,000			
TOTAL						
	TOTAL OPTION 1	$ 15,130,000	$ 5,817,000	$ 4,814,000	$ 4,499,000	
	TOTAL OPTION 2	$ 17,140,000	$ 10,974,000	$ 3,418,000	$ 2,748,000	

Note: Option 2 Projects are shown in italics

| APPENDICES

Appendix 1A

2000 TAP IGA – October 27, 2000

INTERGOVERNMENTAL AGREEMENT

Between

The cities of
Talent, Ashland and Phoenix
Municipal Corporations within the State of Oregon

This Agreement is entered into between the cities of Talent, Ashland and Phoenix, hereinafter referred to collectively as the CITIES, WITNESSETH THAT:

WHEREAS, CITIES are Municipal Corporations within the State of Oregon;

WHEREAS, CITIES have embarked upon the construction of a supplemental water supply conveyance system, which will transport and store potable water from the Medford Water Commission to their respective distribution systems. Scheduled completion of this project's construction is December 31, 2001;

WHEREAS, the cities of Talent and Phoenix will have use of the facilities upon completion of construction, and the city of Ashland is participating in project costs as a protected future user; and

WHEREAS, the purpose of this Agreement is to make provisions for CITIES to perform assigned tasks contained in this Agreement.

NOW THEREFORE, in consideration of the terms, conditions, stipulations and covenants herein contained, the CITIES do mutually agree to the following:

I PROJECT COMPONENTS

Water Intertie Pipeline and Water System Improvements, hereinafter referred to as TAP PROJECT, is designed to serve the municipalities of Talent, Ashland (protected future use) and Phoenix.

A. ENGINEER

The CITIES have entered into an "Agreement for Engineering Services" with Montgomery Watson. See Exhibit A.

B. PRIME CONTRACTOR

The CITIES have entered into a contract with James W. Fowler to be the prime contractor for the construction of the TAP Water Intertie. See Exhibit B.

C. MEDFORD WATER COMMISSION

The CITIES have entered into an agreement with the Medford Water Commission for

maintenance of the Regional Booster Pump Station. See Exhibit C.

The city of Talent has an agreement with the Medford Water Commission, dated June 17, 1998 entitling the city of Talent to a water supply source in the Rogue River utilizing storage in the Lost Creek reservoir and desire to have such water diverted from the Rogue River, treated to obtain potability and transported to its metering point in South Medford, and further that CITY desires to purchase surplus water from the municipal water system of the City of Medford during the winter months.

The city of Phoenix has an agreement with the Medford Water Commission, dated January 27, 1982 entitling the city of Phoenix a water supply source in the Rogue River utilizing storage in the Lost Creek reservoir and desires to have such water diverted from the Rogue River, treated to obtain potability and transported to South Medford, and further that CITY desires to purchase surplus water from the municipal water system of the City of Medford during the winter months.

D. COST SHARING

When a component requires the sharing of costs, the CITIES agree to the following flow-based percentage splits:

TAP Flow-based percent of capacity splits:

- Talent 58.83%
- Ashland 19.39%
- Phoenix 21.78%

It should be noted that the flow-basis protects each CITY for the following maximum capacity amounts in the TAP Intertie Transmission line and the Regional Pump Station:

- Full load-peak day demand required by Phoenix and Talent, plus 25% of the average day demand for Ashland. See Exhibit "D"

E. TAP PROJECT COMPONENTS for construction and future maintenance:

24" Diameter Water Pipeline	all three CITIES - flow-based percent of capacity proportion
12" Diameter Phoenix Pipeline "A"	100% Phoenix only
12" Diameter Phoenix Pipeline "B"	100% Phoenix only
16" Diameter Talent Pipeline "A"	100% Talent only
16" Diameter Phoenix Pipeline	100% Phoenix only
16" Diameter Talent Pipeline "B"	100% Talent only
Phoenix 1.0 MG Reservoir	100% Phoenix only
Talent 1.0 MG Reservoir	100% Talent only
Regional Booster Pump Station	all three CITIES -as outlined in Exhibit C
Talent Booster Pump Station	100% Talent only
Phoenix Booster Pump Station	100% Phoenix only

F. SPECIFICATIONS

The joint use of the 24" diameter pipeline and Regional Booster Pump Station covered by this Agreement shall at all times be in conformity with accepted modern methods and at all times shall conform to the requirements as set forth in Volume's 1 and 2 Contract Documents prepared by Montgomery Watson for Talent, Ashland, Phoenix Water Intertie Pipeline and Water System Improvements, and subsequent revisions thereof, except where the lawful requirements of CITIES may be more stringent, in which case the latter will govern.

CITIES shall at all times maintain all of its attachments in accordance with the specifications mentioned above.

G. TAP COMMITTEE

During Construction Phase:

- The CITIES shall continue with their present TAP Committee for project review and decisions. The TAP Committee consists of four (4) member from each jurisdiction appointed by their governmental unit. The Committee shall meet on the second Tuesday of each month at 5:30 P.M. at the Talent City Council Chambers.
- The responsibilities of the TAP Committee are to a) Make project decisions associated with the pipeline that are not monetary; b) Refer project monetary decisions to respective City Councils, and; c) Ensure elected officials of respective jurisdictions are informed of the project's progress, potential problems and delays.

When Water System is in use:

- The CITIES shall maintain a TAP Committee for ongoing review of project after completion of construction. The TAP Committee shall consist of four (4) members from each jurisdiction appointed by their governmental unit. The Committee shall meet quarterly on the second Tuesday during the months of January, April, July and October. The existing TAP Bylaws will be amended to reflect change of meeting schedule.
- The responsibilities of the TAP Committee are to a) Make project decisions associated with the pipeline that are not monetary; b) Refer project monetary decisions to respective City Councils, and; c) Ensure elected officials of respective jurisdictions are informed of the project's progress, potential problems and delays.

H. CHANGE ORDERS

- Change orders for the 24" Diameter Water Pipeline shall be approved and signed by CITIES.
- Change orders for the Regional Booster Pump Station shall be approved and signed by CITIES.
- Change orders for components of project that are solely one CITY'S

responsibility need not be approved by CITIES.

II CITY OF TALENT RESPONSIBILITIES

A. Shall pay below percentage of costs to construct and later maintain 24" Diameter Water Pipeline.

Construction Cost (% of construction cost)
Talent 58.83%
24" Pipeline Maintenance Cost
Medford to Phoenix 48.2%
Phoenix to Talent 75%

- After construction is complete and the system is in use, maintenance provider to be determined by contractual agreement between CITIES.

B. Shall pay 100% of costs to construct and later maintain 16" Diameter Talent Pipeline "A".

C. Shall pay 100% of costs to construct and later maintain 16" Diameter Talent Pipeline "B"

D. Shall pay 100% of costs to construct and later maintain Talent 1.0 MG Reservoir

E. Shall pay 100% of costs to construct and later maintain Talent Booster Pump Station.

F. Shall pay 58.83% of costs to construct Regional Booster Pump Station. Maintenance shall be on a percent allocation basis based upon actual water delivery through TAP pipelines to each of the CITIES. See Exhibit C.

III CITY OF ASHLAND RESPONSIBILITIES

A. Shall pay below percentage of costs to construct and later maintain 24" Diameter Water Pipeline.

Construction Cost (% of construction cost)
Ashland 19.39%
24" Pipeline Maintenance Cost
Medford to Phoenix 15.7%
Phoenix to Talent 25%

- After construction is complete and system is in use, maintenance provider to be determined by contractual agreement between CITIES.

B. Shall pay 19.39% of costs to construct Regional Booster Pump Station. Maintenance shall be on a percent allocation basis based upon actual water delivery through TAP pipelines to each of the CITIES. See Exhibit C.

IV CITY OF PHOENIX RESPONSIBILITIES

A. Shall pay below percentage of costs to construct and later maintain 24" Diameter Water Pipeline.

Construction Cost (% of construction cost)
Phoenix 21.78%
24" Pipeline Maintenance Cost
Medford to Phoenix 36%
Phoenix to Talent 0%

- After construction is complete and system is in use, maintenance provider to be determined by contractual agreement between CITIES.

B. Shall pay 100% of costs to construct and later maintain 12" Diameter Phoenix Pipeline "A".

C. Shall pay 100% of costs to construct and later maintain 12" Diameter Phoenix Pipeline "B".

D. Shall pay 100% of costs to construct and later maintain 16" Diameter Phoenix Pipeline.

E. Shall pay 100% of costs to construct and later maintain Phoenix 1.0 MG Reservoir.

F. Shall pay 100% of costs to construct and later maintain Phoenix Booster Pump Station.

G. Shall pay 21.78% of costs to construct Regional Booster Pump Station. Maintenance shall be on a percent allocation basis based upon actual water delivery through TAP pipelines to each of the CITIES. See Exhibit C.

V. CREATION OF PROPERTY OWNERSHIP INTEREST.

A. Each party to this agreement shall have an undivided property interest in the 24" pipeline (the "TAP Intertie Transmission Line") equal to the following percentages: Talent = 58.83%; Ashland = 19.39%; Phoenix = 21.78%. Title to the TAP Intertie Transmission Line shall be held in the name of each of the parties in its respective undivided interest.

B. The TAP Intertie Transmission Line is to be held, conveyed, encumbered, leased, rented, occupied and improved subject to limitations, restrictions, covenants and conditions set forth in this Agreement. The Line is dedicated for domestic and municipal water supply purposes.

C. Each CITY shall have the indefeasible right to use the TAP Intertie Transmission Line for the transmission of domestic water and municipal water to its respective city. The City of Talent and the City of Phoenix plan to use the water upon completion of the Project. The City of Ashland anticipates its use of the TAP Intertie Transmission Line at an unspecified time in the future. At such time as the City of Ashland begins to use the

TAP Intertie Transmission Line, it shall be entitled to sufficient capacity within the TAP Intertie Transmission Line to produce a flow and quantity of water equaling 1.6 million gallons per day (1.6 mgd) at the point of diversion located within the City of Talent for the City of Ashland's water.

VI. OPERATION AND MANAGEMENT OF THE PROJECT UPON COMPLETION.

The Rogue Valley Council of Governments (the "Managing Coordinator") shall have the initial responsibility to manage and coordinate the operation, repair and replacement of the Project components after the Project has been completed in December, 2001. The Managing Coordinator shall have the responsibility and authority to perform the following functions and may make decisions with respect to such matters, unless otherwise provided in this Agreement:

A. Operation, Maintenance, Repair, and Replacement. To coordinate contracts, with direction from the TAP Committee, or perform work with its own forces for operation, maintenance and repair of the TAP Intertie Transmission Line pursuant to an approved budget by the Committee.

B. Managing Coordinator's Use of Own Work Forces. The Managing Coordinator may perform work with its own forces. However, The CITIES are in the process of selecting a third party for operation and maintenance of the TAP Intertie Transmission Line. To the extent that any CITY uses its own employees in the performance of its duties under this Agreement, that entity shall be responsible for complying with all applicable state and federal laws and for all employment related benefits and deductions, workers' compensation premiums and pension contributions.

C. Coordination with Medford Water Commission. As necessary, the Managing Coordinator, with direction from the TAP Committee, will coordinate meetings between the Medford Water Commission operators and the CITIES to coordinate ongoing water demands, water quality concerns and any other ongoing operational considerations.

D. Charges. To collect and deposit the charges due from the CITIES into an account established for the Project; to mail written notice to any CITY who is more than 30 days delinquent in payment of any charges; and to mail written notice to the CITIES for additional charges whenever it appears that the funds on hand will be insufficient to cover future expenses.

E. Payment of expenses. To pay when due the expenses of the Project, and all other expenses or payments duly authorized by the TAP Committee.

F. Records. To maintain complete and accurate records of all receipts and expenditures for the CITIES.

G. Improvements or Fixtures. No improvements or fixtures shall be made or attached to the Project which could cause interference with the operation of the TAP Intertie Transmission Line or be an obligation of a fiscal nature for the CITIES without the prior written consent of the CITIES.

VII PAYMENTS

A. The maintenance of the 24" pipeline shall be by contractual agreement between CITIES. Responsible CITY who provides maintenance will invoice other CITIES for maintenance requiring shared costs on a monthly basis, to be reimbursed to responsible CITY within 30 days of receipt.

B. The maintenance of the Regional Booster Pump Station shall be done by the Medford Water Commission (Exhibit C). Payment schedules shall be according to terms set forth in CITIES agreement with the Medford Water Commission.

VIII AMENDMENTS

A. This document and attached Exhibits constitutes the entire Agreement between the CITIES. Any amendments or changes to the provisions of this Agreement shall be reduced to writing and signed by all CITIES.

IX DISPUTE RESOLUTION

If a dispute arises between the parties regarding this Agreement, the parties shall attempt to resolve the dispute through the following steps:

A. Step One - Negotiation. The TAP committee members, or such other persons designated by each CITY, will negotiate on behalf of the CITY they represent. If the dispute is resolved at this step, there shall be a written determination of such resolution signed by the committee members or designated persons and ratified by their respective governing body, which shall be binding upon each of the CITIES.

B. Step Two - Mediation. If the dispute cannot be resolved within 30 days of commencing Step One, the parties shall submit the matter to non-binding mediation. Committee members shall attempt to agree on a mediator. If they cannot agree, then they shall request the Jackson County Circuit Court to appoint a mediator as provided in ORS 36.200. The cost of mediation shall be borne equally between the CITIES. Each CITY shall be responsible for its own costs and fees. The CITIES agree to mediate in good faith. If the issues are resolved at this Step, a written determination of such resolution shall be signed by each city mayor and ratified by each city council.

C. Step Three - Arbitration. If the CITIES are unsuccessful at Steps One and Two, then the dispute shall be settled by arbitration. The parties shall attempt to agree on an arbitrator. If they cannot agree upon an arbitrator with ten days, the parties

shall submit the matter of determining an arbitrator to the Presiding Judge of the Jackson County Circuit Court. Judgment upon the award rendered by the arbitrator may be entered in any court having jurisdiction. The decision of the arbitrator shall be final and binding upon all parties and there shall be no appeal to any court. Expenses of arbitration shall be borne by the losing party or parties. Each party shall pay its own attorney fees in such arbitration unless the arbitrator orders otherwise.

X PROJECT DURATION - TERMINATION

A. This agreement shall take effect as of the last date signed below. The term of this Intergovernmental Agreement shall be perpetual.

Any termination of this Agreement shall not prejudice any rights or obligations accrued to the parties prior to termination.

XI ENTIRE AGREEMENT - AMENDMENTS AND ASSIGNMENTS

A. This document and attached Exhibits shall constitute the entire Agreement between the CITIES.

B. All amendments, modifications, or changes to the provisions of this Agreement in whole or in part, may be entered into at any time upon mutual agreement, signed by all CITIES.

C. Neither party shall assign or transfer any of its interest in this Agreement without the prior written consent of the other CITIES.

XII REPORTS AND RECORDS

A. All work produced by or for the CITIES regarding the TAP Intertie Project shall be the exclusive property of CITIES provided a CITY may obtain a copy of any public record information by paying for the reproduction costs.

XIII INDEMNIFICATION

A. Subject to the limitations and conditions of the Oregon Tort Claims Act, ORS 30.260 through 30.300 and the Oregon Constitution, Article XI, Section 7, the CITIES agree to save, hold harmless and indemnify each other from any loss, damage, injury, claim, or demand by a third party against either party to this agreement arising from the activities of the other party in connection with this Agreement. No party shall be required to indemnify any other party for any liability arising out of the wrongful act of another party or the wrongful act of an agent of another party.

IN WITNESS WHEREOF, CITIES have caused this Agreement to be executed by their authorized representatives as of the date of the last signature affixed below:

PARTIES TO THE AGREEMENT

Marian Telerski 27oct00

Marian Telerski, Mayor Date
City of Talent

10/27/00

Greg Scoles, City Administrator Date
City of Ashland

Larry Parducci 10/27/2000

Larry Parducci, Mayor Date
City of Phoenix

Appendix 1B

2000 TAP IGA Amendment No. 1 – March 20, 2002

INTERGOVERNMENTAL AGREEMENT
Amendment #1

Amendment #1 to the Intergovernmental Agreement Between the Cities of Talent, Ashland and Phoenix signed on October 27, 2000.

Recitals:

A. The cities of Talent, Ashland and Phoenix entered into an intergovernmental agreement entitled "Intergovernmental Agreement Between the Cities of Talent, Ashland and Phoenix Municipal Corporations with the State of Oregon" and signed on October 27, 2000. This agreement is further referred to in this Amendment #1 as the "IGA."

B. The cities desire to amend the IGA in certain respects as shown below. Changes are indicated by lining through words that are to be deleted from the IGA and underlining words that are to be added.

The cities of Talent, Ashland and Phoenix agree:

1. The first paragraph of Section I.G. of the IGA is amended to read:

> The CITIES shall continue with their present TAP Committee for project review and decisions. The TAP Committee consists of ~~four (4) member~~ two members from each jurisdiction appointed by their governmental unit. The Committee shall meet on the second Tuesday of ~~each~~ the month at least quarterly at 5:30 P.M. at the Talent City Council Chambers.

2. Paragraphs B and C of Section V of the IGA is amended to read:

> B. The TAP Intertie Transmission Line is to be held, conveyed, encumbered, leased, rented, occupied and improved subject to limitations, restrictions, covenants and conditions set forth in this Agreement. The Line is dedicated for ~~domestic and~~ municipal and industrial water supply purposes.
>
> C. Each CITY shall have the indefeasible right to use the TAP Intertie Transmission Line for the transmission of ~~domestic water and~~ municipal and industrial water to its respective city. The City of Talent and the City of Phoenix plan to use the water upon completion of the Project. The City of Ashland anticipates its use of the TAP Intertie Transmission Line at an unspecified time in the future.
>
> At such time as the City of Ashland begins to use the TAP Intertie Transmission Line, it shall be entitled to sufficient capacity within the TAP Intertie Transmission Line to produce a flow and quantity of water equaling 25% of

Ashland's average daily demand for the months of July, August and September in the year 2050 not to exceed 1.6 million gallons per day (1.6 mgd) at the point of diversion located within the City of Talent for the City of Ashland's water.

The City of Talent shall be entitled to sufficient capacity within the TAP Intertie Transmission Line to produce a flow and quantity of water equaling a peak daily demand not to exceed 4.0 mgd in the year 2050.

The City of Phoenix shall be entitled to sufficient capacity within the TAP Intertie Transmission Line to produce a flow and quantity of water equaling a peak daily demand not to exceed 3.0 mgd in the year 2050.

[Note: all water quantity figures based on Lee Engineering study dated August 1997]

2. The following paragraphs D and E are added to Section V of the IGA:

D. The CITIES, upon mutual agreement, may reallocate respective capacities if deemed necessary.

E. At such time as the City of Ashland begins to use the TAP Intertie Transmission Line, the City of Ashland shall be responsible for incremental upsizing of the pumps located at the Regional Booster Pump Station unless the pumping system needs to be completely replaced. If the pumping system needs to be replaced, the three CITIES shall share the cost of such based on the flow based formula in effect at the time of upgrade.

3. Paragraphs A, B, C and G of Section VI are amended as follows:

A. Operation, Maintenance, Repair, and Replacement. To coordinate contracts and suitable work only after direction from CITIES ~~, with direction from the TAP Committee, or perform work with its own forces for operation, maintenance and repair of the TAP Intertie Transmission Line~~ pursuant to an approved budget by the Committee.

~~B. Managing Coordinator's Use of Own Work Forces. The Managing Coordinator may perform work with its own forces. However, The CITIES are in the process of selecting a third party for operation and maintenance of the TAP Intertie Transmission Line. To the extent that any CITY uses its own employees in the performance of its duties under this Agreement, that entity shall be responsible for complying with all applicable state and federal laws and for all employment related benefits and deductions, workers' compensation premiums and pension contributions.~~

C. Coordination with Medford Water Commission. As necessary, the Managing

Coordinator, ~~with~~ only after direction from the TAP Committee, will coordinate meetings between the Medford Water Commission operators and the CITIES to coordinate ongoing water demands, water quality concerns and any other ongoing operational considerations.

G. Improvements or Fixtures. No improvements or fixtures shall be made or attached to the Project ~~which could cause interference with the operation of the TAP Intertie Transmission Line or be an obligation of a fiscal nature for the CITIES~~ without the prior written consent of the CITIES.

4. The following paragraph C is added to Section VII of the IGA:

C. To the extent that any CITY uses its own employees in the performance of its duties under this Agreement, such CITY shall be responsible for complying with all applicable state and federal laws and for all employment related benefits and deductions, workers' compensation premiums and pension contributions.

IN WITHNESS WHEREOF, CITIES have caused this Amendment to be executed by their authorized representatives as of the date of the last signature affixed below:

PARTIES TO THE AMENDMENT

Marian Telerski
Marian Telerski, Mayor Date
City of Talent 3/27/02

Greg Scoles, City Administrator 3/26/02
Date
City of Ashland

Larry Parducci 3/20/02
Larry Parducci, Mayor Date
City of Phoenix

Appendix 1C

2000 TAP IGA Amendment No. 2 – Unsigned 2004

INTERGOVERNMENTAL AGREEMENT
Amendment No. 2

Amendment No. 2 to the Intergovernmental Agreement between the cities of Talent, Ashland and Phoenix signed on October 27, 2000.

Recitals:

A. The cities of Talent, Ashland and Phoenix entered into an intergovernmental agreement entitled "Intergovernmental Agreement between the cities of Talent, Ashland and Phoenix Municipal Corporations with the State of Oregon" and signed on October 27, 2000. This agreement is further referred to in this Amendment No. 2 as the "IGA."

B. The cities desire to amend the IGA in certain respects as shown below. Bold underling of words that are to be added indicates changes.

The cities of Talent, Ashland and Phoenix agree:

1. The following paragraph F is to be added to Section V of the IGA:

F. The Talent Ashland Phoenix (TAP) project purchased from Cummins Northwest a 200 KW Onan generator, on February 24, 2004, for $32,415. At such time as the City of Ashland begins to use the TAP Intertie Transmission Line, the City of Ashland shall be responsible for a proportional flow based share of the original cost, based on the depreciated value of the life expectancy of ____years/hours, for the emergency generator located at the Regional Booster Pump Station unless the generator needs to be completely replaced. If the generator needs to be replaced, the three CITIES shall share the cost of such based on the flow based formula in effect at the time of upgrade.

IN WITNESS WHEREOF, CITIES have caused this Amendment to be executed by their authorized representatives as of the date of the last signature affixed below:

PARTIES TO THE AMENDMENT

_____ _____

Marian Telerski, Mayor Date Larry Parducci, Mayor Date

_____

Gino Grimaldi, City Administrator Date

Appendix 1D

2000 TAP IGA Addendum No. 1 – May 15, 2007

City of Talent

204 East Main Street, Post Office Box 445, Talent, Oregon 97540
Telephone: (541) 535-1566 Fax: (541) 535-7423 E-mail: talent@cityoftalent.org

May 25, 2007

RECEIVED
MAY 30 2007
By_____

Dale Shaddox
City Manager
City of Phoenix
PO Box 330
Phoenix, Oregon 97535

Martha Bennett
City Administrator
City of Ashland
20 E. Main
Ashland, Oregon 97520

RE: Intergovernmental Agreement of the TAP Project

Dear Dale & Martha:

Enclosed is a copy of the finally executed TAP Agreement that transfer the responsibility for financial management to the City of Talent. This will be effective on July 1, 2007. I've made arrangements with the Medford Water Commission, Pacific Power and CCIS to transfer their billing to Talent as of that date.

There will be a final audit as arranged by the RVCOG.

There is one thing left open and that I believe can be resolved by the TAC regarding the generator and referred to on page 7 Section 9. I will pursue that with Paula and Jim or Bob to get this resolved.

Thank you for your help in getting this completed.

Sincerely,

Betty Wheeler
City Manger

Cc: Joe Strahl, Talent Public Works Director
Lester Naught, Talent Public Works Superintendent
Paula Brown, Ashland Public Works Director
Phoenix Public Works Director

Enclosure

Addendum to Intergovernmental Agreement

Between
The Cities of
Talent, Ashland and Phoenix
Municipal Corporations within the State of Oregon
For
TAP Project
(Water Intertie Pipeline and Water System Improvements)

This Agreement is made by and between the cities of Talent, Ashland, and Phoenix, Oregon (the "Cities"). This Agreement modifies the Intergovernmental Agreement (IGA) previously entered into by the Cities on October 27, 2000 (attached as part of this agreement) for construction of the TAP Project (Water Intertie Pipeline and Water System Improvements), and supersedes all addenda thereto.

Recitals

A. ORS 190.010 authorizes units of local government, including cities, to enter into written agreements with other units of local government for the performance of any or all of the functions and activities that parties to the agreement themselves have the authority to perform.

B. The Cities entered into an intergovernmental agreement dated October 27, 2000 (the "Original IGA") for construction of a supplemental water supply conveyance system to transport and store potable water from the Medford Water Commission to their respective distribution systems. The system includes a regional booster pump system (the "Regional Pump Station") and a water transmission pipeline (the "TAP Intertie Transmission Line") running beneath Highway 99 south from the booster pump to Talent. Each of the Cities owns an undivided property interest in the TAP Intertie Transmission Line and Regional Pump Station. The system is commonly referred to as the "TAP" system (the "TAP System").

C. Construction of the TAP System as contemplated in the Original IGA has been completed.

D. Section I.G of the Original IGA created a "TAP Committee" for ongoing planning, review, oversight, and maintenance of the TAP system. The TAP committee consists of appointees of the Cities as described in the Bylaws referred to below. The appointees represent the specific interests of the Cities as described in Section 1 below.

E. The duties of the TAP Committee are described in the Original IGA, addenda to the IGA, and in the Bylaws referred to below. This Agreement consolidates all of these duties into one document.

F. The Cities originally contracted with the Rogue Valley Council of Governments ("RVCOG") to perform most of the TAP duties, including coordination of TAP Committee meetings, monitoring of the TAP System, and provision of administrative duties. The Cities now wish to assume the RVCOG responsibilities themselves pursuant to the terms and conditions of this Agreement. The Cities also wish to allocate and clarify these responsibilities.

G. Within the authority granted to the TAP Committee by the Cities, the Cities intend the TAP Committee to monitor TAP System implementation, status, performance, and expenses in order to help ensure that the project meets its intended purpose in the most efficient and effective manner.

H. These Recitals are part of the Agreement

NOW THEREFORE, the Cities of Talent, Ashland, and Phoenix agree as follows:

Agreement

Section 1. Responsibilities of the TAP Committee

1.1 General. The TAP Committee hereby assumes the responsibilities of "Manager Coordinator" set forth in the attached Exhibit A, which is incorporated by reference as a part of this agreement, and as otherwise necessary or appropriate for the overall management, operation, maintenance, repair and replacement of the TAP System. The TAP Committee as a whole will administer these responsibilities unless specifically delegated to and accepted by one of the Cities or contracted to others pursuant to this Agreement.

1.2 Authority to Contract with RVCOG or Others. The TAP Committee may contract with RVCOG or others at its reasonable discretion to perform all or any portion of the duties described in Section 1.1 above.

1.3 Authority of Members to Act on Behalf of Cities. Actions of the members of the TAP Committee must reflect the policies and directives of the Cities they represent. Nothing herein is intended to broaden the authority of the TAP Committee over what was contemplated in the Original IGA.

Section 2. Membership, Voting Privileges And Meetings

2.1 Membership. The TAP Committee will be composed of one (1) representative appointed by each City. Each representative will serve until replaced by

his or her City. Each City shall appoint an alternate to serve in the absence of the representative.

2.2 Voting Privileges. Each member will have one (1) vote. No proxy votes shall be allowed.

2.3. Approval. Any matter may be approved only by the vote of a majority of the members.

2.4 Meetings.

2.4.1 Quorum. A quorum shall consist of a majority of the members.

2.4.2 Frequency. Meetings shall be held at least once every four (4) months (April, August and December) on the second Tuesday of the month at 1:30 p.m. Notice of each regularly scheduled meeting shall be provided at least one week in advance by the Secretary (2.5). Said notice shall be provided to both the member and the alternate of each of the three cities. Meetings shall also be held at any time for any reason upon the request of any one (1) member upon two (2) day's oral or written notice.

2.4.3 Time And Place. The time and place of meeting shall be scheduled and determined by the Secretary in consultation with the TAP Committee members.

2.4.4 Special Meetings. Special meetings may be held at the request of any one (1) TAP Committee member.

2.4.5 Emergency Polls in Lieu of Meetings. Emergency poll votes may be conducted in lieu of meetings if necessary or otherwise advisable. Each member shall have two (2) days to respond to the poll. Non-responding member/alternate shall be contacted by the Secretary as referenced in section 2.5 to ensure notice had been received and to obtain a confirmation of position. Once the results are received, they may be acted upon immediately. Any such results shall be ratified at the next face-to-face meeting.

2.5 Secretary. The members shall appoint a Secretary at the first meeting of each calendar year.

2.6 Minutes. Written Minutes shall be taken at each meeting. The Secretary shall prepare minutes. Minutes shall record all decision items taken by the TAP Committee and all major discussion items.

2.7 Conduct of Meetings. In the event of a dispute, parliamentary procedure shall be conducted in accordance with the latest version of Robert's Rules of Order.

Section 3. Contract Performance And Review

Each TAP Committee member will maintain its own copy of all contracts connected with the construction, ownership, operation, coordination, oversight, maintenance, repair and other components of the TAP System. A list of contracts current as of the date of this Agreement is included under Section 9.

The TAP Committee will monitor the implementation, status and performance of all agreements concerning the TAP System and shall recommend clarifications or changes to these agreements to the Cities as the need arises. As needed, the TAP Committee may prepare reports to the Cities concerning contract status, policies, priorities, and funding.

The TAP Committee will monitor the specific obligations of the Cities set forth in Sections II, III and IV of the Original IGA to the extent that these obligations create current or future commitments or otherwise have a material effect on any aspect of the TAP System.

The TAP Committee will evaluate proposed material changes to the TAP System and make recommendations to the Cities as appropriate.

Section 4. Meetings with the Medford Water Commission And Other Agencies

The Cities entered into an Agreement with the Medford Water Commission for maintenance of the Regional Pump Station on October 18, 2000. This Agreement was subsequently amended in March 2002 to include provisions for allowing the cities to be responsible for routine maintenance of the Pump Station. Talent and Phoenix have each also entered into an independent agreement with the Medford Water Commission for the treatment and delivery of potable water. The TAP Committee will meet with the Medford Water Commission periodically and as otherwise needed to coordinate ongoing and future water demands, water quality concerns, and operational considerations.

Section 5. Duties Delegated to the City of Talent

5.1 Processing And Payment of Bills. The City of Talent shall assume the following responsibilities with respect to the TAP System:

A. Receipt of Bills. The City of Talent will receive and process all bills and other charges connected with the TAP System. Talent will promptly record all such bills and charges, and will apportion each

City's responsibility for payment pursuant to the Original IGA and other applicable agreements.

B. **Confirmation of Accuracy of Bills.** Talent will make every reasonable effort to confirm the accuracy of all bills and charges received. However, each City shall share responsibility for attempting to ensure that source billing information such as meter reads are timely and accurate.

C. **Payment of Bills And Notification to Each City of Its Share.** Talent will promptly pay all bills and charges received no later than the dates they are due. Talent shall notify each City of its contractual share of each bill received and paid by Talent. Notification shall include a copy of the applicable bill or charge.

D. **Customary Bills.** The Customary Bills, while not exhaustive, shared by all three cities will include the annual insurance premiums, annual audit fee and the monthly City of Medford Utility Fees assessed on the Regional Pump Station. Bills shared by just the cities of Phoenix and Talent will include the monthly water bills from the Medford Water Commission and the monthly electrical bills from Pacific Power

1) Billing for the City of Ashland will be once a year for its Proportionate share (19.39%) of the insurance premiums, Medford Utility Fee for 12-month period, and the audit.

2) Billing for the City of Phoenix will be monthly for its proportionate share of the water (based on consumption), power (based on consumption), and Medford Utility Fees (21.78%). Annual bills for the Insurance Premiums and the annual audit are also based on the proportionate share of 21.78%.

3)The City of Talent will be responsible for the payment of the remaining 58.83%

E. **Reimbursement by Cities.** Each City shall promptly reimburse Talent for its share of the bills paid by Talent pursuant to this Agreement. Payment shall be made no later than twenty (20) days after the date of mailing of the notice described in subpart B above.

F. **Reminder Notices.** Talent shall send a reminder notice to any City that has failed to pay a billed charge thirty (30) days after the date of mailing.

5.2 Accounting. The City of Talent shall keep accurate books and records of all bills and other charges received and paid in connection with the TAP System, and of all payments received by Cities in reimbursement of these bills and charges. Talent will establish a separate reserve fund for the receipt of funds and payment of bills under this Section 5. Records shall be provided at each regularly scheduled TAP meeting or upon request.

5.3 Audit. The City of Talent will coordinate an annual audit of TAP System books and procedures. Talent will provide TAP Committee members copies of all audit reports and written materials provided by the auditors, and will immediately notify TAP Committee members in the event that auditors identify material irregularities or recommend substantive changes to accounts, payments, receipts, accounting, record keeping or any other matter connected with the auditor's services. Audit fees directly related to the audit of this "reserve fund" shall be shared by the three cities based on their proportionate shares.

5.4 Notification to TAP Committee Members. The City of Talent will notify TAP Committee members of important events or findings connected with or discovered as a result of the City's services under this Section 5.

5.5 Fees for Services. The City of Talent and the City of Phoenix mutually agree that rather than exchange fees for services to compensate for the services provided by each of the cities as referenced in Section 5.1 and Section 6 of this agreement, that the value of said services will be $100/ month. Neither party will bill the other for these services.

5.6 Term of Services. Talent shall continue to provide the services described in this Section 5 until Talent or one (1) or more of the other TAP Committee Members desires otherwise.

Section 6. Duties Delegated to the City of Phoenix

The City of Phoenix will perform general landscaping services at the Regional Pump station until such time as it, or any other TAP Committee member, desires otherwise.

Section 7. City of Ashland

At such time as the City of Ashland notifies the Cities of Phoenix and Talent that they intend to connect to the TAP Intertie Transmission Line and begin to draw water from the TAP system, the TAP Committee will meet to identify the coordination steps necessary for this to take place. The purpose of this coordination is to ensure appropriate preparation and evaluation is completed to meet the intent of all previous agreements as well as any new requirements current operating system(s). TAP

Committee coordination will help identify the responsibilities of all of the parties and help ensure a smooth transition when the City of Ashland executes its right to tie into the TAP system.

Section 8. TAP Committee Status

The TAP Committee is not an intergovernmental entity pursuant to ORS 294.316(14) or other distinct legal entity, but is instead a purely advisory board whose members strictly represent the interests of the Cities. As such, the Cities are not required to adopt an ordinance ratifying the creation of the TAP Committee pursuant to ORS 190.085 and are not subject to ORS 294 generally, including any requirement therein to undergo an annual budget process. TAP Committee members do not have the discretion to make independent policy decisions but instead carry out policy established by each City regarding the delivery of water to each city on behalf of the Cities that they represent. The TAP committee performs certain purely ministerial duties in addition to its advisory function on behalf of the Cities.

Section 9. Documents that will continue to remain In Force:

1) Intergovernmental Cooperation Agreement-Medford Water Intertie Project, signed by Talent, Ashland, and Phoenix signed October 18, 1995.
2) Intergovernmental Cooperation Agreement-Medford Water Intertie Project, signed by Talent, Ashland, and Phoenix signed October 27, 2000 and Amendment No. 1 signed March 20,25,27, 2002 and Amendment No. 2 generator signed----------.
3) Pump Station Maintenance Agreement between the cities of Phoenix, Talent and Ashland and the Medford Water Commission – dated October 18, 2000 and amended on May 7, 2002.
4) Agreement and Contract for Mutually Granted Easements at Medford Sports and Community Park.
5) Intergovernmental agreement between the City of Talent and the City of Talent for the Provision of Emergency Water Services dated April 19, 2006

Section 10. Documents Superseded by this Agreement:

1) RVCOG Intergovernmental Agreements and amendments
   a) Talent, Ashland and Phoenix effective January 15, 1996
   b) Talent, Ashland and Phoenix effective July 1, 1997
   c) Talent and Phoenix, signed April 7 and 8, 1998
   d) Ashland, June 8, 1999 through June 30, 2000
   e) Ashland, July 1, 2000 through December 30, 2001

f) Talent, Ashland and Phoenix, July 1, 2000 thru December 31, 2001 and amendments No. 1-5 dated respectively April 30, 2002, June 30, 2002, July 31, 2002, September 30, 2002 and November 30, 2002.

2) RVCOG Intergovernmental Agreements and amendments regarding the Managing Coordinator, Amendment 1 to city's IGA effective March 27, 2002 through June 30, 2002. Amendments No. 1-5 dated respectively through June 30, 2003, June 30, 2004, June 30, 2005, June 30, 2006 and June 30, 2007.

3) TAP Bylaws dated March 1999 and as amended June, 2000, January 2001, January 2002, February 2003, August 2004, and June 2005.

This Agreement modifies the following documents:

■ ■ ■

City of Talent

By _____ Date _____

City of Ashland

By _____ Date 5/17/07

City of Phoenix

By _____ Date _____

Appendix 1E

2006 Talent Ashland IGA for Emergency Water Service

April 19, 2006

* original not on file. Use this.

INTERGOVERNMENTAL AGREEMENT FOR THE PROVISION OF EMERGENCY WATER SERVICES

Intergovernmental agreement ("Agreement") made on April 19, 2006, between the CITY OF ASHLAND ("Ashland") and the CITY OF TALENT ("Talent").

RECITALS:

A. Ashland and Talent, together with the City of Phoenix, have entered into an agreement to build, [d] a water distribution system to convey, water from the Medford Water Commission to each of the respective cities. This water conveyance system will hereinafter be referred to as the TAP (Talent, Ashland, Phoenix) line.

B. The TAP line has been completed so as to provide water from the Medford Water Commission to Talent.

C. The TAP line has not yet been completed to provide Medford Water Commission water to the City of Ashland.

D. Until such time as the TAP system is fully completed, the parties desire for Ashland to construct facilities to connect to the TAP system in Talent which will provide for emergency water service for both parties as more specifically set forth in this Agreement.

CITY OF ASHLAND AND CITY OF TALENT AGREE:

1. Services by Ashland: Ashland shall provide the following at Ashland's sole cost, liability and expense:

1.1. Completion of the 16" line in Creel Road at the same time that the reconstruction of Creel Road is performed this spring and summer.

1.2. Right-of-way acquisition and/or agreement with ODOT for the use of highway right-of-way along Highway 99.

1.3. The construction of a 18" waterline between Creel Road in Talent and the north city limits of Ashland, including installation of shut off valves at each end and the installation of a water meter that will measure flow either way.

1.4. The construction of a pumping station near the north city limits of Ashland.

1.5. The construction of emergency pumping facilities as needed to distribute the [inter-tie] TAP water line to all customers within the city.

1.6 All other equipment, materials, labor, supplies, agreements, approvals, and other expenses or arrangements that go into making the project complete and compliant with this Agreement (except as expressly designated in this Agreement as

the responsibility of Talent),

2. Operation upon completion of construction.

2.1. The parties will normally maintain the newly constructed waterline full, with both the valves between the two systems closed.

2.2. The Public Works Directors of each City shall have the authority to activate the TAP [inter-tie] line. Twenty-four hours advance notice of the activation will normally be required except during emergency. If some level of curtailment is required, the Public Works Directors of each respective city shall notify its city administrator or city manager, mayor and city council. The notification shall include the nature of the emergency, expected duration and impacts. Each City shall be responsible to initiate its own curtailment policy as needed to supply the emergency water needs of the other.

2.3. The timing, volume and rate of water available to the TAP line [inter-tie] shall be determined by the supplying City. However, each City, to the extent feasible, shall take reasonable steps to supply the other with sufficient water to meet the basic minimal needs of the other (i.e. fire flows, health and safety).

2.4. The receiving City will pay the delivering city for the cost of water received at the standard TAP charge then in effect as established by the Medford Water Commission.

2.5. Water stored in the system should be changed at least twice per year to maintain good water quality. It shall be Ashland's responsibility to open the valves and operate the pumps as necessary to change the stored water. Ashland shall also be responsible for disposal of water drained from the system. The Cities shall alternately be responsible for re-filling the pipeline from their respective systems. This exchange of water shall only occur during periods of low water use when water storage is at maximum. Neither City shall charge the other for water not delivered to customers as a result of exchanging stale water for fresh water.

2.6. Other than the exchange of stale water for fresh water, the system shall only be activated during a true emergency. The requesting city shall use its discretion in determining what constitutes a true emergency.

3. Worker's Compensation: Each party shall cover its own employees with Worker's compensation insurance.

4. Indemnification: To the extent allowed by the Oregon Constitution, and within the limits of the Oregon Tort Claims Act, Ashland and Talent shall defend, indemnify, and hold the other party, its officers, agents, and employees harmless for, [from] and against any and all claims, actions, costs, judgments, damages, and other expenses resulting from injury to any person (including injury resulting in death) or damage to property (including loss or destruction), of whatsoever nature, arising out of or incident to the performance of this agreement. Neither party shall not be held responsible for

any claims, actions, costs, judgments or other damages, directly and proximately caused by the negligence or willful act of the other party to this agreement.

5. Amendments And Termination

5.1. This document constitutes the entire agreement between the PARTIES and no other agreement exists between them, either stated or implied. Any amendments or changes to the provisions of this agreement shall be reduced to writing and signed by all parties.

5.2. This agreement may be modified or cancelled only if the parties are in agreement of such modification or cancellation.

5.3. This agreement shall be terminated upon completion of the necessary work for Ashland to make full use of the TAP waterline for daily supply of water.

5.4. This agreement may be terminated by either party for default of the other party if written notice of default has been delivered by the terminating party to the defaulting party, setting forth the nature of default and the defaulting party fails to take appropriate steps within a reasonable time to cure the default.

6. Access To Records: The parties and their duly authorized representatives shall have access to all documents, papers, and records directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcript.

7. Compliance With Applicable Laws: The parties shall comply with all federal, state, and local laws and ordinances applicable to any contracted work.

8. Future Intent: It may be possible for the parties to operate their respective systems more efficiently by working with each other to develop similar operational agreements for storage and/or pumping. Any opportunities to achieve more efficiency will be reviewed at operational and administrative levels with both parties before any ideas are discussed with policymakers. The first goal for both parties should be to assure that this emergency agreement works well for all concerned..

CITY OF TALENT

By Betty Wheeler

Its City Manager

CITY OF ASHLAND

By John W Morrison

REVIEWED AS TO FORM

By _____

City Attorney

Date: 3-30-06

City of Talent Engineering Department

200 Suncrest Road
Talent, OR 97540

Phone: (541) 535-5531
Fax: (541) 535-5062

September 11, 2006

Paula Brown, P.E.
City Engineer, Public Works Director
City of Ashland
20 E. Main Street
Ashland, OR 97520

Re: Creel Road Improvements - 16" Waterline

Dear Paula,

We are happy to notify you that the City of Talent has approved the construction of the 16" waterline in Creel Road. The line was inspected, pressure tested, disinfected and is now available to the City of Ashland under the Intergovernmental Agreement for the Provision of Emergency Water Services, dated April 19, 2006.

Sincerely,

Joe Strahl, P.E.
City Engineer, Public Works Director

cc Betty Wheeler, Talent City Manager

CC: Legal
Barbara
Orig to PW

City of Talent

204 East Main Street, Post Office Box 445, Talent, Oregon 97540
Telephone: (541) 535-1566 Fax: (541) 535-7423 E-mail: talent@cityoftalent.org

RECEIVED
APR 24 2006
By

April 20, 2006

Gino Grimaldi
City Administrator
City of Ashland
20 East Main Street
Ashland, Oregon 97520

RE: IGA Emergency Water Services

Dear Gino:

Enclosed is the signed Intergovernmental Agreement for the Provision of Emergency Water Services between the City of Ashland and the City of Talent. The City Council approved this agreement at their meeting of April 19, 2006 and I have dated the agreement as of that date.

The Creel Road project has been placed out to bid and the water line to be paid for by the City of Ashland has been included in that bid.

Please feel free to contact me if you need any additional information.

Sincerely,

Betty Wheeler

Betty Wheeler
City Manager

Enclosure (1)

CC: Joe Strahl, Director of Public Works

Appendix 1F

MWC IGA TAP Regional Pump Station Maintenance Agreement – October 2000

Amendment No. 1 – May 7, 2002

MEDFORD WATER COMMISSION

200 South Ivy Street - Room 177 Medford, Oregon 97501-8601
• Phone (541) 774-2440 • Fax (541) 774-2555 •

October 19, 2000

Pat Foley
Community Planner
Rogue Valley Council of Governments
155 South 2nd Street
P. O. Box 3275
Central Point, Oregon 97502

RE: TAP – Pump Station Maintenance Agreement

Dear Pat,

The Board of Water Commissioners approved Resolution No. 1015 at their meeting held on Wednesday, October 19, 2000. A copy of the resolution is enclosed. Note that the term of the agreement is for five years, commencing from the start up date of the pump station.

Also enclosed is the fully executed agreement. Section 6 has been left blank pending start up of the pump station.

Sincerely,

Edward N. Olson
Manager

mh

enclosures

PUMP STATION
MAINTENANCE AGREEMENT

THIS AGREEMENT made and entered into in duplicate on this 18 day of October 2000, by and between the Cities of Phoenix, Talent, and Ashland, municipal corporations of the State of Oregon herein called the PURCHASERS, and the Medford Water Commission, herein called the VENDOR, witnesseth:

WHEREAS, PURCHASERS are constructing a regional pump station to supply treated domestic water to the cities of Phoenix, Talent and Ashland from the Vendor, and

WHEREAS, PURCHASERS do not have nor want the joint manpower and inventory required to regularly review, maintain, and generally operate said pump station, and

WHEREAS, PURCHASERS agree to the need of one entity to be in charge of general operation and maintenance of the pump station, and

WHEREAS, VENDOR needs to be keenly aware of the use and operation of the pump station regarding being able to supply sufficient water to meet the needs of the station,

NOW, THEREFORE, THE PARTIES HERETO AGREE AS FOLLOWS:

1.

All regulations governing service of the VENDOR as now in effect or as VENDOR may, from time to time, prescribe, shall be deemed a part of this Agreement, and PURCHASERS agree to comply therewith. Nothing contained herein this Agreement shall be deemed to modify, alter or repeal any such regulations now or hereafter adopted.

2.

VENDOR agrees to use reasonable diligence in making all ordinary repairs and provide normal maintenance of PURCHASERS pump station. The VENDOR shall obtain prior approval to perform any non-routine repair or maintenance task which would incur a cost to PURCHASERS in excess of $1,000.00. Prior approval is not needed during an emergency or during after hours when the PURCHASERS approval cannot be obtained in a timely manner. The VENDOR shall make a reasonable effort to notify the PURCHASERS of any such events as soon as reasonably possible.

3.

The definition of routine operation and maintenance shall mean weekly site inspections, routine building and site maintenance and cleaning, routine landscape and irrigation maintenance and employee response to problems during normal working hours.

The definition of non-routine maintenance shall include, but not be limited to, employee response to problems after normal working hours, pump repair and replacement, repainting or replacement of buildings or building components, landscaping, or irrigation replacement and major on-site pipeline repair or replacement.

4.

THE CITIES OF PHOENIX AND TALENT (AND ASHLAND WHEN THEY BECOME A USER) agree that during the term of this Agreement they shall each pay monthly to VENDOR a proportional cost, based on metered flow amounts, of a fixed fee for routine operation, maintenance, and utility billing overhead in an amount of $200.00 to be revised annually on July 1st utilizing the current January Engineering News Record Construction Cost Index.

THE CITIES OF PHOENIX AND TALENT (AND ASHLAND WHEN THEY BECOME A USER) agree that during the term of this Agreement they shall each pay monthly a variable amount based on metered flow amounts, to VENDOR for all utility costs associated with the pump station as billed to VENDOR by other entities

PURCHASERS agree that non-routine operation and maintenance expenses will be billed on a time and material basis plus 10 percent (10%) for overhead and billing and agree that during the term of this Agreement they shall each pay a variable amount, based on a percentage split determined by a separate agreement between Phoenix, Talent, and Ashland, to VENDOR for all non-routine maintenance costs.

The percent allocation of fees and costs are the sole responsibility of the PURCHASERS and shall be established such that the VENDOR will be able to bill each entity on a monthly basis as shown on Addendum A and as may be amended from time to time.

5.

PURCHASERS agree to indemnify VENDOR, and to hold the same harmless from any liability or obligation it may incur or become liable for to PURCHASERS customers or third persons and arising out of its performance of this Agreement. VENDOR shall not be required to service or repair PURCHASERS facility other than in its ordinary course of business in connection with the service and maintenance of its own water facility system.

6.

The agreement shall be in full force and effect until the_____day of _____and PURCHASERS shall make no assignment of the rights or interest granted without written permission from the VENDOR.

7.

It is further understood and agreed by and between the parties hereto that this Agreement may be terminated by mutual consent by either party upon sixty (60) days' notice, in writing and delivered by certified mail or in person.

8.

In the event any suit, action or other proceeding is brought with regard to this Agreement, or to enforce any of the provisions hereof, the prevailing party in any such suit, action or other proceeding, or any appeal therefrom, shall be entitled to reasonable attorney's fees.

IN WITNESS WHEREOF, the Cities of Phoenix, Talent and Ashland have caused this Agreement to be executed in duplicate by its duly authorized officers and the City of Medford, acting by and through its Board of Water Commissioners has caused the same to be executed in duplicate by the Chair of said Commission and its City Recorder, all on the day and year first above written.

CITY OF PHOENIX

Mayor

City Recorder

CITY OF TALENT

Mayor

City Recorder

CITY OF ASHLAND

City Administrator

Director of Public Works

Content review by MB on 27SEP00

Legal review by [illegible] on 9/27/00

MEDFORD WATER COMMISSION

Chair

City Recorder

Addendum A

Pump Station Maintenance Agreement

Re: Item 4

Routine operation and maintenance expenses shall be shared by Phoenix and Talent (and Ashland when they become a user) on a percent allocation basis based upon actual water delivery through TAP pipelines to each of the cities; Talent and Phoenix (and Ashland upon becoming a user).

All non-routine items will be discussed by the TAP Committee and adjudicated based upon actual work performed. It is the intent that Ashland provide reimbursement for items that will benefit the system in total for the future use of those items. Non-routine items include (but are not limited to) pump rebuild, bearings, etc. In general, non-routine operation and maintenance expenses will be on a percent allocation basis as shown below:

Phoenix	21.78%
Talent	58.83%
Ashland	19.39%

Medford Water Commission shall bill Phoenix, Talent and Ashland separately on a monthly basis.

PUMP STATION MAINTENANCE AGREEMENT

Amendment #1

The following statements amend terms and conditions of contract between the Medford Water Commission and the cities of Talent, Ashland and Phoenix. The original contract is dated October 18, 2000. ***Changes are indicated by bold, italic, underline***

Section 2.

~~VENDOR agrees to use reasonable diligence in making all ordinary repairs and provide normal maintenance of PURCHASERS pump station.~~ ***The city of Phoenix agrees to use reasonable diligence in making all ordinary repairs and provide normal maintenance of PURCHASERS pump station.*** ~~The VENDOR~~ ***The city of Phoenix*** shall obtain prior approval to perform any non-routine repair or maintenance task which would incur a cost to PURCHASERS in excess of $1,000.00. Prior approval is not needed during an emergency or during after hours when the PURCHASERS approval cannot be obtained in a timely manner. ~~The VENDOR~~ ***The city of Phoenix*** shall make a reasonable effort to notify the PURCHASERS of any such events as soon as reasonably possible.

Section 4.

THE CITIES OF PHOENIX AND TALENT (AND ASHLAND WHEN THEY BECOME A USER) agree that during the term of this Agreement they shall each pay monthly to ~~VENDOR~~ ***the city of Phoenix*** a proportional cost, based on metered flow amounts of ~~a fixed fee for routing operation, maintenance, and~~ utility billing ~~overhead in an amount of $200.00~~ to be revised annually on July 1st utilizing the current January Engineering News Record Construction Cost Index. ***THE CITY OF TALENT (AND ASHLAND WHEN THEY BECOME A USER) agree that during the term of this Agreement they shall each pay monthly to the city of Phoenix a fixed fee of $100.00 each for routine operation and maintenance of Regional Pump Station.***

THE CITIES OF PHOENIX, TALENT , ASHLAND AND THE MEDFORD WATER COMMISSION shall meet quarterly to discuss operational parameters to insure among other things that conveyance of water is evenly taken from the Regional Booster Pump Station during daily pumping operations.

IN WITNESS WHEREOF, The Cities of Phoenix, Talent and Ashland have caused this Amendment to be executed in duplicate by its duly authorized officers and the City of Medford, acting by and through its Board of Water Commissioners has caused the same to be executed in duplicate by the Chair of said Commission and its City Recorder.

CITY OF PHOENIX

Mayor

City Recorder

CITY OF TALENT

Mayor

City Recorder

CITY OF ASHLAND

City Administrator

Director of Public Works

MEDFORD WATER COMMISSION

Chair

City Recorder

Appendix 1G

2016 TAP RVCOG IGA for Billing

Scanned & Mailed To TAP Partners CS 8/1/16

INTERGOVERNMENTAL AGREEMENT

THIS AGREEMENT is made and entered into by and between the Rogue Valley Council of Governments, hereinafter referred to as "RVCOG", and the Cities of Talent, Ashland, and Phoenix, hereinafter referred to as "CITIES", all of which are hereinafter referred to collectively as the PARTIES;

WITNESSETH

WHEREAS, RVCOG is a voluntary association of local governments serving Jackson and Josephine Counties, Oregon; and

WHEREAS, the CITIES are member agencies of RVCOG; and

WHEREAS, RVCOG has been asked by the CITIES to assist with providing professional accounting services for the CITIES; and

WHEREAS, the purpose of this agreement is to make provisions for RVCOG to perform professional accounting services for the CITIES and to provide for cost reimbursement.

NOW THEREFORE, in consideration of the mutual terms, conditions, stipulations and covenants herein contained, the PARTIES do hereby agree to the following:

A. EMPLOYMENT OF RVCOG

The CITIES hereby agree to engage RVCOG and RVCOG hereby agrees to perform the services hereinafter set forth.

B. SCOPE OF SERVICES

RVCOG shall do, perform, and carry out in a legal and proper manner, as reasonably determined by the CITIES, the services requested by the CITIES, as described in Attachment A – Scope of Services / Fee Schedule, which is attached hereto, and by this reference incorporated herein.

C. TIME OF PERFORMANCE

This agreement is effective July 1, 2016, and shall remain in effect until terminated by either party, in writing, per section D of this Agreement.

D. AMENDMENTS AND TERMINATION

1. This document constitutes the entire agreement between the PARTIES and no other agreement exists between them, either stated or implied. The provisions of this agreement may be changed only by written amendment signed by all the PARTIES.

2. Any of the PARTIES may cancel this agreement at any time with or without cause by giving thirty (30) days notice in writing and delivered in person or by certified mail to the signatory entities to this agreement. Such termination shall be without prejudice to any claims, obligations, or liabilities any of the PARTIES may have incurred prior to such termination.

3. If any contemplated funding is not obtained or continued at levels sufficient to allow for full performance herein, this agreement may be modified or terminated to accommodate such reduction in funds.

E. PAYMENTS

1. RVCOG will invoice the CITIES on a monthly basis. The CITIES will reimburse RVCOG within 30 days of receipt of invoice.

2. Reimbursement will be made at the rates specified in Attachment A, subject to semi-annual adjustments on or about July 1 and January 1 of each year the agreement is in force. These rates apply to travel time to and from the CITIES; actual work time on site; any preparatory or phone consultation work at RVCOG, which has been mutually agreed upon by both parties. The CITIES will also pay for any supplies and materials and travel costs incurred in performing the services.

F. RESPONSIBILITIES

The CITIES shall administratively assist RVCOG in accomplishing the tasks identified under Scope of Services by making the payments identified in Section E. above; maintaining regular communication with RVCOG; helping to resolve differences that may arise between the PARTIES; and providing background information and technical support as necessary to accomplish any task assigned.

G. INDEMNIFICATION

1. Subject to the limitations and conditions of the Oregon Tort Claims Act, ORS 30.260–30.300, the Oregon Constitution, Article XI, Section 7 and the terms of any applicable policies of insurance, the parties agree to save, hold harmless and indemnify each other, including their officers, agents and employees, from any loss, damage, injury, claim, or demand by a third party against either party to this agreement arising from the activities of the other party in connection with this Agreement. None of the PARTIES shall be liable for any loss, damage, injury, claim, or demand against each other arising from their respective activities in connection with this agreement, except as otherwise expressly set forth herein.

2. RVCOG shall comply with all applicable laws, ordinances and codes of the federal, state and local governments in its performance under this Agreement.

3. RVCOG, its subcontractors, if any, and all employees providing work, labor or materials under this agreement are subject employees under the Oregon Workers' Compensation law and shall comply with ORS 656.017 which requires them to provide Workers' Compensation coverage for all their employees.

H. INDEPENDENT CONTRACTOR

RVCOG is an independent contractor under this Agreement, and neither its employees nor its subcontractors are employees of the CITIES. RVCOG is responsible for all federal, state and local taxes and fees applicable to payments for services of its employees under this agreement.

I. ASSIGNMENT AND SUBCONTRACTS

RVCOG may not assign this contract or subcontract any portion of the work without the prior written consent of the CITIES, whose consent will not be unreasonably withheld. Any attempted assignment or subcontract without the CITIES' written consent shall be void. RVCOG shall be fully responsible for the acts or omissions or any of the assigns or subcontractors and of all persons employed by them. The approval by the CITIES of any assignment or subcontract shall not create any contractual relation between the assignee or subcontractor and the CITIES.

J. LIMITATIONS

This agreement in no way restricts RVCOG or the CITIES from participating in similar agreements with other public or private agencies, organizations, or individuals with regard to any aspect of this agreement, so long as the same do not unreasonably interfere with any of the PARTIES' performance herein.

K. CONFIDENTIALITY - NON-DISCLOSURE

Subject to the Oregon Public Records Law, ORS 192.410-192.505, no report, information, or other data given to or prepared or assembled by the RVCOG pursuant to this Agreement which the CITIES have requested be kept confidential, shall be made available to any individual or organization by RVCOG without the prior written approval of the CITIES.

L. REPORTS AND RECORDS

All work produced by RVCOG while working for the the CITIES shall be the exclusive property of the CITIES provided that RVCOG may obtain a copy of any public record information by paying for the reproduction costs thereof.

IN WITNESS WHEREOF, RVCOG and the CITIES have caused this agreement to be executed by their authorized representatives as of the date of the last signature affixed below:

PARTIES TO THE AGREEMENT

City of Talent

Authorized Signature	Title	Date
	CITY MANAGER	7/11/16

City of Ashland

Authorized Signature	Title	Date
	CITY ADMINISTRATOR	7/7/16

City of Phoenix

Authorized Signature	Title	Date
	INTERIM CITY MANAGER	7-28-16

Rogue Valley Council of Governments

Authorized Signature	Title	Date
	Executive Director	8/1/16

ATTACHMENT A – SCOPE OF SERVICES / FEE SCHEDULE

Scope of Services: RVCOG will provide the CITIES with professional accounting services including, but not limited to, invoicing, accounts receivable; accounts payable; financial statements and reporting; audit preparation; financial reporting required by other governmental entities; and other services as required by the CITIES and agreed upon by the PARTIES.

2016 Fee Schedule

Hourly Rates*

Finance Manager	$65.74/hr
Accounting Assistant	$55.32/hr
Accounting Technician	$53.79/hr

*Subject to semi-annual adjustments on or about July 1 and January 1 of each year this agreement is in force. Hourly rates include travel time.

Appendix 1H

TAP Cost Allocation Recommendations – 2017

RH2 TECHNICAL

Memorandum

The Cities of Talent, Ashland, and Phoenix (TAP) Committee	
TAP Committee Administration	
TAL 1011.119.02.201	Jeff Ballard, PE
Jeff Ballard, PE	
Rick Ballard, PE	
TAP Cost Allocation Recommendations	
March 28, 2017	

BACKGROUND

On October 27, 2000, the Cities of Talent, Ashland, and Phoenix (TAP) signed the first agreement for joint usage of a new water facility to supply water in part or in whole to each of the respective municipalities. The agreement was facilitated by the Rogue Valley Council of Governments (RVCOG). In recent years, changes to individual city water systems have created the necessity to re-analyze how water costs are allocated between the TAP municipalities. RH2 Engineering, Inc., (RH2) has been asked to prepare a cost split allocation that covers water costs and utility costs, along with short- and long-term facility maintenance. The TAP committee is moving ahead with amending the existing Intergovernmental Agreements for further clarification, with the intention of including the re-analyzed cost allocations.

The original cost sharing and project splits were detailed under section I. Project Components, D. Cost Sharing, and E. TAP Project Components of the October 27, 2000 agreement, as described below. This information has been provided as a reference to show how the original allocations were established.

> I. PROJECT COMPONENTS
>
> D. COST SHARING
>
> When a component requires the sharing of costs, the CITIES agree to the following flow based percentage splits:
>
> TAP Flow-based percent of capacity splits:
>
> - Talent 58.83%
> - Ashland 19.39%
> - Phoenix 21.78%
>
> It should be noted that the flow-basis protects each CITY for the following maximum capacity amounts in the TAP Intertie Transmission line and the Regional Pump Station:
>
> - Full load-peak day demand required by Phoenix and Talent, plus 25% of the average day demand for Ashland.

E. TAP Project COMPONENTS for Construction and future maintenance:

- 24" Diameter Water Pipeline
  All three CITIES – flow based percent of capacity
- 12" Diameter Phoenix Pipeline "A" 100% Phoenix only
- 12" Diameter Phoenix Pipeline "B" 100% Phoenix only
- 16" Diameter Talent Pipeline "A" 100% Talent only
- 16" Diameter Phoenix Pipeline 100% Phoenix only
- 16" Diameter Talent Pipeline "B" 100% Talent only
- Phoenix 1.0 MG Reservoir 100% Phoenix only
- Talent 1.0 MG Reservoir 100% Talent only
- RBPS
  All three CITIES- flow based percent of capacity
- Talent Booster Pump Station 100% Talent only
- Phoenix Booster Pump Station 100% Phoenix

During RH2's involvement with the TAP committee over the last 12 years, RH2 has witnessed several variations of the cost share allocations, depending on the situation at that time. For example, one variation existed when Ashland was not actively using the facilities (2001 through 2013), and maintenance costs were historically spit between Talent and Phoenix only, which is inconsistent with the agreement. Since Ashland began to utilize the facilities in 2014, the municipalities worked together to establish cost allocations better reflecting the impact on each component within the TAP system. The TAP committee agreed that it would be prudent to establish cost allocations to utilize in the future that ensures all parties are paying an equitable share for their impact on each of the facilities.

FACILITY SPLITS

The original methodology for the cost sharing instituted all partners pay proportionate shares based on the available water volume allocated to each city for the cost of facilities. This approach does not reflect the true proportionate impacts by each city; therefore, it needs to be revised for items such as equipment replacement and major maintenance. Each city has an established usage based on historical maximum volume of water used for maximum day demand (MDD) and should pay its comparable share based on these volumes.

Cost shares for existing facilities maintenance, as shown in **Table 1**, are recommended based on historical MDD for the purpose of setting money aside for long-term maintenance costs and capital replacement needs. The cost allocation should be reviewed annually confirming all TAP members are paying an accurate share. The recommended starting allocations are shown in **Table 1**. This cost split ensures each municipality is covering its respective capacity usage of the facilities. Facilities considered under the cost split are the same facilities that were evaluated during the original allocation, including pump stations and pipes. It is recommended to maintain the use of these allocations until further evaluation is completed as part of a master plan document. This future evaluation should include the impacts and benefits of system storage facilities.

Table 1
Cost Allocations for Existing Facilities

MGD = million gallons per day

Based on the cost allocations in **Table 1** and the attached Life-cycle Cost Estimation, each of the municipalities should be saving the following funds each year for future maintenance and replacement costs.

- Ashland $10,948.49
- Phoenix $4,383.43
- Talent $11,554.49

At a minimum, it is recommended that these funds be set aside until the point in time when the TAP committee has the funding on hand to pay for the largest possible unexpected maintenance item. Other replacements should be scheduled and budgeted through a capital improvement plan that should be included in the future TAP Water Master Plan.

WATER PURCHASE/UTILITY COSTS/ROUTINE MAINTENANCE

Water purchase, utility costs, and routine maintenance should be billed based on existing methods currently calculated by the RVCOG with the inclusion of maintenance costs. The City of Phoenix should take care of routine maintenance at the RBPS, including, but not limited to: pump maintenance; generator maintenance/fueling; site maintenance; and weekly checks. For the RBPS, Phoenix should provide the TAP committee an annual budget for these services for the upcoming year. This budget should be agreed upon and utilized for inclusion in the cost per gallon purchased by each City. This year the City of Phoenix estimated that the annual maintenance costs would be approximately $10,000.00. Based on this budgetary number and the volume of water pumped through RBPS last year, Talent, Ashland, and Phoenix individually will pay $0.025 per 1,000 gallons of water purchased. This cost should be included in the rate by forecasting anticipated annual consumption by each City.

The City of Talent will take care of routine maintenance at the TBPS. The tasks should include, but not be limited to: pump maintenance; generator maintenance/fueling; site maintenance; and weekly checks. For TBPS, Talent should provide the TAP committee an annual budget for these services for the upcoming year. This budget should be agreed upon and utilized for inclusion in the cost per gallon purchased by Talent and Ashland. This year the City of Talent estimated that the annual maintenance cost would be approximately $7,500.00. Based on this budgetary number and the volume of water pumped through TBPS last year, Talent and Ashland will pay $0.025 per 1,000 gallons of water purchased and pumped through the TBPS. This cost should be included in the rate by forecasting anticipated annual consumption by each City.

The funds will be collected throughout the year by RVCOG and returned at the end of the year to Phoenix and Talent, respectively, so they can recover their costs for maintaining the pump stations.

It is also recommended that a maintenance representative for each City visit each pump station on a quarterly basis to make sure that everyone is accepting the level of maintenance and effort going into each joint facility.

LONG-TERM CAPITAL COSTS

It is recommended that the TAP committee move forward with a TAP Water Master Plan in the near future to establish a short- and long-term capital improvement plan that will confirm the system meets the combined needs of the municipalities moving forward. The master planning effort should evaluate future upgrades of pumping facilities and TAP system storage and operation. This document would establish cost allocations moving forward based on system demand forecasts of usage for each respective city. Without this foundation, the TAP facilities will not have a solid plan moving forward.

ATTACHMENTS

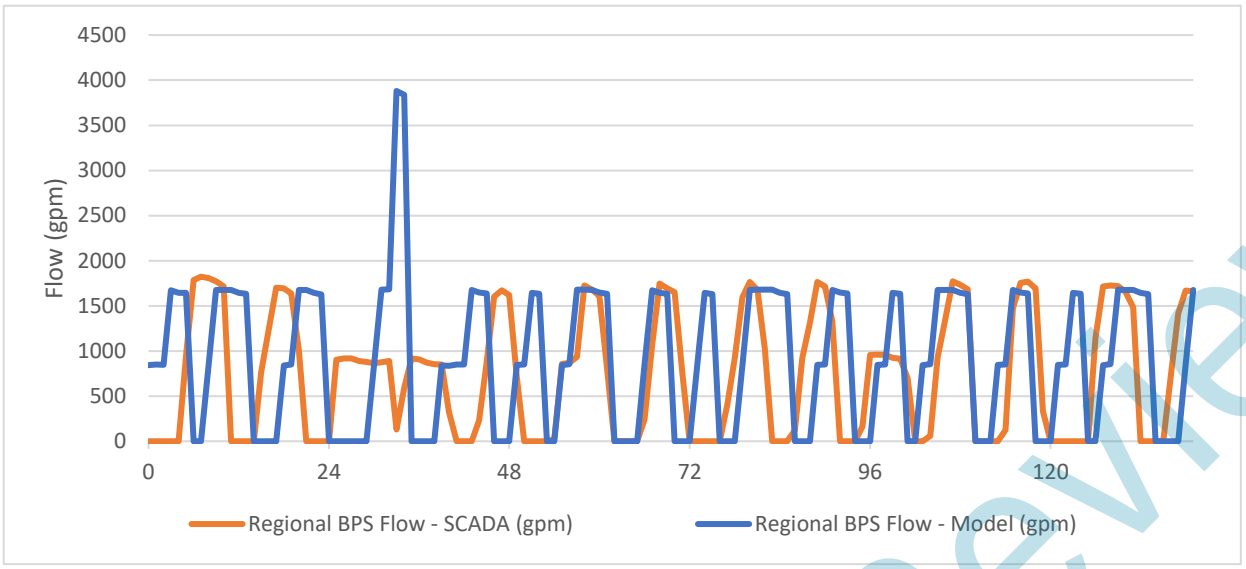
1. Life-cycle Cost Estimation – TAP Pump Stations

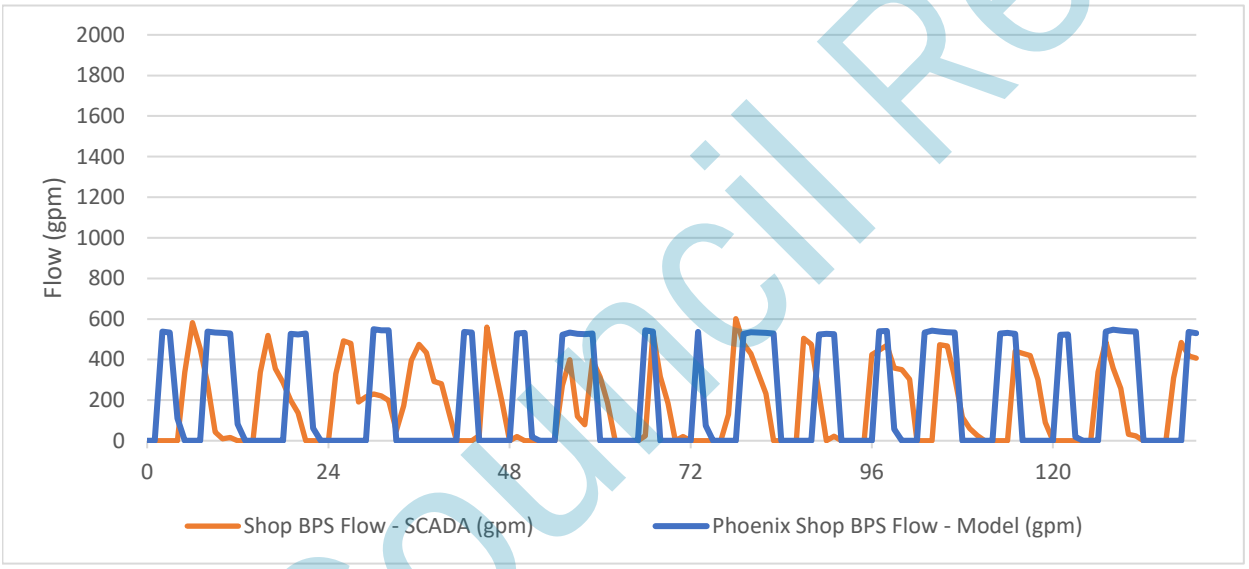
Appendix 3A

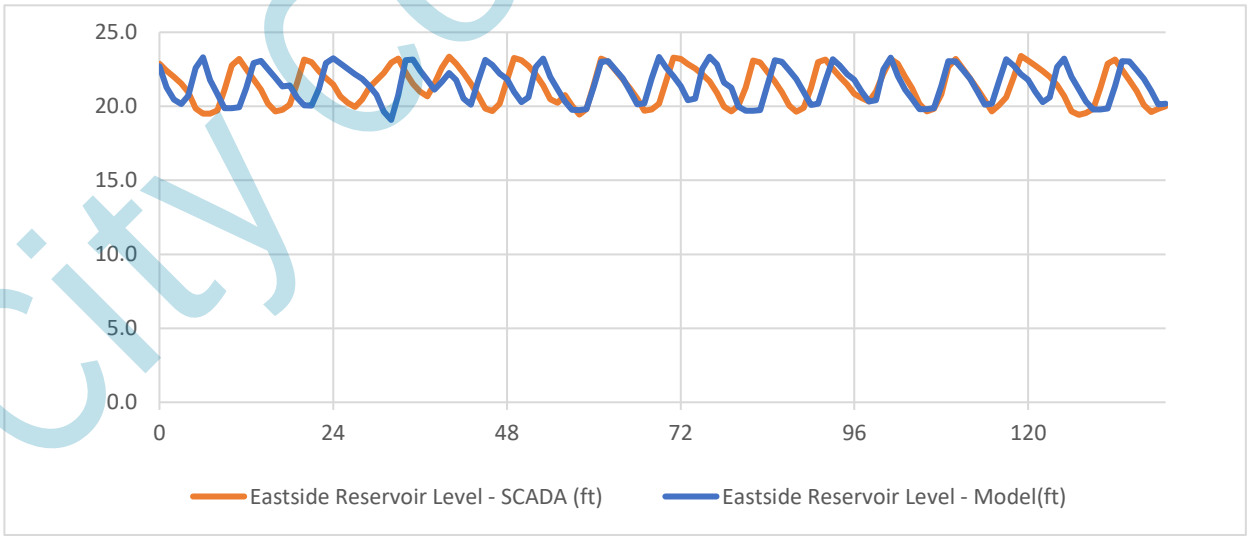
Model Calibration Graphs – May 2017, August 2017, October 2018

May 2017

Phoenix - Regional BPS Flow, Shop BPS Flow, and Eastside Reservoir Levels

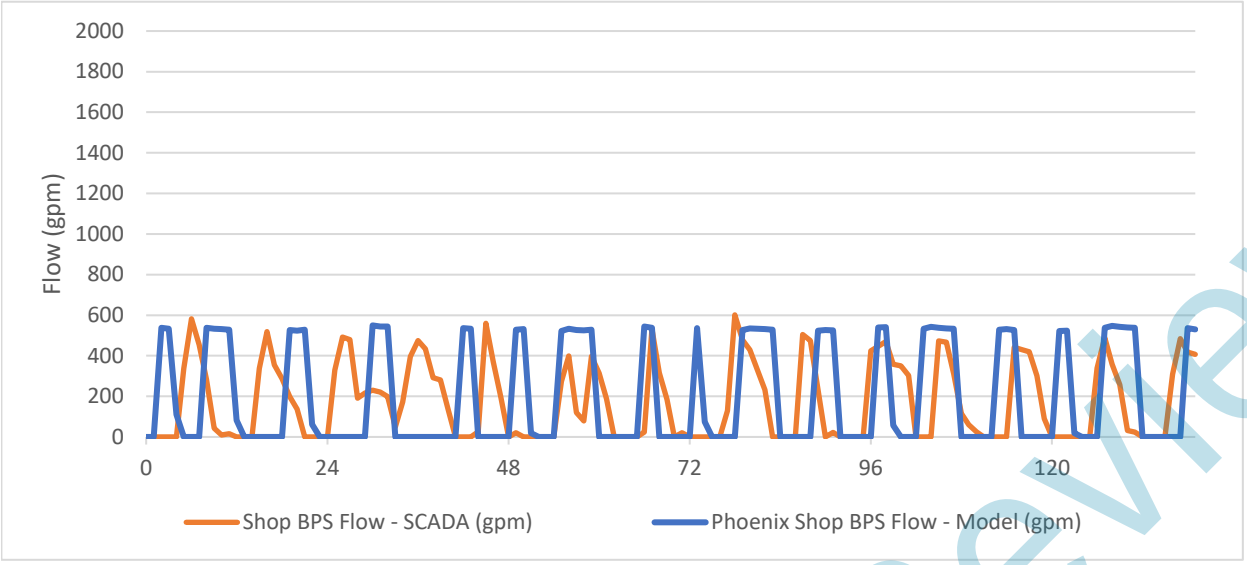


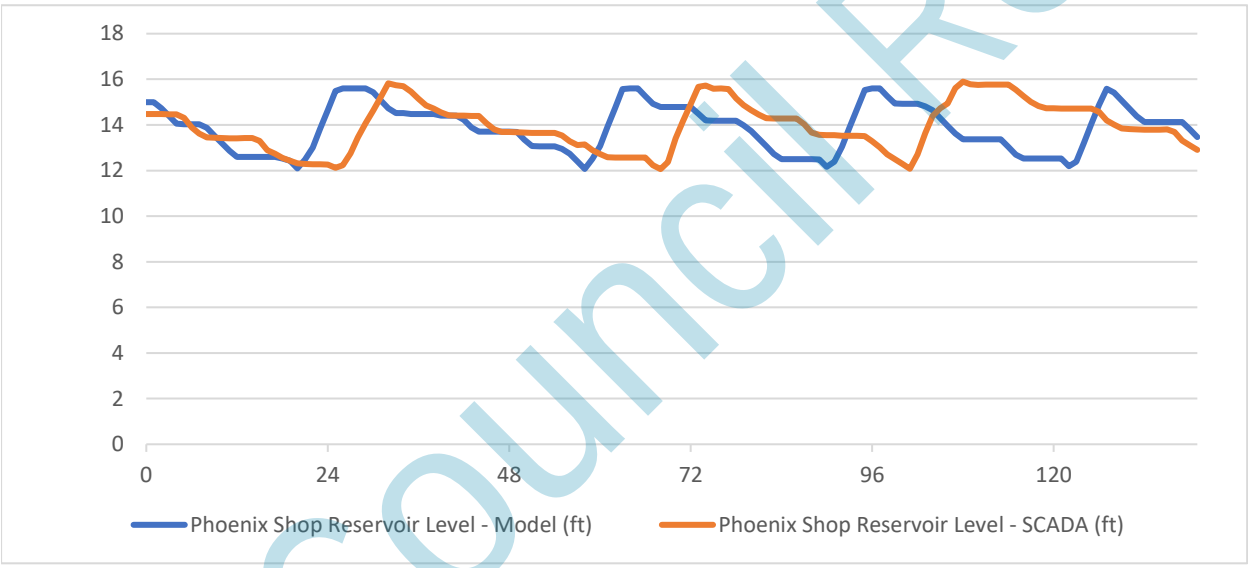




May 2017

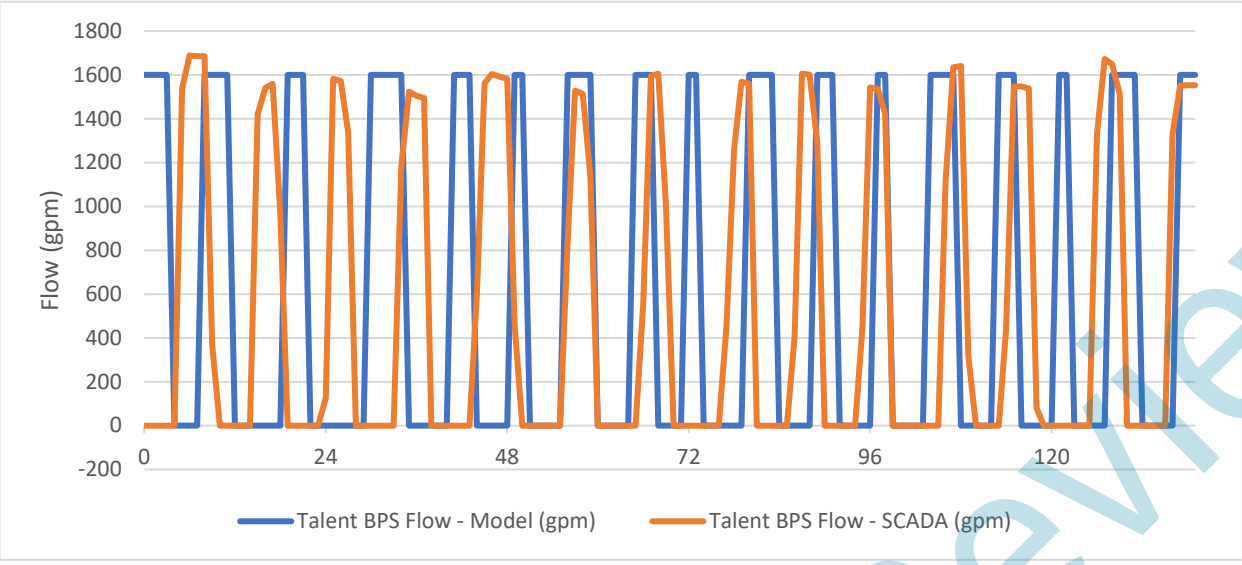
Phoenix - Shop BPS Flow and Shop Reservoir Levels

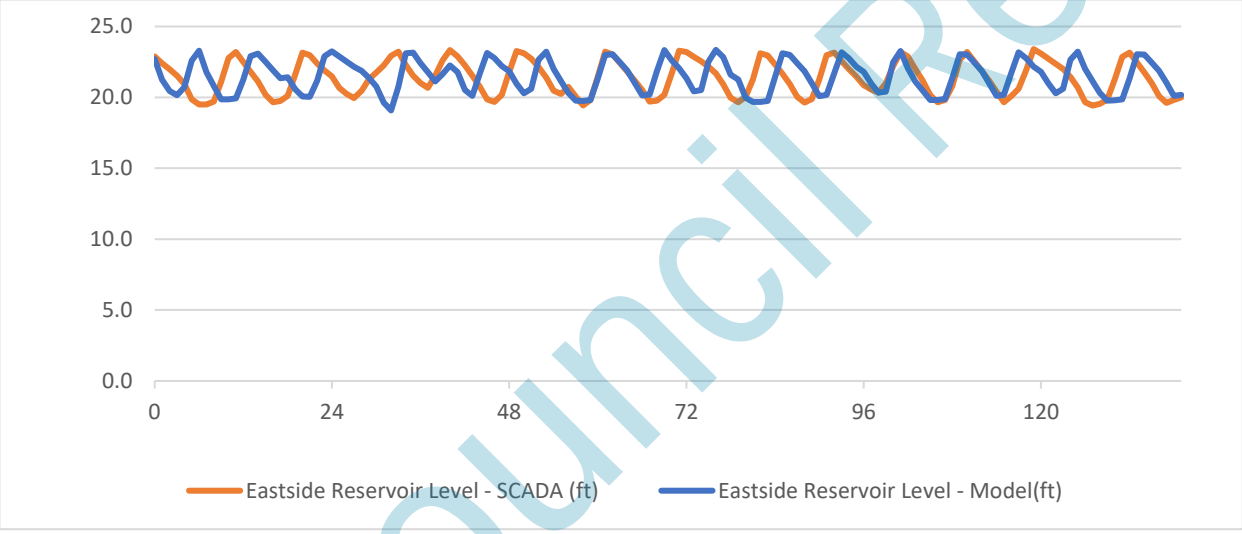




May 2017

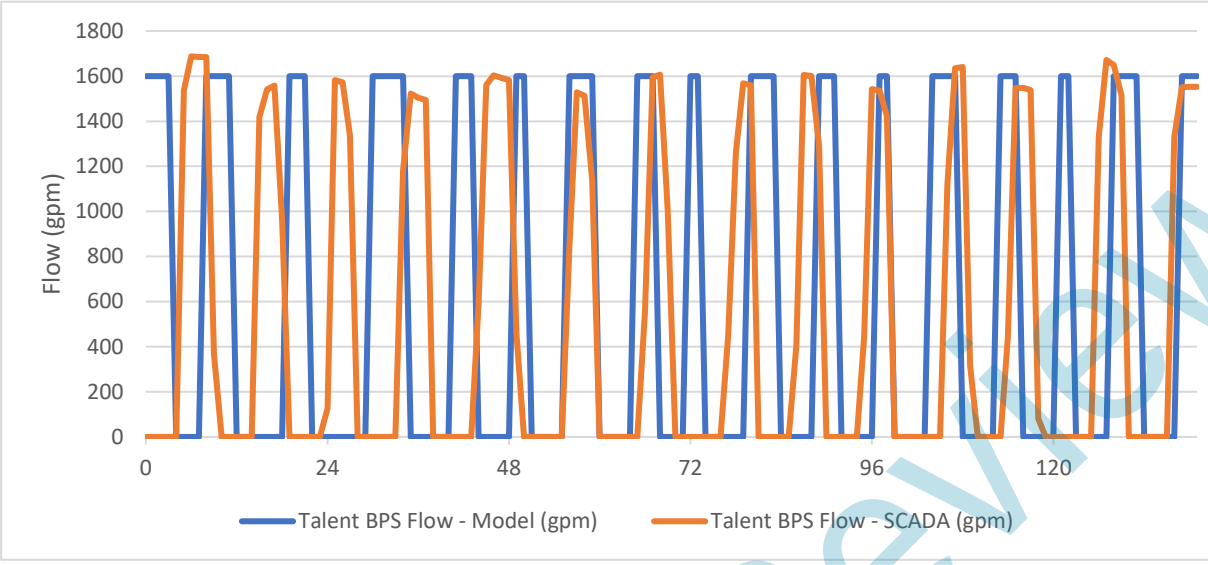
Talent - Talent BPS Flow and Eastside Reservoir Levels

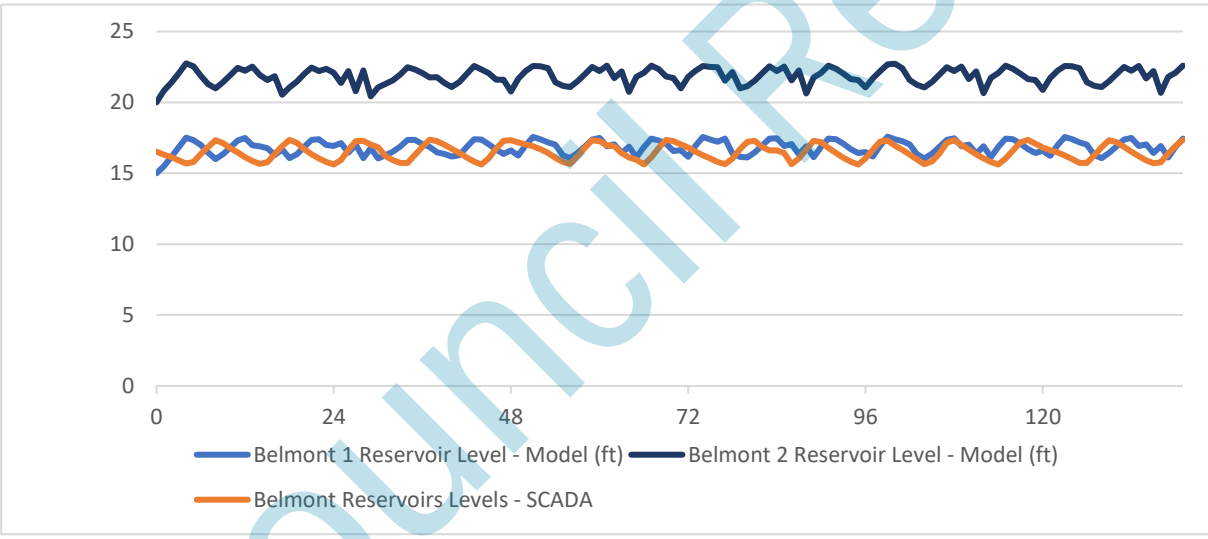




May 2017

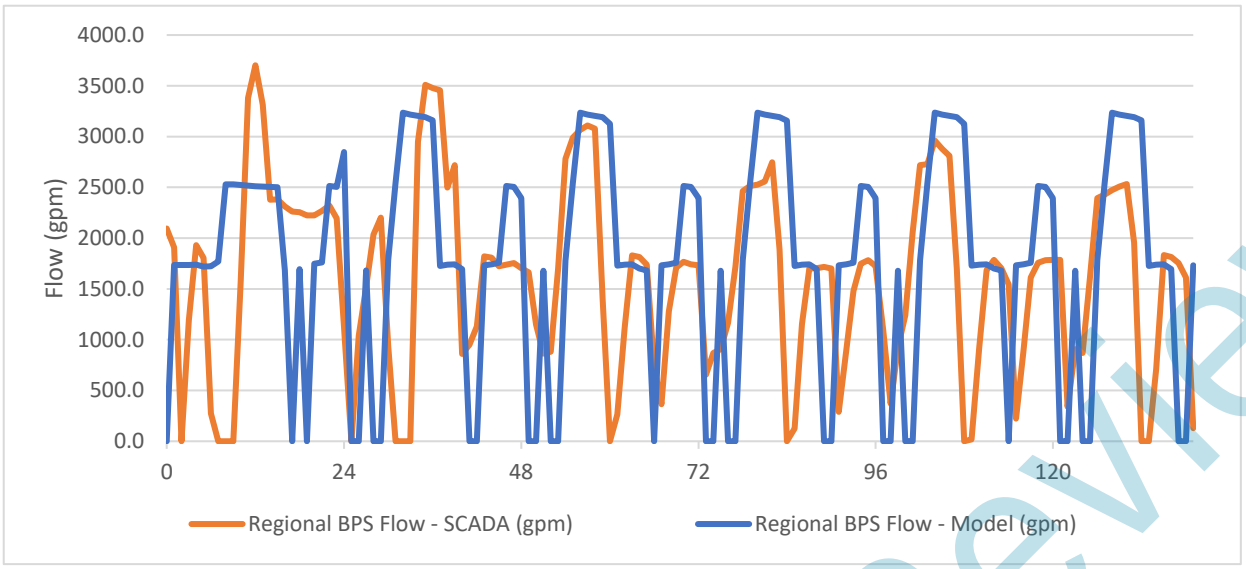
Talent - Talent BPS Flow and Belmont Reservoirs 1 and 2 Levels

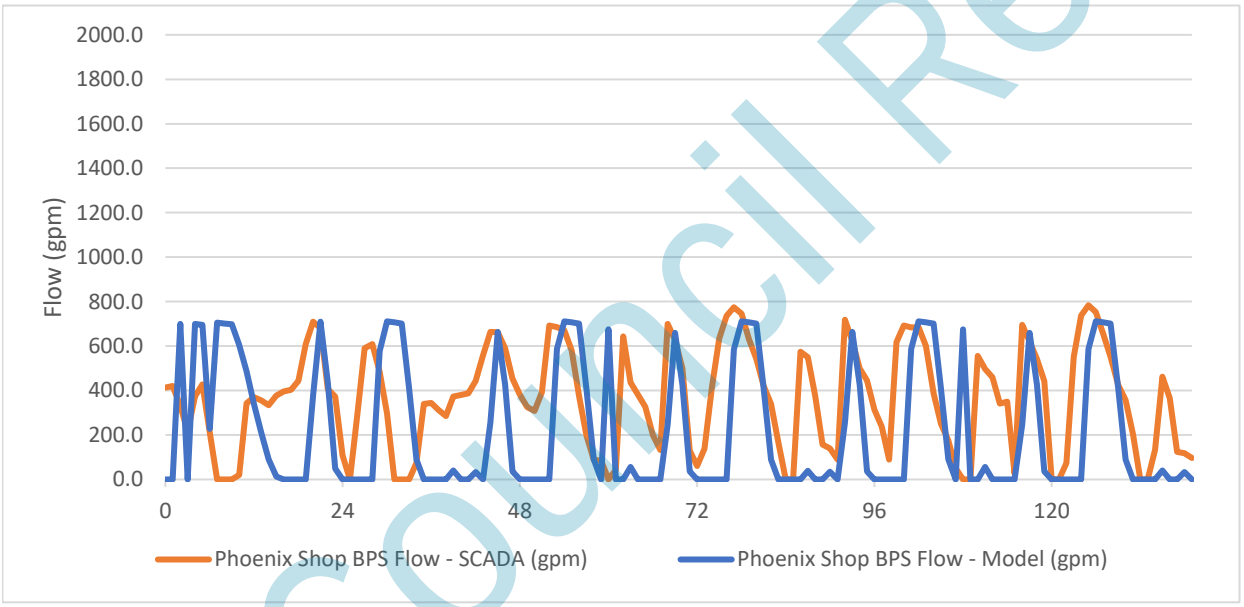


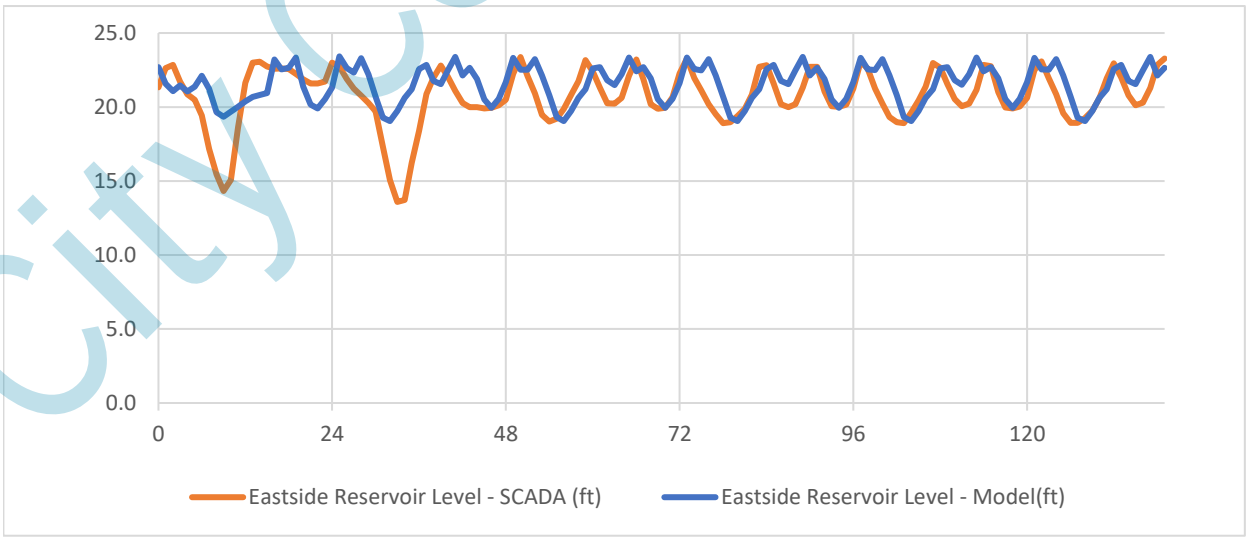


August 2017

Phoenix - Regional BPS Flow, Shop BPS Flow, and Eastside Reservoir Levels

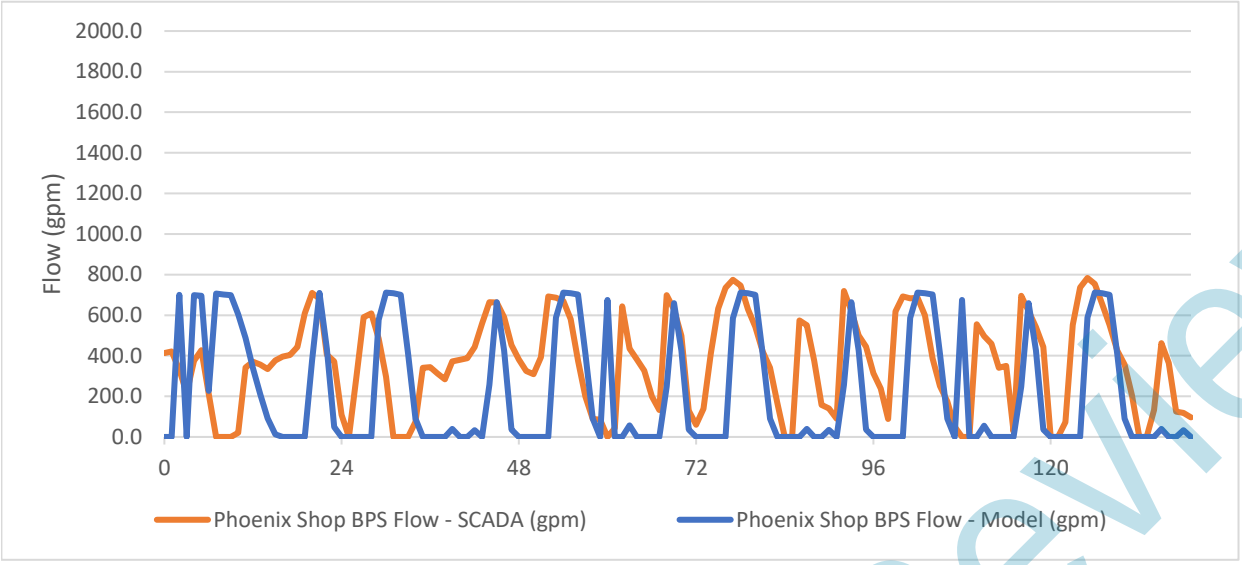


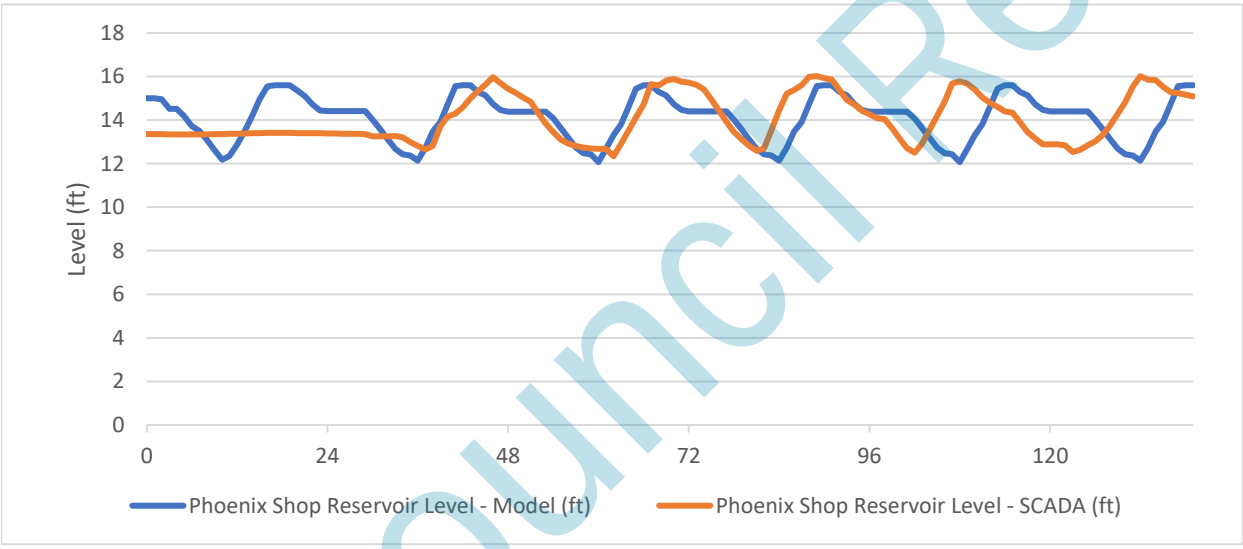




August 2017

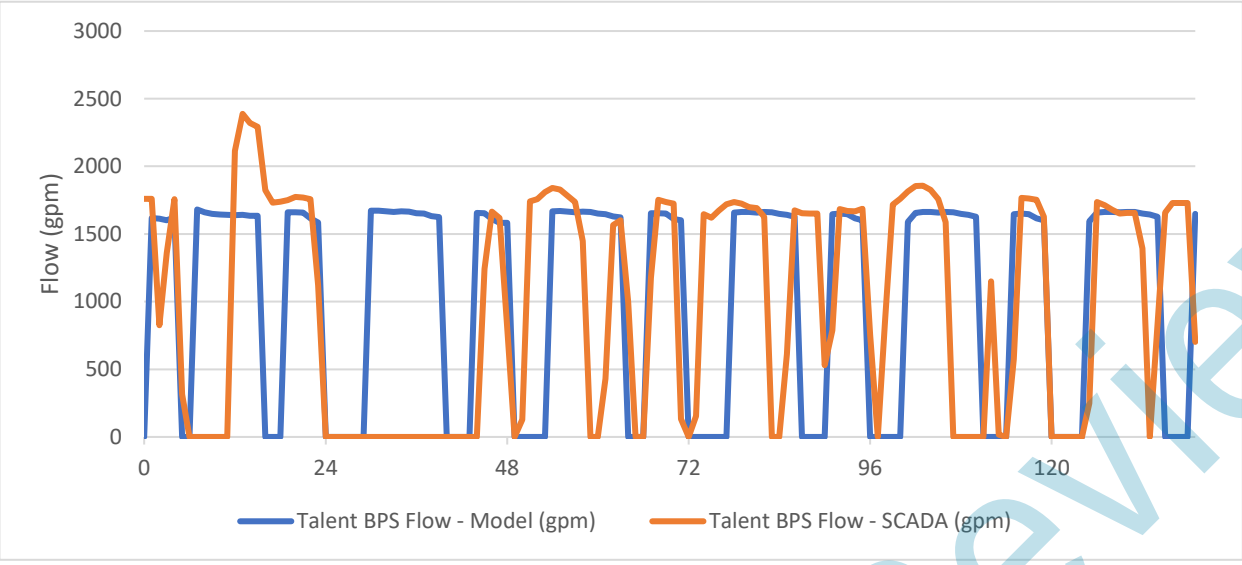
Phoenix - Shop BPS Flow and Shop Reservoir Levels

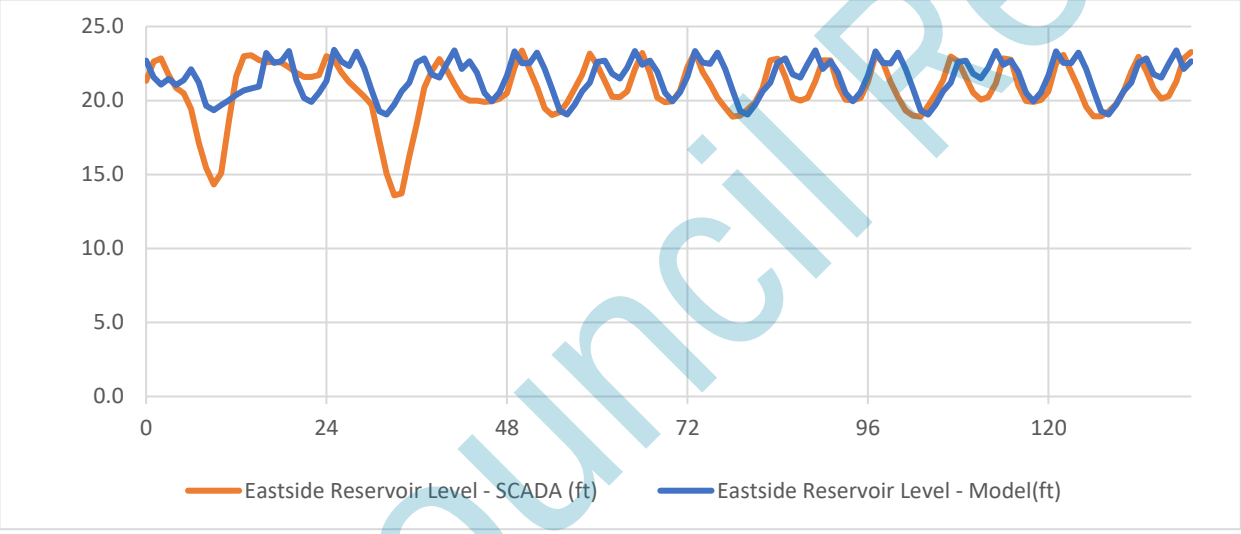




August 2017

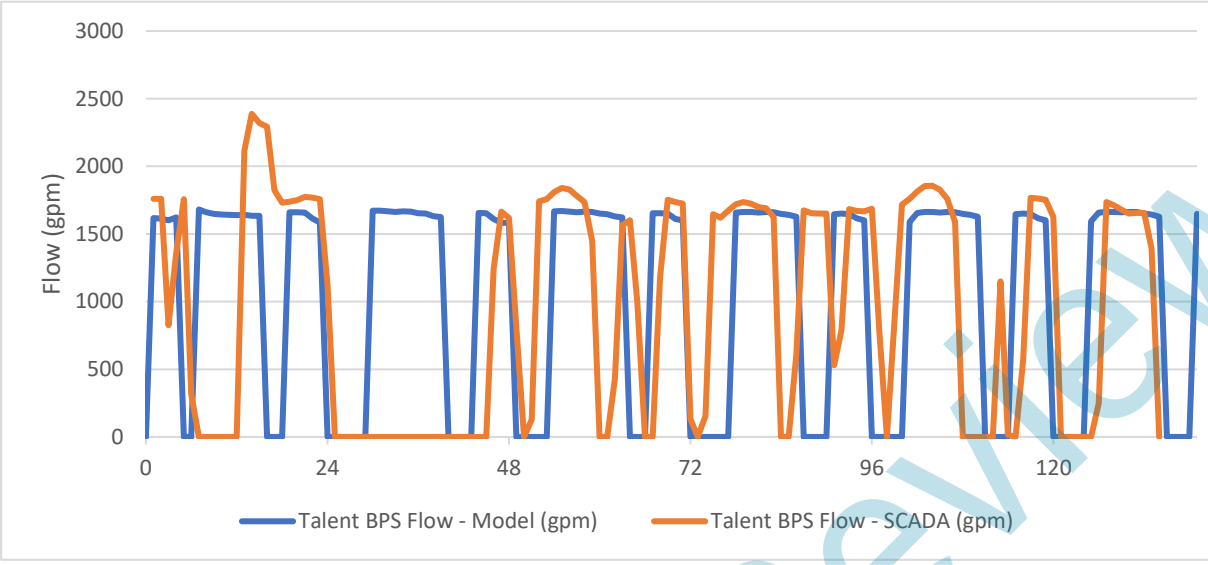
Talent - Talent BPS Flow and Eastside Reservoir Levels

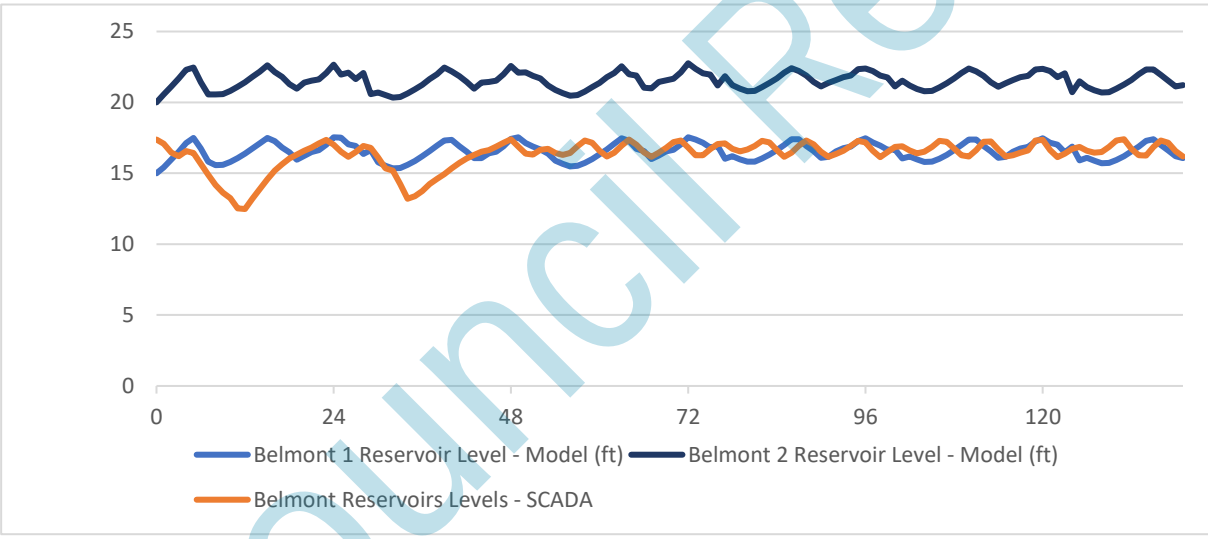




August 2017

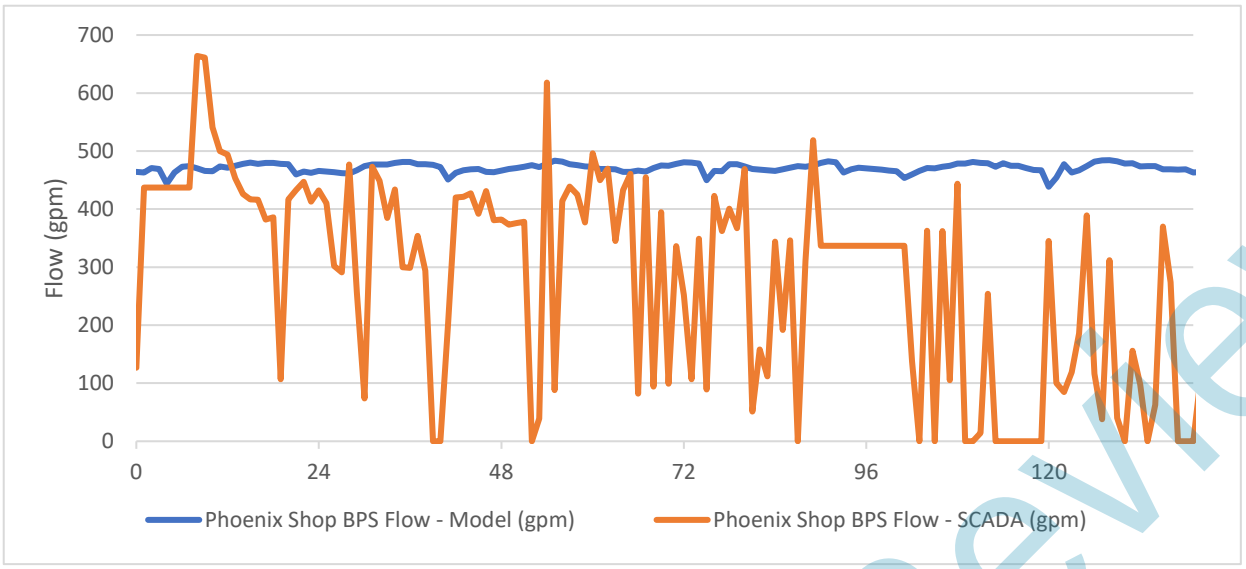
Talent - Talent BPS Flow and Belmont Reservoirs 1 and 2 Levels

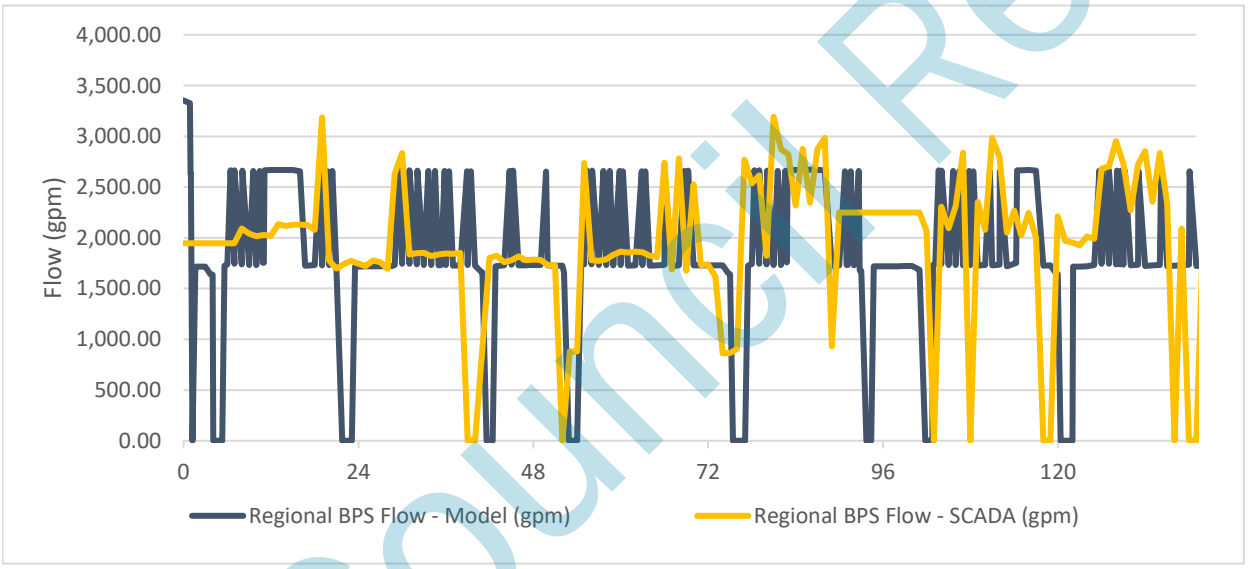


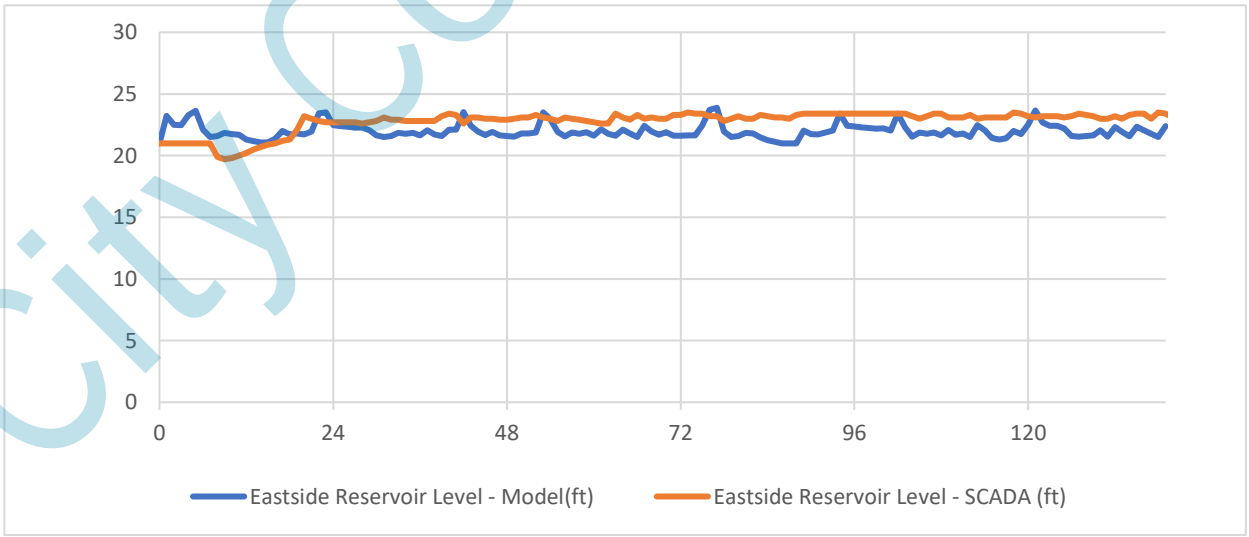


October 2018

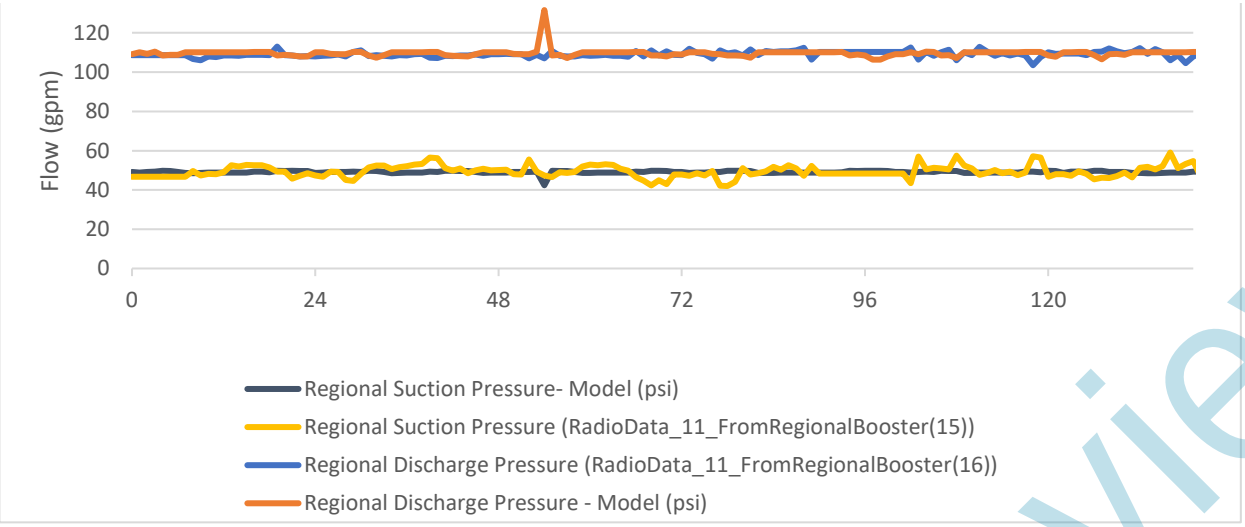
Phoenix - Regional BPS Flow, Shop BPS Flow, and Eastside Reservoir Levels





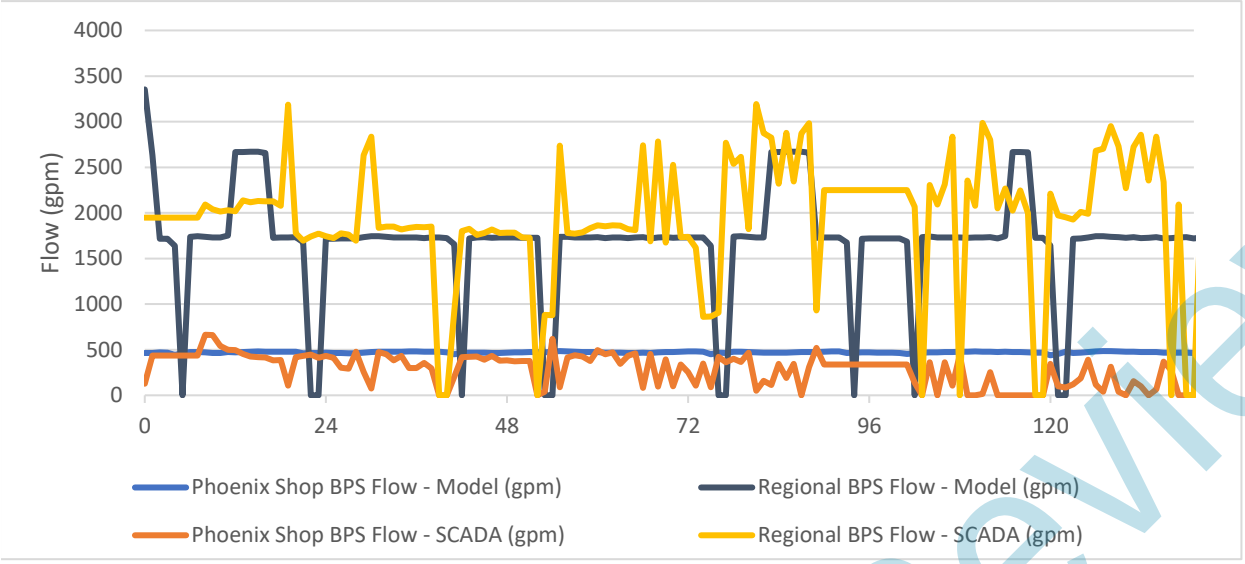


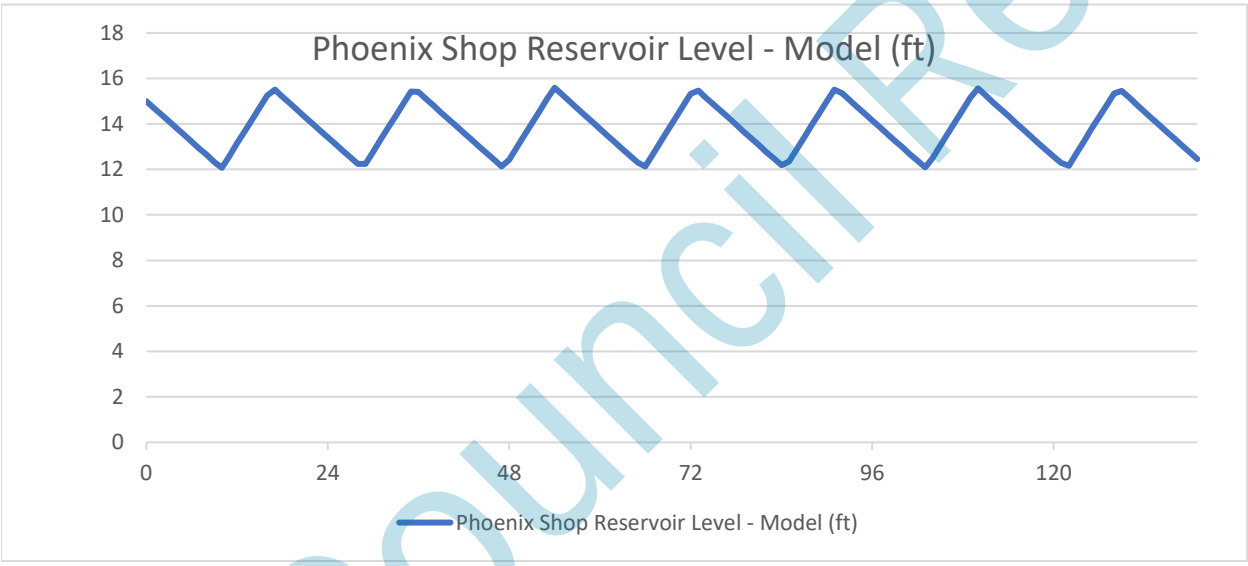
October 2018



October 2018

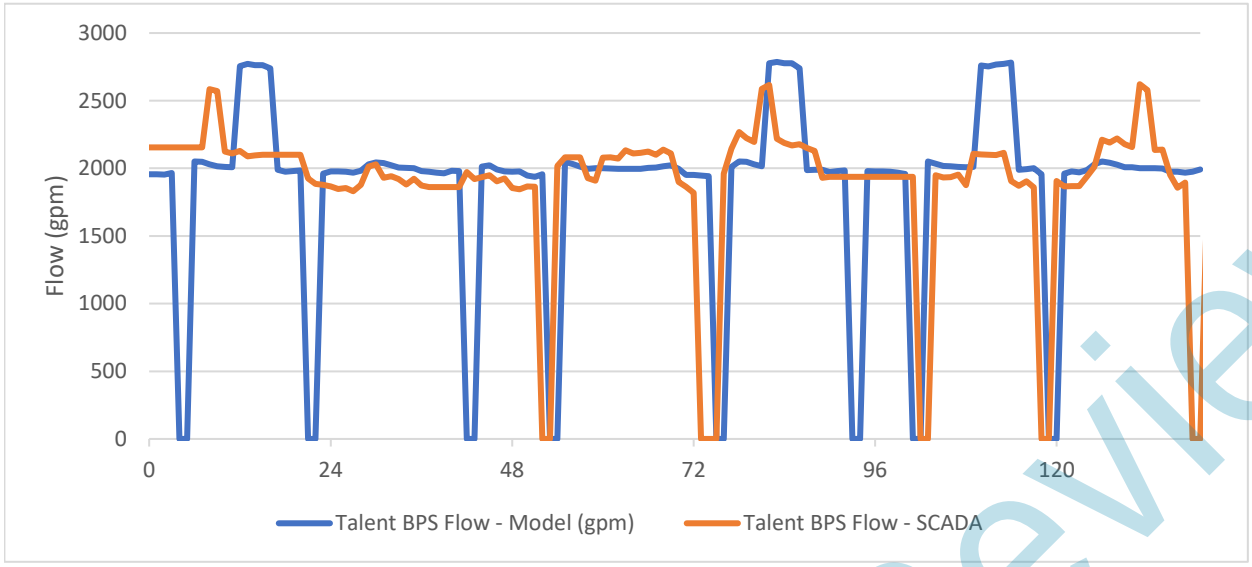
Phoenix - Shop BPS Flow and Shop Reservoir Levels

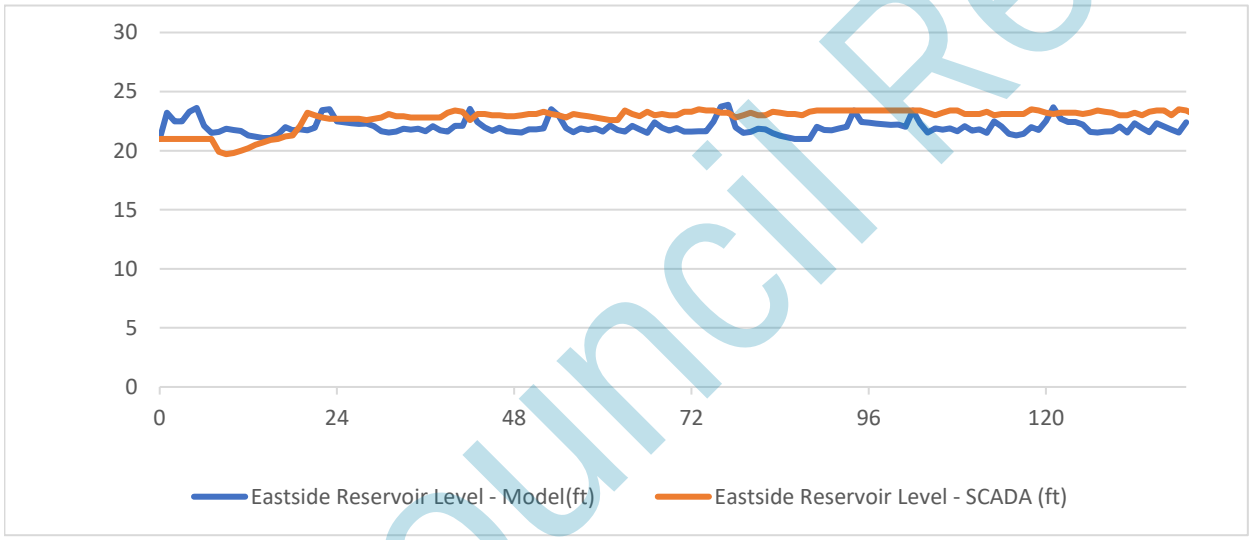


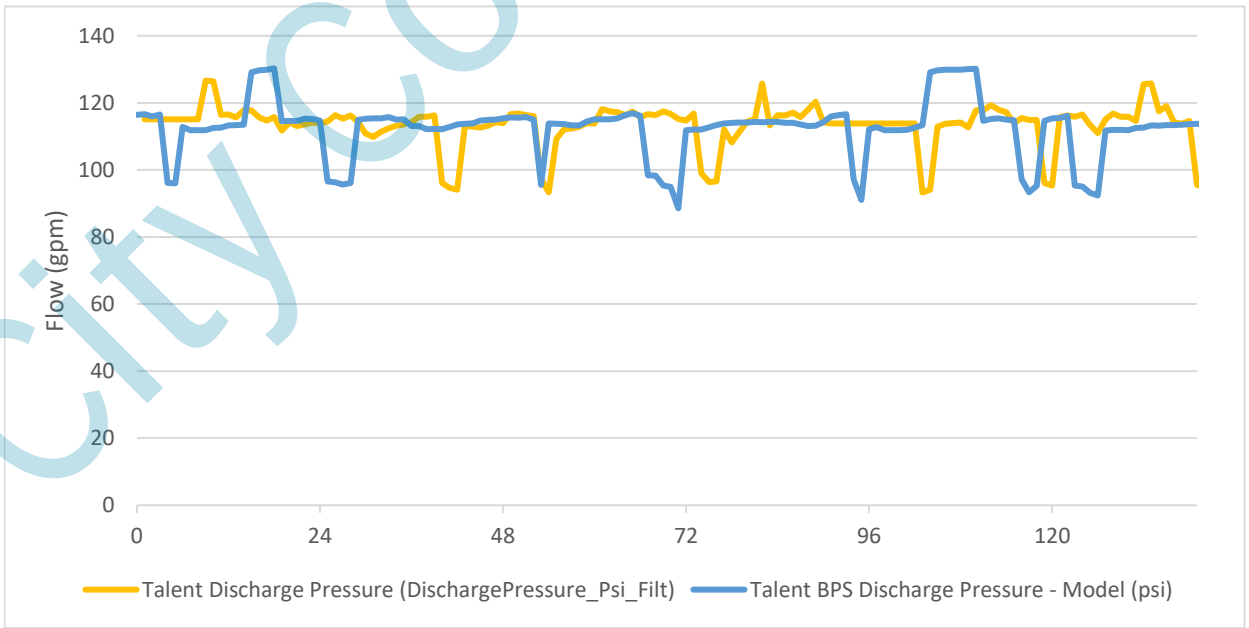


October 2018

Talent - Talent BPS Flow and Eastside Reservoir Levels

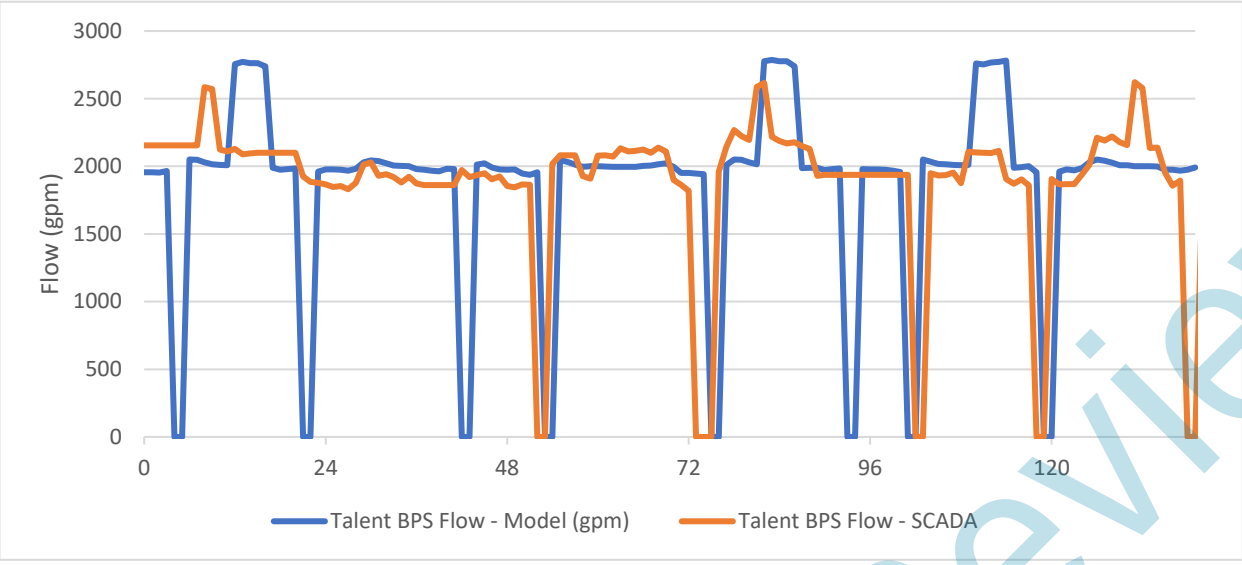


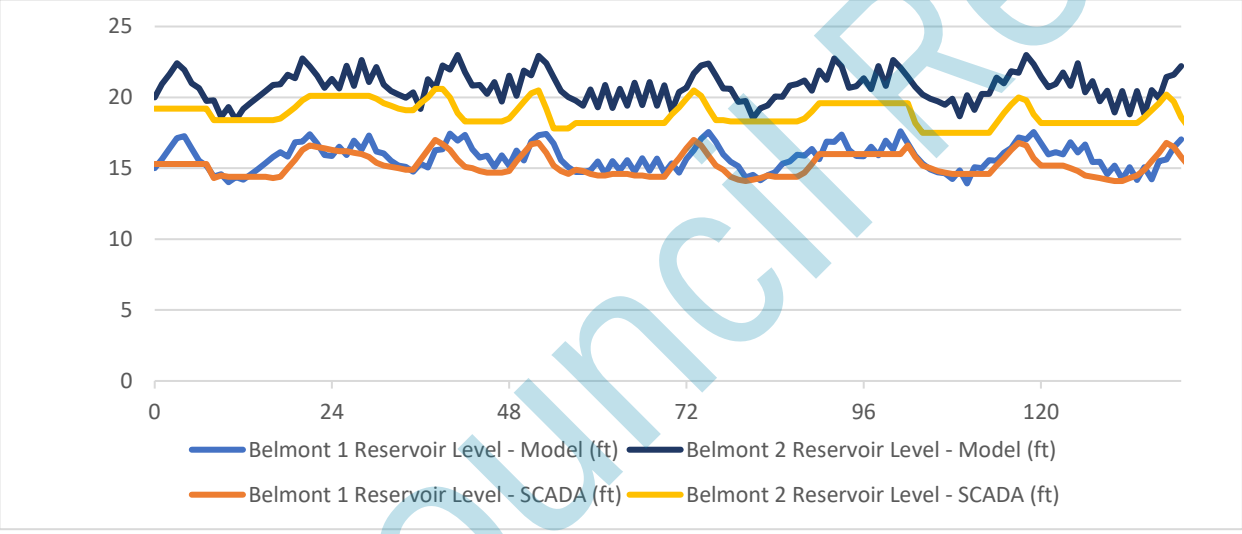




October 2018

Talent - Talent BPS Flow and Belmont Reservoirs 1 and 2 Levels





Appendix 5A

MWC Wholesale Water Service Agreements – Ashland 2014, Phoenix 2016, Talent 2016

WHOLESALE WATER SERVICE AGREEMENT

THIS WATER SERVICE AGREEMENT (Agreement), made and entered in duplicate to commence on the first day of October, 2014, between the City of Ashland, a municipal corporation of the State of Oregon, acting as purchaser (Ashland), and the City of Medford, a municipal corporation of the State of Oregon, acting by and through its Board of Water Commissioners, acting as vendor (MWC), together referred to as the Parties.

RECITALS:

1) MWC is an entity established under the Home Rule Charter (Charter) adopted by the citizens of the City of Medford, comprised of five citizens appointed by the Mayor and confirmed by the City Council, to manage the Water Fund for the purpose of supplying inhabitants of the City of Medford with water; and

2) Under Section 19 of the Charter, the MWC is authorized to sell water and/or supply facilities outside the legal boundaries of the City of Medford, only if said water and/or supply facilities are surplus to the needs of the inhabitants of the City of Medford, and meet certain conditions of MWC Resolution No. 1058; and

3) Under the Charter, the MWC is authorized to set rates for City of Medford inhabitants, and to make all necessary rules and regulations for the sale, disposition and use of water and water service from the City of Medford water system, and the MWC has adopted such rules and regulations; and

4) Per the MWC's projections, reports and plans, the MWC finds it has surplus water and supply facilities capacity available in its system to serve Ashland; and

5) Ashland desires to purchase surplus treated and transported water from MWC from October through April, and purchase surplus supply facilities treatment and transport services for Ashland's own water appropriated under Ashland's own state-issued water rights from May through September;

NOW, THEREFORE, for and in consideration of the foregoing and of the mutual promises herein, the Parties mutually agree as follows:

AGREEMENT:

ARTICLE 1. SCOPE OF SURPLUS WATER SUPPLY AND SERVICE

Subject to Article 3 of this Agreement, MWC agrees to supply surplus water up to a combined (from all connections) maximum of 1480 gallons per minute (GPM) for the months of October through April, and surplus facilities capacity to treat and transport water up to a combined (from all connections) maximum of 1480 GPM for the months of May through September. Ashland agrees to provide sufficient water storage as part of its water system to assure that the maximum rate of withdrawal in GPM by Ashland is not exceeded.

Upon written request by Ashland, this Agreement may be amended to provide supplemental supply and service to Ashland if MWC determines that it has surplus capacity for Ashland's use, and Ashland agrees to reimburse MWC the reasonable cost of providing such supplemental supply and service.

ARTICLE 2. ASHLAND DISTRIBUTION SYSTEM EMERGENCY

Upon notice to MWC by Ashland of a distribution system emergency, MWC will use its best efforts to provide supplemental water supply or services during the emergency.

For purpose of this agreement, "distribution system emergency" means: Any human or natural caused event that disables or impairs the distribution system such that its use constitutes an immediate threat to human life or health.

ARTICLE 3. MWC CONNECTIONS

MWC owns and is responsible for the construction, extension, maintenance, and operation of the MWC system up to the point of and including the master Ashland meter. Ashland shall pay all costs of connections to the MWC system including initial metering, initial and ongoing backflow protection, and annual testing of the backflow device, all in accordance with MWC standards. MWC shall monthly read and annually test the master meter and provide readings and test results to Ashland.

Ashland's water supply is provided by the following master meter(s) with backflow connections to MWC:

- 10" Rosemount Tube Mag Meter at the Talent-Ashland-Phoenix (TAP) Pump Station on Samike Drive, Medford, Oregon

Temporary emergency connections to MWC with prior approval can be provided at the following location(s):

N/A

The following special conditions concerning connections to MWC apply:

- The water supplied by MWC is an emergency source for Ashland, and is limited under this agreement to 2.13 million gallons per day (MGD), after having paid, or arranged to pay, all System Development Charges (SDCs) for that amount. In the future, Ashland can request up to a total of 3.0 MGD by paying future SDC rates on the remaining 0.87 MG.

- MWC acknowledges Ashland's right to exchange and transfer water between the cities of Ashland, Talent and Phoenix, Oregon, within the total cumulative contracted GPM of all three noted cities served through TAP and their individual wholesale customer agreements with MWC.

ARTICLE 4. MWC REGULATIONS

Water service under this Agreement shall be in accordance with Section 30 SURPLUS WATER and Section 31 PROVISIONS RELATING TO UTILITY AND MUNICIPAL CUSTOMERS of the MWC Regulations Governing Water Service (Regulations), as now in effect or as may be amended. If there is any inconsistency between this Agreement and the Regulations, the Regulations control. Notwithstanding the foregoing, nothing herein is intended to relieve MWC of its obligation to supply surplus water in accordance with the terms of this Agreement, except as dictated by Federal/State regulations outside the control of MWC. The Parties acknowledge that implementation of this Agreement and the Regulations are subject to federal or state directives.

MWC shall promptly provide Ashland a copy of any amendments to the Regulations.

~~ARTICLE 5. URBANIZATION POLICY~~

~~[NAME OF CITY] agrees to provide water and services to customers within Ashland city limits, or as otherwise approved by MWC in MWC Resolution No. 1058, as may be amended. [NAME OF CITY] may provide water and services outside of city limits, but within its urban growth~~

~~boundary, provided that the property requesting service has signed an irrevocable consent to annex to the [NAME OF CITY], or as otherwise approved in writing by MWC. The current general water service map covering city limits and urban growth boundaries for the [NAME OF CITY] is attached to this Agreement as Exhibit A. [NAME OF CITY] shall promptly notify MWC and provide a revised map as city limits and urban growth boundaries are modified.~~

ARTICLE 6. MEETING FUTURE WATER DEMANDS

Water and water services provided by MWC under this Agreement are pursuant to water rights held by the MWC and Ashland. Nothing in this Agreement shall be construed to confer upon either party a legal or beneficial interest in each other's water rights, or to prevent either party from seeking additions or alterations to their water rights as deemed necessary.

Ashland shall acquire and maintain such water rights as needed to meet the demand within its service area during the months of May through September. Ashland may use the MWC intake facility, located at the intersection of Table Rock Road and the Rogue River in White City, as the designated point of diversion for Ashland water rights. MWC shall cooperate in the perfection of any Ashland water rights. Ashland currently holds water rights with a diversion point on the Rogue River at the MWC Intake Facility site at the rate of N/A cubic feet per second and volume of 1000 acre feet. Delivery of such Ashland water through MWC facilities shall be subject to the same terms and conditions as delivery of surplus MWC water. MWC shall measure and record at its Robert A. Duff Water Treatment Plant the amount of water withdrawn from the Rogue River by MWC and its municipal water service customers under each of their respective water rights. In its monthly water service invoice, MWC shall provide water use data for Ashland. ~~[NAME OF CITY] shall provide MWC updated demand projections.~~

ARTICLE 7. SYSTEM DEVELOPMENT CHARGES

Pursuant to Resolution No. 774, MWC has established Water System Development Charges (SDCs) and supporting methodology to finance future MWC transmission and treatment facilities expansions. ~~SDCs apply to all new customers, including customers of municipal wholesale customers served by MWC. [NAME OF CITY] shall collect SDCs set by MWC from new [NAME OF CITY] customers.~~ MWC reviews the SDCs annually and reserves the right, in its sole discretion, to modify or replace the SDCs with a different financing mechanism for system improvements.

~~All SDCs collected by [NAME OF CITY] will be held in a separate account and forwarded to MWC along with an accounting of the number and sizes of the services installed. [NAME OF CITY] shall provide MWC with a copy of the section within the annual [NAME OF CITY] audit that~~

~~shows accounting of MWC SDCs collected during the audited year. MWC shall, in turn, provide [NAME OF CITY] an annual accounting of all SDCs collected.~~

MWC utilizes a utility basis for determining the water usage rate it charges Ashland. Under this rate analysis, Ashland is required to pay a return on investment for its share of the facilities paid for by MWC. Facilities funded by SDCs shall not be included in the return on investment portion of the rate analysis.

~~MWC shall render technical assistance to [NAME OF CITY] in determining SDCs. MWC shall defend [NAME OF CITY] against any legal action or appeals which may arise over the development, methodology, or implementation of the SDCs. [NAME OF CITY] shall cooperate and support MWC in the defense, but shall not be obligated to incur any monetary obligation in such defense.~~

Upon termination of this Agreement, the following refund policy shall apply:

(a) MWC shall return to Ashland its prorated share of the unexpended balance of the SDCs fund. This prorated share shall be based upon the actual unexpended SDCs collected by Ashland for the specific facilities funded by the SDCs, plus the interest earned.

(b) MWC shall return to Ashland a prorated share of the depreciated plant value of the specific MWC facilities funded by the SDCs and already installed. The prorated share shall be a percentage based upon the total amount of SDCs paid by Ashland divided by the total SDCs collected and used to fund the facility, not including interest earned during the years in which the SDCs were collected.

(c) In order to avoid a financial hardship, MWC shall develop a reasonable schedule of up to five (5) years for repayment of the depreciated value of the specific MWC facilities funded by the SDCs.

(d) At the request of Ashland, the MWC shall provide an accounting of the refunds made pursuant to this section.

ARTICLE 8. PAYMENTS TO MWC

Ashland shall pay monthly for all water and services provided by MWC at MWC's scheduled wholesale rates then in place. Payment shall be made within ten (10) days after the meeting of the Ashland's Council following receipt by Ashland of a statement of charges from MWC.

MWC reserves the right, in its sole discretion, to change (with prior written notification of a rate study review) said rate at any time upon sixty (60) days written notice to Ashland, following rate procedures and protocols in the MWC Regulations.

ARTICLE 9. TERM OF AGREEMENT

This term of this Agreement shall be two (2) years from its commencement. Ashland may, at its option, extend the term for three additional five-year periods, which periods would run through October of 2021, 2026, and 2031 respectively. Extensions shall be subject to the same terms and conditions as this Agreement. Written notice of the election to exercise a five-year extension of this Agreement must be given to MWC not later than January 1st of the year in which the Agreement would otherwise expire. If Ashland fails to provide MWC such notice, this Agreement shall be deemed canceled at the end of the term then in effect. MWC shall continue service for a reasonable period, determined in MWC's sole discretion, to allow Ashland to secure other sources of water. Provided, however, Section 19 of the Charter of the City of Medford limits the term of water service contracts to 20 years and, therefore, the obligations of MWC under this Agreement, including renewal periods, shall not exceed that period of time.

ARTICLE 10. ASSIGNMENTS

Ashland shall make no assignment of this Agreement without written permission from MWC. Any approved assignee or successor shall agree to be bound by the terms and conditions of this Agreement.

ARTICLE 11. WATER CURTAILMENT PLAN

During periods of drought or emergency, Ashland shall be subject to the MWC Water Curtailment Plan, per MWC Resolution No. 1345, unless Ashland has in effect a state-approved and adopted Water Curtailment Plan at least as stringent as that of MWC. In the event of a conflict between the Ashland plan and the MWC plan, the MWC plan shall control. The MWC shall give Ashland as much advance warning as possible prior to curtailment of water supplies. The level of curtailment shall be determined by MWC based on the severity of the anticipated shortage. Ashland shall be responsible for enforcing the MWC curtailment plan or the above mentioned Ashland plan in its service area.

MWC will require and apply emergency curtailment of water use in an equitable, fair, and consistent manner consistent with Resolution 1345. Continued service during periods of emergency shall neither be construed as a waiver nor limitation of any kind on any water rights held by MWC, or a waiver or curtailment of any water rights held by Ashland, nor as affecting any other terms in this Agreement.

ARTICLE 12. ANNUAL WATER QUALITY REPORTING

MWC will gather annual water quality data and prepare informational reports as required under state Consumer Confidence Reporting (CCR) rules. These CCR reports will include water quality information for MWC and all participating municipal water customers. ~~Annual costs involved will be proportionally shared among participating municipal water customers and billed separately to each.~~

~~Statistical data necessary to create the CCR report for the prior year must be provided by [NAME OF CITY] to MWC no later than April 1st of each year. If bulk mailing is the primary distribution method utilized, [NAME OF CITY] shall also provide MWC with postal routes covering their respective service areas by April 1st of the delivery year. MWC reserves the right to utilize other approved delivery methods (e.g.; electronic), which may impact responsibilities for [NAME OF CITY].~~

~~In the event that [NAME OF CITY] receives water into its system that is supplied by an entity other than MWC, the composite MWC report for that year will not include data for [NAME OF CITY].~~ Ashland shall be responsible for preparation of its own annual CCR, and MWC will provide MWC data by April 1st of the delivery year.

MWC maintains water quality test points throughout the MWC system and one specifically at the master meter location(s) of Ashland. These test points are used to collect water samples for meeting required state water quality parameters on a weekly, monthly, and annual basis. All information collected is of public record and is accessible through state or MWC databases. Responsibility for water quality is transferred to Ashland at the point of the master meter location(s), except where water quality problems are attributable to MWC.

ARTICLE 13. MUTUAL INDEMNITY

To the extent allowed by law, Ashland and MWC shall each defend, indemnify and hold the other, and their officers, employees, and agents harmless from any and all claims, suits, actions, or losses arising solely out of the acts and omissions of the Party's own officers, employees, or agents while acting under this agreement.

ARTICLE 14. PARTIAL INVALIDITY

If any term, covenant, condition, or provision of this Agreement is found by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in force and effect, and shall in no way be affected, impaired, or invalidated thereby.

ARTICLE 15. INTEGRATION

This Agreement represents the entire understanding of MWC and Ashland as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties.

ARTICLE 16. DEFAULT

For purposes of this Agreement "default" means failure to comply with any of the terms of this Agreement. If either party determines that a default has occurred, it shall provide the other party written notice of the default, which such party shall have thirty days in which (a) to cure the default, (b) show that the default is of such a nature that it cannot be reasonably cured within thirty days, or (c) show that no default occurred.

MWC and Ashland will work in good faith to amicably resolve the default. If after thirty days of the notice of default, MWC determines, in its sole discretion, that Ashland is unable or unwilling to cure the default within a reasonable time, MWC may impose escalating penalties as follows: (a) ten percent surcharge for a period of thirty days; (b) twenty percent surcharge for the next thirty days; and (c) termination of this Agreement. Such penalties are in addition to any other remedies at law or equity that may be available to MWC. Failure to issue notice of default or to enforce its remedies under this Article 16 shall not preclude MWC from taking such action for future defaults.

If after thirty days, Ashland determines, in its sole discretion, that MWC is unable or unwilling to cure the default within a reasonable time, Ashland may terminate this Agreement and pursue any other remedies at law or in equity that may be available to Ashland.

ARTICLE 17. FORCE MAJEURE

Neither party hereto shall be liable for delays in performance under this Agreement by reason of fires, floods, earthquakes, acts of God, wars, strikes, embargoes, necessary plant repairs or replacement of equipment, of any other cause whatsoever beyond the control of such party, whether similar or dissimilar to the causes herein enumerated. This clause does not include causes related to water supply and demand planning or failure to engage in such planning.

ARTICLE 18. DISPUTE RESOLUTION

If a dispute arises out of or relates to this contract, and if the dispute cannot be settled through negotiation, the parties agree first to try to settle the dispute by non-binding mediation before resorting to litigation or other process. The parties agree to share equally the costs of mediation.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their proper officers on the dates noted below.

THE CITY OF MEDFORD
BY AND THROUGH ITS
BOARD OF WATER COMMISSIONERS

Jason Anderson, Chair

Karen Spoonts, Deputy City Recorder

12/3/14
Date

THE CITY OF ASHLAND

John Stromberg, Mayor

Barbara Christensen, City Recorder

12/2/2014
Date

WHOLESALE WATER SERVICE AGREEMENT

THIS WATER SERVICE AGREEMENT (Agreement), made and entered in duplicate to commence on the first day of October, **2016**, between the City of Phoenix, a municipal corporation of the State of Oregon, acting as purchaser (Phoenix), and the City of Medford, a municipal corporation of the State of Oregon, acting by and through its Board of Water Commissioners, acting as vendor (MWC), together referred to as the Parties.

RECITALS:

1) MWC is an entity established under the Home Rule Charter (Charter) adopted by the citizens of the City of Medford, comprised of five citizens appointed by the Mayor and confirmed by the City Council, to manage the Water Fund for the purpose of supplying inhabitants of the City of Medford with water; and

2) Under Section 19 of the Charter, the MWC is authorized to sell water and/or supply facilities outside the legal boundaries of the City of Medford, only if said water and/or supply facilities are surplus to the needs of the inhabitants of the City of Medford, and meet certain conditions of MWC Resolution No. 1058; and

3) Under the Charter, the MWC is authorized to set rates for City of Medford inhabitants, and to make all necessary rules and regulations for the sale, disposition and use of water and water service from the City of Medford water system, and the MWC has adopted such rules and regulations; and

4) Per the MWC's projections, reports and plans, the MWC finds it has surplus water and supply facilities capacity available in its system to serve Phoenix; and

5) Phoenix desires to purchase surplus treated and transported water from MWC from October through April, and purchase surplus supply facilities treatment and transport services for Phoenix's own water appropriated under Phoenix's own state-issued water rights from May through September;

NOW, THEREFORE, for and in consideration of the foregoing and of the mutual promises herein, the Parties mutually agree as follows:

AGREEMENT:

ARTICLE 1. SCOPE OF SURPLUS WATER SUPPLY AND SERVICE

Subject to Article 3 of this Agreement, MWC agrees to supply surplus water up to a combined (from all connections) maximum of **440** gallons per minute (GPM) for the months of October through April, and surplus facilities capacity to treat and transport water up to a combined (from all connections) maximum of **1190** GPM for the months of May through September. Phoenix agrees to provide sufficient water storage as part of its water system to assure that the maximum rate of withdrawal in GPM by Phoenix is not exceeded.

During the 5 year term of this agreement the following conditions will be complied with: The above flow rates will not be exceeded between the hours of 5 am and 11 am. During all other hours the maximum flow rate will not exceed 1600 gallons per minute (GPM) in the summer and 1300 gallons per minute (GPM) in the winter. Measurement of total flow rates for the three TAP entities (Talent, Ashland, and Phoenix) will be based on the accumulative summation of the reading of the joint TAP meter at the TAP pump station on Samike Drive and the reading of the 2nd Phoenix meter at Garfield and Kings Highway Medford, Oregon. Notwithstanding the foregoing, in the event this agreement is renewed in October 2021, the maximum flow rates specified in this article may be recalculated by MWC based on future total source supply and future 2020 maximum month demand percentages, and such flow rates will be required over an entire 24 hour period.

Upon written request by Phoenix, this Agreement may be amended to provide supplemental supply and service to Phoenix if MWC determines that it has surplus capacity for Phoenix's use, and Phoenix agrees to reimburse MWC the reasonable cost of providing such supplemental supply and service.

ARTICLE 2. PHOENIX DISTRIBUTION SYSTEM EMERGENCY

Upon notice to MWC by Phoenix of a distribution system emergency, MWC will use its best efforts to provide supplemental water supply or services during the emergency.

For purpose of this agreement, "distribution system emergency" means: Any human or natural caused event that disables or impairs the distribution system such that its use constitutes an immediate threat to human life or health.

ARTICLE 3. MWC CONNECTIONS

MWC owns and is responsible for the construction, extension, maintenance, and operation of the MWC system up to the point of and including the master Phoenix meter(s). Phoenix shall

pay all costs of connections to the MWC system including initial metering, initial and ongoing backflow protection, and annual testing of the backflow device, all in accordance with MWC standards. MWC shall monthly read and annually test the master meter and provide readings and test results to Phoenix.

Phoenix's water supply is provided by the following master meter(s) with backflow connections to MWC:

- 10" Rosemount Spool Mag Meter at the Talent-Ashland-Phoenix (TAP) Pump Station on Samike Drive, Medford, Oregon
- 6" Turbine Meter at the intersection of Kings Highway and Garfield Street, Medford, Oregon

Temporary emergency connections to MWC with prior approval can be provided at the following location(s):

N/A

The following special conditions concerning connections to MWC apply:

- MWC acknowledges Phoenix's right to exchange and transfer water between the cities of Ashland, Talent, and Phoenix, Oregon within the total cumulative contracted GPM of all three noted cities served through TAP and their individual wholesale customer agreements with MWC.

ARTICLE 4. MWC REGULATIONS

Water service under this Agreement shall be in accordance with Section 30 SURPLUS WATER and Section 31 PROVISIONS RELATING TO UTILITY AND MUNICIPAL CUSTOMERS of the MWC Regulations Governing Water Service (Regulations), as now in effect or as may be amended. If there is any inconsistency between this Agreement and the Regulations, the Regulations control. Notwithstanding the foregoing, nothing herein is intended to relieve MWC of its obligation to supply surplus water in accordance with the terms of this Agreement, except as dictated by Federal/State regulations outside the control of MWC. The Parties acknowledge that implementation of this Agreement and the Regulations are subject to federal or state directives.

MWC shall promptly provide Phoenix a copy of any amendments to the Regulations.

ARTICLE 5. URBANIZATION POLICY

Phoenix agrees to provide water and services to customers within Phoenix city limits, or as otherwise approved by MWC in MWC Resolution No. 1058, as may be amended. Phoenix may provide water and services outside of city limits, but within its urban growth boundary, provided that the property requesting service has signed an irrevocable consent to annex to Phoenix, or as otherwise approved in writing by MWC. The current general water service map covering city limits and urban growth boundaries for Phoenix is attached to this Agreement as Exhibit A. Phoenix shall promptly notify MWC and provide a revised map as city limits and urban growth boundaries are modified.

ARTICLE 6. MEETING FUTURE WATER DEMANDS

Water and water services provided by MWC under this Agreement are pursuant to water rights held by the MWC and Phoenix. Nothing in this Agreement shall be construed to confer upon either party a legal or beneficial interest in each other's water rights, or to prevent either party from seeking additions or alterations to their water rights as deemed necessary.

Phoenix shall acquire and maintain such water rights as needed to meet the demand within its service area during the months of May through September. Phoenix may use the MWC intake facility, located at the intersection of Table Rock Road and the Rogue River in White City, as the designated point of diversion for Phoenix water rights. MWC shall cooperate in the perfection of any Phoenix water rights. Phoenix currently holds water rights with a diversion point on the Rogue River at the MWC Intake Facility site at the rate of **8.1** cubic feet per second and/or volume of **1000** acre feet. Delivery of such Phoenix water through MWC facilities shall be subject to the same terms and conditions as delivery of surplus MWC water. MWC shall measure and record at its Robert A. Duff Water Treatment Plant the amount of water withdrawn from the Rogue River by MWC and its municipal water service customers under each of their respective water rights. In its monthly water service invoice, MWC shall provide water use data for Phoenix. Phoenix shall provide MWC updated demand projections.

ARTICLE 7. SYSTEM DEVELOPMENT CHARGES

Pursuant to Resolution No. 774, MWC has established Water System Development Charges (SDCs) and supporting methodology to finance future MWC transmission and treatment facilities expansions. SDCs apply to all new customers, including customers of municipal wholesale customers served by MWC. Phoenix shall collect SDCs set by MWC from new Phoenix customers. MWC reviews the SDCs annually and reserves the right, in its sole

discretion, to modify or replace the SDCs with a different financing mechanism for system improvements.

All SDCs collected by Phoenix will be held in a separate account and forwarded to MWC along with an accounting of the number and sizes of the services installed. Phoenix shall provide MWC with a copy of the section within the annual Phoenix audit that shows accounting of MWC SDCs collected during the audited year. MWC shall, in turn, provide Phoenix an annual accounting of all SDCs collected.

MWC utilizes a utility basis for determining the water usage rate it charges Phoenix. Under this rate analysis, Phoenix is required to pay a return on investment for its share of the facilities paid for by MWC. Facilities funded by SDCs shall not be included in the return on investment portion of the rate analysis.

MWC shall render technical assistance to Phoenix in determining SDCs. MWC shall defend Phoenix against any legal action or appeals which may arise over the development, methodology, or implementation of the SDCs. Phoenix shall cooperate and support MWC in the defense, but shall not be obligated to incur any monetary obligation in such defense.

Upon termination of this Agreement, the following refund policy shall apply:

(a) MWC shall return to Phoenix its prorated share of the unexpended balance of the SDCs fund. This prorated share shall be based upon the actual unexpended SDCs collected by Phoenix for the specific facilities funded by the SDCs, plus the interest earned.

(b) MWC shall return to Phoenix a prorated share of the depreciated plant value of the specific MWC facilities funded by the SDCs and already installed. The prorated share shall be a percentage based upon the total amount of SDCs paid by Phoenix divided by the total SDCs collected and used to fund the facility, not including interest earned during the years in which the SDCs were collected.

(c) In order to avoid a financial hardship, MWC shall develop a reasonable schedule of up to five (5) years for repayment of the depreciated value of the specific MWC facilities funded by the SDCs.

(d) At the request of Phoenix, the MWC shall provide an accounting of the refunds made pursuant to this section.

ARTICLE 8. PAYMENTS TO MWC

Phoenix shall pay monthly for all water and services provided by MWC at MWC's scheduled wholesale rates then in place. Payment shall be made within ten (10) days after the meeting of the Phoenix's Council following receipt by Phoenix of a statement of charges from MWC.

MWC reserves the right, in its sole discretion, to change (with prior written notification of a rate study review) said rate at any time upon sixty (60) days written notice to Phoenix, following rate procedures and protocols in the MWC Regulations.

ARTICLE 9. TERM OF AGREEMENT

This term of this Agreement shall be five (5) years from its commencement. Phoenix may, at its option, extend the term for three additional five-year periods, which periods would run through October of **2026**, **2031**, and **2036** respectively. Extensions shall be subject to the same terms and conditions as this Agreement. Written notice of the election to exercise a five-year extension of this Agreement must be given to MWC not later than January 1st of the year in which the Agreement would otherwise expire. If Phoenix fails to provide MWC such notice, this Agreement shall be deemed canceled at the end of the term then in effect. MWC shall continue service for a reasonable period, determined in MWC's sole discretion, to allow Phoenix to secure other sources of water. Provided, however, Section 19 of the Charter of the City of Medford limits the term of water service contracts to 20 years and, therefore, the obligations of MWC under this Agreement, including renewal periods, shall not exceed that period of time.

ARTICLE 10. ASSIGNMENTS

Phoenix shall make no assignment of this Agreement without written permission from MWC. Any approved assignee or successor shall agree to be bound by the terms and conditions of this Agreement.

ARTICLE 11. WATER CURTAILMENT PLAN

During periods of drought or emergency, Phoenix shall be subject to the MWC Water Curtailment Plan, per MWC Resolution No. 1345, unless Phoenix has in effect a state-approved and adopted Water Curtailment Plan at least as stringent as that of MWC. In the event of a conflict between the Phoenix plan and the MWC plan, the MWC plan shall control. The MWC shall give Phoenix as much advance warning as possible prior to curtailment of water supplies.

The level of curtailment shall be determined by MWC based on the severity of the anticipated shortage. Phoenix shall be responsible for enforcing the MWC curtailment plan or the above mentioned Phoenix plan in its service area.

MWC will require and apply emergency curtailment of water use in an equitable, fair, and consistent manner consistent with Resolution 1345. Continued service during periods of emergency shall neither be construed as a waiver nor limitation of any kind on any water rights held by MWC, or a waiver or curtailment of any water rights held by Phoenix, nor as affecting any other terms in this Agreement.

ARTICLE 12. ANNUAL WATER QUALITY REPORTING

MWC will gather annual water quality data and prepare informational reports as required under state Consumer Confidence Reporting (CCR) rules. These CCR reports will include water quality information for MWC and all participating municipal water customers. Annual costs involved will be proportionally shared among participating municipal water customers and billed separately to each.

Statistical data necessary to create the CCR report for the prior year must be provided by Phoenix to MWC no later than April 1st of each year. If bulk mailing is the primary distribution method utilized, Phoenix shall also provide MWC with postal routes covering their respective service areas by April 1st of the delivery year. MWC reserves the right to utilize other approved delivery methods (e.g.; electronic), which may impact responsibilities for Phoenix.

In the event that Phoenix receives water into its system that is supplied by an entity other than MWC, the composite MWC report for that year will not include data for Phoenix. Phoenix shall be responsible for preparation of its own annual CCR, and MWC will provide MWC data by April 1st of the delivery year.

MWC maintains water quality test points throughout the MWC system and one specifically at the master meter location(s) of Phoenix. These test points are used to collect water samples for meeting required state water quality parameters on a weekly, monthly, and annual basis. All information collected is of public record and is accessible through state or MWC databases. Responsibility for water quality is transferred to Phoenix at the point of the master meter location(s), except where water quality problems are attributable to MWC.

ARTICLE 13. MUTUAL INDEMNITY

To the extent allowed by law, Phoenix and MWC shall each defend, indemnify and hold the other, and their officers, employees, and agents harmless from any and all claims, suits, actions, or losses arising solely out of the acts and omissions of the Party's own officers, employees, or agents while acting under this agreement.

ARTICLE 14. PARTIAL INVALIDITY

If any term, covenant, condition, or provision of this Agreement is found by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in force and effect, and shall in no way be affected, impaired, or invalidated thereby.

ARTICLE 15. INTEGRATION

This Agreement represents the entire understanding of MWC and Phoenix as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties.

ARTICLE 16. DEFAULT

For purposes of this Agreement "default" means failure to comply with any of the terms of this Agreement. If either party determines that a default has occurred, it shall provide the other party written notice of the default, which such party shall have thirty days in which (a) to cure the default, (b) show that the default is of such a nature that it cannot be reasonably cured within thirty days, or (c) show that no default occurred.

MWC and Phoenix will work in good faith to amicably resolve the default. If after thirty days of the notice of default, MWC determines, in its sole discretion, that Phoenix is unable or unwilling to cure the default within a reasonable time, MWC may impose escalating penalties as follows: (a) ten percent surcharge for a period of thirty days; (b) twenty percent surcharge for the next thirty days; and (c) termination of this Agreement. Such penalties are in addition to any other remedies at law or equity that may be available to MWC. Failure to issue notice of default or to enforce its remedies under this Article 16 shall not preclude MWC from taking such action for future defaults.

If after thirty days, Phoenix determines, in its sole discretion, that MWC is unable or unwilling to cure the default within a reasonable time, Phoenix may terminate this Agreement and pursue any other remedies at law or in equity that may be available to Phoenix.

ARTICLE 17. FORCE MAJEURE

Neither party hereto shall be liable for delays in performance under this Agreement by reason of fires, floods, earthquakes, acts of God, wars, strikes, embargoes, necessary plant repairs or replacement of equipment, of any other cause whatsoever beyond the control of such party, whether similar or dissimilar to the causes herein enumerated. This clause does not include causes related to water supply and demand planning or failure to engage in such planning.

ARTICLE 18. DISPUTE RESOLUTION

If a dispute arises out of or relates to this contract, and if the dispute cannot be settled through negotiation, the parties agree first to try to settle the dispute by non-binding mediation before resorting to litigation or other process. The parties agree to share equally the costs of mediation.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their proper officers on the dates noted below.

THE CITY OF MEDFORD
BY AND THROUGH ITS
BOARD OF WATER COMMISSIONERS

Leigh Johnson, Chair

Karen Spoonts, City Recorder

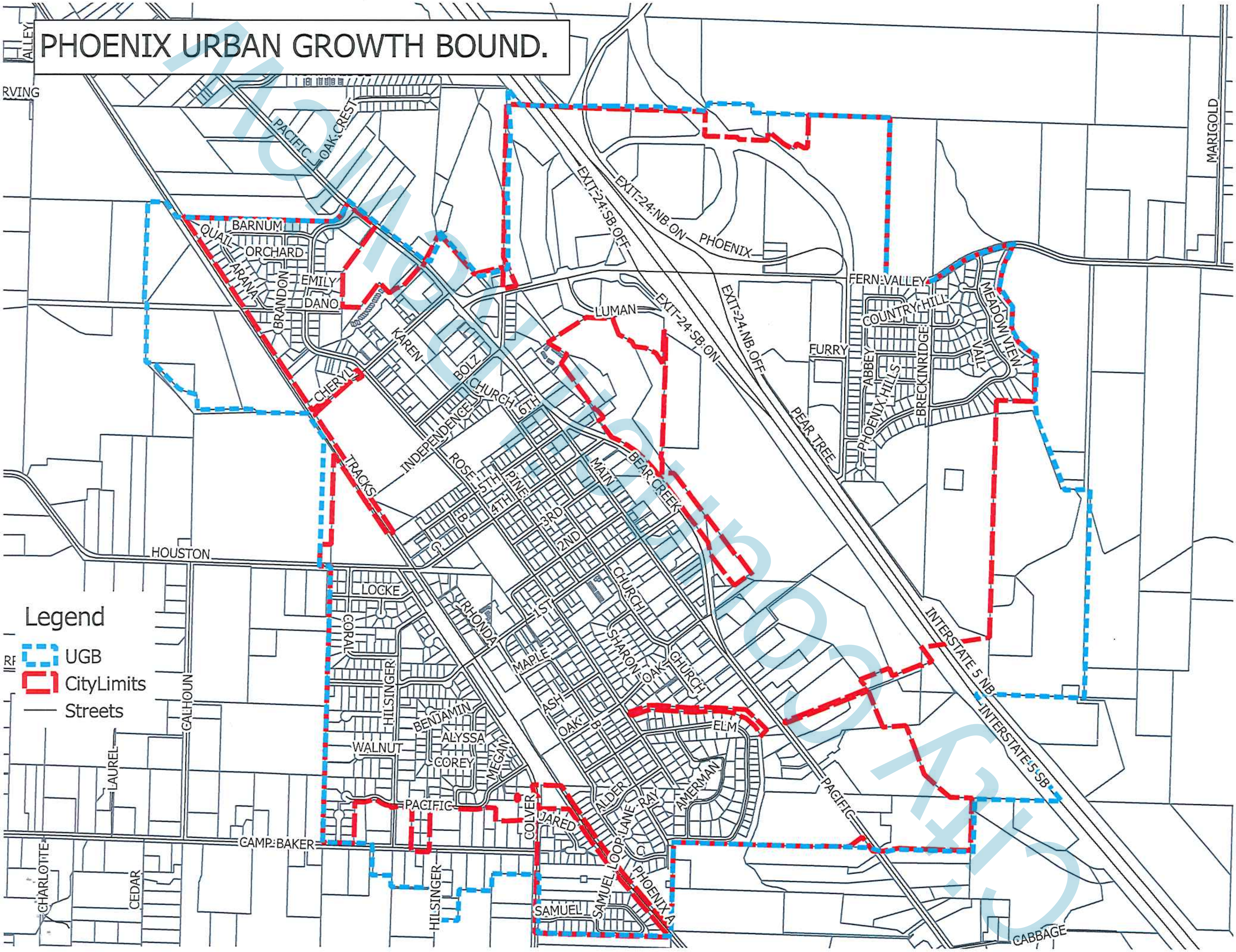
October 5, 2016
Date

THE CITY OF PHOENIX

Mayor

City Recorder

9-22-2016
Date



WHOLESALE WATER SERVICE AGREEMENT

THIS WATER SERVICE AGREEMENT (Agreement), made and entered in duplicate to commence on the first day of October, **2016**, between the City of Talent, a municipal corporation of the State of Oregon, acting as purchaser (Talent), and the City of Medford, a municipal corporation of the State of Oregon, acting by and through its Board of Water Commissioners, acting as vendor (MWC), together referred to as the Parties.

RECITALS:

1) MWC is an entity established under the Home Rule Charter (Charter) adopted by the citizens of the City of Medford, comprised of five citizens appointed by the Mayor and confirmed by the City Council, to manage the Water Fund for the purpose of supplying inhabitants of the City of Medford with water; and

2) Under Section 19 of the Charter, the MWC is authorized to sell water and/or supply facilities outside the legal boundaries of the City of Medford, only if said water and/or supply facilities are surplus to the needs of the inhabitants of the City of Medford, and meet certain conditions of MWC Resolution No. 1058; and

3) Under the Charter, the MWC is authorized to set rates for City of Medford inhabitants, and to make all necessary rules and regulations for the sale, disposition and use of water and water service from the City of Medford water system, and the MWC has adopted such rules and regulations; and

4) Per the MWC's projections, reports and plans, the MWC finds it has surplus water and supply facilities capacity available in its system to serve Talent; and

5) Talent desires to purchase surplus treated and transported water from MWC from October through April, and purchase surplus supply facilities treatment and transport services for Talent's own water appropriated under Talent's own state-issued water rights from May through September;

NOW, THEREFORE, for and in consideration of the foregoing and of the mutual promises herein, the Parties mutually agree as follows:

AGREEMENT:

ARTICLE 1. SCOPE OF SURPLUS WATER SUPPLY AND SERVICE

Subject to Article 3 of this Agreement, MWC agrees to supply surplus water up to a combined (from all connections) maximum of **495** gallons per minute (GPM) for the months of October through April, and surplus facilities capacity to treat and transport water up to a combined (from all connections) maximum of **1338** GPM for the months of May through September. Talent agrees to provide sufficient water storage as part of its water system to assure that the maximum rate of withdrawal in GPM by Talent is not exceeded.

During the 5 year term of this agreement the following conditions will be complied with: The above flow rates will not be exceeded between the hours of 5 am and 11 am. During all other hours the maximum flow rate will not exceed 1338 gallons per minute (GPM) during the months of May through September and 735 gallons per minute (GPM) during the months of October through April. Measurement of total flow rates for the three TAP entities (Talent, Ashland, and Phoenix) will be based on the accumulative summation of the reading of the joint TAP meter at the TAP pump station on Samike Drive and the reading of the 2nd Phoenix meter at Garfield and Kings Highway Medford, Oregon. Notwithstanding the foregoing, in the event this agreement is renewed in October 2021, the maximum flow rates specified in this article may be recalculated by MWC based on future total source supply and future 2020 maximum month demand percentages, and such flow rates will be required over an entire 24 hour period.

Upon written request by Talent, this Agreement may be amended to provide supplemental supply and service to Talent if MWC determines that it has surplus capacity for Talent's use, and Talent agrees to reimburse MWC the reasonable cost of providing such supplemental supply and service.

ARTICLE 2. TALENT DISTRIBUTION SYSTEM EMERGENCY

Upon notice to MWC by Talent of a distribution system emergency, MWC will use its best efforts to provide supplemental water supply or services during the emergency.

For purpose of this agreement, "distribution system emergency" means: Any human or natural caused event that disables or impairs the distribution system such that its use constitutes an immediate threat to human life or health.

ARTICLE 3. MWC CONNECTIONS

MWC owns and is responsible for the construction, extension, maintenance, and operation of the MWC system up to the point of and including the master Talent meter. Talent shall pay all

costs of connections to the MWC system including initial metering, initial and ongoing backflow protection, and annual testing of the backflow device, all in accordance with MWC standards. MWC shall monthly read and annually test the master meter and provide readings and test results to Talent.

Talent's water supply is provided by the following master meter(s) with backflow connections to MWC:

- 10" Rosemount Spool Mag Meter at the Talent-Ashland-Phoenix (TAP) Pump Station on Samike Drive, Medford, Oregon

Temporary emergency connections to MWC with prior approval can be provided at the following location(s):

N/A

The following special conditions concerning connections to MWC apply:

- MWC acknowledges Talent's right to exchange and transfer water between the cities of Ashland, Talent, and Phoenix, Oregon within the total cumulative contracted GPM of all three noted cities served through TAP and their individual wholesale customer agreements with MWC.

ARTICLE 4. MWC REGULATIONS

Water service under this Agreement shall be in accordance with Section 30 SURPLUS WATER and Section 31 PROVISIONS RELATING TO UTILITY AND MUNICIPAL CUSTOMERS of the MWC Regulations Governing Water Service (Regulations), as now in effect or as may be amended. If there is any inconsistency between this Agreement and the Regulations, the Regulations control. Notwithstanding the foregoing, nothing herein is intended to relieve MWC of its obligation to supply surplus water in accordance with the terms of this Agreement, except as dictated by Federal/State regulations outside the control of MWC. The Parties acknowledge that implementation of this Agreement and the Regulations are subject to federal or state directives.

MWC shall promptly provide Talent a copy of any amendments to the Regulations.

ARTICLE 5. URBANIZATION POLICY

Talent agrees to provide water and services to customers within Talent city limits, or as otherwise approved by MWC in MWC Resolution No. 1058, as may be amended. Talent may provide water and services outside of city limits, but within its urban growth boundary, provided that the property requesting service has signed an irrevocable consent to annex to Talent, or as otherwise approved in writing by MWC. The current general water service map covering city limits and urban growth boundaries for Talent is attached to this Agreement as Exhibit A. Talent shall promptly notify MWC and provide a revised map as city limits and urban growth boundaries are modified.

ARTICLE 6. MEETING FUTURE WATER DEMANDS

Water and water services provided by MWC under this Agreement are pursuant to water rights held by the MWC and Talent. Nothing in this Agreement shall be construed to confer upon either party a legal or beneficial interest in each other's water rights, or to prevent either party from seeking additions or alterations to their water rights as deemed necessary.

Talent shall acquire and maintain such water rights as needed to meet the demand within its service area during the months of May through September. Talent may use the MWC intake facility, located at the intersection of Table Rock Road and the Rogue River in White City, as the designated point of diversion for Talent water rights. MWC shall cooperate in the perfection of any Talent water rights. Talent currently holds water rights with a diversion point on the Rogue River at the MWC Intake Facility site at the rate of N/A cubic feet per second and/or volume of **1292** acre feet. Delivery of such Talent water through MWC facilities shall be subject to the same terms and conditions as delivery of surplus MWC water. MWC shall measure and record at its Robert A. Duff Water Treatment Plant the amount of water withdrawn from the Rogue River by MWC and its municipal water service customers under each of their respective water rights. In its monthly water service invoice, MWC shall provide water use data for Talent. Talent shall provide MWC updated demand projections.

ARTICLE 7. SYSTEM DEVELOPMENT CHARGES

Pursuant to Resolution No. 774, MWC has established Water System Development Charges (SDCs) and supporting methodology to finance future MWC transmission and treatment facilities expansions. SDCs apply to all new customers, including customers of municipal wholesale customers served by MWC. Talent shall collect SDCs set by MWC from new Talent customers. MWC reviews the SDCs annually and reserves the right, in its sole discretion, to modify or replace the SDCs with a different financing mechanism for system improvements.

All SDCs collected by Talent will be held in a separate account and forwarded to MWC along with an accounting of the number and sizes of the services installed. Talent shall provide MWC

with a copy of the section within the annual Talent audit that shows accounting of MWC SDCs collected during the audited year. MWC shall, in turn, provide Talent an annual accounting of all SDCs collected.

MWC utilizes a utility basis for determining the water usage rate it charges Talent. Under this rate analysis, Talent is required to pay a return on investment for its share of the facilities paid for by MWC. Facilities funded by SDCs shall not be included in the return on investment portion of the rate analysis.

MWC shall render technical assistance to Talent in determining SDCs. MWC shall defend Talent against any legal action or appeals which may arise over the development, methodology, or implementation of the SDCs. Talent shall cooperate and support MWC in the defense, but shall not be obligated to incur any monetary obligation in such defense.

Upon termination of this Agreement, the following refund policy shall apply:

(a) MWC shall return to Talent its prorated share of the unexpended balance of the SDCs fund. This prorated share shall be based upon the actual unexpended SDCs collected by Talent for the specific facilities funded by the SDCs, plus the interest earned.

(b) MWC shall return to Talent a prorated share of the depreciated plant value of the specific MWC facilities funded by the SDCs and already installed. The prorated share shall be a percentage based upon the total amount of SDCs paid by Talent divided by the total SDCs collected and used to fund the facility, not including interest earned during the years in which the SDCs were collected.

(c) In order to avoid a financial hardship, MWC shall develop a reasonable schedule of up to five (5) years for repayment of the depreciated value of the specific MWC facilities funded by the SDCs.

(d) At the request of Talent, the MWC shall provide an accounting of the refunds made pursuant to this section.

ARTICLE 8. PAYMENTS TO MWC

Talent shall pay monthly for all water and services provided by MWC at MWC's scheduled wholesale rates then in place. Payment shall be made within ten (10) days after the meeting of the Talent's Council following receipt by Talent of a statement of charges from MWC.

MWC reserves the right, in its sole discretion, to change (with prior written notification of a rate study review) said rate at any time upon sixty (60) days written notice to Talent, following rate procedures and protocols in the MWC Regulations.

ARTICLE 9. TERM OF AGREEMENT

This term of this Agreement shall be five (5) years from its commencement. Talent may, at its option, extend the term for three additional five-year periods, which periods would run through October of **2026**, **2031**, and **2036** respectively. Extensions shall be subject to the same terms and conditions as this Agreement. Written notice of the election to exercise a five-year extension of this Agreement must be given to MWC not later than January 1st of the year in which the Agreement would otherwise expire. If Talent fails to provide MWC such notice, this Agreement shall be deemed canceled at the end of the term then in effect. MWC shall continue service for a reasonable period, determined in MWC's sole discretion, to allow Talent to secure other sources of water. Provided, however, Section 19 of the Charter of the City of Medford limits the term of water service contracts to 20 years and, therefore, the obligations of MWC under this Agreement, including renewal periods, shall not exceed that period of time.

ARTICLE 10. ASSIGNMENTS

Talent shall make no assignment of this Agreement without written permission from MWC. Any approved assignee or successor shall agree to be bound by the terms and conditions of this Agreement.

ARTICLE 11. WATER CURTAILMENT PLAN

During periods of drought or emergency, Talent shall be subject to the MWC Water Curtailment Plan, per MWC Resolution No. 1345, unless Talent has in effect a state-approved and adopted Water Curtailment Plan at least as stringent as that of MWC. In the event of a conflict between the Talent plan and the MWC plan, the MWC plan shall control. The MWC shall give Talent as much advance warning as possible prior to curtailment of water supplies. The level of curtailment shall be determined by MWC based on the severity of the anticipated shortage. Talent shall be responsible for enforcing the MWC curtailment plan or the above mentioned Talent plan in its service area.

MWC will require and apply emergency curtailment of water use in an equitable, fair, and consistent manner consistent with Resolution 1345. Continued service during periods of emergency shall neither be construed as a waiver nor limitation of any kind on any water rights held by MWC, or a waiver or curtailment of any water rights held by Talent, nor as affecting any other terms in this Agreement.

ARTICLE 12. ANNUAL WATER QUALITY REPORTING

MWC will gather annual water quality data and prepare informational reports as required under state Consumer Confidence Reporting (CCR) rules. These CCR reports will include water quality information for MWC and all participating municipal water customers. Annual costs involved will be proportionally shared among participating municipal water customers and billed separately to each.

Statistical data necessary to create the CCR report for the prior year must be provided by Talent to MWC no later than April 1st of each year. If bulk mailing is the primary distribution method utilized, Talent shall also provide MWC with postal routes covering their respective service areas by April 1st of the delivery year. MWC reserves the right to utilize other approved delivery methods (e.g.; electronic), which may impact responsibilities for Talent.

In the event that Talent receives water into its system that is supplied by an entity other than MWC, the composite MWC report for that year will not include data for Talent. Talent shall be responsible for preparation of its own annual CCR, and MWC will provide MWC data by April 1st of the delivery year.

MWC maintains water quality test points throughout the MWC system and one specifically at the master meter location(s) of Talent. These test points are used to collect water samples for meeting required state water quality parameters on a weekly, monthly, and annual basis. All information collected is of public record and is accessible through state or MWC databases. Responsibility for water quality is transferred to Talent at the point of the master meter location(s), except where water quality problems are attributable to MWC.

ARTICLE 13. MUTUAL INDEMNITY

To the extent allowed by law, Talent and MWC shall each defend, indemnify and hold the other, and their officers, employees, and agents harmless from any and all claims, suits, actions, or losses arising solely out of the acts and omissions of the Party's own officers, employees, or agents while acting under this agreement.

ARTICLE 14. PARTIAL INVALIDITY

If any term, covenant, condition, or provision of this Agreement is found by a court of competent jurisdiction to be invalid, void, or unenforceable, the remainder of the provisions hereof shall remain in force and effect, and shall in no way be affected, impaired, or invalidated thereby.

ARTICLE 15. INTEGRATION

This Agreement represents the entire understanding of MWC and Talent as to those matters contained herein. No prior oral or written understanding shall be of any force or effect with respect to those matters covered herein. This Agreement may not be modified or altered except in writing signed by both parties.

ARTICLE 16. DEFAULT

For purposes of this Agreement "default" means failure to comply with any of the terms of this Agreement. If either party determines that a default has occurred, it shall provide the other party written notice of the default, which such party shall have thirty days in which (a) to cure the default, (b) show that the default is of such a nature that it cannot be reasonably cured within thirty days, or (c) show that no default occurred.

MWC and Talent will work in good faith to amicably resolve the default. If after thirty days of the notice of default, MWC determines, in its sole discretion, that Talent is unable or unwilling to cure the default within a reasonable time, MWC may impose escalating penalties as follows: (a) ten percent surcharge for a period of thirty days; (b) twenty percent surcharge for the next thirty days; and (c) termination of this Agreement. Such penalties are in addition to any other remedies at law or equity that may be available to MWC. Failure to issue notice of default or to enforce its remedies under this Article 16 shall not preclude MWC from taking such action for future defaults.

If after thirty days, Talent determines, in its sole discretion, that MWC is unable or unwilling to cure the default within a reasonable time, Talent may terminate this Agreement and pursue any other remedies at law or in equity that may be available to Talent.

ARTICLE 17. FORCE MAJEURE

Neither party hereto shall be liable for delays in performance under this Agreement by reason of fires, floods, earthquakes, acts of God, wars, strikes, embargoes, necessary plant repairs or replacement of equipment, of any other cause whatsoever beyond the control of such party, whether similar or dissimilar to the causes herein enumerated. This clause does not include causes related to water supply and demand planning or failure to engage in such planning.

ARTICLE 18. DISPUTE RESOLUTION

If a dispute arises out of or relates to this contract, and if the dispute cannot be settled through negotiation, the parties agree first to try to settle the dispute by non-binding mediation before

resorting to litigation or other process. The parties agree to share equally the costs of mediation.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be signed by their proper officers on the dates noted below.

THE CITY OF MEDFORD
BY AND THROUGH ITS
BOARD OF WATER COMMISSIONERS

Leigh Johnson, Chair

~~**Karen Spoonts**, City Recorder~~ ADMIN. COORDINATOR/ACTING CITY RECORDER

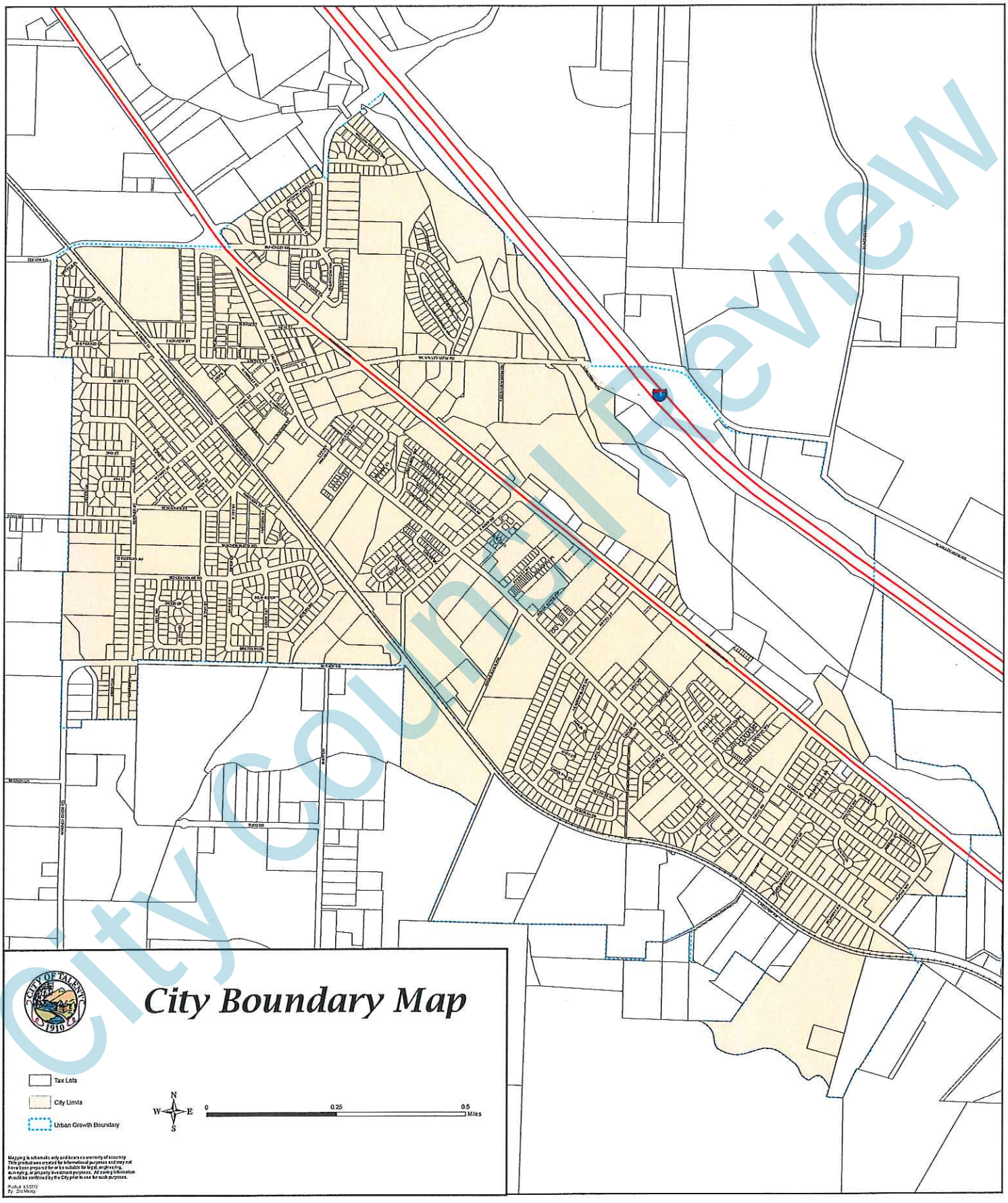
09/21/16
Date

THE CITY OF TALENT

Council President for the Mayor

City Recorder

9/7/16
Date



Appendix 5B

MWC Wholesale Water Service Agreements Recommendations

TECHNICAL MEMORANDUM

Client:	TAP Partner Cities		
Project:	TAP Water Master Plan		
Project File:	TAP1019.158.00.0001	Project Manager:	Rachel Lanigan, PE
Composed by:	Rachel Lanigan, PE		
Reviewed by:	Jeff Ballard, PE		
Subject:	Medford Water Commission Water Service Agreement Recommendations		
Date:	August 19, 2020		

Signed: 08/19/20

Purpose

The purpose of this technical memorandum (TM) is to provide recommendations to the Cities of Talent, Ashland, and Phoenix for the next revision of their wholesale Water Service Agreements with the Medford Water Commission (MWC).

Background

The Talent Ashland Phoenix (TAP) Partner Cities jointly own and operate the TAP Supply System, which is supplied wholesale water from MWC. As part of the 2020 *TAP Water Master Plan* development, the TAP Partner Cities requested recommendations to propose to MWC for revising the Water Service Agreements to reflect changes in operation, ownership, and maintenance of the TAP system.

MWC Water Service Agreements

MWC prepares wholesale water service agreements separately with each partner city that establishes terms of the water supply. These agreements are renewed every 5 years to adjust for growing demands. MWC is restricted from entering into agreements for periods exceeding 20 years, but plans on supplying water to its partner cities for the foreseeable future as demands continue to increase. Each TAP Partner City's latest MWC Water Service Agreement is included in the TAP Water Master Plan, Appendix 5A. A summary of the MWC Water Service Agreements, which are in effect until 2021, is presented in **Table 1**. Flow rates are provided in gallons per minute (gpm).

Table 1
2016 MWC Water Service Agreements

	Maximum Flow Rate (gpm)			
	October – April		May – September	
City	5 AM – 11 AM	Other Hours	5 AM – 11 AM	Other Hours
Ashland[1]	1,480	1,480	1,480	1,480
Phoenix	440	1,300	1,190	1,600
Talent	495	735	1,338	1,338
Total	**2,415**	**3,515**	**4,008**	**4,418**

[1]Ashland's data is from the 2014 Water Service Agreement.

The City of Ashland's (Ashland) MWC Water Service Agreement allows a maximum flow rate of 1,480 gpm (2.13 million gallons per day (MGD)) with no seasonal or time limitations.

The City of Phoenix's (Phoenix) MWC Water Service Agreement allows a maximum flow rate of 1,600 gpm during summer months, and a maximum of 1,300 gpm during the rest of the year. The Agreement further restricts summer and non-summer usage for Phoenix between the hours of 5:00 AM and 11:00 AM to 1,190 gpm and 440 gpm, respectively.

The City of Talent's (Talent) MWC Water Service Agreement allows a maximum flow rate of 1,338 gpm during summer months, and a maximum of 735 gpm during the rest of the year. The Agreement further restricts non-summer usage for Phoenix between the hours of 5:00 AM and 11:00 AM to 495 gpm.

MWC does not track individual water use for the three TAP Partner Cities; instead, MWC tracks the sum of water used by all TAP Partner Cities as the sum of water through both the regional TAP supply meter (located at the TAP Regional Booster Pump Station (BPS)) and the Phoenix Kings Highway meter. **Table 1** also provides the sum of the maximum flow rates for the TAP Partner Cities.

MWC IGA TAP Regional BPS Maintenance Agreement (October 2000, Amended May 2002)

An intergovernmental agreement (IGA) between the TAP Partner Cities and MWC was signed in October 2000 (see TAP Water Master Plan Appendix 1F, Exhibit C). The IGA assigned responsibilities for operation and maintenance of the Regional BPS to MWC. Amendment No. 1 to the IGA (signed in May 2002) reassigned operations and maintenance to Phoenix. Amendment No. 1 notes that the TAP Partner Cities and MWC will meet quarterly to discuss operational parameters to "insure among other things that conveyance of water is evenly taken from the Regional Booster Pump Station during daily pumping operations."

Recommendations

The following are recommendations for updating the MWC Water Service Agreements, which are anticipated to be updated in 2021 following the 5-year update schedule.

Increased Flow Rates

The first recommendation is to request higher peak flow rates in the updated Water Service Agreements that match TAP System demand projections. **Table 2** presents the anticipated TAP demand projections for the TAP Partner Cities. These projections represent the average of low and high demand projections for Talent and Phoenix, and assume Ashland uses 2.13 MGD (1,479 gpm) between 2020 and 2029 and increases to using 3.0 MGD (2,083 gpm) by 2030.

Table 0
TAP Water Master Plan Demand Projections

	Phoenix		Talent		Ashland	Tal/Phx	All TAP
Year	ADD (gpm)	MDD (gpm)	ADD (gpm)	MDD (gpm)	MDD (gpm)	MDD (gpm)	MDD (gpm)
2020	556	1,569	570	1,514	1,479	**3,083**	**4,562**
2030	643	1,826	639	1,699	2,083	**3,525**	**5,608**
2040	764	2,173	736	1,958	2,083	**4,132**	**6,215**
2070	1,028	2,930	944	2,528	2,083	**5,458**	**7,541**

ADD = Average Day Demand
MDD = Maximum Day Demand

Table 3 interpolates the demand projections between 2020 and 2030 to provide the 2026 demand projection, which is recommended for the 2021 MWC Water Service Agreements.

Table 3
TAP 2026 Demand Projections

Year	Phoenix ADD (gpm)	Phoenix MDD (gpm)	Talent ADD (gpm)	Talent MDD (gpm)	Ashland MDD (gpm)	Tal/Phx MDD (gpm)	All TAP MDD (gpm)
2026	556	1,569	570	1,514	1,479	**3,083**	**4,562**

Constant Rate Pumping

Adjusting the operation of the Regional BPS to operate at a constant rate pumping is recommended to meet the requirements of the Water Service Agreements. Historically, the TAP System has been operated by allowing the Regional BPS and Talent BPS to fluctuate flows throughout the day based on the water levels of the Eastside Reservoir and Belmont Reservoirs, respectively. Both Phoenix and Talent prefer to keep the reservoirs as full as possible, especially during summer peak demand periods, and adjust the pump flows to achieve this goal. This type of operation is typical within a city water system; however, when the pump station is a source of supply drawing from a neighboring water system, the variable pump flow rates inevitably impact the neighboring system.

Operating the Regional BPS to fluctuate with water levels in the Eastside Reservoir likely requires use of stored water in MWC's system (although this data was not reviewed). **Chapter 3** of the TAP Water Master Plan provides recommendations to adjust Regional BPS operations to constant rate pumping, thereby reduce any impacts on MWC and staying within the peak flow rate established in the Water Service Agreements. This type of operation is more typical of wholesale water supply facilities because it reduces the impact on the wholesale water supplier. Phoenix staff have agreed to implement changes, including supervisory control and data acquisition (SCADA) programming updates, to adjust to constant rate pumping.

TAP Pipe Segment 1 Ownership and Maintenance

Ownership and maintenance of Segment 1 of the TAP transmission system is disputed between the TAP Partner Cities and MWC. Segment 1 is located in Highway 99 between Garfield Street and the Regional BPS at Samike Drive. Segment 1 only serves TAP customers, but the MWC/TAP meter is located at the Regional BPS (between Segments 1 and 2). It is common practice for a water provider to maintain ownership of water system infrastructure up to a customer meter and not beyond the meter; in this case, MWC would own and maintain all of Segment 1.

During planning and construction of the original TAP facilities, it was assumed that MWC would own and maintain Segment 1 and the Regional BPS, and therefore the TAP meter was designed and constructed on the discharge side of the Regional BPS. However, at some point, MWC opted against ownership of the Regional BPS. This is reflected in the 2000 MWC TAP Regional BPS Maintenance Agreement in which the TAP Partner Cities own the Regional BPS but pay MWC to maintain it (operations and maintenance was later transferred to Phoenix). For several

years, ownership of pipe Segment 1 was not documented. When locates were called, it was unclear what entity was responsible for locating the pipe.

In the 2016 Water Service Agreements, MWC made it clear that ownership and maintenance of the pipe would belong to MWC per their policy to own and maintain all facilities up to the meter. Article 3 of the 2016 MWC Wholesale Water Service Agreement between Phoenix and MWC (**Appendix 5A**) states that "MWC owns and is responsible for the construction, extension, maintenance, and operation of the MWC system up to the point of and including the master Phoenix meter(s)." It goes on to list the two Phoenix meters at the Regional BPS and at Kings Highway. This signed agreement indicates MWC currently owns and is responsible for maintenance of Segment 1.

MWC may argue to remove the ownership and maintenance language in the Water Service Agreements in the 2021 updates. It is recommended that the TAP Partner Cities continue to point to the language in the existing Water Service Agreements to support MWC ownership and maintenance of the pipe.

Appendix 6A

TAP Facility Capacity and Cost Sharing – 2020 - 2070

TAP Capacity Allocation
Demand Assumptions

TAP Water Master Plan Projections

	Phoenix		Talent		Ashland
	ADD	MDD	ADD	MDD	ADD
Year	mgd	mgd	mgd	mgd	mgd
2020	0.80	2.26	0.82	2.18	2.13
2030	0.93	2.63	0.92	2.45	3.00
2040	1.10	3.13	1.06	2.82	3.00
2070	1.48	4.22	1.36	3.64	3.00

From 2017 Cost Share; Based on MDD usage (mgd)

	Phoenix	Talent	Ashland	Sum
Regional BPS	1.40	2.20	2.10	5.70
Talent BPS	-	2.20	2.10	4.30
Regional BPS	25%	39%	37%	100%
Talent BPS	0%	51%	49%	100%

2020 Average Day Demand (mgd)

	Phoenix	Talent	Ashland	Sum	
Regional BPS	0.55	0.82	0.35	1.72	Assumed 60 days of use for Ashland
Talent BPS	-	0.82	0.35	1.17	
Regional BPS	32%	48%	20%	100%	
Talent BPS	0%	70%	30%	100%	

2020 MDD (mgd)

	Phoenix	Talent	Ashland	Sum
Regional BPS	1.84	2.18	2.13	6.15
Talent BPS	-	2.18	2.13	4.31
Regional BPS	30%	35%	35%	100%
Talent BPS	0%	51%	49%	100%

TAP Capacity Allocation
Pump Stations and Supply Assumptions

Facility	ORIGINAL CONSTRUCTION																		
	Year	Total Capacity (mgd)	Cost	Partner City Share of Costs (%)			Partner City Purchased Capacity (mgd)			Partner City Planned Share of Capacity %			Partner City Planned Capacity (mgd)				Equivalent % Share of Capacity		
				Phoenix	Talent	Ashland	Phoenix	Talent	Ashland	Phoenix	Talent	Ashland	Phoenix	Talent	Ashland	Total	Phoenix	Talent	Ashland
Regional Booster Pump Station	2001	6.48		21.78%	58.83%	19.39%	1.41	3.81	1.26	21.78%	58.83%	19.39%	3.00	4.00	1.60	8.60	35%	47%	19%
Programming Updates																			
Talent Booster Pump Station	2001	2.59		0.00%	100.00%	0.00%	-	2.59	-	0.00%	100.00%	0.00%							
Programming Updates																			
Generator Upgrade (Option 1)																			
Generator Upgrade (Option 2)																			
Additional Hydraulic Analysis																			
Seismic Upgrades (Option 1)																			
Seismic Upgrades (Option 2)																			
BPS Expansion Option 1																			
BPS Expansion Option 2																			
New MWC Connection in N Phoenix Road																			
Ashland Emergency Connection																			
Option 2 New Ashland BPS																			

TAP Capacity Allocation
Pump Stations and Supply Assumptions

Facility	COMPLETED CAPACITY IMPROVEMENTS							
	Description	Year	Increased Capacity (mgd)	New Capacity (mgd)	Cost	Partner City Share of Costs		
						Phoenix	Talent	Ashland
Regional Booster Pump Station								
Programming Updates								
Talent Booster Pump Station	Ashland replaced both 100-hp pumps with 125-hp pumps to supply Ashland emergency flows	2015	1.18	3.77	$ 171,965	0%	0%	100%
Programming Updates								
Generator Upgrade (Option 1)								
Generator Upgrade (Option 2)								
Additional Hydraulic Analysis								
Seismic Upgrades (Option 1)								
Seismic Upgrades (Option 2)								
BPS Expansion Option 1								
BPS Expansion Option 2								
New MWC Connection in N Phoenix Road								
Ashland Emergency Connection								
Option 2 New Ashland BPS								

TAP Capacity Allocation
Pump Stations and Supply Assumptions

Facility	FUTURE PROJECTS/EXPANSION												
				Partner City Needed TAP Capacity (mgd)				Partner City Need of Increased Capacity (mgd)				Partner City Share of Increased Capacity (%)	
	Description	Year	Planned Capacity (mgd)	Phoenix	Talent	Ashland	Increased Capacity (mgd)	Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
Regional Booster Pump Station	Replace one 50-hp pump with 125-hp pump to provide adequate supply until 2030	By 2030	7.63	2.21	2.45	3.00	1.15	0.80	(1.37)	1.74	50%	0%	50%
Programming Updates		2021	-	-	-	-	-	-	-	-	33%	33%	33%
Talent Booster Pump Station	Install 50-hp pump for operations only. Not needed for capacity reasons.	2021	4.49				0.72					100%	0%
Programming Updates	For Talent operations only	2021										100%	0%
Generator Upgrade (Option 1)	For both Talent and Ashland	2030	6.64		3.64	3.00						55%	45%
Generator Upgrade (Option 2)	For just Talent	2030	3.64		3.64	-						100%	0%
Additional Hydraulic Analysis	Needed to confirm actual capacity and any hydraulic restrictions	2021										50%	50%
Seismic Upgrades (Option 1)	Needed for Talent and Ashland	2040	6.64		3.64	3.0						55%	45%
Seismic Upgrades (Option 2)	Needed for Talent Only	2040	4.99									100%	0%
BPS Expansion Option 1	Expand Talent BPS for Talent and Ashland	2030	6.64		3.64	3.0	2.15		0.33	1.82		15%	85%
BPS Expansion Option 2	Expand Talent BPS for Talent only	2030	4.99		3.64		0.50		0.33			100%	0%
New MWC Connection in N Phoenix Road	MWC Study	2030	3.40	2.23	(0.17)	1.17					66%	0%	34%
	Master Meter Connection	2030	3.40	2.23	(0.17)	1.17					66%	0%	34%
	Pipe Improvements by 2030	2030	1.81	0.64	(1.36)	1.17					36%	0%	64%
	Pipe Improvements by 2040	2040	2.31	1.14	(0.99)	1.17					100%	0%	0%
	Pipe Improvements by Buildout	2070	3.40	2.23	(0.17)	1.17					66%	0%	34%
Ashland Emergency Connection		2030	2.84	1.48	1.36						52%	48%	
Option 2 New Ashland BPS	Construct new dedicated Ashland BPS	2030	3.00										100%

TAP Capacity Allocation
Pipe Assumptions

Facility	ORIGINAL CONSTRUCTION									
	Year	Size/ Diameter	Total Capacity (mgd)	Length ft	Partner City Share of Costs (%)			Partner City Purchased Share of Capacity (mgd)		
					Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
Existing Pipe Segments										
1 HWY 99 (MWC connection at Garfield Street to Regional BPS)	2001	24	7.63	6,100	21.78%	58.83%	19.39%	1.66	4.49	1.48
2 HWY 99 (Regional BPS to Talent Meter)	2001	24	7.63	12,160	21.78%	58.83%	19.39%	1.66	4.49	1.48
3 HWY 99 (Talent Meter to Suncrest Road)	2001	24	7.63	10,575	21.78%	58.83%	19.39%	1.66	4.49	1.48
4 Suncrest Road (HWY 99 to Talent TAP BPS)	2001	16	4.99	1,750		100.00%	0.00%		4.99	-
5 HWY 99 (Rapp Road to Creel Road)	2013	16	3.64	3,900		100.00%	0.00%		3.64	-
6 HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)	2015	16	3.00	13,400			100.00%			3.00
Creel Road Pipe (HWY 99 to Talent Ave)	2004	16		1,250						
Future Pipes										
ODOT Bridge Pipe Relocation										
Option 1 Talent to Ashland Pipe Improvements										
Option 2 Talent to Ashland Pipe Improvements										

TAP Capacity Allocation
Pipe Assumptions

Facility	FUTURE PROJECTS/EXPANSION								
	Description	Year	Planned Capacity (mgd)	Partner City Needed Capacity (mgd)			Partner City Share of Increased Capacity (%)		
				Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
Existing Pipe Segments									
1 HWY 99 (MWC connection at Garfield Street to Regional BPS)									
2 HWY 99 (Regional BPS to Talent Meter)	Seismic Upgrades	2060					22%	59%	19%
3 HWY 99 (Talent Meter to Suncrest Road)									
4 Suncrest Road (HWY 99 to Talent TAP BPS)									
5 HWY 99 (Rapp Road to Creel Road)									
6 HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)	Ashland supply to Talent/Phoenix	2030	5.84	1.48	1.36	3.00	25%	23%	51%
Creel Road Pipe (HWY 99 to Talent Ave)	Option 2 Only - Talent to Reimburse Ashland								
Future Pipes									
ODOT Bridge Pipe Relocation	Required for ODOT project	2020					22%	59%	19%
Option 1 Talent to Ashland Pipe Improvements	Pipe along irrigation canal	2030	6.64		3.64	3.00		55%	45%
	Talent BPS Suction and Discharge Pipes	2040	6.64		3.64	3.00		55%	45%
	HWY 99 Pipe Improvements (Anjou Club to Rapp)	2070	6.64		3.64	3.00		55%	45%
Option 2 Talent to Ashland Pipe Improvements	Pipe along irrigation canal	2030						100%	0%
	Ashland Dedicated Pipe	2030						0%	100%
	Talent Pump Station Discharge Pipe	2040						100%	0%

TAP Capacity Allocation
Summary of Capacity Share by Year

Facility	ASSUMED CAPACITY (mgd)			
	2020	2030	2040	Buildout
Regional BPS	6.48	7.63	7.63	7.63
N Phoenix Road Supply	0	1.81	2.31	3.40
Talent BPS (Option 1)	3.77	6.64	6.64	6.64
Talent BPS (Option 2)	3.77	4.99	4.99	4.99
Ashland Emergency Connection	0	2.84	2.84	2.84
New Ashland Pump Station (Option 2 Only)	0	3.00	3.00	3.00
Pipe Segments				
1 HWY 99 (MWC connection at Garfield Street to Regional	7.63	7.63	7.63	7.63
2 HWY 99 (Regional BPS to Talent Meter)	7.63	7.63	7.63	7.63
3 HWY 99 (Talent Meter to Suncrest Road)	7.63	7.63	7.63	7.63
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 1)	4.99	4.99	6.64	6.64
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 2)	4.99	4.99	4.99	4.99
5 HWY 99 (Rapp Road to Creel Road)	3.64	3.64	3.64	3.64
6 HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)	5.84	5.84	5.84	5.84
New Ashland Dedicated Pipe (Option 2; HWY 99 Suncrest Road to Creel Road)	3.00	3.00	3.00	3.00

TAP Capacity Allocation

Summary of Capacity Share by Year

Facility	CAPITAL INVESTMENT CAPACITY SHARE																							
	MGD												PERCENT											
	2020			2030			2040			Buildout			2020			2030			2040			Buildout		
	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH
Regional BPS	1.41	3.81	1.26	1.99	3.81	1.83	1.99	3.81	1.83	1.99	3.81	1.83	22%	59%	19%	26%	50%	24%	26%	50%	24%	26%	50%	24%
N Phoenix Road Supply				0.64	-	1.17	1.14	-	1.17	2.23	-	1.17				36%	0%	64%	49%	0%	51%	66%	0%	34%
Talent BPS (Option 1)		2.59	1.18		2.92	3.00		2.92	3.00		2.92	3.00		69%	31%		44%	45%		44%	45%		44%	45%
Talent BPS (Option 2)		2.59	1.18		2.92	1.18		2.92	1.18		2.92	1.18		69%	31%		58%	24%		58%	24%		58%	24%
Ashland Emergency Connection				1.48	1.36		1.48	1.36		1.48	1.36					52%	48%		52%	48%		52%	48%	
New Ashland Pump Station (Option 2 Only)						3.00			3.00			3.00						100%			100%			100%
Pipe Segments																								
1 HWY 99 (MWC connection at Garfield Street to Regional	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	22%	59%	19%	22%	59%	19%	22%	59%	19%	22%	59%	19%
2 HWY 99 (Regional BPS to Talent Meter)	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	22%	59%	19%	22%	59%	19%	22%	59%	19%	22%	59%	19%
3 HWY 99 (Talent Meter to Suncrest Road)	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	1.41	3.81	1.26	22%	59%	19%	22%	59%	19%	22%	59%	19%	22%	59%	19%
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 1)		4.99	-		4.99	-		3.64	3.00		3.64	3.00		100%	0%		100%	0%		55%	45%		55%	45%
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 2)		4.99	-		4.99	-		4.99	-		4.99	-		100%	0%		100%	0%		100%	0%		100%	0%
5 HWY 99 (Rapp Road to Creel Road)		3.64	-		3.64	-		3.64	-		3.64	-		100%	0%		100%	0%		100%	0%		100%	0%
6 HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)			3.00			3.00			3.00			3.00			100%			100%			100%			100%
New Ashland Dedicated Pipe (Option 2; HWY 99 Suncrest Road to Creel Road)						3.00			3.00			3.00						100%			100%			100%

TAP Capacity Allocation

Summary of Capacity Share by Year

Facility	FLOW BASED SHARE To be updated annually																							
	MGD (Based on Average Day Demand)												PERCENT											
	2020			2030			2040			Buildout			2020			2030			2040			Buildout		
	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH	PHX	TAL	ASH
Regional BPS	0.55	0.82	0.35	0.70	0.92	0.25	0.55	1.06	0.25	0.74	1.36	0.25	32%	48%	20%	37%	49%	13%	30%	57%	13%	32%	58%	11%
N Phoenix Road Supply				0.23	-	0.25	0.55	-	0.25	0.74	-	0.25				48%	0%	52%	69%	0%	31%	75%	0%	25%
Talent BPS (Option 1)		0.82	0.35		0.92	0.25		1.06	0.25		1.36	0.25		70%	30%		79%	21%		81%	19%		85%	15%
Talent BPS (Option 2)		0.82	0.35		0.92	-		1.06	-		1.36	-		70%	30%		100%	0%		100%	0%		100%	0%
Ashland Emergency Connection				0.93	0.92		1.10	1.06		1.48	1.36					50%	50%		51%	49%		52%	48%	
New Ashland Pump Station (Option 2 Only)						0.25			0.25			0.25						100%			100%			100%
Pipe Segments																								
1 HWY 99 (MWC connection at Garfield Street to Regional	0.55	0.82	0.35	0.70	0.92	0.25	0.55	1.06	0.25	0.74	1.36	0.25	32%	48%	20%	37%	49%	13%	30%	57%	13%	32%	58%	11%
2 HWY 99 (Regional BPS to Talent Meter)	0.55	0.82	0.35	0.70	0.92	0.25	0.55	1.06	0.25	0.74	1.36	0.25	32%	48%	20%	37%	49%	13%	30%	57%	13%	32%	58%	11%
3 HWY 99 (Talent Meter to Suncrest Road)	0.55	0.82	0.35	0.70	0.92	0.25	0.55	1.06	0.25	0.74	1.36	0.25	32%	48%	20%	37%	49%	13%	30%	57%	13%	32%	58%	11%
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 1)		0.82	0.35		0.92	0.25		1.06	0.25		1.36	0.25		70%	30%		79%	21%		81%	19%		85%	15%
4 Suncrest Road (HWY 99 to Talent TAP BPS) (Option 2)		0.82	0.35		0.92	-		1.06	-		1.36	-		70%	30%		100%	0%		100%	0%		100%	0%
5 HWY 99 (Rapp Road to Creel Road)		0.82	-		1.36	-		1.36	-		1.36	-		100%	0%		100%	0%		100%	0%		100%	0%
6 HWY 99 (Creel Road to Ashland TAP BPS; Ashland TAP BPS to North Main Street)			0.35	0.93	0.92	3.00	1.10	1.06	3.00	1.48	1.36	3.00			100%	19%	19%	62%	21%	21%	58%	25%	23%	51%
New Ashland Dedicated Pipe (Option 2; HWY 99 Suncrest Road to Creel Road)						3.00			3.00			3.00						100%			100%			100%

Appendix 6B

Hansford Economic Consulting Financial Analysis – 2020

HANSFORD
ECONOMIC CONSULTING LLC

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Technical Memorandum

To: **Rachel Lanigan,** RH2 Engineering

From: Catherine Hansford **Date:** August 10, 2020

Subject: **Talent-Ashland-Phoenix Water Master Plan Financial Analysis**

Purpose

HEC was retained to perform a financial analysis of the Talent-Ashland-Phoenix Water Master Plan (TAP Master Plan) conducted by RH2 Engineering in 2020. This memorandum provides the analysis, including a summary of the TAP Master Plan costs, identification of depreciation costs associated with existing facilities, estimated annual operations and maintenance costs of the TAP system, the financial impact of the TAP Master Plan on each of the partner cities, funding strategy and conclusions of the financial analysis, and key considerations for an updated intergovernmental agreement (IGA). **Attachment A**, which accompanies this memorandum, provides detailed tables included in the analysis.

This financial analysis is limited to the capital improvement, operations and maintenance costs of the TAP system. Potential costs associated with increasing supply to 3.0 MGD from the Medford Water Commission (MWC), including payment of system development charges, are excluded from this analysis, as are any potential additional costs associated with water rights.

All figures presented in this memorandum are in 2020 dollars.

Summary of Master Plan Estimated Costs

The TAP Master Plan estimated costs are summarized in **Table 1** on the next page. Under Option 1, the total costs over the next 40 years are estimated to be $15.13 million in 2020 dollars. The estimated costs under Option 2 are $17.14 million in 2020 dollars. Facilities to increase water supply and more efficiently move water between the three cities include a new supply point for taking MWC water at North Phoenix Road, as well as facilitating the movement of Ashland's treated winter water to Talent and Phoenix, upgrades to the Regional Booster Pump Station (RBPS) and Talent Booster Pump Station (TBPS), and possibly a new dedicated Ashland Booster Pump Station (ABPS) (the latter only as described in the Master Plan under Option 2).

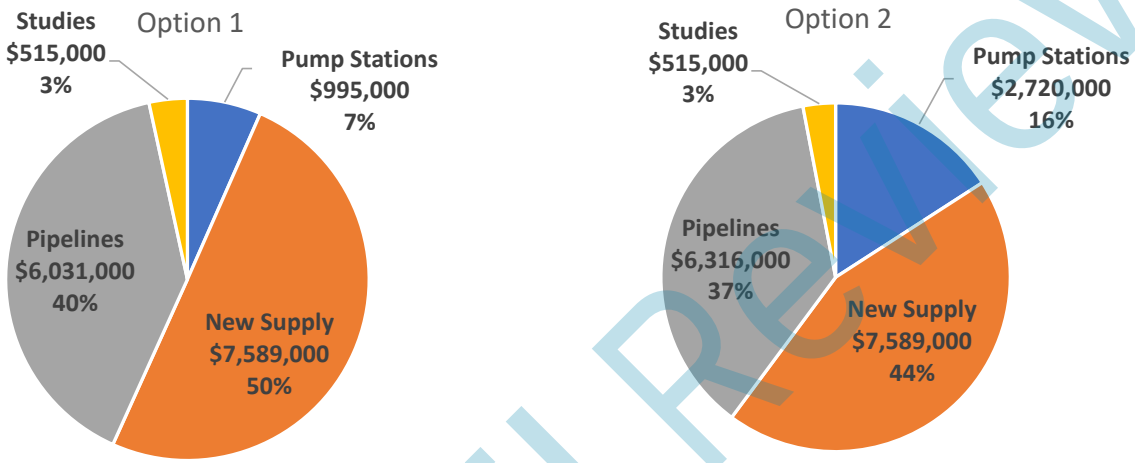
Table 1
Capital Improvements Plan Estimated Costs

Infrastructure	Option 1	Option 2
	All figures in 2020 $'s	
	PUMP STATIONS	
Regional Booster (RBPS) - *this project provides adequate supply through 2030*		
Replace (1) 50-hp pump with 125-hp	$50,000	$50,000
Programming Updates	$35,000	$35,000
Subtotal RBPS	**$85,000**	**$85,000**
Talent Booster (TBPS)		
Install 50-hp pump for operations	$50,000	$50,000
Programming Updates	$25,000	$25,000
Generator Upgrade	$350,000	$250,000
Additional Hydraulic Analysis	$12,000	$12,000
Seismic Upgrades	$70,000	$70,000
Expansion	$403,000	$178,000
Subtotal TBPS	**$910,000**	**$585,000**
New Ashland Booster Pump Station (option 2 only)	**$0**	**$2,050,000**
Total Pump Stations	**$995,000**	**$2,720,000**
	NEW SUPPLY	
N. Phoenix Rd. - *this project provides adequate supply from 2030 through buildout*		
MWC Study	$50,000	$50,000
Master Meter Connection	$325,000	$325,000
Pipe Improvements to 2030	$2,871,000	$2,871,000
Pipe Improvements to 2040	$3,053,000	$3,053,000
Pipe Improvements through Buildout	$1,127,000	$1,127,000
Total N. Phoenix Rd Supply Project	**$7,426,000**	**$7,426,000**
Ashland Non-Peak Supply Connection	**$163,000**	**$163,000**
Total New Supply	**$7,589,000**	**$7,589,000**
	PIPELINES	
Seismic Upgrades Segment 2 (RBPS to Talent Meter)	**$1,221,000**	**$1,221,000**
ODOT Bridge Pipe Relocation	**$300,000**	**$300,000**
Talent to Ashland Improvements		
Pipe along Irrigation Canal	$1,486,000	$1,376,000
Talent BPS Suction and Discharge	$1,373,000	$0
Ashland Dedicated Pipe	$0	$3,264,000
Hwy 99 (Anjou Club to Rapp)	$1,651,000	$0
Talent Pump Station Discharge Pipe	$0	$155,000
Subtotal Talent to Ashland Improvements	**$4,510,000**	**$4,795,000**
Total Pipes	**$6,031,000**	**$6,316,000**
	STUDIES	
New IGA	$50,000	$50,000
TAP Master Plan Updates (every 10 yrs)	$450,000	$450,000
Telemetry Summary Report	$15,000	$15,000
Total Studies	**$515,000**	**$515,000**
TOTAL ESTIMATED CIP COSTS	**$15,130,000**	**$17,140,000**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020. master cip

Figure 1 below shows the estimated total cost by category: new supply, pump stations, pipelines and studies.

Figure 1
Total Estimated 40-Year CIP by Option



Cost responsibility by city is shown in **Table 2** for Option 1 and **Table 3** for Option 2 on the following two pages. Cost share is based on purchased capacity by each city for each facility as determined by RH2 Engineering in the TAP Master Plan. Under Option 2, the city of Ashland bears a larger amount and proportion of the total estimated cost. The city of Talent would repay Ashland for improvements completed at the TBPS and Creel Road. These improvements were paid for entirely by Ashland to enable an emergency supply of water to Ashland during the summer months; under Option 2, Talent would have full use of these improvements. In addition, under Option 2, certain facilities would become the sole responsibility of a city, such as the new ABPS (Ashland's), and the pipe along irrigation canal/TBPS discharge pipe facilities (Talent's). The two reimbursements from Talent to Ashland shown in **Table 3** are based on the remaining value of the assets using a replacement cost valuation approach. If Option 2 is pursued, the cities will determine the appropriate reimbursement at that time.

Although the total cost estimate is greater under Option 2 by $2.01 million, cost alone should not be the deciding factor between options 1 and 2. The cities should conduct a cost-benefit analysis of the two options, including operational advantages and long-term operational costs, resiliency and environmental advantages, ease of facilitation and construction, and other factors.

Table 2
Summary of CIP Costs by City -Option 1

Infrastructure	Cost Share by City			Total	Cost Responsibility by City		
	Phoenix	Talent	Ashland	Estimated Cost	Phoenix	Talent	Ashland
Regional Booster (RBPS)	*capacity cost share [1]*			**PUMP STATIONS**			
Replace (1) 50-hp pump with 125-hp	50.00%	0.00%	50.00%	$50,000	$25,000	$0	$25,000
Programming Updates	33.33%	33.33%	33.33%	$35,000	$11,667	$11,667	$11,667
Subtotal RBPS				**$85,000**	**$36,667**	**$11,667**	**$36,667**
Talent Booster (TBPS)							
Install 50-hp pump for operations	0.00%	100.00%	0.00%	$50,000	$0	$50,000	$0
Programming Updates	0.00%	100.00%	0.00%	$25,000	$0	$25,000	$0
Generator Upgrade	0.00%	54.82%	45.18%	$350,000	$0	$191,867	$158,133
Additional Hydraulic Analysis	0.00%	50.00%	50.00%	$12,000	$0	$6,000	$6,000
Seismic Upgrades	0.00%	54.82%	45.18%	$70,000	$0	$38,373	$31,627
Expansion	0.00%	15.27%	84.73%	$403,000	$0	$61,538	$341,462
Subtotal TBPS				**$910,000**	**$0**	**$372,779**	**$537,221**
Total Pump Stations				**$995,000**	**$36,667**	**$384,446**	**$573,888**
N. Phoenix Rd	*capacity cost share*			**NEW SUPPLY**			
MWC Study	65.66%	0.00%	34.34%	$50,000	$32,832	$0	$17,168
Master Meter Connection	65.66%	0.00%	34.34%	$325,000	$213,407	$0	$111,593
Pipe Improvements to 2030	35.50%	0.00%	64.50%	$2,871,000	$1,019,205	$0	$1,851,795
Pipe Improvements to 2040	100.00%	0.00%	0.00%	$3,053,000	$3,053,000	$0	$0
Pipe Improvements through Buildout	65.66%	0.00%	34.34%	$1,127,000	$740,031	$0	$386,969
Total N. Phoenix Rd Supply Project				**$7,426,000**	**$5,058,475**	**$0**	**$2,367,525**
Ashland Non-Peak Supply Connection	52.11%	47.89%	0.00%	**$163,000**	**$84,944**	**$78,056**	**$0**
Total New Supply				**$7,589,000**	**$5,143,419**	**$78,056**	**$2,367,525**
	capacity cost share			**PIPELINES**			
Seismic Upgrades Segment 2	**21.78%**	**58.83%**	**19.39%**	**$1,221,000**	$265,934	$718,314	$236,752
ODOT Bridge Pipe Relocation	**21.78%**	**58.83%**	**19.39%**	**$300,000**	$65,340	$176,490	$58,170
Talent to Ashland Improvements							
Pipe along Irrigation Canal	0.00%	54.82%	45.18%	$1,486,000	$0	$814,625	$671,375
Talent BPS Suction and Discharge	0.00%	54.82%	45.18%	$1,373,000	$0	$752,679	$620,321
Hwy 99 (Anjou Club to Rapp)	0.00%	54.82%	45.18%	$1,651,000	$0	$905,078	$745,922
Subtotal Talent to Ashland Improvements				**$4,510,000**	**$0**	**$2,472,382**	**$2,037,618**
Total New Pipelines				**$6,031,000**	**$331,274**	**$3,367,186**	**$2,332,540**
	equal cost share			**STUDIES**			
New IGA	33.33%	33.33%	33.33%	**$50,000**	$16,667	$16,667	$16,667
TAP Master Plan Updates (every 10 yrs)	33.33%	33.33%	33.33%	**$450,000**	$150,000	$150,000	$150,000
Telemetry Summary Report	33.33%	33.33%	33.33%	**$15,000**	$5,000	$5,000	$5,000
Total Studies				**$515,000**	**$171,667**	**$171,667**	**$171,667**
TOTAL ESTIMATED CIP COSTS (OPTION 1)	**37.56%**	**26.45%**	**35.99%**	**$15,130,000**	**$5,683,026**	**$4,001,355**	**$5,445,619**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020. cip op1

[1] RH2 Engineering capacity by city calculations, June 19, 2020.

Table 3
Summary of CIP Costs by City -Option 2

Infrastructure	Cost Share by City			Estimated	Cost Responsibility by City		
	Phoenix	Talent	Ashland	Cost	Phoenix	Talent	Ashland
Regional Booster (RBPS)	*capacity cost share [1]*			**PUMP STATIONS**			
Replace (1) 50-hp pump with 125-hp	50.00%	0.00%	50.00%	$50,000	$25,000	$0	$25,000
Programming Updates	33.33%	33.33%	33.33%	$35,000	$11,667	$11,667	$11,667
Subtotal RBPS				**$85,000**	**$36,667**	**$11,667**	**$36,667**
Talent Booster (TBPS) [3]							
Install 50-hp pump for operations	0.00%	100.00%	0.00%	$50,000	$0	$50,000	$0
Programming Updates	0.00%	100.00%	0.00%	$25,000	$0	$25,000	$0
Generator Upgrade	0.00%	100.00%	0.00%	$250,000	$0	$250,000	$0
Additional Hydraulic Analysis	0.00%	50.00%	50.00%	$12,000	$0	$6,000	$6,000
Seismic Upgrades	0.00%	100.00%	0.00%	$70,000	$0	$70,000	$0
Expansion	0.00%	100.00%	0.00%	$178,000	$0	$178,000	$0
Subtotal TBPS				**$585,000**	**$0**	**$579,000**	**$6,000**
New Ashland Booster Pump Station [4]	0.00%	0.00%	100.00%	**$2,050,000**	**$0**	**$0**	**$2,050,000**
Adjust for Previous Improvements to TBPS [5]				**$0**	**$0**	**$171,500**	**($171,500)**
Total Pump Stations				**$2,720,000**	**$36,667**	**$762,167**	**$1,921,167**
N. Phoenix Rd	*capacity cost share*			**NEW SUPPLY**			
MWC Study	65.66%	0.00%	34.34%	$50,000	$32,832	$0	$17,168
Master Meter Connection	65.66%	0.00%	34.34%	$325,000	$213,407	$0	$111,593
Pipe Improvements to 2030	35.50%	0.00%	64.50%	$2,871,000	$1,019,205	$0	$1,851,795
Pipe Improvements to 2040	100.00%	0.00%	0.00%	$3,053,000	$3,053,000	$0	$0
Pipe Improvements through Buildout	65.66%	0.00%	34.34%	$1,127,000	$740,031	$0	$386,969
Total N. Phoenix Rd Supply Project				**$7,426,000**	**$5,058,475**	**$0**	**$2,367,525**
Ashland Non-Peak Supply Connection	52.11%	47.89%	0.00%	**$163,000**	**$84,944**	**$78,056**	**$0**
Total New Supply				**$7,589,000**	**$5,143,419**	**$78,056**	**$2,367,525**
	capacity cost share			**PIPELINES**			
Seismic Upgrades Segment 2	21.78%	58.83%	19.39%	**$1,221,000**	**$265,934**	**$718,314**	**$236,752**
Adjust for Creel Road Pipe (HWY 99 to Talent Ave) [2], [5]				**$0**	**$0**	**$77,550**	**($77,550)**
ODOT Bridge Pipe Relocation	21.78%	58.83%	19.39%	**$300,000**	**$65,340**	**$176,490**	**$58,170**
Talent to Ashland Improvements							
Pipe along Irrigation Canal [3]	0.00%	100.00%	0.00%	$1,376,000	$0	$1,376,000	$0
Ashland Dedicated Pipe [4]	0.00%	0.00%	100.00%	$3,264,000	$0	$0	$3,264,000
Talent Pump Station Discharge Pipe [3]	0.00%	100.00%	0.00%	$155,000	$0	$155,000	$0
Subtotal Talent to Ashland Improvements				**$4,795,000**	**$0**	**$1,531,000**	**$3,264,000**
Total Pipelines				**$6,316,000**	**$331,274**	**$2,503,354**	**$3,481,372**
	equal cost share			**STUDIES**			
New IGA	33.33%	33.33%	33.33%	**$50,000**	$16,667	$16,667	$16,667
TAP Master Plan Updates (every 10 yrs)	33.33%	33.33%	33.33%	**$450,000**	$150,000	$150,000	$150,000
Telemetry Summary Report	33.33%	33.33%	33.33%	**$15,000**	$150,000	$150,000	$150,000
Total Studies				**$515,000**	**$316,667**	**$316,667**	**$316,667**
TOTAL ESTIMATED CIP COSTS (OPTION 2)	**33.16%**	**20.50%**	**46.35%**	**$17,125,000**	**$5,678,026**	**$3,510,244**	**$7,936,730**

Source: RH2 Engineering, Draft MP CIP tables, June 2020. cip op2

[1] RH2 Engineering capacity by city calculations, June 19, 2020.

[2] Not a TAP asset; agreed by partner cities June 6, 2020.

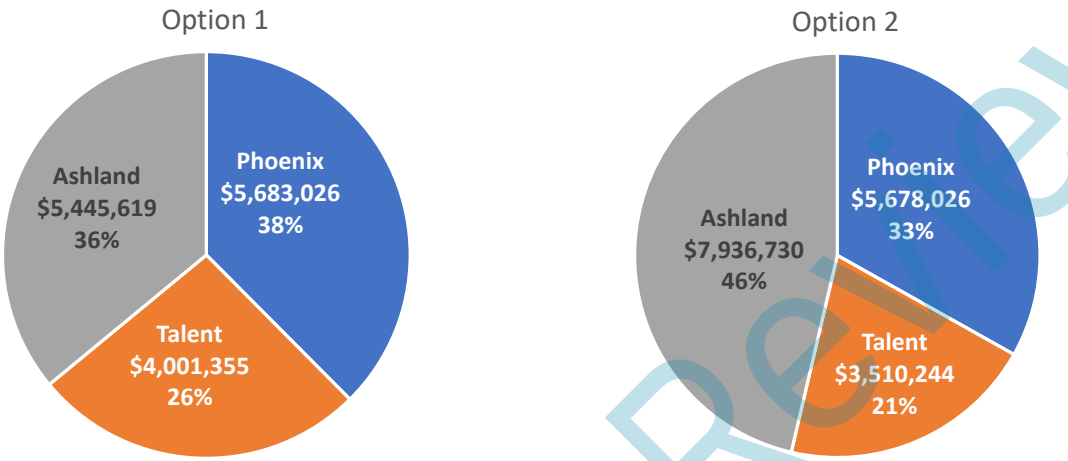
[3] Dedicated facilities for the City of Talent. Not a TAP asset.

[4] Dedicated facilities for the City of Ashland. Not a TAP asset.

[5] Based on remaining value of asset. See Table A-4.

Figure 2 below shows the cost responsibility by city under each option.

Figure 2
CIP Cost Allocation under Options 1 and 2



Estimated CIP Costs by Development Phase
A significant portion of the estimated CIP costs will be incurred in the next ten years under either option. **Figure 3** below shows the estimated costs by phase. Phase 1 represents the next ten years, phase 2 the following ten years, and phase 3 the final twenty years of the forty-year planning period. Estimated costs under Option 2 are almost double those of Option 1 in phase 1, but they are lower than Option 1 in phases 2 and 3. **Table 4** on the next page breaks the costs down by category and by phase.

Figure 3
Summary of CIP Costs by Phase

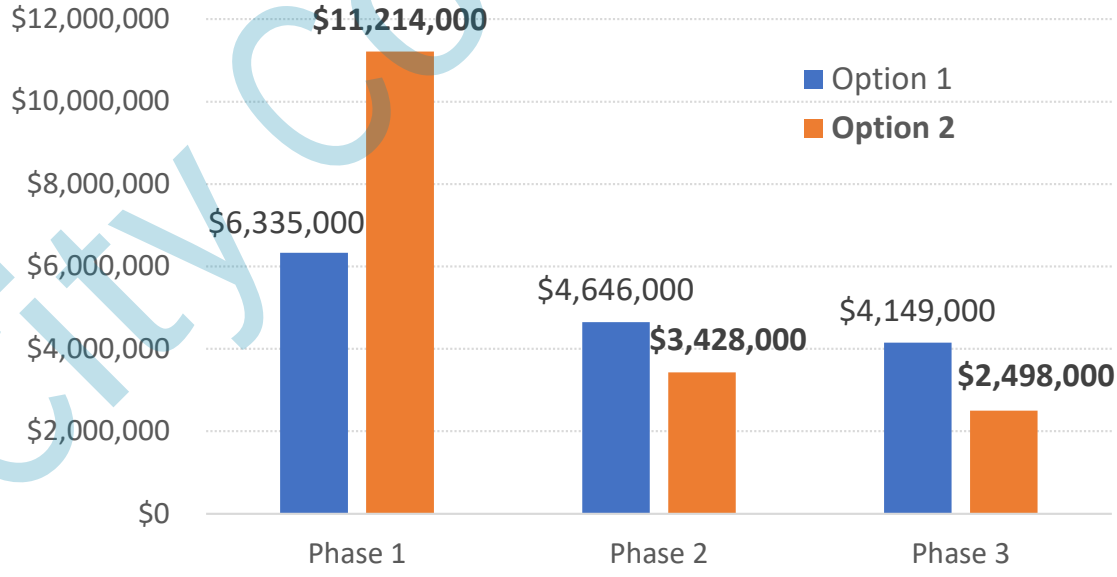


Table 4
Total Estimated CIP Costs by Phase

Option Infrastructure	Phase 1 Next 10 Years	Phase 2 10-20 Years	Phase 3 20-40 Years	Total
		All figures in 2020 $'s		
Option 1				
Pumps	$925,000	$70,000	$0	$995,000
New Supply	$3,409,000	$3,053,000	$1,127,000	$7,589,000
Pipelines	$1,786,000	$1,373,000	$2,872,000	$6,031,000
Studies	$215,000	$150,000	$150,000	$515,000
Total CIP Costs by Phase - Option 1	**$6,335,000**	**$4,646,000**	**$4,149,000**	**$15,130,000**
Option 2				
Pumps	$2,650,000	$70,000	$0	$2,720,000
New Supply	$3,409,000	$3,053,000	$1,127,000	$7,589,000
Pipelines	$4,940,000	$155,000	$1,221,000	$6,316,000
Studies	$215,000	$150,000	$150,000	$515,000
Total CIP Costs by Phase - Option 2	**$11,214,000**	**$3,428,000**	**$2,498,000**	**$17,140,000**
Difference Option 1 and Option 2	**($4,879,000)**	**$1,218,000**	**$1,651,000**	**($2,010,000)**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020. tot ph

Appendix Tables A-1 through **A-3** provide the costs by phase for each city.

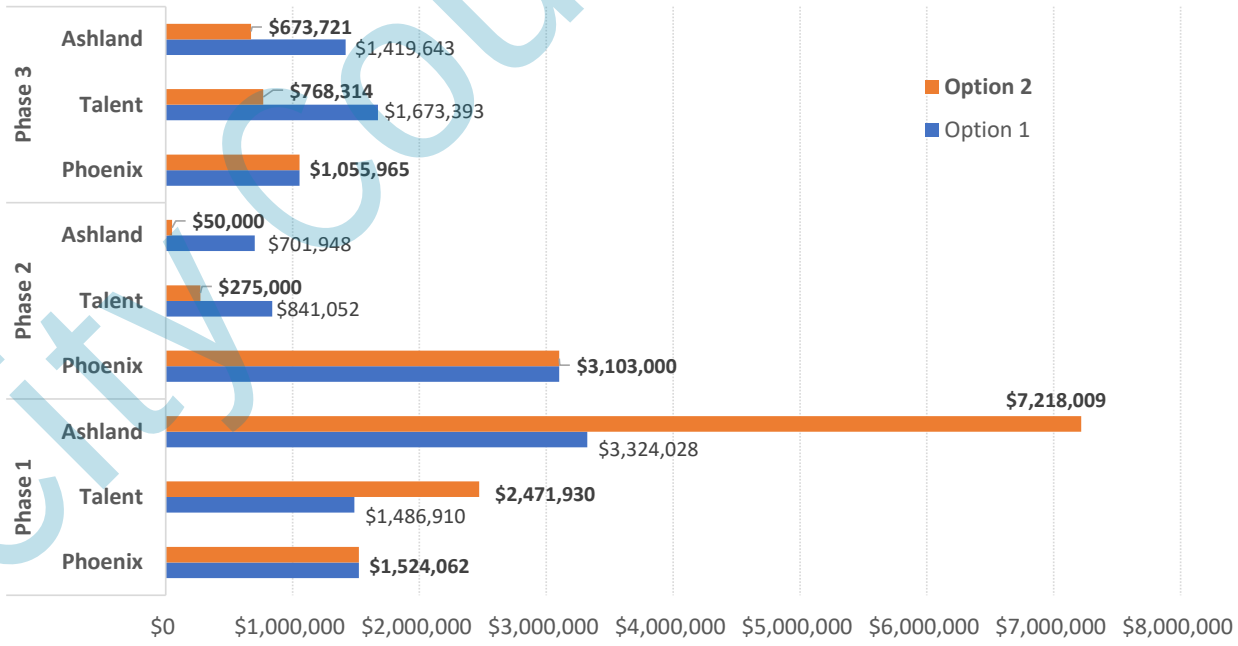
The costs by city are summarized in **Table 5** and illustrated in **Figure 4** on the next page. The financial analysis focuses on the costs in the next ten years; $6.34 million under Option 1, or $11.21 million under Option 2.

Table 5
Summary of CIP Costs by City

City	Option 1	Option 2
Phase 1 Next 10 Years		
Phoenix	$1,524,062	$1,524,062
Talent	$1,486,910	$2,471,930
Ashland	$3,324,028	$7,218,009
Total Phase 1	**$6,335,000**	**$11,214,000**
Phase 2 10-20 Years		
Phoenix	$3,103,000	$3,103,000
Talent	$841,052	$275,000
Ashland	$701,948	$50,000
Total Phase 2	**$4,646,000**	**$3,428,000**
Phase 3 20-40 Years		
Phoenix	$1,055,965	$1,055,965
Talent	$1,673,393	$768,314
Ashland	$1,419,643	$673,721
Total Phase 3	**$4,149,000**	**$2,498,000**
Total Estimated CIP	**$15,130,000**	**$17,140,000**

Source: HEC July 2020. sum cost

Figure 4
Estimated CIP Costs by Phase by City



Planning for Replacement of Existing Capital Assets

In budgeting for TAP water system costs, each city needs to not only plan for the funding of new improvements, but also the replacement of major assets when they reach the end of their useful lives. **Appendix Table A-4** lists all of the current TAP assets, their estimated life span, and the amount that should be set aside each year to pay for replacement of those facilities in future years. Calculation of annual depreciation provides a proxy for the amount that each city should set aside each year for replacement of assets.

Table 6 shows the annual amount of depreciation responsibility by each city if 100% of depreciation was collected and set aside each year. There is currently no obligation for each city to collect an amount for depreciation each year; it is recommended that each city collect for depreciation at some level as this alleviates the need to find funding sources at the time replacement of assets is necessary; however, it is very unlikely that the cities would fully fund depreciation as this would have an undesirable effect on water rates for their customers. Most water utilities do not collect 100% of depreciation each year.

Depreciation of assets is allocated to each city based on historical flow, which approximates use of the facilities. For **Table 6**, the last two years of metered water use (from RVCOG billing records) is used for the cost allocation. Because water use varies from year to year, particularly the quantity of water used by Ashland currently, two years was considered a reasonable historical flow record.

Table 6
Asset Depreciation for Current Facilities by City

Cost Component	TAP System	Phoenix	Talent	Ashland
Pipeline Segment Use by City		*Cost Allocation by Historical Flow [1]*		
Segment 1		*40.46%*	*52.21%*	*7.33%*
Segment 2		*40.46%*	*52.21%*	*7.33%*
Segment 3		*40.46%*	*52.21%*	*7.33%*
Segment 4			*87.69%*	*12.31%*
Segment 5			*87.69%*	*12.31%*
Segment 6 (not a TAP asset)				*100.00%*
Pipelines Annual Depreciation Allocation				
Segment 1	**$38,663**	$15,642	$20,187	$2,833
Segment 2	**$77,063**	$31,177	$40,237	$5,648
Segment 3	**$67,013**	$27,111	$34,990	$4,911
Segment 4	**$9,238**	$0	$8,101	$1,137
Segment 5	**$20,600**	$0	$18,064	$2,536
Segment 6 (not a TAP asset)	**$70,763**	$0	$0	$70,763
Subtotal Pipelines Cost Allocation	**$283,338**	**$73,930**	**$121,580**	**$87,827**
Booster Pump Stations		*Cost Allocation by Historical Flow*		
		40.46%	*52.21%*	*7.33%*
Regional BPS	**$20,297**	**$8,211**	**$10,598**	**$1,487**
			87.69%	*12.31%*
Talent BPS	**$21,383**	**$0**	**$18,751**	**$2,632**
Total Annual Asset Depreciation	**$325,018**	**$82,142**	**$150,929**	**$91,947**

Source: HEC July 2020. city maint

[1] Historical flow in this table is based on RVCOG last 24 months of metered water use April 2018 through March 2020.

Annual Operations and Maintenance Costs

Each city incurs annual operations and maintenance costs for the TAP water system. In this financial analysis, operations costs are those costs that incurred every month for charges by MWC and Pacific Power, as well as the SOS alarm at the RBPS. Maintenance costs are minor item repair costs (electrical fixes and smaller hardware item replacements for example), upkeep of the buildings and grounds.

Estimated Annual Operations Costs by City
Operations costs include those billed monthly by RVCOG for water and power use at the RBPS and TBPS and other miscellaneous costs as well as those incurred by each city that are not reallocated by RVCOG such as Lost Creek water rights, RVSS costs for spills and overflows, and city-wide costs allocated to the water department (and subsequently reallocated to the TAP system specifically). Only those costs that are billed by RVCOG are included in this analysis.

Estimated Annual Maintenance Costs by City
Annual maintenance costs are incurred at the RBPS and the TBPS. Minor and emergency repairs are periodically incurred. The city of Phoenix pays for routine staffing costs of the RBPS, and the city of Talent pays for routine staffing costs of the TBPS. Both cities pay about $10,000 each year to provide these services; to date there has been unofficial agreement that those costs cancel each other out; therefore, there has not been a redistribution of those costs through RVCOG. Hardware costs for equipment components at the two booster pump stations is not currently accounted for at all, neither is potential for costs associated with emergency repairs of pipeline segments.

Table 7 on the following page provides an estimate of routine repair and maintenance costs at the booster pump stations and pipeline segments that are either not currently accounted for, or are currently paid for by the cities of Phoenix and Talent. While in some years zero cost may be incurred for hardware or pipeline fixes, costs may spike in some years. The average annual cost estimate for minor repairs at the booster pump stations is based on cost analysis provided by RH2 Engineering in 2017. The average annual cost estimate for pipeline segment emergency repairs is based on one-tenth of annual depreciation. The latter estimate could be changed to a different level, as deemed most fit by the city members.

The allocation method for costs between the cities in **Table 7** is historical flow for hardware and pipelines (reflecting use of the system by each city), and by thirds/halves for the labor to maintain the equipment, buildings, and grounds (these are costs currently incurred by the cities of Phoenix and Talent that are not shared by all TAP members).

Table 7
Budget for Maintenance Costs, Minor Routine and Emergency Repair Costs

Estimated Routine Maintenance Costs	Avg. Annual Cost Estimate	Allocation Method	Cost Allocation		
			Phoenix	Talent	Ashland
RBPS Hardware	*historical flow [1]*		*40.46%*	*52.21%*	*7.33%*
Pumps	$800	Flow	$324	$418	$59
Valves	$100	Flow	$40	$52	$7
Electrical Equipment	$600	Flow	$243	$313	$44
Building	$400	Flow	$162	$209	$29
Pipes and Valves	$200	Flow	$81	$104	$15
Generator	$600	Flow	$243	$313	$44
Miscellaneous	$300	Flow	$121	$157	$22
Subtotal Hardware	**$3,000**		**$1,214**	**$1,566**	**$220**
Landscaping	$3,850	Thirds	$1,283	$1,283	$1,283
Checks and Responses to Alarms	$4,800	Thirds	$1,600	$1,600	$1,600
Staffing Contingency	$1,350	Thirds	$450	$450	$450
Total Regional Booster Pump Station	**$13,000**		**$4,547**	**$4,900**	**$3,553**
TBPS Hardware	*historical flow [1]*			*87.69%*	*12.31%*
Pumps	$700	Flow		$614	$86
Valves	$300	Flow		$263	$37
Electrical Equipment	$600	Flow		$526	$74
Building	$400	Flow		$351	$49
Pipes and Valves	$200	Flow		$175	$25
Generator	$600	Flow		$526	$74
Miscellaneous	$300	Flow		$263	$37
Subtotal Hardware	**$3,100**			**$2,718**	**$382**
Routine Maintenance	$8,300	Half		$4,150	$4,150
Staffing Contingency	$1,700	Half		$850	$850
Total Talent Booster Pump Station	**$13,100**			**$7,718**	**$5,382**
Pipeline Segments - Emergency & Minor Repairs Allowance (equal to 1/10th depreciation)					
Segment 1 (Phoenix/Talent/Ashland)	$3,866	Flow	$1,564	$2,019	$283
Segment 2 (Phoenix/Talent/Ashland)	$7,706	Flow	$3,118	$4,024	$565
Segment 3 (Phoenix/Talent/Ashland)	$6,701	Flow	$2,711	$3,499	$491
Segment 4 (Talent/Ashland)	$924	Flow		$810	$114
Segment 5 (Talent/Ashland)	$2,060	Flow		$1,806	$254
Total Pipelines Emergency & Minor Repairs	**$21,258**		**$7,393**	**$12,158**	**$1,706**

Source: City of Phoenix RBPS estimates, May 2020, RH2 Engineering 2017 (hardware estimates), and RH2 Engineering June 2020 for remaining costs. maint

[1] Historical flow in this table is based on RVCOG last 24 months of metered water use April 2018 through March 2020.

Current RVCOG Allocation of O&M Costs

Costs that are allocated by RVCOG each month include MWC costs, Pacific Power costs, the SOS alarm at RBPS, and repairs made by contractors at RBPS. The current allocation methodology is shown in **Table 8.**

Table 8
Summary of RVCOG Monthly Cost Allocations

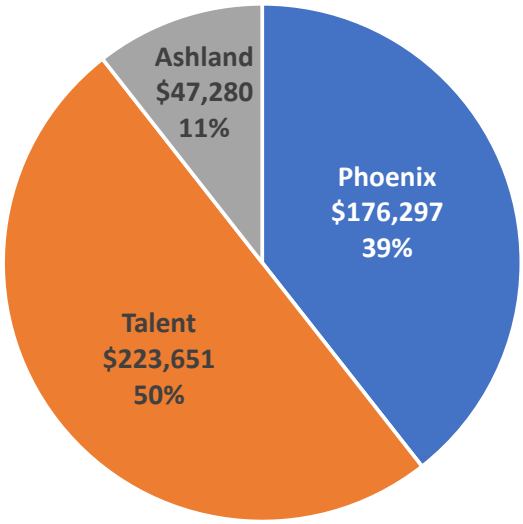
RVCOG Monthly Charges			Phoenix	Talent	Ashland
Medford Water Commission					
Water Use	variable monthly fee	Varies - based on water meter reads			
RBPS Master Meter	flat monthly fee	Each city pays one third	33.33%	33.33%	33.33%
Medford Utility Fees	flat monthly fee	Based on original capacity in IGA	21.78%	58.83%	19.39%
Pacific Power					
Basic Charge	flat monthly fee	Based on original capacity in IGA	21.78%	58.83%	19.39%
Public Purpose	variable monthly fee	Varies - based on electric meter reads			
Energy Conservation	variable monthly fee	Varies - based on electric meter reads			
Low Income Assistance	variable monthly fee	Varies - based on electric meter reads			
J C Boyle Dam Removal	variable monthly fee	Varies - based on electric meter reads			
Copco Iron Gate Dams Removal	variable monthly fee	Varies - based on electric meter reads			
Medford City Franchise	variable monthly fee	Varies - based on electric meter reads			
Metered Use	variable monthly fee	Varies - based on electric meter reads			
SOS Alarm @ RBPS	flat monthly fee	Each city pays one third	33.33%	33.33%	33.33%
Repairs at RBPS [1]	when incurred	Each city pays one third	33.33%	33.33%	33.33%

Source: RVCOG. mo bills

[1] Electrical and radio programming work completed by contractors at RBPS.

In fiscal year 2019 (July 1, 2018 through June 30, 2019), MWC water costs accounted for 88% of the costs billed by RVCOG, Pacific Power costs accounted for 10% of costs, and the SOS alarm and RBPS repairs performed by contractors accounted for 2% of costs. These costs were the responsibility of Talent (50%), Phoenix (39%), and Ashland (11%), as shown in **Figure 5** on the next page. Supporting data for these percentages can be found in **Appendix A, Table A-5.**

Figure 5
RVCOG Fiscal Year 2019 Payments by TAP City



Recommended RVCOG Allocation of O&M Costs

This financial chapter identifies several maintenance costs that are not currently paid for by all TAP member cities. **Table 9** provides recommended changes and additions to the RVCOG allocation of O&M costs.

The facilities listed in **Table 9** are only those that are currently in place. As new facilities are completed, they need to be added to this table, and included in the IGA. The only recommended changes to current allocations are to:

a) ensure that the capacity allocations for fixed costs ("base charges" by MWC and Pacific Power) are based on the current reserved capacities rather than the original IGA, and

b) to allocate repairs by contractors at RBPS by flow rather than capacity.

With regards to a), while the percentages are in fact the same today, upon completion of the pump replacement at RBPS, the percentages will change. **Appendix A, Table A-6** provides the planned capacities of facilities by city through the Master Plan time period. For repairs performed to the pumps, it is more equitable to share these costs according to use of the pumps rather than by equal thirds. New considerations included in **Table 9** include sharing of repairs by contractors at TBPS[1], sharing of maintenance costs at the booster pump stations incurred by Phoenix and Talent city staff (about $10,000 per year each), sharing of booster stations hardware costs, and emergency pipeline segments repair costs when incurred.

[1] Under Option 2, the TBPS reverts back to 100% Talent responsibility.

Table 9
Recommended RVCOG Cost Allocation in New IGA

RVCOG Monthly Charges	Charge / Fee Type	Allocation Methodology	
		Current	Recommended
OPERATIONS COSTS	***As new facilities are constructed they would be added to this list in the IGA***		
Medford Water Commission			
Water Use	variable monthly fee	Metered Water Use	Metered Water Use
RBPS Master Meter	flat monthly fee	Equal Thirds	Equal Thirds
Medford Utility Fees	flat monthly fee	RBPS Orig. IGA Capacity Share	Current RBPS Capacity Share
Pacific Power			
Basic Charge **	flat monthly fee	RBPS Orig. IGA Capacity Share	Current RBPS Capacity Share
Public Purpose	variable monthly fee	Metered Power Use	Metered Power Use
Energy Conservation	variable monthly fee	Metered Power Use	Metered Power Use
Low Income Assistance	variable monthly fee	Metered Power Use	Metered Power Use
J C Boyle Dam Removal	variable monthly fee	Metered Power Use	Metered Power Use
Copco Iron Gate Dams Removal	variable monthly fee	Metered Power Use	Metered Power Use
Medford City Franchise	variable monthly fee	Metered Power Use	Metered Power Use
Metered Use	variable monthly fee	Metered Power Use	Metered Power Use
SOS Alarm @ RBPS	flat monthly fee	Equal Thirds	Equal Thirds
MAINTENANCE COSTS			
Repairs at RBPS [1] [2]	when incurred	Equal Thirds	Last FY Metered Water Use [3]
Repairs at TBPS [1] [2]	when incurred	not included	Last FY Metered Water Use [3]
RBPS Maintenance by Phoenix Staff			
Hardware [2]	when incurred	not included	Last FY Metered Water Use [3]
Labor	variable monthly fee	not included	Equal Thirds
TBPS Maintenance by Talent Staff			
Hardware [2]	when incurred	not included	Last FY Metered Water Use [3]
Labor	variable monthly fee	not included	Equal Halves (Talent/Ashland)
Pipeline Repairs [2]			
Segment 1 (Phoenix/Talent/Ashland)	when incurred	not included	Last FY Metered Water Use [3]
Segment 2 (Phoenix/Talent/Ashland)	when incurred	not included	Last FY Metered Water Use [3]
Segment 3 (Phoenix/Talent/Ashland)	when incurred	not included	Last FY Metered Water Use [3]
Segment 4 (Talent/Ashland)	when incurred	not included	Last FY Metered Water Use [3]
Segment 5 (Talent/Ashland)	when incurred	not included	Last FY Metered Water Use [3]

Source: RVCOG and HEC July 2020. new alloc

** Three meter reads every month (RBPS, TBPS, Ashland) but the basic charge is only for RBPS.

[1] Electrical, radio programming and other work completed by contractors. Includes labor and hardware costs.

[2] Routine and emergency repairs/upgrades, not major capital projects (replacements). May be conducted by City crews or contractors. Costs to be submitted to RVCOG.

[3] When these costs are incurred they would be allocated that month based on the last fiscal year metered water use by city. At the end of the fiscal year a true-up would be necessary, allocating costs by water use in the current fiscal year.

Estimated Financial Impact of TAP Master Plan on Cities

This chapter focuses on the costs of the TAP system that are not currently budgeted for by each city. As such, costs that are included already in city expenses are netted out of the total TAP cost responsibility for that city. The estimated financial impact of the TAP Master Plan for the next ten years (phase 1) for each city is provided in **Appendix A, Tables A-7** through **A-11.** A summary is provided in **Table 10** below. It is important to note that for each city, the costs netted out are only those that are accounted for in adopted rates (through fiscal year 2024 for Talent and 2029 for Phoenix) or included in updated system development charges (Talent and Phoenix). Depreciation is shown at 20% in the illustration of how much should be included in city budgeting; however, this is an estimate and ultimately will depend on the policies of the cities and/or what they are willing to agree to in the amended IGA. Note that the pipeline depreciation cost for Talent shown in **Appendix A, Tables A-8** and **A-9** may be greater than it should be[2].

Table 10
Net Financial Impact to TAP Cities

Options	Phoenix	Talent	Ashland
	Summary of 10-Year Costs		
Option 1			
10-Yr Estimated CIP - NET	($899,438)	$1,083,477	$3,324,028
Operations and Maintenance [1]	$19,401	($9,738)	$106,412
Option 1 Financial Impact	**($880,038)**	**$1,073,738**	**$3,430,440**
Depreciation @ 20% [2]	$164,284	$301,858	$42,369
Option 2	*same as option 1*		
10-Yr Estimated CIP - NET	($899,438)	$2,068,496	$7,218,009
Operations and Maintenance [1]	$19,401	$6,406	$90,268
Option 2 Financial Impact	**($880,038)**	**$2,074,902**	**$7,308,276**
Depreciation @ 20% [2]	$164,284	$301,858	$40,789

Source: HEC July 2020. impact

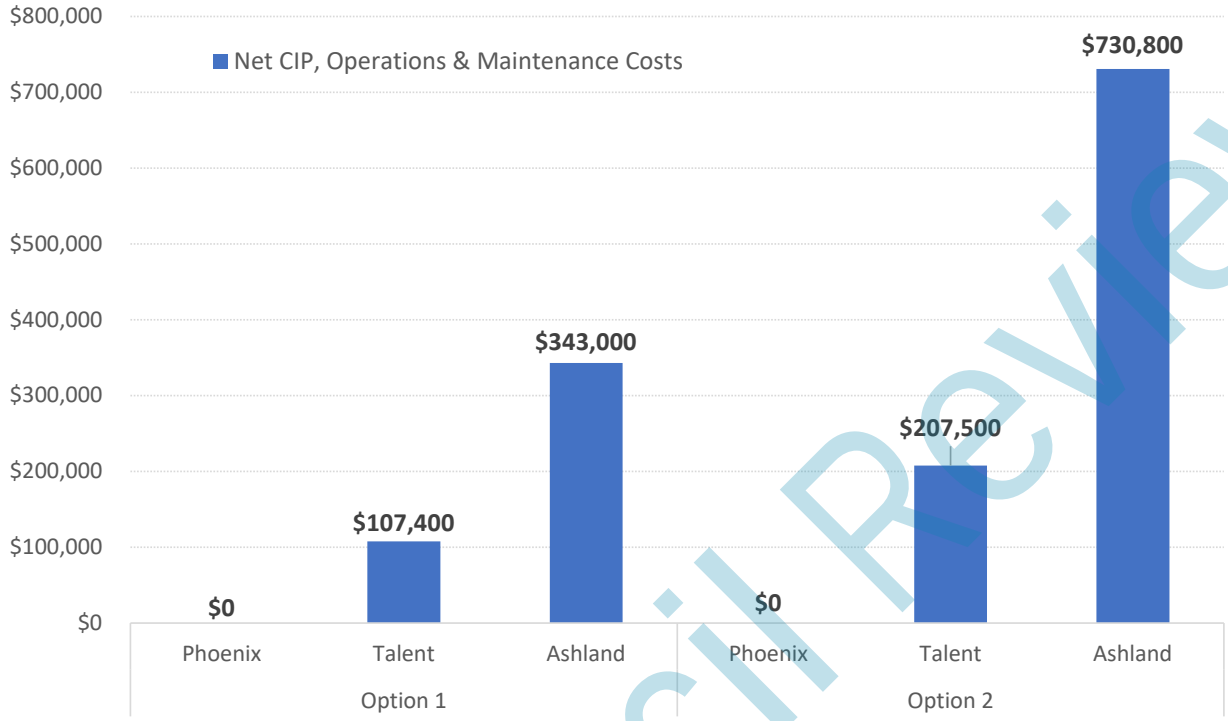
[1] Costs greater than those already accounted for in City budgets.

[2] Depreciation for Ashland excludes pipeline segment 6 which should be included in Citywide asset depreciation funding.

The impact on an annual average basis for the CIP costs and operations and maintenance costs is shown in **Figure 6** on the next page. Depreciation costs are not included in the illustration. The cost impacts are greatest to Ashland in the first ten years under either option because Ashland needs to increase its capacity from the TAP system from 1.6 MGD to 3.0 MGD.

[2] Not in the scope of this study, the pipeline depreciation needs to analyzed in greater depth as pipelines listed in the city's asset list may include some of the TAP pipelines.

Figure 6
Average Annual Additional Cost for TAP by City: Next 10 Years



The financial impact of the costs shown in **Table 10** on rates (existing customers) and system development charges (new customers) is large and unlikely to be acceptable. The cities will have to add the operations costs into rates, and depreciation costs into rates if either bound by the IGA and/or accepted by the City Council of each city. The CIP costs would most likely have to be debt-financed either by selling revenue bonds or by obtaining low-cost financing from the State (see next section).

Table 11 on the next page provides a very preliminary calculation of the impact of debt financing Phase 1 TAP improvements to city water funds. Keep in mind that annual debt service would begin at least six months after the bond or loan proceeds are obtained. Debt service repayments would likely not begin until fiscal year 2027 or 2028. For each city, the ability to debt-finance needs to be made in light of existing debt obligations and debt service coverage ratios requirements. The figures presented here are preliminary and only intended to provide an illustration of magnitude of potential impact.

- For the City of Phoenix, provided new growth is realized at the pace projected in the Master Plan, which would yield about $200,000 per year, there would not be a need to issue debt. If new growth is not realized at the pace projected, the city may also have to issue debt.

- For the City of Talent, the annual debt service would be approximately $105,000 under Option 1, or approximately $205,000 under Option 2.

- For the City of Ashland, the annual debt service would be approximately $325,000 under Option 1, or approximately $705,000 under Option 2. Completion of TAP system improvements may require reshuffling timing of other City water CIP improvements.

Table 11
Estimated Debt Service for Phase 1 Improvements

Item		Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
		OPTION 1			OPTION 2		
Bond Proceeds (Project Cost)		$0	$1,083,477	$3,324,028	$0	$2,068,496	$7,218,009
Term Assumptions	*20 years*		*5.50% interest rate*				
Bond Sizing							
Capitalized Interest	6 months	$0	$29,800	$91,410	$0	$56,880	$198,500
Issuance Costs	3%	$0	$32,500	$99,720	$0	$62,050	$216,540
Underwriter's Discount	1%	$0	$10,830	$33,240	$0	$20,680	$72,180
Bond Reserve Fund	1 year debt service	$0	$105,800	$324,400	$0	$201,900	$704,400
Estimated Bond Size		**$0**	**$1,262,407**	**$3,872,798**	**$0**	**$2,410,006**	**$8,409,629**
Bond Size Adjusted for Rounding		**$0**	**$1,264,000**	**$3,876,000**	**$0**	**$2,412,000**	**$8,417,000**
Estimated Annual Debt Service		**$0**	**$105,800**	**$324,400**	**$0**	**$201,900**	**$704,400**

Source: HEC July 2020. debt

A very high-level analysis was completed for the financial impact of the TAP system in the next ten-year period by city. The analysis is for a residential home using 7,500 gallons per month. Over the next ten years, the average annual impact to a home in 2020 dollars is estimated at:

- **City of Phoenix** - about $0.06 to $0.54 per month, depending on the level of depreciation included in the water rates.

- **City of Talent** – about $2.50 to $3.23 per month, depending on the level of depreciation included in the water rates (Option 1) or $4.84 to $5.56 per month (Option 2). Operations costs decrease under Option 1 because Ashland would share in the operations and maintenance costs of TBPS.

- **City of Ashland** – about $2.80 to $2.83 per month, depending on the level of depreciation included in the water rates (Option 1) or $5.96 to $6.00 per month (Option 2). Debt service would not start until at least six months after bond sales; the rate impacts would be lower in the first five years.

The high-level financial impact analysis is presented in **Table 12** on the next page. The financial impact is likely greater for Talent than Ashland even though the total cost to Ashland is greater because of size of customer base of the two cities.

Table 12
High-Level Analysis Impact of TAP System Phase 1 Costs

Item	Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
	OPTION 1			OPTION 2		
CIP - Debt Service [1]	$0	$105,800	$324,400	$0	$201,900	$704,400
Operations & Maintenance	$1,940	($974)	$10,641	$1,940	$641	$9,027
Depreciation @ 20%	$16,428	$30,186	$4,237	$16,428	$30,186	$4,079
Totl Annual Add'l Cost	**$18,368**	**$135,012**	**$339,278**	**$18,368**	**$232,726**	**$717,506**
Approx. Annual Thousands of Gallons Sold (2021-2030)	255,000	313,900	897,600	255,000	313,900	897,600
Cost per Thousand Gallons						
CIP - Debt Service [1]	$0.00	$0.34	$0.36	$0.00	$0.64	$0.78
Operations & Maintenance	$0.01	($0.00)	$0.01	$0.01	$0.00	$0.01
Depreciation @ 20%	$0.06	$0.10	$0.00	$0.06	$0.10	$0.00
Totl Annual Add'l Cost	**$0.07**	**$0.43**	**$0.38**	**$0.07**	**$0.74**	**$0.80**
Monthly Home Use (gallons)	7,500	7,500	7,500	7,500	7,500	7,500
Approx. Monthly Cost Impact	**$0.54**	**$3.23**	**$2.83**	**$0.54**	**$5.56**	**$6.00**
CIP - Debt Service [1]	$0.00	$2.53	$2.71	$0.00	$4.82	$5.89
Operations & Maintenance	$0.06	($0.02)	$0.09	$0.06	$0.02	$0.08
Depreciation @ 20%	$0.48	$0.72	$0.04	$0.48	$0.72	$0.03

Source; HEC July 2020. bill impact

[1] Debt service would not start until at least 6 months after bond sales (likely in second half of the 10-year period).

Funding Strategy and Conclusions of Financial Analysis

Funding Strategy

All three cities have their own water capital improvements programs in addition to the TAP system that have required some significant increases in water rates over the past several years and/or have adopted rate schedules that are likely reaching the tolerance level of water customers to meet obligations of their water systems. Talent and Ashland do not have reserves of cash that can fund their share of TAP system CIP costs in the next ten years because the reserves that they have are already designated for other projects. As a result, the cities will need to seek advantageous financing to secure TAP system water supplies in the next ten years.

The best source of financing for all three cities is the Oregon Infrastructure Financing Authority (IFA) which has several programs that could fund the TAP water system improvements. The cities of Talent and Phoenix, which are Disadvantaged[3] and have populations less than 10,000, could also apply to the USDA water and wastewater funding program. The IFA can provide repayment over 30 years, and USDA provides for repayment over 40 years, which helps defray the costs over time. Interest rates will be lower than for municipal market revenue bonds, and the IFA and USDA could possibly provide some grant-funding and/or zero percent interest terms.

The IGA is a legally binding agreement to work cooperatively, it does not create a new, separate legal identity. As such, if the cities sell revenue bonds, they should act to mimic a joint authority[4], to obtain the best funding terms. To the extent that bond sales can be coordinated to occur at the same time, the cities may be able to benefit from a pooled bond sale.

Conclusions of Financial Analysis

- Cost should not be the sole deciding factor between options 1 and 2; a cost-benefit analysis should be considered for the differences in the options for Talent and Ashland. The cities should conduct a cost-benefit analysis of the two options, including operational advantages and long-term operational costs, resiliency and environmental advantages, ease of facilitation and construction, and other factors.

- Cost allocation methodology for depreciation costs should be agreed to. This chapter uses the last 24 months of flow data from RVCOG, but that can be amended. It behooves the cities to include some level of depreciation funding in their annual budgets for the TAP system, but it is not a requirement, unless agreed to in the updated IGA.

- Operations, maintenance, and replacement costs should be separated and accounted for by each city. Operations costs include those billed monthly by RVCOG for water and power use at the RBPS and TBPS and other miscellaneous costs as well as those incurred by each city that are not reallocated by RVCOG such as Lost Creek water rights, RVSS costs for spills and overflows, and city-wide costs allocated to the water department (and subsequently reallocated to the TAP system specifically). Only those costs that are billed by RVCOG are included in this analysis. Maintenance costs include labor for maintenance at the booster pump stations, minor repair costs for booster pump station components, and emergency repair costs for pipeline segments. Maintenance costs may be incurred by city crews or by contractors. Replacement costs are for major capital assets. Replacement costs are accounted for in the depreciation calculations.

- The financial impact is estimated to be greatest for Ashland if TAP asset depreciation is not included in the rates, but greatest for Talent if depreciation is included in the rates.[5] All cities currently plan for between 1.50% and 5.25% annual rate increases for the next ten years. While each city needs to

[3] Disadvantaged communities are those with a median household income lower than 80% of the State's median household income.
[4] Reference to Oregon Revised Statutes 198.705.
[5] Note, verification of pipeline assets in Talent's depreciation costs need to be verified; some TAP assets may be included (which would lower the depreciation costs included in Table 12).

evaluate the impact in greater depth, the short-term impact can likely be absorbed by each city with modest rate increases and shuffling of CIP priorities/delaying some City CIP projects. For Phoenix, all of the CIP costs are already accounted for in their adopted rates and water SDC schedule; however, growth may not materialize as projected, in which case it is possible that Phoenix would have to sell bonds to pay for CIP projects.

- Only Phoenix may have the financial resources to pay for the TAP CIP when the facilities are needed. The cities should seek lowest-cost financing for the CIP; most likely this would be from the IFA. If selling revenue bonds, the cities should seek to mimic a joint authority with a pooled bond sale, if possible.

Key Considerations for an Updated IGA

Updated IGA Considerations

This chapter of the Master Plan makes three recommendations for consideration by the TAP partner cities in drafting an updated IGA:

1. **Addition of Description of Improvements and Cost Responsibility.** A matrix or table showing the current reserved capacity by city should be included in the New IGA. As new improvements are added (or taken away) to/from the TAP system, the table should be updated. The capacity shares determine the amount of funding for a facility that each city is responsible is for, and it is used as the basis to split base costs of ongoing operations and maintenance costs (for example, the monthly MWC master meter base charge at RBPS and the monthly basic power charge). The matrix provides a simple way to keep the IGA current.

2. **Minor Repairs/Emergency Repairs/Asset Upkeep Costs Redistributed by RVCOG**. It is recommended that the cities of Phoenix and Talent submit costs for maintenance of the booster pump stations to RVCOG. Maintenance costs include labor and small hardware costs for such activities as checking the alarm systems, landscaping, minor generator repairs, maintenance of electrical equipment, valve replacements, air vac valve maintenance, building painting, heaters, and so forth. Maintenance costs do not include replacement of major equipment components which would be included in the CIP. The submitted costs would be allocated to each city based on use of the TAP system, as approximated by metered water use records for the previous twelve months. At the end of the fiscal year, actual metered water use records would be used for an annual true-up of maintenance costs at the booster pump stations.

   Similarly, any emergency repair costs incurred for pipeline segments would be handled the same way.

3. **Formalize Set Aside of Funds for Asset Replacement.** Currently, it cannot be verified that any of the cities put aside an amount each year for replacement of TAP assets. The City of Talent puts aside an amount each year for minor repairs and hardware costs at the TBPS, but this is not sufficient to include depreciation costs of major capital facilities. The City of Talent collects for depreciation of pipelines costs, some of which might include some TAP pipelines or portions of pipelines; however, this needs to be determined. The City of Ashland collects for a portion of depreciation in its rates,

but it does not appear that the asset list upon which the depreciation is calculated includes TAP facilities. This would also need to be determined.

Under this third recommendation for the new IGA, each city would be required to put aside a percentage of their share of TAP system depreciation costs (or alternatively, a set dollar amount) each year into a separate fund kept at their respective city. Each city would remain in charge of the money in that fund and would retain the ability to borrow from that fund in the event that is necessary; given however, that any money borrowed is required to be replenished by resolution of the city council. If the IGA were to be amended to require each city to put aside an amount for depreciation of TAP facilities each year, language must retain flexibility for the amount to change; the cost allocation of asset depreciation would need to be revisited each time there are water supply, booster pump station, or pipeline improvements.

ATTACHMENT A

TAP MASTER PLAN FINANCIAL ANALYSIS SUPPORT TABLES

Table A-1
TAP Water Master Plan
Costs by Phase for Phoenix **PHOENIX**

Infrastructure	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total **Option 1**	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total **Option 2**
Regional Booster (RBPS)	**OPTION 1 - All Figures in 2020 $'s**				**OPTION 2 - All Figures in 2020 $'s**			
Replace (1) 50-hp pump with 125-hp	$25,000			$25,000	$25,000			$25,000
Programming Updates	$11,667			$11,667	$11,667			$11,667
Subtotal RBPS	**$36,667**	**$0**	**$0**	**$36,667**	**$36,667**	**$0**	**$0**	**$36,667**
N. Phoenix Rd								
MWC Study	$32,832			$32,832	$32,832			$32,832
Master Meter Connection	$213,407			$213,407	$213,407			$213,407
Pipe Improvements to 2030	$1,019,205			$1,019,205	$1,019,205			$1,019,205
Pipe Improvements to 2040		$3,053,000		$3,053,000		$3,053,000		$3,053,000
Pipe Improvements through Buildout			$740,031	$740,031			$740,031	$740,031
Total N. Phoenix Rd Supply Project	**$1,265,445**	**$3,053,000**	**$740,031**	**$5,058,475**	**$1,265,445**	**$3,053,000**	**$740,031**	**$5,058,475**
Ashland Non-Peak Supply Connection	$84,944			$84,944	$84,944			$84,944
Seismic Upgrades Segment 2			$265,934	$265,934			$265,934	$265,934
ODOT Bridge Pipe Relocation	$65,340			$65,340	$65,340			$65,340
New IGA	$16,667			$16,667	$16,667			$16,667
TAP Master Plan Updates (every 10 yrs)	$50,000	$50,000	$50,000	$150,000	$50,000	$50,000	$50,000	$150,000
Telemetry Summary Report	$5,000			$5,000	$5,000			$5,000
Total Estimated Costs	**$1,524,062**	**$3,103,000**	**$1,055,965**	**$5,683,026**	**$1,524,062**	**$3,103,000**	**$1,055,965**	**$5,683,026**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020.

Table A-2
TAP Water Master Plan
Costs by Phase for Talent

TALENT

Infrastructure	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total Option 1	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total Option 2
Regional Booster (RBPS)	**OPTION 1 - All Figures in 2020 $'s**				**OPTION 2 - All Figures in 2020 $'s**			
Replace (1) 50-hp pump with 125-hp	$0			$0	$0			$0
Programming Updates	$11,667			$11,667	$11,667			$11,667
Subtotal RBPS	**$11,667**	**$0**	**$0**	**$11,667**	**$11,667**	**$0**	**$0**	**$11,667**
Talent Booster (TBPS)								
Install 50-hp pump for operations	$50,000			$50,000	$50,000			$50,000
Programming Updates	$25,000			$25,000	$25,000			$25,000
Generator Upgrade	$191,867			$191,867	$250,000			$250,000
Additional Hydraulic Analysis	$6,000			$6,000	$6,000			$6,000
Seismic Upgrades		$38,373		$38,373		$70,000		$70,000
Expansion	$61,538			$61,538	$178,000			$178,000
Subtotal TBPS	**$334,406**	**$38,373**	**$0**	**$372,779**	**$509,000**	**$70,000**	**$0**	**$579,000**
Adjust for Previous Improvements to TBPS [5]					$171,500			$171,500
Ashland Non-Peak Supply Connection	$78,056			$78,056	$78,056			$78,056
Seismic Upgrades Segment 2			$718,314	$718,314			$718,314	$718,314
Adjust for Creel Road Pipe (HWY 99 to Talent Ave) [1]					$77,550			$77,550
ODOT Bridge Pipe Relocation	$176,490			$176,490	$176,490			$176,490
Talent to Ashland Improvements								
Pipe along Irrigation Canal	$814,625			$814,625				$0
Talent BPS Suction and Discharge		$752,679		$752,679				$0
Hwy 99 (Anjou Club to Rapp)			$905,078	$905,078				$0
Subtotal Talent to Ashland Improvements	**$814,625**	**$752,679**	**$905,078**	**$2,472,382**	**$0**	**$0**	**$0**	**$0**
Talent to Ashland Improvements								
Pipe along Irrigation Canal [1]				$0	$1,376,000			$1,376,000
Talent Pump Station Discharge Pipe [1]				$0		$155,000		$155,000
Subtotal Talent to Ashland Improvements	**$0**	**$0**	**$0**	**$0**	**$1,376,000**	**$155,000**	**$0**	**$1,531,000**
New IGA	$16,667			$16,667	$16,667			$16,667
TAP Master Plan Updates (every 10 yrs)	$50,000	$50,000	$50,000	$150,000	$50,000	$50,000	$50,000	$150,000
Telemetry Summary Report	$5,000			$5,000	$5,000			$5,000
Total Estimated Costs	**$1,486,910**	**$841,052**	**$1,673,393**	**$4,001,355**	**$2,471,930**	**$275,000**	**$768,314**	**$3,515,244**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020.

talent

[1] Dedicated facilities for the City of Talent. Not a TAP asset.

Table A-3
TAP Water Master Plan
Costs by Phase for Ashland

ASHLAND

Infrastructure	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total **Option 1**	Phase 1 *Next 10 Years*	Phase 2 *10-20 Years*	Phase 3 *20-40 Years*	Total **Option 2**
Regional Booster (RBPS)	**OPTION 1 - All Figures in 2020 $'s**				**OPTION 2 - All Figures in 2020 $'s**			
Replace (1) 50-hp pump with 125-hp	$25,000			$25,000	$25,000			$25,000
Programming Updates	$11,667			$11,667	$11,667			$11,667
Subtotal RBPS	**$36,667**	**$0**	**$0**	**$36,667**	**$36,667**	**$0**	**$0**	**$36,667**
Talent Booster (TBPS)								
Generator Upgrade	$158,133			$158,133				$0
Additional Hydraulic Analysis	$6,000			$6,000	$6,000			$6,000
Seismic Upgrades		$31,627		$31,627				$0
Expansion	$341,462			$341,462				$0
Subtotal TBPS	**$505,594**	**$31,627**	**$0**	**$537,221**	**$6,000**	**$0**	**$0**	**$6,000**
New Ashland Booster Pump Station [1]				$0	$2,050,000			$2,050,000
Adjust for Previous Improvements to TBPS [5]				$0	($171,500)			($171,500)
N. Phoenix Rd								
MWC Study	$17,168			$17,168	$17,168			$17,168
Master Meter Connection	$111,593			$111,593	$111,593			$111,593
Pipe Improvements to 2030	$1,851,795			$1,851,795	$1,851,795			$1,851,795
Pipe Improvements to 2040		$0		$0		$0		$0
Pipe Improvements through Buildout			$386,969	$386,969			$386,969	$386,969
Total N. Phoenix Rd Supply Project	**$1,980,555**	**$0**	**$386,969**	**$2,367,525**	**$1,980,555**	**$0**	**$386,969**	**$2,367,525**
Seismic Upgrades Segment 2			$236,752	$236,752			$236,752	$236,752
Adjust for Creel Road Pipe (HWY 99 to Talent Ave) [1]					($77,550)			($77,550)
ODOT Bridge Pipe Relocation	$58,170			$58,170	$58,170			$58,170
Talent to Ashland Improvements								
Pipe along Irrigation Canal	$671,375			$671,375				$0
Talent BPS Suction and Discharge		$620,321		$620,321				$0
Hwy 99 (Anjou Club to Rapp)			$745,922	$745,922				$0
Subtotal Talent to Ashland Improvements	**$671,375**	**$620,321**	**$745,922**	**$2,037,618**	**$0**	**$0**	**$0**	**$0**
Ashland Dedicated Pipe [1]				$0	$3,264,000			$3,264,000
New IGA	$16,667			$16,667	$16,667			$16,667
TAP Master Plan Updates (every 10 yrs)	$50,000	$50,000	$50,000	$150,000	$50,000	$50,000	$50,000	$150,000
Telemetry Summary Report	$5,000			$5,000	$5,000			$5,000
Total Estimated Costs	**$3,324,028**	**$701,948**	**$1,419,643**	**$5,445,619**	**$7,218,009**	**$50,000**	**$673,721**	**$7,941,730**

Source: RH2 Engineering, Draft MP CIP tables, June 19, 2020.

ashland

[1] Dedicated facilities for the City of Ashland. Not a TAP asset.

Table A-4
TAP Water Master Plan
Remaining Value of Original TAP Assets

Original Facilities	Estimated Replacement Cost Data Source	Estimated Replacement Cost Current	Useful Life	Year Installed	Years Depreciated	Remaining Life	Cost per Year	Accumulated Depreciation	Remaining Value
Pipelines Segments [1]	**2018 $'s**	**2020 $'s**	**years**						
1 Hwy 99 (MWC connection Garfield St. to RBPS)	$2,973,750	$3,093,000	80	2001	19	61	$38,663	$734,588	$2,358,413
2 Hwy 99 (RBPS to Talent Meter)	$5,928,000	$6,165,000	80	2001	19	61	$77,063	$1,464,188	$4,700,813
3 Hwy 99 (Talent Meter to Suncrest Rd)	$5,155,313	$5,361,000	80	2001	19	61	$67,013	$1,273,238	$4,087,763
4 Suncrest Rd (Hwy 99 to TBPS)	$710,938	$739,000	80	2001	19	61	$9,238	$175,513	$563,488
5 Hwy 99 (Rapp Rd to Creel Rd)	$1,584,375	$1,648,000	80	2013	7	73	$20,600	$144,200	$1,503,800
Total Pipelines	**$16,352,375**	**$17,006,000**					**$212,575**	**$3,791,725**	**$13,214,275**
Regional Booster Pump Station	**2017 $s**	**2020 $'s**							
110 Pump	$60,000	$67,000	40	2005	15	25	$1,675	$25,125	$41,875
120 Pump	$60,000	$67,000	40	2005	15	25	$1,675	$25,125	$41,875
130 Pump	$80,000	$89,000	40	2005	15	25	$2,225	$33,375	$55,625
140 Pump	$80,000	$89,000	40	2005	15	25	$2,225	$33,375	$55,625
MOV 110	$7,500	$8,000	40	2005	15	25	$200	$3,000	$5,000
Check Valve 110	$4,000	$4,000	40	2005	15	25	$100	$1,500	$2,500
MOV 120	$7,500	$8,000	40	2005	15	25	$200	$3,000	$5,000
Check Valve 120	$4,000	$4,000	40	2005	15	25	$100	$1,500	$2,500
MOV 130	$7,500	$8,000	40	2005	15	25	$200	$3,000	$5,000
Check Valve 130	$4,000	$4,000	40	2005	15	25	$100	$1,500	$2,500
MOV 140	$7,500	$8,000	40	2005	15	25	$200	$3,000	$5,000
Check Valve 140	$4,000	$4,000	40	2005	15	25	$100	$1,500	$2,500
VFD 1	$20,000	$22,000	20	2005	15	5	$1,100	$16,500	$5,500
VFD 2	$20,000	$22,000	20	2005	15	5	$1,100	$16,500	$5,500
Electrical Equipment	$40,000	$44,000	30	2005	15	15	$1,467	$22,000	$22,000
Telemetry and SCADA	$25,000	$28,000	20	2005	15	5	$1,400	$21,000	$7,000
Building	$300,000	$333,000	100	2005	15	85	$3,330	$49,950	$283,050
Generator	$52,000	$58,000	20	2005	15	5	$2,900	$43,500	$14,500
Total Regional Booster Pump Station	**$783,000**	**$867,000**					**$20,297**	**$304,450**	**$562,550**
Talent Booster Pump Station	**2017 $s**	**2020 $'s**							
Pump 1	$40,000	$44,000	10	2005	10	0	$4,400	$44,000	$0
Pump 2	$40,000	$44,000	10	2005	10	0	$4,400	$44,000	$0
Replacement Pump 1 (100 to 125 hp)	$86,000	$98,000	40	2015	5	35	$2,450	$12,250	$85,750
Replacement Pump 2 (100 to 125 hp)	$86,000	$98,000	40	2015	5	35	$2,450	$12,250	$85,750
Pump 1 Piping and Valves	$4,000	$4,000	30	2005	15	15	$133	$2,000	$2,000
Pump 2 Piping and Valves	$4,000	$4,000	30	2005	15	15	$133	$2,000	$2,000
VFD 1	$20,000	$22,000	20	2005	15	5	$1,100	$16,500	$5,500
VFD 2	$20,000	$22,000	20	2005	15	5	$1,100	$16,500	$5,500
Electrical Equipment	$40,000	$44,000	30	2005	15	15	$1,467	$22,000	$22,000
Telemetry and SCADA	$15,000	$17,000	20	2005	15	5	$850	$12,750	$4,250
Building [2]	$0	$0	100	2005	15	85	$0	$0	$0
Generator	$52,000	$58,000	20	2005	15	5	$2,900	$43,500	$14,500
Total Talent Booster Pump Station	**$407,000**	**$455,000**					**$21,383**	**$227,750**	**$227,250**
Total Replacement Cost Estimate		**$18,328,000**					**$254,255**	**$4,323,925**	**$14,004,075**
Source: March 28, 2017 RH2 Engineering Memorandum"TAP Cost Allocation Recommendations", and RH2 Engineering June 2020.									assets
[1] Segment 6 Hwy 99 (Creel Rd to Ashland BPS to N. Main St.) is not a TAP asset.									
[a] Creel Road Reimbursement from Talent to	2006 $	2020 $							
Ashland for 550 LF under Option 2	$63,275	$94,000	80	2006	14	66	$1,175	$16,450	$77,550
[2] Considered a sunk cost. The building was already owned by the City of Talent.									

Table A-5
TAP Water Master Plan
Summary of Payments for Fiscal Year 2019

Billed Item	Total	Phoenix	Talent	Ashland
Medford Water Commission				
Water Use	$381,883	$152,290	$193,612	$35,981
RBPS Master Meter	$10,666	$3,555	$3,555	$3,555
Medford Utility Fees	$336	$73	$197	$65
Pacific Power				
Basic Charge	$972	$212	$572	$189
Public Purpose	$1,159	$451	$605	$103
Energy Conservation	$1,101	$429	$568	$104
Low Income Assistance	$273	$106	$141	$26
J C Boyle Dam Removal	$161	$74	$74	$14
Copco Iron Gate Dams Removal	$437	$170	$226	$41
Medford City Franchise	$1,391	$541	$726	$123
Metered Use	$37,678	$14,671	$19,651	$3,356
SOS Alarm @ RBPS	$539	$180	$180	$180
Repairs at RBPS [1]	$10,630	$3,543	$3,543	$3,543
Total Payments for Fiscal Year 2019	**$447,228**	**$176,297**	**$223,651**	**$47,280**
Percent of Total Payments	100%	39%	50%	11%

Source: RVCOG historical billing records. rvcog

[1] Bills for work completed by contractors at RBPS.

Table A-6
TAP Water Master Plan
Supply Facilities Estimated Capacity Shares by City

TAP Facilities Capacity	Phoenix	Talent	Ashland	Phoenix	Talent	Ashland
Regional Booster Pump Station	OPTION 1			OPTION 2		
Original IGA Capacity	21.78%	58.83%	19.39%			
Current Capacity	21.78%	58.83%	19.39%		same	
Anticipated Capacity by 2030	26.04%	49.95%	24.01%		as	
Anticipated Capacity by 2040	26.04%	49.95%	24.01%		option 1	
Anticipated Capacity by 2060	26.04%	49.95%	24.01%			
Talent Booster Pump Station						
Original IGA Capacity	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%
Current Capacity	0.00%	69.70%	31.30%	0.00%	69.70%	31.30%
Anticipated Capacity by 2030	0.00%	43.97%	45.18%	0.00%	58.48%	23.65%
Anticipated Capacity by 2040	0.00%	43.97%	45.18%	0.00%	58.48%	23.65%
Anticipated Capacity by 2060	0.00%	43.97%	45.18%	0.00%	58.48%	23.65%
Ashland Non-Peak Supply Connection (New)						
Anticipated Capacity by 2030	52.11%	47.89%	0.00%		same	
Anticipated Capacity by 2040	52.11%	47.89%	0.00%		as	
Anticipated Capacity by 2060	52.11%	47.89%	0.00%		option 1	
N. Phoenix Road Supply (New)						
Anticipated Capacity by 2030	35.50%	0.00%	64.50%		same	
Anticipated Capacity by 2040	49.46%	0.00%	50.54%		as	
Anticipated Capacity by 2060	65.66%	0.00%	34.34%		option 1	

Source: RH2 Engineering, June 19, 2020.

cap sum

Table A-7
TAP Water Master Plan
Phoenix 10-Year Budget for TAP System

SHORT-TERM COSTS (next 10 years)

Estimated TAP Expenses	Total in 2020 $'s	Fiscal Year Ending 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Improvements		***Timing is illustrative, not yet determined***									
RBPS Replace (1) 50-hp pump with 125-hp	$25,000					$25,000					
RBPS Programming Updates	$11,667						$11,667				
N. Phoenix Rd. MWC Study	$32,832		$32,832								
N. Phoenix Rd. Master Meter Connection	$213,407								$213,407		
N. Phoenix Rd. Pipe Improvements to 2030	$1,019,205								$509,603	$509,603	
Ashland Non-Peak Supply Connection	$84,944			$84,944							
ODOT Bridge Pipe Relocation	$65,340	$65,340									
New IGA	$16,667	$16,667									
TAP Master Plan Updates (every 10 yrs)	$50,000										$50,000
Telemetry Summary Report	$5,000		$5,000								
Subtotal Capital Improvements	**$1,524,062**	**$82,007**	**$37,832**	**$84,944**	**$0**	**$25,000**	**$11,667**	**$0**	**$723,010**	**$509,603**	**$50,000**
TAP Costs Included in Rates and Water SDCs											
ODOT Bridge Pipe Relocation [1]	($100,000)	($100,000)									
Increase RBPS Capacity [1]	($200,000)					($200,000)					
RBPS SCADA Programming [1]	($100,000)						($100,000)				
N. Phoenix Road New Supply [1]	($2,000,000)								($2,000,000)		
TAP Master Plan Updates [1]	($23,500)										($23,500)
TAP Costs Already Included in Phoenix Fees	**($2,423,500)**	**($100,000)**	**$0**	**$0**	**$0**	**($200,000)**	**($100,000)**	**$0**	**($2,000,000)**	**$0**	**($23,500)**
Net Estimated CIP	**($899,438)**	**($17,993)**	**$37,832**	**$84,944**	**$0**	**($175,000)**	**($88,333)**	**$0**	**($1,276,990)**	**$509,603**	**$26,500**
Depreciation @ 20% [2]		***Recommended, not required, to build up funds for replacement of assets***									
RBPS Replacements	$16,423	$1,642	$1,642	$1,642	$1,642	$1,642	$1,642	$1,642	$1,642	$1,642	$1,642
Pipeline Segments 1-3 Replacements	$147,861	$14,786	$14,786	$14,786	$14,786	$14,786	$14,786	$14,786	$14,786	$14,786	$14,786
Subtotal Depreciation	**$164,284**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**	**$16,428**
Operations and Maintenance		***Note: these operations costs exclude costs already accounted for in the city's annual budget for RVCOG***									
Minor repairs & Maintenance @ RBPS	$45,470	$4,547	$4,547	$4,547	$4,547	$4,547	$4,547	$4,547	$4,547	$4,547	$4,547
Emergency/Minor repairs Pipelines 1-3	$73,930	$7,393	$7,393	$7,393	$7,393	$7,393	$7,393	$7,393	$7,393	$7,393	$7,393
Subtotal Operations	**$119,401**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**	**$11,940**
less RBPS Maintenance Costs already paying	($100,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)
Net Operations & Maintenance	**$19,401**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**	**$1,940**
Total Net New Costs for City TAP Budget	**($615,754)**	**$10,375**	**$66,200**	**$113,312**	**$28,368**	**($146,632)**	**($59,965)**	**$28,368**	**($1,248,622)**	**$537,971**	**$54,868**

Source: HEC July 2020.

phoenix ops

[1] Rates and SDC-funded portion of project costs; Phoenix adopted a 10-year rate schedule July 2019.

[2] Includes only current facilities. As new assets as built, collection for depreciation of those assets should begin.

Table A-8
TAP Water Master Plan
Talent 10-Year Budget for TAP System: Option 1 **SHORT-TERM COSTS (next 10 years)** **OPTION 1**

Estimated TAP Expenses	Total in 2020 $'s	Fiscal Year Ending 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Improvements		***Timing is illustrative, not yet determined***									
RBPS Programming Updates	$11,667						$11,667				
TBPS Install 50-hp pump for operations	$50,000	$50,000									
TBPS SCADA Updates	$25,000							$25,000			
TBPS Generator Upgrade	$191,867							$191,867			
TBPS Additional Hydraulic Analysis	$6,000						$6,000				
TBPS Expansion	$61,538							$61,538			
Ashland Non-Peak Supply Connection	$78,056			$78,056							
ODOT Bridge Pipe Relocation	$176,490	$176,490									
Pipe along Irrigation Canal	$814,625									$814,625	
New IGA	$16,667	$16,667									
TAP Master Plan Updates (every 10 yrs)	$50,000										$50,000
Telemetry Summary Report	$5,000		$5,000								
Subtotal Capital Improvements	**$1,486,910**	**$243,157**	**$5,000**	**$78,056**	**$0**	**$0**	**$17,667**	**$278,406**	**$0**	**$814,625**	**$50,000**
TAP Costs Included in Rates and Water SDCs											
ODOT Bridge Pipe Relocation (included in rates)	($100,000)	($100,000)									
RBPS Programming Updates [1]	($50,000)						($50,000)				
TBPS Generator Upgrade [1]	($95,934)							($95,934)			
TBPS Third Pump Expansion [1]	($57,500)							($57,500)			
TBPS Install 50-hp pump for operations [1]	($50,000)	($50,000)									
TAP Master Plan Updates (every 10 years) [1]	($50,000)										($50,000)
TAP Costs Already Included in Talent Fees	**($403,434)**	**($150,000)**	**$0**	**$0**	**$0**	**$0**	**($50,000)**	**($153,434)**	**$0**	**$0**	**($50,000)**
Net Estimated CIP	**$1,083,477**	**$93,157**	**$5,000**	**$78,056**	**$0**	**$0**	**($32,333)**	**$124,972**	**$0**	**$814,625**	**$0**
Depreciation @ 20% [2]		***Recommended, not required, to build up funds for replacement of assets***									
RBPS Replacements	$21,195	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120
TBPS Replacements	$37,503	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750
Pipeline Segments 1-5 Replacements	$243,159	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316
Total Depreciation	**$301,858**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**
Operations and Maintenance		***Note: these operations costs exclude costs already accounted for in the city's annual budget for RVCOG***									
Minor repairs & Maintenance @ RBPS	$48,998	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900
Minor repairs & Maintenance @ TBPS	$77,184	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718
Emergency/Minor repairs Pipelines 1-5	$121,580	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158
Subtotal Operations	**$247,762**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**
less Maintenance Costs already collected by Talent	($157,500)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)
less TBPS Maintenance Costs already paying	($100,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)
Net Operations	**($9,738)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**
Total Net New Costs for City TAP Budget	**$1,633,096**	**$148,119**	**$59,962**	**$133,018**	**$54,962**	**$54,962**	**$22,629**	**$179,934**	**$54,962**	**$869,587**	**$54,962**

Source: HEC July 2020. talent op1

[1] SDC-funded portion of project costs only.

[2] Includes only current facilities. As new assets as built, collection for depreciation of those assets should begin.

Table A-9
TAP Water Master Plan
Talent 10-Year Budget for TAP System: Option 2 **SHORT-TERM COSTS (next 10 years)** **OPTION 2**

Estimated TAP Expenses	Total in 2020 $'s	Fiscal Year Ending 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Improvements		***Timing is illustrative, not yet determined***									
RBPS Programming Updates	$11,667						$11,667				
TBPS Install 50-hp pump for operations	$50,000	$50,000									
TBPS SCADA Updates	$25,000							$25,000			
TBPS Generator Upgrade	$250,000							$250,000			
TBPS Additional Hydraulic Analysis	$6,000						$6,000				
TBPS Expansion	$178,000							$178,000			
Adjustment for Previous Improvements to TBPS	$171,500										$171,500
Ashland Non-Peak Supply Connection	$78,056			$78,056							
Adjustment for Creel Road Pipe	$77,550						$77,550				
ODOT Bridge Pipe Relocation	$176,490	$176,490									
Pipe along Irrigation Canal	$1,376,000									$1,376,000	
New IGA	$16,667	$16,667									
TAP Master Plan Updates (every 10 yrs)	$50,000										$50,000
Telemetry Summary Report	$5,000		$5,000								
Subtotal Capital Improvements	**$2,471,930**	**$243,157**	**$5,000**	**$78,056**	**$0**	**$0**	**$95,217**	**$453,000**	**$0**	**$1,376,000**	**$221,500**
TAP Costs Included in Rates and Water SDCs											
ODOT Bridge Pipe Relocation (included in rates)	($100,000)	($100,000)	$0	$0	$0	$0	$0	$0	$0	$0	$0
RBPS Programming Updates [1]	($50,000)	$0	$0	$0	$0	$0	($50,000)	$0	$0	$0	$0
TBPS Generator Upgrade [1]	($95,934)	$0	$0	$0	$0	$0	$0	($95,934)	$0	$0	$0
TBPS Third Pump Expansion [1]	($57,500)	$0	$0	$0	$0	$0	$0	($57,500)	$0	$0	$0
TBPS Install 50-hp pump for operations [1]	($50,000)	($50,000)	$0	$0	$0	$0	$0	$0	$0	$0	$0
TAP Master Plan Updates (every 10 years) [1]	($50,000)	$0	$0	$0	$0	$0	$0	$0	$0	$0	($50,000)
TAP Costs Already Included in Talent Fees	**($403,434)**	**($150,000)**	**$0**	**$0**	**$0**	**$0**	**($50,000)**	**($153,434)**	**$0**	**$0**	**($50,000)**
Net Estimated CIP	**$2,068,496**	**$93,157**	**$5,000**	**$78,056**	**$0**	**$0**	**$45,217**	**$299,566**	**$0**	**$1,376,000**	**$171,500**
Depreciation @ 20% [2]		***Recommended, not required, to build up funds for replacement of assets***									
RBPS Replacements	$21,195	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120	$2,120
TBPS Replacements [3]	$38,430	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$3,750	$4,059	$4,059	$4,059
Pipeline Segments 1-5 Replacements	$243,159	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316	$24,316
Total Depreciation	**$302,785**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,186**	**$30,495**	**$30,495**	**$30,495**
Operations and Maintenance		***Note: these operations costs exclude costs already accounted for in the city's annual budget for RVCOG***									
Minor repairs & Maintenance @ RBPS	$48,998	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900	$4,900
Minor repairs & Maintenance @ TBPS [3]	$93,329	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$7,718	$13,100	$13,100	$13,100
Emergency/Minor repairs Pipelines 1-5	$121,580	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158	$12,158
Subtotal Operations	**$263,906**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$24,776**	**$30,158**	**$30,158**	**$30,158**
less Maintenance Costs already collected by Talent	($157,500)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)	($15,750)
less TBPS Maintenance Costs already paying	($100,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)	($10,000)
Net Operations	**$6,406**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**($974)**	**$4,408**	**$4,408**	**$4,408**
Total Net New Costs for City TAP Budget	**$2,635,187**	**$148,119**	**$59,962**	**$133,018**	**$54,962**	**$54,962**	**$100,179**	**$354,528**	**$60,653**	**$1,436,653**	**$232,153**

Source: HEC July 2020. talent op2

[1] SDC-funded portion of project costs only.
[2] Includes only current facilities. As new assets as built, collection for depreciation of those assets should begin.

Table A-10
TAP Water Master Plan
Ashland 10-Year Budget for TAP System: Option 1 **SHORT-TERM COSTS (next 10 years)** **OPTION 1**

Estimated TAP Expenses	Total in 2020 $'s	Fiscal Year Ending 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Improvements		***Timing is illustrative, not yet determined***									
RBPS Replace (1) 50-hp pump with 125-hp	$25,000	$25,000									
RBPS Programming Updates	$11,667						$11,667				
TBPS Generator Upgrade	$158,133							$158,133			
TBPS Additional Hydraulic Analysis	$6,000						$6,000				
TBPS Expansion	$341,462							$341,462			
N. Phoenix Rd MWC Study	$17,168		$17,168								
N. Phoenix Rd Master Meter Connection	$111,593								$111,593		
N. Phoenix Rd Pipe Improvements to 2030	$1,851,795								$925,897	$925,897	
ODOT Bridge Pipe Relocation	$58,170	$58,170									
Pipe along Irrigation Canal	$671,375									$671,375	
New IGA	$16,667	$16,667									
TAP Master Plan Updates (every 10 yrs)	$50,000										$50,000
Telemetry Summary Report	$5,000		$5,000								
Subtotal Capital Improvements	**$3,324,028**	**$99,837**	**$22,168**	**$0**	**$0**	**$0**	**$17,667**	**$499,594**	**$1,037,490**	**$1,597,272**	**$50,000**
Depreciation @ 20% [1]		***Recommended, not required, to build up funds for replacement of assets***									
RBPS Replacements	$2,975	$297	$297	$297	$297	$297	$297	$297	$297	$297	$297
TBPS Replacements	$5,264	$526	$526	$526	$526	$526	$526	$526	$526	$526	$526
Pipeline Segments 1-5 Replacements	$34,130	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413
Subtotal Depreciation	**$42,369**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**
Operations and Maintenance		***Note: these operations costs exclude costs already accounted for in the city's annual budget for RVCOG***									
Minor repairs & Maintenance @ RBPS	$35,532	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553
Minor repairs & Maintenance @ TBPS	$53,816	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382
Emergency/Minor repairs Pipelines 1-5	$17,065	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706
Subtotal Operations	**$106,412**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**
Total Net New Costs for City TAP Budget	**$3,472,809**	**$114,715**	**$37,046**	**$14,878**	**$14,878**	**$14,878**	**$32,545**	**$514,473**	**$1,052,368**	**$1,612,150**	**$64,878**

Source: HEC July 2020. ashland op1

[1] Includes only current facilities. As new assets as built, collection for depreciation of those assets should begin.

Table A-11
TAP Water Master Plan
Ashland 10-Year Budget for TAP System: Option 2 **SHORT-TERM COSTS (next 10 years)** **OPTION 2**

Estimated TAP Expenses	Total in 2020 $'s	Fiscal Year Ending 2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Improvements		***Timing is illustrative, not yet determined***									
RBPS Replace (1) 50-hp pump with 125-hp	$25,000					$25,000					
RBPS Programming Updates	$11,667						$11,667				
TBPS Additional Hydraulic Analysis	$6,000						$6,000				
New Ashland Booster Pump Station	$2,050,000							$2,050,000			
Adjust for Previous Improvements to TBPS	($171,500)							($171,500)			
N. Phoenix Rd MWC Study	$17,168		$17,168								
N. Phoenix Rd Master Meter Connection	$111,593								$111,593		
N. Phoenix Rd Pipe Improvements to 2030	$1,851,795								$925,897	$925,897	
Adjust for Creel Road Pipe	($77,550)							($77,550)			
ODOT Bridge Pipe Relocation	$58,170	$58,170									
Ashland Dedicated Pipe	$3,264,000									$3,264,000	
New IGA	$16,667	$16,667									
TAP Master Plan Updates (every 10 yrs)	$50,000										$50,000
Telemetry Summary Report	$5,000		$5,000								
Subtotal Capital Improvements	**$7,218,009**	**$74,837**	**$22,168**	**$0**	**$0**	**$25,000**	**$17,667**	**$1,800,950**	**$1,037,490**	**$4,189,897**	**$50,000**
Depreciation @ 20% [1]		***Recommended, not required, to build up funds for replacement of assets***									
RBPS Replacements	$2,975	$297	$297	$297	$297	$297	$297	$297	$297	$297	$297
TBPS Replacements	$3,685	$526	$526	$526	$526	$526	$526	$526	$0	$0	$0
Pipeline Segments 1-5 Replacements	$34,130	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413	$3,413
Subtotal Depreciation	**$40,789**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$4,237**	**$3,710**	**$3,710**	**$3,710**
Operations and Maintenance		***Note: these operations costs exclude costs already accounted for in the city's annual budget for RVCOG***									
Minor repairs & Maintenance @ RBPS	$35,532	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553	$3,553
Minor repairs & Maintenance @ TBPS	$37,671	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$5,382	$0	$0	$0
Emergency/Minor repairs Pipelines 1-5	$17,065	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706	$1,706
Subtotal Operations	**$90,268**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$10,641**	**$5,260**	**$5,260**	**$5,260**
Total Net New Costs for City TAP Budget	**$7,349,066**	**$89,715**	**$37,046**	**$14,878**	**$14,878**	**$39,878**	**$32,545**	**$1,815,828**	**$1,046,460**	**$4,198,867**	**$58,970**

Source: HEC July 2020. ashland op2

[1] Includes only current facilities. As new assets as built, collection for depreciation of those assets should begin.

Appendix 6C

TAP System Intergovernmental Agency Agreement Recommendations

TECHNICAL MEMORANDUM

Client:	TAP Partner Cities		
Project:	TAP Water Master Plan		
Project File:	TAP 1019158.00.0001.0109	Project Manager:	Rachel Lanigan PE
Composed by:	Rachel Lanigan PE		
Reviewed by:	Jeff Ballard PE		
Subject:	TAP System Intergovernmental Agreement Recommendations		
Date:	August 19, 2020		

Signed: 08/19/20

Purpose

The purpose of this technical memorandum (TM) is to provide recommendations to the Cities of Talent, Ashland, and Phoenix (Partner Cities) for developing an updated intergovernmental agreement (IGA) for the Talent Ashland Phoenix (TAP) Water Supply. The recently completed *TAP Water Master Plan* (WMP) summarizes the initial and current standing IGAs between the TAP Partner Cities, the Medford Water Commission (MWC), and Rogue Valley Council of Governments (RVCOG). Several elements of the existing IGAs are no longer applicable or are outdated. With 20 years of operation of the TAP System, the TAP Partner Cities have a deeper understanding of the management, operations, and maintenance requirements that should be documented with clear roles and responsibilities. With the completion of the first TAP WMP, a new IGA is recommended to improve management of the system and capture the latest understanding between the TAP Partner Cities, the capacity needs of each City, and cost allocations to operate and maintain the system. The recommendations stem from a review of

the existing IGAs, understanding of the TAP infrastructure and operations, and financial considerations resulting from the TAP WMP.

General Recommendations

A new IGA between the TAP Partner Cities should encompass all elements of the existing IGAs (with updates) and expand to include new management and cost needs that have arisen. As such, the new IGA should supersede and nullify existing IGAs to have one clear document going forward. Developing an IGA with guidance or support from an external party (such as RVCOG or a consultant) is recommended to provide a neutral moderator that ensures equity and fairness among the three cities. The IGA should reflect the current agreeable relationships between the TAP Partner Cities but also include clear language on roles, responsibilities, and cost-sharing assumptions so that if future conflicts arise, the IGA provides clear guidance. It is recommended that the TAP Partner Cities establish the details of the IGA prior to engaging legal professionals to finalize the terms.

Additionally, the new IGA should be flexible enough to accommodate changes in the system and City staff without requiring significant amendments. For example, rather than establishing each City's total capacity of the facilities, the new IGA could establish the method to determine each City's capacity share to allow changes to capacities that do not require an IGA amendment. Another example is to have an external contact list that can be modified separately. These examples will allow the IGA to last longer and apply through changing conditions.

It is assumed that the new IGA will require City Council approval by each TAP Partner City.

Through the process of updating the TAP Partner Cities IGA, the need for an updated IGA with RVCOG may also be identified.

Management Recommendations

Management recommendations for the new IGA include clearly defining roles and responsibilities of the TAP Partner Cities. These include roles and responsibilities for operations, maintenance, stockpiling spare parts, coordinating locates, communication protocols, and commitments to regular management meetings.

In addition to clarifying roles and responsibilities, the new IGA should address several management elements not currently documented. These include, but are not limited to:

- Insurance of TAP facilities;
- File storage; and
- Data sharing and visual rights of supervisory control and data acquisition (SCADA) data.

Financial Recommendations

The majority of the following financial recommendations were provided by Hansford Economics, LLC during development of the TAP WMP (see **Appendix 6B**).

1. **Document Existing and New TAP Facilities**. The new IGA should clearly document the current TAP facilities and the capacity for use in developing maintenance and depreciation cost allocations. A stand-alone matrix or table that documents the information for these facilities could be external to the IGA to allow for updates. This will clarify that some of the originally constructed TAP facilities are no longer part of the TAP system, while others are. A table of this type was prepared for the financial analysis for the WMP. Reviewing and confirming the assumptions in the table are recommended for inclusion in the IGA.
2. **Add a Description of Improvements and Cost Responsibility**. The matrix or table of TAP assets should also include the current reserved capacity of each facility by City. As new improvements are added to, or taken away from, the TAP system, the table should be updated. The capacity shares determine the amount of funding for a facility that each City is responsible for, and would be used as the basis to divide ongoing operations and maintenance costs (e.g., the monthly MWC master meter base charge at the Regional BPS and the monthly basic power charge). The matrix provides a simple way to keep the IGA current.
3. **Improve Tracking of Minor Repairs/Emergency Repairs/Asset Upkeep Costs Redistributed by RVCOG**. It is recommended that the Cities of Phoenix and Talent submit costs for maintenance of the booster pump stations to RVCOG. Maintenance costs include labor and small hardware costs for such activities as checking the alarm systems, landscaping, minor generator repairs, maintenance of electrical equipment, valve replacements, air vacuum valve maintenance, building painting, heaters, etc. Maintenance costs do not include replacement of major equipment components that would be included in the TAP WMP Capital Improvement Plan. The submitted costs would be allocated to each City based on use of the TAP system, as approximated by metered water use records for the previous 12 months. At the end of the fiscal year, actual metered water use records would be used for an annual adjusted maintenance costs allocation at the booster pump stations. Similarly, any emergency repair costs incurred for pipeline segments would be handled the same way.
4. **Formalize Funds Set Aside for Asset Replacement**. Under the new IGA, each City would allocate a percentage of its share of TAP system depreciation costs (or alternatively, a set dollar amount) each year into a separate fund held in reserve at its respective city. Each City would remain in charge of the money in that fund and would retain the ability to borrow from that fund in the event that it becomes necessary; given however, that any money borrowed is required to be replenished by resolution of the City Council. If the IGA were to be amended to require each City to put aside an amount for depreciation of TAP facilities each year, language must retain flexibility for the amount

to change, and the cost allocation of asset depreciation would need to be revisited each time there are water supply, booster pump station, or pipeline improvements.

Other Recommendations

Other recommendations for the new IGA include the following:

- Incorporate results of the regional water rights strategy as applicable;
- Specify mechanism for dispute resolution; and
- Provide methods for amending or voiding the IGA.