- EXECUTIVE SUMMARY -

ES.1 INTRODUCTION

This report presents the findings and recommendations relating to the Burley municipal potable water system study. This study was commissioned by the City in an effort to determine the current state of the water system and to plan for future needs. Burley owns and operates a water supply and distribution system.

The planning study updates previous studies to reflect current and projected conditions, as well as address current regulations. A review of the fundamental planning elements such as population, water supply and demand, development and household densities, and fire flow requirements is presented. The study also includes an analysis of the system, a summary of recommendations, and a capital improvement plan. Figures and supporting data for the information presented in this report have been included in the appendices for reference.

ES.2 EXISTING WATER FACILITIES

The City of Burley operates six wells, three water storage tanks, and three booster stations as part of the Burley potable water system. The City also owns two additional wells, two tanks, and a booster station that currently service private industries. Water is disinfected with tablet sodium hypochlorite before entering the storage tanks. Pressure is generally provided in the distribution system by means of the booster stations located near the storage tanks. The City's water distribution system is composed of a network of pipelines totaling approximately 72 miles, and ranging from 1 to 16 inches in diameter as illustrated in Figure 3.1, located in Appendix A. The majority of the pipeline network consists of 6-inch PVC water lines. The City's distribution system contains about 680 fire hydrants.

ES.3 WATER USAGE

Water users consist of single-residence homes, commercial, and industrial. The City's current water billing structure is base rate plus usage.

A summary of 2012 water system demands is presented in Table ES.1. For planning purposes, demands have been rounded in the design columns.

Table ES.1: Existing System Demands

	Gallons per Capita per Day (gpcd)	Gallons per Minute (gpm)
Average Winter Day	192	1,407
Average Annual Day	292	2,139
Average Summer Day	450	3,297
Max Day	747	5,473
Peak Hour	948	6,945

ES.4 POPULATION AND WATER DEMAND PROJECTIONS

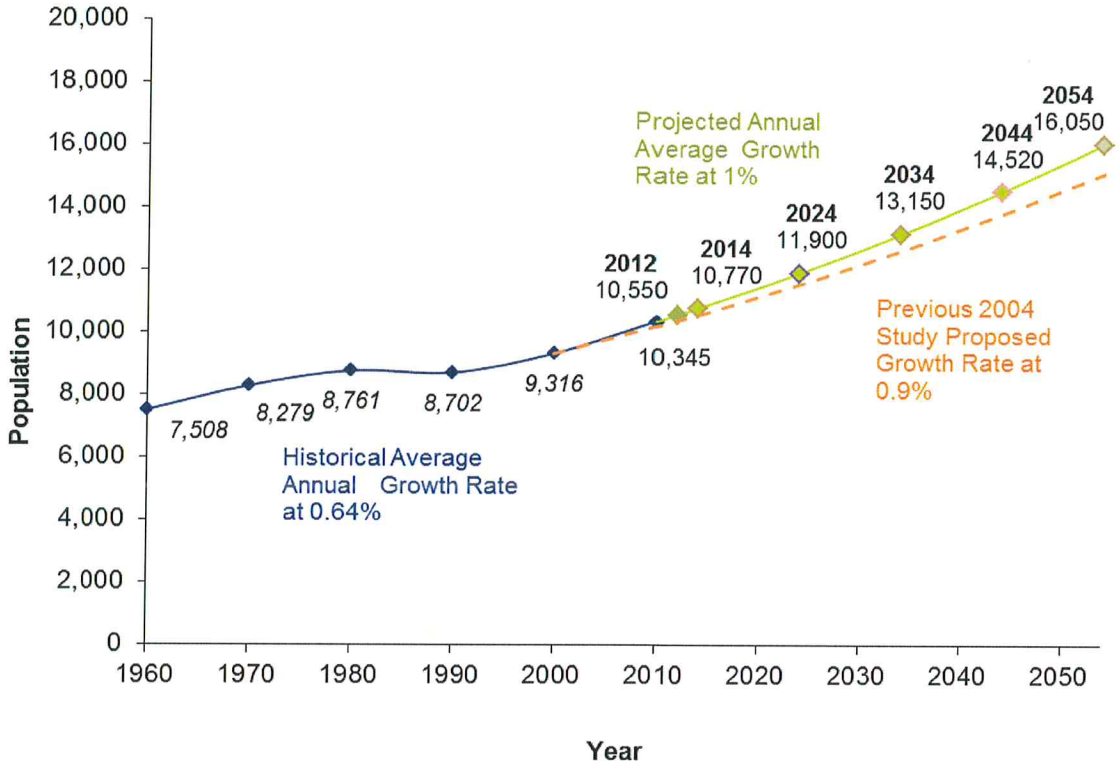
Burley's historical and projected population is illustrated in Chart ES.1. Table ES.2 shows future populations and assumed rates of growth. Future demands were calculated assuming an annual growth rate of 1.0% as selected by the City for the purpose of this planning study. This is above the 0.64% average over the last four decades, but is reasonable for the growth that Burley may see throughout the next twenty years. This growth rate results in 2022 and 2032 populations of 11,660 and 12,890 people, respectively

Throughout the study, Keller Associates has attempted to tie growth-related capital improvements to a population benchmark. Future demands are presented in Table ES.5.

Table ES.2: Historical and Future Populations

	Year	Population	Compound Annual Growth Rate
Historical Census Data	1960	7,508	-
	1970	8,279	0.98%
	1980	8,761	0.57%
	1990	8,702	-0.07%
	2000	9,316	0.68%
	2010	10,345	1.05%
Projected Data	2012	10,550	1.00%
	2014	10,770	1.00%
	2024	11,900	1.00%
	2034	13,150	1.00%
	2044	14,520	1.00%
	2054	16,050	1.00%

Chart ES.1: Future System Population Projections



Design densities refer to anticipated development densities for residential land use within the study area, and the average household density. These densities serve as the basis for estimating potable demands in areas yet to be developed. Table ES.3 and Table ES.4 present design densities per gross acre of undeveloped residential zones, as well as residential household densities for Burley. The residential housing densities are derived from historical densities and input from the City. The average household density assumed for this study is consistent with the household density reported for the City of Burley in the year 2010 US Census.

Table ES.3: Land Use Summary and Density Estimates

Planning Horizon	Year	Pop.	Estimated Service Area (acres)	Growth from Current (acres)	Average Density * (people/ac)
Existing System	2012	10,550	2,377	-	4.44
20-year Horizon	2032	12,890	2,904	527	4.44
Infill of City Limits	2068	18,401	4,146	1,769	4.44
Build-out of Impact Area	2169	50,373	11,350	8,973	4.44

Planning Criteria

* Includes all land uses (residential, commercial, and industrial) – projections assume existing ratios of land-uses will remain relatively constant

Table ES.4: Design Densities

Description	Density	
2010 Census Average Household Density	2.76 people/home	
Burley Residential 1 – Single-Family District	≤3.0 homes/acre	≤8.3 people/acre
Burley Residential 2 – Limited Multi-Family District	≤3.7 homes/acre	≤10.2 people/acre
Burley Residential 3 – General Multi-Family District	≤4.3 homes/acre	≤11.9 people/acre

Based on the planning values for per capita demands in Table ES.1 and population projections in Table ES.2, future demand projections were developed (Table ES.5).

Table ES.5: Future System Demand Projections

	Planning Criteria (gpcd)	Peaking Factor	2014	2024	2034	2044	2054
Projected Population:	-	-	10,770	11,900	13,140	14,510	16,030
			(gpm)				
Annual Average Day	292	1.0	2,184	2,917[c]	3,723[c]	4,615[c]	5,599[c]
Average Summer Day	450	1.54	3,366	4,496	5,740	7,114	8,627
Max Day	747	2.56	5,587	7,462	9,527	11,810	14,327
Peak Hour[a]	948	3.25	7,090	9,470	12,091	14,984	18,178
MDD+Fire[b]	-	-	10,087	11,962	14,027	16,310	18,827
			(MGD)				
Annual Average Day	292	1.0	3.14	4.20	5.36	6.65	8.06
Average Summer Day	450	1.54	4.85	6.47	8.27	10.24	12.42
Max Day	747	2.56	8.05	10.75	13.72	17.00	20.63
Peak Hour[a]	948	3.25	10.21	13.64	17.41	21.58	26.18

[a] Peak Hour = 1.27 * Max Day; based on peak summer day SCADA data

[b] Reflects 4,500 gpm Fire Demand, per City's existing commitment to select industries

[c] Includes an additional 500 gpm every 10 years for new industries (beyond that already included in the planning criteria per capita demand).

[d] All projections assume current ratio of potable/nonpotable irrigation connections remain constant.

ES.5 SYSTEM EVALUATION

The scope of this study included both capacity and condition evaluations of the supply, delivery, and storage components. Keller Associates also evaluated the methods for water treatment.

ES.5.1 Well Supply

The water source for Burley is groundwater. The total pumping capacity of Burley's wells is 10,500 gpm. The Department of Environmental Quality (DEQ) requires that a system meet maximum day demands with the largest source out of service. This is referred to as the firm capacity, and for Burley this equates to 7,000 gpm, which is sufficient for existing maximum day demands. In order to supply future maximum day demands with the largest pump offline, the City would need an additional 2,500 gpm of pumping capacity by 2034 based on the current planning assumptions for growth and future industry.

The City's water rights of 39.26 cfs (17,600 gpm) are sufficient for the projected 20-year maximum day demand. A new point of diversion will be necessary for any future wells.

ES.5.2 Water Quality

The City has not reported any customer complaints for nuisance contaminants, which cause taste and odor problems.

ES.5.3 Storage

The City has three storage tanks with a capacity of 4.75 million gallons. The existing tanks will provide adequate storage volume for the next 20+ years.

ES.5.4 Booster Pump Stations

Most of the water is delivered from the City's storage reservoirs to their customers via three booster pump stations and two pressure zones separated by one pressure reducing/regulating valve (PRV). There are two wells which pump directly into the water system. The total pumping capacity of the booster pumps is 20,750 gpm. The firm capacity (with the largest pump off-line) is 16,750 gpm. DEQ requires that the system deliver the greater of peak hour demands or maximum day demands plus fire demands with the system's firm delivery capacity. Collectively, the booster pumps have adequate pumping capacity for existing and future max day demand plus fire flow for the total system. However, flow across the PRV is limited due to headlosses which restricts actual available flows in the north zone. Additional pumping capacity is recommended for the north zone booster station at Well 4.

ES.5.5 Distribution System Piping

An evaluation of the City's distribution piping is presented in Chapter 4. Several recommended improvements are presented in the master plan to correct existing deficiencies and accommodate future growth. One of the challenges of the existing distribution system is the large number of small pipelines. Approximately

20 percent of pipelines are 4 inches or smaller. Additionally, approximately 40 percent of the system is made up of 6-inch diameter piping (generally considered the minimum water main size), which struggles to deliver current fire demands for larger homes and businesses. Many communities have established a minimum pipe diameter standard of 8 inches.

ES.5.6 System Protection

To protect Burley's water system from the damaging effects of over-pressurizing, pressure relief valves are recommended at Wells 2 and 3. All booster pumps delivering water to the system from the storage tanks are already outfitted with a safe outlet for over-pressurization conditions.

ES.6 CAPITAL IMPROVEMENT PLAN

The Capital Improvement Plan (CIP) is summarized in Table ES.6 and illustrated in Figure 4.1 in Appendix A. The CIP includes priority improvements to meet City water quality goals and regulatory requirements for supply, delivery, storage, and distribution. The costs presented in Table ES.6 are concept level planning estimates and should be refined as the project progresses.

Table ES.6: Capital Improvement Plan Estimate of Most Probable Cost

ID	Description	Probable Cost[a,c]
Priority 1 Improvements (~ 5 yrs)[b]		
1A	Well 4 Booster Station Upgrade	$ 473,000
1B	Well 4 Tank Repairs	$ 61,000
1C	Well 5 Tank Repairs	$ 112,000
1D	Gossner Tank Painting and Improvements	$ 284,000
	Total Priority 1 Improvements	**$ 930,000**
Priority 2 Improvements (5-10 yrs)[b]		
2A	New S. Overland Mainline & Couplet Replacement	$ 1,525,000
2B	New N. Overland Mainline Couplet Replacement	$ 715,000
2C	4-inch Intertie Replacement (RR South)	$ 698,000
2D	4-inch Intertie Replacement (RR North)	$ 387,000
2E	New W. Main Mainline	$ 2,146,000
2F	Burley Inn Mainline Replacement	$ 161,000
	Total Priority 2 Improvements	**$ 5,632,000**
Priority 3 Improvements (10-15 yrs)[b]		
3A	6-inch Replacement Mainline	$ 106,000
3B	New Intertie and 4-inch Replacement	$ 431,000
3C	New Interties and 4-inch Replacement	$ 452,000
3D	6-inch Replacement near Hospital	$ 896,000
3E	New Intertie	$ 288,000
3F	New Intertie	$ 121,000
3G	New Well (by 1,413 gpm increase in MDD; est. in year 2024)	$ 1,503,000
3H	Creation of South Pressure Zone – New Booster Station	$ 1,542,000
	Total Priority 3 Improvements	**$ 5,339,000**
Priority 4 Improvements (15-20+ yrs)[b]		
4A	New North Industrial Park Loop	$ 206,000
4B	N. Overland Industrial Loops	$ 282,000
4C	6-inch Replacement, Commercial Loop	$ 685,000
4D	New Airport & Treatment Plant Loops	$ 2,461,000
4E	Stockyard Loop	$ 317,000
4F	SE Residential Fire Flow Loop & 4-inch Replacement	$ 267,000
(4G)	4-inch Replacement Program	$ 6,927,000
	Total Priority 4 Improvements	**$ 11,145,000**
	TOTAL (rounded)	**$ 23,046,000**

a) All costs in 2014 Dollars. Costs include engineering, contingencies, Davis-Bacon Act wage rates, and American Iron and Steel (AIS) Act requirements.

b) Timing depends on when growth occurs. Development participation anticipated.

c) The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.

ES.7 PROJECT FUNDING AND USER RATE IMPACTS

The City has certified that they have the capability to finance and manage the building and operation of the proposed improvements. This section summarizes the funding and potential user rate impacts associated with implementation of the master plan recommendations.

Table ES.7 shows a six-year CIP. Identified urgent needs (Priority 1 projects) for well and tank improvements are slated for FY 2015 and FY 2016. All costs presented include annual inflation. Basis for costs and user rate calculations can be found in Appendix I.

Table ES.7: 6-Year Capital Improvement Plan

		Annual Budget (Inflated Costs[3])						
ID#	Project Description	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	Total 6-yr Cost
1A	Well 4 Booster Station Upgrade	$ 98,384	$ 409,277	$ -	$ -	$ -	$ -	$ 507,661
1B	Well 4 Tank Repairs	$ 63,440	$ -	$ -	$ -	$ -	$ -	$ 63,440
1C	Well 5 Tank Repairs	$ 116,480	$ -	$ -	$ -	$ -	$ -	$ 116,480
1D	Gossner Tank Painting and Improvements	$ 295,360	$ -	$ -	$ -	$ -	$ -	$ 295,360
	Sub-Total	$ 573,664	$ 409,277	$ -	$ -	$ -	$ -	$ 982,941
Meter Repayment ($1M loan from electrical dept)[1]		$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 600,000
Annual Pipeline Replacement / Priority Improvement[2]		$ -	$ 206,272	$ 536,307	$ 613,535	$ 754,091	$ 904,909	$ 3,015,114
Annual Facility Replacement (booster, well, etc.)		$ -	$ 54,123	$ 225,153	$ 292,699	$ 304,407	$ 316,583	$ 1,192,964
	Total	**$ 673,664**	**$ 769,673**	**$ 861,460**	**$ 1,006,234**	**$ 1,158,497**	**$ 1,321,492**	**$ 5,791,019**

1. $1M loan from electrical department repaid at $100k/year will take 11+ years to repay, depending on interest rate.
2. Fully funded budget assumes funding for Priority 2-4 pipeline projects over the next 20 years.
3. Inflated costs by 4% for capital projects, including annual replacement projects; inflated operating costs at 3%; debt service assumed to be a constant annual amount.

Funding for the recommended system improvements may come from various sources. In estimating future rate impacts, the following assumptions were made with input from City staff:

- The million-dollar loan from the electrical department fund
- Other priority improvements would be funded over time with cash reserves. No additional debt was assumed.
- Construction costs would be inflated 4% annually.
- Other operating costs (salaries, utilities, etc.) would increase 3% annually.
- The pipeline improvement and replacement budget would be increased over the next six years to be 75% funded by fiscal year 2020.
- The water facilities (wells, boosters, and tanks) replacement budget would be increased annually to be fully funded by fiscal year 2018.

The average residential user rates for a customer using 5,000 gallons per month in the winter and 30,000 gallons per month in the summer are $19.85 and $34.17, respectively. For users with higher water consumption, the existing rate increases at $0.57 per 1000 gallons used. This rate does not generate enough revenue to fund repayment of the loan from the electrical department, nor does it produce sufficient revenue to fund priority improvement and replacement projects. A preliminary estimate of the user rate impacts to address this shortfall can be found in Table ES.8.

Table ES.8: Recommended Monthly User Rate Increases

Fiscal Year	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Monthly Increase	$12.02	$3.45	$3.39	$4.65	$4.86	$5.15

Because the system is aging and many components are beyond or near the end of their design life, it is recommended that the City implement a capital replacement fund. In order to minimize the immediate rate impact on the system users, funding for needed replacement budgets is recommended to be increased over time. The larger initial rate increase is recommended to fund Priority 1 improvements and allow for smaller incremental increases to be spread out over future years as the City ramps up their pipeline replacement and facility replacement programs. It should be noted that even with funding at proposed FY 2020 levels, it will take the City more than 20 years to implement the Priority 1 through 4 improvements identified in the CIP.

ES.8 IMPLEMENTATION SCHEDULE

The CIP projects shown in Table ES.6 are grouped by priority, with Priority 1 being the highest priority. Priority 1 improvements are considered to be improvements most critical to the system, and for the purposes of the rate analysis were assumed to be funded within the next 6 years. Once Priority 1 improvements are complete, the City should begin with identified Priority 2 improvements. Subsequent priorities can be phased in as funding is available because they are primarily targeted to reduce the system's vulnerability in emergency scenarios, reduce demands, and improve circulation.

Where possible, future improvements intended to expand capacity (i.e. new wells) have been tied to population benchmarks so they can be completed when they are needed. Ideally, many of the future pipeline improvements can be coordinated with future street improvements to minimize overall costs.

The City has accepted project responsibility, including obtaining necessary financial resources, technical qualifications, experience, organization, and adequate facilities to carry out the project according to the project schedule. The City has a performance record for completion of projects and contracts. The City will follow appropriate procedures required by law for acquiring, maintaining, safeguarding and disposing of property.

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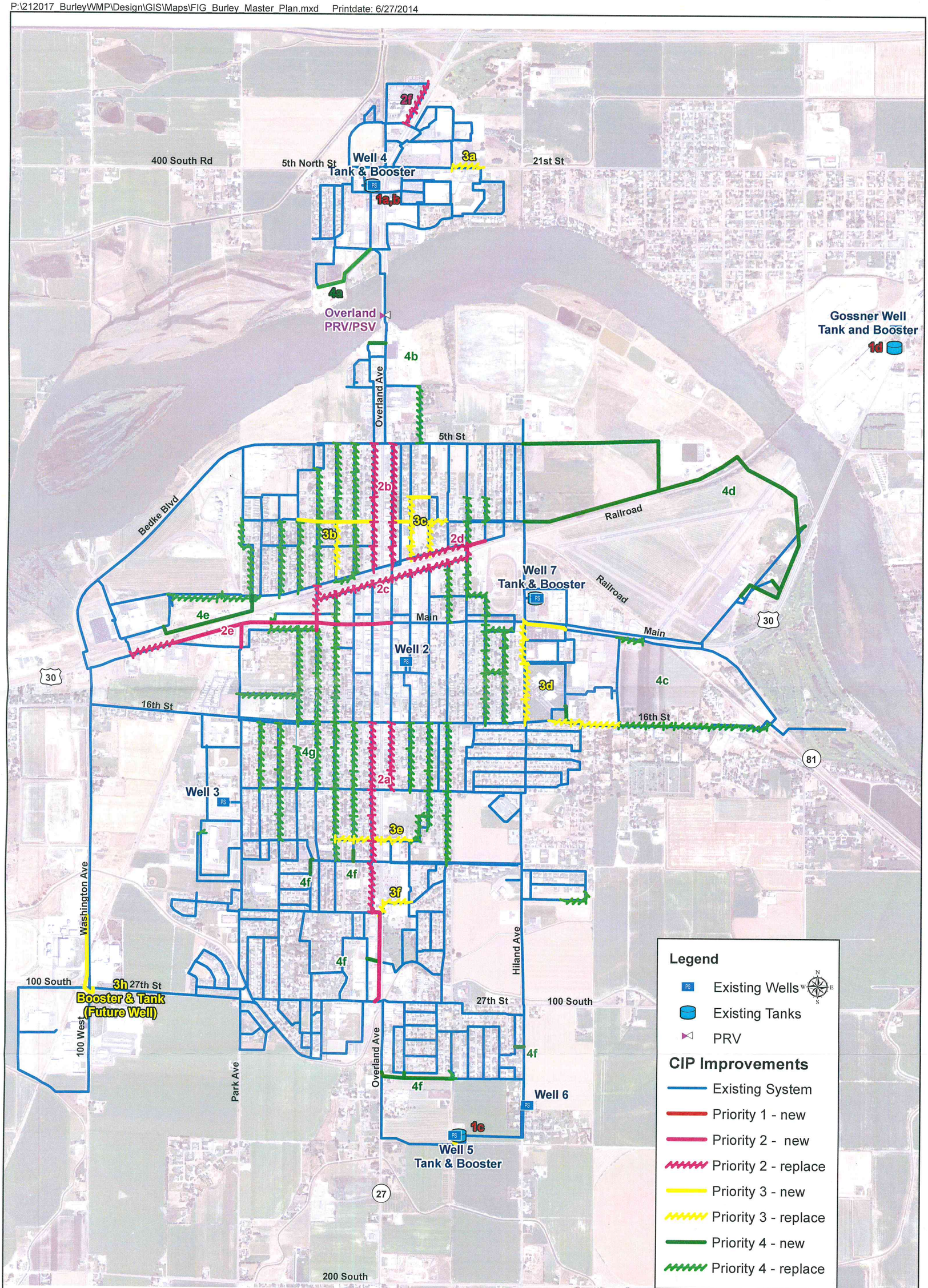

Figure:	Title:	Project:	Prepared for:	
4.1	Master Plan	2014 WATER MASTER PLAN	The City of Burley Idaho	KELLER associates