City of Deer Park

WATER SYSTEM PLAN UPDATE
EXECUTIVE SUMMARY

prepared for the

City of Deer Park
Mayor and City Council
as submitted to the
Washington State Department of Health

JANUARY 2016

by:

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Spokane, WA 99201
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EXECUTIVE SUMMARY

Purpose of this document is to inform Council and Public on items prepared within the entire Comprehensive Plan document as required by Department of Health. Some sections have been modified and or omitted from this summary.

Chapter 1.0 Description of Water System

The City of Deer Park initiated this Water System Plan (WSP) per Washington State Department of Health (DOH) requirements.

The WSP has been prepared in accordance with WAC 246-290 and the DOH Water System Design Standards. It is an update of the previous WSP finalized in October 2007.

1.1 Ownership and Management

The City of Deer Park Water System (ID No. 185006) is owned and operated by the City of Deer Park, a municipal corporation. The City is operated under the laws of the State of Washington as a municipal corporation. The City's Council and Mayor serve as the water system's governing body. The City Community Services Director, Roger Krieger, P.O. Box F, Deer Park, WA 99006, 509-276-8802, performs the day-to-day management of the water system.

The water system is operated as an "Enterprise Fund", one of many within the City's accounting system. Issues requiring funding or contractual authorizations are brought before the City Council for discussion and approval.

A copy of the City's current water facilities inventory (WFI) is presented in **Appendix A**.

1.2 System History and Background

1.2.1 History of Water System Development

The City of Deer Park is located approximately 15 miles north of the City of Spokane and has a 2014 estimated population of 3870.

The water system has been operated as a utility in the City of Deer Park since the early 1900's. All water supplied for the City is acquired from groundwater sources, without supply from any surface water sources. Typically, as the City has grown, additional source, distribution and storage have been constructed to meet the demands. More recently, within the past ten years, the City has adopted requirements for growth to construct or pay for improvements necessary as a direct result of the growth. By adopting such a policy, the existing customers are not burdened by the capital costs associated with growth. In those circumstances where the City has determined the need to upgrade as a result of aging infrastructure, projects have also been completed to maintain the integrity of the water system.

A brief water system development history is as follows:

- An elevated tank reservoir (tank on legs) was constructed near "A" Street prior to 1951. This tank was demolished in 2010.
- An 800,000 gallon standpipe reservoir was erected in 1963.
- A 600,000 gallon standpipe reservoir was constructed in 1981.

- An upper pressure zone was created in 1996 to serve growth at higher elevation to the east of the original City core by constructing a booster pumping station and separating the distribution system into two zones, the upper (closed) and the lower with three reservoirs and all well sources.

- In 2009 the upper zone 500,000 gallon elevated reservoir was constructed.

The City completed a number of significant projects between 2007 and 2014. These projects have included:

- A new Perrins Well was constructed in the summer of 2012, see picture on Page 1-3.
- The Cedar Road Reservoir was constructed providing an additional 500,000 gallon of 170' high elevated storage.
- The 6th Street Booster Station was enhanced with variable speed drives. (3-10hp pumps and 1 50hp).
- The Mission Street Booster Station was added on Mission in 2010, just south of Crawford (5-10 HP Pumps)
- 3,700 lineal feet of 12-inch C-900 water main was installed on 12th Street and also between the new reservoir and Cedar Street.
- The 1951 "A" Street 60,000 gallon storage tank was decommissioned and removed.
- 400 lineal feet of 12-inch diameter C-900 water main was installed as part of the Crawford Avenue project.
- The Airport portion Project 1 of the distribution system was enhanced with 540 linear feet of 8-inch C-900 water main, a new hydrant and 240 linear feet of 1-inch service line.
- The Airport portion Project 2 added an additional 780 lineal feet of 8-inch C-900 water main, 100 feet of 12-inch C-900 water main as well as two additional fire hydrants.
- 640 lineal feet of 8-inch C-900 water main was installed on South Main Street just north of the "H" Street intersection
- 1,125 lineal feet of 1-inch C-900 water main was installed on South Main centered near the railroad crossing, providing redundant supply flow to SW business area of City.
- 2,194 lineal feet of 12-inch diameter C-900 water main was installed on 6th Street west of Cedar Road.
- 1,966 lineal feet of 12-inch diameter C-900 water main was installed on Cedar Road to the south from 6th Street.
- 912 lineal feet of 8-inch diameter C-900 water main stubs were installed on both 6th Street and Cedar Road.

Cedar Reservoir 2010

Perrins Well 2011

1.2.2 Geography

The City of Deer Park lies directly north of the City of Spokane, near the extreme northerly extent of Spokane County. The topography within the City of Deer Park varies from generally level to a gently undulating terrain.

The highest elevation of 2,250 feet is in the northeast corner near the municipal airport, while the lowest elevation of 2,100 feet is in Deer Park's southwest corner. Topography typically slopes from northeast to southwest.

The source of supply in Deer Park is provided by a relatively shallow aquifer system underlying the majority of the City. This aquifer system has provided the City with an adequate resource for many years, although the full extents, boundaries and recharge areas have not been fully defined. The aquifer is an alluvial formation within a femoral channel oriented in the north to south across the city.

1.2.3 Neighboring/Adjacent Purveyors

The City of Deer Park is surrounded by rural farmland, which is served by private wells or unimproved areas that do not have any existing water service. Thus, the City's water system is isolated from neighboring or adjacent water purveyors and has no interties with other public water supply systems. The nearest major public water supply system is Whitworth Water District #2 located over five miles away to the south. Stevens County PUD has service area to the west and the east within one-half mile of Deer Park service area. A small number (3 to 6) of small private water system are within these areas.

1.2.4 Ordinances

The City's activities and operating policies are contained within the ordinances adopted by the City Council. The ordinances adopted by the City that are currently in force include:

- Water Rates
- Water Service Regulations
- Design and Construction Standards
- Cross Connection Control
- Coliform Monitoring

A copy of the current water rates is provided in **Appendix C.** Copies of the Ordinances and Bylaws are provided in **Appendix C.**

City policies for water service are provided in Section 7.0 of this water plan.

1.3 Inventory of Existing Facilities

Prior to 1997, the City operated the water system as a single pressure zone. Following the installation of the 6th Street Booster Pump Station in 1997, The City's system was subsequently divided into two pressure zones. The second pressure zone was needed to provide adequate pressure to the higher land located in the Northeast portion of the City service area.

1.3.1 Description of Facilities and Major Components

The two pressure zones are summarized in the following table.

Pressure Zone Summary

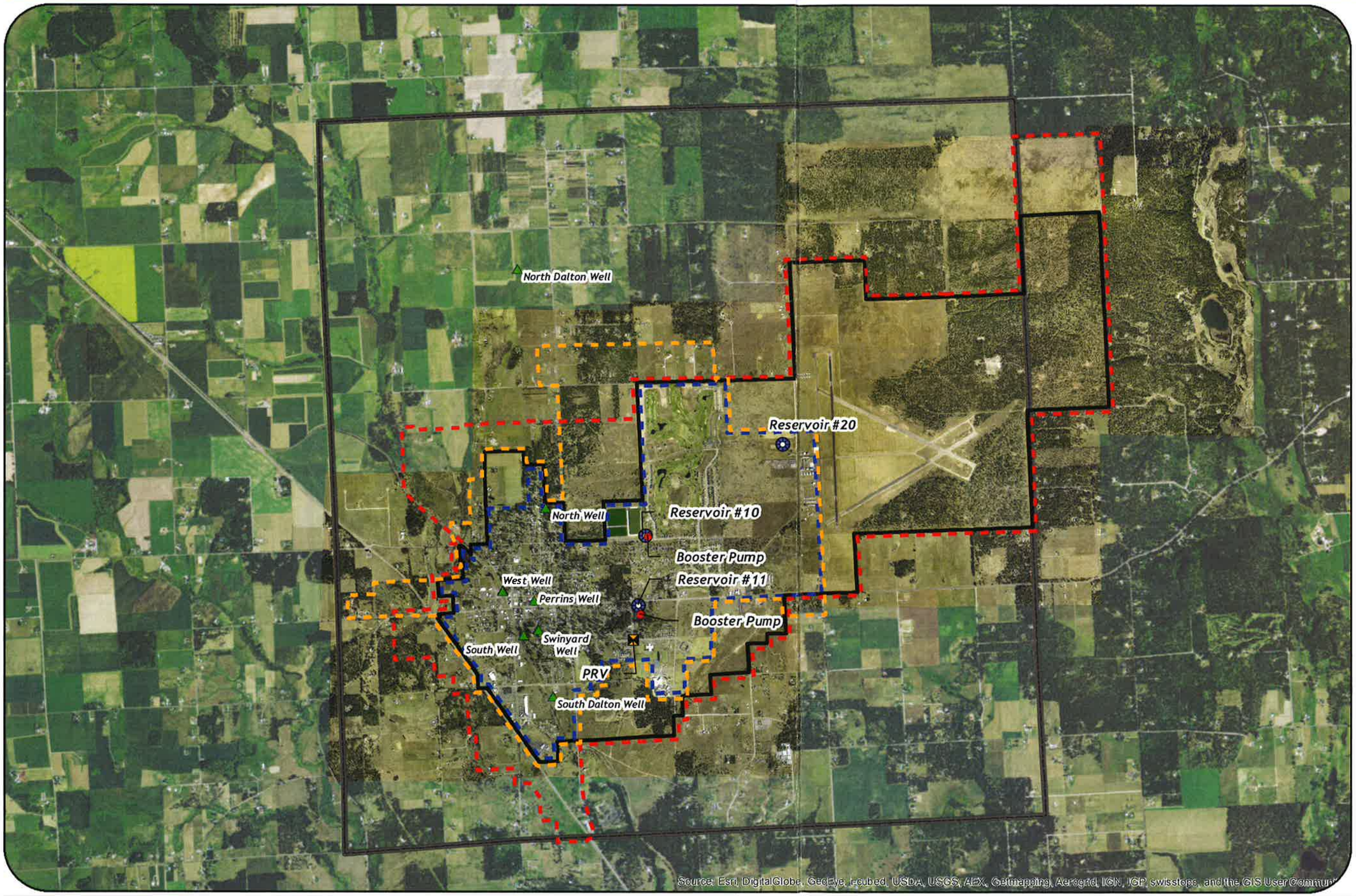
Zone	Approx. Area Description	Supply	Storage
Lower zone	The majority of the City accept those services generally to the east of Forest Street.	Seven groundwater wells	Two lower zone reservoirs
Upper zone	Services generally to the east of Forest including the airport.	Booster stations (Wells indirectly)	Cedar Rd. Reservoir Constructed in 2009 500,000 gallons, 170' elevated tank

- The water system is comprised of the following components: 3 reservoirs, 7 wells (6 within City limits); 2 booster stations, and 1 PRV station.

Water is distributed to customers through many miles of a looped pipeline system consisting of pipes ranging in size from 2 to 12 inches in diameter. The majority of the distribution system consists of 6-inch and 8-inch diameter pipelines.

A map of the City's water system showing the extent of the service area, City limits, the location of storage reservoirs, pumping stations, and wells is presented in **Figure 1-1**.

City of Deer Park, Washington • Water System 2015



- Valves
- Pumps
- Reservoirs
- Wells
- Current (Existing) Service Area
- Retail Service Area
- Urban Growth Area & 20 Year Projected Service Area
- CWSP** - Deer Park Boundary
- Deer Park City Boundary

** CWSP is Spokane County Coordinated Water Service Plan

Figure 1-1 • Water System Infrastructure

0 2,000 4,000 6,000 Feet

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Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

A system of seven wells supplies the City Water. Each of the wells have a source meter. The source meters are connected to the City SCADA system collecting instantaneous flow data (gallons per minute). The City staff collects weekly flow totals at each source and keeps a handwritten log. The City replaces source meters as they become non-functional and provides periodic calibration. **Table 1-2** presents information on the source meters. **Table 1-1** summarizes information on the wells including: City ID#, Water Right Certificates, Physical Address, Depth and Diameter of Source and Pumping Rate.

Table 1-1 Existing Groundwater Supply Wells

Name	City ID No.	DOH ID No.	Water Right Cert. No.	DOE ID #	Tax Parcel #	Street Address	Approx. Well Head Elev.	Depth (feet)	Well Diameter (inches)	Screened Interval	Pump Rate (gpm)	Maximum Yield (mgd)
West	DP-1	S01	303-A	AHC911	Railroad Ave. right-of-way	119 N. Railroad Avenue	2115	28	30	19-28	222	0.319
South	DP-2	S02	G3-00142C	ABR216	28023.1502	214 S. Vernon St.	2116	32	72	22-32	200	0.288
Swinyard	DP-3	S03	G3-26674C	AHC914	28023.1701	201 E. B Street	2120	84	12	44-64	900	1.296
North	DP-4	S04	G3-00142C	AHC912	29353.0301 & .0303	317 E. Ninth Street	2141	49	72	34-54	300	0.432
North Dalton #1	DP-5	S05	G3-22546C	AHC913	29262.9027	36201 N. Dalton Road	2145	50	12	22-47	420	0.605
South Dalton #1	DP-6	S06	G3-24591C	AFA255	28112.0006	300 E. H Street	2106	76	16	40-61	900	1.296
Iron	DP-7		G3-25385C		N. Stevens right-of-way	401 E. Eighth Street					Currently not in use	
Airport	DP-8		G3-00489C		39310.0001	1104 N. Cedar Road					Currently not in use	
North Dalton #2	DP-9		G3-22546C		29262.9027	36201 N. Dalton Road					Currently not in use	
Boyle			G3-25862C		29233.9049	36905 N. Dalton Road						
South Dalton #2					28112.0006	300 E. H Street						
Future												
Perrins Field	DP-14	S07	G3-00142C	BCH 024	28022.1102	16 N. Arnim Street	2127	76	16	46-76	400	.576
Total											3,342	4.812

Appendix G contains well logs for City of Deer Park sources.

Table 1-2 City of Deer Park Source Meters

LOCATION	MAKE	CONDITION	INSTALL DATE	CALIBRATION DATE	USEFUL LIFE	DUE FOR RECALIBRATION
WEST WELL - SO-1	McCrometer	Good	----------	2002	10 years	X
SOUTH WELL - SO-2	McCrometer	Good	2000	2014	10 years	
SWINYARD WELL - SO-3	McCrometer	Good	1980	2009	10 years	
NORTH WELL - SO-4	Sparling	Good	1998	2002	10 years	X
N. DALTON WELL - SO-5	McCrometer	Good	1985	2002	10 years	
S. DALTON WELL - SO-6	Sparling	Good	1997	2014	10 years	X
PERRINS WELL - SO-7	Siemens MAG 5000	New	2012	2011	20 years	

Within the low pressure zone, there are two water storage structures. The upper pressure zone has a 500,000 gallon elevated tank storage. A summary of the reservoirs is provided in **Table 1-3**. The total storage in the system is 1.897 MG. The effective storage (based on minimum static pressure of 20 psi) is .8 MG.

Table 1-3 Reservoirs and Storage

Name	Size/Volume	Overflow Elevation	Type	Top of Roof Elevation	Tank Floor Elevation
Cedar Reservoir #20	500,000 Gallon @ 170' Tall, 50.5' Dia. X 39' with tapered bottom	2370	Welded Steel on Concrete Pedestal	2373	2331.86
6th Street Reservoir #10 - 1981	32' Dia x 100' Tall 600,000 gallons	2284.5	Welded Steel Standpipe	2288	2184.5
Crawford Avenue Reservoir #11 - 1963	38' Dia x 94' Tall 797,000 gallons	2284.5	Welded Steel Standpipe	2288	2190.5
Total	1,897,000				

Supply to the system is automatically controlled by the water level in the 797,000-gallon standpipe (Res #11), the 600,000-gallon standpipe (Res #10) or the 500,000 gallon elevated tank (Res #20) depending on which is selected in the SCADA system. The elevated steel tank has an overflow pipe at elevation 2370.

As described previously, water is supplied to the upper pressure zone through the new 500,000 gallon elevated storage tank (Res #20) just west of Cedar near the 12th Street alignment. The 6th Street and Mission Street Booster Pump Stations working in conjunction supply Reservoir #20. This variable speed booster pump station is controlled by system pressure in the upper zone. The booster pump station has three 10-hp identical variable frequency drive pumps to provide the normal demands of the system and a single 50-hp fire pump. The booster pump station also has auxiliary power from an engine driven generator. The Mission Street Booster Station fills the upper zone reservoir. It is comprised of 5 - 10 hp pumps.

The current static hydraulic grade line of this upper zone is 2,370 feet elevation. Approximately 612 customer connections are currently served in the upper pressure zone. **Table 1-4A** presents information on the existing Mission Street booster station and **Table 1-4B** presents the information on the existing 6th Street Booster Pump station.

Table 1-4A Mission Street Booster Station (Added 2010)

Primary Pumps	Flow/Head	Control
5 - 10 hp centrifugal	250 gpm/90 feet	VFD

Table 1-4B 6th Street Booster Pump Station (Added 1997)

Primary Pumps	Flow/Head	Control
3 - 10 hp centrifugal	250 gpm/90 feet	VFD
Fire Pump	**Flow/Head**	**Control**
1 - 50 hp centrifugal	1500 gpm/105 feet	Full speed soft start. Activated on low discharge pressure.

See **Appendix Y** for all Mission and 6th Street Booster Station activity for the last 5 years.

A pressure reducing station was constructed in 2006 at "D" Street and Forest at the interface between the upper and lower pressure zones. The station (fed by a 12" watermain) consists of a 10" PRV with a 4" bypass in an underground vault. The valve automatically opens to supply flow from the upper zone to the lower zone when the lower zone pressures falls to 35 psi. The valve ceases to open further (sustains) when pressure in the upper zone falls to 50 psi:

1.4 Related Plans

A summary of the key planning documents that affect the City's water system is presented in this section.

1.4.1 Growth Management Act Implementation Program

The City completed its Growth Management Act Implementation Program document (GMA Program) in 1996. The GMA Program was prepared to comply with the Washington State GMA and includes policies and strategies for land use, housing, capital facilities, utilities, transportation, and economic development. As a result, other City plans such as this water system plan and other utility plans, policies, and regulations must be consistent with the GMA Program. This water system plan was developed in concert with the vision, policies, goals, and objectives of the GMA Program.

In accordance with the Growth Management Act of 1990 (GMA), significant coordination is ongoing between the City of Deer Park and Spokane County. Deer Park has a growth management planning consultant, Kathy Marcus who has worked with Spokane County to coordinate the Urban Growth Boundary Line and its relationship to the current Deer Park Municipal Boundary as well as the Official Zoning Map and Future Land Use Plan (both updated 2006). It is confirmed that the Retail Service Area Boundary around Deer Park defines the future water service area as agreed by both the City of Deer Park as well as Spokane County.

1.4.2 Sewer Facilities Plan

The City completed its required facilities plan for the Washington Department of Ecology in 1996. A subsequent update to the collection system east of Forest Avenue occurred in 1998. The City is currently updating the sewer facilities plan scheduled for completion in early 2016.

1.4.3 Spokane County Coordinated Water System Plan

Spokane County has adopted an update of the Coordinated Water System Plan as an element of the Spokane County Generalized Comprehensive Plan. Spokane County Coordinated Water System coordinator was contacted regarding this WSP. **Figure 1-2** illustrates the Coordinated Water System Plan - Service Area Map - 74. **Appendix B** contains a Water System Plan Consistency checklist.

1.4.4 Deer Park Groundwater Characterization Study

Completed in 1991, Spokane County commissioned this study to summarize the geology, hydrogeology, and groundwater quality of the Deer Park basin to guide the acquisition of additional data, and to begin developing long term water resource planning and protection strategies for the area.

1.5 Status of Watershed Plan

J-U-B has spoken with the Department of Ecology (DOE), Kevin Brown (509) 329-3422 about WRIA #55 and how it might affect this comprehensive plan. In 2007 J-U-B also contacted Reanette Boese, lead person for WRIA #55 Little Spokane Watershed.

- Little Spokane Watershed Plan - J-U-B provided Reanette Boese information concerning consistency of the Deer Park WSP with the WRIA 55 plan.

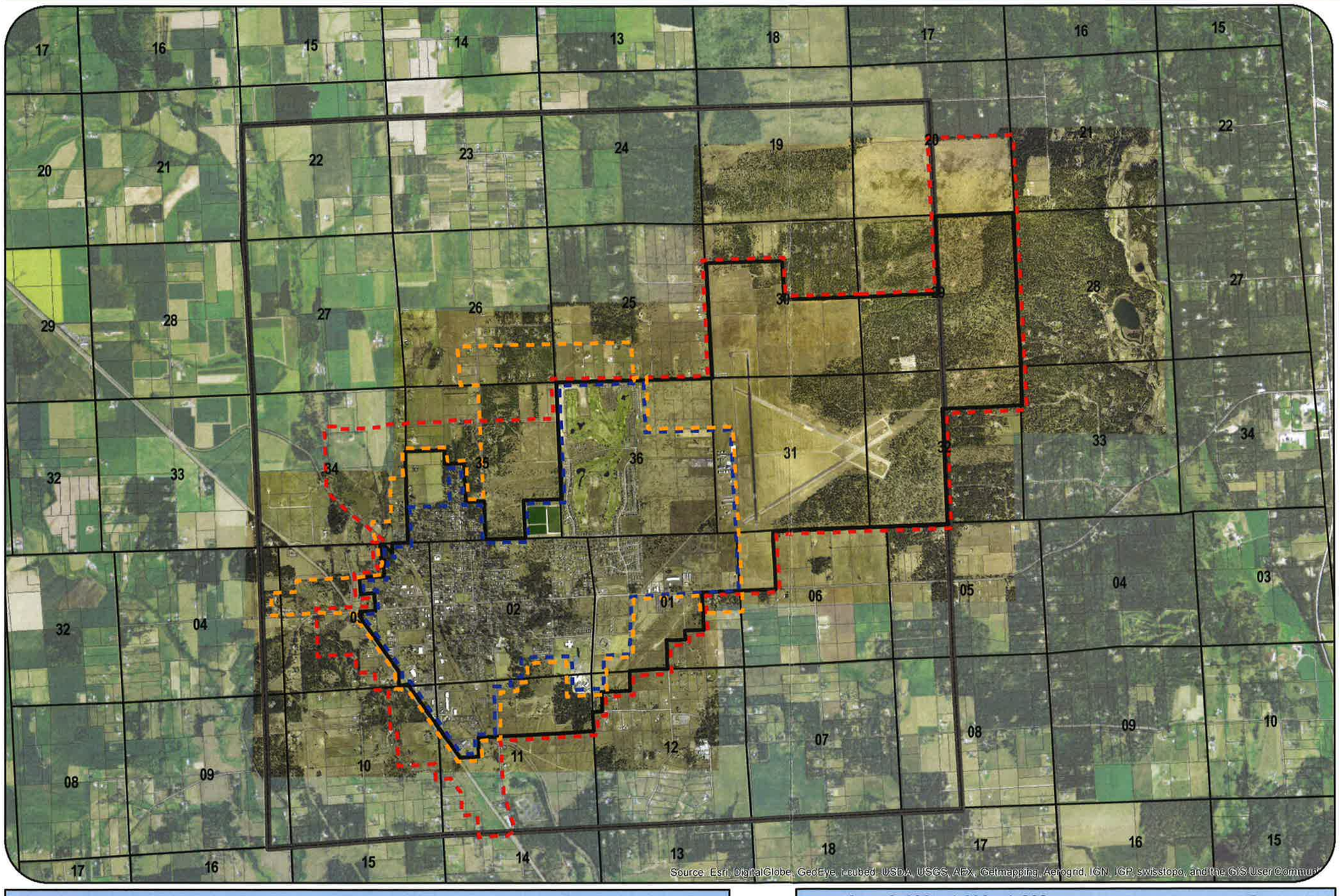
1.6 Service Area and Characteristics

1.6.1 Retail Service Area

The retail service area coincides with the area included in the city limits (with the exception of one portion on the eastern limits) and the Urban Growth Area (UGA). There are currently no other water systems or purveyors serving customers within the City limits, or the City's Retail Service Area. A map displaying the Urban Growth Area Boundary and Retail Service Area is displayed as **Figure 1-2.**

The water service area of the City of Deer Park may include water systems within or adjacent to the areas currently served by the City system. In the case that one of these systems fail due to water quality standards, the City of Deer Park will provide service to this system after extension of main lines to the location are funded, approved and completed. If a system should fall out of compliance due to operating standards or loss of qualified staff, the City of Deer Park can provide certified operators and administration if required. The acquired system will be required to follow the City of Deer Park's Municipal Code and shall be charged according to changes required to bring this system into compliance with the City of Deer Park and Department of Health standards.

City of Deer Park, Washington • Water System 2015



Current (Existing) Service Area

Retail Service Area

Urban Growth Area & 20 Year Projected Service Area

Deer Park City Boundary

CWSP** - Deer Park Boundary and Future Services Area and Service Area

PLSS Sections

** CWSP is Spokane County Coordinated Water Service Plan

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Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

0 2,000 4,000 6,000 Feet

Figure 1-2 • Water System Boundaries

Chapter 2.0 Basic Planning Data

Future population and water demand forecasts are presented in this chapter. These forecasts enable the City to assess the capacity of the water system to meet probable future demand. Growth trends, future population growth, and accounting for land uses are all critical elements in the development of the City's water demand forecast and required system improvements.

2.1 Current and Future (6 and 20 years) Population, Number of Service Connections, and ERUs

2.1.1 Current and Future Population

Historical and projected future population for the City of Deer Park is presented in **Table 2-1**. Historical population data from 2007 to 2014 was taken from records submitted periodically from the Federal Census and annually by the City to the Washington State Office of Financial Management, Forecasting Division. The annual population growth rate during this historical period averaged 2.71 percent. Though there have been arguments between Spokane County population estimates and cities like Spokane, the current OFM numbers are reasonable and logical.

This current 2015 plan 6- and 20- year growth population forecasts were projected with an annual growth rate of 2.71 percent resulting in population projections of 4,543 (2020) and 6,620 (2034) respectively.

2.1.2 Service Connections

The City currently has five service connection classifications within its account system:

1. Single-family residential
2. Combined Commercial, Government, Industrial, and Multi-family residential
3. Irrigation
4. Recreation
5. Bulk water sales

The existing number of residences/businesses serviced is approximately 1,650 active connections. The connections are a mix of single family and multi-family residential, commercial, industrial and schools. This number varies up to 6% within any given year.

Table 2-1 Population and Water Use

Population/Water Use	Historical											Future Estimates	
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	6-year 2020	20-year 2034
Population (1)													
Persons	3,045	3,100	3,135	3,235	3,345	3,450	3,652	3,675	3,715	3,800	3,870	**4,543**	**6,620**
Annual Population Growth Rate (percent)	-0.3%	1.8%	1.1%	3.2%	3.4%	3.1%	5.9%	0.6%	1.1%	2.3%	1.8%	2.71%	2.71%
Ten year Average											2.71%		
Water Consumption and Connections													
Total Number of Connections	1,161	1,188	1,303	1,347	1,391	1,435	1,479	1,523	1,567	1,611	1,656	--	--
Total Consumption (mgd)	1.011	1.003	1.104	1.166	1.169	1.207	0.941	1.02023	1.04	1.071	1.176	--	--
Number of Single-Family Residential Connections	993	1018	1115	1,149	1,183	1,217	1,252	1,286	1,320	1,354	1,388	--	--
Total Single-Family Residential Consumption (mgd)	0.418	0.466	0.5	0.531	0.496	0.548	0.425	0.455	0.468	0.51	0.561	--	--
Average Single-Family Residence (gpd)	421	458	448	462	419	450	340	354	355	377	404	--	--
Number of Commercial/Multi-Family Connections	168	170	188	198	208	218	228	237	247	257	268	--	--
Total Multi-Family/Commercial Consumption (mgd)	0.593	0.537	0.604	0.635	0.673	0.659	0.516	0.565	0.572	0.561	0.615	--	--
Total Water Production (Demand)													
Total Annual Well Production (mgd)(2)	1.055	1.007	1.141	1.245	1.168	1.223	1.011	1.081	1.110	1.125	1.217	**1.334**	**1.652**
Number of ERUs (3)	2,506	2,200	2,544	2,693	2,786	2,716	2,977	3,055	3,131	2,988	3,011	**3,393**	**4,483**
Gallons per ERU	421	458	448	462	419	450	340	354	355	377	404	408	408
Non-Revenue Water (percent)	4.2%	0.4%	3.2%	6.3%	8.1%	1.3%	7.0%	5.6%	6.4%	4.8%	3.4%	--	--
Total Water Demand Estimated (mgd)													
ADD (Same as Total Annual Well Production)	1.055	1.007	1.141	1.245	1.168	1.223	1.011	1.081	1.110	1.125	1.217	**1.334**	**1.652**
MDD (from City Flow Records creating 2.0 factor)	2.114	2.018	2.287	2.494	2.340	2.450	2.026	2.167	2.225	2.255	2.439	**2.673**	**3.311**
min DD (from City Flow Records) (4)	0.299	0.285	0.323	0.353	0.331	0.347	0.287	0.307	0.315	0.319	0.345	**0.4143216**	**0.60374**
PHD (1.68 x MDD)(5)	3.594	3.431	3.887	4.240	3.978	4.165	3.445	3.684	3.783	3.834	4.146	**4.491**	**5.562**

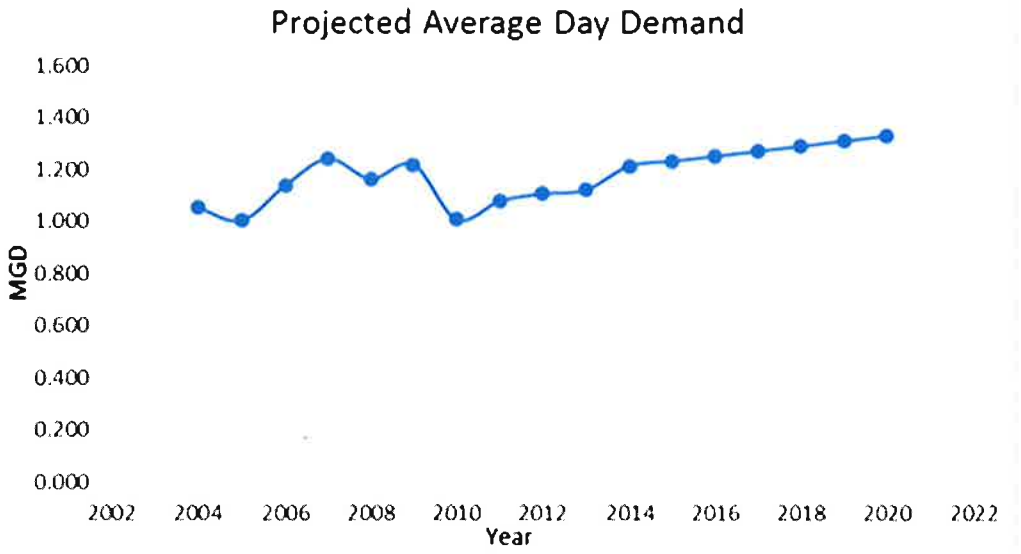
(1) Source of population data is the Washington State Office of Financial Management, Forecasting Division. Future Population was projected from 2014 value at an average annual growth rate of 2.71% to meet the City of Deer Park Population Projection Allocation of 6,620 in 2034.

(2) Total annual production (demand) data was compiled from City records. Future estimates based on projected population growth rate of 2.71 percent from 2014 values. Future demand for Water based on past demand with a 10% conservation goal.

(3) ERUs computed directly from residential total consumption and actual number of residential connections.

(4) Minimum Day Demand (min DD) , created from actual feb 2014 well total,prorated back relative to total annual well production

(5) Peak Hour Demand (PHD) was estimated using MDD and factors from WDOH Design Standards.



The number of single-family residential service connections for the years 2004 through 2014 are also summarized, and presented in **Table 2-1**. Based on the 10 years of data, roughly 84 percent of the City's service connections are for single-family residences.

The City currently estimates that there are approximately 2.79 persons per household.

2.1.3 Equivalent Residential Units (ERUs)

The DOH Water System Planning Handbook guidelines suggest that all utilities convert demand into units of equivalent residential units (ERUs). An ERU is defined as the amount of water consumed in a day by a typical full-time single family residence. The number of single-family residential connections were summarized for the years 2004 to 2014. Dividing total single-family residential consumption by the number of residential connections resulted in consumption per single-family residence for the years 2004 through 2014, as presented in **Table 2-1**.

Demand represented in ERUs indicates the amount of water supplied to the system that could theoretically meet the needs of the number of single-family residences. Non-revenue water is included in the computation of demand in units of ERUs; thus, the actual number of single-family residences that could be supplied would be somewhat less than the number of ERUs. City of Deer Park, however, has very little non-revenue water. See non-revenue percent on **Table 2-1**.

Most municipal water systems are not exclusively comprised of single-family residential customers. However, multi-family and non-residential demand can also be converted to ERUs as well by dividing the total demand of each of these classifications by the average consumption of a single single-family residence. The purpose of converting system demand to ERUs is to permit an assessment of supply capacity of a particular system and/or a comparison of the supply capacity between different systems in terms of the total theoretical number of single-family residences that can be served.

The current ERU water demand for the City of Deer Park is 404 gallons per day for 2014 (average day demand).

The ERUs divided per pressure zone are shown in **Table 2-2.**

Table 2-2 ERUs Per Pressure Zone

	2014	2020	2034
Total ERUs	3,011	3,393	4,483
Lower System	1,897	2,138	2,824
Upper System	1,114	1,255	1,659

ERU remaining is total number of SF connections real or calculated. One (1) dwelling equals one (1) ERU. One (1) large commercial customer using 100,000 gallons per day (GPD) would equal 248 ERUs. If the City experiences large water demand commercial growth in industrial/business park areas of City, or within commercial diversified areas, a reduction in residential connections occurs, thus careful consolidation should be used in the permitting and SEPA process and means to add additional storage, wells or whatever necessary will be required.

2.1.4 Narrative for Worksheet 6-1: ERU Determinations

The following Department of Health table is intended to show the City of Deer Park how its existing water system is limited for future growth whether that growth is in the form of residential, commercial or industrial expansion.

The unit of capacity utilized in these determinations is defined as the amount of water used each day by an Equivalent Residential Unit (ERUs). Currently Deer Park supplies water daily to 3,011 ERUs total.

These comparisons calculations show that at the rate Deer Park is currently growing the "Total Reservoir Standby Storage" will be the first governing (limiting) water system component that takes the water system "out of compliance". This will occur when the total system residential, commercial and industrial daily demand reaches roughly 4,166 ERUs. From **Table 2-1** which shows estimated future water demand this threshold will be reached in roughly 15-3/4 years from the end of 2014 which equates to 14-3/4 years from now.

This discussion is timely because Reservoir #10 on 6th Street requires a recoating of its interior in the very near future, 2 -3 years. This recoating process is costly ($400,000 approximately) so the concept of putting that money into a new reservoir as opposed to a 35 year old reservoir may be cost beneficial. The new reservoir would be designed to increase "Total Reservoir Standby Storage" and push this limiting system component further into the future.

WORKSHEET 6-1: ERU Determinations

Water System Physical Capacity Documentation based on MDD

Note: *Capacity determinations are only for existing facilities that are operational for the water system.*

Specific Single-Family Residential Connection Criteria (measured or estimated demands) (see Chapter 5):

Average Day Demand (ADD): 404 gpd/ERU 1,217,000/3011

Maximum Day Demand (MDD) 810 gpd/ERU 2,439,000/3011

Water System Service Connections correlated to ERUs			
Service Classification	**Total MDD for the classification, gpd**	**Total # Connections in the classification**	**ERUs**
Residential			
Single-family	1,124,244	1388	1388
Multifamily			
Nonresidential			
Industrial			
Commercial/Mult	1,232,460	268	1521
Governmental			
Agricultural			
Recreational			
Other (specify) Bulk Water	82,296	33	102
DSL		N/A	
Other (identify)			
Total existing ERUs (Residential + Nonresidential + Non-revenue + Other) =			3,011

Physical Capacity as ERUs	
Water System Component (Facility)	**Calculated Capacity in ERUs for each component**
Source(s) (assumes south well out)	5585
Treatment	N/A
Equalizing Storage	DOH. Eq. 9-1 shows No Deficit, less the 0 result
Standby Storage	4166 ERUS @ 200 GPM (Excess storage ÷ 200 gal/ERU)
Distribution	Model shows this parameter unconstrained
Transmission	Model shows this parameter unconstrained
Other (specify)	
Water System Physical Capacity (ERUs) = 4166 ERUs of standby storage limiting system **(based on the limiting water system component shown above)**	

Note: *If multiple-day storage is needed to meet MDD, another approach to estimate the ERU capacity is necessary.*

Chapter 3.0 System Analysis

3.1 System Design Standards

Proposed design criteria for the major components of the water system are presented below.

3.1.1 Source

Department of Health Water System Design Standards encourage two or more independent sources and the total source capacity at least equal to (or greater than) the design maximum day demand.

3.1.2 Storage

DOH Design Standards have specific requirements for storage which are summarized in the following bulleted items:

- Dead storage - storage needed to provide minimum water pressures; that is, all water in any reservoir which is less than approx. 46 feet (20 psi) above the highest service in that pressure zone (not including pressure losses in distribution system piping)

- Standby storage - storage for reliability purposes (i.e., if one or more sources are out of service for a short time); required volume is calculated as follows.

  2 x average day demand minus daily supply capacity of all sources except the largest (but not less than 200 gal/day/connection)

- Operation storage - storage required for the operation of well sources and booster pumps

- Fire flow storage - storage for fighting fires; required volume is required fire flow rate times the required duration

- Equalizing storage - storage to supply peak demands in excess of supply capacity; required volume is calculated as follows.

  (Peak hour demand minus capacity of all sources) x 150 minutes

In some cases, fire flow and standby storages, the largest two components, are combined due to economic necessity on the assumption that the likelihood of a source outage and a major fire occurring on the same day is small. For plan evaluation purposes, the City has decided to combine these two storages.

3.1.3 Booster Stations

DOH Design Standards indicate that an open system (i.e., gravity storage available downstream of the booster station) such as Deer Park's system must be designed to provide at least maximum day demand with all booster pumps in service and average day demand with the largest booster pump out of service.

3.1.4 Distribution System

3.1.4.1 Hydraulics

Major requirements of DOH Water System Design Standards include:

- Pressure at all services to be at least 30 psi during peak hour demand, 20 psi during fire flow, maximum pressure generally to be less than 100 psi
- Minimum new main size equal to 6" unless justified by hydraulic analysis
- Minimum size of pipe providing fire flow equal to 6"

In addition, other general design criteria adopted by the City is as follows:

- Maximum pressures 80 psi for new services unless a PRV is installed
- Maximum pipe velocity 10 ft/s for new piping under fire flow conditions
- Pipe burial depth 5 ft
- Water main material: PVC C900/C905 or ductile iron, cement mortar lined (CML).
- Water service pipe material: copper, minimum size 1"
- Water service maximum length: approx. 150'
- Water service connection: saddle, corporation stop, curb stop at property line, meter in meter vault at property line or meter in structure with remote read device on outside wall

3.1.4.2 Fire Flow

The Washington Surveying and Rating Bureau (WSRB) is a private company which rates fire systems for insurance company purposes based on, among other things, available fire flow. In WSRB survey of Deer Park, WSRB designated required fire flows for commercial areas is up to 3,000 gpm. For single residential, required fire flow is 1500 gpm. For individual structures, the City and fire district use the Uniform Fire Code (UFC) which specifies required fire flows by building area and construction type. Note that the UFC code governs new buildings and not water systems. That is, the UFC indicates that the building authority should determine available fire flow then require certain construction practices based on the available fire flow. In general, per UFC, residential areas require 1,000 to 1,500 gpm. For the purposes of this evaluation, the City will use a 1 hour, 1,500 gpm residential fire flow target, and a 2 hour 3,000 gpm commercial/public building fire flow target. This criteria will have the following effect on new and existing buildings:

- Existing buildings requiring a fire flow higher than the City's system can provide, could install a fire sprinkler system to reduce required flow if the building owner so desired.

- New buildings would choose a construction type, floor plan and sprinkler system such that the required fire flow for that building (as required by the UFC) would be less than or equal to the flow available from the City's water system.

3.3 System Inventory, Description and Analysis

3.3.1 Source

Source Capacity

The following paragraphs provide an overview of source capacity.

Total System

The lower pressure zone and the upper pressure zone via the booster station (total system) are supplied by seven wells. **Table 3-1** present the well sources and related data.

From Section 2.00, maximum day demand for the system (inc. both pressure zones) is as follows:

Existing max. day demand	2.439 mgd
Future max. day demand - 6 years	2.673 mgd
Future max. day demand - 20 years	3.311 mgd

With all wells in operation around the clock the source deficit to meet MDD is as follows:

Deficit (existing)	≈ 0 mgd = 0 gpm
Deficit (future - 6 years)	≈ 0 mgd = 0 gpm
Deficit (future - 20 years)	≈ 0 mgd = 0 gpm

Though deficit is not shown from these sources, their locations, construction type, age and output during peak time summer production indicates additional source(s) should be considered during planning period.

Table 3-1 Existing Groundwater Wells

Name	City Number	DOH Source ID No.	Year Well Drilled	Facility Condition	Estimated Future Life Expectancy	Well Yield Max. Inst. [2] GPM	Well Yield Max. [1] MGD
West	DP-1	S01	1919	Fair	25 years	222	0.319
South	DP-2	S02	1946	Good	50 years	200	0.288
Swinyard	DP-3	S03	1981	Good	50 years	900	1.296
North	DP-4	S04	unknown	Good	50 years	300	0.432
North Dalton #1	DP-5	S05	1976	Fair	10 years	420	0.605
South Dalton #2	DP-6	S06	2000	Excellent	100 years	900	1.296
Perrins Field	SP-14	S07	2011	Excellent	100 years	400	.576
Total						**3342**	**4.812**

(1) The MAX was determined by taking pump capacity for each well operating over a 24 hour period which is suitable for short periods of time. Long term operation of wells is generally limited to a 18 to 24 hour per day operation which is the range of duration found to be reliable over extended periods. An 18 hour operating duration is a total well yield of 3.609 MGD.

(2) Maximum Instantaneous flow rate will vary from WFI form depending on operations and well performance.

Chapter 4.0 Conservation Program and Source of Supply Analysis

4.1 Conservation Program History

The City of Deer Park has always recognized the importance of water conservation and the efficient use of water. The City of Deer Park has and will always take action to protect, preserve, and enhance its groundwater resources by developing and maintaining a water conservation program. Beginning In March 1994, the Department of Ecology, the Department of Health, and the Washington Water Utilities Council jointly prepared a document titled *Conservation Planning Requirements.* The document identifies requirements for water use reporting, forecasting and conservation programs, effective July 1, 1994. The City's conservation program then included: conservation objectives, an evaluation of recommended conservation measures, selected conservation measures, and target water savings projections.

Bringing this program forward to 2015 the WUE program is defined below based on the checklist utilized by the Washington state DOH.

4.1.1 2007 Conservation Program

In 2007, the Department of Health adopted an updated Water Use Efficiency (WUE) rule. See **Appendix U.** For this 2015 water plan update the City is revisiting and affirming conservation goals , measures and objectives as it defined in its 2007 and 2008 efforts to meet the rule.

4.1.2 Current WUE Goal and Public Adoption Process

The City goal for the future is being lowered slightly from the old 433 gallons per day per ERU to 430 gallons per day per ERU for the 2015 through 2021 period. Since 2009 the City is proud that it has met the 433 gpd per goal in every year except 2009 (when the goal was only slightly exceeded at 450 gallons per day per ERU) partially due to higher average daily temperatures. This goal requires serious and focused continued public education, technical assistance and city staff efforts.

Deer Park has a very low percent of unaccounted for water (See Section 2.2.3). The City is very progressive and confident in its efforts to conserve water within its distribution system and this data confirms that commitment.

The City of Deer Park is aware of their limited water resource, both in terms of certificated water rights, and the general resource quantity. The water use efficiency program discussed herein is an outgrowth of recognizing the limits of resources.

The City continues to apply conservation measures on new developments. This approach has been a tremendous aid for the City in an overall objective to hold water consumption per ERU constant City wide as future growth occurs. The low use water supply fixtures installed by contractors required by the City building permit process have been very successful

The City is not currently seeking acquisition of new water rights due to a clear and ecology documented surplus at this time, this opportunity will always considered if it becomes available in the future.

4.1.3 Conservation Measures Utilized by Deer Park

A number of conservation measures are possible for a WUE program. Utilities are not necessarily required to implement each recommended conservation measure identified, but are required to consider measures for potential use. Deer Park is a medium sized water system, having over 1,000 services. The measures below are Deer Park's choices for past and future implementation.

4.1.3.1 Program Promotion

Promotion of conservation is a required conservation measure. The City has implemented the delivery of conservation "messages" on the annual water quality report. **Appendix D** contains example letters and conservation program literature which is mailed to all water customers in a periodic basis.

4.1.3.2 Purveyor Assistance

Purveyor assistance programs involve assisting wholesale customers to develop and implement a conservation program. The City currently does not supply water on a wholesale basis to any purveyors (customers), nor does it intend to in the foreseeable future because there are no nearby or adjacent water systems which the City might supply. Therefore, this program is not applicable for implementation by the City.

4.1.3.3 Customer Assistance

Customer assistance involves assisting retail customers, at their request, by providing information on how to best conserve water. Monthly bills mailers include recommendations and guidelines relative to water conservation. When requested by customers, the City makes an appointment to meet and provide information concerning the applicability of each individual's conservation measures.

4.1.3.4 Bill Showing Consumption History

Displaying consumption information from the same billing period of the previous year, as well as the percentage increase or decrease from this same time period, facilitates customers keeping track of their water consumption. It is believed that elevating awareness of water consumption tends to reduce usage. The City provides each water bill with historic consumption for the same time period one year prior for consumer awareness.

4.1.3.5 Unaccounted Water/Leak Detection

Reducing unaccounted water by regularly scheduled leak detection is a required conservation measure. Implementing a leak detection program becomes required when unaccounted water exceeds 20 percent of demand (supply production). The City's unaccounted water percentage was actually 3.4 percent in 2014. The cities real time SCADA water system monitoring system tracks reported well flow rates and compares weekly usage at each source for indication of large losses or usage.

4.1.3.6 Nurseries/Agriculture

This conservation measure involves encouraging and/or requiring the application of low-water use technology of large agricultural/irrigation operations using large volumes of water. Examples of operations include nurseries and commercial agriculture. Examples of current low-water use technology includes: moisture sensors, flow timers, low volume sprinklers, drip irrigation, and weather monitoring. The majority of users in the Deer Park system are mainly residential uses, with City owned parks, schools, and the golf course being the highest users of water within the service area. It should be noted that the irrigation system at Perrins Field monitors weather and adjusts irrigation flows. The City also controls Mix Park irrigation with the weather station funded by a grant awarded in 2007. During this next plan period the city is also working with the Washington state DOE to secure funding for the design and construction of a reclaimed water facility to apply wastewater on the golf course as its irrigation water. This would reduce the annual drinking water consumption in deer park by 50 % and extend the capacity of the sources significantly.

4.1.3.7 Landscape Management/Playfields-Xeriscaping

This conservation measure involves promoting low-water-demand landscaping to all customers. As requested, the City will assist any customer with landscape management planning. The City currently assists the Deer Park School District with reducing their water consumption through discussion on proper irrigation management. City zoning regulations also already require full lot landscaping for all development. This translates to installation of low demand grass, trees or other flora for all development.

4.1.4 Important City Activities that Reduce Water Use and Loss but do not currently qualify as WUE measures

4.1.4.1 Source Meters

Metering of supply sources is a required conservation measure. Please refer to **Table 1-2** on Page 1-9 for source meter details. The City meters all of its supply sources. The SCADA control system monitors the flow at each source with the data being displayed and periodically recorded at SCADA Central Control in City Hall. The City anticipates collecting more of the flow information through electronic data logging in the future. The City calibrates and maintains these meters regularly following manufactures' recommendations

4.1.4.2 Service Meters

All of the City's retail customers have metered service connections. Currently all residential meters are upgraded to Automatic Read System on a 5-year cycle. As part of this upgrade older meters are being replaced to the new technology. Funding is provided by water and wastewater utility funds. Of the 1600 $\pm$ connections only roughly 400 remain to be converted to new automatic meters. The City monitors and replaces faulty meters and checks calibration per manufactures recommendations.

4.1.4.3 Bulk Water Station careful Monitoring

The City of Deer Park operates a bulk water station, which is a pre-pay water delivery system for use by the public. Contractors, citizens, farmers and others in need of water can pre-pay for a quantity and take delivery at any time, day or night from the automated dispensing installation. The usage and payment for this water is metered and carefully monitored.

4.1.4.4 Hydrant Meters

The City of Deer Park owns five hydrant meters with backflow devices which are issued to contractor and those in need of water at a site serviced by a fire hydrant. The water used is measured and paid for by the user. No hydrant connections are allowed without the use of a meter.

4.1.4.5 Conservation Pricing

Conservation pricing is accomplished by implementing a rate structure that provides economic incentives to conserve water. In 1996, the City rehabilitated the water usage, and capitalization pricing structure for water service discussed in the next paragraph. As future needs are determined the City may take future action to implement more stringent pricing strategies.

Currently, the water rate structure is $22.53 per month for the first 4,000 gallons used and $0.60 for each 1,000 gallons used above 4,000. At this time only one rate tier exists above the basis monthly fee. The rate per unit for excess use is fairly expensive and therefore conservation oriented.

The City has discussed the implementation of an Inclining block as well as a seasonal rate structure. The elected leadership of Deer Park has determined that the above current rate structure achieves the desired goals for conservation and believes that the political ramifications of the inclining block approach render that approach counterproductive.

Informal summer season observations by City staff concluded that many residential water customers (perhaps more than 50%) reduce or eliminate lawn and garden irrigation in order to keep water bills affordable. Deer Park is a documented extreme low to moderate income community and is not amenable to increasing water rates significantly each year. Slight increases are approved to reduce harmful financial impacts to LMI families. Further, the current rate impacts are observed during the hot summer periods of time where numerous customers elect to allow lawns to go dormant rather than paying high monthly usage rates already in place for LMI area.

4.1.4.6 Conservation and Rationing

The City has developed a conservation and rationing program, which the superintendent has the authority to impose at any time when the water contained in the City reservoirs is reduced below minimum levels. The Water Conservation Program is found in Deer Park Municipal Code Chapter 13.07 and a copy is included in **Appendix C.**

4.1.4.7 Single Family /Multi Family kits

This conservation measure use to involve distributing kits containing easily installed water savings devices to single family residences and to the owners and managers of apartment buildings and condominiums. Though the city does not currently distribute kits the measure is now achieved by the city in the implementation of the uniform plumbing code during the building permit process. The UPC requires low flow devices such as shower flow restrictors, toilet tank displacement devices, leak detection dye tablets and informational brochures. Significant single and multifamily unit construction over the last 10 years is reaping conservation benefits for Deer Park.

4.1.5 Yearly Consumer Education

The City uses a mailer approach for yearly public education. An important document also sent yearly to all water customers is the annual consumer confidence report discussing water quality and quantity. This information is very informative to help users understand totals for quantity and water quality.

4.1.6 Water Saving Estimate for the Past 6 Year Period, 2009 through 2014

The average gallons per dwelling per day water usage for the last 11 annual periods 2004 through 2014 is 408. The average for the last 6 years 2009 through 2014 is 376. Subtracting 376 from 408 gives us 32 gallons per day per ERU saved as a result of conservation measures focused on since the 2007 plan adoption. This is a total water savings of 86,912 gallons per day using an average 11 period ERU equivalent of 2716. This is an average of 31,700,000 gallons per year over last 6 years of reporting timeframe.

4.1.7 Water Savings Estimate for Projected for Years 2015 through 2020

If the community can continue and maintain saving a 32 gallons per day per ERU average and assuming an average ERU increase to 3,202 over the next 6 years significant savings will be realized. This would be a total average daily savings of 102,464 gallons or 37,399,000 gallons per year over 6 years.

4.2 Water Right Self-Assessment for Existing and 6-year Projection

The City is supplied exclusively by groundwater from several wells. The City has water rights for the wells currently being used in addition to those not being used. The City completed a change to its water rights, which effectively "consolidated" its entire water rights portfolio. A discussion of the City's water rights, recent changes, and an assessment of the adequacy of these water rights to support current and estimated future customer demand is presented in this section.

4.2.1 Recent Water Rights Changes

The City of Deer Park, in Spokane County, received approval for consolidation of all of its existing water rights in order to integrate the system, add points of withdrawal, change the place of use, and to change the purpose of use, as originally granted under Ground Water Certificate Nos. 86-D, 303-A, G3-00142C, G3-25385C, G3-26674C, G3-00489C, G3-25862C, G3-24591C, and G3-22546. The "Reports of Examination" issued by Ecology on February 4, 1999 approved changes to nine (9) ground water rights held by the City.

On March 6, 2003 Ecology rescinded the "Report" issued to Water Certificate No. G3-25862C and deleted the quantities authorized to the City under this certificate. The water rights for this certificate reverted back to its' original owner, Charley Boyle and new "Reports" were issued by Ecology for the remaining eight water rights on April 29, 2003. The March 6, 2003 action also dropped City Well No. 1 as a point of withdrawal at the request of the City.

4.2.2 Description of Water Right Certificates, Permits and Claims

The City of Deer Park, located in Spokane County, have consolidated 6 municipal water rights and 2 seasonal irrigation water rights as described in Ground Water Certificate Nos. 86-D, 303-A, G3-00142C, G3-25385C, G3-26674C, G3-00489C, G3-24591C, and G3-22546C. The six municipal water rights allocate 2,805 gallons per minute (gpm) and 1,250 acre feet (ac-ft.)

per year for continuous municipal supply. The two seasonal irrigation rights allocate 3,100 gpm, and 1,638 ac-ft. per year for the seasonal irrigation of 500 acres. The 3,100 gpm, 1,638 ac-ft. per year of irrigation water rights are allowed as a continuous municipal supply. The total withdrawal under all consolidated rights, seasonal and continuous shall not exceed 5,905 gpm and 2,933 ac-ft. annually for municipal supply from 13 wells (10 existing wells and 3 future wells).

Water rights under Water Certificate No. G3-25862C total 56.25 gpm per year and 39.73 ac-ft. per year for seasonal municipal supply.

All existing water rights are summarized **in Table 4-2** and Forecasted Water Rights are presented in **Table 4-3**. **Appendix E** contains water right certificates.

4.2.3 Assessment of Water Rights and Demand

As shown in **Tables 4-2** and **4-3**, the City's existing water rights are adequate to meet current demands as well as estimated future demands.

4.3 Source of Supply Analysis and Evaluation of Supply Alternatives

As evidenced in **Table 4.3**, the City has adequate water rights to meet its estimated future demand for the 20-year planning horizon. Therefore, a source of supply analysis is not warranted for this Plan.

4.3.1 Source of Supply Water Quality Discussion

Appendix K shows the 2012 through 2014 City of Deer Park Water Quality Reports. These annual consumer confidence reports show no water quality concern.

The City has always monitored static and dynamic depth to water over time for each well source except for the Swinyard and North Dalton Wells. The Swinyard and North Dalton Well were not constructed with the Days Set Monitor tubes so the data can't be collected at these sources. The data for the other sources has been shown in **Appendix K** and reflects solid and consistent well recovery. Well drawdown does not appear to be an issue of concern at this time.

The City has monitored nitrate levels for all sources and has included 2014 monitoring results in the end of **Appendix K.**

Table 4-1 Existing Water Right(s) Status

Permit, Certificate Or Claim No.	Name of Right-Holder or Claimant	Priority Date	Source Name/Number	Primary or Supplemental	Existing Water Rights		Existing Consumption		Current Water Right Status (Excess/Deficiency)	
					Qi	Qa	Qi (1.)	Qa (2.)	Qi	Qa
86-D	Deer Park	Fall 1919	West 1/DP-1	Consolidation	450	140	-			
303-A	Deer Park	01/14/1946	West 2/DP-1	Consolidation	400	650	222	95.1		
G3-00142C	Deer Park	06/24/1971	North, South, West, Perrins	Consolidation	1,205	1,210	340	223.2		
G3-25385C	Deer Park	05/23/1977	DP-1, DP-2 and DP-4	Consolidation	400	-	-	-		
G3-26674C	Deer Park	09/16/1980	Iron/DP-7	Consolidation	1,000	1,210	930	540.0		
G3-00489C	Deer Park	06/24/1971	Swinyard/DP-3	Consolidation	200	40	-	-		
G3-24591C	Deer Park	09/22/1975	Airport/DP-8	Consolidation	1,500	579	830	274.2		
G3-22546C(3.)	Deer Park	02/14/1974	South Dalton/DP-6	Consolidation	1,600	1,104	420	146.0		
Total	--	--	N. Dalton/DP-5, DP-9 --	(See note 4.)	5,905	2,933	2742	1278.5	Excess 3163	Excess 1654

Pending Water Right Application	Name on Permit	Date Submitted	Source Name/Number	Primary or Supplemental	Pending Water Rights Qi Requested	Pending Water Rights Qa Requested
None						

Notes:

1. Qi = maximum instantaneous flow, presented in gallons per minute (gpm).
2. Qa = total annual quantity pumped from well, presented in acre-feet per year (ac-ft/yr) in 2006.
3. 1999 Consolidation of six municipal water rights and two seasonal irrigation water rights allows all existing water rights to be used for "continuous municipal supply" and adds three points of withdrawal for a total of 13 wells.
4. The total amount the City may withdraw for annual continuous municipal use for all water rights shall not exceed: 5905 instantaneous (gpm) and 2933 annual (ac-ft) (2805 gpm and 1250 ac-ft from municipal supply and 3,100 gpm and 1,683 ac-ft from seasonal supply).

Chapter 5.0 Source Water Protection

5.1 Update Fall 2007

CH2M Hill performed a full wellhead protection and susceptibility assessment in 1999-2000. J-U-B ENGINEERS recommends re-use of that study based on discussions with Deer Park Community Services Director and Washington Department of Health planners that there have been no significant changes in either the type of or and number of potential contaminant type businesses. The Perrins Well constructed and brought online in 2011 lies within the influence zone discussed above.

One additional gas station has be constructed on the northeast corner of Crawford and Weber intersection. This station is not inside the Wellhead Contamination Plume discussed above.

One clothing store changed to a day care.

5.1.1 CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) Update.

The CERCLIS Database is the Comprehensive Environmental Response, Compensation and Liability Information (CERCLIS) that contains information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation. The database includes sites that are on the National Priorities List (NPL) or being considered for the NPL.

J-U-B used the following search criteria: State: Washington; Region 10; Zip Code: 99006

- Actives - Found 0 site(s) that matched the search criteria.
- Archived Sites - Found 1 site that matched the search criteria. See **Appendix N.**

5.1.2 Resource Conservation and Recovery Act (RCRAInfo) Update

This is used by the EPA to track entities regulated under RCRAInfo subtitle C (hazardous waste handlers). RCRA includes data on general handler information, permit or closure status, compliance with federal and state regulations, and cleanup activities.

The following business names were shown: See **Appendix O.**

- Deer Park Drug Lab
- Denison Drums
- Qwest Deer Park
- Swenson Road Drums

5.1.3 Hazardous Sites List Update

- No listings for Deer Park

5.1.4 Underground Storage Tanks (UST) and Leaking Underground Storage Tanks (LUST) Update

- There are 48 listings for USTs. See **Appendix P.**
- There are 8 listings for LUSTs. See **Appendix Q.**

5.1.5 Washington Clean Up Sites Update

- There are no listings for Deer Park

5.1.6 Confirmed and Suspected Contaminated Sites (CSCS) Report Data Files Update

The data set contains information about sites that undergoing cleanup and sites that are awaiting further investigation and/or cleanup by the Toxics Cleanup Program. This data is subject to change at any time. Updated files will be made available weekly.

- No listings for Deer Park

5.2 Notification to Property Owners and Agencies

City of Deer Park updated their database for property owner within the wellhead protection areas of their sources. This area includes properties inside and outside of the City limit. Included are businesses and residential properties with septic tanks or cess pools. Other facilities and undeveloped properties are included as well.

Once the database was updated a mailing list was generated of all the property owners. Copies of the lists are contained in **Appendix S** along with a copy of the protection area map. Letters were prepared and mailed in May 2015 to each of the listed property owners. This is the second re-notification since the follow-up notices were sent in 2007. Letters were also sent to local, state and federal agencies. Sample letters to property owners and the agency letters are contained in **Appendix T.**

5.2.1 Summary of Notification Process as Clarified by Washington State Department of Health (WSDOH)

In discussions with WSDOH Regional Planner Ben Serr, it was clarified that businesses inside the city limits, as well as inside the Wellhead Influence Plume map north of Deer Park would receive the business owner letter.

Residences on septic drainfield or cell pool outside the city within the Wellhead Influence Plume map would receive the residential awareness letter.

Chapter 6.0 Operation and Maintenance Program

This chapter summarizes the organization of the City staff and the existing operations programs.

6.1 Water System Management and Personnel

The City of Deer Park operates under the direction of the Mayor and City Council. The Director of Community Services is appointed by the Mayor and City Council for the administration and operation of the water system. The current Director of Community Services is certified as a Level II Water Distribution Manager as well as cross connection specialist and is assisted by two certified water/wastewater utility workers for management of the day-to-day operations, preventative maintenance, water quality monitoring, cross connection control, budget formulation, meter reading and compliant response. The Director of Community Services also receives assistance from the Maintenance Supervisor and his three crewmen to perform minor system maintenance and emergency response.

6.2 Operator Certification

The Washington State Drinking Water Regulations require that the person responsible for the administration and operation of a water system be certified as a Water Distribution Manager (WDM) in the waterworks operator program. In addition, the WDM must be certified at a level determined by the population served. The purpose of the certification is to protect public health and to preserve the water resources of the State.

Based on the City's population of more than 3870, the person responsible for the administration and operation for the City's water system must be certified as a level 2 WDM. The City meets this requirement currently and is making arrangements to have additional staff secure certifications in water distribution as well as their current certifications in wastewater.

In addition to the WDM certification, the Community Services Director has become certified as a Cross-Connection Control Manager. This employee is responsible for the City's Cross Connection Program and assures that required inspection and testing of backflow prevention assemblies are current.

The City of Deer Park's employees that have current operator certification as required by DOH:

Roger Krieger/Community Services Director - Water Distribution Manager 2 and Cross Connection Specialist (CCS).

Mark Lewis/Operator - Water Distribution Specialist and CCS.

Chapter 7.0 Distribution Facilities Design and Construction Standards

7.1 Standard Construction Specification for Distribution Mains

7.1.1 Project Review Procedures

New customers and developers requesting service are required to complete new service applications. The applications may require a water plan with the location of other utilities in the vicinity. After review and revisions of the application and water plan, a new service order or a main extension agreement is signed by the owner/developer.

7.1.3 Design Standards

The minimum size for distribution system pipelines is set at six inches by both the DOH and the City of Deer Park. More standard is the City's policy to have a minimum 8-inch distribution pipeline. Eight-inch pipelines provide better fire protection than six inch lines, particularly on dead-end lines at a modest cost increase. The standards provide parameters for system design.

A copy of the City's Design Standards is provided in **Appendix L.**

Chapter 8.0 Improvement Program

8.1 Selection and Justification of Proposed Capital Improvements Projects

Improvement alternatives are discussed as they were analyzed in Section 3. In some cases, for example the replacement of an undersized main, there aren't really alternatives as much as a statement of the required size of the new main. **Table 8-2** shows a list of future recommended projects based on hydraulics.

The estimated costs included in this Water System Plan are 2015 planning level estimates based on preliminary evaluations and assumptions to indicate approximate financing needed in preparation of a capital facilities plan (CFP). Estimated costs will vary depending on actual project design specifics as well as the cost of labor, materials and market conditions. Once an improvement plan or project element is selected for implementation, a more detailed evaluation and cost estimate should be prepared during and update preliminary and final design. Since 2005, the Spokane region has seen major escalation of labor and material prices for water related construction project. Cost estimating diligence must continue in planning of these projects.

8.1.1 Source Improvements

8.1.1.1 Possible Source Additions

Rehabilitation of the North Dalton well site and/or an additional source well constructed nearby there may be used to increase source flow to the City. An increase in well source flow would provide redundancy for existing sources as well as decrease overall system source pump run times.

8.1.1.2 Well Sources and Potential Biological Risk Discussion

The City of Deer Park uses chlorine gas to disinfect ground water for drinking purposes. Deer Park has used chlorine for more than 20 years. The chlorine is injected at the well head for each source. Disinfection is precautionary and the City has no history of microbiological contamination in their water system.

A number of the well sources do not have sufficient contact time for the chlorine to react with the water flow prior to the first service to meet a CT of 6 unless the rate of chlorine is raised to a high level. A CT of 6 or more is recommended for water at a temperature of 55 degrees F. However, Deer Park has demonstrated sufficient treatment of their water such that "no evidence of biological contamination" as required in WAC 246-290-453(3) has been experienced for any well. A CT of 6 or greater may not be needed for Deer Park where they have no history of microbiological contamination.

The City constructed a new well in 2013. The well, known as Perrins Well (S-07), is located immediately northwest of City Hall. The well produces a peak flow of 450 gpm. The design incorporates a large looped watermain immediately downstream of the well house to increase detention time for the water flow after chlorine injection and prior to the first service. Data has been collected on the water produced from Perrins Well and other locations in the water distribution system. No evidence of microbiological contamination has been documented for

Perrins Well or any other well source in the City. The City's water system operators have found the technology available and then utilized in the Perrins Well CT6 piping and automatic monitoring system to perform poorly. The flow demand downstream and the related pump operation and chlorination is unstable. See the letter to Department of Health from the City of Deer Park dated October 1, 2013 as well as the resulting DOH response in **Appendix EE**.

As **Table 8-1** shows there is a higher biological contamination risk for the West Well and Swinyard Well. It is recommended that biological risk mitigation projects be undertaken at those locations once discussions for concurrency occur between the City and DOH staff.

Table 8-1 also shows an inventory of well sources in Deer Park and other data relative to biological contamination risk, chlorination and CT evaluations.

Table 8-1 Well Sources and Potential Biological Contamination Risk

Name	City ID No.	DOH ID No.	DOE ID #	Street Address	Approx. Well Head Elev.	Depth (feet)	Well Diameter (inches)	Screened Interval	Pump Rate (gpm)	Maximum Yield (mgd)	Detention Time To First Service	CT Value at First Service @ 1.0 mg/l chlorine concentration	Distance to Nearest Biological Potential Source of Contamination	Risk
West	DP-1	S01	AHC911	119 N. Railroad Avenue	2115	28	30	19-28	222	0.319	10 sec.	0.2	45'	Higher
South	DP-2	S02	ABR216	214 S. Vernon St.	2116	32	72	22-32	200	0.288	3 sec.	0.1	295'	Low
Swinyard	DP-3	S03	AHC914	201 E. B Street	2120	84	12	44-64	900	1.296	1.5 min	1.5	120'	Medium
North	DP-4	S04	AHC912	317 E. Ninth Street	2141	49	72	34-54	300	0.432	2.7 min	2.7	240'	Low
North Dalton #1	DP-5	S05	AHC913	36201 N. Dalton Road	2145	50	12	22-47	420	0.605	1.1 hour	66.0	1200'	Very Low
South Dalton #1	DP-6	S06	AFA255	300 E. H Street	2106	76	16	40-61	900	1.296	4.3 min	4.3	270'	Low
Iron	DP-7			401 E. Eighth Street					Currently not in use					
Airport	DP-8			1104 N. Cedar Road					Currently not in use					
North Dalton #2	DP-9			36201 N. Dalton Road					Currently not in use					
Boyle				36905 N. Dalton Road					Currently not in use					
South Dalton #2				300 E. H Street					Currently not in use					
Perrins Field	DP-14	S07		16 N. Arnim Street	2127	76	16		400	.576	13 min.	13.0	180'	Low

1. Approximate distance to nearest sanitary sewer line or on-site septic system.

2. Approximity distance is to a sanitary sewer force main.

8.1.3 Distribution System Improvements

8.1.3.1 Existing Distribution System Deficiencies

Distribution system deficiencies are summarized as follows. (See Chapter 3.0)

- Undersized main lines (for fire flow)
- Dead end mains

The distribution system deficiencies are shown graphically on **Figure 8-1a**. Specific deficiencies and the corresponding improvements are summarized in the following **Table 8-2**.

Table 8-2 Existing Deficiencies and 6 Year and 20 Year Proposed Projected Projects

	Deficiency Type and Location	Planned Improvements	Comments
	Existing Deficiencies[1]		
1	4th street from North to Main; Park from 4th to 5th	1,060 LF of 8" Pipe	Replaces 3"
2	Larch from Crawford to 1st; 1st from Larch to Fir	1,140 LF of 8" Pipe	Replaces 4"
3	Park Ave from 1st to 2nd	400 LF of 8" Pipe	Complete loop in commercial district
4	3rd from Stevens to Colville; Colville from 2nd to 3rd	985 LF of 8" Pipe	Replaces 3"
5	Fir from 1st to 2nd; 2nd from Fir to Park Ave	985 LF of 8" Pipe	Replaces 4"
6	Hydrant on Southeast corner of "E" street and Colville	New Hydrant	Tie FH to 12" main on East side of Colville
7	Hydrant on Northeast corner of "B" Street and High Street	New Hydrant	Tie FH to 12" Main on North side of the street
8	Hydrant on Southeast corner of "C" Street and Colville	New Hydrant	Tie FH to 12" main on East side of Colville
	6 Year and 20 Year Proposed Projected Projects		
9	Reiper from Crawford to 2nd	500 Lf of 8" Pipe	Improve looping to increase fire flow (By 2020)
10	New Well in Dalton Well Zone	New Well	This well will add to an existing well (By 2020)
11	"H" street from Colville to Forest; Forest from "H" to "D"	3,400 LF of 12" Pipe	Upgrades distribution capacity to south growth area (By 2034) (City will require developer funding)
12	Crawford from Larch to Main	2,000 LF of 10" Pipe	Undersized for fire flow. Provides for expansion to west. (By 2034)
13	Colville from "B" to "C"	400 LF of 12" Pipe	Provides North/South connection (By 2034)
14	Replace 6th street storage reservoir	400,000 gal elevated tank	This tank will resolve storage deficit (By 2020)

(1) City crews will install 10" main on 8th Avenue from Main Street to North Street summer 2015. Hydraulic model completed for this plan already reflects this upsize project.

8.1.3.2 Future Distribution System

As described in preceding sections, growth outside the existing system limits is generally projected to occur in a northwest and northeast direction. Assumed distribution of growth was also presented in a preceding section. (See **Figure 2-3** and **2-4**). Because fire flow requirements are large relative to normal demands, sizing of water main extensions to the outlying future growth areas are generally determined by fire flow requirements.

Growth in an easterly direction will be at elevations served by the upper pressure zone. Growth in a northerly direction will be generally at elevations in the lower pressure zone. Improvements to serve these areas will be needed as growth occurs and graphically shown in **Figure 8-1b**.

8.1.3.3 Estimated Costs of Distribution System Improvements

As described in paragraph 8.1, costs vary with market conditions, the cost of labor, etc. In addition, distribution system costs vary significantly with the amount of asphalt surface restoration, the amount of rock excavation/blasting, the number of services on the reach (if any), the number of valves, fittings and hydrants which must be installed on the reach and other factors. The estimated costs for distribution system improvements are presented in the order of priority and listed in **Table 8-3**.

Table 8-3 Preliminary Estimate of Distribution System Improvement Costs

Number	Description	Quantity	Unit Cost	Cost
1	8" on 4th Street from North to Main; 8" on Park from 4th to 5th	1,060 LF	$99	$105,394.21
2	8" on Larch from Crawford to 1st; 8" on 1st from Larch to Fir	1,140 LF	$100	$113,702.44
3	8" on Fir from 1 to 2nd; 8" on 2nd from Fir to Park Ave	985 LF	$100	$98,592
4	8" on 3rd from Stevens to Colville; 8" on Colville from 2nd to 3rd	985 LF	$100	$98,592
5	8" on Park Ave from 1st to 2nd	400 LF	$106	$42,331
6	Connect hydrant on Southwest corner of "B" Street and High Street (8") to 12" Main	1	$12,266	$12,266
7	Connect hydrant on Southwest corner of "C" Street and Colville (8") to 12" Main	1	$12,266	$12,266
	Existing Deficiencies Subtotal			$483,142
8	New Well in Dalton Well Zone	1	$318,385	$318,385
	6-Year Subtotal			$318,385
9	8" on Reiper from Crawford to 2nd	500 LF	$105	$52,463
10	12" on 'H' Street from Colville to Forrest; 12" on Forrest from 'H' to 'D'	3,400 LF	$119	$403,533
11	10" on Crawford from Larch to Main	2,000 LF	$112	$223,489
12	12" on Colville from 'B' to 'C'	400 LF	$127	$50,895
13	Replace 6th Street Storage Reservoir	400,000 GAL	$5.60	$2,240,000
	20-Year Subtotal			$2,970,381
			Total	$3,771,908
			Tax & Cont. (23%)	$867,539
			Design, Inspection, Administration (23%)	$867,539
			GRAND TOTAL	**$5,506,986**

8.2 Capital Facilities Plan (6 and 20 years)

The following **Table 8-4** summarizes the planned improvements as presented above including the estimated cost and purpose of each. Prioritization was based on judgments made by the City of Deer Park working with the Engineer.

Figure 8-2 illustrates a hydraulic profile of the proposed 20-year improvements.

Figure 8-3 illustrates the work completed since the 2000 WSP Update.

Table 8-4 Implementation of 6 and 20 year Improvement Capital Facilities Plan

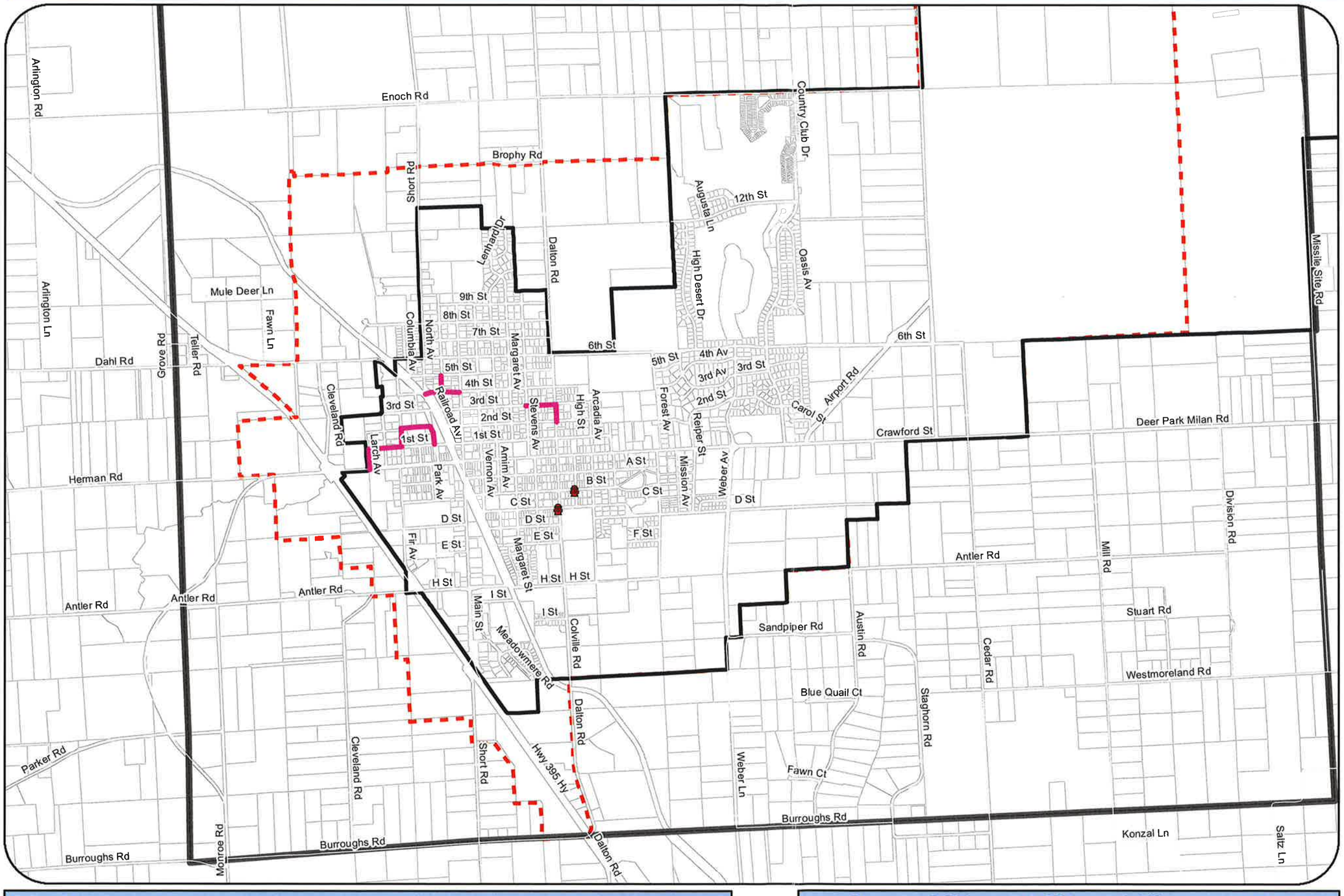
	Improvement	Estimated Cost	Year Anticipated	Years Out	Add .02 Assumed Esc. Rate	Add 8.1% Sales Taxes	Add 10% Contingency	Add 10% Design Fees	Add 10% Construction Observation Fees	Add 3% Administration Fees	Proposed Payment Method comments	costs for table 9-2
Existing Deficiencies												
1	8" on 4th Street from North to Main; 8" on Park from 4th to 5th	$105,394	2018	3	$ 109,652	$ 118,534	$ 130,387	$ 143,426	$ 157,769	$ 162,502	future STP grant	0
2	8" on Larch from Crawford to 1st; 8" on 1st from Larch to Fir	$113,702	2019	4	$ 120,662	$ 130,436	$ 143,479	$ 157,827	$ 173,610	$ 178,818		$ 178,818
3	8" on Fir from 1 to 2nd; 8" on 2nd from Fir to Park Ave	$98,592	2016	1	$ -	$ 106,578	$ -	$ -	$ -	$ 106,578	city forces	$ 106,578
4	8" on 3rd from Stevens to Colville; 8" on Colville from 2nd to 3rd	$98,592	2017	2	$ 102,575	$ 110,883	$ 121,972	$ 134,169	$ 147,586	$ 152,013	street bond	$ -
5	8" on Park Ave from 1st to 2nd	$42,331	2020	5	$ 46,736	$ 50,522				$ 50,522	city forces	$ 50,522
6	Connect hydrant on Southwest corner of "B" Street and High Street (8") to 12" Main	$12,266	2016	1		$ 13,259				$ 13,259	city forces	$ 13,259
7	Connect hydrant on Southwest corner of "C" Street and Colville (8") to 12" Main	$12,266	2016	1		$ 13,259				$ 13,259	city forces	$ 13,259
	TOTAL	**$483,142**								**$ 676,951**		$ 362,436
Within 6 Year Planning Period												
8	New Well in Dalton Well Zone	$318,385	2018	3	$ 331,248	$ 358,079	$ 393,887	$ 433,275	$ 476,603	$ 490,901		$ 490,901
	TOTAL	**$318,385**								**$ 490,901**		$ 490,901
Within 20 Year Planning Period												
9	8" on Reiper from Crawford to 2nd	$52,463	2022	7	$ 60,264	$ 65,145	$ 71,660	$ 78,826	$ 86,708	$ 89,310		$ -
10	12" on 'H' Street from Colville to Forrest; 12" on Forrest from 'H' to 'D'	$403,533	2034	19	$ 587,872	$ 635,490	$ 699,038	$ 768,942	$ 845,837	$ 871,212		$ -
11	10" on Crawford from Larch to Main	$223,489	2035	20	$ 332,094	$ 358,993	$ 394,892	$ 434,382	$ 477,820	$ 492,154		$ -
12	12" on Colville from 'B' to 'C'	$50,895	2036	21	$ 75,627	$ 81,753	$ 89,929	$ 98,921	$ 108,814	$ 112,078		$ -
13	Replace 6th Street storage reservoir, being discussed only (1)	$2,240,000	2-3 years from now									
	TOTAL (2)	**$2,970,381**								**$ 1,564,753.73**		$ 853,337

Capitol improvement yearly total for projects in restructures 6 year cash flow

3	8" on Fir from 1 to 2nd; 8" on 2nd from Fir to Park Ave	$98,592	2016	1	$ -	$ 106,578	$ -	$ -	$ -	$ 106,578	city forces	$ 106,578
6	Connect hydrant on Southwest corner of "B" Street and High Street (8") to 12" Main	$12,266	2016	1		$ 13,259				$ 13,259	city forces	$ 13,259
7	Connect hydrant on Southwest corner of "C" Street and Colville (8") to 12" Main	$12,266	2016	1		$ 13,259				$ 13,259	city forces	$ 13,259
	TOTAL	**$123,123**								**$ 133,096**		$ 133,096
4	8" on 3rd from Stevens to Colville; 8" on Colville from 2nd to 3rd	$98,592	2017	2	$ 102,575	$ 110,883	$ 121,972	$ 134,169	$ 147,586	$ 152,013	street bond	$ -
	TOTAL	**$98,592**								**$ 152,013**		$ -
1	8" on 4th Street from North to Main; 8" on Park from 4th to 5th	$105,394	2018	3	$ 109,652	$ 118,534	$ 130,387	$ 143,426	$ 157,769	$ 162,502	future STP grant	0
8	New Well in Dalton Well Zone	$318,385	2018	3	$ 331,248	$ 358,079	$ 393,887	$ 433,275	$ 476,603	$ 490,901		$ 490,901
	TOTAL	**$105,394**								**$ 162,502**		$ 490,901
2	8" on Larch from Crawford to 1st; 8" on 1st from Larch to Fir	$113,702	2019	4	$ 120,662	$ 130,436	$ 143,479	$ 157,827	$ 173,610	$ 178,818		$ 178,818
	TOTAL	**$113,702**								**$ 178,818**		
5	8" on Park Ave from 1st to 2nd	$42,331	2020	5	$ 46,736	$ 50,522				$ 50,522	city forces	$ 50,522
	TOTAL	**$42,331**								**$ 50,522**		

(1) $2,240,000 project being discussed and evaluated would construct new reservoir as the existing 6th Street storage reservoir currently requires interior recoating. "Standby Storage Capacity" limiting water system component could be resolved to more distant future with a new reservoir while recoating costs would only extend the reservoir life 10 - 15 years.

City of Deer Park, Washington • Water System 2015



Legend

- Deer Park City Boundary
- CWSP** - Deer Park Boundary
- Urban Growth Area & 20 Year Projected Service Area
- Deer Park Area

2015 Existing Deficiencies

- Up-size or Add 8 inch Pipe
- Connect Hydrant to 12" Main

** CWSP is Spokane County Coordinated Water Service Plan

J-U-B ENGINEERS, INC.

Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

Figure 8-1a • Existing Infrastructure Needs

0 2,000 4,000 6,000 Feet

City of Deer Park, Washington • Water System 2015

▲ **New well to replace an existing well in the Dalton Well Zone.**

Arlington Rd
Arlington Ln
Dahl Rd
Grove Rd
Teller Rd
Mule Deer Ln
Fawn Ln
Herman Rd
Antler Rd
Parker Rd
Burroughs Rd
Monroe Rd
Cleveland Rd
Larch Av
Columbia Av
North Av
Railroad Av
Main St
Vernon Av
Fir Av
Park Av
Short Rd
Brophy Rd
Lenhard Dr
Dalton Rd
Margaret Av
Margaret St
Stevens Av
Colville Rd
Washington Av
High St
Arnim Av
Meadowmere Rd
Hwy 395 Hwy
Weber Av
Weber Ln
Forest Av
Reiper St
Mission Av
High Desert Dr
Eagle Point Ln
Country Club Dr
Oasis Av
Airport Rd
Crawford St
Deer Park Milan Rd
Missile Site Rd
Division Rd
Mill Rd
Cedar Rd
Austin Rd
Sandpiper Rd
Blue Quail Ct
Fawn Ct
Staghorn Rd
Antler Rd
Stuart Rd
Westmoreland Rd
Konzal Ln
Saltz Ln
Burroughs Rd
9th St
8th St
7th St
6th St
5th St
4th St
3rd St
2nd St
1st St
1st Ct
4th Av
3rd Av
A St
B St
C St
D St
E St
F St
H St
I St
6th St

Legend

- Deer Park City Boundary
- CWSP** - Deer Park Boundary
- Deer Park Area
- Urban Growth Area & 20 Year Projected Service Area

6 Year Infrastructure Needs

- New well to replace an existing well in the Dalton Well Zone.

** CWSP is Spokane County Coordinated Water Service Plan

Figure 8-1b • Infrastructure Needs (6 Year)

0 2,000 4,000 6,000 Feet

N

J-U-B ENGINEERS, INC.

Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

City of Deer Park, Washington • Water System 2015

New 600,000 to 750,000 gallon elevated water tank to replace existing storage reservoir.

Legend

- Deer Park City Boundary
- CWSP** - Deer Park Boundary
- Deer Park Area
- Urban Growth Area & 20 Year Projected Service Area

20 Year Infrastructure Needs

- 8 inch
- 10 inch
- 12 inch

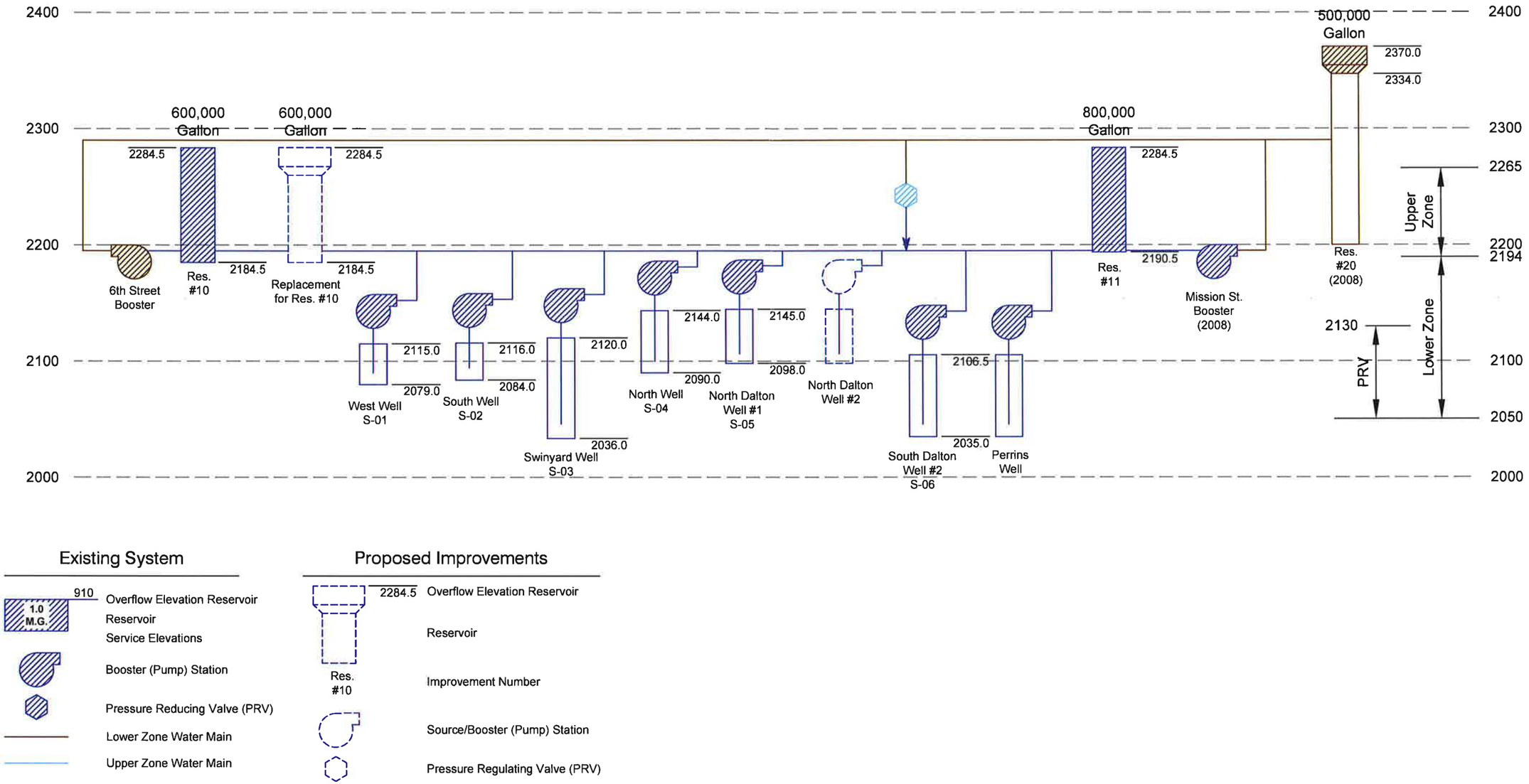
** CWSP is Spokane County Coordinated Water Service Plan

J-U-B ENGINEERS, INC.

Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

Figure 8-1c • Infrastructure Needs (20 Year)

0 2,000 4,000 6,000 Feet



Existing System

- 910 / 1.0 M.G. — Overflow Elevation Reservoir / Reservoir / Service Elevations
- Booster (Pump) Station
- Pressure Reducing Valve (PRV)
- Lower Zone Water Main
- Upper Zone Water Main

Proposed Improvements

- 2284.5 — Overflow Elevation Reservoir
- Reservoir
- Res. #10 — Improvement Number
- Source/Booster (Pump) Station
- Pressure Regulating Valve (PRV)

J-U-B Engineers • Surveyors • Planners

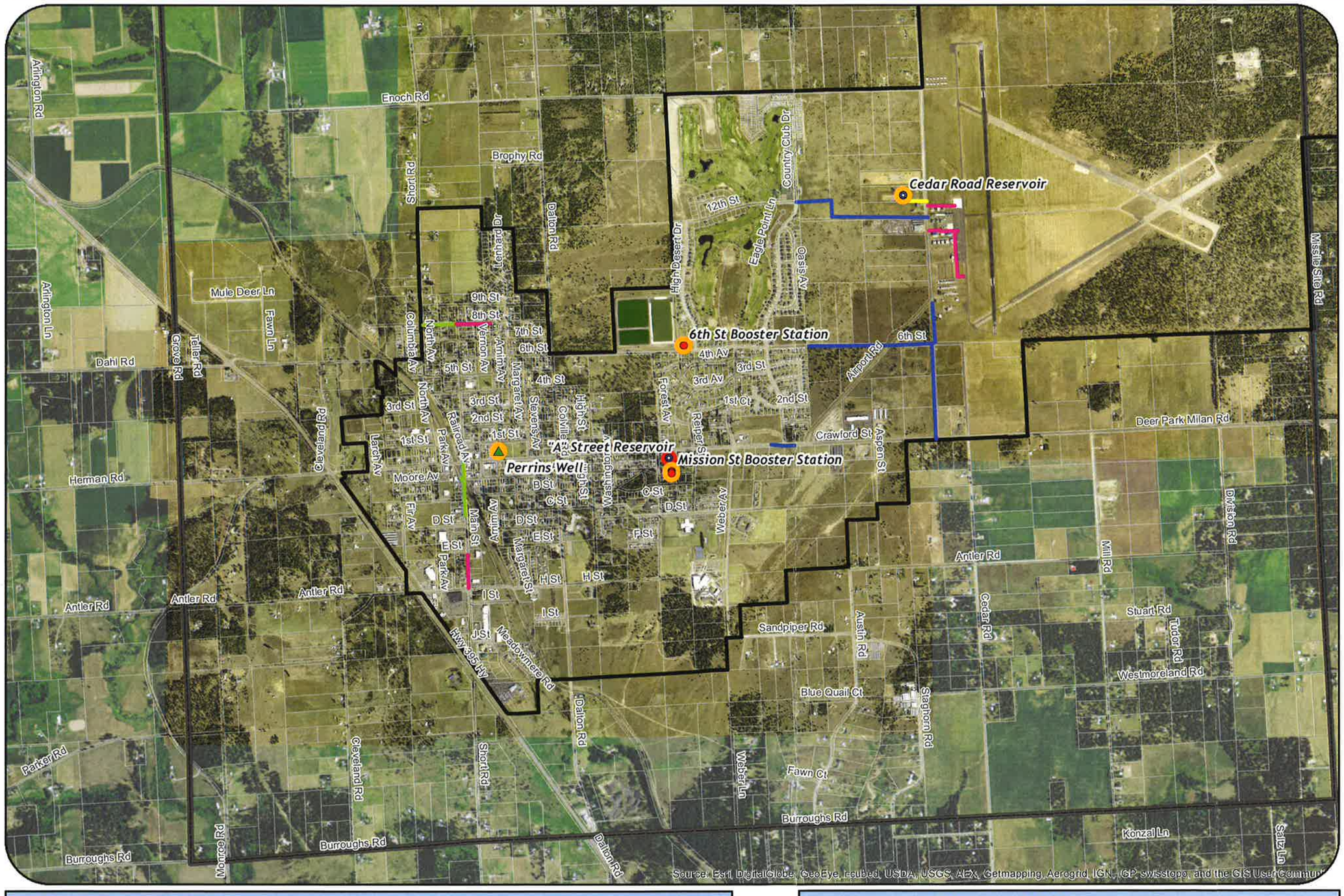
DATE: 05-27-2015 DWG. 70-15-001_Figure 8-2

City of Deer Park Water System
Hydraulic Profile - 20 Year Plan

FIGURE 8 - 2

City of Deer Park

City of Deer Park, Washington • Water System 2015



Legend

- Booster Stations
- Reservoirs
- Wells
- New Construction Projects
- Decommission Projects

System Projects 2007 - 2014

- 8 inch
- 10 inch
- 12 inch
- 16 inch (at reservoir)
- 18 inch (at reservoir)
- Deer Park City Boundary
- CWSP** - Deer Park Boundary
- Deer Park Area

** CWSP is Spokane County Coordinated Water Service Plan

Figure 8-3 • Completed Projects 2007-2014

0 2,000 4,000 6,000 Feet

J-U-B ENGINEERS, INC.

Map Coordinate System:
NAD 1983 HARN Lambert Conformal Conic
(Based in Feet)

Chapter 9.0 Financial Program

This chapter provides tables reflecting the solid financial condition and plan for the City of Deer Park's continued operation of its water system.

9.1 Balanced 1- 6 year Budget

The summary of the financial condition for years 2010 through 2014 is shown on **Table 9-1**. As shown in the table, the City has demonstrated extreme financial health by maintaining a positive net income each for the past six years. During this time period, the City has maintained a positive end of year balance between the operating fund and improvement fund.

9.2 Future Budget Stability Analysis 2015 through 2020

Table 9-2 shows the balance sheet for the next six years. This table includes the future costs of new meter replacements and change outs and miscellaneous pipeline size upgrades. The assumptions used for developing the sheet are provided at the bottom of the table.

9.3 Rates Summary

The current water rates for the City are shown in **Appendix C** and discussed in Section 4.1.2.12.

As shown in the water revenues on **Table 9-2**, the City has properly planned for the current and future proposed improvement projects. With the extremely low unaccounted current and future water figures combined with a far and consistent rate structure the Deer Park Water System is financially sound.

9.4 Evaluation of Rate Structure that Considers Affordability and Water Conservation

The City of Deer Park leadership has evaluated and considered various conservation pricing structures such as an inclining block rate. The City currently uses a uniform block rate structure where residents pay more for the more water they use. This rate structure works for Deer Park and manifested itself in very visually measurable way this past summer of 2015 where greater than 50 % of the lawns in deer park were not irrigated to a level to keep them green. The City will always consider affordability in rate analysis and feels that the inclining is not politically acceptable in this community.

9.5 UTC Financial Viability and Feasibility Test

As shown on **Table 9-2**, the City plans to pay for all projects with revenues, reserves and grants. The City is extremely low to moderate income and regularly qualifies for grant financing to assist with many projects. However, monies are also properly saved in reserve and capitol funds so that many additional projects have and will be completed (such as small diameter pipe replacement) with out of pocket funds and in house water maintenance staff. Adjustments to the capital improvements program will be made on an annual basis to meet upgrade and maintenance needs with available funds.

Table 9-1 Past Financial Status

Operating Fund					
	2010	2011	2012	2013	2014
Beginning Operating Fund Balance	**$ 638,128**	**$ 524,604**	**$ 465,754**	**$ 453,196**	**$ 387,499**
Water Revenues (1)	$ 539,512	$ 586,112	$ 591,714	$ 586,300	$ 675,753
Residential (included above)	$ -	$ -	$ -	$ -	$ -
Commercial (included above)	$ -		$ -	$ -	$ -
Misc. Revenues	$ 19,765	$ 1,944	$ 4,052	$ 2,350	$ 10,200
Merch Sales/Misc (2)	$ 125	$ 4,997	$ 8,877	$ 5,000	$ 175
Development Fees (Includes Connection Fees) (3)	$ 6,101	$ 4,971	$ 5,919	$ 10,000	$ 6,721
Rent/Lease	$ -	$ 2,107	$ 1,125	$ 1,150	$ 1,150
Late Notices (4)	$ 21,475	$ 27,991	$ 25,249	$ 20,000	$ 23,056
Investment Interest	$ 2,225	$ 1,208	$ 1,124	$ 1,000	$ 586
Grants & Loans	$ -	$ -	$ -	$ -	$ -
Total Revenues	**$ 1,227,331**	**$ 1,153,934**	**$ 1,103,815**	**$ 1,078,996**	**$ 1,105,140**
Operations (5)	$ 310,524	$ 299,230	$ 362,771	$ 359,291	$ 361,843
Interfund Transfer	$ 159,904	$ 141,514	$ 35,305	$ 86,473	$ 88,100
Debt Service/Loan Payments	$ 232,298	$ 247,436	$ 252,543	$ 245,733	$ 215,000
Total Expenses	**$ 702,726**	**$ 688,180**	**$ 650,619**	**$ 691,497**	**$ 664,943**
Ending Operating Fund Balance	$ 524,605	$ 465,754	$ 453,196	$ 387,499	$ 440,197

Improvement Fund					
	2010	2011	2012	2013	2014
Beginning Improvement Fund Balance	**$ 525,425**	**$ 376,776**	**$ 573,624**	**$ 269,533**	**$ 406,353**
Connection Fees (Water Development Fees)	$ 30,451	$ 9,941	$ 11,838	$ 20,000	$ 13,443
Investment Interest	$ 1,992	$ 1,050	$ 1,044	$ 1,500	$ 294
Interfund Transfer	$ 100,000	$ 241,667	$ 25,256	$ 122,220	$ 50,000
Reservoir Leases for Wireless (6)	$ 53,810	$ 56,733	$ 57,639	$ 60,100	$ 62,846
Grant Loan Funds (State Revolving Fund)	$ -	$ -	$ -	$ -	$ -
Total Revenues	**$ 711,678**	**$ 686,167**	**$ 669,401**	**$ 473,353**	**$ 532,936**
Capital Improvements	$ 344,324	$ 111,494	$ 399,868	$ 67,000	$ 308,065
Services	$ -	$ -	$ -	$ -	$ -
Total Expenses	**$ 344,324**	**$ 111,494**	**$ 399,868**	**$ 67,000**	**$ 308,065**
Ending Improvement Fund Balance	$ 367,354	$ 574,673	$ 269,533	$ 406,353	$ 224,871

Table 9-2 Future Financial Status

Operating Fund						
	2015	2016	2017	2018	2019	2020
Beginning Operating Fund Balance	**$ 638,128**	**$ 602,442**	**$ 524,372**	**$ 498,596**	**$ 482,334**	**$ 482,564**
Water Revenues (1)	$ 675,000	$ 688,500	$ 702,270	$ 716,305	$ 730,642	$ 745,254
Residential (included above)	$ -	$ -	$ -	$ -	$ -	$ -
Commercial (included above)	$ -		$ -	$ -	$ -	$ -
Misc. Revenues	$ 300	$ 300	$ 300	$ 300	$ 300	$ 300
Merch Sales/Misc (2)	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000
Development Fees (Includes Connection Fees) (3)	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000	$ 11,000
Rent/Lease	$ 1,200	$ 1,200	$ 1,200	$ 1,200	$ 1,200	$ 1,200
Late Notices (4)	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
Investment Interest	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Grants & Loans	$ -	$ -	$ -	$ -	$ 6,721	$ 6,721
Total Revenues	**$ 1,351,628**	**$ 1,329,442**	**$ 1,265,142**	**$ 1,253,401**	**$ 1,258,197**	**$ 1,273,039**
Operations (5)	$ 441,000	$ 447,615	$ 452,091	$ 456,612	$ 461,178	$ 465,790
Interfund Transfer	$ 93,731	$ 143,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Debt Service/Loan Payments	$ 214,455	$ 214,455	$ 214,455	$ 214,455	$ 214,455	$ 214,455
Total Expenses	**$ 749,186**	**$ 805,070**	**$ 766,546**	**$ 771,067**	**$ 775,633**	**$ 780,245**
Ending Operating Fund Balance	$ 602,442	$ 524,372	$ 498,596	$ 482,334	$ 482,564	$ 492,794

Improvement Fund						
	2015	2016	2017	2018	2019	2020
Beginning Improvement Fund Balance	**$ 227,660**	**$ 188,013**	**$ 264,767**	**$ 342,521**	**$ 421,275**	**$ 501,029**
Connection Fees (Water Development Fees)	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000
Investment Interest	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Interfund Transfer	$ 50,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Reservoir Leases for Wireless (6)	$ 74,754	$ 75,754	$ 76,754	$ 77,754	$ 78,754	$ 79,754
Grant Loan Funds (State Revolving Fund)	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenues	**$ 373,414**	**$ 384,767**	**$ 462,521**	**$ 541,275**	**$ 621,029**	**$ 701,783**
Capital Improvements (7)	$ 185,401	$ 120,000	$ 120,000	$ 120,000	$ 120,000	$ 120,000
Services	$ -	$ -	$ -	$ -	$ -	$ -
Total Expenses	**$ 185,401**	**$ 120,000**	**$ 120,000**	**$ 120,000**	**$ 120,000**	**$ 120,000**
Ending Improvement Fund Balance	$ 188,013	$ 264,767	$ 342,521	$ 421,275	$ 501,029	$ 581,783

(1) Assumes average water rate increases of 1.0%
(2) Assumes flat line merch sales
(3) Assumes development fees are held at current rates
(4) Assumes late notices held at $20,000 per year
(5) Assumes operations costs increase 1.5% per year
(6) Assumes $1,000 lump sum increases per year (also pays for water use efficiency measures discussed in Chapter 4)
(7) Assumes a mix of meter changeouts, upsize pipelines and capitol improvement projects

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