

Drinking Water System Development Fee Study

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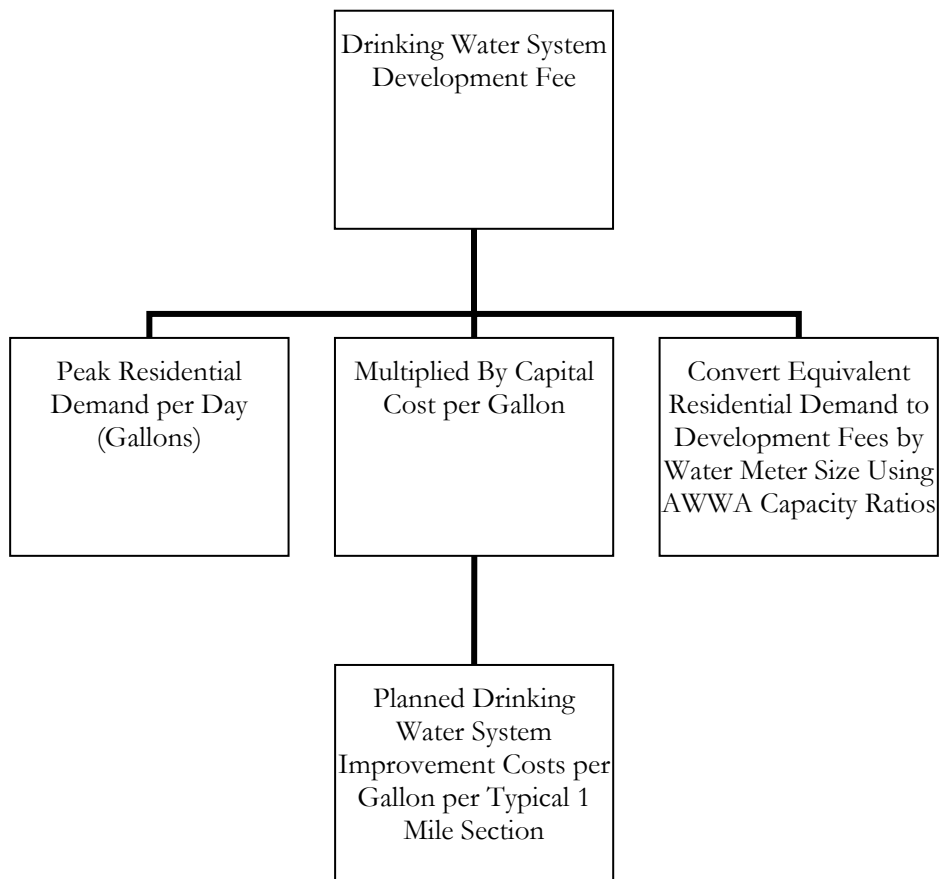
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Drinking Water System

METHODOLOGY

The Drinking Water System Development Fee is derived using the plan-based methodology. Capital costs are based on the drinking water system and system improvements necessary to provide potable water to a typical 1 mile section of land. As shown in Figure 1, the net capital cost per gallon of peak capacity is multiplied by the peak daily residential demand in Surprise. Fees for meters larger than 0.75 inches are derived from capacity ratios according to the size of the water meter needed by a new utility customer.

Figure 1: Drinking Water System Development Fee Methodology Chart



PLANNED DRINKING WATER SYSTEM PROJECTS PER TYPICAL 1 MILE SQUARE SECTION OF LAND

City staff estimates the peak water demand of a 1 mile section of land to be 1,563,000 gallons of drinking water for all land uses. The total cost of the drinking water system infrastructure which the City is responsible for providing is \$10,028,000 per 1 mile section of land (see Figure 2 below). The cost per gallon for this infrastructure is \$6.42 ($\$10,028,000 / 1,563,000 \text{ gallons} = \6.42).

Figure 2: Planned Drinking Water System Cost per Typical 1 Mile Section of Land

PEAK DEMAND PER TYPICAL 1 MILE SECTION OF LAND

Residential	1,280,000 Gallons per peak day
Commercial	86,000 Gallons per peak day
Turf	176,000 Gallons per peak day
Open Space	21,000 Gallons per peak day
TOTAL	1,563,000 Gallons per peak day

Assumptions:

1. Residential demand is based on 607 gallons per DU per peak day.
2. Commercial demand is 2,000 gallons per acre per peak day.
3. 55 acres of open space irrigation (40 acres turf and 15 acres of low water use landscape).
4. Turf demand is based on 4,400 gallon per acre per peak day, approximately 4.9 acre feet per acre per year (ADWR).
5. Low water use demand is based on 1,400 gallons per acre per peak day, approximately 1.5 acre feet per acre per year (ADWR).

WATER SYSTEM INFRASTRUCTURE PER TYPICAL 1 MILE SECTION OF LAND

<i>Item</i>	<i>Quantity</i>	<i>Units</i>	<i>Unit Cost</i>	<i>Total Cost</i>
Production Well Construction	2	Lump Sum	\$650,000	\$1,300,000
Production Well Design and CMI	2	Lump Sum	\$65,000	\$130,000
Well Site Construction	2	Lump Sum	\$900,000	\$1,800,000
Well Site Design and CMI	2	Lump Sum	\$90,000	\$180,000
Well Site Land	1	Acre	\$100,000	\$100,000
Water Supply Facility Construction	1,563,000	MGD	\$2.40	\$3,751,200
Water Supply Facility Design and CMI	1	Lump Sum	\$375,100	\$375,100
Water Supply Facility Land	4	Acres	\$100,000	\$400,000
Arsenic Treatment	1,563,000	MGD	\$0.70	\$1,094,100
Well Transmission Main (12 inch)	5,280	Feet	\$100.00	\$528,000
Well Transmission Main Design and CMI	1	Lump Sum	\$52,800.00	\$52,800
Well Transmission Main Oversize	5,280	Feet	\$30	\$158,400
Water Distribution Main Oversize	5,280	Feet	\$30	\$158,400
TOTAL				\$10,028,000

Peak Gallons per Day per Square Mile 1,563,000

Cost per Peak Gallon \$6.42

Source: City of Surprise, Water Services.

Assumptions:

1. Production well construction costs are based on the SPA 2 Asante Wells 1-4.
2. Production well design and CMI costs are based on 10% of construction costs.
3. Well construction is based on recent City projects (Marley Park #1).
4. Well site design and CMI is based on 10% of costs.
5. Well site land is based on two 150 ft by 150 ft well sites.
6. WSF construction costs are based on MVRWSF Phase 2.
7. WSF design and CMI costs are based on 10% of construction costs.
8. WSF land is based on 4 acres per site (based on ARWSF and Rancho Gabriella WSF).
9. Arsenic treatment costs are based on recent City projects (Sierra Verde and ARSWF).
10. Well transmission main minimum standard is 12-inch for each well.
11. Well transmission main design and CMI based on 10% of construction costs.

DEVELOPMENT FEE STUDY

The City should update its development fees every three years to ensure the methodologies, assumptions, and cost factors used in the calculations are still valid and accurate. As we do with many of our Arizona development fee clients, TischlerBise has included the cost of preparing the current Drinking Water System Development Fee in the fee calculations in order to create a source of funding to conduct this regular update. This cost (\$3,900) is allocated to the projected increase in peak gallons over the next three years. This results in a development fee study cost per demand unit of \$0.002 per gallon (\$3,900/2,433,729 gallons).

DRINKING WATER SYSTEM DEVELOPMENT FEE

Figure 3 provides a summary of the variables used to calculate the Drinking Water System Development Fee. Future revenue credits have been considered to avoid potential double payment for capital facilities and no such credit is needed for this fee category. Developers may be eligible for site-specific credits or reimbursements only if they provide system improvements that have been included in the Drinking Water System Development Fee calculation schedule. Specific policies and procedures related to site-specific credits for system improvements are addressed in the ordinance that establishes the City’s fees. Project improvements normally required as part of the development approval process are not eligible for credits against development fees.

Figure 3: Drinking Water System Development Fee Cost Summary

<i>Cost Summary</i>	<i>Standards:</i>
Peak Gallons per Day per Residential Connection	607
Planned Drinking Water System per 1 Mile Section Cost per Peak Gallon	\$6.42
Development Fee Study Cost per Gallon	\$0.002
Net Capital Cost per Gallon of Peak Capacity	\$6.42

A capacity ratio by meter size was used to convert the residential equivalent fee for a 0.75-inch meter into a proportionate fee for larger meter sizes. The capacity ratios by meter size are from the American Water Works Association (AWWA). For a one-inch meter, Surprise will use a conservative, typical-service ratio (see AWWA Manual 1, page 24). For all other meter sizes, Surprise will use ratios that assume 33% of maximum capacity, indexed to 0.75” meter (see AWWA Manual 6). If a large-scale development submits an independent engineering analysis, the Water System Development Fee may be based on the net capital cost per gallon of peak capacity and the peak daily demand for the particular development

Figure 4: Drinking Water System Development Fee

Development Fees

<u>All Development</u>				
<i>Meter Size (inches)</i>		<i>Type</i>	<i>Capacity Ratio</i>	<i>Per Meter</i>
0.75	Displacement		1.0	\$3,895
1.00	Displacement		1.3	\$4,958
1.50	Displacement		3.3	\$12,858
2.00	Displacement		5.3	\$20,559
3.00	Compound		10.7	\$41,551
3.00	Turbine		12.0	\$46,601
4.00	Compound		17.0	\$66,186
4.00	Turbine		20.5	\$79,838
6.00	Compound		33.0	\$128,584
6.00	Turbine		41.2	\$160,505
8.00	Compound		53.3	\$207,755
8.00	Turbine		60.2	\$234,364