



November 30, 2000

Carolyn Thomas, Finance Director
City of Fort Bragg
416 North Franklin St.
Fort Bragg, CA 95437

Re: Sewer & Water
Capital Improvement Fees

Dear Carolyn:

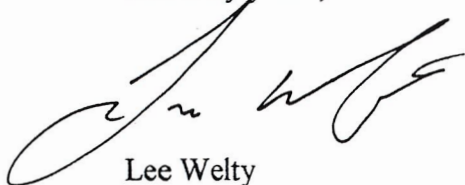
Attached please find the Capital Improvement Fee methodology and charts for determining sewer and water fees for various commercial uses as well as multi-family and single family homes. The equivalent dwelling unit flows were developed by Bartle Wells Associates. The water flow equal to one EDU was developed with our input. The Capital Improvement Fees are based upon the estimated sewer usage and water demand as opposed to the size of meter.

At the finance and administration committee meeting on August 31, 2000 the committee recommended that water use be estimated using the city historic water use pattern for the business type based upon peak demand periods which coincide with the periods of the year when the city may exceed its permitted draw from the existing water source. The developed water flow per single family home was obtained by using the highest monthly demand since 1992 and applying an average peaking factor for the same time period. This highest demand is found to be in the middle of the time period when the permitting agencies are concerned about the city's use. The percentage of residential use vs. commercial use is consistent regardless of the time of year.

For unusual and large projects where a variety of uses are proposed, Capital Improvement Fees will be individually established after project flows are developed.

If a change in occupancy is proposed on an existing site where the Capital Improvement Fees have been paid, the fee may be recalculated. An additional fee may be charged if the changes in occupancy results in a new fee greater than the original fee paid. There will be no refunds issued if the change in occupancy results in a fee less than the original fee charged.

Sincerely yours,



Lee Welty

Sewer & Water Capital Improvement Fees

November 29, 2000

In accordance with the request of the City of Fort Bragg, I.L. Welty and Associates have developed sewer and water flow quantities to be used to determine the capital improvement fees for connections to the existing sewer and water infrastructure.

Bartle Wells Associates, in a March, 2000 report, developed numbers for sewer and water demand for a single-family residence. These values were accepted as the definition of an Equivalent Dwelling Unit (EDU).

Accepted Flow Rates:

Average Peak Water Flow per single family home:	452gpd = 1.0 EDUwater*
Average Sewage Flow per single family home:	150gpd = 1.0 EDUsewer*

The accepted flow rates generated by Bartle Wells Associates was developed using data published in the August, 1999 water reclamation feasibility study by Carrollo Engineers. The water flow value represents the highest monthly average use and an average daily peaking factor. The sewage flow value was generated using annual flows to develop the average daily use.

Relationship between avg. peak

monthly residential water	$\frac{1.0 \text{ EDUwater}}{1.0 \text{ EDUsewer}} = \frac{452\text{gpd}}{150\text{gpd}} = 3.01$
use and avg. residential sewer use:	

Peaking Factors:

Single Family Residential Peaking Factor(generally accepted value):	2.0
Multifamily Peaking Factor:	1.75
Commercial Peaking Factor:	1.46

Average Peaking Factor:	1.68
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The estimated sewage generated by commercial entities was estimated with the use of the following references:

- Uniform Building Code, 1997 edition
- Wastewater Engineering: Collection and Pumping of Wastewater, copyright 1981 by McGraw-Hill, Inc.
- Manual of Septic-Tank Practice, US Department of Health, Education, and Welfare, Reprinted 1969
- Design Manual Onsite Wastewater Treatment and Disposal Systems, U.S. Environmental Protection Agency, October, 1980

Estimated water flows were compared with historical data from the City of Fort Bragg when the historical data was available. When a difference in the numbers existed, the larger flow value was used.

* See appendix for explanation of these terms and values

Calculation of Capital Improvement Fee for Sewer Connection City of Fort Bragg

Residential

Description (Organized by Strength Factor, Based on Bio-chemical Oxygen Demand & Suspended Solids)	Unit of Measure	Sewer Flow (Estimated) GPD	Strength Factor	Sewer EDU per unit of measure
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Domestic

Single Family Home	Unit	150	1.00	1.00
Multi-Family Home	Unit	150	1.00	1.00

Commercial

Description (Organized by Strength Factor, Based on Bio-chemical Oxygen Demand & Suspended Solids)	Unit of Measure	Sewer Flow (Estimated) GPD	Strength Factor	Sewer EDU per unit of measure
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Very Low

Car Wash	Stall	1060	0.62	4.38
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Low

Schools	1000 SF of classroom	1100	0.74	5.43
Laundromats	Washing Machine	160	0.74	0.79

Medium Low

Hospitals	Bed	250	0.92	1.53
Convalescent Homes	Bed	100	0.92	0.61

Domestic

Church	1000 SF	70	1.00	0.47
Retail/Wholesale	1000 SF	50	1.00	0.33
Professional Office	1000 SF	150	1.00	1.00
Beauty Shops	1000 SF	270	1.00	1.80
Brewery	1000 SF	440	1.00	2.93
Theater	Seat	3	1.00	0.02

Hotel (with spa)	Room	250	1.00	1.67
Hotel (without spa)	Room	150	1.00	1.00
Motel (with spa)	Room	205	1.00	1.37
Motel (without spa)	Room	105	1.00	0.70
Gas Stations	1000 SF	180	1.00	1.20
Garage	1000 SF	50	1.00	0.33

Medium

Lodging with kitchenette	Room	150	1.48	1.48
Bed and Breakfast (with spa)	Room	210	1.48	2.07
Bed and Breakfast (without spa)	Room	110	1.48	1.09

High

Restaurant with Bar (fixed seating)	Seat	45	3.06	0.92
Restaurant with Bar (no fixed seating)	1000 SF of dining area	3000	3.06	61.20
Restaurant (fixed seating)	Seat	30	3.06	0.61
Restaurant (no fixed seating)	1000 SF of dining area	2000	3.06	40.80
Supermarket	1000 SF	130	1.48	1.28

Equation for Sewer Fee Calculation:

Capital Improvements Sewer Fee = Number of Units x Sewer EDU per unit of measure x \$2050*

(* \$2050 is the fee required for 150gpd with a strength factor of 1.00)

Example:

Proposed Supermarket, 30,000 SF

Capital Improvements Sewer Fee = 30 x 1.28 x \$2050

Capital Improvements Sewer Fee = \$78,720.00

Capital improvement fees will be established after project flows are developed for unusual and large projects where a variety of uses are proposed.

If a change in occupancy is proposed on an existing site where the capital improvement fees have been paid, the fee may be recalculated. An additional fee may be charged if the change in occupancy results in a new fee greater than the original fee paid. There will be no refunds issued if the change in occupancy results in a fee less than the original fee charged.

Calculation of Capital Improvement Fee for Water Connection City of Fort Bragg

Residential

Description (Organized by Strength Factor of related sewer flow, based on Biochemical Oxygen Demand & Suspended Solids)	Unit of Measure	Water Flow (Estimated) GPD	Water EDU per unit of measure
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Domestic

Single Family Home	Unit	452	1.00
Multi-Family Home	Unit	390.0	0.86

Commercial

Description (Organized by Strength Factor, Based on Biochemical Oxygen Demand & Suspended Solids)	Unit of Measure	Water Flow (Estimated) GPD*	Water EDU per unit of measure
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Very Low

Car Wash (Self Serve)	Stall	2332.0	5.16
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Low

Schools	1000 SF of classroom	2420.0	5.35
Laundromats	Washing Machine	352.0	0.78

Medium Low

Hospitals	Bed	550.0	1.22
Convalescent Homes	Bed	220.0	0.49

Domestic

Church	1000 SF	154.0	0.34
Retail/Wholesale	1000 SF	110.0	0.24
Professional Office	1000 SF	330.0	0.73
Beauty Shops	1000 SF	594.0	1.31
Brewery	1000 SF	968.0	2.14
Theater	Seat	6.6	0.01

Hotel (with spa)	Room	550.0	1.22
Hotel (without spa)	Room	330.0	0.73
Motel (with spa)	Room	451.0	1.00
Motel (without spa)	Room	231.0	0.51
Gas Stations	1000 SF	396.0	0.88
Garage	1000 SF	110.0	0.24

Medium			
Lodging with kitchenette	Room	330.0	0.73
Bed and Breakfast (with spa)	Room	462.0	1.02
Bed and Breakfast (without spa)	Room	242.0	0.54

High			
Restaurant with Bar (fixed seating)	Seat	99.0	0.22
Restaurant with Bar (no fixed seating)	1000 SF of dining area	6600.0	14.60
Restaurant (fixed seating)	Seat	66.0	0.15
Restaurant (no fixed seating)	1000 SF of dining area	4400.0	9.73
Supermarket	1000 SF	286.0	0.63

Equation for Water Fee Calculation:

Capital Improvements Water Fee = Number of Units x Water EDU per unit of measure x \$2620*

(*\$2620 is the fee required for a Water EDU of 1.0)

Example:

Proposed Supermarket, 30,000 SF

Capital Improvements Water Fee = 30 x 0.63 x \$2620*

Capital Improvements Water Fee = \$49,518.00

Equations for Calculating Water Flow:

For Commercial Uses: $\text{Water Flow} = \text{Sewer Flow} \times 3.01 \times \frac{1.46}{2.0}$

For Multi Family Home: $\text{Water Flow} = \text{Sewer Flow} \times 3.01 \times \frac{1.75}{2.0}$

(Note: These formulas do not apply to the single family home water flow)

Capital improvement fees will be established after project flows are developed for unusual and large projects where a variety of uses are proposed.

If a change in occupancy is proposed on an existing site where the capital improvement fees have been paid, the fee may be recalculated. An additional fee may be charged if the change in occupancy results in a new fee greater than the original fee paid. There will be no refunds issued if the change in occupancy results

Appendix

- Bartle Wells Associates, Water Demand
- Bartle Wells Associates, Sewer Demand
- Carollo Report, Maximum Average
- Carollo Report, Projected Water Demand



BARTLE WELLS ASSOCIATES
INDEPENDENT PUBLIC FINANCE ADVISORS

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TO: Carolyn Thomas, Finance Director
City of Fort Bragg

FROM: Lora Stovall

DATE: October 27, 2000

RE: Water Capital Improvement Fee

As the City requested, I have worked with the City Engineer Lee Welty to revise the water capital improvement fee we had recommended to the City.

We have develop a revised estimate of water demand for a single family residence to use as a basis for the fee and calculated a new fee on that basis.

Water demand: We recommend that the fee be based on water demand of 452 gallons per day, calculated as follows.

Daily Demand from Carollo Report	
Average daily demand, 2000 (gallons/day)	1,080,000
Single family share of water use	40%
Total single family demand (gallons)	437,076
Times peaking factor of 2	874,152
Per account, 1,932 accounts	452

Single family fee: Based on water demand of 452 gallons per day per single family dwelling, the water capital improvement fee would be \$2,620, as shown below.

System Capacity	
Total system capacity (gallons)	2,370,000
Capacity per equivalent dwelling unit	452
System capacity, EDUs	5,243

Water Capital Improvement Fee	
Total capital investment (Table 6, 3/27 report)	\$13,733,000
System capacity, EDUs	5,243
Fee per EDU	\$2,620

I believe that this completes our assignment for the City in this matter.

The depreciated value for the facilities listed totals about \$4.6 million. The current value of these facilities is estimated by adjusting each asset's depreciated value by the change in the ENR construction cost index from its acquisition date to the December 1999 20-cities index of 6127. The current adjusted value of the facilities listed totals about \$9 million. This value is included in the calculation of the capital improvement fee.

Interest on Debt

In 1998, the District borrowed \$770,000 to finance sewer capital projects. Table 4 shows a schedule of annual interest and principal payments. Debt service payments will total about \$1.2 million through maturity in 2017/18. Of this, the District will incur a total expense of about \$475,000 in interest payments through the full term. The payments to date are included in the calculation of the capital improvement fee.

Sewer Capital Improvement Fee Calculation

Table 5 calculates a new sewer capital improvement fee based on the average cost approach discussed earlier: total capital investment divided by total capacity in equivalent dwelling units (EDUs). An EDU is a unit of measurement that represents the wastewater discharge of a standard single family residence. The District's capacity in the sewer system will serve 6,700 EDUs. This is based on the definition of an EDU developed in the sewer rate study which Bartle Wells Associates prepared in 1999. That study found that a typical single family dwelling discharged 150 gallons per day of wastewater, with loadings or wastewater strengths of 200 parts per million of both biochemical oxygen demand and suspended solids.

As shown on Table 5, capital investment in the sewer system totals about \$13.8 million. This yields a capital improvement fee of \$2,050 per EDU.

We recommend that the residential charge be applied to each residential unit, whether single family, multiple, or mobile home.

BARTLE WELLS ASSOCIATES
SEWER CAPITAL IMPROVEMENT FEE STUDY

day demands by average day demands. An average peaking factor of 1.68 was also calculated. Table 3 summarizes this information.

Table 3 Average and Maximum Day Demands for 1992-1998 Water System Study City of Fort Bragg			
Year	Average Day mgd	Maximum Day mgd	Annual Peaking Factor
1992	0.82	1.41	1.73
1993	1.04	2.09	2.00
1994	0.82	1.22	1.49
1995	0.71	1.13	1.59
1996	0.81	1.47	1.81
1997	0.86	1.35	1.58
1998	1.03	1.60	1.56
Maximum: 1.04			Average: 1.68

Average day and maximum day demand values reflect seasonal changes in water demand. Maximum day demand usually occurs during the summer months of July or August. Winter demands are significantly lower. Figure 2 illustrates the seasonal fluctuation in demand for the City.

The highest average day demand for the period of 1992 to 1998 occurred in 1993, with a value of 1.04 mgd, or 169 gallons per capita per day (gpcd). To be conservative, this value was adopted as the base demand. Applying the average peaking factor of 1.68, the estimated present maximum day demand is 1.75 mgd. This equates to a per capita maximum day demand of 284 gpcd (based on a 1993 population of 6,171).

Projected Water Demands

Water demands through 2032 were estimated using 169 gpcd. The service population is expected to shift from 98 percent City and 3 percent SOI to 99 percent City by the year 2032. The exact year of this shift is unknown. The more conservative estimate (slightly larger population during the intermediate years) results from the 98 percent and 3 percent service population scenario applied throughout the decades to buildout. Therefore, this scenario will be used until the year 2032, when the 99 percent City service population will come into effect. Both service scenarios culminate with the same population of 8,795 people.

Projected water demands from the year 2002 to 2032 are detailed in Table 4. Figure 3 details the projected demand and available supply.

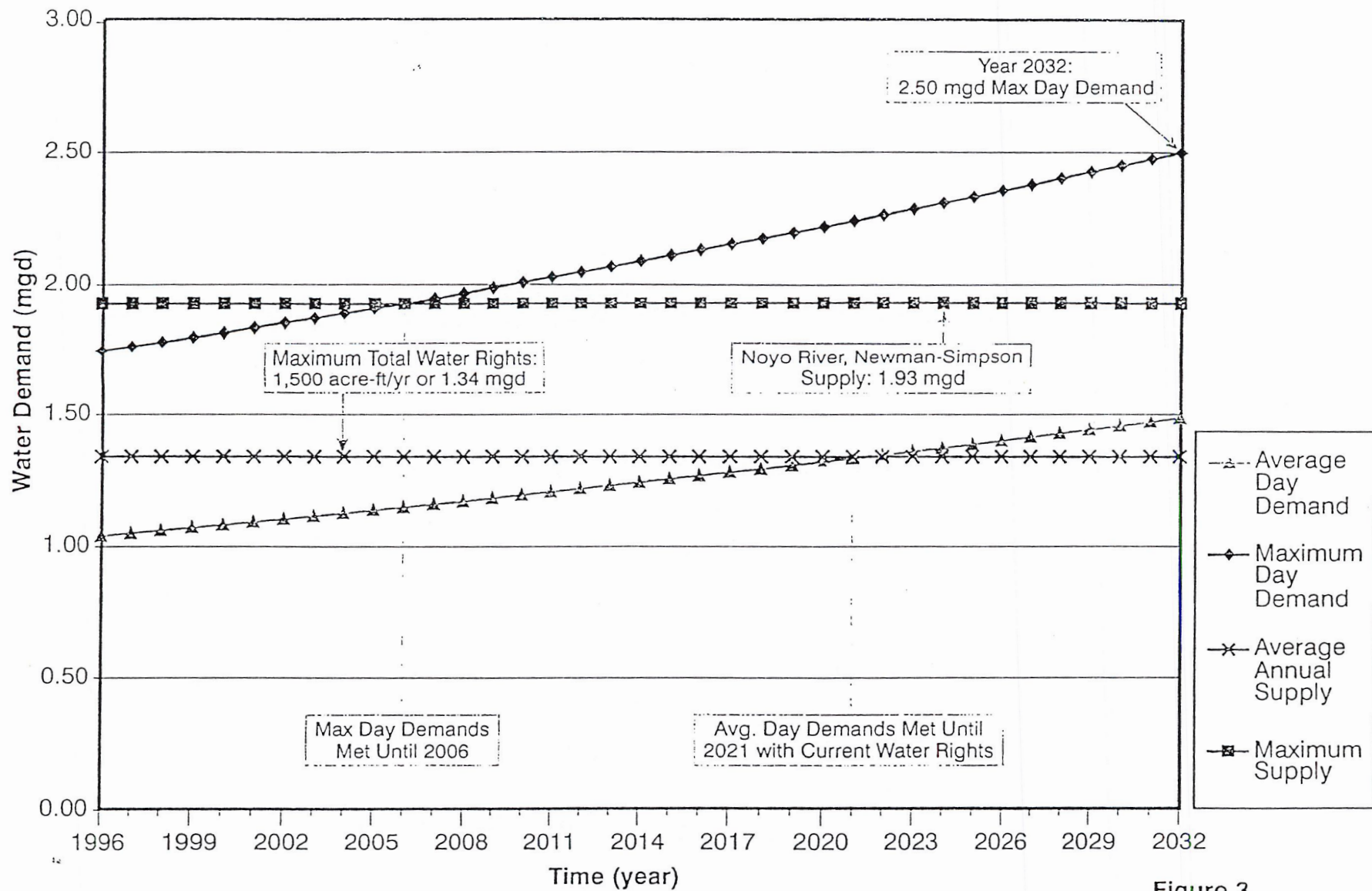


Figure 3
EXISTING WATER DEMAND
AND WATER SUPPLY
CITY OF FORT BRAGG