

Fee Plan

Sacramento County
Water Agency

Engineer's Report

For

Zones 11A, 11B, and 11C

Effective Date: August 16, 2004

Sacramento County Water Agency Code

Zone 11A, 11B, 11C Fee Plan and Engineer's Report

On June 8, 2004, by Resolution Number WA-2543, the Board of Directors of the Sacramento County Water Agency, a statutorily created district operating under the authority of and pursuant to the provisions of the Sacramento County Water Agency Act (California Water Code, Appendix, Chapter 66, commencing at Section 66-1 et seq.), adopted the 2004 Fee Plan and Engineer's Report, thereby replacing the Fee Plan and Engineer's Report dated January 9, 1996 in its entirety, effective coincident with the updated Titles 1 and 2 on August 16, 2004.

RESOLUTION NO. WA-2543

**ZONE 11A, 11B, and 11C
2004 FEE PLAN UPDATE**

WHEREAS, Zones 11A, 11B, and 11C were established in 1996 as separate Zones of the Sacramento County Water Agency ("Agency"); and

WHEREAS, Section 66001 of the Government Code requires periodic review of fees imposed pursuant to that section and further requires the governing board to make finding which identify the purpose to which the fee is to be put, and to demonstrate a reasonable relationship between the fee and the purpose for which it is charged; and

WHEREAS, the Agency Engineer has revised and updated the fee plan for Zones 11A, 11B and 11C of the Agency, which updated fee plan is entitled the Zone 11A, 11B and 11C 2004 Fee Plan ("Fee Plan") as required law; and

WHEREAS, the fees contemplated by the Fee Plan shall take effect, commensurate with the effective date of the Ordinances to updates Title 1 and Title 2 of the Water Agency Code, scheduled for approval at the Board of Directors meeting of June 15, 2004.

NOW, THEREFORE, the Board of Directors of the Sacramento County Water Agency hereby finds and determines that:

1. The development of property within Zones 11A, 11B, and 11C will require the construction of the additional facilities described in the Fee Plan because existing facilities in said Zones are inadequate to support development; and
2. The fees set forth in the Fee Plan are fairly apportioned within each of Zones 11A, 11B and 11C based on the need for the aforesaid facilities created by proposed development; and
3. The fee as to any property proposed for development within each of Zones 11A, 11B and 11C does not exceed the proportionate share of the amount of the total estimated costs of all facilities within each of said Zones which would be assessable on such property if such costs were apportioned uniformly on a per-acre basis; and
4. The findings of nexus contained within the Zone 11A, 11B and 11C Fee Plan are appropriate pursuant to California Government Code 66000, et seq; and
5. The 2004 Zone 11A, 11B, and 11C Fee Plan is hereby adopted.

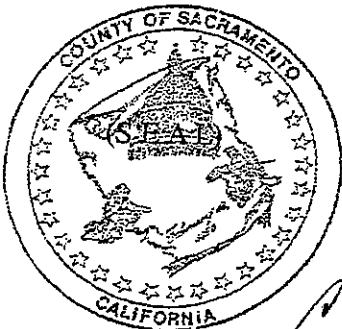
WA-2543

ON A MOTION by Director Nottoli, and seconded by Director Niello, the foregoing resolution was passed and adopted by the Board of Directors of the Sacramento County Water Agency, State of California, this 8th day of June, 2004, by the following vote, to wit:

AYES:	Director,	Collin, Niello, Nottoli, Johnson
NOES:	Director,	None
ABSENT:	Director,	Dickinson
ABSTAIN:	Director,	None

Muriel P. Johnson

Chair of the Board of Directors of the Sacramento County Water Agency, a district organized under the laws of the State of California



ATTEST:

Cathy A. Turner

Clerk of the Board of Supervisors of Sacramento County, California and ex officio Secretary of the Board of Directors of the Sacramento County Water Agency

In accordance with Section 25103 of the Government Code of the State of California a copy of the document has been delivered to the Chairman of the Board of Supervisors, County of Sacramento on **JUN 08 2004**

By *Faye Romo*
Deputy Clerk, Board of Supervisors

FILED

JUN 08 2004

BOARD OF SUPERVISORS
Cathy A. Turner
CLERK OF THE BOARD

2004 DRAINAGE IMPACT FEE PLAN for ZONES 11A, 11B and 11C

This Fee Plan is drawn pursuant to the Water Agency Code, Title 2, specifically, Sections 2.25.020 and 2.25.040, Content of the Fee Plan and Requisite Findings, respectively. The Fee Plan is to be reviewed and adjusted as necessary and periodically, pursuant to Section 2.25.060. This Fee Plan supercedes the 1996 Fee Plan. Where Conflict may arise, the Water Agency Code shall take precedence.

BACKGROUND DISCUSSION

The Sacramento County Department of Water Resources (SCDWR) is currently revising the drainage fee for Zones 11A, 11B, and 11C. The purpose of this document is to provide the basic assumptions used in developing the fee and the fee rate structure.

Periodic Fee Revision

The assumptions and methods used in calculating the new drainage fee are based on the best available information. As future development occurs in each Zone, and master plan improvements are implemented, the fee may be periodically revised based on updated information in order to keep the fee as current as possible.

Zone 11 History

Zone 11 of the Sacramento County Water Agency was originally formed in April 1965 with the purpose of providing funding for the construction of major drainage facilities. The area within Zone 11 includes the urbanized and urbanizing areas of the unincorporated portions of the County. All development that contributes to storm water runoff (intensity and/or volume) is required to pay a drainage impact fee to offset the cost of trunk and regional drainage facilities necessitated by development.

Computations were made, in the 1965 study, to determine the average cost of constructing drainage facilities. These costs were based on the type of construction prevalent at the time, primarily pipe and trapezoidal concrete-lined open channels. The total cost of such facilities within Zone 11 was estimated, and a per acre cost was determined. The per acre cost varied for different types of development based on average percent of impervious area. Development was broken into three categories: residential, commercial, and parks.

The fee is adjusted annually, based on the Engineering News Record's Construction Cost Index, to account for inflation of construction costs.

In April 1990, a 15% increase in the drainage fee was approved by the Board to allow for the increased drainage facility construction required for environmental mitigation, including additional channel excavation due to wetlands mitigation, and to mitigate some determined cumulative impacts of urban drainage on downstream properties.

The Fee Plan was revised in 1996 to create Zones 11A, 11B, and 11C and to account for the 1996 City/County of Sacramento Hydrology Standards and to add additional drainage components common to development, including:

- Flood control detention (local and regional peak flow)
- Water quality facilities (such as detention)
- Environmental mitigation and monitoring
- Master planning costs, including wetlands delineation
- Limited property acquisition
- Upsizing bridges and large culverts for ultimate capacities

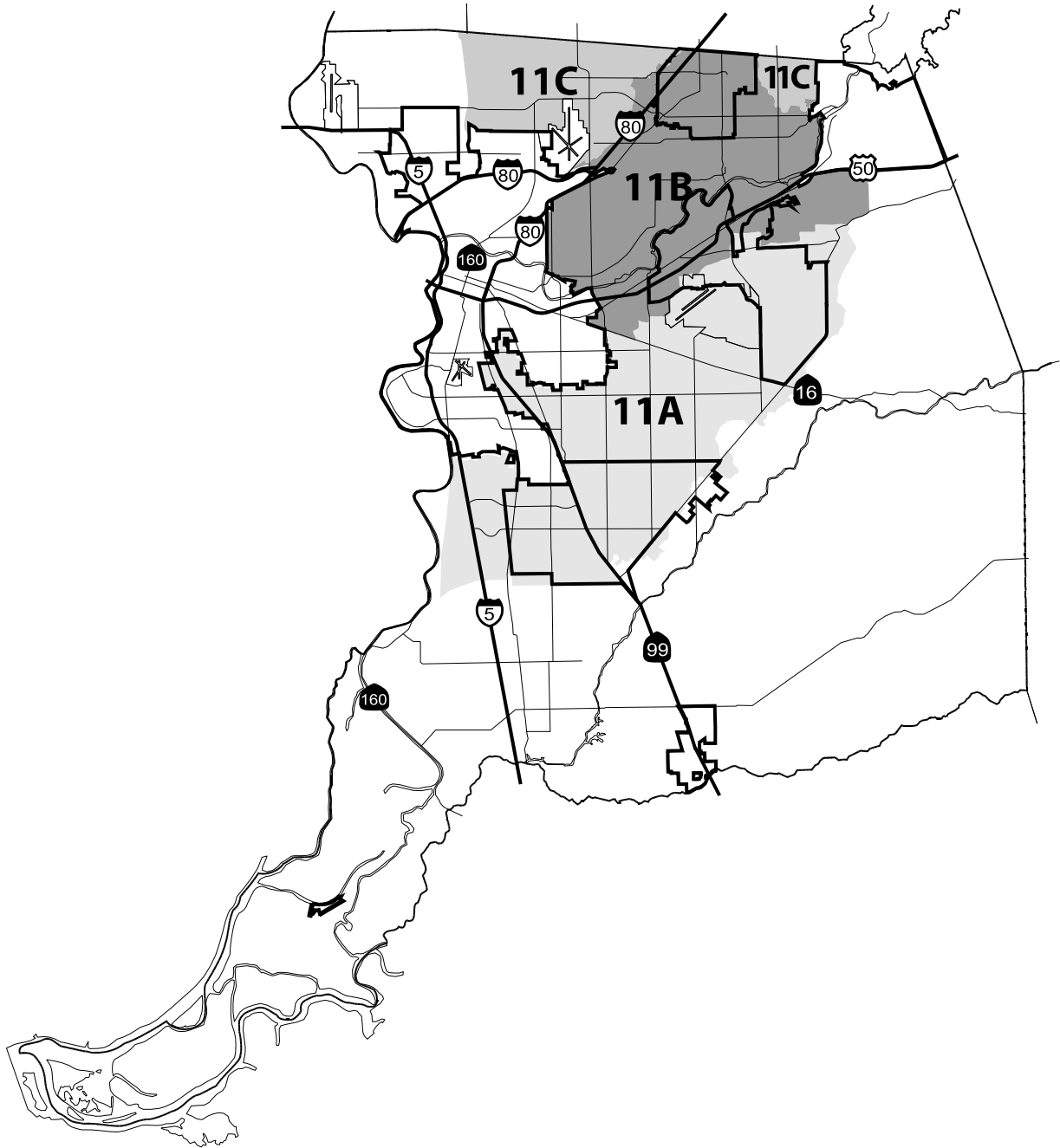
Revisions in this 2004 Fee Plan included an analysis of Zone 11 creditable work in current and recent specific plan areas. A questionnaire was sent out to several developers, engineers, and construction companies to review the unit prices paid for items of work on an expanded Schedule D (Appendix 2). The quantities from the specific plan areas were applied to the updated Schedule D prices and totals were quantified for the following major categories of trunk drainage facilities:

- Closed Conduit (Pipes)
- Channel Excavation
- Basin Excavation
- Basin Real Estate
- Channel crossings
- Utility Relocation
- Engineering
- Administration
- Contingency, Interest, In-fill Absorption

Fee Zones

Zones 11A, 11B, and 11C (see map, Figure 1) are intended to account for the variability of facilities required within different major watersheds, due primarily to topography and the existence of natural streams versus man-made channels.

The boundaries of each Zone are based on major watershed boundaries. Within each Zone there is a constant fee, regardless of any specific differences in facility needs of the smaller sub-sheds within that Zone. For example, although some sub-sheds may require flood control detention while other sub-sheds do not, the same fee will be required throughout the Zone and regional nexus is found in the fact that each development, whether upstream or



downstream, contributes and that people must travel the roadways throughout their region expecting the storm drain systems to function. The Zones 11A, 11B and 11C are described as follows:

- Zone 11 A - Morrison Creek stream group and watersheds draining to the Beach Stone Lake region.
- Zone 11 B - American River tributaries and Arden/Arcade watersheds
- Zone 11 C - Dry Creek and tributaries and watersheds draining to Steelhead Creek (aka. Natomas East Main Drainage Channel).

Zones 11A, 11B, and 11C are regional and overlap the political boundaries of the Cities of Citrus Heights, Rancho Cordova, and Elk Grove. The fees for each Zone are collected and administered by the Sacramento County Water Agency. Each Zone has a separate budget account and the funds are not co-mingled.

Development Classifications and Component Impacts

There are three basic trunk drainage components: pipes, channels and basins. For purposes of assessing the drainage impact fee, the contribution to the need for each trunk drainage component was considered for a nominal development of various density and corresponding percentage of impervious area. These results were plotted creating a continuum for setting fees for any specific project based on the impervious area of that project.

There will continue to be a different fee for each land use; however, the distinctions are revised (from the 1996 Fee Plan) to reflect the way that increased impervious area impacts (per County Hydrology Standards) the drainage facilities. An effort is made to simplify the method for determining site specific impervious area and the fee is set based on the outcome of this calculation. This is of particular importance in the case of parks and schools for which the impervious area may vary widely. It also creates an incentive for a park, school, and commercial projects to reduce drainage impacts in order to enjoy some relief in the fee charged.

DRAINAGE FEE CALCULATION

The drainage fee for each Zone is based on the estimated drainage credits that will be given for installation of trunk drainage facilities, plus engineering, administration, and contingency. The fees and credits will not zero balance on a project by project basis or a year by year basis, rather, the immense infrastructure required to safely convey storm water, flood water and to achieve the goals of the Clean Water Act are estimated over the entirety of each Zone.

Specifically, the fee was determined by:

1. Compilation of estimated trunk drainage facilities, including size and quantity, for each Zone. For Zones 11A and 11C, the estimate was derived from current drainage master plans and specific plan areas. For Zone 11B, the estimate was derived by carrying forward the regional analysis used in the 1996 Fee Plan.
2. Schedule D, unit prices, were updated based on a survey sent out to various developers, engineers, and contractors.
3. Land use was determined based on a county-wide average provided by the Planning Department (see Table 2).
4. The impact of each land use, percent impervious area, was determined using the Hydrology Standards, HEC-1 software, and the Improvement Standards.
5. These component costs were summed.
6. Consulting engineering, administration –external expenditures, Water Resources Department labor, storm water pollution prevention program and minor drainage review labor, National Pollutant Discharge Elimination Program labor, and other County labor were determined as a percentage and applied to the total.

The effective percent impervious area of a site is primarily related to land use; that is, it is assumed that building on the parcel will complete over time to account for the percentages listed in the table below. Therefore, actual calculations of percent impervious area should only be necessary for land uses not listed in Table 1.

Rainfall can infiltrate, evaporate, transpire, or run-off. Drainage facilities are designed based on estimation of run-off flows using computer modeled design storms. The Sacramento County Improvement Standards and the City/County Hydrology Standards provide a method for designing pipes, channels, and detention basins based on effective percent impervious for various land use. The cost of drainage facilities is increased with the percent impervious area. The basis for fees shall be effective percent impervious area.

Example 1:

A 1.2 acre parcel with an existing house was built in 1983 and paid fees at that time. The owner desires to split the parcel into two 0.6 acre lots, equaling 1.67 dwelling units per acre, from the above table, the fee should be based upon the interpolated fee from the Drainage Fee Schedule minus the inflated value of the fees paid in 1983.

Example 2:

A school is proposed on a 12-acre parcel in which 5-acres will be building, parking and paved surfaces and 7-acres will be grass graded to field drain inlets and collected in a storm drain pipe conveyed to the trunk system. There is no attenuation of peak flows, so the fee is based on 5 acres at 90% and 7-acres at the rate for graded and piped sports fields.

Example 3:

The Department of Water Resources finds that there would be some value in attenuating peak flow in the above example #3 parcel and suggests to the school district that their fees could be reduced if they direct some of the flows from the hard surface area to the grass area and create a shallow grassy area with a restricted inlet capacity to serve as peak flow detention. The engineering is determined and the school district agrees to grade the property in the suggested manner, detaining at least 50% of the 100-year peak volume. The flow from 2-acres of hardscape and 4-acres of lawn are graded toward this depressed area. Fees for the school may be reduced by 50%, per Section 2.50.050.

Example 4:

A ten acre park with 2.6 acres of impervious area (paving and roof tops) and 7.4 acres of graded landscaping and grass sports field. There is a grade break such that the runoff sheds to the north and to the south. The north shed includes 1.2 acres of impervious area and 0.9 acres of landscape. The south shed includes 1.4 acres of impervious area and 6.5 acres of landscape. The drainage fee is based on 2.6 acres at 90% impervious area and 7.4 acres at the rate for graded and piped sports fields.

Example 5:

The same ten acre park decides to work with Water Resources to design > 50% peak flow attenuation in the southern shed area. This volume is calculated using the Sacramento Hydrology Method to be 0.32 acre feet or 13,700 cubic feet. The advantage is that the peak flow runoff through the neighboring residential subdivision is reduced. The fee can therefore be reduced by 50% for the acres developed in the southern shed.

Table 1 (adapted from Table 5-3 of the Sacramento City/County Hydrology Standards- Volume 2 provides, where du/ac is dwelling units per acre) effective percent impervious as follows:

Highway/Parking	95%
Commercial / office / retail	90%
Industrial	85%
Apartments 31+ du/ac	80%
Mobile Home Park	75%
Apartment/Condo (13-30 du/ac)	70%
Residential 8-10 du/ac	60%
Residential 6-8 du/ac	50%
Residential 4-6 du/ac	40%
Residential 3-4 du/ac	30%
Residential 2-3 du/ac	25%
Residential 1-2 du/ac	20%
Mowed grass with graded and piped to drain	20%
Residential 0.5-1 du/ac	15%
Residential 0.2-0.5 du/ac	10%
Park without piped drainage	10%
Residential <0.2 du/ac	5%
Open Space	2%

The Sacramento County Planning Department provided information on typical zoning countywide (Table 2). This information is used to determine the average impervious area and to adjust for the impact in each Zone of the development types and their related impact on the trunk drainage facilities.

Table 2

Approximate Acres of Zoning (Unincorporated County, Elk Grove, Citrus Heights) (1)

	Acres	% of Total	% impervious area	% land use	Determine Average Impervious Area (3)
RD 1-3					
RD 1	466.90				
RD 2	5342.78				
Total	5809.68	9.20%	20%	9.20%	1.84%
RD 3-5					
RD 3	2958.49		30%	4.68%	1.41%
RD 4	3288.98		40%	5.21%	2.08%
RD 5	29159.39		40%	46.17%	18.47%
Total	35406.86	56.06%			
RD 5-7					
RD 7	2884.71		50%	4.57%	2.28%
Total	2884.71	4.57%			
RD 15 - 40 (2)	3861.09	6.11%	70%	6.11%	4.28%
Commercial	6715.90	10.63%	90%	10.63%	9.57%
Park/Open Space	8482.13	13.43%	15%	13.43%	2.01%
Grand Total	63160.37	100.00%		100.00%	41.94%

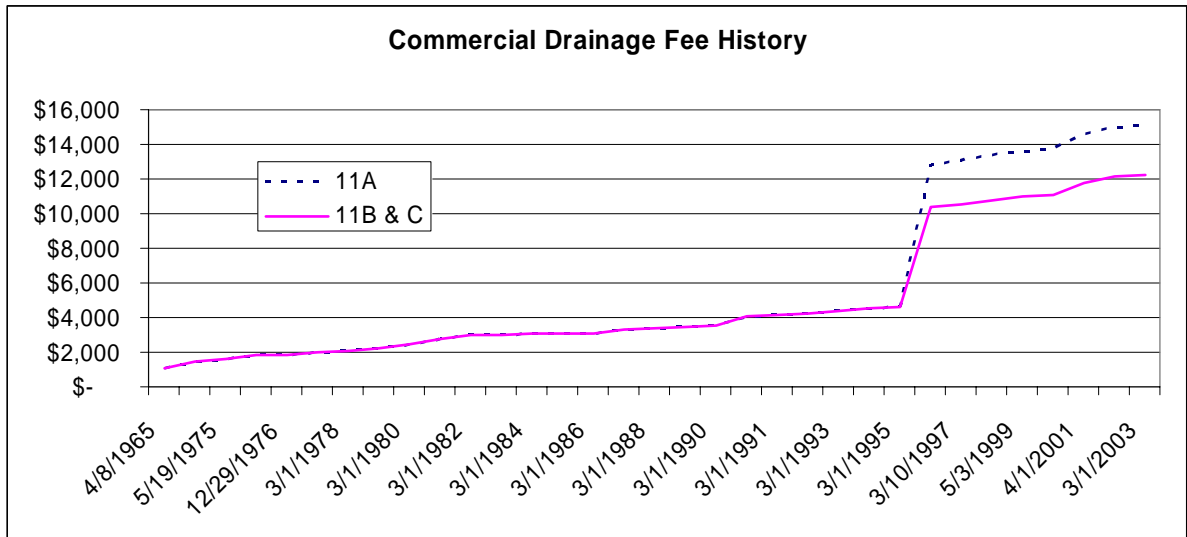
- 1) Acreage totals do not include parcels that have more than one zoning (RD 00, Z 00 parcels) nor does it include parcels in Special Planning Areas (SPA)
- 2) Acreage include single-family houses
- 3) Determined percent land use from the acreages listed in the second column and multiplied by the percent impervious area. The sum of this column equals the weighted average percent impervious area.

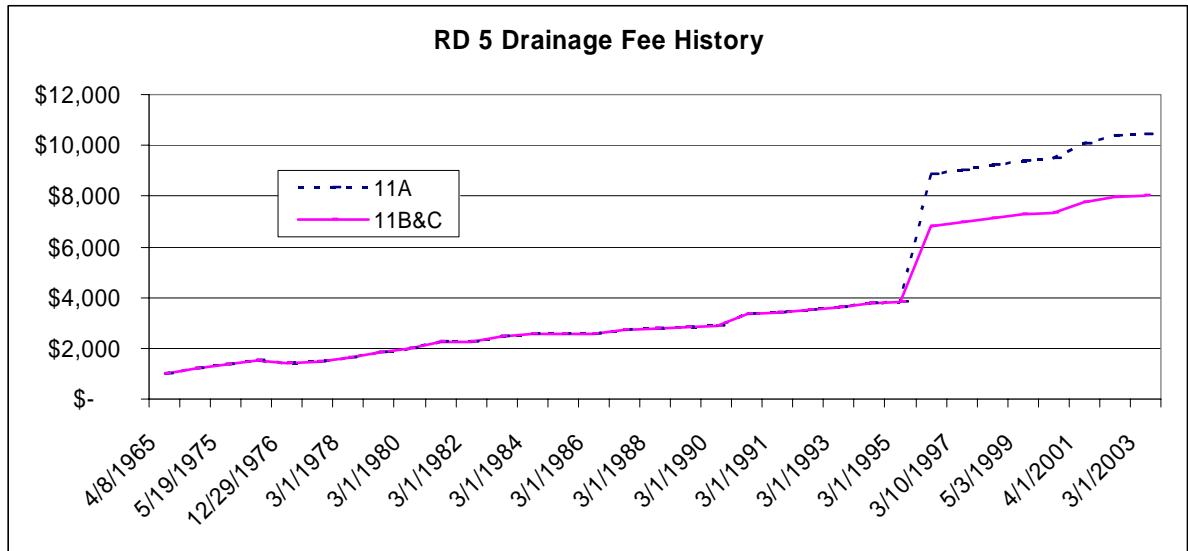
Source of first three columns: Tim Kohaya, Sacramento County Planning Dept.- February 2003

The basic components of the Fee Plan include:

- Closed Conduit (Pipes)
- Channel Excavation
- Basin Excavation
- Basin Real Estate
- Railroad Bridges and Over-chutes
- Utility Relocation
- Engineering
- Zone Administration
- Contingency, Interest, In-fill Absorption

Historic Zone 11 Fee





The Engineering News Record mean between the twenty city average and the San Francisco construction cost index was 6035 in 1996 and 7112 in 2003, amounting to a total inflation increase of 17.8%.

Measurement and Payment of Credits Schedule D

All credits shall be pursuant to Chapter 2.55 of Water Agency Code, Title 2. Where conflicts arise the Water Agency Code shall take precedence.

Trunk drainage pipe will be paid by as-built measured lineal foot from center of junction structure or manhole, at the unit prices listed in Schedule D, which includes excavation, traffic control, shoring, bedding and backfill.

Four inch thick concrete channel lining shall be paid at the unit price listed in Schedule D. If the design thickness is different than 4", the revised unit price shall be calculated and paid. That is, a 5" thick lining shall be paid at 125% the price listed per as-built measured square foot. The unit price includes rebar, wire mesh, grading, and all leveling material (aggregate base rock and sand) under the slab.

Three foot post and cable fence shall be paid per as-built measured lineal foot at the unit price listed in Schedule D, which includes a complete fence.

Pipe gate shall be paid at the unit price per each as listed in Schedule D. This assumes a pipe gate with three or four pipes of 15 foot width and shall be adjusted based on as-built post to post width. For example, an 18 foot wide gate shall be paid at 120% the price listed.

Six foot high chain-link fence shall be paid per as-built measured lineal foot at the unit price listed in Schedule D, which includes a complete fence. If the fence is more or less than 6 feet high, the price shall be adjusted. That is, an 8' high chain-link fence shall be paid at 133% of the price listed.

Six foot high chain-link gate shall be paid per each at the unit price listed in Schedule D, which includes a complete fence. This is for a gate width, measured post to post, of 16 feet. If the width is different, the unit price shall be adjusted. That is a 12 foot wide gate shall be at 75% of the unit price listed.

Signs required by the Department of Water Resources, or a state or federal resource agency, shall be paid per as-built measured square foot sign face area, at the unit price listed in Schedule D, which includes a complete sign. There are two prices: for 16 square feet or smaller and for signs that are larger than 16 square feet.

Miscellaneous metal, such as: handrails, access racks, debris racks, flap gates shall be paid per as-built calculated weight per unit price listed in Schedule D. This information should come in the form of an initial estimate based on the density of the metal and verified by a receipt or invoice from the vender, or other method of checking the weight of material used. Nuts and bolts and minor appurtenances are included in the unit price, and not included in the weight paid. Manhole rims and lids are not miscellaneous metal.

Channel excavation shall be paid by as-built measured cubic yard (neat line per the plans) at the unit price listed in Schedule D. Volume can be calculated manually by average end cross section or by digital methods. The same unit price is paid for short haul scraper excavation and for long haul truck export. The original ground for use in determining the excavated quantity shall be the lowest of either the existing ground or the finish development grade.

Basin excavation shall be paid by as-built cubic yard at the unit price listed in Schedule D. This can be done manually by average end cross section or by digital methods. The same unit price is paid for short haul scraper excavation and for long haul truck export. The original ground for use in determining the excavated quantity shall be the lowest of either the existing ground or the finish development grade.

Erosion control rip-rap shall be paid per as-built ton placed neatly per the approved plans at the unit prices listed on Schedule D. Estimate of tons of rip-rap can be done based on specific gravity and neat lines on plans. The tons shall be verified by weigh slips, if this amount varies from the estimated amount, field measurements to assure that the construction approximates the neat line approved drawings may be required.

Access ramps, driveways and maintenance road materials: structural sections of asphalt concrete on aggregate base rock, aggregate base rock alone, decomposed granite, and geotextile fabric shall be paid per as-built square feet at the unit price listed on Schedule D, which includes all appurtenances and no additional compensation shall be allowed.

Repairing asphalt concrete surfaces shall be paid per as-built quantities and the unit prices listed in Schedule D. Asphalt concrete patching shall be paid at the listed unit price per square foot regardless of thickness, saw cutting, temporary cut back, trench plates, trench guarantee requirements or traffic control. The measured quantity shall be the t-trench width per the Construction Specifications. This item is only paid when the patch paving is the final accepted product. That is, if the existing asphalt concrete is to remain, patch paving is to be done, and the surface is overlaid or slurry sealed, patch paving shall be credited. However, if the surfacing is removed for a greater width than the trench patch, due to requirements of the inspector or others, patch paving credit shall not be allowed.

Repair of concrete sidewalks, curbs and gutters is not credited.

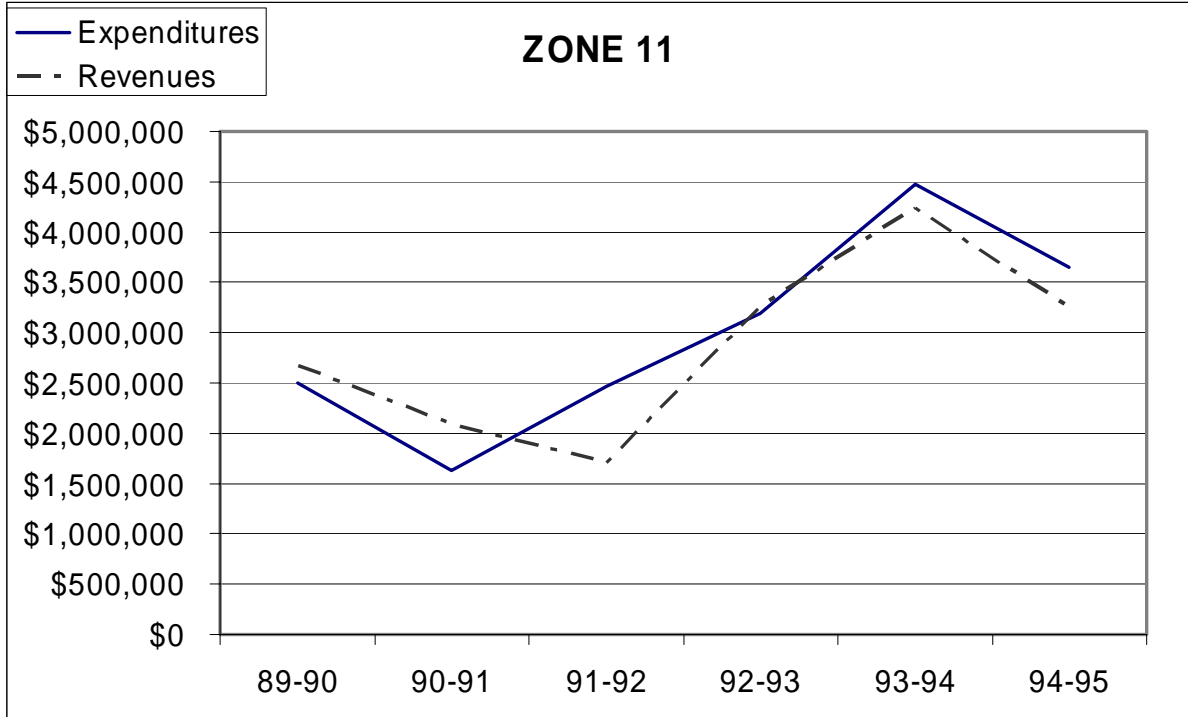
Hydroseeding shall be paid per as-built measured area, top of bank to top of bank of the drainage channel only, at the unit price listed on Schedule D.

Miscellaneous concrete shall be paid per the as built calculated cubic yard at the unit price listed on Schedule D, and includes (without additional allowance) all rebar, excavation, grading, rock and sand base, and backfill. Miscellaneous concrete is paid in two broad categories: formed structures (junction boxes, headwalls, box culverts, and stairways) and flat work (flat pads, driveways, and weirs). The listing of these items does not infer that they are necessarily creditable. For example, if non trunk drainage pipes coming to a junction with the trunk pipe system create the need for a junction box, the credit shall be the least expensive of the junction box or a manhole that hypothetically would have been used if it were not for the non-trunk pipes. Note that box culverts are almost always paid by the funding mechanism that is construction the roadway and not the Water Agency.

Zone 11 Cash Flow prior to 1996

Zone 11 was subdivided into Zones 11A, 11B, and 11C in the 1996 Water Agency Code and Fee Plan update. The annual expenditures and revenue are plotted on the chart below.

Expenses exceeded revenue during the recession years of 1992 to 1995.

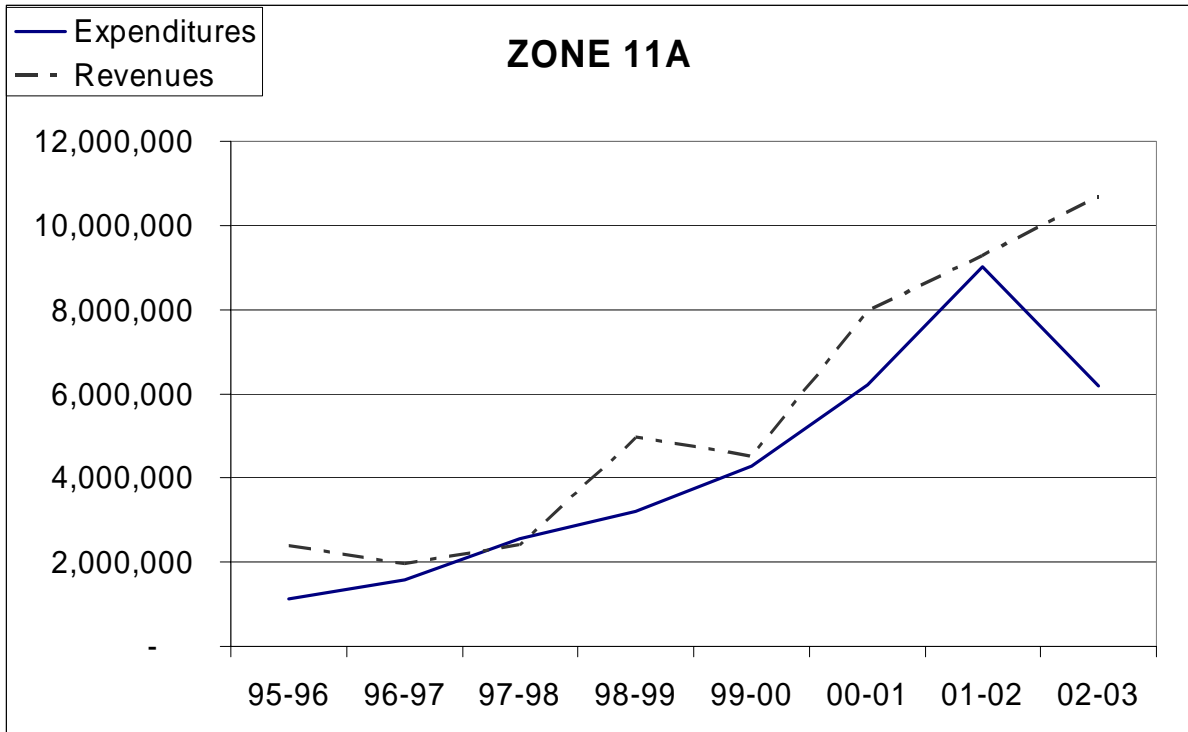


Zone 11A Cash Flow

Fund 315A account summary for fiscal years 1995/1996 to 2002/2003 are shown on the following table labeled SCWA-Zone 11A. The annual expenditures and revenue are plotted on the chart below.

Positive cash flow in Zones 11A has maintained since the 1996 Fee Plan revision. There were peaks and valleys and currently the economy is robust. The following Zone 11A cash flow chart shows a peak in expenses in fiscal year 2001/2002 due to some detention basin acquisitions. The gap between revenue and expenses in fiscal year 2002/2003 should not be alarming as there were \$9,395,000 in credit agreements written in that same calendar year. Revenue on this chart is the sum of credits used and cash fees paid.

Zone 11A reserve balance in the fiscal year 2003/2004 initial budget was \$5,580,846. Considering the robust development climate and the typical annual expenses, this amount should not be deemed too high.



FEE PLAN FOR ZONE 11A

Closed Conduits (Pipes)

1. The trunk pipe facilities for several specific plan areas were compared with the new Schedule D credit unit prices to determine this component of the fee plan.
2. Additionally, pipe sizes are increased in Zone 11A due to a revision to the Sacramento County Improvement Standards Section 9-16C:

Overland flow passing over street vertical curves shall not exceed a depth of six inches (6") over the back of walk.

It is found that this new standard is particularly sensitive in areas of flat topography, typical of Zone 11A. This is explained further in the appendix of this document.

Channel Excavation

All piped drainage ultimately discharges to a constructed or natural open channel. Trunk drainage channels are constructed whenever an area can not be piped either for environmental reasons or when the size of the necessary pipe exceeds 72" diameter. There are also occasions when existing open channel conveyances are widened or otherwise improved.

1. Channel excavation volumes for several specific plan areas were compared to the new Schedule D credit unit prices to determine this component of the fee plan
2. Channel widths are increased in Zone 11A due to the Sacramento County Improvement Standards Section 9-11 in which the Manning's "n-value" was increased from the previously specified 0.060 to 0.080. This accounts for increased desire to create natural channels with reduced maintenance and better riparian habitat, pursuant to the goals of the Clean Water Act and the Endangered Species Act as well as the desires of the local citizens. This is further described in appendix of this document.
3. Storm Water Quality is improved by careful design of channel bottom grading and planting.

Basin Excavation

Peak flow detention basins are constructed to attenuate high water to accommodate a downstream constraint or impact to a floodplain or stream confluence. For the improvement of storm water quality, detention volume is often added to the bottom of the flood basin volume creating a wet volume area for settling of particulates from the water.

Volume impacts are accommodated in the form of floodplain management, pump station operation, or detention. Volume impacts were measured for a typical small 160 acre drainage shed, the point at which a large diameter pipe might discharge to a creek, stream or channel.

The total cost of basins included in several drainage master plans for specific plan areas was used to calculate the cost per acre of development. While it is realized that not every development will require a detention basin, the regional nexus is found as discussed earlier in this text and in Titles 1 and 2.

Assuming simple detention basin projects are the typical solution, the volume of storage that would be required was calculated using HEC1 software and the Sacramento Method.

Assumptions used for peak flow and volume:

- SacPre Zone 2, Elevation 100', Slope 0.50%, Soil Type C*, Shed160-acres.
- Conveyance of the 10-year peak flow is conveyed without concern.
- Consider the volume above 10-year peak flow conveyance for build-out of the 160 acres to a total impervious percentage of 15% to 90%.

*NOTE: Soil type D was also run, yielding very similar results.

The above listed impervious percentages and the volume impact above the ten year flow represents a fictitious build out of a 160 acre shed area with one type of development, edge to edge. This is done to determine a relative difference and is not intended to be indicative of any specific site or storm water shed. This is explained further in the appendix of this document.

Basin Real Estate

For Zone 11A, several current or recent specific plan areas were reviewed. An estimate of detention basin real estate costs were totaled and divided by the total combined acres of the specific plan areas.

All storm water quality basins are to be in the bottom of flood control basins or the real estate component will be paid by the developer, unless otherwise approved by the Director and serving a regional benefit in order to comply with the County's NPDES permit.

Railroad Bridges

In the Specific Plan areas reviewed in Zone 11A, there were some railroad bridges included. These are located in master planned areas where channel improvements are required to convey the flow from the proposed development(s).

Over-chutes

Folsom South Canal over-chutes may be installed to off-set the need for excessive detention upstream. These costs estimated were included in the Fee Plan.

Utility Relocation

Typically, utilities are required to relocate their facilities at no cost to the Water Agency or County when they are in the road right-of-way. A small allowance was added to the Fee Plan for the rare occasions Zones 11A will pay for utility relocation when the existing utility facility is in the alignment of a new channel right-of-way.

Engineering

Fee credit for engineering work associated with the design of trunk drainage facilities was increased from 5% to 8% to recognize the complexity inherent in the design of these facilities. This 8% engineering factor is applied to all construction components (pipes, channels, and detention basins) of the drainage fee. While this component is being increased, it is only intended to compensate the developer for a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11A administration costs were tabulated below for fiscal year 2001 current as a percentage of the revenue (sum of cash fees and credits), for items 1, 2, and 5 below. Items 3 and 4 are added in this Fee Plan.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
4. Administration (NPDES program labor) includes Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
5. Administration (Other County labor) includes: a nominal budget for handling plan in take and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

Zone 11A		Revenue	Revenue in 2003 dollars		
FY 02/03	\$	10,678,134	\$	10,678,134	
FY 01/02	\$	9,266,871	\$	9,322,808	
FY 00/01	\$	7,977,637	\$	8,272,306	
FY 99/00	\$	4,511,916	\$	4,978,794	
FY 98/99	\$	4,961,205	\$	5,518,723	
FY 97/98	\$	2,414,506	\$	2,742,890	
FY 96/97	\$	1,953,679	\$	2,271,636	
		Average Revenue:	\$	6,255,042	
		External Expenditures:	\$	177,384	2.84%
		Water Resources Labor:	\$	754,646	12.06%
		Other County Labor:	\$	226,571	3.62%

More detail is provided in Appendix 5.

Addition labor added to this Fee Plan includes:

1. Staff time for review of minor drainage, grading plans, and storm water pollution (erosion control) \$209,954 per year or a factor of 3.35%.
2. Staff time for the Zone 11A storm water pollution control program, under the Clean Water Act \$113,840 per year or a factor of 1.82%.

Contingency, Interest, In-fill Absorption

The 15% contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

Please see Appendix for additional detail.

SUB-FEES WITHIN ZONE 11A

Beach Stone Lake Flood Volume Mitigation Fee

Point Pleasant, Glanville Tract, and Interstate 5 rely upon a railroad (WPRR) grade to function as their upstream levee, and that embankment (which was not constructed to levee standards) failed in both 1986 and 1997. The County is working with State Department of Water Resources (DWR) staff to formulate a project that upgrades existing RD 1002 levees, that improves the function of the WPRR grade pursuant to levee standards, and to evaluate alternatives for protecting the area from south-to-north flows. Finally, there is an effort to examine means of reducing flood hazard upstream of the WPRR.

All of Zone 11A contributes to the Interstate 5 / Point Pleasant Flood Protection Project in the amount of \$220.00 per acre (in 2003 dollars) as provided in Schedule 11A and adjusted annually in accordance with Section 2.50 of Title 2. These funds are to be held in reserve for contribution toward a flood damage reduction project that will be formulated by California Department of Water Resources as it advances the CALFED North Delta program in coordination with flood control elements at Lambert Road and Point Pleasant.

This subject has been heard several times by the Board, as of the writing of this document. The project is evolving. The reader interested in the history of the fee is referred to:

- On October 2, 2001, Sacramento County Water Agency Board, Item #32 on October 2, 2001, Coordination of CALFED North Delta Project and Sacramento County's Interstate 5, Point Pleasant Flood Protection Project;
- Board of Supervisors, Item #60 on November 24, 1998, Beach Stone Lake Flood Control Plan;
- Board of Directors Sacramento County Water Agency, On February 11, 1992 Update on the Lambert Road Flood Control Project...;
- Sacramento County Board of Supervisors, April 17, 1990, Lower Morrison Creek Drainage Improvements...; and
- Sacramento County Board of Supervisors, October 26, 1988, Report Back... Morrison & Laguna Creek Drainage Basin.

Zone 11A Fee Reductions

The following is reiterated from the 1996 Fee Plan and shall be continued and made a part of this 2004 Fee Plan. Within the proposed Zone 11A fee area, there are specific developments which were assessed a reduced Morrison Creek Stream Group Fair Share (MCSG) fee rate. These developments are: Laguna West, Lakeside, Elliott Ranch South, Laguna Business Park (Laguna Oaks, Parkside Village), and Calvine-99 SPA (Property "A").

These developments constructed extensive trunk drainage and detention facilities. Rather than giving them drainage credits against the full fee, they were given a reduction in the old MCSG fee rate based on the value of the facilities constructed. With creation of Zone 11A and its revised fee, in 1996, these areas will be assessed at an appropriately revised fee rate. An explanation of the fee reduction is below.

Laguna West, Lakeside, Elliott Ranch South

These developments provided drainage facilities which were allowed to receive full reduction of most component costs of the fee. The exceptions were for trunk pipe and channel construction, which are assessed at the full rate.

Laguna Business Park (Laguna Oaks, Parkside Village), Calvine-99 SPA (Property "A")

These developments provided drainage facilities which were comparable to drainage master plan floodplain corridors. These facilities are located along Elk Grove Creek (Laguna Business Park) and Strawberry Creek (Calvine 99SPA). These facilities were significant in size and allowed for complete reduction of many of the component costs of the fee. The exceptions were for dual-purpose detention construction and property acquisition. For these components the developments received a 56% reduction of the component fee rates. Also, no reduction in component fee rate was given for trunk pipe construction, channel construction or volume detention.

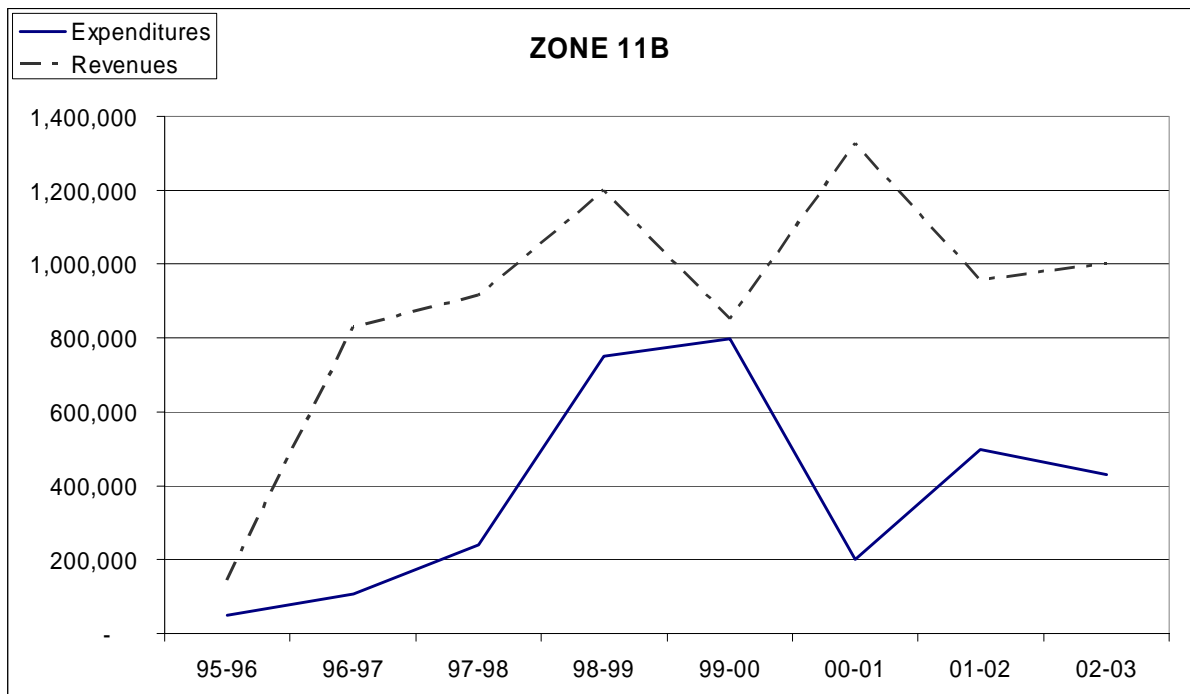
The Zone 11A fees for these aforementioned areas are detailed in fee schedule. They were each increased by an amount associated with the increase in Schedule D and the increased cost of Department of Water Resources staff for plan check and storm water pollution prevention. These fees will be revised annually pursuant to Section 2.50.080.

Zone 11B Cash Flow

Fund 315B account summary for fiscal years 1995/1996 to 2002/2003 are shown on the following table labeled SCWA-Zone 11B. The annual expenditures and revenue are plotted on the chart labeled Zone 11B.

Zone 11B is a mature development area. Much of the trunk drainage infrastructure is in place. In fill development continues at a modest rate. Revenues have exceeded fees since the 1996 Fee Plan revision. Credit agreements in fiscal year 2002/2003 totaled only \$24,000.

Zone 11B reserve balance in the fiscal year 2003/2004 initial budget was \$3,091,149. Considering the need for detention basins, storm water quality improvement, floodwalls, and administration of the fee, this amount should not be deemed too high.



FEE PLAN FOR ZONE 11B

The following shed areas were studied in the 1996 Fee Plan and the same creditable items used in this 2004 Fee Plan, updated pursuant to the revised Schedule D, plus administration, engineering and contingencies.

Creek	Sample Watersheds net area
Chicken Ranch Slough	2436 acres
Strong Ranch Slough	861 acres
Verde Cruz Creek	888 acres
Coyle Creek	758 acres
	4943 acres

The 1996 Fee Plan reduced this gross acreage by 20% for roads and other unbuildable areas:

$$4943 \text{ acres} \times 80\% = 3954 \text{ acres.}$$

Closed Conduit (Pipes)

In the 1996 Fee Plan, a sample trunk facility inventory was summarized over an area of 4943 acres in the Chicken Ranch Slough, Strong Ranch Slough, Verde Cruz and Coyle Creek watersheds in an effort to determine the typical trunk pipe facilities in Zone 11B. These same figures are used for this 2004 Fee Plan, as shown below:

These pipe and manhole quantities were multiplied by the 2004 Schedule D unit prices to determine the fee component.

Item	Quantity
21" storm drain pipe	18,125 LF
24" storm drain pipe	38,492 LF
27" storm drain pipe	7,400 LF
30" storm drain pipe	20,320 LF
33" storm drain pipe	1,145 LF
36" storm drain pipe	19,620 LF
42" storm drain pipe	18,978 LF
48" storm drain pipe	4,342 LF
54" storm drain pipe	5,245 LF
60" storm drain pipe	1,990 LF
66" storm drain pipe	1,300 LF
72" storm drain pipe	1,007 LF
84" storm drain pipe	675 LF
Manholes	233 LF

Channel Excavation and Fencing

The quantities used in the 1996 Fee Plan are used in the 2003 Fee Plan and are listed below:

Channel Excavation	173,389 CY
Fencing	116,314 LF

In the 1996 Fee Plan, there was allowance for 2,094,848 square feet of channel lining. Under current standards and policies there should not be much if any new channel lining constructed in the future.

Volume Mitigation

An allowance for basin real estate acquisition and construction is included in this Fee Plan as there will be need, over time, to construct facilities for the purpose of reducing peak flows and improving storm water quality in the natural streams. These projects include, but are not limited to:

- Basin(s) on tributaries to Arcade Creek and on Linda Creek.
- Improvements on Strong Ranch and Chicken Ranch Sloughs.

For this study, it is estimated that 125 acre feet of detention basin volume will be constructed.

Zone 11B may anticipate making a \$1,500,000 contribution from Zone 11B for upgrading existing pump stations.

The volume impact comparison is better described in the appendix.

Basin Real Estate

This Department, the Urban Creek's Council, Sacramento Splash as well as other government and volunteer organizations are becoming increasingly concerned about storm water quality in the Sacramento County natural streams. While potential improvement projects are not yet formulated, it is critical to reserve some funds for these purposes, in the form of joint use flood control and storm water quality facilities. For this study, it was assumed that 35-acres of land may to be acquired. Much of this land should be already encumbered by floodplain restrictions, so the estimated cost is low. The estimated value is:

$$35 \text{ acres @ } \$80,000 = \$2,800,000.$$

Floodwalls

Over the many years of development and considering the increased rainfall intensities and durations experienced in winters since 1986, it is prudent to include some budget for floodwalls to protect existing homes. Specific projects are purposefully not listed.

$$1333 \text{ ft @ } \$150 \text{ per lineal foot} = \$2,000,000$$

Railroad Bridges and Utility Relocation

No railroad bridges, but a small budget for utility relocation is included at \$200,000

Engineering

Fee credit for engineering work associated with the design of trunk drainage facilities was increased from 5% to 8% to recognize the complexity inherent in the design of these facilities. This 8% engineering factor is applied to all construction components (pipes, channels, and detention basins) of the drainage fee. While this component is being increased, it is only intended to compensate the developer for a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11B administration costs were tabulated below for fiscal year 2001 current as a percentage of the revenue (sum of cash fees and credits), for items 1, 2, and 5 below. Items 3 and 4 are added in this Fee Plan.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
4. Administration (NPDES program labor) includes Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
5. Administration (Other County labor) includes: a nominal budget for handling plan in take and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

Zone 11B		Revenue	Revenue in 2003 dollars
FY 02/03	\$	1,000,713	\$ 1,000,713
FY 01/02	\$	955,589	\$ 961,357
FY 00/01	\$	1,325,992	\$ 1,374,970
FY 99/00	\$	851,222	\$ 939,304
FY 98/99	\$	1,198,473	\$ 1,333,152
FY 97/98	\$	914,507	\$ 1,038,884
FY 96/97	\$	795,874	\$ 925,401
Average Revenue:		\$	1,081,969
External Expenditures:		\$	40,200 3.72%
Water Resources Labor:		\$	200,218 18.50%
Other County Labor:		\$	36,230 3.35%

More detail is provided in Appendix 4.

Addition labor added to this Fee Plan includes:

1. Staff time for review of minor drainage, grading plans, and storm water pollution (erosion control) \$70,869 per year or a factor of 6.55%.
2. Staff time for the Zone 11A storm water pollution control program, under the Clean Water Act \$42,413 per year or a factor of 3.92%.

Contingency, Interest, In-fill Absorption

The 15% contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

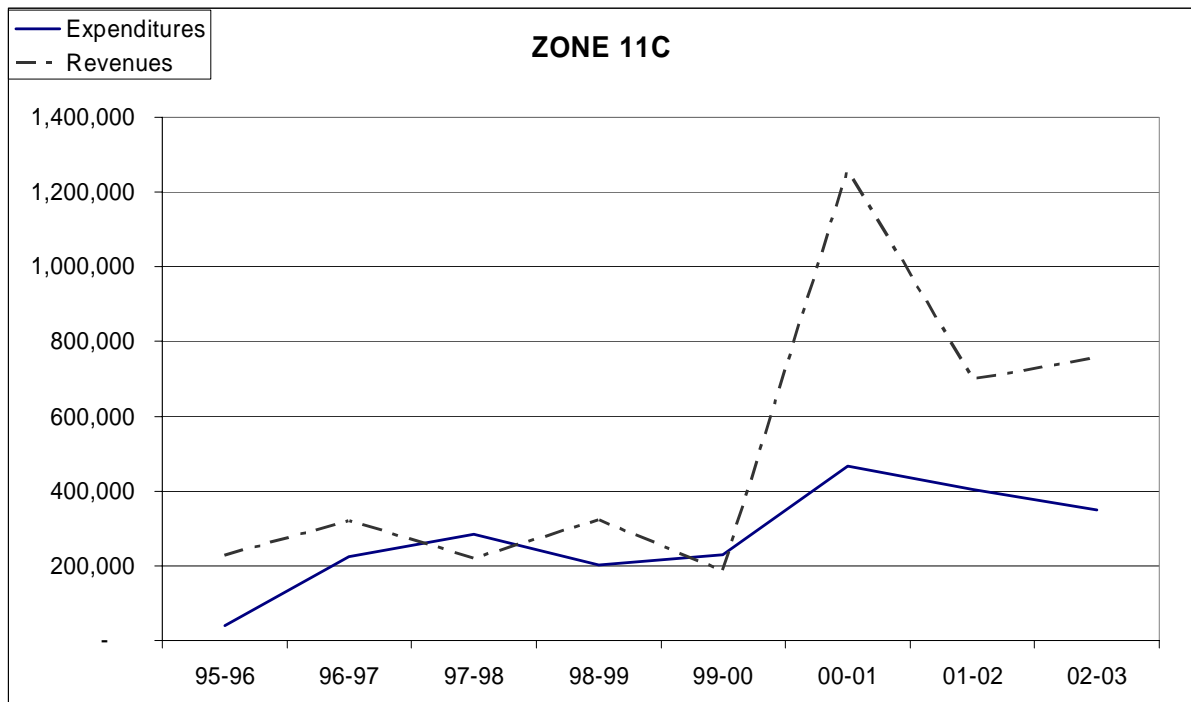
Please see Appendix for additional detail.

Zone 11C Cash Flow

Fund 315C account summary for fiscal years 1995/1996 to 2002/2003 are shown on the following table labeled SCWA-Zone 11C. The annual expenditures and revenue are plotted on the chart labeled Zone 11C.

Zone 11C has opportunities for additional development. The Zone lacks much of the necessary trunk drainage infrastructure. Streams are inadequate for conveyance of the 100-year peak flows. Revenues have been modest since the 1996 Fee Plan revision. Credit agreements in fiscal year 2002/2003 totaled only \$76,000.

Zone 11C reserve balance in the fiscal year 2003/2004 initial budget was \$1,730,240. Considering the need for detention basins, storm water quality improvement, trunk drainage facilities, channel capacity improvements and administration of the fee, this amount should not be deemed too high.



FEE PLAN FOR ZONE 11C

Closed Conduit (Pipes)

1. The trunk pipe facilities estimated for several specific plan areas were compared with the new Schedule D credit unit prices to determine this component of the fee plan.
2. Sacramento County Improvement Standards Section 9-16C (limiting depth of overland release flows) does not have an impact where the topography is steeper than 0.5% as is typically the case in Zone 11C.

Channel Excavation

All piped drainage ultimately discharges to a constructed or natural open channel. Trunk drainage channels are constructed whenever an area can not be piped either for environmental reasons or when the size of the necessary pipe exceeds 72" diameter. There are also occasions when existing open channel conveyances are widened or otherwise improved.

1. Channel excavation volumes for several specific plan areas were compared to the new Schedule D credit unit prices to determine this component of the fee plan
2. Channel widths are increased in Zone 11A due to the Sacramento County Improvement Standards Section 9-11 in which the Manning's "n-value" was increased from the previously specified 0.060 to 0.080. This accounts for increased desire to create natural channels with reduced maintenance and better riparian habitat, pursuant to the goals of the Clean Water Act and the Endangered Species Act as well as the desires of the local citizens. This is further described in the appendix.
3. Storm Water Quality is improved by careful design of channel bottom grading and planting.

Basin Excavation

Peak flow detention basins are constructed to attenuate high water to accommodate a downstream constraint or impact to a floodplain or stream confluence. For the improvement of storm water quality, detention volume is often added to the bottom of the flood basin volume creating a wet volume area for settling of particulates from the water.

Volume impacts are accommodated in the form of floodplain management, pump station operation, or detention. Volume impacts were measured for a typical small 160 acre drainage shed, the point at which a large diameter pipe might discharge to a creek, stream or channel.

The total cost of basins included in several drainage master plans for specific plan areas was used to calculate the cost per acre of development. While it is realized that not every

development will require a detention basin, the regional nexus is found as discussed earlier in this text and in Titles 1 and 2.

Assuming simple detention basin projects are the typical solution, the volume of storage that would be required was calculated using HEC1 software and the Sacramento Method.

Assumptions used for peak flow and volume:

- SacPre Zone 2, Elevation 100', Slope 0.50%, Soil Type C*, Shed 160-acres.
- Conveyance of the 10-year peak flow is conveyed without concern.
- Consider the volume above 10-year peak flow conveyance for build-out of the 160 acres to a total impervious percentage of 15% to 90%.

*NOTE: Soil type D was also run, yielding very similar results.

The above listed impervious percentages and the volume impact above the ten year flow represents a fictitious build out of a 160 acre shed area with one type of development, edge to edge. This is done to determine a relative difference and is not intended to be indicative of any specific site or storm water shed.

This is further described in the appendix.

Basin Real Estate

For Zone 11C, several current or recent specific plan areas were reviewed. An estimate of detention basin real estate costs were totaled and divided by the total combined acres of the specific plan areas.

All storm water quality basins are to be in the bottom of flood control basins or the real estate component will be paid by the developer, unless otherwise specifically approved by the Director and serving a regional benefit in order to comply with the NPDES permit.

Bridges and Utility Relocation

There is no allowance in Zone 11C for crediting for the construction of new or improvement of existing bridges or box culverts. These should be paid by a funding mechanism related to the roadway construction or roadway maintenance.

Typically, utilities are required to relocate their facilities at no cost to the Water Agency or County when they are in the road right-of-way. On some rare occasions Zones 11C will pay for utility relocation when the existing utility facility is in the alignment of a new channel right-of-way.

Engineering

Fee credit for engineering work associated with the design of trunk drainage facilities was increased from 5% to 8% to recognize the complexity inherent in the design of these facilities. This 8% engineering factor is applied to all construction components (pipes, channels, and detention basins) of the drainage fee. While this component is being increased, it is only intended to compensate the developer for a reasonable portion of the engineering costs associated with the fact that trunk drainage facilities typically serve other upstream, downstream and adjacent properties.

Administration

Zone 11C administration costs were tabulated below for fiscal year 2001 current as a percentage of the revenue (sum of cash fees and credits), for items 1, 2, and 5 below. Items 3 and 4 are added in this Fee Plan.

1. Administration (external expenditures) includes: legal notices, public outreach, blue printing, copying, postal service, supplies, permits, consultant contracts, fiscal services staff, legal counsel, and specialized computer software.
2. Administration (Department of Water Resources labor) includes staff time reviewing: hydrology and hydraulic analyses, planning applications, improvement plans and environmental documents involving trunk drainage. It also includes administration of the credit and reimbursement agreements pursuant to this Fee Plan.
3. Administration (SWPPP and minor drainage) includes Department of Water Resources staff time reviewing: storm water pollution prevention plans, erosion control plans, grading and drainage for shed areas smaller than 30-acres.
4. Administration (NPDES program labor) includes Department of Water Resources staff time implementing the National Pollution Discharge Elimination System, an ever improving effort to improve the quality of surface water as it is conveyed to streams and rivers.
5. Administration (Other County labor) includes: a nominal budget for handling plan in take and accumulating comments (Land Development and Site Improvement Review), Building Inspection Division's accounting and cashier services for collection of fees pursuant to the Plan, accounting services for the administration of the Plan, obtaining as-built field quantities, and computer technical support.

Zone 11C			
	Revenue		Revenue in 2003 dollars
FY 02/03	\$	756,082	\$ 756,082
FY 01/02	\$	698,284	\$ 702,499
FY 00/01	\$	1,258,120	\$ 1,304,591
FY 99/00	\$	184,283	\$ 203,352
FY 98/99	\$	322,192	\$ 358,399
FY 97/98	\$	220,547	\$ 250,542
FY 96/97	\$	320,454	\$ 372,607
	Average Revenue:	\$	564,010
	External Expenditures:	\$	14,827 2.63%
	Water Resources Labor:	\$	145,036 25.72%
	Other County Labor:	\$	35,149 6.23%

More detail is provided in Appendix 4.

Addition labor added to this Fee Plan includes:

1. Staff time for review of minor drainage, grading plans, and storm water pollution (erosion control) \$35,138 per year or a factor of 6.23%.
2. Staff time for the Zone 11A storm water pollution control program, under the Clean Water Act \$20,530 per year or a factor of 3.64%.

Contingency, Interest, In-fill Absorption

The 15% contingency amount includes, but is not limited to:

1. Appurtenant structures and features to accompany the major trunk drainage facilities, as listed in Schedule D;
2. A nominal allowance development absorption and vacant remainder parcels within the Zones; and
3. Interest costs on reimbursement agreements.

Please see Appendix for additional detail.

SUB-FEES WITHIN ZONE 11C

Placer County Dry Creek Fair Share Fees

This supplemental fee is for the mitigation of impacts within Placer County and shall only be collected from new construction/development of properties that drain to Placer County. Linda Creek flows into Roseville and ultimately into Dry Creek consequently having a different impact and different fee than that amount charged to new construction in the portion of the Antelope area that drains toward Placer County. These fees are deposited to sub-accounts of Zone 11C and sent annually to Placer County where they are held in trust for specific improvements described in the Dry Creek Drainage Master Plan.

History:

On October 6, 1987 a Memorandum of Understanding Concerning Flood Control, Drainage, and Water Conservation Activities in Placer, Sacramento and Sutter Counties and the City of Sacramento was signed (WA Resolution #779).

In April 1992, the Placer County Flood Control and Water Conservation District and Sacramento County Water Agency Final Report Dry Creek Flood Control Plan was published. The Plan recommends six structural and non-structural program elements as follows:

- Local detention basins;
- Regional detention basins;
- Channel improvements, levees, and floodwalls;
- Bridge and culvert improvements;
- Floodplain management; or
- Regional data acquisition and flood warning system.

January 23, 1996 Resolution 96-0056 and WA Resolution #2202 approved the Dry Creek Watershed Flood Control Program Final Environmental Impact Report (Control Number 95-0577). These resolutions found that the Final Environmental Impact Report for the Dry Creek Watershed Flood Control Program was adequate and agreed to establish a fair share fee for contribution to the project.

March 19, 1996 letter to the Board of Supervisors titled Linda Creek Fair Share Contribution Condition (filed March 26, 1996, numbered as 19).

Dry Creek Watershed (flowing north across the County line and into Dry Creek) --

Prior to improvement plan approval or recordation of the final map, whichever occurs first, a drainage fee as identified in the Placer County Dry Creek Watershed Flood Control Plan shall be paid. In 1996, the amount of the fee was \$950.00 per acre for commercial and industrial land uses, and \$125.00 per residential unit.

The fee shall be inflated now, and in the future inflated annually, by the ENR Construction Cost Index. The 1996 fee is increased 17.8% to 2003 dollars to \$1119 per acre for commercial and industrial uses, and \$147 per residential unit.

These funds are remitted annually to Placer County where they are to be held in interest bearing trust and used for activities specified in the April 1992 Plan or as amended. This fee shall continue to be deemed interim and shall be subject to periodic review.

Linda Creek Watershed –

Payable prior to improvement plan approval or recordation of the final map, whichever occurs first, a fair share contribution. In 1996, the fair share contribution was \$621 per acre for commercial and industrial land uses, and \$490 per residential unit.

The fee shall be inflated now, and in the future inflated annually, by the ENR Construction Cost Index. The 1996 fee is increased 17.8% to 2003 dollars to \$731 per acre for commercial and industrial uses, and \$577 per residential unit (not to exceed \$731 per acre).

These funds are remitted annually to Placer County where they are to be held in interest bearing trust and used for activities specified in the April 1992 Plan or as otherwise amended. This fee shall continue to be deemed interim and shall be subject to periodic review.

Steelhead Creek Fair Share Fee

The area east of Steelhead Creek (also known as the Natomas East Main Drain Tributaries, NEMDC) flooded in 1986 and again in 1995. High water was measured at an elevation of nearly 37 feet at Elkhorn Blvd and Elverta Road. Subsequent construction of the D15 pump station (including three pumps totaling 1000 cubic feet per second and an automatic gravity outlet) lowered the 100-year FEMA floodplain adjacent to the channel levee to elevation 31 feet at Elkhorn Blvd and 32.5 feet one mile north of Elverta Road. The Sacramento County Department of Water Resources regulates new construction using a conservative floodplain of elevation that is 2.2' higher than the FEMA map. This allows for the possibility of one pump being out of service during a 100-year storm.

D15 pump station serves to lower the water surface elevation inside of the NEMDC levees by blocking Dry Creek backwater from backing up the canal while pumping the water into the downstream higher water surface. This system allows for gravity outfall from the 17,216 acres draining to the east side of NEMDC.

According to engineering analysis, when development of the basin east of NEMDC is completed, the all three pumps running scenario will yield a higher 100-year water surface elevation upstream of D-15 pump station, calculated to rise 1.2 feet, at the Elkhorn Blvd bridge. Therefore, in order to maintain the current regulated floodplain with the possibility of one pump failing during the 100-year event, one must add a fourth pump.

While the repair and replacement cost of the existing facility will be paid by other funds, the cost of mitigation due to volume impacts attributed to development should be an anticipated future cost of this Zone 11C Fee Plan.

Estimated cost to add a fourth pump to the D-15 Pump Station is \$3,000,000 (based on other pump plants recently constructed and original cost of existing D-15). If it is constructed after 65% build out of the area, the fee per acre shall be:

$$(\$3,000,000 \div 17216 \text{ acres}) \div 65\% = \$268 \text{ per acre}$$

Annual Fee Adjustment

Steelhead Creek Volume Mitigation Fee is adjusted annually.

Referring to volume impacts, see Table H in Appendix 3 of this text, and assuming an average one acre residential zoning (percent impervious area of 20%) the fee shall be apportioned according to the adjusted component impact. This amount will be inflated annually, per Section 2.50.080. This fee is detailed on the Zone 11C Fee Schedule.

Steelhead Creek Volume Impact Fee

<u>Imperv.%</u>	<u>Basin impact</u>	<u>D-15 component</u>	<u>Fee per acre</u>
15%	55.51%	88%	\$ 235
20%	63.42%	100%	\$ 268
30%	85.02%	134%	\$ 359
40%	99.08%	156%	\$ 419
50%	108.24%	171%	\$ 457
60%	120.21%	190%	\$ 508
70%	129.91%	205%	\$ 549
80%	139.81%	220%	\$ 591
90%	148.87%	235%	\$ 629

The basin impact percentages are the same as those used in Zone 11A and 11C volume component calculations earlier in this text. The pump station D-15 component is centered around a typical 20% impervious area for the basin at build out. That is 63.42% is to 100% as 108.24% is to 171%. Therefore, the fee for a proposed development that has 50% impervious area is \$457 per acre.

APPENDICES

1. Schedule A – Zone 11A, 11B, 11C Fees
2. Schedule D Unit Prices – for Credit Agreements
3. Comparison of Closed Conduit (Pipe) Size for Commercial versus Residential Development; Channel (Peak Flow) Impact; Basin (Volume) Impact; Reduce Fee for Parks and Schools
4. Impact of Section 9-16C (Improvement Standards) on Pipe Size
5. Cost Summary, Compare Fee for 5-acre Development, Summary of Component Impacts
6. Four Year Summary of Administration Costs
7. History of Zone 11 (Inflator since 1965)
8. Template for Assignment of Drainage Credits Agreement

APPENDIX 1

Schedule A – Zone 11A, 11B, 11C Fees

APPENDIX 1		EFFECTIVE DATE: August 16, 2004		
DRAINAGE FEE SCHEDULE "A" (formerly Schedule A, B and C)				
LAND USE	New Developments after adoption of the 2004 Fee Plan ZONE 11A (per acre)	Parcels recorded prior to adoption of the 2004 Fee Plan [4] ZONE 11A (per acre)	Always add the Beach Stone Lake Volume Mitigation Fee (per acre) [3]	
Raw Land and Open Space	\$ 0	\$ 0	\$ 0	0
Road Right-of-Way, greater than 40' [1]	\$ 0	\$ 0	\$ 0	0
Residence on 5.0 acres(+)	\$ 0	\$ 0	\$ 0	0
Eqn: subtract \$\$/ac from the 3.5ac fee	\$ 2,560	\$ 454	\$ 8	8
Residence on 3.5 acres	\$ 3,841	\$ 681	\$ 13	13
Eqn: subtract \$\$/ac from the 2.0ac fee	\$ 2,546	\$ 340	\$ 6	6
Residence on 2.0 acres	\$ 7,659	\$ 1,192	\$ 22	22
Eqn: subtract \$\$/ac from the 1.0 ac fee	\$ 2,539	\$ 1,192	\$ 22	22
Residence on 1.0 acre	\$ 10,198	\$ 2,383	\$ 44	44
Eqn: subtract \$\$/ac from the 0.50ac fee	\$ 608	\$ 4,555	\$ 88	88
Residence on 0.50 acre	\$ 10,502	\$ 4,661	\$ 88	88
Eqn: subtract \$\$/ac from the 0.25ac fee	\$ 5,660	\$ 16,954	\$ 352	352
Residence on 0.25 acre	\$ 11,917	\$ 8,899	\$ 176	176
Eqn: subtract \$\$/ac from the 0.20 ac fee	\$ 8,300	\$ 39,216	\$ 880	880
Residence on 0.20 acre	\$ 12,332	\$ 10,860	\$ 220	220
Eqn: subtract \$\$/ac from the 0.14ac fee	\$ 9,867	\$ 34,400	\$ -	-
Residence on 0.14 acre	\$ 12,924	\$ 12,924	\$ 220	220
Eqn: subtract \$\$/ac from the 0.10ac fee	\$ 27,950	\$ 27,950	\$ -	-
Residence on 0.10 acre	\$ 14,042	\$ 14,042	\$ 220	220
Eqn: subtract \$\$/unit/ac from the RD20 fee	\$ 93	\$ 93	\$ -	-
Residential RD20 to RD30	\$ 14,974	\$ 14,974	\$ 220	220
Mobilehome Park	\$ 15,465	\$ 15,465	\$ 220	220
Industrial	\$ 16,257	\$ 16,257	\$ 220	220
Commercial (office/retail)	\$ 16,558	\$ 16,558	\$ 220	220
Parking Lot	\$ 16,558	\$ 16,558	\$ 220	220
School Campus	\$ 12,924	\$ 12,924	\$ 220	220
School Campus with detention [2]	\$ 6,462	\$ 6,462	\$ 220	220
Sports Field graded with field drains	\$ 10,022	\$ 10,022	\$ 220	220
Sports Field no piped field drains	\$ 3,841	\$ 3,841	\$ 220	220
Sports Field with detention [2]	\$ 1,920	\$ 1,920	\$ 220	220
Impervious areas of park [2]	\$ 16,558	\$ 16,558	\$ 220	220
[1] The fees are calculated based on the net parcel area plus 20 feet of road width.				
That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on				
$43560sf + (300' \times 20') = 1.138 \text{ acre}$				
[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%.				
[3] Beach Stone Lake Volume Mitigation Fee is accounted for separate from Zone 11A.				
[4] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%.				

APPENDIX 1		EFFECTIVE DATE: August 16, 2004	
DRAINAGE FEE SCHEDULE "A" (formerly Schedule A, B and C)			
LAND USE	New Developments after adoption of the 2004 Fee Plan ZONE 11B (per acre)	Parcels recorded prior to adoption of the 2004 Fee Plan [3] ZONE 11B (per acre)	
Raw Land and Open Space	\$ 0	\$ 0	
Road Right-of-Way, greater than 40' [1]	\$ 0	\$ 0	
Residence on 5.0 acres(+)	\$ 0	\$ 0	
Eqn: subtract \$\$/ac from the 3.5ac fee	\$ 1,869	\$ 368	
Residence on 3.5 acres	\$ 2,804	\$ 552	
Eqn: subtract \$\$/ac from the 2.0ac fee	\$ 1,869	\$ 276	
Residence on 2.0 acres	\$ 5,608	\$ 966	
Eqn: subtract \$\$/ac from the 1.0 ac fee	\$ 1,870	\$ 966	
Residence on 1.0 acre	\$ 7,478	\$ 1,932	
Eqn: subtract \$\$/ac from the 0.50ac fee	\$ 328	\$ 3,864	
Residence on 0.50 acre	\$ 7,642	\$ 3,864	
Eqn: subtract \$\$/ac from the 0.25ac fee	\$ 2,836	\$ 15,456	
Residence on 0.25 acre	\$ 8,351	\$ 7,728	
Eqn: subtract \$\$/ac from the 0.20 ac fee	\$ 4,340	\$ 16,800	
Residence on 0.20 acre	\$ 8,568	\$ 8,568	
Eqn: subtract \$\$/ac from the 0.14ac fee	\$ 4,667	\$ 4,667	
Residence on 0.14 acre	\$ 8,848	\$ 8,848	
Eqn: subtract \$\$/ac from the 0.10ac fee	\$ 18,900	\$ 18,900	
Residence on 0.10 acre	\$ 9,604	\$ 9,604	
Eqn: subtract \$\$/unit/ac from the RD20 fee	\$ 64	\$ 64	
Residential RD20 to RD30	\$ 10,248	\$ 10,248	
Mobilehome Park	\$ 11,085	\$ 11,085	
Industrial	\$ 11,085	\$ 11,085	
Commercial (office/retail)	\$ 11,229	\$ 11,229	
Parking Lot	\$ 11,229	\$ 11,229	
School Campus	\$ 8,848	\$ 8,848	
School Campus with detention [2]	\$ 4,424	\$ 4,424	
Sports Field graded with field drains	\$ 7,478	\$ 7,478	
Sports Field no piped field drains	\$ 2,804	\$ 2,804	
Sports Field with detention [2]	\$ 1,402	\$ 1,402	
Impervious areas of park [2]	\$ 11,229	\$ 11,229	
[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on 43560sf + (300' x 20') = 1.138 acre			
[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%.			
[3] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%.			

APPENDIX 1		EFFECTIVE DATE: August 16, 2004			
DRAINAGE FEE SCHEDULE "A" (formerly Schedule A, B and C)					
LAND USE	New Developments after adoption of the 2004 Fee Plan ZONE 11C (per acre)	Parcels recorded prior to adoption of the 2004 Fee Plan [4] ZONE 11C (per acre)	Sheds Flowing to Dry Creek into Placer County (Fee per acre)	Sheds Flowing to Linda Creek (Fee per acre)	Sheds Flowing to NEMDC Tributaries (Fee per acre)
Raw Land and Open Space	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Road Right-of-Way, greater than 40' [1]	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Residence on 5.0 acres(+)	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
Eqn: subtract \$\$/ac from the 3.5ac fee	\$ 2,518	\$ 368	\$ 28	\$ 110	\$ 157
Residence on 3.5 acres	\$ 3,778	\$ 552	\$ 42	\$ 165	\$ 235
Eqn: subtract \$\$/ac from the 2.0ac fee	\$ 2,518	\$ 276	\$ 21	\$ 82	\$ 11
Residence on 2.0 acres	\$ 7,555	\$ 966	\$ 74	\$ 289	\$ 252
Eqn: subtract \$\$/ac from the 1.0 ac fee	\$ 2,519	\$ 966	\$ 74	\$ 289	\$ 17
Residence on 1.0 acre	\$ 10,074	\$ 1,932	\$ 147	\$ 577	\$ 268
Eqn: subtract \$\$/ac from the 0.50ac fee	\$ 602	\$ 3,864	\$ 294	\$ 308	\$ 121
Residence on 0.50 acre	\$ 10,375	\$ 3,864	\$ 294	\$ 731	\$ 329
Eqn: subtract \$\$/ac from the 0.25ac fee	\$ 5,224	\$ 15,456	\$ 1,176	\$ -	\$ 242
Residence on 0.25 acre	\$ 11,681	\$ 7,728	\$ 588	\$ 731	\$ 389
Eqn: subtract \$\$/ac from the 0.20 ac fee	\$ 8,060	\$ 38,640	\$ 2,940	\$ -	\$ 600
Residence on 0.20 acre	\$ 12,084	\$ 9,660	\$ 735	\$ 731	\$ 419
Eqn: subtract \$\$/ac from the 0.14ac fee	\$ 8,567	\$ 48,967	\$ 4,900	\$ -	\$ 633
Residence on 0.14 acre	\$ 12,598	\$ 12,598	\$ 1,029	\$ 731	\$ 457
Eqn: subtract \$\$/ac from the 0.10ac fee	\$ 24,050	\$ 24,050	\$ 2,250	\$ -	\$ 1,275
Residence on 0.10 acre	\$ 13,560	\$ 13,560	\$ 1,119	\$ 731	\$ 508
Eqn: subtract \$\$/unit/ac from the RD20 fee	\$ 80	\$ 80	\$ -	\$ -	\$ 4
Residential RD20 to RD30	\$ 14,361	\$ 14,361	\$ 1,119	\$ 731	\$ 549
Mobilehome Park	\$ 14,782	\$ 14,782	\$ 1,119	\$ 731	\$ 570
Industrial	\$ 15,476	\$ 15,476	\$ 1,119	\$ 731	\$ 591
Commercial (office/retail)	\$ 15,749	\$ 15,749	\$ 1,119	\$ 731	\$ 591
Parking Lot	\$ 15,749	\$ 15,749	\$ 1,119	\$ 731	\$ 591
School Campus	\$ 12,598	\$ 12,598	\$ 1,119	\$ 731	\$ 457
School Campus with detention [2]	\$ 6,299	\$ 6,299	\$ 1,119	\$ 731	\$ 457
Sports Field graded with field drains	\$ 10,074	\$ 10,074	\$ 1,119	\$ 731	\$ 268
Sports Field no piped field drains	\$ 3,778	\$ 3,778	\$ 1,119	\$ 731	\$ 235
Sports Field with detention [2]	\$ 1,889	\$ 1,889	\$ 1,119	\$ 731	\$ 235
Impervious areas of park [2]	\$ 15,749	\$ 15,749	\$ 1,119	\$ 731	\$ 591
[1] The fees are calculated based on the net parcel area plus 20 feet of road width. That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on 43560sf + (300' x 20') = 1.138 acre					
[2] Pursuant to Section 2.50.050, a school or park that detains greater than 50% of the peak flow volume, at the discretion of Water Resources, may reduce the fee by 50%.					
[3] Supplemental fees pursuant to Fee Plan and Chapter 2.75					
[4] Pursuant to Section 2.50.060 the fee is reduced for parcels recorded prior to adoption of this Fee Plan. RD5 and larger lots are adjusted to 2003 fee plus 20%.					

APPENDIX 1	EFFECTIVE DATE: August 16, 2004				
ZONE 11A REDUCED FEES					
	LAGUNA WEST, LAKESIDE, ELLIOTT RANCH SOUTH	Laguna Business Park (Laguna Oaks, Parkside), Calvine-99 SPA			
LAND USE	ZONE 11A (per acre)	ZONE 11A (per acre)			
Raw Land and Open Space	\$ -	\$ -			
Road Right-of-Way, greater than 40' [1]	\$ -	\$ -			
Residence on 5.0 acres(+)	\$ -	\$ -			
Eqn: subtract \$\$/ac from the 3.5ac fee	\$ 185	\$ 258			
Residence on 3.5 acres	\$ 278	\$ 387			
Eqn: subtract \$\$/ac from the 2.0ac fee	\$ 139	\$ 194			
Residence on 2.0 acres	\$ 487	\$ 678			
Eqn: subtract \$\$/ac from the 1.0 ac fee	\$ 487	\$ 678			
Residence on 1.0 acre	\$ 973	\$ 1,356			
Eqn: subtract \$\$/ac from the 0.50ac fee	\$ 1,946	\$ 2,712			
Residence on 0.50 acre	\$ 1,946	\$ 2,712			
Eqn: subtract \$\$/ac from the 0.25ac fee	\$ 7,786	\$ 10,848			
Residence on 0.25 acre	\$ 3,893	\$ 5,424			
Eqn: subtract \$\$/ac from the 0.20 ac fee	\$ 19,464	\$ 27,120			
Residence on 0.20 acre	\$ 4,866	\$ 6,780			
Eqn: subtract \$\$/ac from the 0.14ac fee	\$ 1,120	\$ 2,240			
Residence on 0.14 acre	\$ 4,933	\$ 6,914			
Eqn: subtract \$\$/ac from the 0.10ac fee	\$ 2,520	\$ 5,040			
Residence on 0.10 acre	\$ 5,034	\$ 7,116			
Eqn: subtract \$\$/unit/ac from the RD20 fee	\$ 26	\$ 55			
Residential RD20 to RD30	\$ 5,292	\$ 7,671			
Mobilehome Park	\$ 5,549	\$ 8,225			
Industrial	\$ 5,807	\$ 8,780			
Commercial (office/retail)	\$ 6,065	\$ 9,335			
Parking Lot	\$ 6,065	\$ 9,335			
School Campus	\$ 4,006	\$ 5,750			
School Campus with detention	\$ 4,006	\$ 5,750			
Sports Field graded with field drains	\$ 1,622	\$ 2,167			
Sports Field no piped field drains	\$ 1,622	\$ 2,167			
Sports Field with detention	\$ 1,622	\$ 2,167			
Impervious areas of park	\$ 6,065	\$ 9,335			
[1] The fees are calculated based on the net parcel area plus 20 feet of road width.					
That is, a 1.00 acre parcel fronting 300 feet of a thoroughfare shall pay fees based on					
43560sf + (300' x 20') = 1.138 acre					

APPENDIX 2

Schedule D Unit Prices – for Credit Agreements

APPENDIX 2**Effective 8/16/04****2004 PROPOSED Zone 11 Credit Schedule****pg 1 of 2****Schedule D****Pipe Size (<24" for storm water quality basins, not trunk)**

12"	\$	26.24	per lf
15"	\$	29.28	per lf
18"	\$	33.73	per lf
21"	\$	38.40	per lf
24"	\$	42.08	per lf
27"	\$	48.80	per lf
30"	\$	50.24	per lf
33"	\$	59.00	per lf
36"	\$	61.44	per lf
42"	\$	84.10	per lf
48"	\$	96.80	per lf
54"	\$	102.80	per lf
60"	\$	114.56	per lf
66"	\$	146.00	per lf
72"	\$	169.00	per lf
84"	\$	169.00	per lf
96"	\$	169.00	per lf

Manhole Size*

48"	\$	2,480.00	per ea
60"	\$	3,608.80	per ea
72"	\$	4,453.33	per ea
84"	\$	5,200.00	per ea
96"	\$	6,400.00	per ea
108"	\$	6,400.00	per ea
Saddle Manhole	\$	3,200.00	per ea

4" thick Concrete Channel Lining	\$	6.00	per sf
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Fencing and Gates

3' high post + cable	\$	9.25	per lf
Pipe gate	\$	2,500.00	per ea
6' high wrought iron	\$	18.00	per lf
6' chain link gate	\$	10.90	per lf
6' high chain link fence	\$	10.90	per lf

Signs 16sf or smaller	\$	216.00	per ea
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Signs >16sf	\$	324.00	per ea
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Miscellaneous metal (handrails, debris and access racks, and flap gates)	\$	4.08	per lb
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APPENDIX 2		Effective 8/16/04	
2004 PROPOSED Zone 11 Credit Schedule		pg 2 of 2	
Channel excavation			
Scraper	\$	3.15	per cy
Truck export	\$	3.15	per cy
Channel/basin bottom	\$	0.00	per sf
Basin excavation			
	\$	3.15	per cy
Erosion Control riprap (Caltrans			
Class 1 backing rock	\$	30.00	per ton
Class 2 backing rock	\$	32.00	per ton
1/4 ton	\$	35.00	per ton
Cobbles	\$	32.00	per ton
GeoWeb - rock weir	\$	32.50	per ton
Access and Maintenance Roads			
1" thick asph conc	\$	0.39	per sf
1" thick aggr base	\$	0.24	per sf
1" thick Decomposed Granite	\$	0.31	per sf
Geotextile fabric	\$	0.17	per sf
Repair Surfaces			
Asphalt concrete patch paving	\$	7.50	per sf
Hydroseed	\$	1,500.00	per acre
Miscellaneous Concrete*:			
Junction Box	\$	835.00	per cy
Headwall	\$	835.00	per cy
Stairway	\$	835.00	per cy
Flat pad	\$	500.00	per cy
Ramp	\$	500.00	per cy
Driveway	\$	500.00	per cy
Weir Structure	\$	500.00	per cy
*Notes: Concrete unit prices include rebar, structure excavation and backfill, sub-base material, and grading.			
Manhole unit price is complete including rim and lid.			

APPENDIX 3

Comparison of Closed Conduit (Pipe) Size for Commercial versus Residential Development.

Channel (Peak Flow) Impact

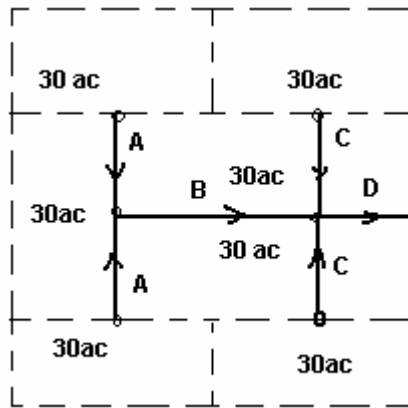
Basin (Volume) Impact

Reduce Fee for Parks and Schools

Appendix 3

Commercial versus Residential

The County Improvement Standards have two pipe design curves, residential and commercial. Commercial includes dense residential and industrial, while the residential curve is used for parks and schools. The following will compare these two design curves to determine the appropriate weighting of the total estimated cost of trunk pipe drainage. Consider a fictitious square 240-acre drainage shed in Nolte zone 3:



Zone 3 "Nolte Method"

PIPE	LENGTH (ft)	SHED	Residential		Commercial	
A	1616	30ac	7.5cfs	21"	15cfs	27"
B	1616	90ac	32cfs	36"	42cfs	42"
C	1616	30ac	7.5cfs	21"	15cfs	27"
D	808	210ac	106cfs	54"	124cfs	60"

Residential

Commercial

21"	3232	ft	\$ 124,109	27"	3232	ft	\$ 157,722
36"	1616	ft	\$ 99,287	42"	1616	ft	\$ 135,906
54"	808	ft	\$ 83,062	60"	808	ft	\$ 92,564
<hr/>				<hr/>			
\$ 306,458				\$ 386,192			

\$386,192 divided by \$306,458 equals 1.26. Therefore, one can see that the impact to trunk pipe drainage is 26% greater for commercial development than that required for residential developments.

Table G
 HEC-1 Output
 SacPre Zone 2, elevation 100', soil C
 160-acres, L=2640', Lc=1320'
 Impervious

Area	Peak Flow
5%	158.5 cfs
15%	246.1 cfs
20%	255.3 cfs
30%	279.2 cfs
40%	296.1 cfs
50%	306.4 cfs
60%	321.5 cfs
70%	333.8 cfs
80%	346.4 cfs
90%	358.6 cfs

Channel Impacts

To determine the channel component impact of various development types based on impervious area, a small shed area of 160 acre was considered. This shed area seems to be typical of pipe conveyance to an open channel. The peak 100-year flow for the average imperviousness (41.94% per Table 2) was used to compare the peak flow impact of each type of development ranging from 15% to 90% impervious area.

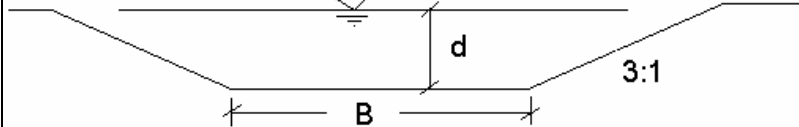
HEC-1 output, for various impervious area percentages, is contained in Table G for a 160-acre square shed with soil type C, a slope of 0.50%, at elevation 100 feet. The weighted impact is determined by centering over the 41.94% impervious area "average development", 298.1 cfs (interpolated) peak flow.

For example, if the entire 160-acre shed is made up of development that is 20% impervious, the peak flow is 255.3 cfs which is 85.64% ($255.3 \div 298.1$) of the peak flow impact compared to what it would be if the area was all developed at 41.94% imperviousness. Likewise, if it is all developed at 80%, the impact is 116.20% of that of the average development. These results are tabulated in Table H.

Impact of increased Manning's n-value.

Due to various state and federal wildlife regulations and a desire of many to maintain drainage channels and creeks to a minimum level to allow for habitat, and pursuant to the updated County Improvement Standards, the Manning's roughness coefficient (n-value) will typically be 0.080. This is an increase from the previous 0.060 that was used as a basis for the 1996 Fee Plan channel component.

If roughness coefficient is increased from 0.060 to 0.080, what increase in excavation quantities should be expected?



$$Q = \frac{1.49 A R^{.67} s^{.50}}{n}$$

Compare $n = .060$ to $n = .080$ that is $n/n = 0.75$.
Set depth and side slope same and adjust bottom width B iteratively to achieve 0.75 ratio.

Starting with a bottom width B_1 and calculating the wetted perimeter P_1 and the hydraulic cross sectional area A_1 and the area times the $2/3$ root of the hydraulic radius (R_1) then by iterating B_2 until the resultant ratio of A times the $2/3$ root of R is 0.75, one may solve for the cross sectional area A_2 and determine the increased excavation quantity, due to increasing the Manning's n -value from 0.060 to 0.080 (described in the figure above). Table I is a compilation of channels 6 feet and 8 feet deep with bottom widths of 10 feet to 100 feet.

In the first example, a 6' deep channel is 10 feet wide at the bottom if $n=0.060$. Increasing n to 0.080 increases the bottom width to 17.3' and the cross sectional area by 26% (B_2 was manually input into the Excel spreadsheet until the ratio on the right came to 0.75).

Looking at the comparisons on Table I, the average is $(1.31+1.31+1.28+1.29+1.26+1.26)/6 = 1.29$. Therefore, it is found that there is an average 29% increase in the cost of channel excavation quantities due to increasing Manning's n -value from 0.060 to 0.080. It is noted that not every channel will be built at 0.080, but there will be an overall proportionate increase in roughness coefficients for constructed channels.

Volume Impacts

To determine the volume impact of various development types based on impervious area, a small shed of 160-acre was considered, as it was for channel impacts. The 100-year flow was calculated using the Sacramento Method and HEC-1 software assuming soil type C, 0.50% slope, elevation 100' and a square 160-acre drainage shed area in Sacramento hydrology zone 2.

One may assume that in almost every case the 10-year flow can be conveyed without consequence. Volume impacts, therefore, are not a concern until a storm exceeds the 10%

annual recurrence level. For this study, the Sacramento 10-year flow was calculated and the volume above this flow was determined (see Table J).

The countywide average impervious area (Table 1) of 41.94% contributes 2.23 acre feet (interpolated) of volume above the 10-year flow. The impact of a range of impervious area percentages was developed centered around this average. That is, if the 160-acre shed is developed at 15% impervious area, the volume impact is 55.0% of that of the average development. While an 80% impervious development is 38.6% greater than the average ($3.09\text{AF} \div 2.23\text{AF}$).

It is recognized that not every shed will require peak flow attenuation; however, this comparison is deemed appropriate when considering how to best spread the cost of volume mitigation over an entire Zone.

Table H

% impervious area	peak flow (cfs)	volume exceeding 10yr (ac-ft)	channel impact	volume impact
15%	246.1	1.23	82.55%	55.04%
20%	255.3	1.40	85.64%	62.87%
30%	279.2	1.88	93.68%	84.29%
40%	296.1	2.19	99.32%	98.24%
50%	306.4	2.39	102.80%	107.32%
60%	321.5	2.65	107.86%	119.19%
70%	333.8	2.87	111.98%	128.80%
80%	346.4	3.09	116.20%	138.62%
90%	358.6	3.29	120.29%	147.60%
41.94%*	298.1	2.23		

* calculated by interpolation.

Table I

If Manning's "n" value is increased from 0.060* to 0.080, the effect is as follows:

		bottom width	area		wetted perimeter	A R ^{.67}	Ratio
depth 6	B1 =	10.0	A1 = 168.0	P1 =	46.0	400.1	
	B2	17.3	A2 211.8	P2	53.3	533.8	0.75
			126%				
depth 8	B1	10.0	A1 272.0	P1	58.0	766.0	
	B2	18.8	A2 342.4	P2	66.8	1023.5	0.75
			126%				
depth 6	B1	50.0	A1 408.0	P1	86.0	1157.9	
	B2	70.0	A2 528.0	P2	106.0	1548.3	0.75
			129%				
depth 8	B1	50.0	A1 592.0	P1	98.0	1975.4	
	B2	71.0	A2 760.0	P2	119.0	2632.3	0.75
			128%				
depth 6	B1	100.0	A1 708.0	P1	136.0	2138.4	
	B2	136.0	A2 924.0	P2	172.0	2850.2	0.75
			131%				
depth 8	B1	100.0	A1 992.0	P1	148.0	3548.9	
	B2	138.0	A2 1296.0	P2	186.0	4758.6	0.75
			131%				

Notes:

Middle Branch Strawberry Creek was the basis for the Green Book (1996 Fee Plan)

analysis, with an "n" of 0.060, per Heidi Huber (SCDWR staff).

B2 is input iteratively until the ratio becomes 0.75

Table J

SacPre Zone 2, elevation 100', Slope 0.50%

Soil type C, 160 acres

L=2640', Lc=1320'

Impervious Area	Volume above 10- year	
15%	1.23	acre-feet
20%	1.40	acre-feet
30%	1.88	acre-feet
40%	2.19	acre-feet
50%	2.39	acre-feet
60%	2.65	acre-feet
70%	2.87	acre-feet
80%	3.09	acre-feet
90%	3.29	acre-feet

Reduce Fee for Parks and Schools

The following is a comparison of impacts from the spreadsheets titled Summary of Component Impact for Zones 11A, 11B, and 11C. Schools and parks typically fall within the 20% to 50% impervious area range. As one can see, the average impact exceeds 50%. This serves to justify the reduction in fees when schools and parks include peak flow and volume attenuation in their grading plans, pursuant Section 2.50.050.

50% Impervious Area	Peak Flow	Volume	Basin Real Estate	Sum
11A	21.00	15.75	32.10	68.85
11B	23.76	11.24	17.54	52.54
11C	47.67	9.79	21.03	78.49
Average	30.81	12.26	23.56	66.63

20% Impervious Area	Peak Flow	Volume	Basin Real Estate	Sum
11A	17.49	9.23	18.80	45.52
11B	19.79	6.58	10.28	36.65
11C	39.72	5.73	12.52	57.97
Average	25.67	7.18	13.87	46.71

Average 20% and 50% Imp Area	Peak Flow	Volume	Basin Real Estate	Sum
11A	19.25	12.49	25.45	57.19
11B	21.78	8.91	13.91	44.60
11C	43.70	7.76	16.78	68.23
Average	28.24	9.72	18.71	56.67

Appendix 4

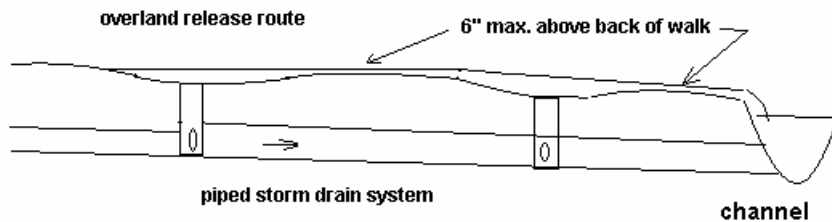
Impacts of Section 9-16C (Improvement Standards) on Pipe Size

APPENDIX 4

Impact of Section 9-16C on Pipe Sizes

Pipes are designed to convey a finite flow; however, sometimes nature delivers bigger storms. During these high intensity storms, piped storm drain systems may become overwhelmed. Inlets surcharge, storm water ponds in low areas until they are full and flows over land to creeks, streams, basins, channels and ditches. The depth of the over-land flow in the street can be calculated and the building can safely be constructed above the 100-year water surface; however, there is a concern about the depth of flowing water in a street (see figure below). In the 2002 revision to the Drainage Improvement Standards, the Department of Water Resources added Section 9-16C, as follows:

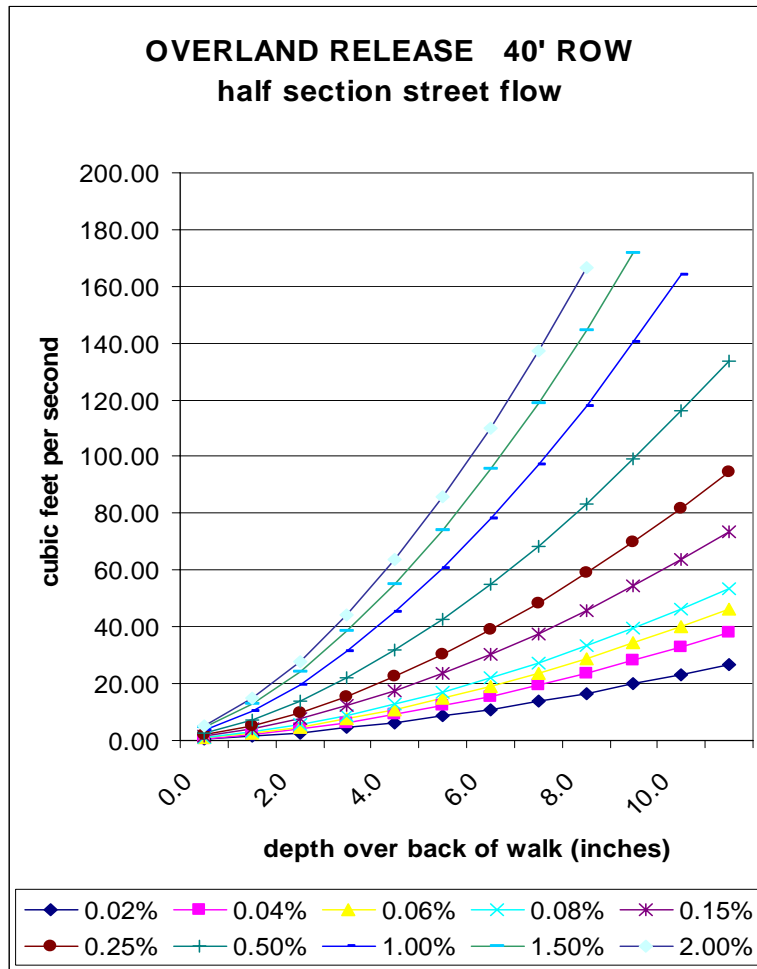
Overland flow passing over street vertical curves shall not exceed a depth of six inches over the back of walk.



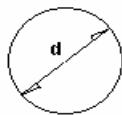
Flow versus depth was calculated using normal flow and Manning's Equation. This relationship for a 40' wide street right of way is graphically represented in the following chart, "Overland Release 40' Right of Way half section street flow". This is linked, in Excel to Table B.

Manning's equation was used, assuming normal flow in full pipes, to determine pipe sizes based on the Sacramento County Improvement Standards (aka. the Nolte runoff curves). The 100-year curves in the Sacramento City/County Volume 2 Hydrology Standards were used to determine the 100-year runoff. Table A is a list of various shed areas, the design capacity of the trunk pipe and the 100-year storm runoff, for the purposes of this comparison.

The goal of this section is to determine in what topographic areas Section 9-16C has the most impact, requiring increased pipe size and to what extent this may be an additional cost the Fee Plan.



Estimated pipe capacity



Full flow pipe, no pressure, normal flow conditions

$$Q = \frac{1.49 A R^{.67} s^{.50}}{n} \rightarrow d = \left(\frac{Q}{30.82 s^{.5}} \right)^{0.375}$$

- Manning's n = .015
- Q = flow in pipe (cfs)
- A = cross sectional area (sf)
- R = wetted perimeter A/p
- p = pipe circumference (ft)
- s = longitudinal slope (ft/ft)

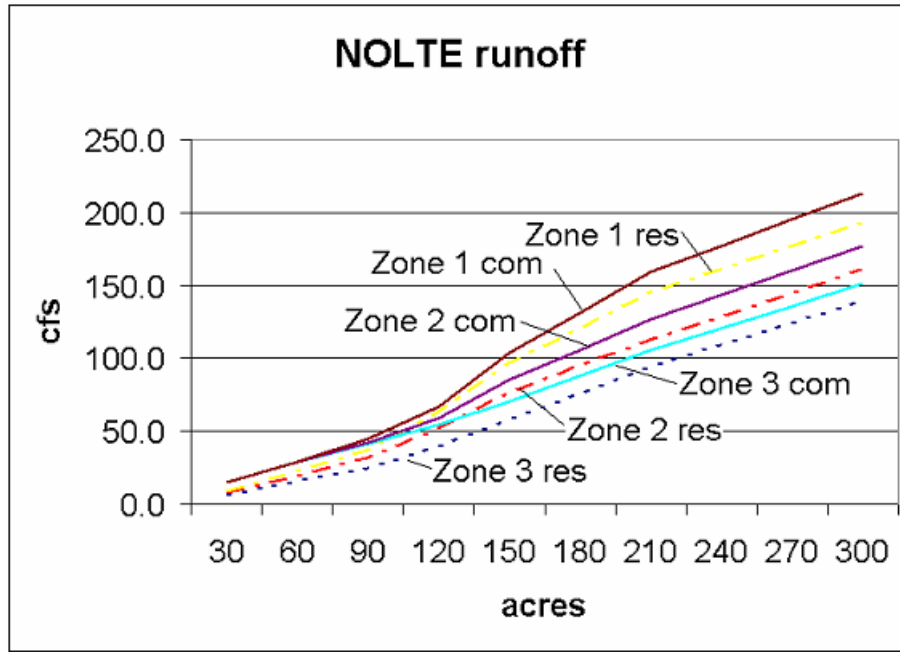


Table A

Acres	Q in the pipe		
	Nolte (zone 3)	100-yr	Overland
20	6.0	23.2	17.2 cfs
40	12.0	46.4	34.4 cfs
60	18.0	69.6	51.6 cfs
80	24.0	92.8	68.8 cfs
100	30.0	116.0	86.0 cfs
120	36.0	139.2	103.2 cfs
140	42.0	140.0	98.0 cfs
160	48.0	160.0	112.0 cfs
180	54.0	171.0	117.0 cfs
200	60.0	182.0	122.0 cfs
220	66.0	200.2	134.2 cfs
240	72.0	218.4	146.4 cfs
260	78.0	236.6	158.6 cfs
280	84.0	249.2	165.2 cfs
300	90.0	255.0	165.0 cfs

Table B

		Half of 40' wide street section									
		←----- Q (cfs) per Longitudinal Slope ----->									
		cross slope = 2.00%									
d BOW (inch)	T (ft)	0.02%	0.04%	0.06%	0.08%	0.15%	0.25%	0.50%	1.00%	1.50%	2.00%
0.0	13.1	0.69	0.98	1.20	1.39	1.90	2.45	3.46	4.90	6.00	6.93
0.0	13.1	0.53	0.75	0.92	1.06	1.45	1.88	2.65	3.75	4.59	5.30
1.0	15.2	1.48	2.09	2.56	2.96	4.05	5.22	7.39	10.45	12.80	14.78
2.0	15.2	2.79	3.95	4.84	5.59	7.65	9.88	13.97	19.76	24.20	27.94
3.0	15.2	4.43	6.27	7.68	8.86	12.14	15.67	22.16	31.34	38.38	44.32
4.0	15.2	6.36	9.00	11.02	12.73	17.42	22.50	31.81	44.99	55.10	63.63
5.0	15.2	8.56	12.11	14.83	17.13	23.46	30.28	42.82	60.56	74.17	85.65
6.0	15.2	11.02	15.59	19.09	22.05	30.19	38.97	55.12	77.95	95.46	110.23
7.0	15.2	13.73	19.41	23.77	27.45	37.59	48.53	68.63	97.05	118.86	137.25
8.0	15.2	16.66	23.56	28.86	33.32	45.62	58.90	83.30	117.80	144.28	166.60
9.0	15.2	19.82	28.03	34.33	39.64	54.28	70.07	99.09	140.14	171.64	198.19
10.0	15.2	23.19	32.80	40.17	46.39	63.52	82.00	115.97	164.01	200.87	231.94
11.0	15.2	26.78	37.87	46.38	53.56	73.34	94.68	133.90	189.36	231.92	267.80

The following examples assume constant slopes, flat super elevations, normal flow and neglecting ponding, but they serve well for comparison purposes.

Example: A 100-acre residential drainage shed, in Nolte Zone 3, must pipe 30cfs while the 100-year runoff is 116cfs. The remaining 86cfs must flow overland, down the gutter at 43cfs on each side. This flow can be conveyed at a depth less than 6" in the gutter if the longitudinal slope is greater than about .31%. However, if the slope is flatter, a large pipe will have to be installed to reduce the overland flow.

Example: For a sample 160-acre shed, the excess runoff in 100-year storm is 56.0 cfs flowing down each gutter. In this case, the longitudinal slope must be greater than 0.54%. If the slope is only 0.15%, the depth above back of walk is calculated at 9.2"; therefore, a larger pipe will be required.

Tables C is a compilation of pipe design flows (Nolte Method) for fictitious shed areas using impervious area of 50% in zone 3 (Figure 2-6 and 2-9 of the Sacramento City/County Hydrology Standards). The 100-year flow was taken from the charts for Sacramento Method (Figures 2-20 and 2-21 of the Hydrology Standards). Notice that 'Nolte' and Sacramento Method have different 'zones' (see maps, Figures 2-4 and 2-11 of the Hydrology Standards).

Subtracting the 100-year flow from the pipe design flow and dividing by two gives the half street flow. Comparing this flow to Table B and interpolating, gives the required longitudinal street slope if the flow is to be limited as required by Section 9-16C of the Improvement Standards. Assuming the pipe flow is normal and the pipe is sloped parallel with the street, the pipe size is determined (not used in these calculations other than to indicate the range of trunk pipes being considered). One might reasonably assume that a typical pipe outfall is 48" diameter, in this example serving 160-acres. At a slope of 0.32% the 100-year flow can be safely conveyed to the open channel. This is typical in Zones 11B and 11C, but Zone 11A is often flatter.

Table D summarizes the results with street flow limits (from Table B) for comparison with various longitudinal slopes. For example, a 100-acre shed area has a pipe designed to convey 29cfs and a 100-year runoff flow of 105cfs, the half street flow is 38cfs requiring a slope of .25% to safely convey. Looking at a larger shed area of 220 acres, the pipe conveys 101.6cfs and the half street 100-year overland flow is 49.0cfs, requiring a slope steeper than .38%. Table E provides additional example calculations of the effect of 'Section 9-16C.' As one considers the typical shed areas, one can deduce that if the slope is flat, less than 0.25%, the "typical" shed outfall pipe will have to be enlarged in order to convey more flow and to reduce overland flow in the street. Table F compares the effect of '9-16C' on trunk drainage cost in various specific plan areas.

Table C

50% impervious area							Required Slope at 6"	Normal Flow Pipe Size (in.)
Acres	Q in the pipe Nolte (zone 3)	(Sac Zn 2)		Q (half street)				
			100-yr	Overland				
40	8.0	52.0	44.0 cfs	22.0 cfs		0.08%	27.6	
60	15.0	70.0	55.0 cfs	27.5 cfs		0.13%	32.0	
80	22.0	88.0	66.0 cfs	33.0 cfs		0.18%	32.8	
100	29.0	105.0	76.0 cfs	38.0 cfs		0.24%	35.4	
120	40.5	122.0	81.5 cfs	40.8 cfs		0.28%	40.1	
140	52.0	137.5	85.5 cfs	42.8 cfs		0.31%	43.1	
160	67.0	153.0	86.0 cfs	43.0 cfs		0.32%	47.1	
180	80.0	169.0	89.0 cfs	44.5 cfs		0.34%	49.9	
200	93.0	185.0	92.0 cfs	46.0 cfs		0.37%	51.9	
220	101.6	199.5	97.9 cfs	49.0 cfs		0.41%	52.7	
240	110.2	214.0	103.8 cfs	51.9 cfs		0.45%	53.4	
260	118.8	227.3	108.5 cfs	54.3 cfs		0.49%	54.0	
280	127.4	240.7	113.3 cfs	56.6 cfs		0.53%	54.5	
300	136.0	254.0	118.0 cfs	59.0 cfs		0.59%	54.9	
400	214.5	315.5	101.0 cfs	50.5 cfs		0.43%	69.0	
450	254.0	346.0	92.0 cfs	46.0 cfs		0.36%	75.9	
500	293.0	377.0	84.0 cfs	42.0 cfs		0.30%	83.1	

Table D

Acres	Nolte Q	Q-half st. (overland)	Q-half st. 6" flow
40	8.0	22.0	
60	15.0	27.5	0.06% 19.1 cfs
80	22.0	33.0	0.08% 22.1 cfs
100	29.0	38.0	0.15% 30.2 cfs
120	40.5	40.8	0.25% 39.0 cfs
140	52.0	42.8	0.38% 47.0 cfs
160	67.0	43.0	0.50% 55.1 cfs
180	80.0	44.5	
200	93.0	46.0	
220	101.6	49.0	
240	110.2	51.9	
260	118.8	54.3	
280	127.4	56.6	
300	136.0	59.0	
400	214.5	50.5	
450	254.0	46.0	
500	293.0	42.0	

Table E

Compare piped storm drainage required per the proposed revision to Section 9-16C of the Improvement Standards.						
	Longitudinal slope of storm drain pipe and street					
	0.15%		0.25%		0.50%	
30" pipe conveys*	13	cfs	17	cfs	22	cfs
Serving**	59	acres	77	acres	100	acres
Q-100yr***	69	cfs	82	cfs	103	cfs
Max. Q-Street~	60	cfs	80	cfs	110	cfs
Req'd Q pipe	9	cfs	2	cfs	-	cfs
Pipe size *	30"	okay	30"	okay	30"	okay
48" pipe conveys*	47	cfs	60	cfs	85	cfs
Serving**	132	acres	152	acres	187	acres
Q-100yr***	131	cfs	145	cfs	175	cfs
Max. Q-Street~	60	cfs	80	cfs	110	cfs
Req'd Q pipe	71	cfs	65	cfs	65	cfs
Pipe size *	55	inch dia.	49	inch dia.	48"	okay
54" pipe conveys*	65	cfs	83	cfs	118	cfs
Serving**	159	acres	185	acres	258	acres
Q-100yr***	155	cfs	172	cfs	223	cfs
Max. Q-Street~	60	cfs	80	cfs	110	cfs
Req'd Q pipe	95	cfs	92	cfs	113	cfs
Pipe size *	62	inch dia.	56	inch dia.	54"	okay
60" pipe conveys*	83	cfs	110	cfs	150	cfs
Serving**	185	acres	235	acres	333	acres
Q-100yr***	172	cfs	210	cfs	279	cfs
Max. Q-Street~	60	cfs	80	cfs	110	cfs
Req'd Q pipe	112	cfs	130	cfs	169	cfs
Pipe size *	66	inch dia.	63	inch dia.	60"	okay

*Assuming normal flow using Manning's equation

**Using Sacramento County Design Runoff Curve "Nolte Method" Zone 3 Residential

***From Sacramento Method Chart Zone 2 at 50% impervious (note that reference to Zone 2 and 3 above are because the pipe design map than the county hydrology map use different zone designations).

~Using Table B, assuming standard 2% cross slope and 6" deep over back of walk, normal flow equal on both sides of the street, neglecting ponded volume in the sag areas.

Table F

EFFECT OF PROPOSED OVERLAND RELEASE REVISION SECTION 9-16C OF THE IMPROVEMENT STANDARDS (REV DECEMBER 2002) Assuming every pipe is in a 40' wide street section with the street as the primary overland release route.										
Quantities under old standard										2004
	East Franklin	Laguna Stonelake	North Vineyard Sta.	Vineyard Springs	Total Ft	Priced as	Unit Price	Total Cost		
30-33 inch	6320 feet	4302 feet	7298 feet	2,550 feet	20,470	avg 30to33"	\$ 54.62	\$ 1,118,071		
36 inch	8340 feet	1772 feet	8724 feet	650 feet	19,486	36"	\$ 61.44	\$ 1,197,220		
42 inch	6660 feet	585 feet	3745 feet	480 feet	11,470	42"	\$ 84.10	\$ 964,627		
48-54 inch	14720 feet	4752 feet	7505 feet	1,000 feet	27,977	avg48-54"	\$ 99.80	\$ 2,792,105		
60 inch	11580 feet	2652 feet	5230 feet	7,250 feet	26,712	avg 60to72"	\$ 114.56	\$ 3,060,127		
								\$ 9,132,150		
Quantities if limit overland flow to 6" over back of walk										
	East Franklin	Laguna Stonelake	North Vineyard Station	Vineyard Springs						
30-33 inch	6320 feet	4302 feet	7298 feet	2,550 feet	20,470	30-33"	\$ 54.62	1,118,071		
42 inch	8340 feet	1772 feet	8724 feet	650 feet	19,486	42"	\$ 84.10	1,638,773		
48 inch	6660 feet	585 feet	3745 feet	480 feet	11,470	48"	\$ 96.80	1,110,296		
60 inch	14720 feet	4752 feet	7505 feet	1,000 feet	27,977	60"	\$ 114.56	3,205,045		
66 inch	11580 feet	2652 feet	5230 feet	7,250 feet	26,712	66"	\$ 146.00	3,899,952		
								\$ 10,972,137		
Estimated increase in trunk pipe due to proposed overland release revision, only in flat areas Zone 11A:										20.1%

P:\Shared Folders\DRAINDEWOrdinance\FeePlan\2003 Fee Plan and appurtenances\compare pipe flow with reduced depth overland release.xls

It is recognized that pipe size increase is not always necessary and not all of Zone 11A is topographically flat; nevertheless, the impact of this standard is measurable. Reviewing East Franklin, Laguna Stonelake, North Vineyard Station, and Vineyard Springs Specific Plan Areas, pursuant to 9-16C, it was found that large diameter pipes in topographically flat areas will have to be upsized to reduce the 100-year flow in the street, see Table E. For example, a 48" pipe will serve 187 acres if the slope is 0.5%, but if the slope is 0.15% the same 187 acres will require a 66" diameter pipe. Table F concludes that the anticipated impact due to Section 9-16C is 20.1%.

In addition to Section 9-16C of the Improvement Standards, the reader is directed to the introductory paragraph under Section 9-16 in which the design engineer is required to limit the depth of ponding in the street to no more than 8" over back of walk, in the 100-year storm. When considering both of these standards, and the fact that it is desired to maintain passable collector streets in case of emergency, one should be reassured that pipe sizes should increase in many locations.

Recognizing that short of doing a detailed drainage master plan for the build out of Zone 11A, one is left with a decision of how to handle this apparent need for increase in pipe size. Based on review of the USGS quad map and the aforementioned design standards, it is agreed that the increase should be 56% [as calculated by Bill Owens, SCDWR staff, on 8/18/03] of the 26% calculated increase (Table F); therefore a multiplier of $20.1\% \times .56 = 11.3\%$ is used as an addition to the sum of the estimated trunk pipe costs in Zone 11A.

Appendix 5

Zone 11A

Comparison of Fee for 5-acre Development
Summary of Component Impacts

Zone 11B

Comparison of Fee for 5-acre Development
Summary of Component Impacts

Zone 11C

Comparison of Fee for 5-acre Development
Summary of Component Impacts

APPENDIX 5
 ZONE 11A COST SUMMARY 7135 ACRES IN STUDY AREA

	BASE FACILITIES [2]	FACILITIES WITH SOFT COSTS [3]	% OF TOTAL
TRUNK PIPE CONSTRUCTION	\$ 17,685,521	\$ 25,942,891	29.48%
PEAK FLOW MITIGATION	\$ 12,255,821	\$ 17,978,064	20.43%
VOLUME MITIGATION	\$ 8,804,041	\$ 12,914,648	14.67%
BASIN REAL ESTATE [1]	\$ 18,979,595	\$ 26,322,800	29.91%
CROSSINGS AND UTILITIES [1]	\$ 3,500,000	\$ 4,854,150	5.52%
SUB-TOTAL	\$ 61,224,978	\$ 88,012,553	100.00%
		\$ 12,335	per acre (average)

[1] No credit is given for consultant costs for these items

[2] The detailed cost estimates of the base facilities are found in the Fee Plan

[3] Soft costs include (percentage applied to base facility costs):

Credit for developer's consultants	8.00%	\$ 3,099,631
Administration (external expenses)	2.84%	\$ 1,738,789
Water Resources labor [4]	17.23%	\$ 10,549,064
Other labor	3.62%	\$ 2,216,344
Contingency, absorption, interest	15.00%	\$ 9,183,747
	46.69%	\$ 26,787,575
		\$ 61,224,978
		\$ 88,012,553
		100.00%

[4] Water Resources staff- planning, plan check (including minor drainage and grading),
 Clean Water Act planning, environmental planning, hydrology/hydraulics modeling.

APPENDIX 5
 ZONE 11B COST SUMMARY 3954 ACRES IN STUDY AREA

	BASE FACILITIES [2]	FACILITIES WITH SOFT COSTS [3]	% OF TOTAL
TRUNK PIPE CONSTRUCTION	\$ 10,021,971	\$ 16,841,922	49.14%
PEAK FLOW MITIGATION	\$ 4,713,302	\$ 7,920,704	23.11%
VOLUME MITIGATION	\$ 2,135,250	\$ 3,588,288	10.47%
BASIN REAL ESTATE [1]	\$ 3,500,000	\$ 5,601,750	16.34%
UTILITY RELOCATION [1]	\$ 200,000	\$ 320,100	0.93%
SUB-TOTAL	\$ 20,570,523	\$ 34,272,764	100.00%

\$ 8,668 per acre (average)

[1] No credit is given for consultant costs for these items

[2] The detailed cost estimates of the base facilities are found in the Fee Plan

[3] Soft costs include (percentage applied to base facility costs):

Credit for developer's consultants	8.00%	\$ 1,349,642
Administration (external expenses)	2.63%	\$ 541,005
Water Resources labor [4]	36.19%	\$ 7,444,472
Other labor	6.23%	\$ 1,281,544
Contingency, absorption, interest	15.00%	\$ 3,085,578
		<u>\$ 13,702,241</u>
		<u>\$ 20,570,523</u>
		<u>\$ 34,272,764</u>
		100.00%

[4] Water Resources staff- planning, plan check (including minor drainage and grading),
 Clean Water Act planning, environmental planning, hydrology/hydraulics modeling.

APPENDIX 5		1095 ACRES IN STUDY AREA		
ZONE 11C COST SUMMARY				
	BASE FACILITIES [2]	FACILITIES WITH SOFT COSTS [3]	% OF TOTAL	
TRUNK PIPE CONSTRUCTION	\$ 1,987,227	\$ 3,148,562	23.77%	
PEAK FLOW MITIGATION	\$ 3,876,401	\$ 6,141,770	46.38%	
VOLUME MITIGATION	\$ 762,195	\$ 1,207,622	9.12%	
BASIN REAL ESTATE [1]	\$ 1,725,000	\$ 2,595,090	19.60%	
UTILITY RELOCATION [1]	\$ 100,000	\$ 150,440	1.14%	
SUB-TOTAL	\$ 8,450,823	\$ 13,243,484	100.00%	
		\$ 12,095	per acre (average)	

[1] No credit is given for consultant costs for these items

[2] The detailed cost estimates of the base facilities are found in the Fee Plan

[3] Soft costs include (percentage applied to base facility costs):

Credit for developer's consultants	8.00%	\$ 530,066
Administration (external expenses)	3.72%	\$ 314,371
Water Resources labor [4]	28.37%	\$ 2,397,498
Other labor	3.35%	\$ 283,103
Contingency, absorption, interest	15.00%	\$ 1,267,623
		<u>\$ 4,792,661</u>
		<u>\$ 8,450,823</u>
		<u>\$ 13,243,484</u>

[4] Water Resources staff- planning, plan check (including minor drainage and grading), Clean Water Act planning, environmental planning, hydrology/hydraulics modeling.

Appendix 6

4-year Summary of Expenses

Zone 11A

Zone 11B

Zone 11C

SCWA - ZONE 11A		APPENDIX 6						
FUND 315A - Fund Center 2815000								
Derived from Financial Status Reports								
Account Title	2000-2001 YE Actuals	2001-2002 YE Actuals	2002-2003 YE Actuals	2003-2004 Budget	Average (inflated)	Adjusted		
OUTSIDE EXPENDITURES								
Advertising/Legal Notices	\$ -	\$ 2,006	\$ 527	\$ 1,000	\$ 886	\$ 886	\$ 886	
Blueprint/Copying Service	\$ 510	\$ 67	\$ -	\$ 1,000	\$ 399	\$ 399	\$ 399	
Office Supplies	\$ 77	\$ -	\$ -	\$ -	\$ 20	\$ -	\$ -	
Construction	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Permits	\$ 500	\$ 250	\$ -	\$ 20,000	\$ 5,192	\$ 5,192	\$ 5,192	
Accounting/Financial Svc	\$ 10,486	\$ 5,505	\$ 8,138	\$ -	\$ 6,138	\$ 6,138	\$ 6,138	
Appraisal Svcs	\$ -	\$ 2,300	\$ -	\$ -	\$ 578	\$ -	\$ 2,000	
Engineering Svcs	\$ 12,682	\$ 92,956	\$ 94,535	\$ 565,000	\$ 191,551	\$ 95,000	\$ 95,000	
Legal Svcs	\$ -	\$ 2,423	\$ 14,873	\$ 45,000	\$ 15,578	\$ 15,578	\$ 15,578	
Environmental Svcs	\$ 19,259	\$ 24,749	\$ 9,316	\$ 50,000	\$ 26,046	\$ 26,046	\$ 26,046	
Other Professional Services	\$ 20,200	\$ 31,360	\$ -	\$ 27,000	\$ 19,874	\$ 19,874	\$ 19,874	
Prior Year Expenditures	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	
Other Operating Expenses	\$ 2,683	\$ -	\$ 10	\$ -	\$ 698	\$ -	\$ 698	
Sys Dev Sup	\$ -	\$ -	\$ 534	\$ -	\$ 134	\$ -	\$ 134	
Systems Data Sup-program spec software	\$ 6,247	\$ -	\$ 103	\$ 15,000	\$ 5,395	\$ 5,395	\$ 5,395	
Compass Project Costs	\$ 2,755	\$ 5,808	\$ 5,508	\$ 4,340	\$ 4,637	\$ 4,637	\$ 4,637	
GS Printing Svcs	\$ 54	\$ -	\$ -	\$ -	\$ 14	\$ -	\$ 100	
Total External Expenditures	\$ 75,455	\$ 167,424	\$ 133,545	\$ 728,340	\$ 277,140	\$ 177,384	\$ 177,384	
Water Resources Z11A Labor	\$ 264,322	\$ 217,939	\$ 172,250	\$ 223,374	\$ 222,241	\$ 222,241	\$ 222,241	
Developer Plan Review-WR Labor	\$ 295,188	\$ 476,397	\$ 580,331	\$ 763,926	\$ 532,405	\$ 532,405	\$ 532,405	
Total Water Resources Labor	\$ 559,510	\$ 694,336	\$ 752,581	\$ 987,300	\$ 754,646	\$ 754,646	\$ 754,646	
Real Estate Labor	\$ 70,619	\$ 51,308	\$ 17,494	\$ 160,000	\$ 75,585	\$ 55,000	\$ 55,000	
AFS Labor (reimb agr, etc.)(20283)	\$ -	\$ -	\$ -	\$ 8,417	\$ 2,104	\$ 6,000	\$ 6,000	
AFS Contract desk labor	\$ -	\$ 1,968	\$ 3,504	\$ 2,448	\$ 1,983	\$ 2,650	\$ 2,650	
CMD Labor	\$ 2,234	\$ 1,750	\$ 2,158	\$ 62,400	\$ 17,159	\$ 62,400	\$ 62,400	
MIS Services	\$ -	\$ -	\$ 2,296	\$ 8,000	\$ 2,574	\$ 3,000	\$ 3,000	
BID cashier services	\$ 65,606	\$ -	\$ 141	\$ 35,000	\$ 25,793	\$ 47,000	\$ 47,000	
BID allocated costs for cashing (122071)	\$ -	\$ 1,562	\$ 311	\$ 200	\$ 521	\$ 521	\$ 521	
Tech Resources dev plan labor (190247)	\$ -	\$ -	\$ 54,653	\$ 45,000	\$ 24,913	\$ 50,000	\$ 50,000	
LDSIR labor (190322)	\$ -	\$ 82,412	\$ 17,372	\$ 15,000	\$ 28,820	\$ -	\$ -	
Total Other County Labor	\$ 138,459	\$ 139,000	\$ 97,929	\$ 336,465	\$ 179,452	\$ 226,571	\$ 226,571	

SCWA - ZONE 11B							APPENDIX 6					
FUND 315B - Fund Center 2816000												
Derived from Financial Status Reports												
Account Title	2000-2001 Actuals	2001-2002 Actuals	2002-2003 Actuals	2003-2004 Budget	Average (inflated)	Adjusted						
OUTSIDE EXPENDITURES												
Advertising/Legal Notices	\$ -	\$ 1,727	\$ 527	\$ 1,000	\$ 816	\$ 816						
Blueprint/Copying Service	\$ -	\$ 44	\$ -	\$ 100	\$ 36	\$ 36						
Postal Services	\$ -	\$ -	\$ -	\$ 100	\$ 25	\$ 25						
Const. & Sup	\$ -	\$ -	\$ -	\$ 200,000	\$ 50,000	\$ -						
Permits	\$ -	\$ -	\$ -	\$ 500	\$ 125	\$ -						
Accounting/Financial Svc	\$ 1,952	\$ 399	\$ 839	\$ -	\$ 816	\$ 839						
Engineering Svcs	\$ -	\$ 9,263	\$ 22,384	\$ 100,000	\$ 32,926	\$ 25,000						
Legal Svcs	\$ -	\$ -	\$ 184	\$ 2,000	\$ 546	\$ 546						
Environmental Svcs	\$ -	\$ -	\$ -	\$ 2,000	\$ 500	\$ 2,000						
Public Relation Svcs	\$ -	\$ -	\$ -	\$ 2,000	\$ 500	\$ 2,000						
Other Professional Svcs	\$ -	\$ -	\$ -	\$ 27,000	\$ 6,750	\$ 6,750						
Other Operating Expense	\$ -	\$ -	\$ -	\$ 1,000	\$ 250	\$ -						
Systems Data Supp-program spec. software	\$ 2,099	\$ -	\$ 103	\$ 5,000	\$ 1,820	\$ 1,000						
Compass Project Costs	\$ 706	\$ 1,488	\$ 1,411	\$ 1,111	\$ 1,188	\$ 1,188						
Total External Expenditures	\$ 4,757	\$ 12,921	\$ 25,449	\$ 341,811	\$ 96,298	\$ 40,200						
WR Labor	\$ 116,109	\$ 176,541	\$ 247,263	\$ 255,605	\$ 200,218	\$ 200,218						
Convert to 2003 dollars	\$ 120,398	\$ 177,607	\$ 247,263	\$ 255,605								
Tech Resources dev plan labor (190248)	\$ 29,009	\$ -	\$ 30,245	\$ 30,000	\$ 22,581	\$ 30,000						
LDSIR labor (190323)	\$ -	\$ 45,161	\$ 17,214	\$ 15,000	\$ 19,412	\$ 0						
BID acctg svcs to Zone 11B (122072)	\$ -	\$ -	\$ 130	\$ 200	\$ 82	\$ 200						
BID cashier svcs to Zone 11B (121942)	\$ -	\$ 710	\$ 705	\$ 2,500	\$ 980	\$ 2,000						
AFS svcs (20847)	\$ -	\$ -	\$ 137	\$ 834	\$ 243	\$ 243						
AFS Contract Desk labor	\$ -	\$ 660	\$ 1,104	\$ 1,089	\$ 714	\$ 1,000						
MIS Labor	\$ -	\$ -	\$ 1,148	\$ 4,000	\$ 1,287	\$ 1,287						
CMD Labor	\$ -	\$ -	\$ -	\$ 1,500	\$ 375	\$ 1,500						
Total Other County Labor	\$ 29,009	\$ 46,531	\$ 50,684	\$ 55,123	\$ 45,675	\$ 36,230						

SCWA - ZONE 11C		APPENDIX 6						
FUND 315C - Fund Center 2817000								
Fiscal Year 2002-2003, AP 04 (33% of the FY expended)								
Financial Status Report								
Acct No	Account Title	2000-2001 Actual	2001-2002 Actuals	2002-2003 Actuals	2003-2004 Budget	Average (inflated)	Adjusted	
EXTERNAL EXPENDITURES								
	Advertising/Legal Notices	\$ -	\$ 1,356	\$ 527	\$ 400	\$ 573	573	
	Blueprint/Copying Service	\$ -	\$ 19	\$ -	\$ 200	\$ 55	55	
	Postal Services	\$ -	\$ -	\$ -	\$ 100	\$ 25	25	
	Construction & Supplies	\$ -	\$ -	\$ -	\$ 20,000	\$ 5,000	0	
	Permits	\$ -	\$ -	\$ -	\$ 500	\$ 125	125	
	Accounting/Financial Svc	\$ 559	\$ 379	\$ 613	\$ -	\$ 394	394	
	Engineering Svcs	\$ -	\$ -	\$ -	\$ 5,000	\$ 1,250	5,000	
	Legal Svcs	\$ -	\$ 5,477	\$ 1,706	\$ 3,000	\$ 2,554	2,554	
	Environmental Svcs	\$ -	\$ -	\$ -	\$ 1,000	\$ 250	1,000	
	Public Relation Svcs	\$ -	\$ -	\$ -	\$ 1,000	\$ 250	1,000	
	Other Professional Svcs	\$ 6,000	\$ -	\$ -	\$ 5,000	\$ 2,805	2,805	
	Other Operating Expense	\$ -	\$ -	\$ -	\$ 1,000	\$ 250	250	
	Systems Data Sup-program-spec. software	\$ -	\$ -	\$ 103	\$ 2,000	\$ 526	526	
	Compass Project costs	\$ 309	\$ 652	\$ 618	\$ 487	\$ 520	520	
	Total External Expenditures	\$ 6,869	\$ 7,883	\$ 3,568	\$ 39,687	\$ 14,577	14,827	
	WR Labor	\$ 60,340	\$ 129,699	\$ 145,575	\$ 241,518	\$ 145,036	145,036	
	Tech Resources dev plan labor (190249)	\$ -	\$ -	\$ 24,766	\$ 35,000	\$ 14,941	24,766	
	LDSIR labor (190324)	\$ 26,353	\$ 39,936	\$ 16,406	\$ 15,000	\$ 24,727	0	
	BID cashier svcs (20293400-121942)	\$ -	\$ 284	\$ 282	\$ 500	\$ 267	267	
	BID acctg svcs to Zone 11C (122073)	\$ -	\$ -	\$ -	\$ 500	\$ 125	125	
	AFS Labor	\$ -	\$ -	\$ 203	\$ 834	\$ 259	259	
	CMD Labor	\$ 726	\$ -	\$ 28	\$ 4,000	\$ 1,195	1,195	
	MIS Labor	\$ -	\$ -	\$ 1,148	\$ 5,000	\$ 1,537	1,537	
	RE Labor	\$ 140	\$ -	\$ -	\$ -	\$ 36	7,000	
	Total Other County Labor	\$ 27,219	\$ 40,220	\$ 42,833	\$ 60,834	\$ 43,088	35,149	

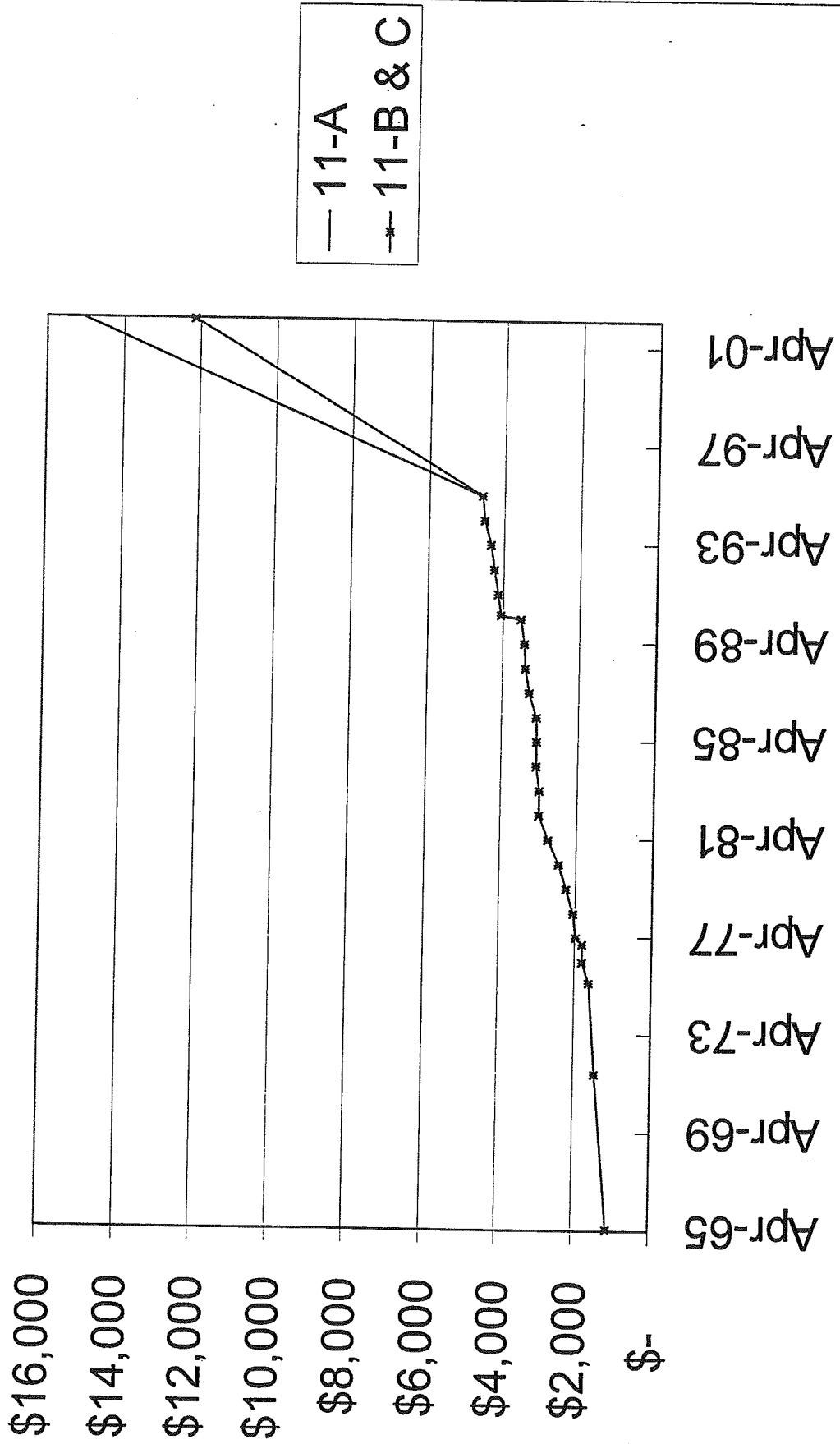
Appendix 7

History of Zone 11 Drainage Fee (Inflator)

	History of Zone 11 Drainage Fee per Acre										
	Zone 11A		Zone 11B		Zone 11C		Inflator		Accumulated inflator		
	RD5	Commercial	RD5	Commercial	RD5	Commercial	11A	11B	11A	11B	
4/8/1965	\$ 1,010	\$ 1,100	\$ 1,010	\$ 1,100	\$ 1,010	\$ 1,100	0.00%	0.00%	0.00%	0.00%	0.00%
8/26/1971	\$ 1,180	\$ 1,460	\$ 1,180	\$ 1,460	\$ 1,180	\$ 1,460	32.73%	32.73%	132.73%	132.73%	132.73%
5/19/1975	\$ 1,360	\$ 1,630	\$ 1,360	\$ 1,630	\$ 1,360	\$ 1,630	11.64%	11.64%	144.37%	144.37%	144.37%
3/15/1976	\$ 1,500	\$ 1,810	\$ 1,500	\$ 1,810	\$ 1,500	\$ 1,810	11.04%	11.04%	155.41%	155.41%	155.41%
12/29/1976	\$ 1,400	\$ 1,810	\$ 1,400	\$ 1,810	\$ 1,400	\$ 1,810	0.00%	0.00%	155.41%	155.41%	155.41%
3/1/1977	\$ 1,450	\$ 1,980	\$ 1,450	\$ 1,980	\$ 1,450	\$ 1,980	9.39%	9.39%	164.81%	164.81%	164.81%
3/1/1978	\$ 1,600	\$ 2,060	\$ 1,600	\$ 2,060	\$ 1,600	\$ 2,060	4.04%	4.04%	168.85%	168.85%	168.85%
3/1/1979	\$ 1,850	\$ 2,250	\$ 1,850	\$ 2,250	\$ 1,850	\$ 2,250	9.22%	9.22%	178.07%	178.07%	178.07%
3/1/1980	\$ 2,000	\$ 2,450	\$ 2,000	\$ 2,450	\$ 2,000	\$ 2,450	8.89%	8.89%	186.96%	186.96%	186.96%
3/1/1981	\$ 2,250	\$ 2,740	\$ 2,250	\$ 2,740	\$ 2,250	\$ 2,740	11.84%	11.84%	198.80%	198.80%	198.80%
3/1/1982	\$ 2,258	\$ 2,980	\$ 2,258	\$ 2,980	\$ 2,258	\$ 2,980	8.76%	8.76%	207.55%	207.55%	207.55%
3/1/1983	\$ 2,450	\$ 2,980	\$ 2,450	\$ 2,980	\$ 2,450	\$ 2,980	0.00%	0.00%	207.55%	207.55%	207.55%
3/1/1984	\$ 2,550	\$ 3,070	\$ 2,550	\$ 3,070	\$ 2,550	\$ 3,070	3.02%	3.02%	210.57%	210.57%	210.57%
3/1/1985	\$ 2,550	\$ 3,070	\$ 2,550	\$ 3,070	\$ 2,550	\$ 3,070	0.00%	0.00%	210.57%	210.57%	210.57%
3/1/1986	\$ 2,550	\$ 3,080	\$ 2,550	\$ 3,080	\$ 2,550	\$ 3,080	0.33%	0.33%	210.90%	210.90%	210.90%
3/1/1987	\$ 2,700	\$ 3,280	\$ 2,700	\$ 3,280	\$ 2,700	\$ 3,280	6.49%	6.49%	217.39%	217.39%	217.39%
3/1/1988	\$ 2,800	\$ 3,390	\$ 2,800	\$ 3,390	\$ 2,800	\$ 3,390	3.35%	3.35%	220.75%	220.75%	220.75%
3/1/1989	\$ 2,825	\$ 3,430	\$ 2,825	\$ 3,430	\$ 2,825	\$ 3,430	1.18%	1.18%	221.93%	221.93%	221.93%
3/1/1990	\$ 2,900	\$ 3,530	\$ 2,900	\$ 3,530	\$ 2,900	\$ 3,530	2.92%	2.92%	224.84%	224.84%	224.84%
5/17/1990	\$ 3,335	\$ 4,060	\$ 3,335	\$ 4,060	\$ 3,335	\$ 4,060	15.01%	15.01%	239.86%	239.86%	239.86%
3/1/1991	\$ 3,400	\$ 4,140	\$ 3,400	\$ 4,140	\$ 3,400	\$ 4,140	1.97%	1.97%	241.83%	241.83%	241.83%
3/1/1992	\$ 3,500	\$ 4,250	\$ 3,500	\$ 4,250	\$ 3,500	\$ 4,250	2.66%	2.66%	244.48%	244.48%	244.48%
3/1/1993	\$ 3,600	\$ 4,350	\$ 3,600	\$ 4,350	\$ 3,600	\$ 4,350	2.35%	2.35%	246.84%	246.84%	246.84%
3/1/1994	\$ 3,750	\$ 4,530	\$ 3,750	\$ 4,530	\$ 3,750	\$ 4,530	4.14%	4.14%	250.98%	250.98%	250.98%
3/1/1995	\$ 3,800	\$ 4,590	\$ 3,800	\$ 4,590	\$ 3,800	\$ 4,590	1.32%	1.32%	252.30%	252.30%	252.30%
3/3/1996	\$ 8,600	\$ 12,816	\$ 8,600	\$ 12,816	\$ 8,600	\$ 12,816	179.22%	125.80%	431.52%	378.10%	378.10%
3/10/1997	\$ 8,750	\$ 13,060	\$ 8,750	\$ 13,060	\$ 8,750	\$ 13,060	1.90%	1.89%	433.42%	379.99%	379.99%
5/4/1998	\$ 8,950	\$ 13,360	\$ 8,950	\$ 13,360	\$ 8,950	\$ 13,360	2.30%	2.27%	435.72%	382.26%	382.26%
5/3/1999	\$ 9,150	\$ 13,640	\$ 9,150	\$ 13,640	\$ 9,150	\$ 13,640	2.10%	2.04%	437.81%	384.30%	384.30%
4/1/2000	\$ 9,200	\$ 13,750	\$ 9,200	\$ 13,750	\$ 9,200	\$ 13,750	0.81%	0.82%	438.62%	385.11%	385.11%
4/1/2001	\$ 9,800	\$ 14,580	\$ 9,800	\$ 14,580	\$ 9,800	\$ 14,580	6.04%	6.12%	444.66%	391.23%	391.23%
4/1/2002	\$ 10,050	\$ 15,010	\$ 10,050	\$ 15,010	\$ 10,050	\$ 15,010	2.95%	2.97%	447.60%	394.20%	394.20%
3/1/2003	\$ 10,150	\$ 15,100	\$ 10,150	\$ 15,100	\$ 10,150	\$ 15,100	0.60%	0.58%	448.20%	394.78%	394.78%
2004 update *	\$ 12,552	\$ 16,778	\$ 12,084	\$ 15,749	\$ 12,084	\$ 15,749	23.67%	6.43%	471.87%	401.21%	444.89%

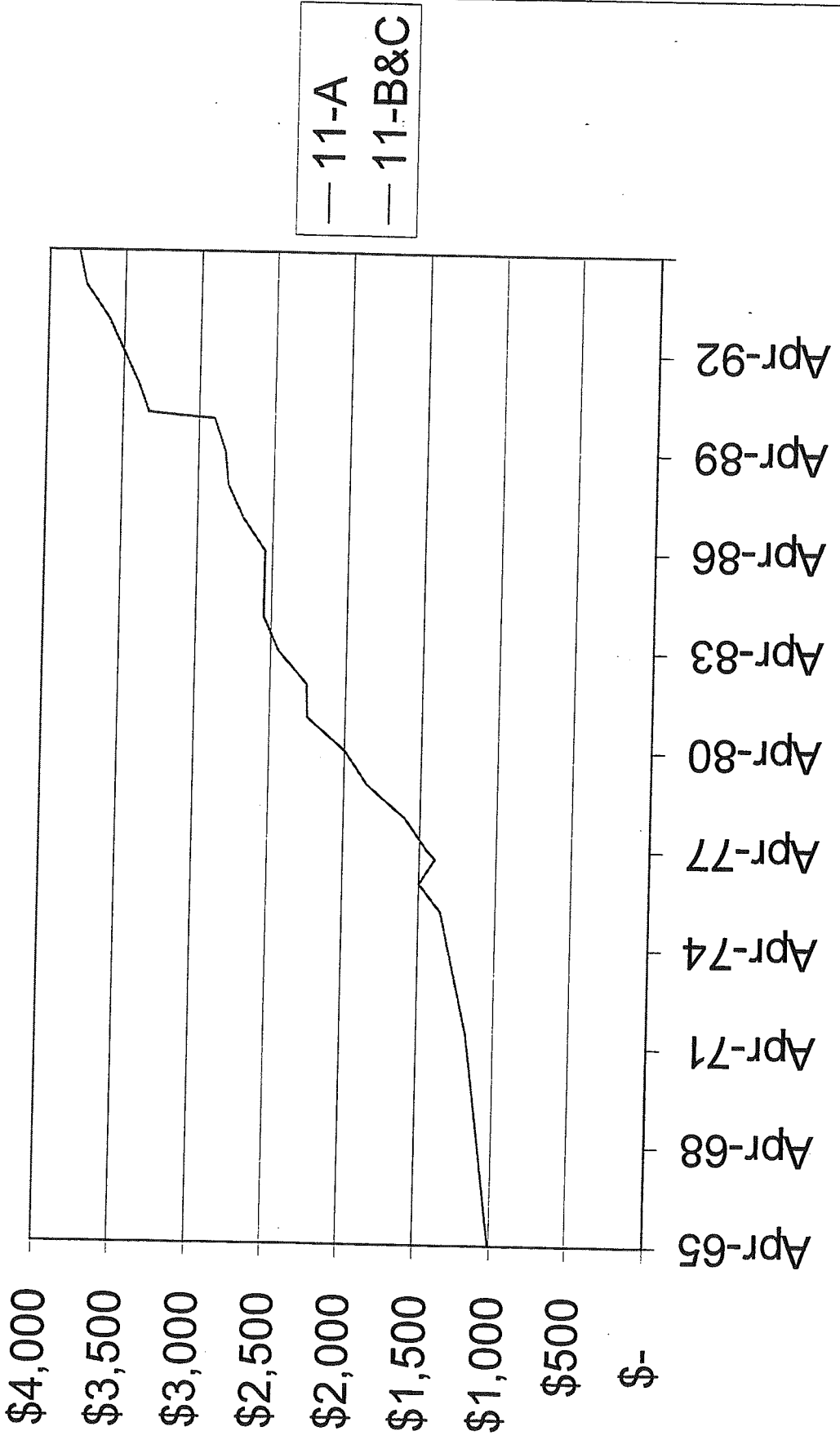
* Note: prior to 2004 update, use comparison of commercial fee to inflate (historical method). After update compare the residential RD5 (closest to average 42% impervious area).

Zone 11 Commercial Rates



INFLATION CURVE FOR ZONE 11 SINCE THE BEGINNING (COMPARING COMMERCIAL RATES)				
	11A	11B & C	11A % change	
4/8/1965	\$ 1,100	\$ 1,100		
8/26/1971	\$ 1,460	\$ 1,460		33%
5/19/1975	\$ 1,630	\$ 1,630		12%
3/15/1976	\$ 1,810	\$ 1,810		11%
12/29/1976	\$ 1,810	\$ 1,810		0%
3/1/1977	\$ 1,980	\$ 1,980		9%
3/1/1978	\$ 2,060	\$ 2,060		4%
3/1/1979	\$ 2,250	\$ 2,250		9%
3/1/1980	\$ 2,450	\$ 2,450		9%
3/1/1981	\$ 2,740	\$ 2,740		12%
3/1/1982	\$ 2,980	\$ 2,980		9%
3/1/1983	\$ 2,980	\$ 2,980		0%
3/1/1984	\$ 3,070	\$ 3,070		3%
3/1/1985	\$ 3,070	\$ 3,070		0%
3/1/1986	\$ 3,080	\$ 3,080		0%
3/1/1987	\$ 3,280	\$ 3,280		6%
3/1/1988	\$ 3,390	\$ 3,390		3%
3/1/1989	\$ 3,430	\$ 3,430		1%
3/1/1990	\$ 3,530	\$ 3,530		3%
5/17/1990	\$ 4,060	\$ 4,060		15%
3/1/1991	\$ 4,140	\$ 4,140		2%
3/1/1992	\$ 4,250	\$ 4,250		3%
3/1/1993	\$ 4,350	\$ 4,350		2%
3/1/1994	\$ 4,530	\$ 4,530		4%
3/1/1995	\$ 4,590	\$ 4,590		1%
4/1/2002	\$ 15,010	\$ 12,140	#DIV/0!	
		diff since beginning	11b+c	1104%
			11a	1365%

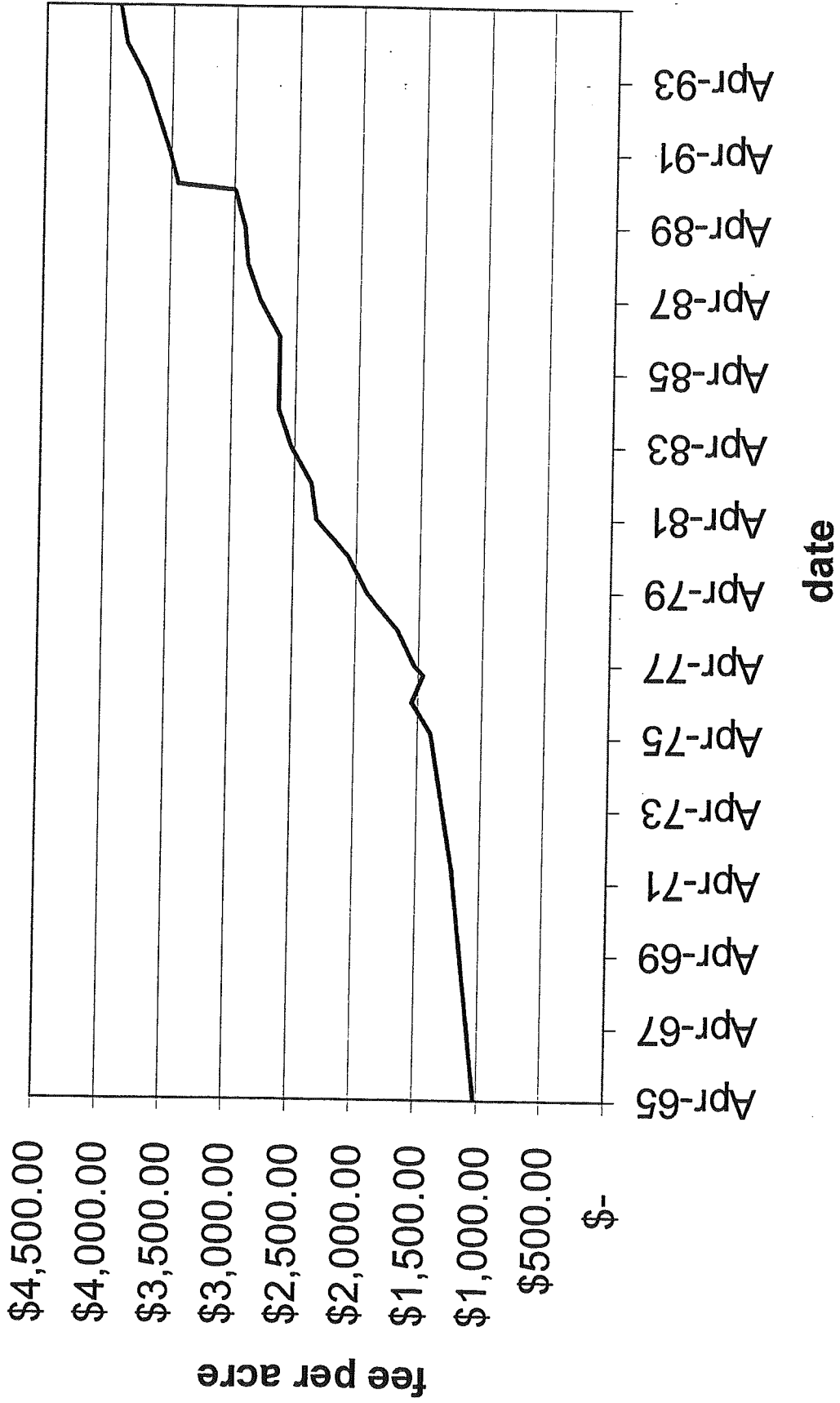
Zone 11 RD-5 Resid Fees



INFLATION CURVE FOR ZONE 11 SINCE THE BEGINNING (COMPARING RD-5 RESID. RATES PER ACRE)				
	11A	11B&C	11A % change	
4/8/1965	\$ 1,010	\$ 1,010		
8/26/1971	\$ 1,180	\$ 1,180	17%	
5/19/1975	\$ 1,360	\$ 1,360	15%	
3/15/1976	\$ 1,500	\$ 1,500	10%	
12/29/1976	\$ 1,400	\$ 1,400	-7%	
3/1/1977	\$ 1,450	\$ 1,450	4%	
3/1/1978	\$ 1,600	\$ 1,600	10%	
3/1/1979	\$ 1,850	\$ 1,850	16%	
3/1/1980	\$ 2,000	\$ 2,000	8%	
3/1/1981	\$ 2,250	\$ 2,250	13%	
3/1/1982	\$ 2,258	\$ 2,258	0%	
3/1/1983	\$ 2,450	\$ 2,450	9%	
3/1/1984	\$ 2,550	\$ 2,550	4%	
3/1/1985	\$ 2,550	\$ 2,550	0%	
3/1/1986	\$ 2,550	\$ 2,550	0%	
3/1/1987	\$ 2,700	\$ 2,700	6%	
3/1/1988	\$ 2,800	\$ 2,800	4%	
3/1/1989	\$ 2,825	\$ 2,825	1%	
3/1/1990	\$ 2,900	\$ 2,900	3%	
5/17/1990	\$ 3,335	\$ 3,335	15%	
3/1/1991	\$ 3,400	\$ 3,400	2%	
3/1/1992	\$ 3,500	\$ 3,500	3%	
3/1/1993	\$ 3,600	\$ 3,600	3%	
3/1/1994	\$ 3,750	\$ 3,750	4%	
3/1/1995	\$ 3,800	\$ 3,800	1%	

diff since beginning 0% 11b+c
0% 11a

Zone 11A inflator



I propose an inflator that is 85% RD5 and 15% Commercial (approximating build out)

	Resid. RD5 11A	Commercial 11A	85% resid. avg 11A	inflator
4/8/1965	\$ 1,010	\$ 1,100	\$ 1,023.50	-
8/26/1971	\$ 1,180	\$ 1,460	\$ 1,222.00	-
5/19/1975	\$ 1,360	\$ 1,630	\$ 1,400.50	-
3/15/1976	\$ 1,500	\$ 1,810	\$ 1,546.50	-
12/29/1976	\$ 1,400	\$ 1,810	\$ 1,461.50	-
3/1/1977	\$ 1,450	\$ 1,980	\$ 1,529.50	-
3/1/1978	\$ 1,600	\$ 2,060	\$ 1,669.00	-
3/1/1979	\$ 1,850	\$ 2,250	\$ 1,910.00	-
3/1/1980	\$ 2,000	\$ 2,450	\$ 2,067.50	-
3/1/1981	\$ 2,250	\$ 2,740	\$ 2,323.50	-
3/1/1982	\$ 2,258	\$ 2,980	\$ 2,366.30	-
3/1/1983	\$ 2,450	\$ 2,980	\$ 2,529.50	-
3/1/1984	\$ 2,550	\$ 3,070	\$ 2,628.00	-
3/1/1985	\$ 2,550	\$ 3,070	\$ 2,628.00	-
3/1/1986	\$ 2,550	\$ 3,080	\$ 2,629.50	-
3/1/1987	\$ 2,700	\$ 3,280	\$ 2,787.00	-
3/1/1988	\$ 2,800	\$ 3,390	\$ 2,888.50	-
3/1/1989	\$ 2,825	\$ 3,430	\$ 2,915.75	-
3/1/1990	\$ 2,900	\$ 3,530	\$ 2,994.50	-
5/17/1990	\$ 3,335	\$ 4,060	\$ 3,443.75	-
3/1/1991	\$ 3,400	\$ 4,140	\$ 3,511.00	-
3/1/1992	\$ 3,500	\$ 4,250	\$ 3,612.50	-
3/1/1993	\$ 3,600	\$ 4,350	\$ 3,712.50	-
3/1/1994	\$ 3,750	\$ 4,530	\$ 3,867.00	-
3/1/1995	\$ 3,800	\$ 4,590	\$ 3,918.50	-

Appendix 8

Template for Assignment of Drainage Credit Agreements

APPENDIX 8

Template for Assignment of Drainage Credit Agreement

ASSIGNMENT OF DRAINAGE CREDITS [DRAFT]

This Assignment ("Assignment") is made this ____ day of 2____ by and between _____, a _____ ("Assignor") and _____ a _____ corporation ("Assignee"), with reference to the following facts:

- A. WHEREAS, Assignor is the owner of that certain real property located in the County of Sacramento, State of California commonly known as " _____ ", Assessor's Parcel Number _____ and more particularly described on Exhibit "A" to the Purchase Agreement and attached (the "Property").
- B. WHEREAS, an agreement for trunk drainage credits for Zone 11____ was signed by the Assignor, dated _____ and by the Director of the Sacramento County Department of Water Resources, dated _____, (the "Credit Agreement") pursuant to the Sacramento County Water Agency Code Titles I and II (the "Code").
- C. WHEREAS, the Credit Agreement lists quantities of estimated trunk drainage facilities to be adjusted based upon project completion, pursuant to the Code.
- D. WHEREAS, pursuant to a Purchase and Sale Agreement dated _____, as amended (the "Purchase Agreement"), Assignor has agreed to sell to Assignee all of Assignor's rights, title and interests in and to the Property, including, but not limited to Assignor's right, title, and interest to certain drainage credits applicable to the Property pursuant to the Credit Agreement.
- E. WHEREAS, Assignor and Assignee desire to enter into this agreement to confirm the assignment by Assignor to Assignee of all the Assignee's rights to drainage credits and the Credit Agreement applicable to the Property.

NOW, THEREFORE, in consideration of the mutual covenants of the parties herein, and for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. **Assignment By Assignor.** Pursuant to _____ of the Purchase Agreement, Assignor hereby unconditionally sells, transfers and presently assigns the Credit Agreement to Assignee, without warranty or recourse (except as otherwise provided in this Assignment), all of Assignor's rights, title and interest in and to the drainage credits applicable to _____ and pursuant to the terms of the Credit Agreement.

- 2. **Indemnity.** Assignor agrees to indemnify the Sacramento County Water Agency and the County of Sacramento and its employees against all liability, claims, damages, losses, costs, or expenses, including attorney fees and court costs, relating to the drainage credits applicable to the Credit Agreement, this Assignment, and the Purchase Agreement.

- 3. **Further Assurances.** Whenever requested to do so by the other party, each party shall execute, acknowledge and deliver any further conveyances, assignments, confirmations, satisfactions, releases, powers of attorney, and any further instruments or documents that are necessary, expedient, or proper to complete any conveyances, sales and assignments contemplated by this Assignment. In addition, each party shall do any other acts and execute, acknowledge, and deliver any requested documents in order to carry out the intent and purpose of this Assignment.

- 4. **Governing Law.** This Assignment is made and entered into the State of California and shall be interpreted, construed and enforced in accordance with the laws of the State of California.

- 5. **Binding Effect.** This Assignment shall apply to, bind, and inure to benefit of Assignor and Assignee, and their respective heirs, legal representatives, successors and assigns.

IN WITNESS WHEREOF, this Assignment has been executed as of the date first above written.

ASSIGNOR:

By: _____

Its: _____

ASSIGNEE:

By: _____

Its: _____

[signatures shall be notarized]

2004 Proposed Revision to
Water Agency Code - Titles 1 and 2
and
Zone 11 Fee Plan update
Frequently Asked Questions

1. What is meant by percent impervious area?

The Sacramento County Hydrology Standards, dated 1996, considers the percent impervious area when determining peak and volume of runoff from a developed site. This is the fraction of a site that is covered by impervious surface, such as, patios, rooftops, driveways, parking lots, sidewalks, streets. The Standards apply typical coverage to various types of development, for example: farm land is set at a nominal 5% impervious area; a sports field in a park is graded and piped to drain is 20% impervious area because of its runoff characteristics; a five house per acre residential development is 40%; and a commercial development is 90%; and so on. Countywide, the average built out development is 42% covered with impervious area. [see Figure 1]

2. Will parcels that are already recorded be subject to the same fee increase?

No, due to a belief that the ministerial act of issuing a building permit should not be deemed as significant of an impact to the watershed as the act of subdividing. Furthermore, this action does not usually allow for any requirements for the construction of trunk drainage facilities.

3. Why is the fee for low density residential, schools and parks increasing?

The 1996 Fee Plan analyzed the impact of RD-5 and commercial development but did not account completely for the impact of low density development. The proposed 2004 Fee Plan study analyzes the impact of a full range of development densities including 15% to 90% impervious area developments (i.e., two acre residential lots to commercial) and their contribution to the basic fee components (pipes, channels, and basins).

The proposed 2004 Fee Plan finds that fees must increase significantly for low density development. The following table describes the pipe, channel, and basin impact due to various development densities. More detail is provided in Appendix 3 of the Fee Plan.

It was found, for example, that an RD2 (20% impervious area) development requires the same trunk pipes, has 86% of impact on the open-channel requirements and has 63% of the impact on detention basin requirements as compared to the county-wide average development (42% impervious area). These differences were not calculated in the 1996 Fee Plan.

	<u>% imperv. area</u>	<u>pipe</u>	<u>channel</u>	<u>basin</u>
RD1(+)	15%	100.00%	82.55%	55.04%
RD1-2	20%	100.00%	85.64%	62.87%
RD3-4	30%	100.00%	93.68%	84.29%
RD4-5	40%	100.00%	99.32%	98.24%
RD6-8	50%	100.00%	102.80%	107.32%
RD8-10	60%	109.00%	107.86%	119.19%
RD20	70%	117.00%	111.98%	128.80%
Indust.	80%	126.00%	116.20%	138.62%
Comm	90%	126.00%	120.29%	147.60%

4. How can schools and parks reduce their drainage fee?

There is a proposed revision to Title 2 that would give schools and parks the ability to reduce fees by demonstrating that the site would result in some attenuation of runoff. The proposed revision, Section 2.50.050C, reads as follows:

To encourage peak flow detention in sports fields, if a proposed school or park can show that it will attenuate at least one half of the volume of the 100-year 24-hour design storm (greater than the pipe design flow) the fees for those acres of the site may be reduced by 50%. This shall be determined on a case-by-case basis, subject to approval by the Director.

For example - A 10-acre park or school that drains 2.1 acres north and 7.9 acres east to a pipe system might enjoy a reduction in drainage fee if it attenuates peak flow volume. In this example, it is impractical to provide detention in the 2.1 acre shed, but the 7.9 acre area includes a sports field that can be graded to retain some volume of peak flow. The 100-year peak runoff is calculated to be 19 cfs, while the design capacity of a pipe serving 7.9 acres is only 2 cfs. It is agreed that reduced runoff would be helpful for the downstream neighborhood.

The calculated volume greater than the pipe design flow is 0.63 acre feet, so if the planner can accommodate 0.32 acre feet of volume in the sports field, to the satisfaction of Water Resources staff, the fees for the 7.9 acre area can be reduced by 50%.

5. Will there still be supplemental drainage fees?

Yes. Supplemental fees may still be proposed by developers as a way to spread the costs of new facilities or related costs (such as environmental mitigation or right-of-way acquisition) that are not specifically included in the Zone 11 Fee Plan.

6. Will the supplemental drainage fee for Vineyard Springs change due to this proposed Code and Fee Plan update?

No, this fee is for items that will not be included in the Zone 11A credits.

7. How will reimbursement agreements be paid?

The proposed revision to the code will provide for the proposed Code revision provides for full amortization over 10-years with interest paid at County Treasury rate and minimum annual payments of \$100,000 (versus the existing system in which Water Resources has the discretion to pay out reimbursements anytime within a six year period, as deemed appropriate by the Department). For example, a \$1,000,000 reimbursement will be paid at \$123,291 per year for ten years. While a \$500,000 reimbursement would be paid at \$100,000 per year for five years and on the sixth year a final payment of \$66,694 would be made. (Both examples assume 4% interest.)

8. Will the Director of the Department of Water Resources be authorized to sign credit agreements without going to the Board?

Yes. The proposed revision includes the ability for the Director to sign credit agreements that are equal to or less than \$100,000 without any other authorization from the Water Agency Board. This aligns itself with other provisions that allow, for example, the Director to sign contracts in that amount.

9. Why is there no provision for credits for channel right-of-way costs?

Any one who owns or buys land must logically recognize that there is a natural storm water flow path that must be accommodated. Furthermore, storm water channel improvements often provide for floodplain reclamation and a direct benefit to the developer. Furthermore, additional width is often added to these wet corridors to allow for buffers and environmental mitigation that are not directly related to trunk drainage but are required of the development by other agencies.

10. Why is there no provision for credits for wetland and environmental mitigation costs?

Wetland and environmental mitigation requirements are determined by the overall impact from a development project, not just the trunk drainage facilities. The costs for these items will vary widely depending on the nature and location of the project, thus trying to include a consistent cost for mitigation in the fee plan is difficult. It is inappropriate for the Water Agency to be involved in environmental mitigation as they relate to promoting the interests of a developer. When a developer applies for a Section 404 permit with the Corps, he must look at the overall impact of his development, When a land speculator acquires a property, he should discount it by the cost of environmental mitigation, i.e., if we were involved he would be paid twice.

11. Why is there no provision for credits for landscaping of channel corridor?

Landscaping beyond simple hydro-seeding is not credited as this additional landscaping is typically a condition placed on the developer by others, such as, tree mitigation, or wetland mitigation. Furthermore, Water Resources does not want to encourage extensive high maintenance landscaping in flood control facilities unless there is a maintenance partner and funding source.

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12. Why is there no credit for pump stations?

Development that depends on pump facilities for drainage are discouraged both by the ordinances and policies. The Department of Water Resources has determined that long term operation and maintenance of storm water pump stations is very expensive and thus not desirable or practical on a large scale. While pump stations may still be allowed, as directed by the Board, crediting drainage fees for pump stations would only serve to encourage a less than desirable development scenario.

13. Why is there no credit for culverts and bridges?

Bridges and culverts are a cost of the roadway being constructed, and therefore, part of the finance plan for the roadway.

14. Why was Schedule D (drainage credit unit prices) expanded and revised?

An effort was made to include every conceivable trunk drainage facility in the new credit schedule. This list was sent to several developers, engineers and contractors, (recognizing that every project is different) they were asked to provide typical unit prices for each item. These submitted unit prices were used to determine a fair and reasonable unit price for each item. It is realized that on a case-by-case basis the credits may be more or less than the actual costs.

15. Why was the engineering allowance increased from 5% to 8%?

It was recognized that an increase in engineering credit was appropriate given the additional costs associated with the rigor of today's drainage design requirements.

16. How much will credit agreements increase?

A quick review of four randomly selected credit agreements indicates that the difference might average about 18%.

Compare 2003 Credits to Proposed 2004 Credits

	2003	2004	
Van Ruiten Ranch 2	\$ 204,269	\$ 211,239	3%
Machado Dairy 1	\$ 119,591	\$ 142,573	19%
Machado Dairy 3	\$ 265,276	\$ 315,082	19%
Sheltonham Estates	\$ 85,652	\$ 125,651	47%
TOTAL	\$ 674,788	\$ 794,545	18%

17. Why is there more administration cost in Zone 11B and 11C than in Zone 11A?

We looked at the average cost of administration in each Zone, over the past few years, and applied this as a percentage of credits. Note that Water Resources spends much more staff time, per acre of development, on north area projects due to the size and types of development and the physical constraints.

Also, we added staff time for plan checking of minor drainage and grading and for storm water quality. Some of this will turn out to be a savings to the developer in that they will not be billed directly for this phase of plan checking.

18. Why is the channel excavation volume increased?

More and more we are seeing channels that are designed to a much greater roughness coefficient to accommodate a more habitat friendly corridor. The Fee Plan includes a comparison of Manning's roughness coefficient "n" of 0.060 versus 0.080 for various channel widths and channel excavation costs are increased accordingly.

19. Why are pipe credit expenses increased in the flat areas of Zone 11A?

Section 9-16C of the new Drainage Improvement Standards requires the design engineer to limit the depth of overland flow in streets. Overland flow occurs during peak storm events, such as the 100-year storm, when the capacity of the piped system is overwhelmed. The Fee Plan includes an analysis of this issue and finds that in topographically flat areas larger pipes will be required to reduce overland flow. Large expanses of these flat areas are found in Zone 11A.

20. Why will the date of valuation for detention basin land acquisition be subject to reservation agreements?

This is pursuant to the Subdivision Map Act which specifies that the date of application a development be used to determine the market value of such land acquisition. While it is appropriate for Zone 11 to pay for real estate associated with regionally beneficial detention basins, the reservation is necessary to establish and document the specified point in time when the value is determined.

21. Why are there no additional credits available for channel and basin excavation that is truck-hauled?

While it is recognized that on occasion excavated material from channels and basins may be exported via dump trucks, it is assumed that in these cases the developer or his contractor has a place to take the material, an area that is in need of the fill. This fill material has value to the recipient. Consequently, no additional credit is given.

22. Why can't credit agreements be transferred to other properties?

The fee plan is dependant on a fairly consistent cash flow. Transferring credits from one property to the other, on a wide spread basis, would potentially hinder the Zone 11 program's ability to maintain adequate cash flow to pay out other reimbursement obligations. There may be occasions when a developer has a credit balance or reimbursement agreement on one project within a Zone and desires to apply these credits to another project in the same Zone. This is not allowed, because, credit agreements rest on the parcel(s) of land that are served by the facilities that were constructed, as specifically described in the signed agreement. While the desire for trading credits is understood, the mechanism for such action is not available. Instead, the developer will have to use the credits on the subject parcel(s) and accept a reimbursement agreement for the balance.

23. How will acreage be calculated and how does that compare with the current fee plan?

The current fee is based on net acres. That is, if a single family home is to be constructed on a 7000 sf lot (excluding road right-of-way) the fee is based on 0.161 acre per house, or RD 6.22. Under the proposed fee plan, the fee for the same house would be based on 7000 sf plus the road frontage times 20 feet. This accounts for the nominal street width of 40 feet, while there will be no fee charged for the additional width associated with collector and thoroughfares.