FINAL ENGINEER'S REPORT

WEST SACRAMENTO AREA FLOOD CONTROL AGENCY
ASSESSMENT DISTRICT

Prepared for:
City of West Sacramento and
West Sacramento Area Flood Control Agency

Prepared by:
PB

July 16, 2007

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1.0 INTRODUCTION

1.1 BACKGROUND

The West Sacramento Area Flood Control Agency (WSAFCA) is a Joint Powers Authority (JPA) created in 1994 through a Joint Exercise of Powers Agreement by the City of West Sacramento (City), Reclamation District 900 (RD 900) and Reclamation District 537 (RD 537). WSAFCA was established to coordinate the planning and construction of flood protection facilities within the boundaries of the JPA and to finance the local share of flood control projects.

WSAFCA formed an assessment district in 1995 to fund the local cost share of the West Sacramento Project, which is part of the federal Sacramento Metro Area project authorized by the Water Resources Development Act (WRDA) of 1992. The WSAFCA assessment is currently funding geotechnical and engineering investigations of the Sacramento River levees and the southern boundary cross levee in the Southport area. The maximum total WSAFCA assessment amount is $5.85 million. Upon completion of the current levee investigation work, WSAFCA will have reached its maximum spending amount and will be unable to fund additional levee investigations or the construction of additional flood control improvements.

RD 900 is responsible for operating and maintaining the detention basins and pump stations, as well as the majority of the levees protecting the City of West Sacramento. RD 900 imposes an annual Operation and Maintenance Assessment on properties within its jurisdictional boundary to pay for the cost of operation and maintenance of this system of levees and flood control facilities. When the WSAFCA assessment district was formed in 1994, RD 900 reduced its Operations and Maintenance Assessment by 50-percent. The cost to adequately operate and maintain the levees and other flood control facilities requires an increase in RD 900 revenue.

The City, RD 900 and RD 537 have actively pursued the goal of providing reliable flood protection for the West Sacramento area. Working through WSAFCA, and in coordination with the U.S. Army Corps of Engineers (USACE), the California Reclamation Board (The Reclamation Board), and the California Department of Water Resources (DWR), two major flood control projects have been completed. The first was constructed in 1990 to 1993 as part of the Sacramento Urban Levee Reconstruction Project. This project placed a stability berm and related features to address through-seepage along the entire length of the Sacramento River levee bordering the Southport area. The second project was the West Sacramento Project. Constructed between 1998 and 2002, it involved raising more than a mile of the south levee of the Sacramento Bypass by up to 5 feet and raising 4.5 miles of the Yolo Bypass levee by up to 5.5 feet. The West Sacramento Project was designed to provide the City with greater than a 200 year level of protection.

However, even as design work was nearing completion on the West Sacramento Project, under-seepage was noted along the Sacramento Bypass levee in 1997 and stability issues became apparent in 1998 along the RD 537 levee. The City and RD 900 requested the USACE to conduct additional geotechnical investigations and incorporate design changes to address these issues. As a result, the completed West Sacramento Project included the entire reconstruction of one section of RD 537 levee to replace the original clay and organic material with engineered fill, and the placement of a 60 to 70 feet deep slurry wall to control under-seepage along the segment where the Sacramento Bypass and Yolo Bypass levees intersect.

In the wake of the 1997 storms, the USACE identified under-seepage as an area of concern. Only recently, the USACE has issued revised federal levee design criteria to provide a consistent approach for addressing potential levee under-seepage. The geotechnical and engineering investigations currently being conducted for West Sacramento levees have utilized the revised federal levee design criteria. The current engineering analysis has resulted in the identification of levee deficiencies and necessary improvements to provide a 200-year level of flood protection for West Sacramento. Levee evaluation studies have identified significant work needed to meet the FEMA 100-year minimum standard level of flood protection.

1.2 PURPOSE OF ENGINEER'S REPORT

The purpose of this Engineer's Report is to support the creation of a new special benefit assessment district to provide approximately half the local share of the cost of constructing and maintaining the improvements that, based on current engineering and information, are needed to achieve the City's 200-year flood protection goals. This new special benefit assessment district, which would be known as the West Sacramento Area Flood Control Agency Assessment District (the "District"), would replace WSAFCA's existing assessment district. The District would include all properties located within the JPA boundaries. The JPA boundary is the boundary of the City of West Sacramento.

This Engineer's Report proposes a financial structure for the District. Section 2 of the report identifies the improvements that would be funded; Section 3 provides an estimate of the total cost of these improvements and the share of this cost that is allocable to the JPA; Section 4 describes a financing plan for providing this cost share; and Section 5 describes the assessment methodology, including the boundaries of the District and the flood damage reduction benefits that are used to proportionally spread the assessments among the properties in the District, the assessment equations that guide this spread, and sample calculations.

An Assessment Roll (Appendix B) has been prepared that identifies the proposed initial annual assessments for each individual parcel within the District.

1.3 AUTHORITY

The proposed District is being formed by WSAFCA under the Benefit Assessment Act of 1982[1] (the 1982 Act) and Article 4 (commencing with Section 6584 of the Government Code) of the Joint Exercise of Powers Act. Government Code Section 54710.5 in the 1982 Act authorizes agencies that are authorized to provide flood control services, which include the City and the Reclamation District members of WSAFCA, to levy assessments to finance the cost of installation and improvement of facilities. Section 54710 of the 1982 Act authorizes such agencies to levy assessments to finance the operations cost of flood control services. The WSAFCA may exercise these assessment powers. The assessments authorized under the 1982 Act are levied annually based on a budget for expenditures. Government Code Section 6588 authorizes WSAFCA to issue revenue bonds secured by assessments.

[1] *Government Code Sections 54703 – 54719)*

2.0 DESCRIPTION OF FUNDED PROJECTS AND ACTIVITIES

2.1 GENERAL

The District would provide approximately half the local share of the funding to complete the projects necessary to provide 200-year protection for West Sacramento, based on current information and engineering. These projects are described below. The descriptions are intended to be general enough to authorize any necessary or appropriate additional elements that may be required to accomplish the flood control objectives of the projects. Proposed levee improvements considered herein are based on HDR's on-going Problem Identification and Alternatives Analysis Study[2]. The District would also provide funding for required repairs to the Yolo Bypass levee and operation and maintenance of flood control facilities by the responsible agency (RD 900, RD 537 and the City for internal drainage facilities). Funds loaned to WSAFCA by the member agencies at the startup of the JPA in 1993 and 1994, and funds advanced from the City's General Fund for the levee investigation studies, are to be repaid from a combination of proceeds from District assessments and any In-Lieu Fee[3] revenue collected for flood control based on City Ordinance No. 07-11 enacting Chapter 15.50 related to 200 Year Flood Protection. These funded activities are also briefly described below.

2.2 TYPES OF LEVEE IMPROVEMENTS

The City of West Sacramento is bounded on the west by the Yolo Bypass, on the north by the Sacramento Bypass and the Sacramento River, on the east by the Sacramento River, and on the south by the cross levee that separates RD 900 and RD 999. Geotechnical investigations and engineering studies have recently been conducted on these levee reaches (Figure 2-1) by the WSAFCA and DWR. Although results are preliminary, these investigations conclude that mitigation measures are required to provide 200-year level of flood protection.

The levees were evaluated according to the latest USACE criteria for stability, seepage, erosion, geometry and freeboard. Mitigation measures to correct for existing deficiencies include the following:

Cutoff Walls

Cutoff walls reduce levee through-seepage and underseepage by providing a barrier of low permeability material through the levee and levee foundation where sandy or gravelly soils of higher permeability can transmit seepage during high water stages. Cutoff walls are installed to depths sufficient to minimize seepage both through the levee and beneath it. The depths for cutoff walls necessary to limit underseepage at the design water surface elevation to gradients specified by the USACE are determined by geotechnical analysis. Cutoff walls for underseepage are generally installed to depths that will tie in with existing impervious or lower permeability soil layers beneath the levee foundation. For cutoff walls up to 80 feet in depth a conventional

[2] *Preliminary descriptions of levee repairs are presented in the Administrative Draft Interim Report – West Sacramento Levee System Repairs, West Sacramento Levee Evaluation Report, HDR, March 2, 2007.*

[3] *Public Review Draft Report, West Sacramento Flood 200 Year Flood Protection In-Lieu Fee Study, Economic & Planning Systems, April 11, 2007 and City Council adopted Resolution No. 07-34.*

FIGURE 2-1: CITY OF WEST SACRAMENTO LEVEE SYSTEM

soil-cement-bentonite slurry wall is used. Where cutoff walls greater than 80 feet are required, a deep soil mix (DSM) wall is used.

Seepage Berms

Seepage berms are wide embankments placed outward from the levee landside toe to lengthen the underseepage path and thereby lower the exit gradient of seepage through permeable layers under the levees to acceptable levels. Seepage berms typically extend 100 to 400 feet from the levee. The berm thickness depends on the severity of the seepage pressure, but generally berms are 5 feet thick near the landside toe and taper to a thickness of 3 feet at the prescribed distance from the toe. A seepage collection ditch likely will be constructed at the landward toe of all seepage berms.

Relief Wells

Relief wells provide protection against levee underseepage by providing a path for underseepage to exit to the ground surface at the landside toe of the levee without creating sand boils or piping levee foundation materials. Relief wells are an option for addressing underseepage in reaches where continuous sand and gravel layers have been identified by the geotechnical analysis. Relief wells are constructed near the levee landside toe to provide pressure relief beneath surficial fine-grained soils. The wells are constructed using soil boring equipment to bore a hole vertically through the fine-grained blanket layer and into the coarse-grained aquifer layer beneath. Pipe casings and filters are installed to allow the pressurized water to flow to the ground surface, thereby relieving the pressures beneath the clay blanket. Relief wells either may discharge onto open ground or may require conveyance to a stormwater drainage system or a pump station. The wells require regular maintenance to ensure proper operation.

Levee Raising

Freeboard deficiencies would be corrected by raising the levees to achieve the specifications established by the USACE. Freeboard deficiencies may be mitigated by crown-only raises or full levee raises:

- Crown-only raise—For a minor levee crown elevation raise (typically 6 inches or less), the recommended levee repair may be to raise the levee crown area only. However, a crown-only raise is feasible only where there is enough existing crown width to accommodate the raise without narrowing the crown to widths less that the minimum requirement, typically 20 feet.
- Full levee raise—For levees requiring a crown raise in excess of 6 inches, the required crown elevation can be met through full levee raises (i.e., an embankment raise from the landside or waterside toe [or both] upward to the increased crown elevation). This requires excavating the levee slope to provide a working platform, typically 10 feet wide, and rebuilding the levee to the appropriate elevation. The final levee configuration must meet the USACE criteria of a 20-foot-wide minimum crown, a 3:1 horizontal to vertical (3H:1V) waterside slope, and a 2H:1V landside slope. Landside slopes would be flattened to 3H:1V to provide additional slope stability.

Levee Reshape and Slope Repair

Where the waterside slopes are steeper than deemed acceptable by the slope stability evaluation, the waterside slopes are laid back to meet USACE requirements of 3H:1V slope and to provide additional stability assurance. The crown width will remain the same, but may be shifted towards

the landside if possible. The landside slope will be built out from the new crown hinge point. This will include acquiring additional permanent easement at the landside toe to accommodate the increased levee footprint.

Slope repair involves taking any stone revetment off the waterside slope of the levee and excavating a 12 foot wide section. Imported material is used to rebuild the levee to meet the required slopes and the revetment placed back onto the slope.

Erosion Control

Erosion protection would consist of the placement of rock revetment along the waterside slope of the levee at bank protection sites where erosion may threaten levee stability. Wherever possible, the bank protection would be designed both to control erosion and to maintain existing vegetation and instream woody material as much as possible. This can be accomplished by incorporating rock benches that serve as buffers against extreme toe scour and shear stress while providing space for planting riparian vegetation and creating a platform to support aquatic habitat features. Consideration is also being given to setting back the existing levee to re-establish a waterside river bank, provide slope stability and minimize the amount of rock that would be constructed in the river.

2.3 FUNDED PROJECTS

Based on the geotechnical investigations and engineering studies to date, mitigation measures specific to each levee reach have been identified as provided in Table 2-1. Only preliminary analyses have been completed to date. The specific type and extent of improvements for each reach are subject to change as more detailed engineering evaluations are conducted.

2.4 OPERATION AND MAINTENANCE

The operation and maintenance component of the District assessment would be used to fund the incremental increase in operation and maintenance costs attributable to the funded improvements and the aging of the flood control system over time. These activities would consist of regular urban levee maintenance; a variety of waterside and landside levee strengthening efforts, including bank protection, encroachment management, vegetation management, improved system access, levee monitoring and flood fight operations during a flood event; maintenance of internal drainage systems; and repairs to damaged infrastructure.

2.5 WSAFCA STARTUP ACTIVITIES

When the WSAFCA was formed in 1994, the member agencies of the JPA loaned funds to WSAFCA to cover startup expenses. These advances are a District responsibility to be paid back to the member agencies from District assessment revenue.

2.6 ADVANCES FOR LEVEE INVESTIGATIONS

The City advanced the WSAFCA funds to cover a portion of the cost of the current levee investigations and engineering studies. Such advances are eligible expenses from District assessment revenue.

TABLE 2-1: PROJECT FEATURES

Reach	Cutoff Wall Length (ft)	Seepage Berm Length (ft)	Relief Wells	Levee Raise Length (ft)	Levee Crown Regrade Length (ft)	Slope Flattening Length (ft)	Erosion Protection Length (ft)
1	5,700	20,950				31,250	11,900
2	2,800			100			
3	2,000			5,000			
4	2,200					600	1,000
5	7,100		Yes (3)			2,000	
6	3,000						3,200
7	5,800						
8	2,000			700		2,000	1,000
9A							TBD
9B	5,000						TBD
9C	4,500			43,400	18,000		TBD
TOTAL	**40,100**	**20,950**	**3**	**49,200**	**18,000**	**35,850**	**17,100**

3.0 ESTIMATED COST OF FUNDED PROJECTS AND ACTIVITIES

3.1 GENERAL

This section discusses the estimated cost of the projects and activities that would be funded by the District and the assumptions underlying the determination of the local share of this cost.

3.2 COST SHARING ASSUMPTIONS

The WSAFCA anticipates that virtually all of the funded capital improvement projects will be federally authorized and will be subject to cost sharing by the federal government and the State of California under established cost sharing guidelines. The specific cost share to be provided by the federal government for projects constructed using District funds is not known at this time. As a general rule, the cost share to be provided by the federal government for projects authorized prior to 1999 is 75 percent. For projects authorized in 1999 or after, this share is generally assumed to be 65 percent. Under applicable state law, local sponsors must provide at least 30 percent of the remaining non-federal share (35%) while the state provides a maximum of 70 percent. In practice, this means that for projects authorized prior to 1999, the local share of the total project cost is generally 7.5 percent; while for projects authorized in 1999 or later, the local share is assumed to be 10.5 percent.

However, because the majority of the proposed new levee improvements may require a new federal authorization, the determination of the local share of levee improvement costs was estimated by bracketing the range of federal and state contributions to determine a reasonable local match for future state and federal funds. The following outlines a low and high range of local contributions to the levee improvements based on varying levels of federal and state commitment and identifies the local funds assumed (Scenario 3) for purposes of the cash flow analysis in Section 4 of this Engineer's Report.

TABLE 3-1: COST SHARE SCENARIOS

Item	SCENARIO 1 Low Local Contribution (Historic Cost Sharing)	SCENARIO 2 High Local Contribution (No Federal Contribution – State / Local Funds Only)	SCENARIO 3 Doubling the Historic Local Contribution (Assumed for Cash Flow)
Federal	75.0%	00.0%	50.0%
State	14.5%	50.0%	29.0%
Local	10.5%	50.0%	21.0%
TOTAL	**100.0%**	**100.0%**	**100.0%**

- Scenario 1 – Local Contribution (Historic Cost Sharing). Scenario 1 generally represents the historical cost sharing that has occurred in West Sacramento. The cost sharing percentages shown under Scenario 1 are generally based on federal projects that have been authorized

prior to 1999.[4] Future levee improvements in West Sacramento may not be funded using the historic cost sharing formulas assumed previously. Given competing priorities at the federal level, competition for federal appropriations and state bond funds for flood protection, and the timing implications that result from waiting for the federal authorization process to occur, West Sacramento must be more aggressive in its plans to provide a local match for levee improvements.

- Scenario 2 – High Local Contribution (No Federal Contribution – State / Local Funds Only). Scenario 2 assumes no federal contribution to future levee improvements in West Sacramento. Given the uncertainties in federal funding priorities and timing, this scenario assumes that the state and the local community fully fund all the levee improvements in West Sacramento. This scenario provides for significant local control over the funding plan by requiring that 50% of the costs for levee improvements be the responsibility of West Sacramento. Scenario 2 also increases the state share of the costs to 50% and assumes the state will use its Proposition 1E and Proposition 84 bond funds that were authorized for flood protection by the voters, in West Sacramento. However, the federal government has responsibility for improving levees and federal funding is expected to be available to improve flood protection systems. As a result, the cost sharing identified in Scenario 2 does not form the basis for calculating the District's share of project costs shown in this Engineer's Report.
- Scenario 3 – Doubling the Historic Local Contribution. Scenario 3 assumes that the historical local and state contributions are doubled and the federal share is reduced from 75% to 50%. This cost sharing approach is the basis for calculating the District's share of project costs shown in this Engineer's Report.

3.3 ESTIMATED CAPITAL PROGRAM COSTS

Table 3-2 shows total program costs are currently estimated to be $400 million (current 2007 dollars). This cost includes improvements to the levees, the purchase of lands for levee improvements and mitigation, relocations of existing structures, project design, engineering, construction management, and funds set aside for contingency costs. Included in the $400 million estimate is the cost of levee evaluation studies and environmental analysis, a general re-evaluation report, and economic analysis.

For the purpose of this study it has been assumed that the federal government will pay $200 million (50%) of the estimated total project costs. The State of California is estimated to pay for $116 million (29%) of the estimated project costs. The City's share of the project costs is estimated to be $84 million (21%) of total project costs.

[4] *The existing West Sacramento project was authorized prior to 1999 and as a result has a technical 7.5% local cost share requirement. However, because of other provisions of the cost sharing agreements that require locals funds for one hundred percent of lands, easements, and rights of way as in-kind contribution, in addition to requirements that a certain amount of funds being required as cash payment, the historic local share in West Sacramento has been closer to 10.5 percent.*

TABLE 3-2: ESTIMATED CAPITAL PROGRAM COSTS BY LEVEE REACH

Reach	Lands & Mitigation	Geotechnical	Erosion	PD & E and CM[5]	Contingency	Total Costs
Area 1 (HDR)						
1	$75,148,900	$47,548,800	$13,808,700	$14,581,600	$30,218,200	$181,306,200
3	$3,522,200	$6,537,200	$0	$1,569,000	$2,325,800	$13,954,200
Area 2 (HDR)						
4	$534,300	$3,215,200	$2,000,000	$1,251,600	$2,576,700	$9,577,800
9A	$50,000	-	$2,500,000	$600,000	$1,260,000	$4,410,000
9B	$50,000	$9,460,300	$2,500,000	$2,870,400	$5,341,000	$20,221,700
9C	$8,835,600	$19,288,200	$5,000,000	$5,829,200	$13,949,000	$52,902,000
Area 2 (DWR)						
2	$3,152,500	$4,830,800	-	$1,159,400	$3,202,000	$12,344,700
5	$3,743,500	$12,244,500	-	$2,902,600	$6,614,000	$25,504,600
6	$725,700	$3,821,700	$6,400,000	$2,453,200	$5,093,600	$18,494,200
7	$2,058,500	$8,512,400	-	$2,043,000	$4,416,000	$17,029,900
8	$5,293,000	$5,658,400	$7,000,000	$3,038,000	$7,789,000	$28,778,400
					West Sacramento Administrative Costs (5 years)	10,000,000
Total	**$103,114,200**	**$121,117,500**	**$39,208,700**	**$38,298,000**	**$82,785,300**	**$394,523,700**
Levee investigation studies, financing plan, hydrology analysis currently underway						**$5,476,300**
					TOTAL	**$400,000,000**

[5] *Planning, design and environmental analysis and construction management.*

3.4 OPERATION AND MAINTENANCE

As a condition of securing federal and state cost sharing for all of the above projects, WSAFCA must provide assurances that the constructed improvements are maintained in accordance with adopted federal and state standards. These projects principally involve improvements to the existing levee system surrounding West Sacramento. WSAFCA has consulted with its member agencies responsible for maintaining the affected levees to develop an appropriate cost estimate for following through on the required assurances. The agencies have agreed on a cost formula that they believe will allow them to carry out the required maintenance effort. This formula is based on an estimate of the extent of the lands within each local maintenance district or agency and an estimate of the cost per acre of the maintenance effort. As set forth in Table 3-3, this formula assumes a total of $588,000 is needed each year. This sum is subject to adjustment based on the actual needs of the maintaining agencies.

TABLE 3-3: ALLOCATION OF MAINTENANCE COSTS

Maintenance Agency	Acres	Annual Levee or Interior Drainage Maintenance Cost	Cost per Acre	Percent of Total
RD 900	12,500	$500,000	$40	**85%**
RD 537	1,000	$40,000	$40	**7%**
City	1,200	$48,000	$40	**8%**
TOTAL	**14,700**	**$588,000**	**$40**	**100%**

4.0 FINANCING PLAN

4.1 GENERAL

In order to determine the annual financing requirements necessary to fund WSAFCA's share of the total cost of the projects and activities covered by the District, WSAFCA created a cash flow analysis and financing plan representing the proposed timing for carrying out these projects and activities and the resulting funding demands on the Agency. The key assumptions supporting this analysis are outlined below.

4.2 KEY ASSUMPTIONS

The most important assumption in the cash flow analysis is that virtually all of the funded improvements will be subject to federal cost sharing. Many of these improvements are logical extensions of existing authorized projects for which it has been determined that a broadening of the project scope and lifting of the cost ceiling is required in order to secure the underlying Federal participation in the project. Such extensions are the predictable outcomes of changing circumstances and new engineering insights.

The cash flow analysis also assumes that there will be state cost sharing for all of the funded improvements. In most cases, it is assumed that this share will amount to on average 58 percent of the non-Federal cost of the improvements. This assumption is uncertain, however, because the State Department of Water Resources has not yet adopted regulations implementing Water Code Section 12585.7(d) (AB 1147, adopted in 2000).

The cash flow analysis assumes that WSAFCA and the state will take advantage of federal crediting mechanisms to accelerate the completion of some of the improvements that would be covered by the District. Specifically, the analysis assumes that the state will use its Proposition 1E and 84 bond funds, WSAFCA will use the bonding capacity of the District, and the City will utilize In-Lieu Fee revenue to construct substantial portions of the required levee improvements prior to the USACE's determination of a federal participation in the project.

4.3 CASH FLOW ANALYSIS

Tables 4-1, 4-2, 4-3 present the cash flow analysis that was prepared for purposes of providing an example of how the levee improvements identified in this Engineer's Report will be funded using local, state, and federal funds. The cash flow analysis shows the by the end of the funding plan, the shares of funding are projected to be:

Local	21%
State	29%
Federal	50%

Tables 4-1 and 4-2 summarize the cash flow projects for three points in time:

- The first five years of the project – 2007 through 2011. This period represents the time frame when the construction elements and associated design/engineering work are financed primarily from state and local funding sources.

- The completion of construction period – 2012 through 2014. During this period, construction is funded primarily from state and federal funding sources.
- The reconciliation/reimbursement period – This period represents the time frame when the construction is complete but the assessments and In-Lieu Fees continue to be collected to repay the Assessment Bonds and reimburse the WSAFCA member agencies and state for advancing funding above the cost sharing targets. The purpose of the reconciliation/reimbursement period is to show a mechanism to reach the targeted cost sharing amounts identified in this Engineer's Report. However, to the extent that those cost sharing targets are modified, it is likely that the amount and structure of the reimbursements / reconciliations would be modified.

Table 4-1 shows the totals for each time frame. Table 4-2 shows cumulative totals since the start of the Project for each time frame. Table 4-3 shows an annual projection. The projections are meant to show the interaction of the various funding sources through the completion of the various elements of the flood control project.

It is likely that the timing of the actual receipt of revenues and construction of the project will vary from the cash flow projection. However, the fundamental relationships will remain the same. In the early years, state and local monies will be the primary source of project funding. Completion of the project will rely heavily on state and federal funding.

Revenues

The cash flow analysis assumes an initial annual revenue from the assessment of $2.9 million for levee improvements[6]. The assessments will be used to fund Project costs on a cash basis in the early years and then be used to fund assessment bond debt service after bonds are issued. The cash flow does not show the repayment of assessment debt. An escalation allowance of 2-percent per year will contribute to the increase over time in annual assessment revenue. This incremental increase in assessments is allocated to anticipate changes in project costs as more detailed engineering studies are completed. It is likely that as new development occurs within the City, the annual assessment revenue will increase over time. However, in order to be conservative, the assessment revenue assumed in the cash flow relies only on revenue that can be obtained based on the level of development that currently exists within the City. Should assessment revenue increase due to new development, it is possible that the project construction schedule could be accelerated or the cost sharing assumptions could be revisited.

In order to fund WSAFCA's share of the total cost of the projects covered by the District, the cash flow analysis assumes that WSAFCA will issue assessment bonds in the amount of $35.9 million in 2010. The cash flow analysis also recognizes $1.35 million in funding from existing assessments and the City of West Sacramento's loan of $4 million.

[6] *An additional $588,000 will be collected by the assessment for operations and maintenance. However, operations and maintenance is not included in the cash flow analysis. Instead the focus of the cash flow analysis is to identify an example of how the project costs for levee improvements will be funded. The total amount of estimated assessment revenue accounts for potential delinquency.*

Expenditures

The middle section of Tables 4-1, 4-2, and 4-3 show the estimated timing of construction of the major elements of the Project. It is expected that construction will be completed by 2014, but this is dependent on the availability of federal funding.

Reimbursements

The bottom portion of Tables 4-1, 4-2, and 4-3 show the timing of reimbursements from In-Lieu Fees, assessments, and other funding to repay the outstanding principal and interest ($1.9 million) that remains from the 1994 loan from the member agencies to the WSAFCA (called the JPA 1994 loan), the City's $4 million loan and state funding advances in excess of its funding target of 29%. The reimbursements shown in this cash flow are based on the following assumptions.

- The member agencies (RD 900, RD 537, and the City) will receive 1/30th of the $1.9 million loan that was made to the WSAFCA including interest. Note: interest is not calculated in the cash flow analysis.
- City will receive all remaining funding available for reimbursement each year until $4.0 million General Fund loan is repaid.
- After the City General Fund loan is repaid, the member agencies will receive all remaining funding available from reimbursement each year until JPA loan is repaid.
- Once the City General Fund loan and the JPA loan is repaid, the state will be reimbursed from the remaining cash balances until the State's funding match is reached. Advance funding from the state and potential reimbursements still need to be negotiated between the City of West Sacramento and the State.

TABLE 4-1: CASH FLOW ANALYSIS – POINTS IN TIME

Funding Source	First Five Years of Project 2007-2011	Percent	End of Construction 2012-2014	Percent	Reconciliation / Reimbursement Period 2015-Buildout	Percent	Total After Reconciliation / Reimbursement	Percent
Revenues								
Local Funds								
In-Lieu Fees	$9,954,000	5%	$6,867,000	3%	$25,179,000	N.A.	$42,000,000	11%
Annual Assessment (Proposed AD)	$6,088,000	3%	[1] $0	0%	[1] $0	N.A.	$6,088,000	2%
Assessment Bonds (Proposed AD)	$35,912,000	20%	$0	0%	$0	N.A.	$35,912,000	9%
Existing Assessment Revenue	$1,350,000	1%	$0	0%	($1,350,000)	N.A.	$0	0%
General Fund Loan	$4,000,000	2%	$0	0%	($4,000,000)	N.A.	$0	0%
Subtotal Local Funds	**$57,304,000**	31%	**$6,867,000**	3%	**$19,829,000**	N.A.	**$84,000,000**	21%
State	**$118,446,000**	64%	**$21,740,700**	10%	($24,186,700)	N.A.	**$116,000,000**	29%
Federal	**$8,000,000**	4%	**$192,000,000**	87%	**$0**	N.A.	**$200,000,000**	50%
Total Revenues	**$183,750,000**	100%	**$220,607,700**	100%	**($4,357,700)**	N.A.	**$400,000,000**	100%
Expenses								
Project Costs								
Levee Investigation, financing plan, hyrdology, etc	($5,476,300)	3%	$0	0%	$0	0%	($5,476,300)	1%
Plans, Designs, & Environment (includes GRR & Economic)	($19,149,000)	10%	$0	0%	$0	0%	($19,149,000)	5%
Lands & Mitigation	($41,245,800)	22%	($61,868,400)	28%	$0	0%	($103,114,200)	26%
Project Construction (includes const. mgmt)	($111,306,200)	61%	($150,954,300)	68%	$0	0%	($262,260,500)	66%
Project Administration	($4,000,000)	2%	($6,000,000)	3%	$0	0%	($10,000,000)	3%
Subtotal Project Costs	**($181,177,300)**	**99%**	**($218,822,700)**	**99%**	**$0**	**0%**	**($400,000,000)**	**100%**
Reconciliation/ Reimbursements								
JPA Member Loan from 1994 [2]	($252,000)	0%	($215,000)	0%	($1,433,000)	6%		
General Fund Loan from 2006	($2,320,700)	1%	($1,570,000)	1%	($109,300)	0%		
State Funds	$0	0%	$0	0%	($24,186,700)	94%		
Subtotal Reconciliation/ Reimbursements	**($2,572,700)**	**1%**	**($1,785,000)**	**1%**	**($25,729,000)**	**100%**		
Total Expenses	**($183,750,000)**	**100%**	**($220,607,700)**	**100%**	**($25,729,000)**	**100%**		

"key_cash2"

Note: Numbers may not total accurately due to rounding.
[1] Annual Assessments from proposed Assessment District after 2010 continue to be collected and are assumed to be used to fund debt service on bonds.
[2] JPA Member Loan is a liability that is transferred from the existing Assessment District to the proposed Assessment District.

Source: Economic & Planning Systems, April 25, 2007

TABLE 4-2: CASH FLOW ANALYSIS – CUMULATIVE TOTALS

Funding Source	Year Five of Project Cumulative to 2011	Percent	End of Construction Cumulative to 2014	Percent	Reconciliation / Reimbursement Period Cumulative to Buildout	Percent	Total After Reconciliation / Reimbursement	Percent
Revenues								
Local Funds								
In-Lieu Fees	$9,954,000	5%	$16,821,000	4%	$42,000,000	11%	$42,000,000	11%
Annual Assessment (Proposed AD) [1]	$6,088,000	3%	$6,088,000	2%	$6,088,000	2%	$6,088,000	2%
Assessment Bonds (Proposed AD)	$35,912,000	20%	$35,912,000	9%	$35,912,000	9%	$35,912,000	9%
Existing Assessment Revenue	$1,350,000	1%	$1,350,000	0%	$0	0%	$0	0%
General Fund Loan	$4,000,000	2%	$4,000,000	1%	$0	0%	$0	0%
Subtotal Local Funds	**$57,304,000**	**31%**	**$64,171,000**	**16%**	**$84,000,000**	**21%**	**$84,000,000**	**21%**
State	**$118,446,000**	**64%**	**$140,186,700**	**35%**	**$116,000,000**	**29%**	**$116,000,000**	**29%**
Federal	**$8,000,000**	**4%**	**$200,000,000**	**49%**	**$200,000,000**	**50%**	**$200,000,000**	**50%**
Total Revenues	**$183,750,000**	**100%**	**$404,357,700**	**100%**	**$400,000,000**	**100%**	**$400,000,000**	**100%**
Expenses								
Project Costs								
Levee Investigation, financing plan, hyrdology, etc	($5,476,300)	3%	($5,476,300)	1%	($5,476,300)	1%	($5,476,300)	1%
Plans, Designs, & Environment (includes GRR & Economic)	($19,149,000)	10%	($19,149,000)	5%	($19,149,000)	4%	($19,149,000)	5%
Lands & Mitigation	($41,245,800)	22%	($103,114,200)	26%	($103,114,200)	24%	($103,114,200)	26%
Project Construction (includes const. mgmt)	($111,306,200)	61%	($262,260,500)	65%	($262,260,500)	61%	($262,260,500)	66%
Project Administration	($4,000,000)	2%	($10,000,000)	2%	($10,000,000)	2%	($10,000,000)	3%
Subtotal Project Costs	**($181,177,300)**	**99%**	**($400,000,000)**	**99%**	**($400,000,000)**	**93%**	**($400,000,000)**	**100%**
Reconciliation/ Reimbursements								
General Fund Loan from 2006	($2,320,700)	1%	($3,890,700)	1%	($4,000,000)	1%		
JPA Member Loan from 1994 [2]	($252,000)	0%	($467,000)	0%	($1,900,000)	0%		
State Funds	$0	0%	$0	0%	($24,186,700)	6%		
Subtotal Reconciliation/ Reimbursements	**($2,572,700)**	**1%**	**($4,357,700)**	**1%**	**($30,086,700)**	**7%**		
Total Expenses	**($183,750,000)**	**100%**	**($404,357,700)**	**100%**	**($430,086,700)**	**100%**		

"key_cash1"

Note: Numbers may not total accurately due to rounding.

[1] Annual Assessments from proposed Assessment District after 2010 continue to be collected and are assumed to be used to fund debt service on bonds.

[2] JPA Member Loan is a liability that is transferred from the existing Assessment District to the proposed Assessment District.

Source: Economic & Planning Systems, April 25, 2007

TABLE 4-3: CASH FLOW ANALYSIS – ANNUAL PROJECTION

Fiscal Year	Total [1]	Pre-2008	2008	2009	2010	2011	2012	2013	2014
Beginning Balance		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Revenues [2]									
Local Funds									
In-Lieu Fees	$42,000,000	$384,000	$2,826,000	$2,166,000	$2,289,000	$2,289,000	$2,289,000	$2,289,000	$2,289,000
Annual Assessment (Proposed AD)	$6,088,000	$0	$2,984,000	$3,104,000	[3] $0	[3] $0	[3] $0	[3] $0	[3] $0
Assessment Bonds (Proposed AD) [4]	$35,912,000	$0	$0	$0	$35,912,000	$0	$0	$0	$0
Existing Assessment Revenue	$1,350,000	$1,350,000	$0	$0	$0	$0	$0	$0	$0
General Fund Loan	$4,000,000	$4,000,000	$0	$0	$0	$0	$0	$0	$0
Subtotal Local Funds	**$89,350,000**	**$5,734,000**	**$5,810,000**	**$5,270,000**	**$38,201,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**
State	**$140,186,700**	**$0**	**$3,810,000**	**$8,066,000**	**$35,329,000**	**$71,241,000**	**$21,740,700**	**$0**	**$0**
Federal	**$200,000,000**	**$0**	**$8,000,000**	**$0**	**$0**	**$0**	**$49,500,000**	**$71,241,000**	**$71,259,000**
Total Revenues	**$429,536,700**	**$5,734,000**	**$17,620,000**	**$13,336,000**	**$73,530,000**	**$73,530,000**	**$73,529,700**	**$73,530,000**	**$73,548,000**
Expenses									
Project Costs									
Levee Investigation, financing plan, hyrdology, etc	($5,476,300)	($5,476,300)	$0	$0	$0	$0	$0	$0	$0
Plans, Designs, & Environment (includes GRR & Economic)	($19,149,000)	$0	($6,383,000)	($12,766,000)	$0	$0	$0	$0	$0
Lands & Mitigation	($103,114,200)	$0	$0		($20,622,900)	($20,622,900)	($20,622,600)	($20,622,900)	($20,622,900)
Project Construction (includes const. mgmt)	($262,260,500)	$0	($10,670,000)	$0	($50,318,100)	($50,318,100)	($50,318,100)	($50,318,100)	($50,318,100)
Project Administration	($10,000,000)	$0	$0	$0	($2,000,000)	($2,000,000)	($2,000,000)	($2,000,000)	($2,000,000)
Subtotal Project Costs	**($400,000,000)**	**($5,476,300)**	**($17,053,000)**	**($12,766,000)**	**($72,941,000)**	**($72,941,000)**	**($72,940,700)**	**($72,941,000)**	**($72,941,000)**
Reconciliation/ Reimbursements									
In-Lieu Fees	$0	$0	$0	$0	$0	$0	$0	$0	$0
Annual Assessment Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0
Assessment Bonds	$0	$0	$0	$0	$0	$0	$0	$0	$0
JPA Member Loan from 1994 [5]	($1,900,000)	$0	($63,000)	($63,000)	($63,000)	($63,000)	($63,000)	($63,000)	($89,000)
General Fund Loan from 2006	($4,000,000)	($257,700)	($504,000)	($507,000)	($526,000)	($526,000)	($526,000)	($526,000)	($518,000)
State Funds	($24,186,700)	$0	$0	$0	$0	$0	$0	$0	$0
Federal Funds	$0	$0	$0	$0	$0	$0	$0	$0	$0
Subtotal Reconciliation/ Reimbursements	**($30,086,700)**	**($257,700)**	**($567,000)**	**($570,000)**	**($589,000)**	**($589,000)**	**($589,000)**	**($589,000)**	**($607,000)**
Total Expenses	**($430,086,700)**	**($5,734,000)**	**($17,620,000)**	**($13,336,000)**	**($73,530,000)**	**($73,530,000)**	**($73,529,700)**	**($73,530,000)**	**($73,548,000)**
Ending Balance [6]		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

"cash_flow1"

[1] Cash Flow based on cost sharing assumptions from Table 14 of the West Sacramento 200 Year Flood Protection In-Lieu Fee Study.
[2] Revenue totals do not match cost sharing assumptions from the West Sacramento 200 Year Flood Protection In-Lieu Fee Study due to advanced funding and repayment of loans.
[3] Annual Assessments from proposed Assessment District after 2010 continue to be collected and are assumed to be used to fund debt service on bonds.
[4] Assessment bonding revenues assumed not to reach full capacity. Should funding needs increase, additional bonding capacity from assessment revenue may be available.
[5] Loan provided JPA member agencies in 1993, 1999, and 2005. Loan amount accrues interest at 5 pecent simple interest on principal only. As of June 30, 2006, the loan amount was $1,906,894 (City=$565,156, RD 900=$798,549, and RD537=$543,188). Future interest not shown in this cash flow.
[6] Any balance outstanding at the time of buildout will be paid for with surplus project revenue. Outstanding balance is a result of cost sharing assumptions

Source: Economic & Planning Systems, April 25, 2007

TABLE 4-3: CASH FLOW ANALYSIS – ANNUAL PROJECTION (CONTINUED)

Fiscal Year	2015	2016	2017	2018	2019	2020	2021
Beginning Balance	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Revenues [2]							
Local Funds							
In-Lieu Fees	$2,289,000	$2,289,000	$2,289,000	$2,289,000	$2,289,000	$2,289,000	$2,289,000
Annual Assessment (Proposed AD)	[3] $0	[3] $0	[3] $0	[3] $0	[3] $0	[3] $0	[3] $0
Assessment Bonds (Proposed AD) [4]	$0	$0	$0	$0	$0	$0	$0
Existing Assessment Revenue	$0	$0	$0	$0	$0	$0	$0
General Fund Loan	$0	$0	$0	$0	$0	$0	$0
Subtotal Local Funds	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**
State	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Federal	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Total Revenues	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**
Expenses							
Project Costs							
Levee Investigation, financing plan, hyrdology, etc	$0	$0	$0	$0	$0	$0	$0
Plans, Designs, & Environment (includes GRR & Economic)	$0	$0	$0	$0	$0	$0	$0
Lands & Mitigation	$0	$0	$0	$0	$0	$0	$0
Project Construction (includes const. mgmt)	$0	$0	$0	$0	$0	$0	$0
Project Administration	$0	$0	$0	$0	$0	$0	$0
Subtotal Project Costs	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Reconciliation/ Reimbursements							
In-Lieu Fees	$0	$0	$0	$0	$0	$0	$0
Annual Assessment Revenue	$0	$0	$0	$0	$0	$0	$0
Assessment Bonds	$0	$0	$0	$0	$0	$0	$0
JPA Member Loan from 1994 [5]	($1,433,000)	$0	$0	$0	$0	$0	$0
General Fund Loan from 2006	($109,300)	$0	$0	$0	$0	$0	$0
State Funds	($746,700)	($2,289,000)	($2,289,000)	($2,289,000)	($2,289,000)	($2,289,000)	($2,289,000)
Federal Funds	$0	$0	$0	$0	$0	$0	$0
Subtotal Reconciliation/ Reimbursements	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**
Total Expenses	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**
Ending Balance [6]	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Source: Economic & Planning Systems, April 25, 2007

TABLE 4-3: CASH FLOW ANALYSIS – ANNUAL PROJECTION (CONTINUED)

Fiscal Year	2022	2023	2024	2025
Beginning Balance	**$0**	**$0**	**$0**	**$0**
Revenues [2]				
Local Funds				
In-Lieu Fees	$2,289,000	$2,289,000	$2,289,000	$2,289,000
Annual Assessment (Proposed AD)	[3] $0	[3] $0	[3] $0	[3] $0
Assessment Bonds (Proposed AD) [4]	$0	$0	$0	$0
Existing Assessment Revenue	$0	$0	$0	$0
General Fund Loan	$0	$0	$0	$0
Subtotal Local Funds	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**
State	**$0**	**$0**	**$0**	**$0**
Federal	**$0**	**$0**	**$0**	**$0**
Total Revenues	**$2,289,000**	**$2,289,000**	**$2,289,000**	**$2,289,000**
Expenses				
Project Costs				
Levee Investigation, financing plan, hyrdology, etc	$0	$0	$0	$0
Plans, Designs, & Environment (includes GRR & Economic)	$0	$0	$0	$0
Lands & Mitigation	$0	$0	$0	$0
Project Construction (includes const. mgmt)	$0	$0	$0	$0
Project Administration	$0	$0	$0	$0
Subtotal Project Costs	**$0**	**$0**	**$0**	**$0**
Reconciliation/ Reimbursements				
In-Lieu Fees	$0	$0	$0	$0
Annual Assessment Revenue	$0	$0	$0	$0
Assessment Bonds	$0	$0	$0	$0
JPA Member Loan from 1994 [5]	$0	$0	$0	$0
General Fund Loan from 2006	$0	$0	$0	$0
State Funds	($2,289,000)	($2,289,000)	($2,289,000)	($2,839,000)
Federal Funds	$0	$0	$0	$0
Subtotal Reconciliation/ Reimbursements	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,839,000)**
Total Expenses	**($2,289,000)**	**($2,289,000)**	**($2,289,000)**	**($2,839,000)**
Ending Balance [6]	**$0**	**$0**	**$0**	**($550,000)**

Source: Economic & Planning Systems, April 25, 2007

5.0 ASSESSMENT METHODOLOGY

5.1 GENERAL

Under Proposition 218, a governmental agency may fund public improvements by levying an assessment on the properties that would receive a special benefit from the improvements. A special benefit is a particular and distinct benefit over and above the general benefits conferred on real property located in the district or to the public at large. The cost of the improvements must be apportioned among the properties being assessed based on the proportionate special benefit these properties will receive. Moreover, the governmental agency must demonstrate through a balloting process, weighted to reflect these special benefits, that the ballots submitted in opposition to the assessment do not exceed the ballots submitted in favor of the assessment, weighted according to the proportional financial obligation of the affected property.

In this instance, the properties within the proposed new District will receive a special flood protection benefit in the form of a substantial reduction in expected flood damages. For a relatively wide range of flood events, these properties will escape all of the pre-project damages to structures, the contents of structures and the land comprising the property they could have otherwise suffered.

In addition to this special benefit, the flood control improvements funded by the new District will provide general benefits throughout the greater West Sacramento and Sacramento area. Such general benefits, which are not particular to any property, will include: the avoidance of flood damages to transportation infrastructure, places of employment, shopping centers and other retail services; in a major flood, streets and roads become impassable, preventing or at least disrupting the normal flow of traffic; employees are unable to go to work if their places of employment are flooded; emergency services are directed to provide assistance in the flooded areas, potentially reducing or delaying such services in the non-flooded areas of the community. With the implementation of flood control improvements, the regional employment base will be protected from short-term disruption and potential long-term relocation due to severe flooding.

The federal and state governments are expected to provide about 79 percent of the funding for the flood protection improvements. The special benefits provided by the improvements are not less than 21-percent of the total benefit, special and general.

The special flood damage reduction benefit provided by these flood control improvements will vary based on the size and use of the affected structures, and the relative size and location of the affected property. The sections that follow describe in detail the methodology that will be used to calculate these new assessments.

5.2 FLOOD DAMAGE REDUCTION BENEFIT

The special flood damage reduction benefit that will be provided to all of the properties in the new District is based on avoidance of damage to structures, to the contents of the structures, and to land.

5.2.1 Structure and Content Damage

The USACE has defined potential flood damages to structures and contents by land use category:

- Industrial – losses and destruction of industrial properties, including warehouses, from inundation consist of fixtures and equipment, inventory, and structure.
- Commercial – structure value and content value including equipment and furniture, supplies, merchandise, and other items used in the conduct of business.
- Residential – physical damages to dwelling units (single-family, multi-family, and mobile homes) and to residential contents including household items and personal property.

To reflect relative differences in the exposure of structures and their contents to flood-related damages, a structure and content damage factor has been calculated based on the following:

- Relative structure values for residential, commercial, and industrial structures were determined using USACE data developed in connection with the American River Watershed Investigation[7]. These values represent gross averages for the different land uses based on the USACE estimates for structure replacement costs. They do not represent assessed value or current market value for any individual structure. Relative structure values in Table 5-1 are used in the assessment methodology to reflect the relative value relationships between land use categories.

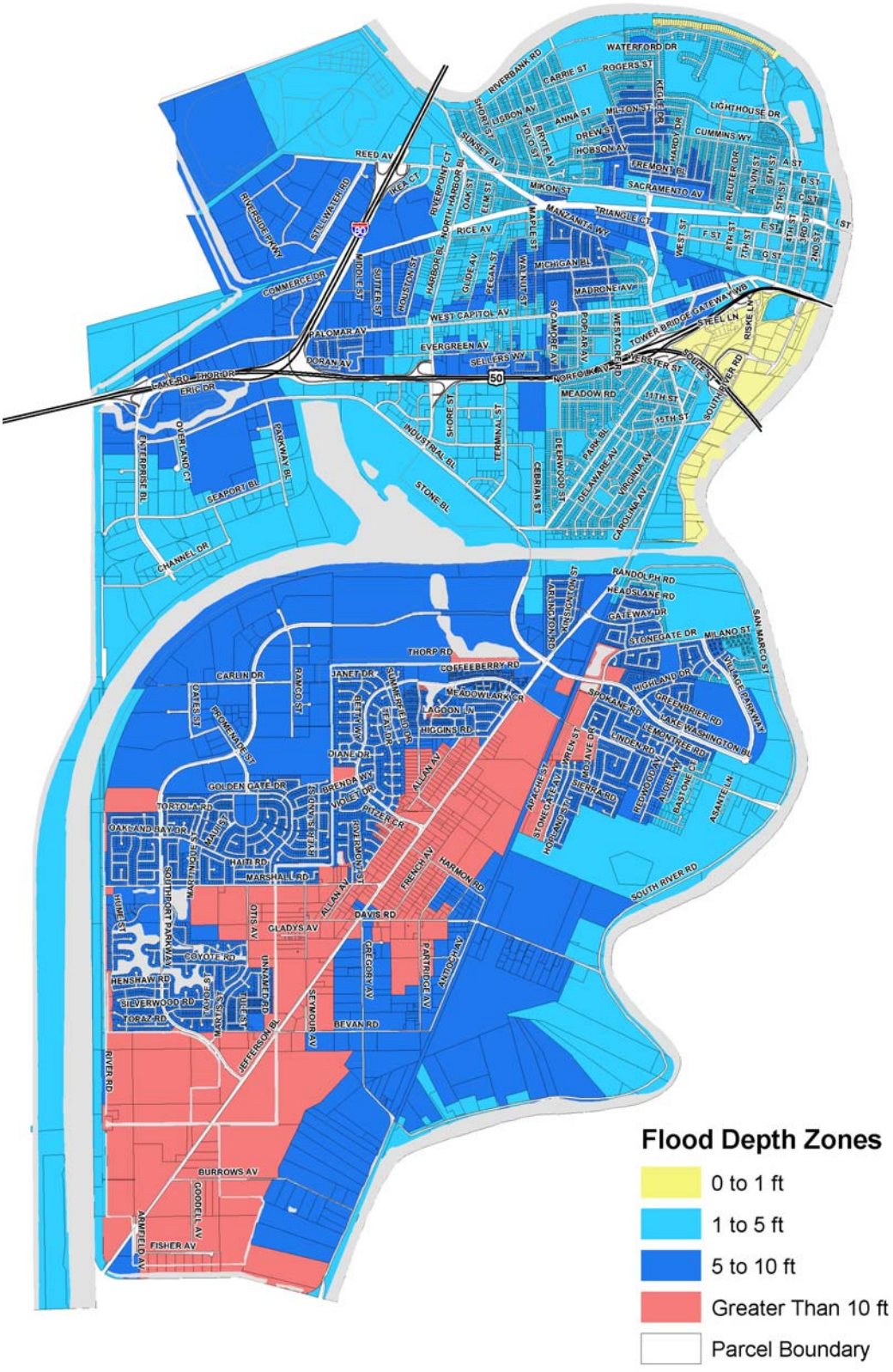
TABLE 5-1: RELATIVE STRUCTURE VALUE

Land Use	Relative Structure Value ($/SF)
Residential	60
Residential – Mobile Home	30
Commercial	70
Industrial	50

- Relative flood depths for the 100-year event were established by dividing the new assessment district into four depth zones (0 to 1 feet, 1 to 5 feet, 5 to 10 feet, and 10 feet or greater), as shown in Figure 5-1. These flood depth maps were derived from Flood Emergency Preparedness Mapping prepared by Wood Rodgers for the City of West Sacramento. Additional evaluation of potential shallow flooding of areas adjacent to the Sacramento River supplemented the Wood Rogers flood depth maps.

[7] *US Army Corps of Engineers, Sacramento District, American River Watershed Investigation, California, Feasibility Report, Parts I and II, Volumes 1 through 8, Appendixes A through T, December 1991.*

FIGURE 5-1: FLOOD DEPTH ZONES



- The relationship between depth of flooding and damages to structure and contents was calculated for each land use category (residential, commercial, and industrial) and depth zone in the new assessment district using the depth-damage curves established for the USACE American River Watershed Investigation[8]. The depth-damage curves for residential structures used in the ARWI and in this report were developed by the Federal Insurance Administration (FIA). USACE damage surveys of flood damaged structures along Dry Creek in Roseville conducted immediately after the storm of February 1986 confirmed the reasonableness of these 1988 FIA depth-damage relationships. The commercial depth-damage curves used by the USACE in the ARWI and used in this report are based on depth-damage relationships developed by the Tennessee Valley Authority (TVA) for the Department of Housing and Urban Development (HUD). For the USACE Morrison Creek Investigation in Sacramento County, interviews with owners and managers of commercial buildings established depth-percent damage relationships that were very similar to those in the HUD study. The industrial depth-damage curves used by the USACE in the ARWI and used in this report were developed by the USACE from inventories of industrial structures in the ARWI study area.

The depth-damage relationships for structure and contents, expressed as a percent of the structure value, are shown in Table 5-2.

TABLE 5-2: PERCENT DAMAGE TO STRUCTURE AND CONTENTS

	Flood Depth Zones			
Land Use	**Zone 0 0 to 1 ft**	**Zone 1 1 to 5 ft**	**Zone 2 5 to 10 ft**	**Zone 3 Greater than 10 ft**
Residential	15%	33%	70%	79%
Commercial	20%	72%	125%	146%
Industrial	59%	74%	105%	136%

Flood damages to structures and their contents were calculated for each property in the new District using the following:

- An average first floor square footage of 900 SF was assigned for single family residential structures identified by Yolo County Assessor's Office as single-story structures having a total living area less than 1050 SF or multi-story structures having a total living area less than 2150 SF
- An average first floor square footage of 1375 SF was assigned for single family residential structures identified by the Yolo County Assessor's Office as single-story structures having a total living area greater than 1050 SF or multi-story structures having a total living area greater than 2150 SF

[8] *US Army Corps of Engineers, Sacramento District, American River Watershed Investigation, California, Feasibility Report, Parts I and II, Volumes 1 through 8, Appendixes A through T, December 1991.*

- An average first floor square footage of 800 SF was assumed for residential condominium units
- The aggregate of representative values for individual mobile home square footage was used for mobile home parks
- Estimates of actual first floor square footage was used for multi-family residential, commercial, industrial and public structures
- An appropriate structure value and depth-percent damage relationships for the particular land use was used.

For example, the relative structure and contents damages of a single-family residential structure with first floor square footage of 1200 SF and located in flood depth zone 1 (1 to 5 ft) would be calculated as follows: $60/sf x 1375 SF x 33% = $27,225

5.2.2 Damage to Land

There are a number of factors that contribute to the flood damage reduction benefit to land, both vacant and improved. These include, but are not limited to, reduced cost of development, the ability to secure financing for urban development projects, reduced cost of flood insurance, changes in highest and best land use and preservation of land values. Based on information developed by a certified real estate appraiser for an existing flood control assessment district in Sacramento, and applying those results to West Sacramento, all parcels in the new assessment district would be subject to a ten-percent land damage factor. This is considered a conservatively low estimate of the assumed land damages that would occur in recognition that the affected parcels could be inundated by a major flood event.

The methodology to determine relative land values between land use types in West Sacramento was based on work completed in Sacramento with some modifications to reflect industrial land values in West Sacramento. As part of the Sacramento Area Flood Control Agency (SAFCA) 1990 Operation and Maintenance Assessment District No. 1 formation process, approximately 300,000 properties in the Sacramento County area were assigned a land value by an appraisal report based on land use, geographic location, parcel size and zoning. These base value estimates considered land alone, exclusive of any building improvements. The values derived are not assessed value or market value for any individual parcel of land. Rather they represent the value relationships between various land use classifications. For industrial land uses, land values specific to West Sacramento were used to develop an average for this category.

The resulting relative land use values were multiplied by the ten-percent land damage factor to define the relative land damage values shown in Table 5-3. For the acreage greater than 0.5 acres on large lot single family residential parcels, the generalized Land Use Index that was developed in connection with SAFCA's 1995 North Area Local Capital Assessment District No. 2 provided the basis for using a land value approximately equal to 10 percent of the corresponding single-family residential (non-large lot) land value.

The amount of flood damages to land for a particular property is calculated using the actual parcel acreage and the appropriate relative land damage value. For example, the flood damage benefit to land for a single-family residential property with a parcel area of 0.17 acres would be calculated as follows: $25,100/acre x 0.17 acres = $4,267

5.2.3 Total Relative Flood Damage Reduction Benefit

The total relative flood damage reduction benefit for each parcel in the District is the sum of the structure and content damages and the land damages associated with that parcel. For example, the single-family residential property used in the above example calculations would have total flood damage reduction benefits of $27,225 + $4,267 = $31,492.

TABLE 5-3: RELATIVE LAND DAMAGE

Land Use	Relative Land Damage ($/Acre)
Single-Family Residential	25,100
Multi-Family Residential	27,800
Commercial	55,400
Industrial	23,300
Vacant	12,100
Residential – Mobile Home	25,100
Large Lot SFR (portion GT 0.5 acres)	2,500

5.3 DISTRICT BOUNDARY

The new assessment district would fund approximately half the local share of the cost of the improvements needed to provide "200-year" protection along the Sacramento River, Yolo Bypass, and Deep Water Ship Channel levees protecting West Sacramento. Accordingly, the new District would encompass all properties within the boundaries of the WSAFCA. Approximately 15,200 parcels are within the new District boundary.

5.4 ASSESSMENT SPREAD

The amount of the annual assessments collected from all properties is sized to be sufficient to cover the local share of the cost of the flood control improvements and the system operation and maintenance (O&M) costs associated with these improvements. These costs were described in Section 3 and presented in Tables 3-2 and 3-3. The assessment rate for the new District is calculated by dividing the amount of annual revenue required to support the improvements and O&M by the total relative flood damage reduction benefits for all parcels within the new District. These assessment rates are then added together to create the aggregate assessment rate. This aggregate assessment rate is shown in Table 5-4. The annual assessment for each parcel is computed by multiplying that parcel's total relative flood damage reduction benefit by the aggregate assessment rate. Table 5-5 shows relative flood damage reduction benefits and assessments by land use categories.

TABLE 5-4: ASSESSMENT RATES

Project Feature	Assessment Rate
Flood Control Improvements	0.0016086
O&M	0.0002956
Total	**0.0019042**

TABLE 5-5: RELATIVE FLOOD DAMAGES AND ASSESSMENTS BY LAND USE

Land Use	Number Parcels	Land Damage Per AC	Parcel Area (acres)	Land Damage ($)	Struct Value $/SF	Flood Damage %	Building Footprint (sf)	Structure Damage ($)	Total Benefit ($)	Asmt Rate	Annual Revenue ($)
Flood Depth -- 0 to 1 ft											
Commercial	0	55,400	0.0	0	70	20%	0	0	0	0.0019042	0.00
Industrial	24	23,300	83.5	1,945,317	50	59%	402,499	11,873,721	13,819,038	0.0019042	26,314.13
Multi Family Residential	0	27,800	0.0	0	60	15%	0	0	0	0.0019042	0.00
Public-Commercial	0	55,400	0.0	0	70	20%	0	0	0	0.0019042	0.00
Public-Industrial	3	23,300	7.7	178,944	50	59%	68,971	2,034,645	2,213,589	0.0019042	4,215.10
Public-Residential	0	25,100	0.0	0	60	15%	0	0	0	0.0019042	0.00
Public-Vacant	8	12,100	15.9	192,429	0	0%	0	0	192,429	0.0019042	366.42
Residential	16	25,100	3.8	96,133	60	15%	20,575	185,175	281,308	0.0019042	535.66
Residential-MobileHome	0	25,100	0.0	0	30	15%	0	0	0	0.0019042	0.00
Vacant	79	12,100	98.2	1,188,704	0	0%	0	0	1,188,704	0.0019042	2,263.52
Residential-Condo	0	25,100	0.0	0	60	15%	0	0	0	0.0019042	0.00
Subtotal	**130**		**209.1**	**3,601,527**			**492,045**	**14,093,540**	**17,695,067**		**33,695**
Flood Depth -- 1 to 5 ft											
Commercial	221	55,400	240.4	13,318,160	70	72%	2,418,901	121,912,610	135,230,770	0.0019042	257,505.60
Industrial	267	23,300	800.6	18,653,571	50	74%	9,538,731	352,933,047	371,586,618	0.0019042	707,572.94
Multi Family Residential	65	27,800	70.8	1,966,850	60	33%	728,975	14,433,705	16,400,555	0.0019042	31,229.84
Public-Commercial	26	55,400	610.4	33,814,621	70	72%	2,044,484	103,041,994	136,856,614	0.0019042	260,601.52
Public-Industrial	7	23,300	89.0	2,074,570	50	74%	399,406	14,778,022	16,852,592	0.0019042	32,090.60
Public-Residential	5	25,100	13.6	341,862	60	33%	120,844	2,392,711	2,734,573	0.0019042	5,207.16
Public-Vacant	175	12,100	814.3	9,852,635	0	0%	0	0	9,852,635	0.0019042	18,761.33
Residential	4,226	25,100	701.7	17,612,670	60	33%	5,332,650	105,586,470	123,199,140	0.0019042	234,595.04
Residential- Large Lot (1)	100	2,500	123.8	309,500	0	0%	0	0	309,500	0.0019042	589.35
Residential-MobileHome	13	25,100	57.4	1,439,736	30	33%	398,324	3,943,408	5,383,144	0.0019042	10,250.55
Vacant	542	12,100	1,114.0	13,479,177	0	0%	0	0	13,479,177	0.0019042	25,666.97
Residential-Condo	168	25,100	11.8	295,176	60	33%	134,400	2,661,120	2,956,296	0.0019042	5,629.36
Subtotal	**5,815**		**4,647.6**	**113,158,528**			**21,116,715**	**721,683,087**	**834,841,615**		**1,589,700**
Flood Depth -- 5 to 10 ft											
Commercial	55	55,400	138.3	7,662,275	70	125%	1,147,271	100,386,213	108,048,487	0.0019042	205,745.26
Industrial	194	23,300	621.9	14,489,914	50	105%	6,987,595	366,848,738	381,338,651	0.0019042	726,142.70
Multi Family Residential	45	27,800	82.2	2,284,875	60	70%	844,643	35,475,006	37,759,881	0.0019042	71,902.13
Public-Commercial	20	55,400	250.0	13,849,223	70	125%	433,987	37,973,863	51,823,086	0.0019042	98,681.20
Public-Industrial	7	23,300	103.5	2,411,976	50	105%	624,327	32,777,168	35,189,143	0.0019042	67,006.95
Public-Residential	0	25,100	0.0	0	60	70%	0	0	0	0.0019042	0.00
Public-Vacant	272	12,100	611.9	7,403,570	0	0%	0	0	7,403,570	0.0019042	14,097.83
Residential	6,996	25,100	1,155.4	28,999,536	60	70%	9,184,100	385,732,200	414,731,736	0.0019042	789,729.60
Residential- Large Lot (1)	177	2,500	443.3	1,108,229	0	0%	0	0	1,108,229	0.0019042	2,110.28
Residential-MobileHome	10	25,100	70.5	1,770,052	30	70%	509,000	10,689,000	12,459,052	0.0019042	23,724.45
Vacant	767	12,100	1,605.7	19,428,578	0	0%	0	0	19,428,578	0.0019042	36,995.78
Residential-Condo	235	25,100	31.5	789,897	60	70%	188,100	7,900,200	8,690,097	0.0019042	16,547.63
Subtotal	**8,778**		**5,114.1**	**100,198,123**			**19,919,023**	**977,782,386**	**1,077,980,509**		**2,052,684**
Flood Depth -- 10 to 15 ft											
Commercial	14	55,400	28.5	1,576,684	70	146%	136,581	13,958,578	15,535,262	0.0019042	29,582.15
Industrial	4	23,300	4.1	96,229	50	136%	11,507	782,476	878,705	0.0019042	1,673.22
Multi Family Residential	0	27,800	0.0	0	60	79%	0	0	0	0.0019042	0.00
Public-Commercial	1	55,400	1.8	99,866	70	146%	4,984	509,365	609,231	0.0019042	1,160.09
Public-Industrial	0	23,300	0.0	0	50	136%	0	0	0	0.0019042	0.00
Public-Residential	0	25,100	0.0	0	60	79%	0	0	0	0.0019042	0.00
Public-Vacant	38	12,100	157.9	1,910,595	0	0%	0	0	1,910,595	0.0019042	3,638.14
Residential	135	25,100	141.2	3,544,873	60	79%	449,550	21,308,670	24,853,543	0.0019042	47,325.96
Residential- Large Lot (1)	222	2,500	375.1	937,739	0	0%	0	0	937,739	0.0019042	1,785.64
Residential-MobileHome	0	25,100	0.0	0	30	79%	0	0	0	0.0019042	0.00
Vacant	260	12,100	1,044.6	12,639,483	0	0%	0	0	12,639,483	0.0019042	24,068.03
Residential-Condo	0	25,100	0.0	0	60	79%	0	0	0	0.0019042	0.00
Subtotal	**674**		**1,753.2**	**20,805,469**			**602,622**	**36,559,089**	**57,364,558**		**109,233**
TOTAL	**15,397**		**11,724.0**				**42,130,405**		**1,987,881,750**		**3,785,312**

Summary of Total Assessment											
Commercial	290	55,400	407.2	22,557,119	70		3,702,753	236,257,401	258,814,520	0.0019042	492,833
Industrial	489	23,300	1,510.1	35,185,031	50		16,940,332	732,437,981	767,623,012	0.0019042	1,461,703
Multi Family Residential	110	27,800	152.9	4,251,725	60		1,573,618	49,908,711	54,160,436	0.0019042	103,132
Public-Commercial	47	55,400	862.2	47,763,710	70		2,483,455	141,525,221	189,288,931	0.0019042	360,443
Public-Industrial	17	23,300	200.2	4,665,490	50		1,092,704	49,589,834	54,255,324	0.0019042	103,313
Public-Residential	5	25,100	13.6	341,862	60		120,844	2,392,711	2,734,573	0.0019042	5,207
Public-Vacant	493	12,100	1,599.9	19,359,229	0		0	0	19,359,229	0.0019042	36,864
Residential	11,373	25,100	2,002.1	50,253,212	60		14,986,875	512,812,515	563,065,727	0.0019042	1,072,186
Residential-MobileHome	23	25,100	127.9	3,209,788	30		907,324	14,632,408	17,842,196	0.0019042	33,975
Vacant	1,648	12,100	3,862.5	46,735,942	0		0	0	46,735,942	0.0019042	88,994
Residential-Condo	403	25,100	43.2	1,085,073	60		322,500	10,561,320	11,646,393	0.0019042	22,177
TOTAL	**15,397**		**11,724.0**	**237,763,648**			**42,130,405**	**1,750,118,102**	**1,987,881,750**		**3,785,312**

The details of applying the assessment rates to calculate an individual parcel's assessment are illustrated in Appendix A. The formula used to calculate assessments for all parcels can be expressed as follows:

For residential structures:

Annual Assessment = Building Factor Constant + [(Parcel Rate)(Parcel Acreage)]

For other land use categories:

Annual Assessment = [(Building Rate)(1st Floor Building Square Footage)]

+ [(Parcel Rate)(Parcel Acreage)]

- Building Factor Constant and Building Rate are functions of Land Use and Flood Depth Zone
- Parcel Rate is a function of Land Use
- First floor square footage for single family residential structures is classified into two categories: less than 1050 SF and greater than or equal to 1050 SF. These categories were developed from Yolo County Assessor's data as described in Section 5.2.1. The first floor square footage excludes garage area. The square footage for residential condominium units is 800 SF.
- For all commercial, industrial and multifamily residential structures, the first floor square footage was determined for each improved parcel in the new District using available data from the Yolo County Assessor's records, measurement of building size using the City's GIS database, or other sources
- Parcel Acreage was obtained from the Yolo County Assessor's records.
- Land Use categories were assigned to each parcel based on the Yolo County Assessor's Land Use Codes, RD 900 land use classifications, or special land use research conducted by the City.
- Flood Depth Zones are as defined in Figure 5-1.
- Table 5-6 contains the Building Factor Constant, Building Rate and Parcel Rate multipliers for the various Land Use categories and Flood Depth Zones. The use of Table 5-6 is demonstrated in the example assessment calculations below.

5.5 EXAMPLE ASSESSMENT CALCULATIONS

Using the assessment formula, Table 5-6, and the steps listed below, an individual parcel's assessment for either a current land use or potential future land use can be conveniently calculated.

- Step 1 – determine the appropriate Land Use category for the property.
- Step 2 – using Figure 5-1, determine the Flood Depth Zone for the property.
- Step 3 – using Table 5-6, determine the appropriate Parcel Rate and Building Rate or Building Factor Constant.

- Step 4 – insert the actual parcel acreage and, for non-residential properties, first floor building square footage into the assessment formula and calculate the assessment.

The following examples illustrate such calculations.

Example 1

Assume a two story single-family residential property located in Flood Depth Zone 2, parcel size 0.17 acres and a first-floor square footage (excluding garage area) of 1,200 square feet.

From Table 5-6, Parcel Rate = 47.795 and Building Factor Constant = 109.97. The assessment is calculated as:

$$(47.795 \times 0.17 \text{ ac}) + 109.97 = \$118$$

Example 2

Assume a one story single-family residential property located in Flood Depth Zone 1, parcel size 6.76 acres and a first-floor square footage (excluding garage area) of 1,010 square feet.

From Table 5-6, Parcel Rate for the first 0.5 acres = 47.795 and the Parcel Rate for the remaining acreage above 0.5 = 4.760. The Building Factor Constant = 33.93 in Flood Depth Zone 1. The assessment is calculated as:

$$(47.795 \times 0.50 \text{ ac}) + (4.760 \times (6.76 \text{ ac} - 0.50 \text{ ac})) + 33.93 = \$88$$

Example 3

Assume a commercial property located in Flood Depth Zone 2, parcel size is 1.02 acres and building first-floor square footage is 4,300 square feet.

From Table 5-6, Parcel Rate = 105.492 and Building Rate = 0.166617. The assessment is calculated as:

$$(105.492 \times 1.02 \text{ ac}) + (0.166617 \times 4{,}300 \text{ sf}) = \$824$$

Example 4

Assume a residential condominium unit located in Flood Depth Zone 2, parcel size 0.17 acres.

From Table 5-6, Parcel Rate = 47.795 and Building Factor Constant = 63.98. The assessment is calculated as:

$$(47.795 \times 0.17 \text{ ac}) + 63.98 = \$72$$

TABLE 5-6: BUILDING AND PARCEL RATES BY LAND USE

		RATE BY FLOOD ZONE			
		0' to 1'	1' to 5'	5' to 10'	GT 10'
Land Use	**Factors**	**0**	**1**	**2**	**3**
Single-Family Residential	Parcel (per Acre) (1)	47.795	47.795	47.795	47.795
	Building Factor Constant: First Floor SqFt Less than 1050 Sq Ft (2)	15.42	33.93	71.98	81.23
	Building Factor Constant: First Floor SqFt Greater than 1050 Sq Ft (2)	23.56	51.84	109.97	124.11
Residential-Condo	Parcel (per Acre)	47.795	47.795	47.795	47.795
	Building Factor Constant	13.71	30.16	63.98	72.21
Residential-Mobile Home Park	Parcel (per Acre)	47.795	47.795	47.795	47.795
	Building (per FF Sq Ft)	0.008569	0.018852	0.039988	0.045129
Multi-Family Residential	Parcel (per Acre)	52.937	52.937	52.937	52.937
	Building (per FF Sq Ft)	0.017138	0.037703	0.079976	0.090259
Commercial	Parcel (per Acre)	105.492	105.492	105.492	105.492
	Building (per FF Sq Ft)	0.026659	0.095971	0.166617	0.194609
Industrial	Parcel (per Acre)	44.368	44.368	44.368	44.368
	Building (per FF Sq Ft)	0.056174	0.070455	0.099970	0.129485
Vacant	Parcel (per Acre)	23.041	23.041	23.041	23.041
	Building (per FF Sq Ft)	0.000000	0.000000	0.000000	0.000000
Agricultural	Parcel (per Acre)	4.760	4.760	4.760	4.760
	Building (per FF Sq Ft)	0.000000	0.000000	0.000000	0.000000

(1) For large lot Single Family Residential parcels (parcel area greater than 0.5 acres) multiply area greater than 0.5 acre by Agricultural Parcel rate.
(2) First Floor (FF) Sq Ft not including garage area

5.6 SPECIAL PROCEDURES

Condominiums. Condominium unit owners typically have an undivided interest in the structure "shell." Currently the condominium projects already constructed in the City are not multi-story, meaning that all condominium units in the City currently have a ground floor entrance. However, as identified in the City's General Plan, over time multi-story condominium projects are anticipated for development. The assessment formula has been developed in order to anticipate that type of development. Condominium units located on the first floor are assessed for damages to structure and contents. In flood depths 0 to 1 feet, 1 to 5 feet and 5 to 10 feet, condominium units on the second floor or higher will be assessed for structure damages only. In the greater than 10 feet flood zone, condominium units on second floor will be assessed for structure and content damages while units above the second floor will assessed for structure damages only. The land damage benefit is allocated to the common parcel owned by the condominium's homeowner association. Percentage damages for condominium units on the second floor or higher are 8%, 20%, 43% and 67% for 0 to 1 ft, 1 to 5 ft, 5 to 10 ft and greater than 10 ft flood depth zones, respectively.

Public Parcels. Consistent with the requirements of Proposition 218, all publicly owned parcels are assessed proportionately to the special flood damage reduction benefit they receive from the improvements. That is, public parcels are treated the same as privately owned parcels for assessment calculation purposes. To calculate assessments for these parcels, a land use category was assigned to each public parcel based on its current use.

Assessment Exclusions. All parcels within the new assessment district that receive a special benefit from the flood control improvements are assessed. The only parcels excluded are those that are part of the flood control system itself such as levees and the deep water ship channel.

Minimum Assessments. The minimum annual assessment will be $1.50 to reflect WSAFCA's cost to administer the Assessment District roll. All annual assessments calculated to be less than $1.50 will be raised to the $1.50 minimum.

Updating Assessment Rolls. Recalculating assessments on an annual basis would accommodate changes in the new assessment district over time. These changes can result from development activity such as recordation of subdivision maps, zoning changes, conditional use permits, and lot splits. An increase in building square footage, placement of a structure on an undeveloped parcel, or other such changes would trigger a recalculation of the assessment on the underlying property.

It is recognized that when dealing with the thousands of parcels that will be part of the new District, using information from the Yolo County Assessor's Office as the primary source of data for individual parcel characteristics may lead to some errors and some circumstances that do not precisely fit the intent of the new District. Where such circumstances are discovered, either by the persons administering the new assessment district or by the owners of the properties affected, the Executive Director of WSAFCA (or his designee) shall review such circumstances. The Executive Director of WSAFCA (or his designee) shall determine if corrections or adjustments are appropriate, any such corrections or adjustments being consistent with the concept, intent and

parameters of the new District as set forth herein. Unless such proposed changes are appealed to the WSAFCA Board of Directors, they will be incorporated into the assessment roll.

Annual Escalation and Termination. The assessment rate may increase by a maximum of two percent (2%) annually at the sole discretion of the WSAFCA Board of Directors. This escalation allowance will account for inflation in project costs. The assessment district will remain in effect until terminated by the WSAFCA Board of Directors.

5.7 ELIMINATION OF EXISTING ASSESSMENT DISTRICT

The WSAFCA Assessment District would replace the existing WSAFCA assessment district. Since 1995 the WSAFCA has been collecting approximately $500,000 annually through an existing assessment district to fund the local share of previous levee improvements projects. The existing assessment district will be terminated if the proposed Assessment District is approved by property owners. If the proposed Assessment District is not approved by the property owners, the current assessment district will continue for approximately two years, when the revenue collection cap is reached.

6.0 CONCLUSION

It is concluded that the proposed new assessments do not exceed the special benefit received by the properties assessed over and above the benefits conferred on the public at large. It is also concluded that the amount of each assessment is proportional to, and no greater than, the special benefits conferred on each property assessed.

By: Robert J. Cermak, P.E.
PB

7.0 SCHEDULE

In order to have Fiscal Year 2007-08 assessments collected on the Yolo County tax bills, the assessment roll for the new assessment district must be endorsed and filed with the Yolo County Auditor/Tax Collector no later than August 15, 2007. A schedule to meet this requirement is as follows:

Date	Event
April 12, 2007	Public Draft of Engineer's Report filed and delivered to JPA Board
May 8, 2007	JPA Board Meeting/Public Hearing on the new District: Board Action: Adopt Resolution of Intention to undertake a special capital assessment proceeding for the formation of the new West Sacramento Area Flood Protection Assessment District (the District), JPA Board Action: Adopt resolution tentatively approving the Engineer's Report and setting the date, time and place for a public hearing to consider formation of the new assessment district.
May 15, 2007	City and RD 900 present Community Workshops on the new assessment district.
May 22, 2007	Clerk of the JPA Board mails notice of hearing and assessment district ballots.
June 5, 2007	City and RD 900 present Community Workshops on the new assessment district.
July 10, 2007	JPA Board Meeting/Public Hearing on formation of the new assessment district: Open public hearing Opportunity for property owners to cast ballot or change ballot Consider any protests lodged against the new assessment district Determine whether any modifications need to be made to Engineer's Report Close public hearing Direct Clerk of JPA Board to tabulate the assessment ballots Adjourn JPA Board meeting to allow the Clerk time to tabulate the ballots, including any submitted at the hearing.
July 16, 2007	Reconvene JPA Board meeting: JPA Board Action: Receive and certify ballot tabulation JPA Board Action: Assuming no majority protest, adopt Resolution Confirming Engineer's Report (including any modifications to the report); ordering formation of the new assessment district and the levy and collection of assessments, and the sale of bonds as necessary to implement the project
August 2007	If new assessment district is formed, assessment roll transmitted to Yolo County Auditor/Tax Collector for inclusion on County tax bills.
October 2007	Final day for property tax bills to be mailed.

APPENDIX A: ASSESSMENT EQUATION

The assessment equation is, in general:

> Assessment = {[(Relative Land Damage Value) x (Parcel Acreage)] + [(Relative Structure Value) x (1^{st} Floor Building Square Footage) x (Percent Damage)]} x Assessment Rate

Where:

- Relative Land Damage Value is as defined in Table 5-3 by land use category.
- Parcel Acreage is a particular parcel's acreage.
- Relative Structure Value is the unit structure cost as defined in Table 5-1 by land use category.
- First floor square footage for single family residential structures was assigned based on data provided by Yolo County Assessor's Office. The data provided by the County categorized residential parcels as having a building area (excluding garage area) greater than or less than 1050 SF or greater than or less than 2150 SF. The data also identified whether the structure was single or multi-story. A Square Footage for single family residential structures of 900 SF was assigned to single story homes having a building area less than 1050 SF and multi-story homes having a building area less than 2150 SF. For single story homes having a building area greater than 1050 SF and multi-story homes having a building area greater than 2150 SF, a square footage of 1375 SF was assigned. The square footage for residential condominium units is 800 SF.
- Percent Damage is the flood damage to structure and contents expressed as a percent of structure value as defined in Table 5-2. Flood depth zones are shown on Figure 5-1.
- Assessment Rate is as defined in Table 5-4.

The example assessment calculations provided in Section 5.5 of this Engineer's Report illustrated the use of the simplified combined assessment formula presented Section 5.4. The following assessment calculation demonstrates the use of the equivalent assessment equations defined in this Appendix.

Example 1 (same as Example 1 in Section 5.5)

Assume a two story single-family residential property with first floor square footage of 1200 SF, located in Flood Depth Zone 2 (5 to 10 ft) with parcel size 0.17 acres.

- From Table 5-3, Relative Land Damage Value is $25,100 per acre.
- From Table 5-1, Relative Structure Value is $60 per square foot.
- From Table 5-2, Percent Damage to Structure and Contents is 70-percent.
- From Table 5-4, the Assessment Rate is 0.0019042.
- Assessment = [($25,100/ac x 0.17 ac) + ($60/sf x 1,375 sf x 70%)] x 0.0019042 = $118

APPENDIX B: ASSESSMENT ROLL
(UNDER SEPARATE COVER)