

Informational Hearing:

Cache Creek Flood Management

Background Paper

In the late 1990's, new Federal Emergency Management Agency (FEMA) maps placed the City of Woodland within the Cache Creek floodplain, particularly if levees failed. Since then, federal, state and local agencies have studied the options for addressing Cache Creek flood management issues. Achieving further progress will require substantial cooperation among agencies and other interested parties. Because of the controversial nature of these flood issues, solutions have been difficult to achieve, despite the continuing threat of flooding. After Woodland voters rejected the City's proposals for setback levees or a flood barrier north of Woodland, voters passed a 2004 initiative prohibiting the City from working on any flood barrier.

The City of Woodland requested that the Committee hold this hearing to discuss possible next steps for protecting its citizens from flood. This hearing will improve the dialogue among the agencies and the public, which will encourage all interested parties toward consensus on a regional solution for Cache Creek flood management, and increased flood protection for the Woodland area.

Current Status of Cache Creek Flood Management Efforts

Since Woodland voters rejected the flood barrier concept in 2004, only limited flood management efforts have continued. In the last month, the agencies involved in this issue have returned to discussions about how to proceed. These discussions – and this hearing – may consider the next steps in the context of the agencies' continuing activities:

- **Levee Maintenance.** The California Department of Water Resources (DWR) continues to maintain the existing Cache Creek levees. Subject to appropriation, it will endeavor to continue correcting the sites where serious levee erosion has occurred.
- **Completion of the USACE/DWR Study.** The United States Corps of Engineers (USACE or the Corps) has identified the need to continue with its feasibility study process started in 2000. They need to respond to the high volume of public comments made to the 2003 Draft Feasibility Study and EIR/EIS. The Corps, however, has no money allocated this year or in FY 2005-06 for a study or project for flooding in the

region. The City of Woodland budgeted \$200,000 for the study that was never spent. The Corps is committed to developing and implementing a process that will provide Woodland with 100-year flood protection and is willing to consider all options which make 100-year flood protection possible.

- **Integrated Regional Water Management Plan.** The County has applied for \$500,000 in Proposition 50 planning grant money in order to develop an integrated water management plan. A decision on whether or not this money is approved is expected by September. The WRA hopes to complete their plan by September 2006, and to achieve this goal, it has set to commence a professionally facilitated process by September 2005 which is scheduled to end by the summer of 2006. The Water Resources Association Technical Committee, which is composed of senior staff of the association's members, has recommended that the City of Woodland's flood control issues be dealt with in the Integrated Regional Water Management Plan. This plan is still in its preliminary phase, but it can emerge to be an avenue for local leadership in solving flood issues.
- **Paterno Response.** Cache Creek may be seen as a microcosm of the larger Sacramento Valley flood management discussions now occurring in the Legislature. This activity responds to a 2003 court decision holding the State liable for failed levees, commonly known as the *Paterno* decision. In the time since this court decision, the Legislature and the administration have worked on various ways to deal with this increased liability.

History of Flood Management in Cache Creek Basin

Cache Creek relies on rainfall and reservoir releases, as it flows down from the Coastal Range, through dramatic canyons to the Central Valley. North of Woodland, the Creek flows east, but then turns southeast toward a sediment settling basin and the Yolo Bypass, which ultimately empties into the Delta. Early settlers built Cache Creek levees to contain flood flows and reduce flood damage. In 1917, the Legislature passed the Sacramento River Flood Control Act, which encompassed Cache Creek as a tributary to the Sacramento River. In effect, the State adopted Cache Creek as part of a valley-wide plan for flood protection, focused mostly on levees. Cache Creek flooding nevertheless has occurred in 10 years since 1939.

United States Army Corps of Engineers

Beginning in the 1950s, the Corps began working on ways to better manage the ever-changing Cache Creek basin. Natural changes, such as the shifting of the stream channel as a result of eroding banks and storms, were combining with human-induced changes, such as channel and levee work for flood damage reduction and irrigation. The Corps enlarged and extended the levees along both banks of the creek, and this project was designed to provide 1 in 10 year flood protection.

Cache Creek continues to change, and the Corps has worked with state and local agencies to manage those changes. In the 1990's, the Corps completed reconnaissance studies of the basin, including an examination of a flood control dam at Blue Ridge, just upstream from Rumsey. The Corps determined that the dam site is not feasible because, among other reasons, it straddles five seismic faults. The Corps also considered other dam sites, but concluded that such options were too expensive, not effective, or not technically feasible.

Settling Basin

The Settling Basin, located near where Cache Creek now flows into the Yolo Bypass, provides a dumping ground for sediment coming down Cache Creek. Originally constructed in 1937, the Settling Basin has been modified several times since its construction to control sediment deposition and increase sediment storage capacity. In 1991, the basin was modified to include 50-year storage capacity with an average of 340 acre-feet of sediment accumulation per year, giving the basin an average trapping efficiency of 55 percent. During times of heavy runoff when the creek carries a high sediment load, the basin is critical in protecting the Yolo Bypass from filling with sediment.

Clear Lake

Clear Lake, another element of the Cache Creek basin, is a relatively shallow lake and is thus not well-suited for water storage or floodwater retention. In fact, in the last decade, the Lake has overflowed its bank, causing some flood damage to adjacent structures. Its limited water release capabilities, due to a low-capacity outlet channel that cannot handle high outflows from the lake, further diminish its function as a means of water storage.

Yolo County Flood Control and Water Conservation District (Yolo Flood)

Yolo Flood has managed water resources in the area since its formation in 1951. The district began construction in 1972 on the Indian Valley Reservoir, which it subsequently completed in 1976. This reservoir allows for storage and diversion of water from the North Fork of Cache Creek for irrigation, flood control, power generation, recreation, and domestic purposes. This diversion of water has also allowed for hydroelectric power generation. Indian Valley Reservoir has a total storage capacity of 300,000 acre-feet of which 40,000 acre-feet provides flood flow reduction. Other than Indian Valley Reservoir, Yolo Flood has played only a limited role in Cache Creek flood management. It remains focused on its water delivery responsibilities.

Emergence of the Current Flood Management Issue

Federal Emergency Management Agency Maps

In 1998, the Federal Emergency Management Agency (FEMA) issued its preliminary flood maps for the Cache Creek Basin and placed all land downstream of I-5 and south of Cache Creek in an "unnumbered A" zone, meaning that it was susceptible to flooding but that exact depths were still to be determined. In 2001, FEMA completed its study of the basin and issued new flood maps to take effect in April 2002.

These new maps placed 35% of Woodland in the floodplain. About 3,200 single family homes and 300 multiple family homes are currently in the floodplain, and about 500 additional structures ranging from industrial to retail to restaurants are in the floodplain. Since 1983, when a Cache Creek levee broke and flooded much of this area, Woodland has grown and new development of homes and industry has occurred in the floodplain. In the northeastern corner of Woodland, several new warehouses lie in the section where floodwaters are projected to be deepest.

Now that FEMA has recognized the risk for flooding, owners of properties in this portion of the city with federally insured mortgages, which includes virtually all residences, were required to purchase flood insurance. FEMA estimates the cost of flood insurance per year to be at least \$2 million for the entire community. Homeowners pay approximately \$500-1150 annually for flood insurance through the Federal Government's National Flood Insurance Program.

Woodland Flood Control Task Force

In March 1999, the Woodland Public Works staff recommended creating an advisory body to assist in the evaluation of flood effects, flood reduction plans, and methods of funding improvements to assist in dealing with Woodland's flood threats. This group consisted of the Mayor and the Vice Mayor, an Association of General Construction member, a member of the Cache Creek Conservancy, two Woodland Chamber of Commerce members, and three citizens at large. This task force was formed to evaluate potential options for flood control and to recommend those deemed viable for further study, as part of the Corps of Engineers feasibility study that started in 2000. In February 2001, task force members were presented with the Corps' five preliminary plans for Cache Creek flood management.

2002 Elections

In 2002, the City of Woodland put three measures relating to flood protection on the ballot. Two advisory measures included Measures E and F, the flood control options, and Measure G, which called for the extension of the ½-cent sales tax. All three measures asked the voters to approve funding for whichever plan the Corps ultimately decided was the plan with the greatest net benefits for the National Economic Development Plan. All three measures failed.

Measure E: Overflow Barrier (flood wall), estimated the total project cost at \$50 million.

- \$40 million coming from federal/state funds
- \$10 million coming from local funds
- Local funds would come from a ½ cent sales tax that would run for three years.

Measure F: the setback levees, estimated the total project cost at \$110 million.

- \$94 million coming from federal/state funds
- \$16 million in local funds coming from a ½ cent sales tax which would run for six years.

Measure G: extension of ½-cent sales tax.

- General tax would allow for approval by a simple majority
- Stated purpose of the money generated by the tax is of course general, but in the buildup to the election the City Council stated that money generated by Measure G would be used for flood protection.

2004 Flood Control Initiative

In 2004, a group of Woodland area residents put on the ballot Measure S, which asked whether the City should be prohibited from funding or taking any action that supported the Lower Cache Creek Flood Barrier (flood wall) or a substantially similar structure. Specifically, the ballot measure, whose language proved to be contentious, asked: "Shall the ordinance establishing a Regional Flood Control Project Policy for the City of Woodland and prohibiting the City from

funding or taking any action that supports the Lower Cache Creek Flood Barrier or a substantially similar structure be adopted?" This measure was placed on the ballot in order to reinforce the July 2003 decision taken by the City Council, which voted to not support a flood wall. The proponents of the measure wanted to ensure that future councils could not overturn that decision. Despite opposition from those who did not want the flood wall option to be taken off the table permanently and who do not want to continue having to pay flood insurance, the measure passed.

USACE Feasibility Study

The Corps began a flood control feasibility study in January 2000. Its purpose was to develop and implement a plan that would reduce flood risk to the City of Woodland resulting from 100-year flooding of Lower Cache Creek, a waterway that has a history of flooding. On 30 May 2000, the Corps, the City of Woodland, and the Reclamation Board hosted a public meeting to solicit public input on flood damage reduction, environmental and cultural resources issues along lower Cache Creek. These same entities organized another public meeting on 31 May 2001 to discuss FEMA flood maps and the Corps' flood damage reduction plans and to invite public participation in the flood management process. The Corps and the Board met numerous times with public and private entities such as private landowners, a private gravel mining company, and the Sacramento and Yolo County Farm Bureaus. Work on the study was presented to the public at a meeting on 21 December 2001. The Corps issued its "Draft Feasibility Report for Potential Flood Damage Reduction Project" in March 2003.

Options Eliminated. The Corps evaluated five preliminary action plans, but three of these plans were eliminated in the preliminary phase. The eliminated plans either did not have a high benefit-to-cost ratio or did not fulfill the basic requirement, providing 100-year flood protection. Those three eliminated options were: channel clearing; raising existing levees and constructing new levees; and channelization and new levees. The following points identify some of the deficiencies in the eliminated options:

Channel Clearing

- Provides a 1 in 40 chance flood protection, not the required 1 in 100 chance flood protection needed to bring flood protection up to FEMA standards.
- Increases channel velocity which would require slope protection to stabilize the banks
- Increases sediment flows into the Settling Basin.
- Causes significant loss of riparian habitat and could disturb mercury-laden sediments.

Raising Existing Levees And Constructing New Levees

- An overly expensive solution both to implement and to maintain, especially when compared to its expected benefits.
- Requires the costly replacement of many bridges.
- Requires slope protection for bank stabilization.
- Causes increased flows into the Settling Basin
- Causes significant loss of riparian habitat and could disturb mercury-laden sediments.

Channelization And Constructing New Levees

- Very expensive solution to implement and maintain.
- Requires the replacement of a railroad bridge and installation of slope protection.
- Requires the use of 500-700 feet of terraced land adjacent to the channel.
- Could disturb mercury-laden sediments.

Draft Issuance/Request for Public Comments. Extensive public comments were received during and after the draft document was issued in its final form. After the March 2003 release of the draft EIS/EIR, a public workshop was held in Woodland on 23 April 2003, during the 45-day review period, in order to solicit comments on the EIS/EIR. Local farmers and others raised concerns about the flood wall option in particular. They were concerned about the extent of the area that would be protected by the wall (no increased protection for the area above the wall) and about potential impacts on land values, agriculture, and transportation. These concerns had begun to manifest themselves even before the study was completed.

Options Analyzed. Consistent with the National Environmental Policy Act, the Corps analyzed three "plans" for improving Cache Creek flood management: no action (which is maintenance of the status quo), Lower Cache Creek Flood Barrier, and Modified Wide Setback Levee Plan.

No Action: Although this alternative would not involve new improvements by the Corps, it would require continued levee maintenance by State and local agencies. Cache Creek suffers from a systematic erosion problem acknowledged by both the Corps and DWR. Some have suggested that allowing the same levees to remain may require comprehensive rehabilitation, in order to address systemic levee erosion issues. In the long run, a comprehensive project would be less expensive than maintenance work performed solely to deal with this chronic problem.

Flood Barrier: This barrier, or levee, would be approximately 6 miles in length originating near the intersection of CR 19B and CR 96B and extending to the Cache Creek Settling Basin. The height of the levee varies from 2 feet in height near CR 96B to 18 feet in height at the west levee of the Cache Creek Settling Basin. This would set a northern barrier to Woodland's urban development and would not reduce flood risks for areas north of the wall. The post-project flood plain west of I-5 and north of the Lower Cache Creek Flood Barrier (LCCFB) would not be significantly changed from pre-project conditions.

Setback Levees: Consists of 19 miles of levees, beginning at the west levee of the settling basin and terminating upstream near CR 94B. Would establish new levees farther from the water, and allow for a broader swath of riparian habitat. Setback levees allow the river to meander within a wider "channel," but would offer protection to a greater area of land (including transportation infrastructure) than the flood wall. They also decrease flooding both north and south of Cache Creek. Further analysis of setback levees may show that the environmental benefits, which the Corps did not study in detail, would help this option to achieve a better benefit-to-cost ratio.

US Army Corps Preliminary Evaluation of Final Plans

| Plan | Cost (\$ millions) | Plan Formulation Criteria | | | |
|--|--------------------|---|---|----------------------|--|
| | | <i>Investment Cost</i> | <i>Completeness</i> | <i>Effectiveness</i> | <i>Efficiency</i> |
| Constructing Setback Levees and Raising Existing Levees | \$3 to \$46 | Meets flood damage reduction goal, minimizes use of existing facilities, but also requires large setback area and new levees. | Meets 4 of 8 planning objective, but with significant environmental damage while meeting flood damage reduction goals. Has potential for ecosystem restoration component. | | Public acceptance of cost, however, little public approval for using large sections of agricultural land for new levee construction. |
| Ranking | | Good | Good | Good | Moderate |
| Constructing a flood barrier | \$27 | Meets flood damage reduction goal, no further action required, but does include hydraulic impact to new area. | Meets 7 of 8 planning objectives, is easily physically implemented. | | Public acceptance of cost, public approval for minimization of environmental damage and land acquisition. |
| Ranking | | Good | Excellent | Good | Moderate |

US Army Corps of Engineers Evaluation and Comparison of Final Plans

| Objectives/Constraints | No-Action | LCCFB Plan | Modified Wide Setback Levee Plan |
|--|-----------|------------|----------------------------------|
| Protect Woodland | Poor | Good | Good |
| Protect Agricultural Areas North of Woodland | Poor | Poor | Good |
| Protect Major Transportation Facilities | Poor | Moderate | Good |
| Minimize Project Impact on Homes | N/A | Good | Poor |
| Minimize Biological Effects | N/A | Good | Good |
| Flood Damage Reduction Benefits (Avg. Annual, \$ Millions) | N/A | \$11.5 | \$11.6 |
| Project Costs (\$ Millions) | | | |
| Total Investment Costs | N/A | \$43.8 | \$163.0 |
| Annual Operation and Maintenance | | \$0.1 | \$0.4 |
| O&M and Rehab. of Existing Cache Creek System by DWR | \$0.94 | \$0.94 | \$0 |
| Benefit-to-Cost Ratio | N/A | 3:9 | 1:1 |
| Net Benefits (\$Millions) | N/A | \$8.6 | \$1.6 |