

Agenda of May 15, 2008

**TO: Sacramento Area Flood Control Agency
Board of Directors**

**FROM: John Bassett, Director of Engineering
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**SUBJECT: INFORMATION – NATOMAS LEVEE IMPROVEMENT PROGRAM
UPDATE**

SUMMARY

As described in earlier reports to the Board, the Natomas Levee Improvement Program (NLIP) is a large and complex undertaking, moving forward on multiple fronts at once. This report provides updated information on two aspects of the program: the program schedule; and the program oversight by SAFCA's Senior Board of Consultants. A separate report (Item 12) includes an update on community outreach and the right-of-way acquisition process for the NLIP.

BACKGROUND

The NLIP has grown markedly in scope and complexity since it was presented to the SAFCA Board on April 20, 2006. At that meeting, the SAFCA Board authorized the Executive Director to execute 12 contracts for consulting services, based on the preliminary Natomas Levee Evaluation Study, thus initiating the project execution phase of the NLIP. Staff presented the Final Natomas Levee Evaluation Study Report to the Board at the July 14, 2006 meeting, along with a program update. The program update included a summary table (FR-1) showing the proposed execution schedule and costs for the period 2006 through 2012. SAFCA staff proposed an aggressive implementation schedule which could restore 100-year flood protection by the end of the 2010 construction season and 200-year flood protection by the end of the 2012 construction season, assuming full funding and timely Federal authorization for the program.

Since the program was conceived, presented, and approved by the Board, new information and new regulatory constraints have necessitated major program changes. The most significant change has been the shift from in-place levee improvements, with seepage cut-off walls as the primary solution option for under-seepage, to construction of an adjacent levee setback along the Sacramento River East Levee in response to new U.S. Army Corps of Engineers (USACE) levee vegetation and encroachment guidelines. More stringent USACE levee certification

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criteria, a new regulatory compliance process for 33 U.S.C Section 408 compliance, and new geotechnical data have led to more execution challenges and a more conservative design for most of the Natomas levees. The urgent need to meet National Flood Insurance Program requirements for an "A99" flood map designation has also become a new critical milestone for the program.

As the program moves forward, staff will provide updates on critical information and decision issues. The program schedule is regularly updated, and has recently been re-structured to serve as a more effective communication tool. The schedule is discussed in more detail below, and attached for reference (Attachment 1). In addition, the schedule will be posted on the SAFCA website to facilitate public review and coordination.

In order to assure that the completed program levee improvements will fulfill design expectations at a reasonable cost, SAFCA has recently created a Board of Senior Consultants (BOSC) consisting of three experts: George Sills, Dr. David Williams, and Dr. Les Harder. They will provide support for strategic planning and provide technical review of program data, assumptions, designs, and construction. The first meeting of the BOSC took place on March 4 and 5, with the Corps, California Department of Water Resources (DWR), Central Valley Flood Protection Board (CVFPB), and SAFCA staffs participating in the presentations and discussions. The first BOSC report was completed in early May and is attached for reference (Attachment 2). The primary findings and recommendations are summarized below.

DISCUSSION

NLIP Schedule Update

The updated schedule for the NLIP (Attachment 1) is primarily focused on achieving completion of 50 percent of the levee improvements by November 2009 and completion of all of the repairs necessary to certify that the levees meet 100-year requirements by the end of 2010. If met, this schedule would result in achieving a FEMA Flood Insurance Rate Map Zone A99 by June, 2010 and the Natomas Basin being mapped out of the FEMA 100-year floodplain by June, 2011.

The project is being designed to a flood that has a 1/200 chance of occurring in any given year. Implementation is focused on identifying and categorizing sites that do not meet 100-year and 200-year standards. Wherever a levee reach does not meet a 100-year criterion, the levee improvements for that reach to correct the deficiency for that criterion are designed to achieve the full 200-year standard so that two construction phases will not be required to correct a deficiency. Reaches that meet 100-year but not 200-year standards will be deferred for repair until 2011. Based on current information, it appears that no portion of the Natomas levee system is fully compliant with all of the 100-year standards. For this reason, the schedule conservatively reflects that all reaches of the Natomas Basin perimeter levees will need work to meet the 100-year level of protection. Additional

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improvements will likely be required to achieve 200-year protection and would be initiated in 2011. This is subject to change following completion of data collection efforts and analysis of the entire Natomas levee system.

Based on current, very aggressive assumptions about the durations and relationships between program tasks, the schedule indicates that that we will be in a position to award construction contracts for all work needed to achieve the A99 goal by April 2009. However, there is a significant risk that we will not meet this goal. The primary risk factors include:

- The USACE Section 408 process will take longer than currently reflected in the schedule.
- The proposed 2008 utility and canal relocation work could be delayed, adding to the work that must be done in 2009, as well as delaying the start of the levee work in those reaches.
- The Central Valley Flood Protection Board staff may need more detailed information than we are proposing to provide for their Board to take action.
- The NLIP design team is moving at an extremely aggressive pace for the 2009 work. Data collection efforts as well as USACE, CVFPB, and our own BOSC review may lead to substantive changes in levee system, utility alignments, or canal designs, making it difficult to stay on schedule.

To mitigate these risks, we have limited the proposed 2009 construction to that which is needed to achieve the A99 Zone goal, while minimizing the purchase of private property and relocation of homes. Figure 1 shows the proposed sequencing of construction reaches by construction year. Because each year's construction season is highly constrained by the flood season and protection of sensitive wildlife species, if award of construction contracts is delayed past April 2009, it will be very difficult to complete the proposed construction prior to start of the 2009/2010 flood season.

Levee work adjacent to the more densely populated southern portion of the Natomas Basin is scheduled to occur in 2010. This will allow the design team to fully explore ways to minimize the project footprint in the vicinity of homes and other structures and to allow the maximum time for relocations to be completed. The 2010 work is likely to impact as many as 25-30 residential structures along the Natomas East Main Drainage Canal and Sacramento River, by requiring acquisition of portions of some of the affected parcels and the removal of a number of structures.

In addition, work on the American River north levee may require full or partial closure of the Garden Highway from Northgate Boulevard to Truxel Road.

Given the complexity and number of real estate and traffic issues which need to be thoroughly addressed, it will be very difficult to maintain the schedule and complete all of the 100-year improvements by the end of 2010.

The draft schedule is currently under review by the USACE, the CVFPB, Montgomery Watson Harza, Inc (MWH) for the City of Sacramento, and SAFCA consultants. Once they provide input on the schedule, it will be finalized to establish a baseline against which future schedule changes can be compared as the project moves forward. As described in the March 20, 2008 Executive Director's Report, MWH will continue to work with the NLIP management team to provide independent review, analysis, and input on the program schedule and program execution strategy.

The schedule will be updated and reports will be provided to the Board on a regular basis as the program moves forward.

Board of Senior Consultants Report #1 Overview

A Board of Senior Consultants has been formed to provide expert peer review of the levee improvement designs for the Natomas Levee Improvement Program. The BOSC consists of Dr. Leslie F. Harder, Jr., George L. Sills, and Dr. David T. Williams. The BOSC met for the first time on March 4 - 5, 2008 to receive general briefings and to be introduced to the program. The BOSC's first report was submitted to SAFCA on May 9, 2008 and contains initial comments and recommendations. The BOSC's general comment was as follows:

"The Board understands and appreciates the pressures that are being placed for rapid completion of the work, but wishes to caution that going too fast on a large, complicated project can potentially result in substantial additional costs and delays due to selection of non-optimum alternatives, inconsistent construction schedules, or incomplete designs and construction documents. The Board strongly recommends that each phase and element of the project have adequate, detailed reviews completed before the beginning of any construction work."

The BOSC also provided specific recommendations in the following areas:

- Lessons from Hurricane Katrina - The BOSC recommended that two technical memorandums be completed documenting measures that have been put in place to avoid mistakes made in the design and construction of the flood protection system in New Orleans. One technical memorandum should address the quality control measures in use to assure the avoidance of errors in the use of different vertical datums. The other should document the assumptions and procedures that will be used for connecting/overlapping different types of levee improvements.
- Seismic Stability - The BOSC recommended that the design team put together a seismic mitigation design plan that describes the measures that

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will be used to rapidly repair Natomas levees should they suffer significant damage during an earthquake, and to submit the plan to the State and the USACE for review and comment.

- Hydrology and Hydraulic Design Approach – The BOSC concurred that the hydrology and hydraulic design approach being used for the NLIP was adequate for both the 100-year and 200-year floods, but recommended that SAFCA consider potentially higher water surfaces that might be generated using new USACE procedures.
- Emergency Action Plans – The BOSC recommended that interim emergency action plans be developed that define the actions necessary to respond to flood emergencies while the levee improvements are underway.
- Specific Design Issues – The BOSC had specific comments and recommendations regarding design details associated with slurry cut-off walls, levee embankment zoning, borrow area analyses, piezometers (water level monitoring wells) between relief wells, and the Pritchard Lake area.

It is expected that the BOSC will meet approximately four times a year to review the progress of the NLIP design and construction work.

RECOMMENDATION

Staff recommends that the Board review and file this report.

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Attachment(s) – To Board Members Only