Donald H. Babbitt
Consultant
3860 West Land Park Drive
Sacramento, CA 95822

Faiz I. Makdisi
AMEC Geomatrix, Inc.
2101 Webster Street
Oakland, CA 94612

David T. Williams
Consultant
1112 Oakridge Dr, #104
Fort Collins, CO 80525

October 20, 2011

Mr. Larry Dacus
MBK Engineers
1771 Tribute Road
Sacramento, CA 95815

Dear Mr. Dacus:

Subject: Upper Yuba River Levee Improvement Project
September 15, 2011 Meeting of Board of Senior Consultants

In response to your letter of September 2, 2011, the undersigned attended the fifth meeting of the Board of Senior Consultants (BOSC) for the Three Rivers Levee Improvement Authority's (TRLIA) Upper Yuba River Levee Improvement Project (UYLIP) on September 15, 2011. The purpose of the meeting was to review the UYLIP construction status, construction occurrences, visit the site to observe the construction status and any changes to the final design based on field conditions.

The meeting started at MBK Engineers' office in Sacramento and was attended by members of the project design and construction management teams (MBK, Kleinfelder, and HDR), TRLIA, Handen Company, Reclamation District 784, representatives of the Central Valley Flood Protection Board, the California Department of Water Resources, and the Corps of Engineers. The agenda and a list of attendees are attached to this letter. In the afternoon, most of the participants visited the construction site.

The BOSC was informed that an attempt to obtain a Corps of Engineers'408 permit delayed the originally planned construction schedule and that construction started in June of this year. Construction is expected to be essentially completed by November 1st of this year. The presentations by the project staff focused on cutoff wall construction, especially the issues related to Questions 1 and 2 listed below. Quality control/quality assurance data for work accomplished to date was presented. The BOSC requested plots of the data and you e-mailed plots of the following to the BOSC on October 5, 2011:

- Levee Embankment: relative compaction, water content, liquid limit and plasticity index
- Seepage Berm: relative compaction
- Working Platform- Initial Cap: relative compaction and water content
- Subgrade: relative compaction and water content
- Cutoff Wall: permeability, slurry density, viscosity, filtration, slump, and soil-slurry density.

The QA/QC program is administered by HDR, with Kleinfelder providing QA testing. It is our understanding that both entities are satisfied with the quality of the constructed project. Based on our review of the QA/QC plots provded to us we concur with this assessment.

Mr. Brunner of TRLIA stated that the FEMA certification process for the project is going well and will be finalized after construction is completed. Mr. Brunner also presented the MBK hydraulic study of the Gold Fields. The BOSC is pleased that this study was conducted and look forward to resolution of the issues brought up by this study.

The construction site visit covered the entire project and included stops at both cutoff wall construction headings, the borrow area, and the levee at the seepage berm. Much of the existing levee had been degraded for cutoff wall installation. The portion near Simpson Lane, which only required minor modifications, was essentially complete, as was the upstream quarter section. Fill was being placed on the seepage berm during the visit.

Your letter posed four questions that were discussed and addressed during the meeting. The following is a summary of our responses and comments that we provided orally during the meeting.

Question 1 *Does the BOSC concur in the specification modification to increase filtrate loss?*

We concur with the specification modification that increased the allowable filtrate loss in test API RP 13B-1.2.7 from 1.25 to 1.9 cubic inches in 30 minutes, as measured by the filter press at 100 psi.

Question 2 *Does the BOSC see any loss in cutoff wall effectiveness from the slight exceedence in trench slurry density in the early stages of the project?*

The specified slurry trench density had been occasionally exceeded apparently because of the sandy nature of the foundation soils. The concern is that the dense slurry might retard settlement of the trench backfill. A desander has been employed in an attempt to lower the slurry density. The soil-slurry density data show that the trench backfill has been consistently 18 to 20 lb/ft^3 denser than the slurry, hence should be settling through the slurry. We also note that other trench backfill specifications are being met. For these reasons, we believe that there has not been a loss in cutoff wall effectiveness due to the slight exceedence in the slurry density.

Question 3 *Does the BOSC see any field changes or occurrences during construction that would necessitate a change in the project features or construction approach?*

In addition to the events covered in Questions 1 and 2, we learned that unacceptable debris was found in the seepage berm foundation. A sizable amount of manure was found on the waterside toe of the levee, and cobbley pervious material was found in the waterside of the levee near the gold fields. This cobbley material apparently had been placed in the levee during emergency repairs in 1997. We were informed that these materials had been removed and have been or will be properly disposed of. We believe that removal of these unacceptable materials and replacement with specified levee and berm materials was the appropriate corrective action. In addition, we were told that two irrigation pipe crossings have been abandoned. The existing pipes have been removed, but the planned replacement pipes will not be constructed.

Question 4 *Does the BOSC see any reduction in robustness, resiliency, or redundancy of the project based on field changes and occurrences during construction?*

As implied by our responses to Questions 1 to 3, we believe that there has been no impact on the robustness, resiliency or redundancy due to the reported field changes and occurrences during construction

We appreciate the efforts of the project team in preparing the technical presentations, the informative briefings, and in conducting the site visit. The participation and input of other meeting attendees is also appreciated.

Respectfully submitted,

Donald H. Babbitt, P.E.	Faiz I. Makdisi, P.E.	David T. Williams, P.E.
Board of Senior Consultants	Board of Senior Consultants	Board of Senior Consultants

Attachments:

- Agenda
- List of attendees

Three Rivers Levee Improvement Authority
Upper Yuba Levee Improvement Project
Board of Senior Consultants, Fifth Meeting
UYLIP Construction
September 15, 2011

Agenda

1. Introductions and Administrative Details/Dacus
2. Construction Status/Handen
3. Embankment and Cutoff Wall QA/QC Summary/Kleinfelder
4. Safety Assurance Review: Departures from Design Assumptions/Kleinfelder
    a. Specification modification to increase filtrate loss of trench slurry
    b. Early occurrences of higher than specified trench slurry densities
5. Construction Occurrences/HDR
    a. Debris Pile
    b. Removal of 1997 Erosion Emergency Repair
6. Remaining Work and Schedule/Handen
7. Questions/Feed Back from the BOSC
8. Other Topics
9. Site Visit

UPPER YUBA LEVEE IMPROVEMENT PROJECT
BOSC Meeting No. 5
Attendance
September 15, 2011

NAME	ORGANIZATION	PHONE NO.
Larry Dacus	MBK/TRLIA	(916) 456-4400
Paul Brunner	TRLIA	(530) 749-5679
David T. Williams	BOSC	(619) 823-4778
Faiz Makdisi	BOSC	(510) 663-4204
Donald Babbitt	BOSC	(916) 442-0990
Tim Williams	Kleinfelder	(916) 366-1701
Byron Andersen	Kleinfelder	(916) 366-1701
Andrew Pendery	DWR/CVFPB	(916) 574-4046
Phillip LeCocq	DWR DOE	(916) 657-3257
Selva Selvamohan	DWR – Urban Levee Evaluation	(916) 574-1443
Steve Fordice	RD 784	(530) 742-0520
Jose Gomez	USACE/Geotech	(916) 557-7147
Erik James	USACE/Geotech	(916) 557-5259
Daniel Jabbour	HDR	(916) 817-4943
Doug Handen	Handen Co./TRLIA	(916) 635-5200
Claudio Avila	DWR – Urban Levee Evaluation	(916) 574-1473
Johnnie Mack	HDR	(916) 817-4887
Kathleen Considine	DWR – Urban Levee Evaluation	(916) 574-1420
Joe Royer	DWR DOE	(916) 657-7047