

**SAN FRANCISCO BAY AREA WETLANDS RESTORATION PROGRAM  
DESIGN REVIEW GROUP**

**MEETING SUMMARY  
MARCH 17, 2003**

**Attendees:**

Bob Batha (San Francisco Bay Conservation and Development Commission)  
Peter Baye (Independent Biologist)  
Harold Bexton (Bahia Homeowner)  
Andree Breaux (San Francisco Bay Regional Water Quality Control Board)  
John Brosnan (Wetlands Restoration Program)  
Jim Browning (U.S. Fish and Wildlife Service)  
Carla Chokel ((San Francisco Bay Conservation and Development Commission)  
Josh Collins (San Francisco Estuary Institute)  
Jim Emrich (Bahia Homeowner)  
Lynn Emrich (Bahia Homeowner)  
Jules Evens (Avocet Research)  
Jenn Feinberg (San Francisco Bay Conservation and Development Commission)  
Brenda Goeden (San Francisco Bay Conservation and Development Commission)  
Allan Hulme (Bahia Homeowners' Association)  
Terry Huffman (Huffman-Broadway Group)  
Beth Huning (San Francisco Bay Joint Venture)  
Rachel Kamman (Kamman Hydrology and Engineering)  
Marla Lafer (San Francisco Bay Regional Water Quality Control Board)  
Phil Lebednik (LFR Levine-Fricke)  
Michelle Levenson (San Francisco Bay Conservation and Development Commission)  
Roger Leventhal (FarWest Engineering)  
Marshall Levy (Bahia Receiver)  
Stuart Lirette (Bahia Homeowner)  
Mike Monroe (U.S. Environmental Protection Agency)  
Chris Potter (California Resources Agency)  
Alice Rich (A. A. Rich and Associates)  
Barbara Salzman (Marin Audubon Society)  
Stuart Siegel (Wetlands and Water Resources)  
Diane Thompson (Bahia Homeowners' Association)  
Jack Word (MEC Analytical)  
John Zentner (Zentner and Zentner)

<sup>1</sup> Bahia Homeowners' Association Lagoon Dredging and Lock Project Design Review Team

**1. Introductions/Review Agenda**

Mike Monroe chaired the meeting and opened the discussion with a review of the agenda and a roundtable of introductions.

**2. DRG Business**

John Brosnan stated that the last DRG meeting saw a good deal of discussion about the Design Review Team process. After the meeting, some members of the DRG expressed their thoughts, via email, about improving the DRG process. John said the suggestion had been made to devote a significant portion of the next meeting to further discussing these suggestions and developing means to remedy any issues. John mentioned the Restoration Program's release of the Request for Qualifications for new paid members of the DRG; the document can be downloaded at the Program's website [www.sfwetlands.ca.gov](http://www.sfwetlands.ca.gov). John stated there is no project scheduled for review at the next (April) meeting and that DRG members should encourage others to bring projects to the group. Project proponents should see the website and/or contact John.

John said the Letter of Review for the Lake Merritt Marsh Restoration study was posted to the website on March 7. A representative from the Lake Merritt Institute had contacted John and asked about the provision of certain information to the DRG; he felt that said information might have affected the feedback of the Letter of Review. John said that this raises the concept that the materials and data provided by the project proponent may limit the DRG's feedback; this topic warranted further discussion. John also shared that the Letter of Review for the Coyote Hills Wetlands Enhancement and Drainage Improvement project is near complete and should be finalized within the next week.

### **3. Bahia Homeowners' Association Lagoon Dredging and Lock Project Presentation**

Mike Monroe clarified the role of the DRG. He stated the group is a body that reviews the technical aspects of projects and provides feedback meant to result in habitat projects of a high-quality value. He added that time would be provided at the end of the meeting for guests to share comments on the technical aspects of the project before the DRG. Mike stated attendees could raise policy issues before the Coordinating Committee of the Restoration Program. He also called for feedback from the audience on DRG process and encouraged attendees to make suggestions. Mike reviewed the list of "ground rules" for the group and gave the floor to John Zentner.

John distributed maps of the project and informed the group of the project's location in Novato, alongside the lower Petaluma River, north of Highway 37. The proposed project would dredge the lagoon at Bahia, build a lock between the lagoon and the river, and, as mitigation, use the dredged material to create wetland habitat at a site directly east across the river. The proposed creation of 108 acres of tidal marsh would occur on both state-owned land and on the Twin House ranch site. Tidal marsh would be created on the site by excavating pilot channels, laying down the dredge material, and opening the site to the tides through breaching the adjacent riverside levee. This project has been designed based on lessons learned at several reference sites, including Carl's Marsh, Toy Unit, Mariner's Cove, Faber Tract, and Sonoma Baylands. John also noted Williams and Orr (2002) as providing integral support for this project's design.

The Bahia lagoon is located approximately 5,200 feet southwest from its connection to the Petaluma River. In 1987 the lagoon was dredged to an elevation of -5 NGVD and subsequently silted in; in 2001, 80% of the lagoon was vegetated. For the proposed project, the dredge material extracted from the lagoon would be piped across to the east side of the river as slurry

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and the pipes run along the tops of the existing levees. The end result would see the elevation of the mitigation site brought to +2 NGVD with abundant tidal channel development and corresponding sedimentation. John stated there are numerous dredge material testing documents available for this project; he added dredge material testing has proven the material to be used is not substantially greater in toxicity compared to reference sites. A weir box would be installed at the northeast end of the mitigation site to collect the process water (after the sediment has settled out of the slurry); process water would be clarified and then travel through one mile of drainage ditches before returning to the Petaluma River.

One alternative to the proposed project would see creation of smaller channels (approximately 10-15% percent of what is presently planned) that would guide restoration, thereby allowing erosion to do most of the work in channel development. John stated the rationale for creating larger channels, including that some unknowns exist in tidal channels that can constrain the flow and not erode properly (John added there is never perfect knowledge of the marsh substrate). John said smaller channels in the design would correlate with more and higher marsh berms; conversely, larger channels would correlate with fewer and smaller berms that are more natural, include greater species diversity, and reduce wind fetch. Presently, berms are planned to have 12'-15' flat tops; if smaller channels are excavated, created berms would likely be 8' across the top. Channel berms will be +4 to +4.5 NGVD in height; levees along the river will be brought down to the same elevations. Channel meander curves are based on historic conditions near the site. The conservation of existing PG&E infrastructure (an electric line tower) is also considered in the site's design. Based on the present design and prevailing sedimentation conditions at and around the site, 50% vegetation cover is expected for the entire site in 8-10 years and 80% vegetation cover for the berms in 3-4 years. Clapper rail habitat is of particular concern with this project, as clapper rails currently inhabit the Bahia lagoon. The monitoring plan contains the criteria that states clapper rail population numbers must increase measured against regional population growth patterns.

The floor was then turned over to the Design Review Team for questions. John stated that Jack Word had to depart the meeting early and invited Review Team members to ask Jack questions about dredge material. In response to a question from Roger Leventhal, Jack stated the Dredged Material Management Office (DMMO) has declared the lagoon dredge materials to be unsuitable for wetland cover, but suitable for non-cover. Jack added mercury concentrations within the material are less than half of that found at reference sites. Phil Lebednik asked if intact sediment cores were taken to test toxicity; Jack said this had been done. Jack added that there were toxicity issues, but that certain species of amphipod had 60-70% survival rates. Jack stated that bioaccumulation tests have been done and marsh biota is found in the source material. Phil clarified that the marina area to be dredged currently has marsh biota growing in it. John Zentner confirmed that it did. Phil then asked if Jack had considered collecting biota currently growing at the marina to assist in determining the accuracy of laboratory-determined bioaccumulation rates. Phil suggested comparing field information with lab results to determine how artificial the results are regarding bioaccumulation. Roger wanted to know if both mercury and methylated mercury have been tested; Jack stated they have been tested and that there has been less methylated mercury found, due to sulfides, and that total mercury could become more available. Stuart asked what conditions were used in the acclimation studies; Jack stated that the survival of particular amphipod species was up to 100% after

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acclimation. Jack said dredged material would be dried before tidal action was established on the project site.

John stated toxicity testing on the Twin House site has shown high toxicity. Stuart stated those agricultural sediments have no comparability to dredge materials and stated such a comparison was a case of "apples and oranges." Stuart noted acidification of the soil substrate could happen with drying out of the material and then rewetting it. Josh Collins noted a new publication in the online CALFED journal that discusses management of mercury in tidal marshes.

Rachel Kamman asked about how the dredge process would affect water quality. Jack stated that the water would be treated with the weir box at the site and that the water itself would take a few days to treat, at most. The average trip time of the water before reaching the Petaluma River would be 3-4 weeks. Stuart noted the project description counted on the assumption that the dredge material would be reclassified as acceptable for use as a cover material. John responded that there were another 2 months before he had the aging testing data and that he would be working with the DMMO to manipulate the soil on top and that the material would be replaced in time. Stuart then inquired if this rapid turn around was a timing issue as a result of this being a mitigation project. Phil highlighted the potential for mercury methylation under these conditions, and asked about the project contributing to a potential net increase in contamination within the entire system and that handling these materials could lead to a net increase in contamination in the system. **He suggested that they consider this issue.** Roger stated that design could help address this issue. Rachel added the concern here is over remobilization of materials and questioned the thorough analysis of organic content, soil density, and erosion thresholds of the dredge material. Phil referred to a statement in the project description (section 6b) stating that selenium in the sediments was unavailable for bioaccumulation. He asked how this was determined. John said that the determinations were made based on bioaccumulation studies but his summary had left that out due to length concerns. Mike Monroe asked about what methods were being employed to make the land suitable; Jack said they would be mimicking farm operations. John expounded on this and said the Port of Sonoma and local farmers had problems with high gypsum content in the soil and that, sometimes, four passes per site were needed to thoroughly break up the material.

The discussion then turned to the desired feedback, first addressing the issue of channels. In response to a question from Josh Collins, John said the planned levee breach is not aligned with historical channels. John added the site is not a good correlate for historic channel recreation, given historical conditions. Rachel wanted to know the size of the mudflats along the riverbank and Stuart stated the mudflats were not too wide and sloped off to approximately -12 NGVD. Roger pointed out that Williams and Orr (2002) article being referenced by John was based on different data sets and may be less applicable to this project site. Josh expressed the need to match local tides and salinities to the project. **Josh stated that given the high sedimentation rate, bigger was better in terms of created channel size. He also felt the meander proposed in the site plans would be hard to achieve with the breach in its proposed location.** John stated the need to keep the breach away from the PG&E tower.

John stated the process would involve, in sequence, excavating channels, laying the sediment, and breaching the levee. Rachel stated the design had good merits; she pointed out that historic channels could be created with just the smallest topographic relief. She asked how the channel

bottom elevations correspond to equilibrium elevations. Stuart suggested the pilot channels should excavate down to -1.5 at the back of the site and maybe lower than -2.5 at the channel mouth; Rachel agreed. John stated the channel excavation on the state lands parcel would go down into the present sediment. **Josh suggested greater excavation in pilot channels and at confluences, but less excavation at back channels; he suggested maintaining berms at the outside of channel elbows.** Josh stated smaller channels at the Twin House site would likely come and go before becoming vegetated. **Josh then suggested relocating the levee breach might provide better chances at providing water to the Twin House site. Rachel suggested making a best effort at getting sediment to the back portion of the site and that numerous berms may not be necessary.** She also raised the prospect of not rushing into tidal marsh, adding that higher elevations would yield more rapid vegetation of the site. **Rachel suggested lowering the target elevations to maximize the target high marsh band; she advised the project not preclude subtidal channels at the channel mouth.** Josh agreed that longer entrances were better for energy and flow handling. Stuart pointed out that the high rate of sedimentation seen at Carl's Marsh is only true up to the mean high water line; the sedimentation rate diminishes greatly above that elevation point in the marsh plain. Stuart added that wind-wave resuspension would occur at Twin House, given the site's orientation to prevailing winds. John stated that the accretion rate, per se, is not as critical as steady accretion seen over a longer period of time. **Rachel stated the mitigation goals should then state there is no haste to achieve this.**

Josh felt the channel design is too straight and noted the potential for interference with sedimentation as soon as the site begins to vegetate. (John noted that the line on the handout diagram many people were referring to was not a performance standard) Roger discussed the merits of pilot channel excavation while the site is dry. He stated that, if the site were wet during excavation, there would be less oxidation and excavation equipment could leave less visible impact. Stuart felt the review was being too conscious of the temporal factor associated with mitigation and stated that the "how fast" components of achieving functionality and optimal elevations was a regulatory matter. Stuart added the lower the elevation of the design, the better the outcome, ecologically. He added that, in lieu of high sedimentation rates, elevations at Carl's Marsh went down due to daytime desiccation of the exposed sediment. **Stuart suggested lowering the elevation of the Twin House site in order for it to function well; he stated the current Twin House design represents a strong risk element in terms of elevation and vegetation.** John disagreed, stating this suggestion would result in over-engineering and over-construction. John alluded to the Williams and Orr (2002) paper, which claimed less fill is not always better and that optimal elevation for functional wetlands restoration was between +1.5 and +2 NGVD. Stuart suggested those data were based on sites that were not directly relatable to the proposed project site; he suggested data from local projects would demonstrate that excavating to a lower elevation will not significantly delay accretion and vegetation cover, with perhaps a few years between similar outcomes.

**Rachel suggested eliminating some of the berms and replacing them with broad, flat areas of raised elevations; she suggested excavating and constructing the berms first, then building the channels.** She stated that this sequence would help establish and direct the fans. **Josh stated these berms could direct and help achieve the channels being proposed.** Phil requested a copy of the references used in the Project Summary and provided some suggestions on the monitoring of vegetation development. **Phil stated stratified sampling would be helpful here and, for composition of vegetation, a species list might be helpful and efficient.**

Phil asked if John had taken into account landscape functionality. John stated community development has been the driver at the site and expected a variation in species over time and space. Phil stated the *Goals Report's* identification of three historical wetland types at this site and asked if these have been taken into account in the design. John said yes and no, with upland transition being included and wet meadow being too far inland from this site to be viable. **Josh suggested placing shallow sediment on top of channels. Relative to monitoring, Josh suggested looking into PRBO's working with aerial imaging protocols. Josh also recommended a timed gauge at the site in order to obtain plan form of the area at different points in the tide. Terry Huffman suggested employing both a spotting scope and binoculars. Rachel Kamman suggested creating the "islands" in close proximity to the channels to provide opportunities for ground truthing the monitoring data; she also suggested categorizing the factors that may be limiting vegetation establishment.**

Laura Hanson asked about the monitoring criteria for *Lepidium latifolia* and wanted to know how the species would be kept controlled; John stated spraying would be used. **Laura felt there was a good species palate in the monitoring plan, but suggested that more rare plant species could be incorporated into the list.** Peter Baye was asked to provide input on this point, and he stated the appropriate species mix would have to depend on substrate and slopes at the site. Terry felt the upland species standard was high and wanted to know if this standard could be met; John felt that it could. John added that mowing would be used to control nonnative grasses. **Terry suggested taking soil samples following levee construction; Terry also suggested limited use of islands, although he noted their potential use as permanent reference points.** He felt that grading slopes after the discharge might be necessary. Roger felt that elevation control would be critical factor.

Stuart referred to post-construction sediment monitoring and stated pins are useful where there is a lot of sediment. **Stuart suggested low elevation DEMs and air photographs for recording purposes (and banking for future data, if it is needed). Josh suggested the possibility of maintaining a diked marsh for 2-3 years before opening the area to tidal action; this would allow for adequate vegetation and soil consolidation in the interim.**

Mike Monroe stated the conclusion of the question and answer session. Mike then offered the floor to any individuals who would like to comment on the technical aspects of the project and/or the process of the DRG. Marshall Levy thanked the group for the opportunity and felt the group was a good peer review resource. Jim Emrich stated his concerns with the mitigation plan's use of dredge material as wetlands cover and encouraged the receiver to notify the homeowners of future DRG meetings. Barbara Salzman pointed out that this project is mitigation for destruction of active clapper rail habitat and was troubled by this point not having been addressed.

John stated that he would provide references to the Design Review Team.

#### 4. Closing Business and Next Meeting Date

Mike Monroe thanked the project proponent team. The meeting was adjourned.

[PLEASE NOTE: Although not covered at the meeting, the next DRG meeting is planned for Monday, April 21st. - JTB]