

NOTICE AND AGENDA
Regular Meeting

Board of Directors
Aquatic Science Center

To Be Held
December 14, 2009
10:00am-12:00pm

San Francisco Estuary Institute
7770 Pardee Lane
First Floor Conference Room

Oakland, CA 94621
Phone (510) 746-7334

1. **Call to Order**
2. **Public Comments**
3. **Consent Items**
 - a) **Approval of Agenda**
 - b) **Approval of September 23, 2009 Meeting Minutes (Attachment 1)**
4. **Action Item**
Board Resolution for appointing a new Executive Director (Attachment 2)
5. **Information and Discussion Items**
 - a) **Updated 2009/2010 Program Plan (Attachment 3)**
 - b) **Initiating a strategic planning process for ASC in 2010 (Attachment 4)**
6. **Future Meeting Agenda Items and Meeting Schedule**
7. **Adjournment**

7770 Pardee Lane
Second floor
Oakland, CA 94621
p: 510-746-7334
f: 510-746-7300

Board Members
CHAIR Bruce Wolfe
VICE-CHAIR, SEC David Tucker
TREASURER Frank Leung
David Williams
Darrin Polhemus
Doug Craig
Alexis Strauss
Pamela Creedon



AQUATIC SCIENCE CENTER

www.aquaticsciencecenter.org

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Attachment 1

DRAFT
Minutes of the Aquatic Science Center Board of Directors
September 23, 2009
San Francisco Estuary Institute
7770 Pardee Lane, Floor 2
Oakland, CA 94621
11:30am-3:00pm

Members Present:

Bruce Wolfe, San Francisco Bay Regional Water Quality Control Board
Dave Tucker, Bay Area Clean Water Agencies
Darrin Polhemus, State Water Resources Control Board
Pamela Creedon, Central Valley Regional Water Quality Control Board
Doug Craig, Bay Area Clean Water Agencies
Mike Connor (Alternate), Bay Area Clean Water Agencies
Karen Schwinn (Alternate), U.S. Environmental Protection Agency, Region 9
Dyan Whyte (Alternate), San Francisco Bay Regional Water Quality Control Board
Amy Chastain (Alternate), Bay Area Clean Water Agencies
Rainer Hoenicke, San Francisco Estuary Institute
Frank Leung, San Francisco Estuary Institute

Non-Members Present:

Stephanie Seto, San Francisco Estuary Institute

Others Present:

None

Call to Order

Mr. Wolfe, Board Chair, called the meeting to order at 1:30 p.m.

Public Comments

No members of the public attended the meeting.

Consent Items

Review and Approve Agenda

Mr. Tucker made a motion to approve all consent items, including the June 19, 2009 meeting minutes. The motion was seconded by Ms. Creedon and passed unanimously.

Action Items

Appointment of new Executive Director

The Board appointed Dr. Hoenicke as the new ASC Executive Director. Mr. Tucker made a motion to approve this appointment. Some discussion centered

around the fact that a resolution appointing the new Executive Director was not included in the agenda package. Mr. Polhemus stated that an appointment resolution was not necessary as long as the meeting minutes reflected the vote. It was agreed, however, to make the appointment more formal at the next board meeting and include a resolution at that time. The motion to appoint Dr. Hoenicke as Executive Director was seconded by Ms. Creedon and passed unanimously.

Information and Discussion items

Project update

Dr. Hoenicke gave an update regarding the Delta Historical Ecology Project. The Department of Fish and Game signed the contract, and the project is back on track. Dr. Connor suggested that the Board brainstorm the strategic direction of ASC. There was discussion of looking at an inner caucus and utilizing SCCWRP's strategic plan as a benchmark. Mr. Wolfe suggested a retreat in late spring to discuss strategic initiatives and directions with staff.

Follow-up to Supplemental Environmental Project discussion

Dr. Hoenicke suggested that the Board postpone this discussion to the next Board meeting in December due to time constraints. The December board package will contain one-page write-ups of SEP concepts in both Region 2 and Region 5.

Future Meeting Agenda Items and Meeting Schedule

Dr. Hoenicke mentioned that a more detailed program plan is in the works and will be available at the next Board meeting in December. Future agenda items include ASC's strategic process, follow-up to the Supplemental Environmental Project discussion, a science briefing, and the Resolution for appointing a new Executive Director.

Adjournment

The meeting was adjourned at 2:37 p.m. The next Board Meeting is tentatively scheduled for December 14, 2009 from 10:00 a.m. to noon at SFEI.

Respectfully submitted,

David W. Tucker, Board Secretary

Date

Attachment 2

**AQUATIC SCIENCE CENTER
RESOLUTION NO. 02-09**

**RESOLUTION FOR APPOINTMENT OF THE NEW EXECUTIVE DIRECTOR
OF AQUATIC SCIENCE CENTER**

WHEREAS:

1. Dr. Rainer Hoenicke was appointed by the Board as Interim Executive Director on December 1, 2008, following resignation of Dr. Mike Connor as Executive Director of the Aquatic Science Center.
2. Following an eight-month tenure as Interim Director, the Board appointed Dr. Rainer Hoenicke as Executive Director of the Aquatic Science Center on the 23rd day of September, 2009, to be followed by a Resolution at its subsequent quarterly Board Meeting.

THEREFORE BE IT RESOLVED THAT:

The Aquatic Science Center:

1. Adopts Resolution 02-09 on the 14th day of December, 2009, following the vote on September 23, 2009.

CERTIFICATION

The undersigned, Board Secretary, does hereby certify that the foregoing is a full, true and correct copy of a resolution duly and regularly adopted at a meeting of the Aquatic Science Center on December 14, 2009.

AYE:

NAY:

ABSENT:

ABSTAIN:

David W. Tucker
Board Secretary

Attachment 3

Staff Summary

To: Board of Directors
From: Rainer Hoenicke, Interim Executive Director
Date: December 14, 2009
Re: Project Status

Recommendation

None. The purpose is to summarize the Aquatic Science projects completed since last Board Meeting, underway, or in negotiation. Projects highlighted in orange have been successfully completed within the current reporting period. Projects highlighted in green were previously suspended grant-funded projects that have recently come back online.

The joint SFEI and ASC 2010 Program Plan will be distributed separately. It includes a comprehensive list of projects funded through SFEI and ASC and those with a high likelihood of being funded some time during 2010.

Project Title	Amount	Funder	Leads	Start	End
Application of SQO approach in San Diego Bay	\$31,000	SWRCB	Davis, Melwani	April 09	Successfully completed
Delta RMP	\$200,000	RB 5	Jabusch, Davis	April 08	March 10
Petaluma, Tomales TMDL	\$214,000	RB 2	McKee, Ridolfi	Sept 08	March 10
Wetland Monitoring Toolkit	\$650,000	MMS via Resources Agency	Collins, Williams	January 10	Jul 11
401 Certification and Wetland Tracker	\$299,947	EPA via SWRCB	May	Oct 08	Sept 10
Science Support for Wetland Protection Policy	\$270,200	EPA via SWRCB	Collins, Williams	Nov 08	Oct 10
Delta Historical Ecology	\$350,000	DFG	Grossinger, Whipple	October 09	September 11
North-Bay Mercury Biosentinels (re-scoped)	\$65,000	SCC	Grenier, Slotton	November 09	September 10

San Leandro Bay Clean-up Strategy	\$1,000,000 (estimate only)	SWRCB	Grenier, Davis	Dependent on SWRCB approval in January	
Science Support for Statewide Wetland and Riparian Protection Policy, Phase II	\$350,000	USEPA	Collins and Williams	In negotiation	

**Projects Summaries and Updates
Agreements Signed and Underway:**

San Diego Bay Sediment Assessment

The San Diego Regional Water Quality Control Board (SDRWQCB) received a technical report from us in July. Board staff indicated that the report was helpful in their mediation process with parties required to implement sediment remediation efforts. The final report can be found on both the ASC (www.aquaticsciencecenter.org) and SFEI websites (www.sfei.org).

Delta RMP Technical Support

In partnership with Brock Bernstein, ASC staff members are assisting the Regional Board in developing a Regional Monitoring Program for the Delta and its tributaries. The team has produced a report describing current water quality monitoring efforts in the Delta. It includes discussions of monitoring drivers, sites, approaches, parameters, and data availability. The report is intended primarily as an important background for stakeholders involved in the Delta RMP planning effort. The draft report has been posted for review on the Regional Board's Delta RMP website at http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/comprehensive_monitoring_program/index.shtml.

The Delta RMP Planning team has prepared a strawman proposal describing funding options for the Delta RMP. Based on existing models, it describes five basic funding options. The strawman proposal is intended as raw material for stakeholder work group discussions. A work group meeting to discuss funding for the Delta RMP is planned for early 2010. The funding strawman proposal is now available for review on the Delta RMP website.

The Delta RMP Planning Team is proposing an approach for how the Delta RMP effort can facilitate better data access and integration in the region. The data integration strawman proposal is consistent with recommendations of the California Water Quality Monitoring Council and based on following a coordinated organizational approach; coordinated access to monitoring and assessment information; performance-based monitoring and assessment methods; and standardized data management protocols. It is available for review at the Delta RMP website.

At a previous work group meeting held in November 2009, participants felt their input would be better informed, once two key products would be available for review:

- * Summary of current water quality monitoring programs in the Delta (now available on the Delta RMP website)

- * POD Contaminants Synthesis Report: Evaluation of Chemical, Toxicological, and Histopathological Data to Determine their Role in the Pelagic Organism Decline (slated for public distribution in early 2010)

The next stakeholder meeting(s) will be scheduled following the release of the contaminants synthesis report by UC Davis researchers. Topics for upcoming meeting(s) will include the results of these two reports and their relevance to the Delta RMP planning process, further discussion concerning governance, and the initiation of discussions concerning monitoring questions, funding options, data integration and other issues.

The Delta RMP Planning team is planning to prepare a draft program plan by April 2010. Additional strawman proposals that have been prepared previously and address Governance and Monitoring Objectives are available on the Delta RMP website.

Petaluma River, Tomales Bay TMDL

Staff are assisting the Regional Board with developing the scientific basis of Total Maximum Daily Load (TMDL) projects to resolve water quality impairments for the Petaluma River and Tomales Bay. Preliminary data have been discussed with Regional Board staff, as well as an annotated outline for Tomales Bay. Data were analyzed, and in the case of biota, compared to numeric targets proposed for the protection of birds and other wildlife in a report submitted to the Regional Water Board. An impairment assessment, which includes interpretation of the data for mercury, will follow. A draft sediment impairment assessment was submitted in early September. In the Petaluma River watershed, the Regional Board would like us to focus on nutrients and pathogens. Based on the findings from our preliminary impairment assessment, we will be developing a detailed monitoring plan and QAPP for nutrients and pathogens. The field work will not take place under this contract due to limits on timing and funding, however when it is completed, it will include using the new SWAMP algae sampling protocol to characterize nutrients.

Science Support for Development of Wetland and Riparian Protection Policy

The main objective of this project is to extend key policy elements developed in the North Coast and San Francisco Bay Regional Water Boards' *Stream and Wetlands System Protection Policy* by further developing these concepts into a State Water Board *Policy to Protect Wetlands and Riparian Areas*. The Water Board will develop a wetland regulatory mechanism based on Clean Water Act 404 (b)(1) guidelines; and extend statewide beneficial use definitions and water quality objectives developed by the North Coast and SF Bay Regional Water

Boards. A series of technical memoranda are being published for use by the Policy Development Team.

Technical Memorandum No. 1 – Role of the TAT – Completed and accepted.

Technical Memorandum No. 2 – Definition of wetlands – Completed and accepted.

Technical Memorandum No. 3 – Landscape Context – Completed and accepted.

Technical Memorandum No. 4 – Wetland Identification and Delineation – in review.

Technical Memorandum No. 5 – Wetland Classification – in review.

401 Certification in Wetland Tracker

This project, conducted in collaboration with the Southern California Coastal Water Research Project, Moss Landing Marine Laboratories, California Coastal Commission, Humboldt Bay Harbor, Recreation and Conservation District, is intended to enable the Wetland Tracker to be the common data management system for the State's primary wetland protection policies and programs, including the 401 Certification and WDR Programs, the proposed Wetland and Riparian Area Protection Policy, and the State's No-Net-Loss Policy. The main product will be a new version of Wetland Tracker that streamlines 401 Certification, provides access to historical 401 cases, and enables standardized reports on the status and trends of 401 projects and ambient conditions for watersheds, regions, and statewide.

A draft of the software specifications was submitted to State Water Board staff for review to insure all initial requirements are met. After State Board staff has had a chance to comment, the specifications will be vetted with Region 2 and 4 staff and other stakeholders. Coding to facilitate electronic submittal of standardized reports will commence in January 2010.

Projects with Approved Funding – Agreements not yet signed

Wetland Monitoring Toolkit

Level 1-2-3 framework has now expanded across the state. This project will continue to develop CRAM, eCRAM and Wetland Tracker infrastructure to cover four regions of the state (South Coast, Central Coast, SF Bay Area, and North Coast) in collaboration with the Southern California Coastal Water Research Project, Moss Landing Marine Laboratories, California Coastal Commission, Humboldt Bay Harbor, Recreation and Conservation District. This project will continue coordination with regional teams to ensure their output builds statewide capacity to monitor and assess wetlands and riparian areas. This includes the statewide Steering Committee and coordination of IT engineering with the user community. We will expand CRAM habitats to include depressional wetlands and seasonal estuarine/coast lagoon systems. This funding will also be used to continue development of the "train-the-trainers" program. A revised scope has been submitted based on partner input. We are including the North Coast Regional Water Board in the coordination infrastructure. Eventually, these toolkits will benefit all local, state, and federal agencies with land use jurisdiction, CWA and ESA implementation, and granting agencies promoting integration among

various ecosystem services that wetlands, including streams and riparian areas provide.

Projects Re-started:

Delta Historical Ecology

SFEI will conduct a historical ecology study of the Sacramento-San Joaquin Delta, documenting the hydrogeomorphic and ecological characteristics of the Delta prior to significant Euro-American modification. This effort will use well-developed methods for the synthesis of historical data through GIS development and analysis. This historical reconstruction will document, to the extent possible, patterns of variation and extent of habitats throughout the Delta to better understand species support functions and controlling physical processes within the native landscape. Such information will provide a basis for identifying target locations and physical conditions necessary to restore functional habitat mosaics within the projected future Delta landscape.

The project will synthesize hundreds of independent historical data sources to build a reliable picture of early conditions that is sufficiently detailed to inform the ERP Conservation Strategy. SFEI will assist and train DFG staff to participate in the project, including assisting with data collection, GIS, and report production and presentation. Project deliverables will include a GIS of historical conditions documenting target habitat types (e.g. tidal channels, riparian forest, ponds and lakes, tidal marsh-upland ecotone, etc.) and a final report describing the methodology and results.

Small Fish Biosentinels Monitoring in North-Bay Wetlands (with UCD) – reduced in scope by 50%

In conjunction with the Conservancy's salt marsh and tidal restoration projects at the Napa-Sonoma Marsh complex, former Hamilton Airfield, and along the Petaluma River, the Aquatic Science Center and UC Davis are collaborating in a monitoring project for methyl mercury, principally using techniques designed to measure whole body concentrations of total mercury in small fish. We will carry out approximately 30 unique site-sampling events in San Pablo Bay and its environs. Data will be analyzed for trends and compared to other stations in the San Francisco Bay and Delta, and to previous data from the project areas.

Wetland Data Portal –original scope canceled; morphed into new, more phased project with SWAMP funding)

We submitted a proposal to the State Water Board, which was approved for funding on December 2, 2008, to implement the Wetland Tracker (www.wetlandtracker.org) as a model Data Center portal, as recommended by the California Water Quality Monitoring Council. The Wetland Tracker has many of the desired portal attributes and functions. It is based on the 3-level monitoring framework outlined in the USEPA guidance for comprehensive wetlands monitoring and assessment (USEPA 2006); it is consistent with the State's growing interest in open source engineering (CPRC 2004); its development is led by Data Center staff and water quality experts with oversight by regional and statewide advisory groups; and it permits public data exchanges, although these

functions are rather limited at this time. The Wetland Tracker must have functions added to deliver the data to the broad community of wetland interests throughout the State. The project became a victim of the budget crisis and was suspended before an agreement could be completed. It now is back on track, albeit in much reduced form, with phased-in SWAMP funding to SFEI under subcontract with the San Jose State University Foundation (MLML), rather than the ASC, at an initial level of approximately \$32,000.

Projects in Discussion

Development of Regional Data Centers

SFEI was designated as one of four current Regional Data Centers. The State Board approved allocation of bond funds last December that would provide funding for the purposes of collecting and integrating project data into the California Environmental Data Exchange Network (CEDEN) in order to more comprehensively track water quality project effectiveness and make it accessible to the public. The funds were earmarked for the operation of the four centers for up to a three-year period. Following the bond-freeze, the project was cancelled but may be revived in 2010 through the Office of Information Management and Assessment, following a legislative briefing in January 2010 and development of the strategic plan for the California Environmental Data Exchange Network. ASC will work in close collaboration with the other Regional Data Centers for how to make them self-sustaining and independent of General Fund contributions.

San Leandro Bay Cleanup and Abatement Project

At its November 18, 2009, meeting, the SF Bay Regional Water Board voted to approve a resolution requesting \$3M of funding from the Cleanup and Abatement Account. In collaboration with the San Francisco Bay Water Board, ASC would conduct studies needed to provide a scientific foundation for a cleanup and abatement plan for San Leandro Bay. The Board item, unanimously approved resolution, and preliminary scope are included as an attachment due to its significance as an interdisciplinary project with multiple benefits to a broad array of Bay Area stakeholders. The item is now being prepared for consideration by the State Water Resources Control Board. This would be a multi-year effort that would include stakeholder participation. ASC's role would be to coordinate the project and implement scientific studies in support of cleanup plan development. San Leandro Bay was included on the 2006 303(d) list for multiple pollutants, including mercury, PCBs, chlordane, dieldrin, dioxins, furans, exotic species, lead, PAHs, pesticides, and zinc. This project would develop a blueprint for cleaning up this valuable ecosystem, and lessons learned from study of this microcosm of San Francisco Bay would also be broadly applicable to other contaminated sites on the Bay margin and the Bay as a whole.

Elements of this project to be performed by ASC would include some or all of the following:

- preparation of a conceptual model/impairment assessment report,
- studies of sediment quality in support of assessments relating to the new sediment quality objectives (for both direct effects and indirect effects),
- monitoring and modeling of contaminant loading from local watersheds,

- sediment core studies to evaluate load attenuation and the spatial distribution of contamination,
- fate modeling in support of recovery forecasting,
- food web monitoring and modeling,
- exposure and effects studies to fill critical information gaps,
- emerging contaminant screening, and
- studies to support human risk reduction.

This project would test many of the approaches being implemented on a broader scale in the RMP, would be closely coordinated with the RMP, and might have implications for wetland restoration and storm water management from a variety of urban landscapes draining into this sub-embayment.

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Thomas Mumley
and Richard Looker)

MEETING DATE: November 18, 2009

ITEM: 14

SUBJECT: **San Leandro Bay Contamination Cleanup and Abatement Project, Alameda County** – Resolution Requesting Funding From the State Water Pollution Cleanup and Abatement Account

CHRONOLOGY: The Board has not considered this item before.

DISCUSSION: This item recommends that the Board adopt a Tentative Resolution (Appendix A) that would request funding from the State's Cleanup and Abatement Account for the proposed San Leandro Bay Contamination Cleanup and Abatement Project. The purpose of the proposed project is to accomplish cleanup and abatement of contamination in San Leandro Bay that adversely impacts or poses a threat to aquatic life, wildlife, and human health. We have prepared a Project Plan (Attachment B) that describes the project and tasks that would be implemented. The projected cost of the project is \$3 million to be spent over five years.

San Leandro Bay is a subembayment of Lower San Francisco Bay whose drainage area is highly urbanized and includes industrially-dominated catchments (Appendix C). Sediments in San Leandro Bay have been contaminated by historical and current industrial activities in addition to urban commercial and residential runoff and atmospheric deposition. Contaminants of concern include dioxins and furans, lead, mercury, selenium, zinc, legacy pesticides (DDT, dieldrin, and chlordane), polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons. Contaminants continue to be conveyed to the embayment via creeks, storm drain channels, and tidal action from the Oakland Inner Harbor. However, there is no known "smoking gun" that is the cause or source of contamination: contamination is distributed throughout San Leandro Bay; the contaminants are associated with legacy spills, releases, and discharges; and the contaminants are ubiquitous in urban runoff discharges.

The project would provide a nexus for several of the Board's regulatory programs. San Leandro Bay is on the State's list of impaired water bodies and list of Toxic Hot Spots, subject to the Bay Protection and Toxic Clean Program, due to excessive levels of contamination. In addition to cleanup of a toxic hot spot and resolution of the 303(d) listings, the project would help implement the San Francisco Bay mercury and PCBs TMDLs and sediment quality objectives. Also, contaminant sources are or may be associated with the Municipal Regional Stormwater Permit, the Statewide Industrial Stormwater General Permit, and/or the Site Cleanup Program. Moreover, cleanup and abatement of San Leandro Bay

contamination can serve as a model for the remediation and enhancement of other contaminated portions of enclosed bays and estuaries throughout California.

The project will follow the steps we have used for San Francisco Bay-margin site cleanups. These include:

1. Characterizing the current spatial extent of contamination;
2. Determining temporal trends in sediment contamination;
3. Identifying and characterizing past and current sources and loads;
4. Performing an ecological and human health risk assessment;
5. Conducting a feasibility study assessing remedial alternatives;
6. Performing appropriate cleanup and abatement activities; and
7. Evaluating post-cleanup residual risks to humans and wildlife.

Identifying an optimal approach to addressing the complex combination of problems in San Leandro Bay will be technically challenging. The cleanup must be accomplished with care such that this ecosystem is supported and enhanced but not threatened as a result of cleanup activities. Despite the presence of legacy contamination, San Leandro Bay is a productive, yet vulnerable, aquatic ecosystem that supports birds and wildlife and provides fishing opportunities for local residents. An additional challenge is the threat of sea level rise and potential changes in runoff volume and intensity. Therefore, project plans and products will be reviewed by a scientific peer review panel whose members will be nationally or internationally recognized authorities in their fields, and will represent all areas of expertise needed to guide this multi-disciplinary effort. The Aquatic Science Center (San Francisco Estuary Institute) will be the technical lead on the project, and we envision engaging the technical expertise of the United States Geological Survey and other stakeholders. We will also call on State Water Board staff working on sediment quality-related issues to participate on our project team.

An important guiding principle of the project is to initiate cleanup and abatement and other regulatory action as quickly as possible, commensurate with our understanding of the site. We have no conclusive presumptions regarding a list of responsible parties, but we have identified a number of key stakeholders that we will engage throughout the project's adaptive implementation. Key stakeholders include: Alameda County; local municipalities including the cities of Alameda, San Leandro, and Oakland; Pacific Gas and Electric; General Electric; East Bay Municipal Utility District; and the Port of Oakland. Once responsible parties have been identified, we will pursue appropriate regulatory action to direct abatement of discharges, cleanup of contamination, and/or recover, offset, or augment State resources used in the cleanup and abatement effort.

**RECOMMEN-
DATION:**

Adopt the Tentative Resolution

APPENDICES:

- A. Tentative Resolution
- B. Project Plan
- C. Location Map

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

TENTATIVE RESOLUTION No. R2-2009-XXX

**Requesting Funds from the State Water Pollution Cleanup and Abatement Account
to Cleanup and Abate Contaminated Sediment in San Leandro Bay**

Whereas, San Leandro Bay in Alameda County, a subembayment of Lower San Francisco Bay, supports human consumption, aquatic life, wildlife, and recreational beneficial uses, and provides valuable habitat for endangered species;

Whereas, contamination of sediment in San Leandro Bay is a significant water pollution problem that adversely impacts or poses a threat to aquatic life, wildlife, and human health;

Whereas, San Leandro Bay is on California's 303(d) list of impaired water bodies due to excessive levels of lead, mercury, pesticides, polycyclic aromatic hydrocarbons, and zinc in its sediment, and it is part of Lower San Francisco Bay, which is on California's 303(d) list of impaired water bodies due to excessive levels of chlordane, DDT, dieldrin, dioxins, furans, mercury, and polychlorinated biphenyls in fish;

Whereas, San Leandro Bay is on California's list of Toxic Hot Spots, subject to the Bay Protection and Toxic Cleanup Program, due to excessive levels of DDT, lead, mercury, pesticides, polychlorinated biphenyls, polycyclic aromatic hydrocarbons selenium, and zinc in its sediment;

Whereas, the San Leandro Bay drainage area is a highly urbanized watershed that includes industrially-dominated catchments;

Whereas, contaminants of concern in San Leandro Bay are associated with legacy spills, releases, and discharges, and are ubiquitous in urban runoff discharges;

Whereas, Sediment Quality Objectives adopted by the State Water Resources Control Board (State Water Board) are tools to assess sediment hot spots and set priorities for cleanup and abatement actions, and San Leandro Bay provides a good test case to implement the direct effects (toxicity) Sediment Quality Objectives that have been adopted and evaluate the indirect effects (bioaccumulation) under development;

Whereas, successful implementation of the San Francisco Bay mercury and PCBs Total Maximum Daily Loads and attainment of mercury and PCBs water quality standards throughout San Francisco Bay will depend on resolving legacy contamination in San Leandro Bay and other designated hot spots in San Francisco Bay;

Whereas, successful cleanup and abatement of San Leandro Bay contamination will require consideration of sea level rise and changes in rainfall and runoff patterns associated with future climate changes;

Whereas, cleanup and abatement of San Leandro Bay contamination can serve as a model for the remediation and enhancement of other contaminated portions of enclosed bays and estuaries throughout California;

Whereas, staff of the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) have prepared a San Leandro Bay Contaminated Sediment Cleanup and Abatement Project Plan (Project Plan) to accomplish cleanup and abatement of contamination in San Leandro Bay; and

Whereas, the Regional Water Board does not have adequate resources budgeted to undertake the work described in the Project Plan.

Therefore, be it resolved that the Regional Water Board requests that the State Water Board consider this request and supporting documentation and authorize the release of up to \$3,000,000 from the State Water Pollution Cleanup and Abatement Account to fund the San Leandro Bay Contaminated Sediment Cleanup and Abatement Project.

Therefore, be it further resolved that the Regional Water Board may take enforcement action or other appropriate action against the party or parties responsible for contamination of San Leandro Bay, once identified, to direct abatement of discharges, cleanup of contamination, and/or recovery of incurred costs, including State Water Pollution Cleanup and Abatement Account costs.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on November 18, 2009.

Bruce H. Wolfe
Executive Officer

San Leandro Bay Contamination Cleanup and Abatement Project Plan

The purpose of the project is to accomplish cleanup and abatement of contamination in San Leandro Bay, an industrialized subembayment on the east side of Lower San Francisco Bay. The project provides a nexus for several regulatory programs, including the region's cleanup program, municipal and industrial stormwater programs, implementation of TMDLs, potential resolution of 303(d) listings, and implementation of sediment quality objectives.

This project presents a unique blend of challenges and opportunities. The project is challenging because there is no known "smoking gun" of contamination. Instead, because of historical and ongoing industrial landuse on the Bay's shoreline and local watershed, contamination is distributed throughout San Leandro Bay sediments. A second challenge will be to accomplish cleanup while simultaneously promoting the resiliency of both San Leandro Bay's ecosystem and lower watershed against impacts of rising sea levels already being detected in California. A third challenge simultaneously represents a valuable opportunity – despite the presence of legacy contamination, San Leandro Bay has a productive, yet vulnerable aquatic ecosystem that supports birds and wildlife and provides recreational fishing opportunities for local residents. The cleanup and abatement must be accomplished with care such that this ecosystem is supported and enhanced but not threatened as a result of cleanup activities executed.

The guiding principles of the project are threefold – 1) to take actions as rapidly as possible commensurate with our evolving understanding of the site; 2) to adapt the remediation strategy as our understanding improves; and 3) to remedy the water quality and sediment threats caused by past actions while simultaneously making the system more resilient against harm in the future. In this respect, the cleanup and abatement of San Leandro Bay can serve as a model for the remediation and enhancement of other contaminated portions of enclosed bays and estuaries throughout California.

Problem Statement and Regulatory Background

San Leandro Bay is a focal point of the type of sediment contamination problems managed by our agency in that the sediments of this embayment have been contaminated as a result of historical and current industrial activities including electric transformer manufacturing, metal plating, automotive industries, and lead manufacturing industries in addition to urban commercial and residential runoff and atmospheric deposition. Contaminants continue to be conveyed to the embayment via creeks, storm drain channels, and tidal action from the Oakland Inner Harbor.

Because San Leandro Bay is a productive aquatic ecosystem, it represents an area of active transfer of contamination from the sediments into the food web. The sediments have sufficiently high levels of contamination to be directly toxic to aquatic life, and many of the contaminants can cause indirect effects through bioaccumulation in birds and other wildlife higher in the food web. Despite posted fish advisories to limit fish consumption, recreational fishing is popular both from boats and shore locations in San Leandro Bay. Fish caught from this embayment are likely contaminated with a number of toxic constituents. The impairment of recreational-fishing uses represents an environmental justice issue to the extent that some anglers depend on fishing in San Leandro Bay for some of their protein needs.

San Leandro Bay was designated as a toxic hot spot¹ by the State Water Board in 1999² for mercury, lead, selenium, zinc, PCBs, PAHs, DDT, and pesticides. The water body is currently on the 303(d) list for all of these contaminants as well as dioxins, furans, and invasive species. The adopted San Francisco Bay PCBs and mercury TMDLs also apply to San Leandro Bay.

The success of the San Francisco Bay PCBs and mercury TMDLs will depend on resolving legacy contamination in San Leandro Bay and other designated hot spots in the Bay. These Bay margin contaminated sites are areas that pose not only a local risk to aquatic life and humans but also risk to the Bay as a whole. One of the few available remedies to accelerate recovery of portions of San Francisco Bay is the cleanup of in-Bay contaminated sites. Areas like San Leandro Bay present the best opportunity for cleanup because contaminants are still somewhat concentrated and there are viable opportunities for remediation. Both TMDLs call for technical studies to better understand contaminated sites along the San Francisco Bay margins like the San Leandro Bay toxic hot spot.

This project also presents an important opportunity to implement the already adopted direct effects triad component of sediment quality objectives (SQOs) as well as provide an excellent “case study” opportunity for the indirect effects component now under development.

Physical Background

San Leandro Bay is a shallow embayment of San Francisco Bay formed by the confluence of several freshwater creeks and channels draining a heavily industrialized 420,000 acre watershed. The open water portion of the embayment extends 690 acres at mean higher high-tide and about 100 acres at mean lower low tide. San Leandro Bay is representative of many contaminated sites on the margin of San Francisco Bay and other urban estuaries that typically have:

- multiple pollutants above thresholds, multiple listings, multiple impairments of beneficial uses, and multiple applicable TMDLs;
- many historic and continuing sources of contamination; and
- a long history of contamination and degradation.

In spite of this legacy of alteration and degradation, San Leandro Bay today still supports many beneficial uses, including providing valuable habitat for endangered species (including least terns and more than 5% of the entire population of the California Clapper Rail) and many other animal and plant species; fishing; recreation; and navigation.

An investigation conducted by the San Francisco Estuary Institute and published in 2000³ provided a preliminary characterization of the lateral and vertical contamination gradients in San Leandro Bay based on surface sediment measurements and data from sediment cores. The study

¹ Section 13391.5 of the Water Code defines toxic hot spots as: ...[L]ocations in enclosed bays, estuaries, or adjacent waters in the ‘contiguous zone’ or the ‘ocean’ as defined in Section 502 of the Clean Water Act, the pollution or contamination of which (1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries, or human health, or (2) may adversely affect the beneficial uses of the bay, estuary, or ocean waters as defined in the water quality control plans, or (3) exceeds adopted water quality or sediment quality objectives.”

² State Water Resources Control Board (1999). “Consolidated Toxic Hot Spots Cleanup Plan Volume I: Policy, Toxic Hot Spot Lists And Findings.”

³ San Francisco Estuary Institute 2000). “Sediment Contamination in San Leandro Bay, CA: A Watershed Based Investigation”

revealed horizontal concentration gradients for most of the measured contaminants originating at one or more of the creek channel inputs to the embayment. One exception to this pattern was mercury, which seems to be diffusely distributed in the embayment with no obvious gradients emanating from creek mouths. The evidence of scouring of the input creek channels during high flow periods and vertical gradients for a number of contaminants suggest the possibility of localized ongoing inputs of contaminants. There were discernible vertical gradients for most contaminants, with higher concentrations at depth as expected.

The Proposed Project

Our working hypothesis based on preliminary characterization studies is that there is no obvious known “smoking gun” in terms of a single source or region of San Leandro Bay that contains all the contaminants threatening humans and wildlife. Instead there are many possible historical and ongoing contributions of contaminants to the embayment as well as physical processes (creek flow, winds, tides, currents) at play that tend to redistribute the contamination in the Bay over short and long time scales. Some contaminants are distributed with obvious gradients originating in creek mouths, and others are diffusely distributed around the embayment.

We have no conclusive presumptions regarding the list of responsible parties, but we have identified a number of key stakeholders that we will engage throughout the adaptive implementation of the project. Some of the following stakeholders will likely emerge as responsible parties: Alameda County, local municipalities including the City of Alameda, San Leandro and Oakland, Pacific Gas and Electric, General Electric, East Bay Municipal Utility District, and the Port of Oakland. Once responsible parties have been identified, we will pursue appropriate cost recovery to offset or augment state resources used for the cleanup and abatement efforts.

Addressing the complex combination of problems in San Leandro Bay will be technically challenging so project products will be reviewed by a science peer review panel whose members will be nationally or internationally recognized authorities in their fields, and will represent all areas of expertise needed to guide this multi-disciplinary effort.

An important guiding principle of the project is to initiate cleanup and abatement and other regulatory actions as quickly as possible, commensurate with our understanding of the site. As we gain knowledge of the site through focused studies, we proceed in an adaptive manner where targeted investigations lay the scientific foundation for refined remedial actions.

The project will proceed in a step-wise fashion as outlined in the following paragraphs. The first product will be a detailed project work plan based on a compilation of existing information and current understanding of the sources pathways and loadings of contaminants and their transport and fate within San Leandro Bay. This proposal covers work on steps 1 through 5. Separate proposals for the remaining steps may be prepared in the future depending on whether responsible parties are identified and the nature of the cleanup and abatement actions.

We are requesting \$3 million to be spent over 5 years and allocated as follows: project management, including stakeholder participation and scientific peer review (\$200,000), project scoping, including compilation of existing data and preparing preliminary impairment

assessment, and detailed work plan (\$200,000), spatial and temporal trends (\$900,000), sources and loads (\$800,000), ecological and human health risk assessment (\$300,000), and feasibility assessment of remedial alternatives (\$600,000). The Aquatic Science Center (a Joint Powers Authority created by the State Water Board) will be the technical lead on the project, but we envision tapping technical expertise of multiple partners and stakeholders like the United States Geological Survey. A detailed project outline for work is provided as Attachment 1.

1. Characterizing the current spatial extent of contamination

The project team will review available data regarding the contamination patterns as well as collect additional data from shoreline and wetland areas as well as biosentinels (juvenile resident fish and possibly benthic organisms) and sediment quality triad data. These data will provide for a detailed picture of the spatial extent of contamination to aid development in a site conceptual model and to set priorities for cleanup and abatement actions. All data will also be considered in the context of possible 303(d) list revision and refinement.

2. Determining temporal trends in sediment contamination

Temporal trends can be examined on both short and long time scales. Short term trends can be analyzed by comparing current surface sediment contaminant data with those collected a decade or more ago through the Bay Protection and Toxic Cleanup Program and San Francisco Estuary Institute monitoring efforts. Longer timescale trends can be determined through analysis of contaminant data from vertical sediment cores from several locations in the Bay as well as fringing wetlands. Sediment cores record the history of contamination, and measuring the decay of metal isotopes allows scientists to assign dates to vertical strata. These sediment core data provide a timeline for when various contaminants entered the Bay and settled in the sediments. These data can also provide insights as to the location of buried contaminants that may be exposed by erosion of overlying sediments or, conversely, where historical contamination is sequestered under a deep layer of cleaner overlying sediments. The sediment core data from wetlands are especially useful because these are generally areas where sediments only deposit and thus reveal an unambiguous historical record. In contrast, the vertical contaminant profiles from open water sites may be distorted due to vertical mixing from a variety of physical and biological mechanisms. Both types of cores are needed to establish the historical sediment contamination trends.

3. Identifying and characterizing past and current sources and loads

In addition to suspected historical and ongoing industrial sources, San Leandro Bay is likely impacted by stormdrain discharge, sewage discharge, and flux from the greater San Francisco Bay. Information about past and current sources and loads of contaminants comes largely from four types of information: tributary loading data; analysis of sediment cores; review of historical land use information; and industrial production data. The preliminary sediment contamination characterization work from the late 1990s revealed horizontal concentration gradients for most of the measured contaminants originating at one or more of the creek channel inputs to the embayment. This step in the project will include detailed measurements of the contaminant loads entering the embayment from these creeks, especially during high flow events. Review of sediment cores, historical and current land use, and industrial production data can reveal important information about past and current sources and loads as well. For example, the

sediment cores provide a timeline for when contaminants entered the Bay. This can be cross-checked against available information on historical landuse and industrial production data. This approach often yields valuable insights regarding where to look for ongoing sources and how to approach cleanup and abatement. If we identify ongoing sources through this step, we are well-positioned to take immediate action through existing permitting and regulatory mechanisms, including the municipal regional stormwater permit, the industrial stormwater general permit and the site cleanup program.

4. Performing an ecological and human health risk assessment

Ecological and human health risk assessment identifies vulnerable and valued resources, prioritizes data collection activity, and links human activities with their potential effects. A useful first step in this endeavor is the development of a site conceptual model that describes the key physical, chemical and biological features of the San Leandro Bay site as well as the linkages of these features to relevant risk endpoints. The data described previously from surface and sub-surface sediments, wetlands, and biota will inform this conceptual model, and the direct and indirect effects metrics of California's sediment quality objectives as well as relevant water quality objectives will serve as useful risk-related endpoints as well. The risk assessment process is a powerful way to organize the many types of information needed to develop and evaluate remedial alternatives that can reduce human health and ecological risk and protect the environment in a cost-effective manner.

5. Conducting a feasibility study assessing remedial alternatives

The human and ecological risk assessment will be the basis of identifying a suite of candidate remediation strategies to evaluate. The feasibility evaluation will consider a range of factors including degree of risk reduction resulting from each candidate strategy, technical feasibility, degree of scientific uncertainty, and cost. It is possible that additional monitoring or technical studies will be needed during this step to fill data gaps prior to establishing the remediation action plan. The optimum cleanup strategy may be a hybrid of measures in which where actions having a high probability of success can be initiated immediately, and additional cleanup measures are phased in subject to focused information gathering.

6. Performing appropriate cleanup and abatement activities

All of the preparatory investigations and assessments culminate in the actual design and execution of the remedial action. Of course it is not possible to pre-judge the outcome of the remedial action selection, but foreseeable measures include removal of contaminated in-bay sediments, removal of shoreline sediments, remediation of on-land source areas, in-situ capping, interception of ongoing contaminant loads from the watershed, and monitored natural recovery.

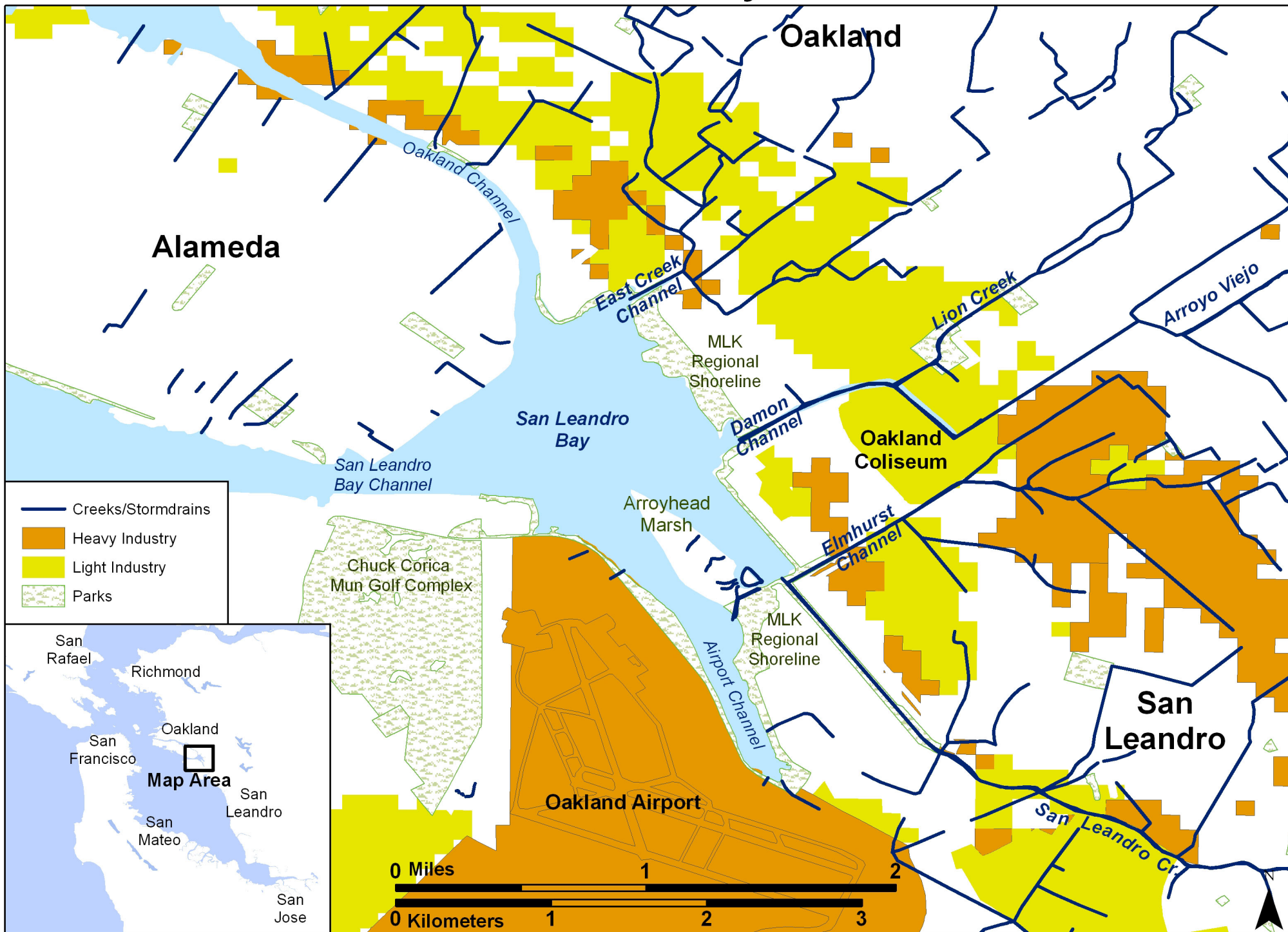
7. Evaluate post-cleanup and residual risks to humans and wildlife

Once cleanup and abatement measures are underway and eventually completed the importance of ongoing evaluation, including monitoring, cannot be understated. Conceptual and quantitative models will be developed and tested against field observations to forecast recovery of the physical environment and food web. Field observations will likely continue for several years after cleanup measures have been completed.

Attachment 1**Outline of San Leandro Bay Contamination Cleanup and Abatement Project Plan Tasks**

- I. Program Management - **(All Steps 1-7 from narrative)**
 - a. Stakeholder Coordination
 - b. Peer Review Panel Coordination
 - c. Identification of Goals and Objectives
 - d. Workplan Development
 - e. Budget and Funding Plan
 - f. Internal Coordination
 - g. Financial Administration
 - h. Outreach Communication
 - i. Reporting
- II. Preliminary Impairment Assessment, Conceptual Model Development, and Sampling Plan Development Based on Existing Information - **(Supports Steps 1-4)**
 - a. Evaluation of status of beneficial uses in San Leandro Bay
 - b. Development of conceptual models of pollutant impacts
 - c. Products
 - i. Preliminary Impairment Assessment and Conceptual Model Report
 - ii. Sampling Plan to Address Critical Information Needs
 - iii. Quality Assurance Plan
- III. Remedial Investigation Studies
 - a. Ecological and Human Health Risk Assessment - **(Step 4)**
 - i. Sediment quality assessment – direct effects
 - ii. Sediment quality assessment – indirect effects
 - iii. Wildlife risk assessment
 - iv. Human exposure assessment
 - b. Loading: Trends and Current Status - **(Step 3)**
 - i. Tributary loading
 - ii. Wetland coring
 - c. Spatial Extent and Temporal Trends in Contamination - **(Steps 1-2)**
 - i. Vertical extent in Bay cores
 - ii. Shoreline inventory
 - iii. Wetland inventory
 - iv. Watershed inventory
 - v. Sentinel monitoring for linkage analysis
 - d. Recovery Forecasting - **(Steps 2,3, and 5)**
 - i. Model development (including wetlands)
 - ii. Field observations
 - iii. Food web modeling (including field observations)
 - e. Feasibility Assessment **(Step 5)**
 - i. Identification of candidate remediation measures
 - ii. Feasibility evaluation for candidates including pilot tests
 - iii. Identification of data gaps and plan to address them
 - iv. Remedial action selection and preparation of remedial action plan
 - f. Products
 - i. Peer-reviewed technical reports on each of these elements

San Leandro Bay Area



Attachment 4

Staff Summary

To: Board of Directors
From: Rainer Hoenicke, Executive Director
Date: December 14, 2009
Re: Strategic Directions for ASC

Recommendation:

Agree on process for developing strategic directions for the Aquatic Science Center in 2010 and assign a planning committee to work with ED to identify: (1) Issues an efficient planning process ought to address; (2) rationale behind the issues and possible consequences of not addressing them; (3) desired outcomes and means to achieve them.

Background:

The Aquatic Science Center was formed to facilitate efficient delivery of science support and information management services to public agencies that do not currently have the capacity to meet scientific needs on their own, or that prefer to utilize a neutral external party with the mission of applied science support for management and policy decisions to enhance credibility and incorporate external science review. After more than two years of operations, the time has come to evaluate how the Center may focus its activities and directions, reflect on lessons learned since its inception, and evaluate if any structural modifications may be needed in the near future to meet identified science needs beyond those with a direct nexus between water quality attainment strategies and the mandated and voluntary activities of clean water agencies.

Emerging Issues:

An increasing number of TMDL implementation plans are being approved and incorporated into discharge permits and requirements. In addition, the continued decline of valued aquatic resources and the likelihood of additional listings of species under the federal and California Endangered Species Acts with concomitant research about limiting factors to recovery is prompting a more holistic approach to beneficial use attainment, habitat preservation, and species recovery. For example, it appears that chronic pollutant exposure effects may be a significant factor for species recovery. Closer coordination mechanisms and joint approaches for leveraging scarce resources among previously disparate programs would be helpful for various agencies whose activities contribute to a multitude of stressors on aquatic ecosystems. Recently, this interconnectivity was recognized with the initiation of the state's Integrated Regional Water Management Planning process and the recognition that water management can no longer be conducted efficiently and effectively with single-purpose approaches (water supply, water treatment and recycling, flood protection, and preservation of water-dependent habitat and species).

Central Valley stakeholders have begun to implement a variety of initiatives that are linked to the overall health of the Sacramento-SanJoaquin watershed and the estuary. For example, Central Valley Salinity Alternatives for [Long-Term Sustainability](#) (CV-

SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. What role can and should ASC play in removing some of the technical and scientific barriers to management solutions of salt and nitrate contamination in the Central Valley? Should the ASC become one of the Coalition members? What, if any, longer-term role should ASC play in helping launch the Delta RMP and make it sustainable?

Risk reduction of contaminated fish is another key issue that affects multiple programs and agencies, and is best explored jointly. Such an effort has begun to develop a multi-pronged risk reduction strategy that BACWA, BASMAA, Reg 1, Reg 5 and State Board are all thinking about. What role could ASC play to inform this joint effort and help move it along?

Another issue that cuts across regions and BACWA is biosolids use for abandoned Hg mine remediation or urban brownfields contaminated with PCBs and future legacy contaminants, such as flame retardants and other persistent synthetic substances.

Climate change adaptation strategies also could best be developed jointly among multiple agencies with the appropriate level of science, modeling, and geospatial analysis support. Both ASC and SFEI are likely to be in a financially secure situation in 2010 to afford to dedicate some effort to exploring if and how ASC's involvement could advance pilot projects, synthesize data and information in relevant ways, and help define cross-programmatic goals common to multiple agencies.