

Additional Sediment Sampling and Analysis Plan

South Bay Salt Ponds Initial Stewardship Plan

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1.0 Introduction

In preparation of the initial Report of Waste Discharge (ROWD) for the South Bay Salt Ponds Initial Stewardship Project (ISP) sediment data was collected from several sources: sediment samples collected and analyzed from various project areas for the ROWD, data previously collected by the US Fish and Wildlife Service from the project sites, and data collected from adjacent properties for other projects. There is some uncertainty with several data sets, as essential sampling and analytical method information was not available. Trends in the data suggest that mercury and selenium may be elevated in some ponds, but the extent of the problem cannot be determined by this data set alone. The Regional Water Quality Control Board (RWQCB) staff, upon review of the ROWD, recommended that additional sampling be undertaken to delineate the nature and extent of mercury and selenium contamination. Additionally, during the ISP, the ponds will be managed, to the extent possible, in a manner that minimizes methylation of mercury in sediments. The DFG and FWS will need baseline information about total mercury and methyl-mercury levels to adaptively manage the ponds.

There is little indication that contaminants are elevated at either the Baumberg or the West Bay Complexes. But this statement is based on only three samples from the Baumberg Complex and one sample from the West Bay Complex. Additional sampling will be performed at both complexes to confirm the status of contaminants at these sites.

This sampling analysis plan (SAP) describes the procedures and rationale for the collecting of samples and submittal of these samples for chemical and physical analysis. The purpose of this SAP is to describe the sample locations, sample collection procedures, and analyses to be performed.

The sampling plan will involve discrete sediment sampling at three locations and two depths in each of the selected ponds. Part of each sample will be archived for future analysis should it be useful. Specific ponds for inclusion in this SAP were selected on the basis of pond function (e.g. outfall), location, lack of existing data, and anticipated changes in management regime. For example, ponds for which there is a proposed change in water regimes, have little available data on mercury levels, and are located in an area of known contamination were chosen for characterization. Ponds with mercury greater than 0.35 mg kg^{-1} , previous and proposed sampling points are shown in Figures 1, 2, and 3.

2.0 Sampling Locations

Samples will be taken in 16 ponds at a total of 50 sampling locations. Figures 1, 2, and 3 present the general location of these sample points. Table 1 identifies the ponds and type of analysis to be performed at each sample location.

Alviso Complex

Pond A3N was chosen for sampling due to its position (adjacent to a pond with elevated mercury) and changing water levels (may be managed as a seasonal pond). Pond A2E was chosen due to the elevated Hg levels in tissues detected by the FWS. Ponds A7, A11, A12, A13, and A14 were chosen for sampling due to their positions (adjacent to ponds with elevated mercury levels) and lack of data. Pond A8 was chosen for five sampling sites due to its position (adjacent to Alviso Slough), changing water levels (portions of it may be allowed to dry out), use by special status species (Snowy Plover nesting site), and lack of useful data. Pond A23 was chosen due to the recent presence of Snowy Plover nesting sites and lack of data in this area.

Baumberg Complex

Ponds 2, 6A, 11, and 12 were chosen for sampling to give a reasonable spatial distribution of sampling points and their function (all outfalls will be sampled).

West Bay Complex

Ponds 2, 3, and 4 were chosen for sampling to give a reasonable spatial distribution of sampling points and their function (all outfalls sampled).

Table 1. Summary of Samples to be Collected.

Pond Number	Locations	Constituents to Be Analyzed			
		Hg	MeHg	Se and Arsenic?? ?	Metals
Alviso Complex					
A3N	3	X	X	X	
A3E	3	X	X	X	
A7	3	X	X	X	
A8	5	X	X	X	
A11	3	X	X	X	
A12	3	X	X	X	
A13	3	X	X	X	
A14	3	X	X	X	
A23	3	X	X	X	
<i>Sub-total</i>	<i>29</i>				
Baumberg Complex					
2	3	X	X		X
6A	3	X	X		X
11	3				X
12	3				X
<i>Sub-total</i>	<i>12</i>				
West Bay Complex					
2	3	X	X		X
3	3				X
4	3				X
<i>Sub-total</i>	<i>9</i>				
Total	50	38	38	29	21

Notes: All sampling locations will be sampled at the surface and at depth.

All samples will be analyzed for salinity and pH. Additionally, Hg and MeHg samples will be analyzed for total organic carbon.

3.0 Sediment Sampling

Sample Collection

Sediment Samples will be collected from the bottom of ponds with a 2-1/4" diameter AMS sediment sludge sampler near the shore water interface. Six samples will be submitted for analysis from each pond, three from the surface (0–2 inches) and the other three at depth (6–8 inches). Figures 1, 2, and 3 present the sample station of each sub-sample (at both depths). Upon completion of each sample collection, the sediment sample will be directly placed in an ice chest and cooled to 4°C.

4.0 Sample Analysis

As shown in Table 1, a total of 50 locations at two depths are proposed for sediment sample collection at the three Complexes that make up the ISP (total of 100 samples). The sediment samples will be analyzed for the parameters as listed in Table 1. Selenium and Arsenic will be analyzed using atomic adsorption spectroscopy (graphite furnace, methods 7740 and 7060, respectively) not by ICP. Sediment samples will analyzed for metals by EPA Method 6010/6020, mercury by EPA method 7471, and methyl-mercury by cold vapor atomic florescence spectrophotometry detection. All samples will be analyzed for salinity and pH (method 9045). Additionally, samples analyzed for mercury/methyl-mercury will be analyzed for total organic carbon (weight loss on ignition) (method 9060).

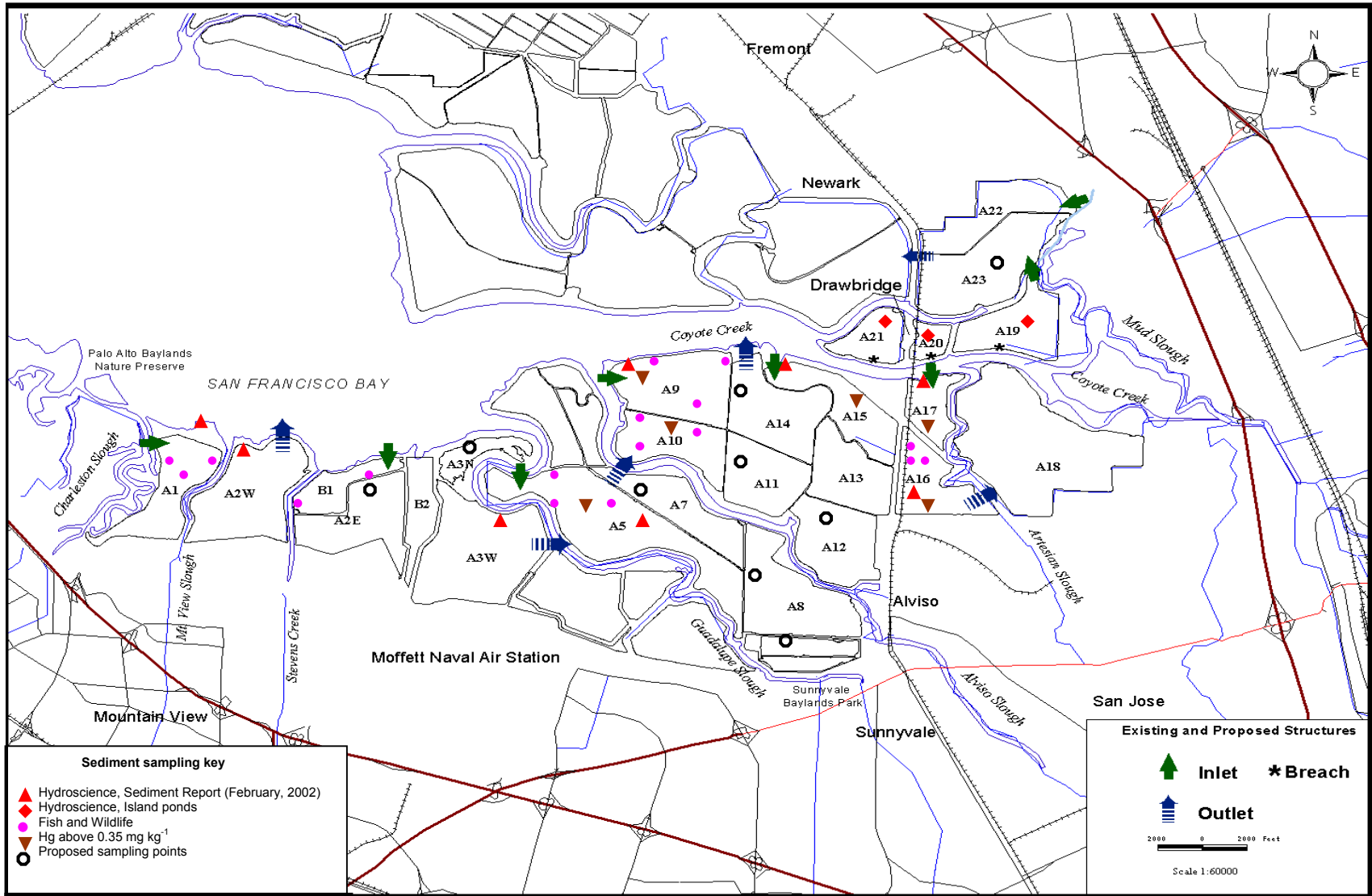


Figure 1. Previous and proposed sediment sample locations within the Alviso Complex.

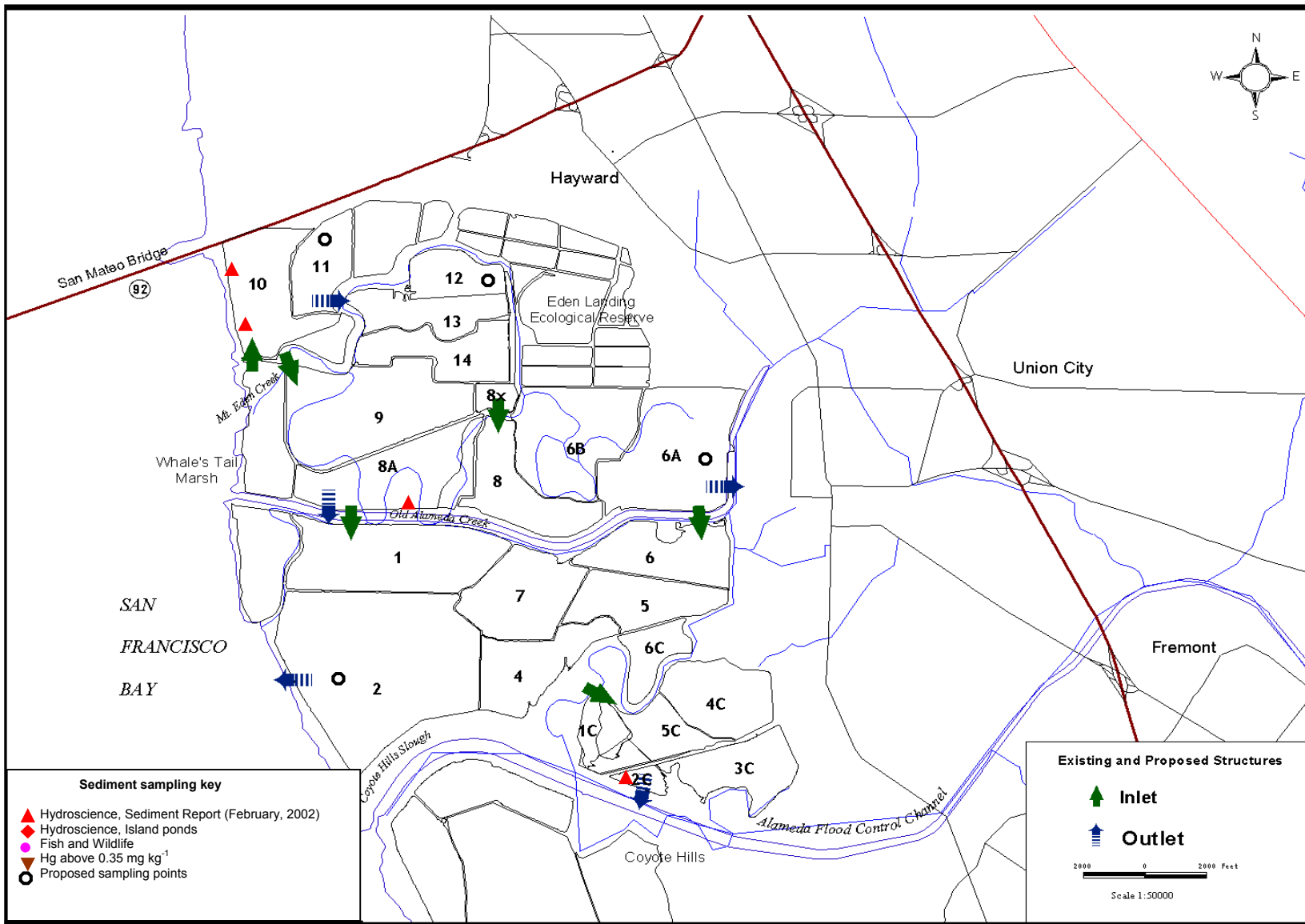


Figure 2. Previous and proposed sediment sample locations within the Baumberg Complex.

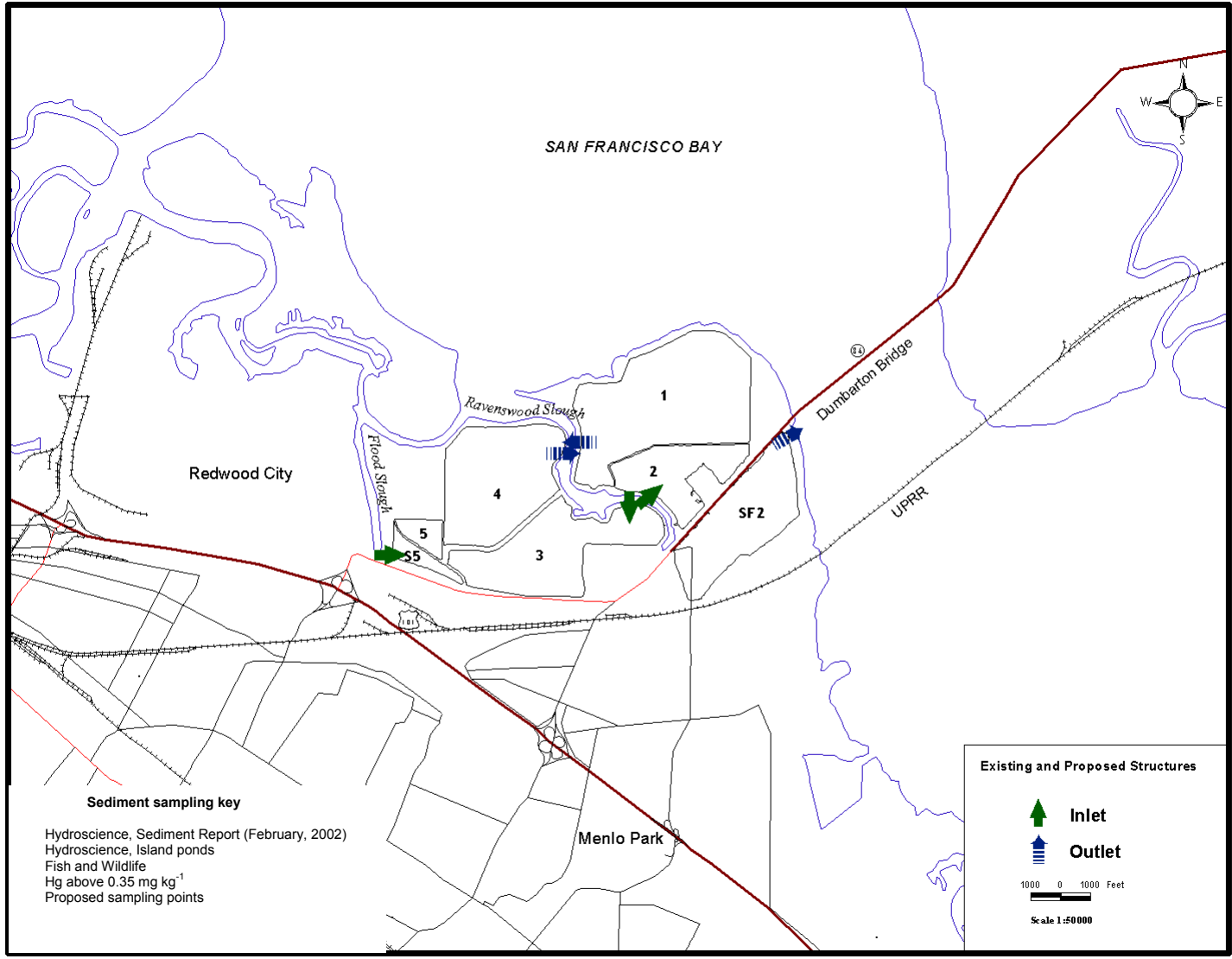


Figure 3. Previous and proposed sediment sampling locations within the West Bay Complex.