2012 Self-Monitoring Report
Baumberg Complex - Hayward, California
Eden Landing Ecological Reserve

Order Number: R2-2008-0078

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Table of Contents

Introduction

This annual self-monitoring report summarizes the pond operations, management and monitoring conducted by the Department of Fish and Wildlife (Department) from May through October 2012 at the former Baumberg Complex salt ponds, also known as the Eden Landing Ecological Reserve (ELER), in Hayward, California. Monitoring is conducted for typical operations as necessary and as required by the Regional Water Quality Control Board (RWQCB) in Final Order R2-2008-0078 (Final Order). The Final Order for the South San Francisco Bay Low Salinity Salt Ponds covered 15,100 acres of ponds in Alameda, Santa Clara and San Mateo counties. The U.S. Fish and Wildlife Service (USFWS) submits a report for the Alviso Ponds under separate cover.

ELER pond systems operated by the Department in 2012, as updated for 2013, are fully described in the attached Operations Plans. Current pond operations are modified from the Initial Stewardship Plan (ISP) and reflect implementation of the South Bay Salt Ponds (SBSP) Restoration Project (SBSPRP) in Ponds E9, E8A and E8X (full tidal restoration) and E10, E12, E13 and E14 (reconfigured managed ponds), as well as modified pond operations in System E6A (ponds E8, E6B and E6A).

Data was collected by Department staff in accordance with the waste discharge requirements. Water quality monitoring was performed in 2012 using grab samples only. Continuous data recorder use was not required and receiving water monitoring was not conducted. Pond operations and management activities were conducted as necessary for the current configuration and objectives of managed ponds.

Data was collected at the locations described in the Self-Monitoring Program outlined in the Final Order. Previous nomenclature used the initial “B” for the Baumberg Complex ponds, which has been subsequently changed to “E” for Eden Landing, in accordance with the nomenclature used for the larger SBSPRP. This report uses the “E” nomenclature, except where noted and older figures or references provided by others are not easily modified.

The ponds are generally being operated as “muted tidal” systems, as described in the updated 2013 Operations Plans, augmenting flow-through systems described in the ISP. Bay water entered the ponds from San Francisco Bay (Bay) through associated sloughs at high tides; flowed to one or more ponds; and discharged at low tides (often from the same structures where intake occurs). The ponds presumably discharge at tide stages lower than pond water elevations, typically averaging 3.5-feet (NGVD), over a duration ranging approximately 13 to16 hours per day (based on predicted tides and spring or neap tide cycle variation). Pond intake of Bay/slough water is presumed to occur at elevations of approximately 1.5- feet or more above pond water levels due to required head (pressure) to allow in-flows (based on predicted tide stages). It is not known from interpreting the data whether discharge has a similar head requirement or if discharge begins after a similar time-lag when tide stages are just below pond water elevations.

The Final Order recognized discharges from the ponds would be characterized with maximum salinity levels below 44 parts per thousand (ppt) and would generally operate with discharge below 40ppt. In 2012, operation of all systems was generally within prescribed salinity parameters. Other water quality parameters were not regularly sampled. In ponds not being affected by construction and operated as open water or seasonal (dry) as typical, no adverse conditions were observed in ponds or receiving waters. Water quality monitoring activities were conducted as described in subsequent sections of this report.

As in previous years, the Self Monitoring Report (SMR) includes summary information of pond operations and management, including Best Management Practice (BMP) implementation. Pond operations were similar to previous years, except in System E6A ponds, as discussed later. Low dissolved oxygen (DO) levels at the point of discharge have previously been observed to fall below a 10^{th} percentile value of 3.3 mg/L (calculated on a calendar weekly basis). Low DO conditions may be expected during extended periods of high air and water temperature and appear to represent natural DO variations in sloughs or lagoon systems. It has been documented that DO levels below the Basin Plan standard of 5.0 mg/L are observed in sloughs not affected by any pond discharge and are within the natural range of variation in functional slough and lagoon environments of the South San Francisco Bay. Correspondingly, low DO water (of Bay origin) has been observed at pond intake locations. Regular DO monitoring was not required nor conducted in 2012. Additional analysis and interpretation of monitoring data is not expected to be completed nor submitted for 2012.

2012 Annual Summary

Pond operations were not substantially modified in 2012, except for System E6A, as more fully described later and in updated operations plans. No major construction activities were undertaken to implement Phase One of the South Bay Salt Ponds Restoration Project (SBSPRP). In 2012, continuous circulation operations occurred as described in Operations Plans, with intake to, and discharge from, Pond E10, E12, E8X, E6A, E6B, E2C and E2 during the summer monitoring season. For water quality monitoring, 2012 activities did not include continuous discharge monitoring and no applied studies were conducted.

No significant SBSPRP Phase One actions occurred at ELER in 2012 and construction activities were limited to minor repairs and maintenance. Pond operations were modified in 2012 for Ponds E12, E13 and E14 as well as for Ponds E6A, E6B and E8. Ponds E12 and E13 will be fully reconfigured as part of the SBSPRP Phase One actions, with construction continuing in 2013-2014. Phase One construction activities for each restoration action typically necessitate two years to complete because of seasonal biological restrictions and construction requirements. E12 and E13 will subsequently be operated year round as an intensively managed pond to provide shorebird foraging habitat and obtain information regarding the management of reconfigured ponds that will be

applied to future SBSPRP phases. The reconfiguration of Ponds E12-E13 is expected to be completed and be fully operational in 2015.

For the 2012 monitoring season, periodic (weekly) collection of monitoring data was sufficient to inform pond management (summer and winter). Targeted monitoring efforts may be useful to address areas of uncertainty and may be conducted as necessary in future years. Pond management operations and intrinsic pond system details are discussed in greater detail as related to compliance with the RWQCB Final Order.

Water quality monitoring at the ELER ponds conformed to the Final Order. Salinity, water levels and waterbird use were the primary basis for determining pond management activities for the 2012 season. Typical pond operations and monitoring of salinity and water levels indicated that the ponds were operating within parameters that met biological and water quality objectives. No abnormal conditions, such as fish kills, were observed. It is expected that there may have been brief periods of low DO within ponds in 2012, although no DO or continuous data was collected. In previous years (2004-09), low DO levels were observed in a number of the South Bay Salt Ponds (SBSP), including ELER ponds, notably in the late-summer/early-fall when seasonal temperatures, winds and evaporation were expected to be highest. Review and analysis of data from previous years indicated there appears to be some correlation with abiotic factors, such as spring and neap tide periods, weather conditions, and seasonal variation. It is likely that biotic factors also affect DO levels, such as consumption of DO by pond invertebrates or larger animals, including fish, and algal growth, respiration and decomposition. Observations made in 2012 included typical amounts of macroalgae found in the water column and living and necrotic algal mats that may be observed within the ponds.

Pond operations were similar in 2012 to previous years in systems that were operated "normally" (as compared to modified operations associated with construction activities, or for multi-season, multi-species objectives begun in 2012 in System E6A). For example, in System E2, pond discharge from one-48-inch gate in Pond E2 to the Bay was set at approximately 25% open during the May-October monitoring season. System E2C intake and discharge was periodically minimized to maintain water levels during neap tide periods and/or during high ambient temperatures. Temporary suspension of discharge operations was only occasionally and briefly conducted in 2012, in cases where brief periods of elevated salinity were observed at the discharge.

System E6A ponds (E8, E6B, E6A) were managed in winter for waterfowl and shorebird roosting, while in summer, the ponds are operated more like seasonal ponds, albeit with higher intake and discharge volumes. In the winter, System 6A ponds were managed for waterfowl, specifically for diving ducks. In the summer, System 6A ponds were managed for western snowy plover (WSP) breeding and shorebird foraging during the monitoring season, therefore, discharge operations were conducted. In previous years, the ponds were primarily seasonally dry, with minimal intake to maintain foraging habitat. In 2012, System 6A ponds were operated with intake and discharge operations via Old Alameda Creek (Pond E6A) and North Creek (Pond E6B and E8). Pond management was primarily focused on providing WSP nesting and foraging habitat as

well as shorebird foraging and roosting areas, while maintaining low salinities within the primary circulation patterns within borrow ditches. This system provided good habitat conditions for waterbirds, including WSP during 2012.

The ELER site location is shown on Figure 1; sampling and water control structure (WCS) locations are shown on Figure 2.

For all pond systems:

Grab samples were collected at pond-to-pond, intake and/or discharge locations to ensure ponds were operating as expected, as well as to provide information regarding salinity and circulation through pond systems. Some ponds were managed as seasonal (dry) ponds to facilitate nesting substrate and foraging habitat, in particular for WSP. By 2009, the Department had determined optimum pond operations such that discharge settings were less frequently adjusted. After reviewing previous year's data DFW determined that increased discharge operations resulted in improved water quality, particularly salinity. Further, experience acquired through management in this manner required less frequent field adjustments. Current or anticipated weather and predicted tidal conditions are also considered, but pond operations are apparently less affected by those factors than intrinsic pond dynamics. In previous years attempts were made to minimize discharge of pond waters not meeting water quality objectives (WQO's), for salinity and DO, however, this increased residence time. Review of past year's data indicates that more consistent, moderate volume discharges improved (lowered) salinity conditions. Salinity, and presumably other water quality parameters were improved based on observed conditions overall. A summary of discharge events is shown on Table 1.
Under normal summer operations, water levels in the ponds are maintained throughout the season primarily by adjusting discharge gates, depending on tide cycles, weather, habitat targets and species use. Management activity for the systems was typical for summer operations. Typically, ponds E6 and E5 are operated as "batch" ponds, which entails maintaining water levels by providing "make up" water for that lost to evaporation, allowing salinity to increase to as high as 120-parts per thousand (ppt).

For all pond system operations, adjustment to intake, discharge and pond-to-pond culvert gates for continuous circulation were similar in 2012 to recent years.

System E2C:
Pond E2C was operated in 2012 similar to previous years. In 2012, a continuous monitoring device was not utilized or required. Management of this system was performed as described in the Operations Plan and was informed by grab samples collected on an approximately weekly basis. Grab samples were collected for salinity and water levels analyses and waterbird use was monitored to determine operational parameters. This system presumably had periods of low DO levels, as observed in 2005-10, but continued to provide good habitat conditions for numerous waterbirds. Discharge was at or below 25% of capacity; therefore, no receiving water monitoring was required, as noted in RWQCB's May, 2008 letter and reflected in the Final Order. For 2012, System E2C operations continued to use BMP's developed over the past five years,

including periodically allowing pond E2C to flow into the adjacent seasonal ponds (E5C, E4C and E1C) to improve pond system water quality (due to greater intake volumes). This BMP was sustained in 2012 to help manage salinity and to maintain consistent water levels within the system. Repeated wetting and drying events may be correlated with higher methyl-mercury production and would be undesirable, particularly for nesting and foraging waterbirds. The pond E2C to E5C culvert was maintained partially open throughout the season to allow regular circulation into and out of pond E5C during spring tides. Other factors may have also moderated DO and other water quality conditions.

System E2:

Pond E2 operations in 2012 were similar to previous years. Refer to Table 1: Summary of Intake/Discharge Activities for pond operations information during this period. A continuous water quality monitoring device was not used, and management of System E2 was informed by grab samples collected on approximately a weekly basis as noted previously for System E2C and as described in the Operations Plan. It is assumed that during 2012 this system had periods of low DO levels, as observed in 2005-11, however it continued to provide habitat conditions sufficient to support substantial waterbird use. No abnormal conditions were observed and no receiving water monitoring was required. Discharge at the Bay from Pond E2 was maintained at 25% of capacity of one 48-inch gate for much of the year and occurs directly to the Bay. The system was operated with primary flow entering the system through Pond E1 from Old Alameda Creek. Muted tidal inflow from the bay also provided supplemental intake into the E2 system. Muted tidal intake from the Bay into E2 also provided supplemental intake to this system. System E2 management included typical discharge operations via E2 for the winter season, including successful recirculation of the higher salinity "batch" ponds (E5 and E6).

System E10:

Typical operations were conducted in 2012 in System E10 ponds. Pond E10 normally discharges directly into the Bay immediately adjacent to the mouth of Mount Eden Creek (MEC). Pond E10 was operated as a circulation pond in the 2012 monitoring season. Pond E11 was operated as a seasonal pond in 2012, as is typical and described in the ISP and previous Operations Plans. Continuous monitoring devices (Datasondes) were not utilized nor did they appear necessary based on monitoring in Pond E10 during the May-October monitoring period and receiving water sampling was not required.

System E6A:

In 2012, System E6A ponds (E8, E6B, E6A) were managed in winter for waterfowl and shorebird roosting and managed in summer for shorebird foraging, roosting and nesting. In summer, the system is managed to promote WSP nesting. In the winter, System 6A ponds were managed to promote foraging and roosting habitat for diving ducks. In past years, System E6A was operated as a seasonal pond, with minimal intake and discharge in summer, and allowed to dry by evaporation. Dry pond bottoms were used by WSP for nesting and salinities were typically high in small pond areas remain. The dry summer

conditions resulted in the loss of most, if not all, invertebrates that tolerate only low salinity conditions, although a suite of invertebrates with a tolerance for high salinity conditions was able to persist. While low salinity conditions were restored in winter with resumed intake and discharge operations, invertebrate communities were distinctly different than in year-round, open water, low salinity ponds where continuous circulation operations occur. Therefore, seasonal ponds would have complete turnover of invertebrate communities between seasons.

In an effort to maintain more suitable habitat for diving waterfowl in winter, while maintaining sufficient suitable nesting habitat for WSP in summer, pond management objectives were modified. Under this modified, seasonal pond operation, continuous circulation intake/discharge operations were conducted, whereby low salinity conditions were maintained throughout the year in most of the ponded areas throughout the system.

In 2012, discharge operations and monitoring was conducted in the summer in System E6A ponds to promote WSP nesting objectives, and provided good WSP breeding and shorebird foraging habitat during the summer monitoring season. System E6A ponds were drawn down and maintained as partly flooded, low salinity circulation ponds with intake and discharge operations via Old Alameda Creek (Pond E6A) and North Creek (Pond E6B and E8). Pond management was primarily focused on providing WSP nesting foraging habitat as well as shorebird foraging and roosting areas, while maintaining low salinity conditions in the ponds. This system provided good habitat conditions for waterbirds, including WSP and diving waterfowl during 2012.

System E9:

Ponds E9, E8A and E8X in System E9 were restored to full tidal action in 2011 as part of Phase One of the SBSPRP. The remaining managed ponds in this system are described in System E12, below.

System E12:

Seasonal ponds previously operated via pond E9, including E14, E13 and E12, were operated with intake from and discharge to Mt. Eden Creek via pond E12 and former pond E9 (tidally restored), and Pond E8X was operated with intake from and discharge to North Creek via the portion of pond E8X restored to full tidal action in 2011. Ponds E12 and E13 are expected to be fully reconfigured in 2013-14 for intensive pond management as part of the SBSPRP Phase 1 Actions. In the winter, System E12 ponds were managed to promote foraging and roosting habitat for shorebirds and dabbling ducks. Diving ducks also use the deeper portions of these ponds, such as borrow ditches, but to a lesser extent than dabbling ducks and shorebirds which utilize the majority of the pond, depending on water levels and conditions. Pond management in summer was primarily focused on providing WSP nesting foraging habitat as well as shorebird foraging and roosting areas, while maintaining low to moderate salinity conditions in the ponds.

In 2012, discharge operations and monitoring was conducted in the summer in System E12 ponds. Pond E8X was operated as a forebay for intake and discharge operations in

ponds E12 and E14. Pond E12 was operated with primary intake and discharge via Mt. Eden Creek using the new WCS (2x48") constructed in 2011 and operated to determine what water level and salinity levels may be expected in the system. Pond E12 and E13 will be fully reconfigured in 2013-14 to be operated year-round in 2015 and beyond for shorebird foraging and roosting habitat. System E12 ponds with more continuous intake and discharge operations, such as E12 and E8X were generally maintained as partly flooded, low salinity circulation ponds with intake and discharge operations via full tidal action in Mt. Eden Creek and North Creek as well as ponds restored to full tidal action. Ponds E13 and E14 were operated as seasonal ponds, similar to other seasonal ponds in ELER, with limited intake from adjacent ponds, as needed to support WSP nesting. This system provided good habitat conditions for waterbirds, including waterfowl, as well as WSP and other shorebirds during 2012.

Table 1: Summary of Intake/Discharge Activities

Complete datasets and field notes for pond operations/conditions and management activities were provided electronically to RWQCB and are otherwise available upon request.

NOTE: Table 1 salinity values obtained from a hand-held refractometer (Parts Per Thousand, or ppt). In some figures, nomenclature for ponds "B" & "E" are interchangeable (Baumberg aka Eden Landing). Staff gauge readings are specific to each pond (or pond system), and vary between NGVD 29, NAVD 88 or relative to pond bottom.

Pond	Location	Date	Salinity (ppt)	Staff	Activity and notes
2C	E2c-14	4/18/2012	28	3.00	1x48" Disch. at 25%, begin transition to summer ops.
2C	E2c-15	5/8/2012	30	3.65	1x48" Disch. cont. 25% during spring tides, max circ.
2C	E2c-14	5/15/2012	47	0.60	Closed 1x48" Disch. Salinity mgmt, refill pond
2C	E2c-14	5/16/2012	31	3.05	Opened 1x48" Disch. to 10% during spring tides, resume circulation, draw down "C" ponds
2C	E2C-14	6/1/2012	42	2.95	O&M ops, WCS repair. Closed 1x48" Disch, Red.2x48" Intakes to 25%
2C	E2c-14	6/8/2012	34	2.95	WCS repair complete. 2x48" Intake 100% open, 1x48"Disch.set to 15%.
2C	E2c-14	6/12/2012	44	1.10	Red.1x48" Disch. to 10% for neap tides; maintain water level, salinity mgmt. cont.
2C	E2c-14	6/19/2012	32	3.30	Increased 1x48" Disch. to 20% for spring tides, maintain water level.
2C	E2c-14	8/9/2012	44	below	Reduced 1x48" Disch. to 10% for neap tides, increase water level for salinity mgmt.
2C	E2c-14	8/21/2012	36	3.45	Increased 1x48" Disch. to 20% for spring tides
2C	E2c-14	9/5/2012	44	2.20	Reduced 1x48" Disch. to 10% for salinity mgmt, neap tides
2C	E2c-14	9/27/2012	35	3.75	Increased 1x48" Disch. to 15%, max circulation.
2	E2-10	4/27/2012	38	3.35	1x48" Disch. at 25%, begin transition to summer ops.
2	E2-10	6/1/2012	46	2.90	Closed 1x48" Disch. for salinity mgmt
2	E2-10	6/8/12	42	3.25	Opened 1x48" Disch.25%.
2	E2-10	6/19/12	42	3.55	Increased 1x48" Disch. to 50% for spring tides/salinity mgmt
2	E2-10	7/20/12	34	3.25	Reduced 1x48" Disch. to 25%, prep for spring tides, cont. salinity mgmt.
2	E2-10	9/21/12	39	3.35	Reduced 1x48" Disch. to 5%, reflood, prep for winter ops, batch pond

Pond	Location	Date	Salinity (ppt)	Staff	Activity and notes
					recirculation
10	E11-1	4/27/12	32	3.20	1x48” Discharge at 20%, summer ops
10	E11-1	6/21/12	35	4.20	Increased 1x48" Disch. to 25%
10	E11-1	9/7/12	38	3.40	Reduced 1x48" Disch. to 5% for neap tides, maintain water levels, prep for winter ops.
12	E12-1	4/25/12	37	*6.0	1x48” Discharge at 5%, summer ops
12	E12-1	5/10/12	39	*6.7	Opened 1x48" Disch. to 25%. Pond flooded, draw down, salinity mgmt.
12	E12-1	5/16/12	32	*5.0	Reduced 1x48" Disch. to 10%.
12	E12-1	7/25/12	38	< *3.0	Reduced 1x48" Disch. to 5%, discharge basin below pond bottom.
12	E12-1	9/7/12	50	*6.2	Closed 1x48" Disch. for neaps, salinity mgmt.
12	E12-1	9/11/12	36	*5.75	Opened 1x48" Disch. to 5%, resume circulation operations.
8X	E8X-Tidal	4/27/12	30	*4.8	1x48” Intake at 100%, Discharge at 50%, summer circulation ops
8X	E8X-Tidal	5/29/12	34	*4.75	Reduced 1x48" Disch. to 25%
8X	E8X-Tidal	7/10/12	42	*4.7	1x48" Disch. set to 50% for neap tides draw down, prep for spring tides, salinity mgmt.
8X	E8X-Tidal	10/3/12	39	*4.8	Transition to winter ops
6A	E6A-10	4/27/12	26	2.45	1x48” Intake at 100%, Discharge at 25%, winter circulation ops
6A	E6A-10	5/15/12	25	2.35	Increased 1x48" Disch.to 100%, Reduced 1x48" Intake to 25%, draw down for SNPL nesting ops.
6A	E6A-10	11/20/12	30	2.6	Increased 1x48" Intake to 75%, Reduced 1x48" Disch. to 25%, transition to winter ops
6B	E6A-2	4/5/12	26	2.60	1x48” Intake at 100%, Discharge at 25%, winter circulation ops
6B	E6A-2	4/27/12	28	2.50	Increased 1x48" Disch. to 50%, draw down for SNPL nesting ops.
6B	E6A-2	5/15/12	32	2.05	Reduced 1x48" Intake to 25%, cont. Disch. at 50%, draw down, SNPL ops
6B	E6A-2	5/29/12	36	1.05	Increased 1x48" Intake to 50%. Cont. 1x48" Disch.50%, max. circ. to maintain water level.
6B	E6A-2	6/1/12	34	2.20	Reduced 1x48" Intake to 25% for spring tides, maintain water level.
6B	E6A-2	7/25/12	38	1.70	Reduced 1x48" Disch. to 25%,

Pond	Location	Date	Salinity (ppt)	Staff	Activity and notes
					increase water levels in spring tides.
6B	E6A-2	8/6/12	49	2.55	Increased 1x48" Disch. to 50%, 1x48" Intake to 50%, salinity mgmt, SNPL ops cont.
6B	E6A-2	8/9/12	44	1.65	Reduced 1x48" Disch. to 25% for neap tides, cont. salinity mgmt.
6B	E6A-2	8/14/12	35	2.35	Reduced 1x48" Intake to 25%, Increased 1x48" Disch.to 50%, reduce water levels, SNPL/migratory shorebird mgmt.
6B	E6A-2	8/23/12	41	1.70	Increased 1x48" Intake to 50%, Cont. 1x48" Disch. 50%, salinity/SNPL/shorebird mgmt.
6B	E6A-2	8/28/12	34	2.35	Reduced 1x48" Intake to 25%, reduce water levels in neap tides.
6B	E6A-2	11/8/12	33	2.30	Increased 1x48" Intake to 100%, cont. 1x48" Disch at 25%, winter ops

Water Quality Monitoring Requirements

Water quality monitoring was performed at the sampling stations shown in Figure 2. The water quality parameters are provided in the Final Order and are summarized below for reference:

Table 2 Continuous Circulation Period Discharge Limits

All pond waters discharging to the Bay or Sloughs shall meet the following limits:

Constituent	Instantaneous Maximum	Instantaneous Minimum	Units
Salinity	44	n/a	ppt
Dissolved Oxygen[1]	n/a	5.0	Mg/L
pH[2]	8.5	6.5	

[1] = Limitation applies when receiving waters contain $\geq$ 5.0 mg/L of dissolved oxygen (DO). When receiving waters do not meet the Basin Plan objective, pond discharges must be $\geq$ DO receiving water level. Dissolved Oxygen (DO) Trigger: At each pond discharge location when using a continuous data recorder (Datasonde), if the DO concentration is < 3.3 mg/L, calculated on a calendar weekly basis, values below the trigger shall be reported promptly to RWQCB, corrective measures shall be implemented in an attempt to increase DO concentrations, receiving waters shall be monitored and Operation Plans shall be revised, as appropriate, to minimize reoccurrence.

[2] = The Discharger may determine pH compliance at the discharge or in the receiving water.

Water Quality Monitoring Methodology

Pond Discharge Monitoring/Sampling:

Continuous data were not required in Ponds E2, E2C and E6A, E6B, E8, E8X, E12 and E10 as described in the Final Order, as modified by RWQCB. The Department did not utilize continuous monitoring devices in 2012. Pond salinity was monitored using grab samples, and water levels and waterbird use were also monitored weekly. The operation

of these ponds conformed to previously submitted operations plans as no construction activity occurred in those systems, except at pond E2C, where the WCS was repaired due to a sink hole which had formed behind the headwall. No Datasondes were utilized, rather grab samples were collected for salinity analyses approximately weekly.

Discharge Time-Period and Volume Estimates:

Estimates of discharge volume may provide context for monitoring of management activities but are not easily obtained. RWQCB previously modified ASMR requirements such that volume estimates are not required.

Discharge time period information can be used as a proxy for discharge volume, and may be interpreted from monitoring data and predicted tides. Table 1: Summary of Discharge Events, provides context for management operations. However, the time-period each day that a pond discharges is not specifically provided in this report. It should be noted that the daily discharge time-period information is based on predicted tidal elevations, not actual tide stages and time periods because there is currently no tide stage or other instrumentation installed to record actual discharge time-periods. Discharge periods in the ISP were assumed to be approximately 8 hours per day. We assumed that discharge would occur once tide stage was below pond water elevations, estimated to occur for approximately 13-16 hours daily. This assumption may over-estimate discharge time periods (and volumes) because it disregards affects of head (pressure) that may alter typical discharge flows through culverts. Based on observed data, intake requires tide stages that are approximately 1 ½ to 2 feet higher than pond water elevations. Nonetheless, discharge event information is useful to contextualize management actions and BMP's implemented during ponds operations and provides information to complement the broader information contained in the Operations Plans.

Receiving Water Sampling:

Receiving water was not monitored in 2012 as approved by RWQCB. Ponds E2 and E10 discharge to the Bay, while limited discharge occurs into sloughs via Ponds E2C, E6A, E6B, E8, E8X and E12.

Sampling requirements under the Final Order were modified by RWQCB in 2008, such that receiving water sampling needed only be conducted when water quality objectives are not expected to be met; particularly when adverse conditions are observed concurrent with pond discharge operations occur at volumes greater than 25% capacity of the system water control structure(s). Discharges were maintained at greater than 25% capacity in System E6A and in Pond E8X in order to maintain nesting habitat for WSP in ponds E6B, E6B and in ponds E12, E13, E14, respectively.

Table 3 –Water Quality Monitoring For Eden Landing Ponds

Sampling Station:	D.O.	pH	Temp	Salinity	Sample Function
E2-10	A	A	A	A	Discharge
E2C-1 (E2C-14)	A/B	A/B	A/B	A/B	Discharge
E2C-	C	C	C	C	Receiving Water
E2C-	C	C	C	C	Receiving Water
E2C-	C	C	C	C	Receiving Water
E2C-	C	C	C	C	Receiving Water
E2C-	C	C	C	C	Receiving Water
E6A-10 (E6A, E6B, E8)	A	A	A	A	Discharge
E8X (E12)	A*	A*	A*	A*	Discharge

LEGEND FOR TABLE 3

A = For time periods between May and October when the Discharger is not monitoring its discharge continuously in accordance with Table 2B and 4A/B, it shall collect weekly grab samples before pond water mixes with receiving water. The Discharger shall also report standard observations, as described in Section D of the SMP. Additionally, the Discharger shall report the time of sample collection and alternate the time it collects weekly grab samples between the morning and the afternoon to the maximum extent practicable. Based on weekly grab samples and standard observations, the Discharger shall consider implementing continuous monitoring, as necessary, to determine pond operations and management.

B = From July 7 to October 10, the Discharger shall monitor discharge ponds at the point of discharge using a continuous monitoring device if adverse conditions are expected or observed within ponds discharging at greater than 25% of capacity.

C = Receiving water samples shall be collected at discrete locations near the surface and bottom from downstream to upstream of the discharge point. Receiving water slough samples shall be collected monthly from July through October as close to low tide as practicable, if pond waters are discharging at greater than 25% capacity from the E2C system. For days it collects receiving water samples, the Discharger shall also report standard observations, as described in Section D of the SMP, and document if it collect samples at flood tide, ebb tide, or slack tide. Additionally, the Discharger shall record a daily estimate of the quantity and time-period of discharge based on pond water levels and the strength of tides. No pond water quality monitoring was conducted during period when pond was dry (seasonal/construction ops).

Calibration and Maintenance:

The refractometer instrument used for salinity sampling as part of the Self-Monitoring Program was calibrated by using pure water to reset the instrument to zero. As no Datasondes were used, no calibration of this equipment was required.

Pond Management Sampling:

The Department regularly conducted pond management sampling in 2012 in all ponds in each system where the data would be useful in determining pond management and discharge operations. Data include pond water elevation (staff gages), salinity (hand-held refractometer), wildlife use (observations), meteorological/tidal conditions and physical pond conditions.

Chlorophyll-a Sampling:

Chlorophyll-a sampling in all ponds was not conducted due to limited analysis and applicability, as approved by RWQCB in 2005.

Metals- Annual Water Column Sampling:

The Department did not collect water column samples, as approved by RWQCB in 2005, because previous data showed metals concentrations were within WQO's.

Sediment Monitoring

The Department did not conduct sediment sampling because previous analysis showed metals concentrations were within WQO's. In 2006, RWQCB supported redirection of monitoring efforts to address specific issues rather than generalized pond monitoring; accordingly, mercury studies were focused on areas of concern, such as the USFWS Alviso Pond Complex, in Pond A8 and Alviso Slough.

Invertebrate Monitoring

Invertebrate monitoring was not conducted in 2012. Previous collections (2005-06) proved to be of limited use for analysis and had little applicability to pond operations.

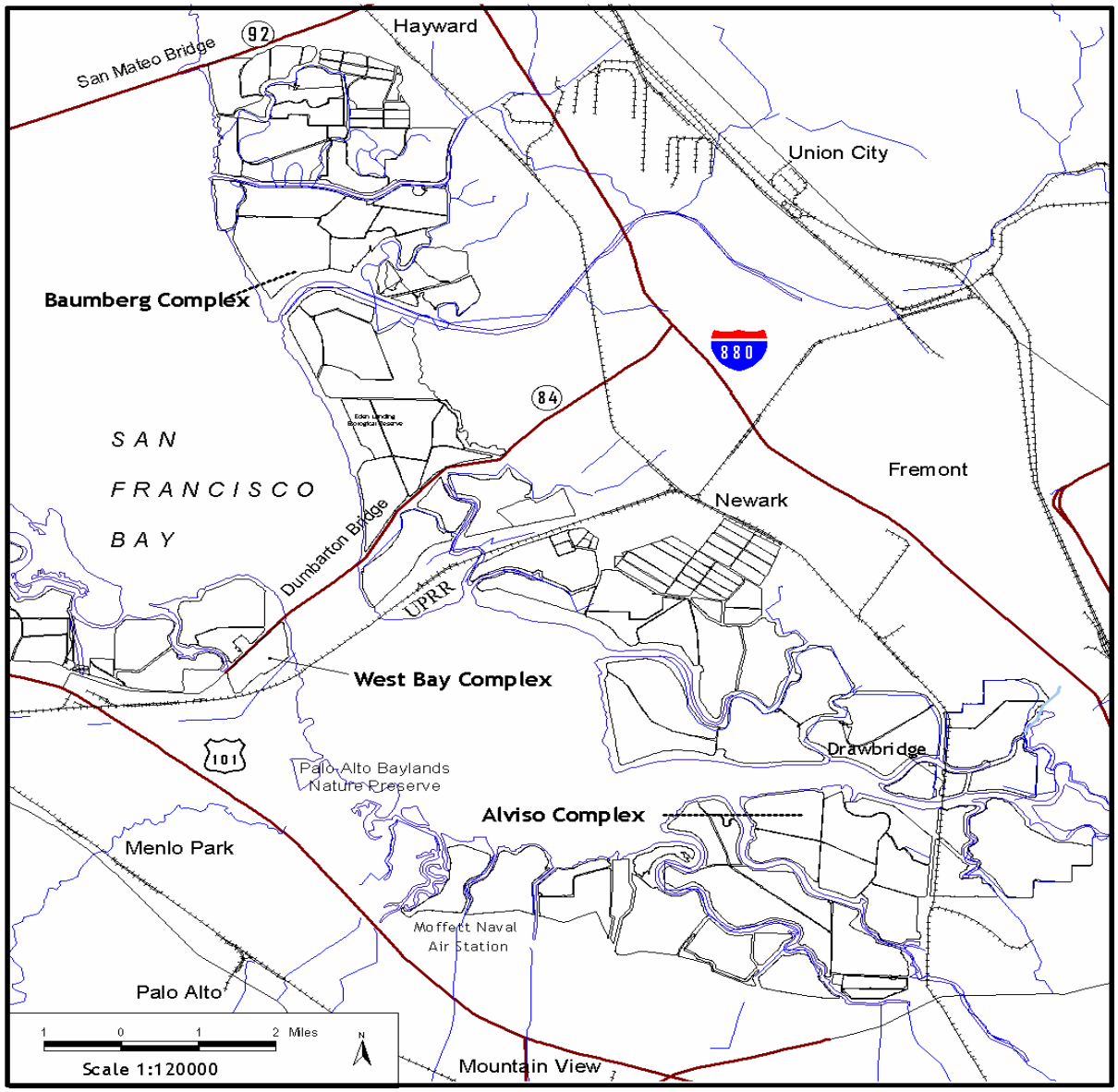

Figure 1. Vicinity Map of the Eden Landing Ecological Reserve (Baumberg Complex) Ponds

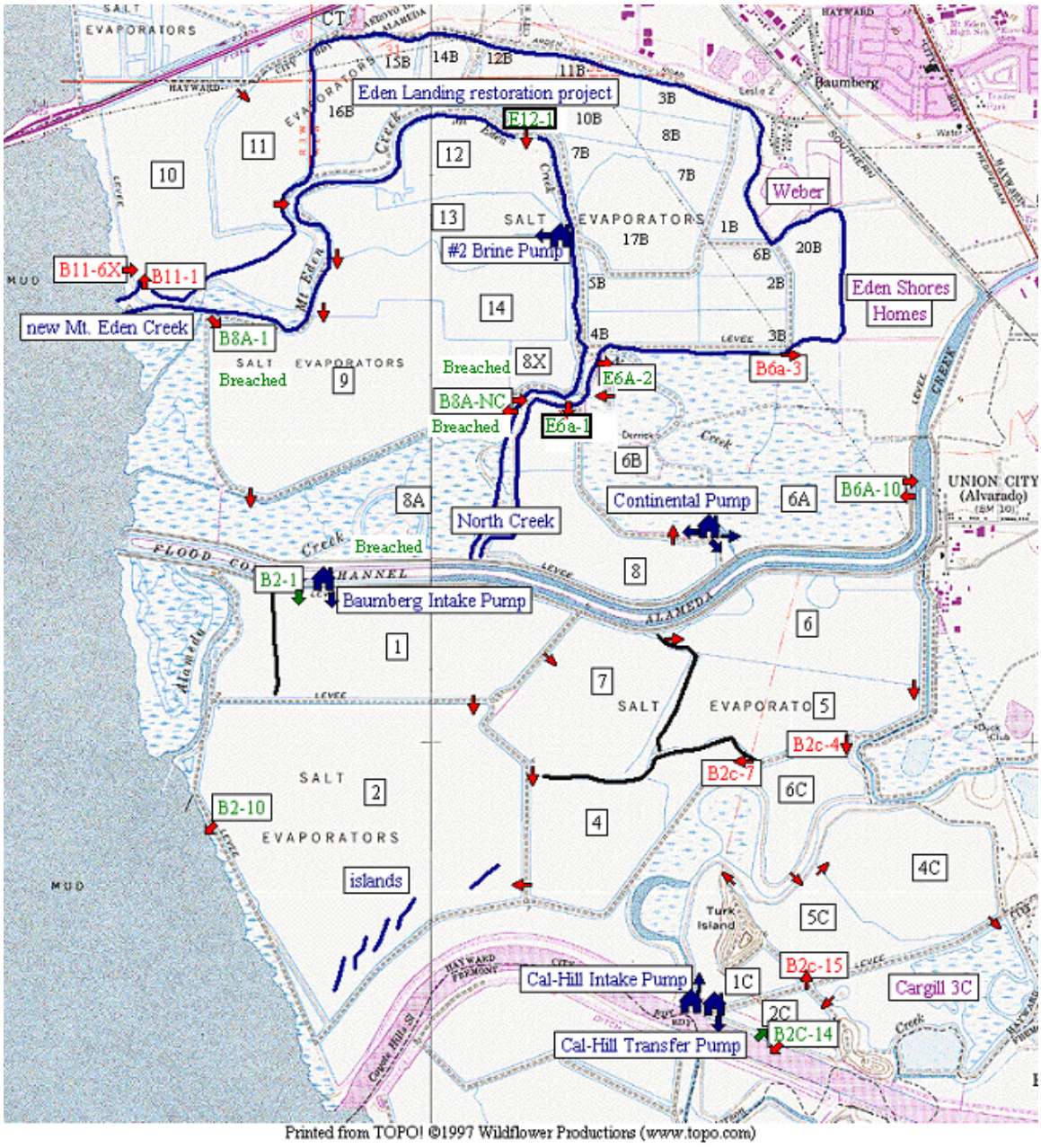

Figure 2. Eden Landing Ecological Reserve (Baumberg Complex) Ponds: Discharge and Intake Locations

Green text boxes note Intake and Discharge Locations, Red text boxes note other key pond operation and monitoring locations. ("B" nomenclature from water control structure names for ISP is replaced by "E" in most documents and field notes. SBSP Restoration Project naming convention uses "E" on ponds, WCS)

Water Quality Monitoring Results

Discharge and Receiving Waters

Results from the monitoring of pond waters at discharge locations are summarized below. Pond discharges do not occur continuously. Pond discharge data should be reviewed with consideration of the variation in tide stage and cycles, and operational activities which resulted in suspending or modifying discharges. During the 2012 water quality monitoring period, salinity appeared to follow the typical patterns and ranges as in previous years. While pH, temperature and DO were not monitored directly, it is presumed that those parameters continued to present the typical patterns and ranges in 2012 as in previous years, based on visual observed conditions.

Salinity data from 2012 were generally consistent with data collected during previous years on comparative calendar dates in Systems E10, E12/E8X, E6A, E2, E2C, and E10. Salinity values in the past few years have been lower as compared to 2005-08 due to a return to near average rainfall amounts. Additionally, modified pond operations sustained more consistent and higher discharge gate settings and associated discharge volumes. System E6A was successfully managed as a modified seasonal pond system, with salinity and water levels managed for WSP nesting habitat and migratory shorebird foraging in spring through fall, with deeper, low salinity open water habitat in the winter. Modified seasonal operations are typified by large areas of dry pond bottom exposed, with areas of shallowly inundated pond, and deeper water levels in circulation areas, primarily within borrow ditches. Overall pond conditions within this system allowed for continuous circulation discharge operations.

Temperature has generally been consistent across years since monitoring at the ELER began. Dissolved oxygen has been more difficult to interpret and has been highly variable across the years. Similarly, pH has also been variable and difficult to interpret in regards to the affects of management activities on these levels.

The 2012 pond water monitoring results (grab samples) and field observations are large files and are not included in this SMR. Rather, this data is provided in electronic format. Please contact the Department for requests to cite, distribute or utilize this information for purposes other than in the context of this report.

Table 1 lists the observed (grab sample) values for salinity at the discharge location on dates that changes were made to pond operations. Refer to the electronic pond management and field observations files for data on weekly monitoring and for other monitoring locations**.**

Salinity

Pond salinities in 2012 were similar to those found in preceding years, reflecting current management operations which sustain higher volume discharges. Salinities were generally maintained below the 44 ppt limit based on information provided by on-going

monitoring. Short term observations of elevated salinity were noted and normalization of salinity typically occurred within one day of pond operations changes. Refer to Table 1 and comprehensive pond management data files for observed salinity values, pond management and related construction modifications and overall pond conditions.

The salinities for all system ponds are expected to remain operating with low salinity discharge conditions in future normal rainfall years, and will continue to function chiefly as low to medium salinity managed ponds, reflecting only relatively higher salinities than the intake waters from the Bay and sloughs, except in seasonal or managed "batch" ponds. Differences in mean salinity between low salinity ponds and Bay waters are more apparent during neap tide periods and higher salinity should be expected during drought years. Review of data collected to date indicates that management operations provide sufficient maintenance of salinities in seasonal or batch pond operations, where a limited number of ponds are allowed to reach moderate salinities, and do not prevent continued management of primarily low salinity ponds. Batch ponds are sufficiently mixing with system ponds before discharge.

E2C:

System E2C is operated as a muted tidal pond, by intake and discharge at the same location. Salinity, therefore, varied depending on duration of intake periods resulting from spring and neap tide cycles and other environmental factors. Grab samples obtained during routine pond operations prior to May 2012 showed values ranging from 23 to 28 ppt, (9 to 23 ppt in 2011; 17 to 29 ppt in 2010; 27 to 40 ppt in 2009), and grab sample monitoring values during the 2012 monitoring season from May to October showed pond salinities from 30 to 47 ppt (9 to 38 ppt in 2011; 23 to 40 ppt in 2010; 30 to 44 ppt in 2009). Elevated salinity values are typically observed with a brief neap tide between two stronger spring tide periods which may have resulted in circulation of a "pocket" of higher salinity water to the discharge location. Sufficient tidal mixing resulted in more typical salinity ranges. Observed E2C salinity was below 40 ppt throughout the season, except on 5/15/12, when higher salinity was observed (47ppt), due to flow from seasonal pond E5C occurring when pond E2C water level became drawn down during neap tides. The discharge gate was closed for one day, allowing pond E2C to restore typical water levels and salinity (31 ppt) for operations during the spring tide. In 2012, the pond water transfer BMP was in place during the summer, such that Pond E2C regularly mixed with Pond E5C to maximize circulation and increase intake at Pond E2C. Generally, BMP's such as weekly discharge timing and minimizing discharge volumes adequately protected receiving waters. The system was operated assuming typical low salinity conditions, and average salinity over the entire monitoring season (May to October) was 38 ppt (27 ppt in 2011; 37 ppt in 2010; 36 ppt in 2009).

E2:

System E2 is operated as a circulating system, rather than a primarily muted tidal system as is done with all other ponds. However, System E2 is augmented by muted tidal intake at the E2-10 discharge location to the Bay. Observed salinity at the E2-10 discharge at the beginning of May, 2012 was approximately 37 ppt (25ppt in 2011; 37ppt in 2010; 42ppt in 2009) and ranged from 29 to 46 ppt during the season **(**25 to 42ppt in 2011; 25

to 42ppt in 2010; 33-56ppt in 2009). Salinity for the majority of the 2012 season based on grab samples averaged 40 ppt (29 ppt in 2011; 37ppt in 2010; 40ppt in 2009) and were generally below 44 ppt**.** An elevated salinity of 46 ppt was observed on 6/1/12 and discharge was temporarily suspended (approx. one week, during a spring tide). On 6/8/12 water levels were restored and salinity was moderated (42ppt) and discharge resumed. The elevated salinity observed on 6/1/12 coincided with low water levels and a neap tide period which may have resulted in circulation of a "pocket" of higher salinity water at the discharge location due to insufficient mixing after a neap tide period. It is apparent that sufficient tidal mixing thereafter resulted in more normal continuous circulation salinity (42 ppt). The system was operated as low salinity, continuous circulation ponds for the season, with muted tidal intake/discharge directly on the Bay, with primary inflow from E1.

E10:

System E10 was operated with typical management activities, with intake and discharge at the same location (muted tidal operations) at the mouth of MEC. No construction was completed and E10 was operated as open water for the summer. Pond E11 is operated as a seasonal pond and is allowed to drawn down and dry during the summer. E10 salinity in 2012 ranged from 27-39 ppt (20-33 ppt in 2011; 28-36 ppt in 2010; 30-41ppt in 2009). At the start of the monitoring season in early-May 2012, salinity in E10 at the E11-1 discharge location was approximately 29 ppt (20 ppt in 2011; 27ppt in 2010; 32ppt in 2009). Weekly mean salinities were not above 44 ppt in 2012 (0 days in 2011, 2010, 2009) and the system had typical low salinity conditions throughout the season.

System E10 provided good habitat conditions for numerous waterbirds, including piscivores and wading birds. E11 provided seasonal shallow water habitat for shorebirds.

E9:

System E9 ponds, including E9, E8A and E8X were restored to full tidal action in 2011. Seasonal ponds previously operated via pond E9, including E14, E13 and E12 were operated, with intake from and discharge to Mt. Eden Creek via pond E12, and North Creek via the remaining managed pond portion of pond E8X. Ponds E12 and E13 are expected to be reconfigured in 2013-14 for intensive pond management as part of the SBSPRP Phase 1 Actions. These actions are described below and more fully in the updated Operations Plan and within the environmental compliance documents for the SBSPRP.

E6A:

In 2012, System E6A ponds (E8, E6B, E6A) were managed in winter for waterfowl and shorebird roosting and managed in summer for shorebird foraging, roosting and nesting. System E6A is operated as a modified seasonal pond system, with continuous circulation via muted tidal intake and discharge at the same location. In the winter, System 6A ponds are managed for waterfowl, specifically with deep, low salinity water to support benthic invertebrates as the prey base for diving ducks. In spring, the ponds are drawn down and operated such that pond conditions are similar to seasonal ponds, albeit with higher intake and discharge volumes, lower salinity and a slightly higher water surface

elevation (typical seasonal pond has little intake or discharge and is allowed to continue to draw down, salinity is elevated and in late summer is mostly dry). Salinity is generally low in the borrow ditches that act as water conveyances with continuous circulation, while some areas of the ponds have shallow water which are presumed to have moderate salinity conditions. Salinity is maintained below 44 ppt near the discharges, and is less varied because the pond is operated at a low water surface elevation, there is ample mixing and water has a low residence time.

Grab samples obtained during routine pond operations prior to May 2012 showed values ranging from 24 to 26 ppt in pond E6A, from 26 to 30 ppt in pond E6B and from 28 to 38 ppt in pond E8. During the 2012 monitoring season from May to October, pond salinity values were as follows: from 25 to 43 ppt in pond E6A (mean 32ppt), from 29 to 49 ppt (mean 37 ppt) in pond E6B, and from 30 to 44 ppt (mean 37 ppt) in pond E8.

Observed weekly System E6A discharge salinities were below 44 ppt throughout the season, except on 5/15/12, when higher salinity was observed in E8 (44ppt) potentially attributable to the reduced intake associated with neap tides. Consequently, discharge was negligible, as pond water surface elevation remained at the level of the weir boards. Elevated salinity (49 ppt) was also observed briefly at the discharge in pond E6B on 8/6/12 during a neap tide period, but was corrected (44 ppt) by 8/9/12 by increasing intake and draining water to pond E6A while reducing discharge by 25%. Observed pond E6A salinities were below 43 ppt at the discharge throughout the season, and were generally 25-38 ppt. Elevated salinity values occur infrequently and are typically brief, observed primarily during neap tide periods, which may result in a "pocket" of higher salinity water at the discharge location. Sufficient tidal mixing during spring tide periods resulted in more typical salinity ranges. BMP's such as weekly discharge timing adequately protected receiving waters.

E12:

System E12 was operated with typical management activities, with intake and discharge at the same location (muted tidal operations) at MEC. Pond operations were also conducted via Pond E8X, which acts as a mixing basin and forebay. No construction was completed and E12 was operated as shallow, open water for the summer. Pond E13 and E14 were operated as seasonal ponds, allowed to draw down and be mostly dry during the summer. E12 salinity in 2012 ranged from 30-50 ppt and averaged 37 ppt during the summer monitoring season (E12 was operated as a seasonal pond in 2011 and prior, with no substantive discharge). At the start of the monitoring season in early-May 2012, salinity in E12 at the E12-1 discharge location was approximately 33 ppt **(**E12 was operated as a seasonal pond in 2011 and prior years, with no substantive discharge**)**. E8X salinity in 2012 ranged from 30-42 ppt and averaged 35 ppt during the summer monitoring season **(**E8X was operated as a seasonal pond in 2011 and prior, with no substantive discharge**)**. At the start of the monitoring season in early-May 2012, salinity in E8X at the E8X-Tidal discharge location was approximately 30 ppt **(**E8X was operated as a seasonal pond in 2011 and prior, with no substantive discharge**)**. Weekly mean salinities were not above 44 ppt in 2012 and the system had typical low salinity conditions throughout the season.

System E12 provided good habitat conditions for numerous waterbirds, including piscivores and wading birds. Ponds E12, E13 and E14 provided seasonal nesting, foraging and fledging habitat for WSP.

pH

For 2012, no Datasondes were utilized to collect instantaneous or continuous pH values, rather ponds were managed based on construction, biological resource management and sensitive species requirements. Based on salinities, pond depth, observed conditions and waterbird use, typical pond water quality conditions were assumed to be similar during the 2012 monitoring period as in previous years. For reference, in 2009, sampled pH values at the E10 discharge using continuous data collection, daily mean and grab sample ranged from approximately 7.9 to 8.5 throughout the monitoring season, including in-pond transects. Higher values were found in more distant areas of E10 associated with poor circulation (8.2-9.6 pH during August transects). In other ELER pond systems in 2009, pH similarly ranged approximately one point over the season. In Pond E2C, grab sample pH values ranged from approximately 8.0 to 8.6 during the 2009 season and pH averaged 8.2 throughout the season. In Pond E9 during 2009, grab sample pH values ranged from approximately 8.1 to 8.6 and pH averaged 8.1. In Pond E2, grab sample pH values ranged from approximately 8.0 to 8.6 during the 2009 season and averaged 8.2 pH. Receiving water sampling in 2007 showed that a discharge "signal" was not discernable except in the immediate vicinity of the discharge. Compliance with the Final Order allowed pH levels to be measured in either the pond or receiving waters, as determined by the discharger. There is no apparent pattern in pH values as related to discharge operations.

Temperature

Water temperature data were not collected in 2012. However, since the Department began operations and management of the ponds at the ELER for waterbirds, pond water temperatures were generally similar to ambient Bay and slough temperatures and were only slightly warmer during hot weather periods, primarily in shallower ponds. The ponds easily met the temperature discharge limits, not exceeding ambient temperatures of the receiving waters by 20^{o}F in any case.

Dissolved Oxygen (DO)

Since grab sample values are highly variable, considering the diurnal pattern observed in previous years, no pond dissolved oxygen values were collected for the 2012 monitoring season. In past years the ponds showed a pattern of periods of low or sustained depressed DO, demonstrating that achieving compliance with the Final Order is problematic. Monitoring efforts showed that DO levels in the ponds generally continued to exhibit a strong diurnal pattern where lower DO is observed near dawn and higher DO is observed at mid-day. Substantial algal growth and decomposition in the ponds is assumed to be the cause of diurnal fluctuations of DO levels throughout the ELER Ponds during the summer. In 2012, large algal blooms were notably less prevalent and persistent than in previous years, due to annual variation patterns that are not well understood as to

relationships or correlations with annual weather, pond conditions and pond management operations.

However, little immediate change can be affected since managed ponds have high residence time and management changes require several days to several months to effectively implement and observe demonstrable changes in water quality conditions and aquatic habitat quality.

Effectiveness of Dissolved Oxygen Best Management Practices (BMPs) for Pond Management

It is recognized that it will not be feasible for a well-operated lagoon/pond system to continuously meet an instantaneous DO limitation of 5.0 mg/L as specified in the Basin Plan (based on the national criteria published by the U.S. Environmental Protection Agency [USEPA]). It is also understood that a stringent interpretation of this limit is not necessary to protect water quality, based on review of monitoring data in the Bay, site-specific standards work in recent years in the Everglades and Virginian Province (Cape Cod, MA to Cape Hatteras, NC), and data collected by USGS in Newark Slough in 2005, 2006 and 2007. The Department maintains that DO levels lower than 5.0 mg/l naturally occur in estuaries and lower values, therefore, do no necessarily implicate pond discharges.

To address normal pond seasonal depressed DO levels, as observed in previous years, several operational strategies or BMPs were routinely implemented, as described herein and in the individual system operations plans. The Department evaluated BMPs such as closure of discharge gates during periods of time when observed pond conditions indicated that DO may be below the 3.3 mg/L trigger. An example of these BPMs would be to reduce the daily period of time when low DO within the ponds occur, with subsequent pond discharge occurring after DO had increased to sufficient levels, achieving standards described in the Final Order. As stated in previous SMR's, a daily discharge timing BMP is not practicable at the ELER due to staffing and budget constraints. The Department did, however, use a weekly discharge timed BMP to minimize discharge of low DO waters during potential "trigger" value periods. Weekly discharge timing entailed setting pond discharges at greater volumes when spring tide periods occur, to maximize intake and mixing. The result of this BMP is that the majority of pond discharges occur during the daytime when photosynthesis increases the pond DO levels.

During particularly weak (neap) tide periods, intake is limited and pond water has the least turnover. In reviewing previous years' data, it appears that ceasing discharge for prolonged periods of depressed DO levels may even degrade water quality. Reducing residence time of water in the ponds appears to improve overall DO levels; therefore, maintaining discharge, particularly at higher sustained volumes, provides for increased circulation and mixing. Muted tidal intake/discharge provides for the greatest circulation and mixing and is generally implemented in all ponds. It is presumed that DO levels in

the ponds were similar to ambient conditions in sloughs and the Bay, since most daily intake waters were discharged at low tide.

Refer to Table 1 for a full summary of discharge events and gate settings in 2012.

Compliance Evaluation Summary

Maintaining dissolved oxygen levels in the ponds within water quality objectives and Final Order requirements has been the most notable management challenge discovered during operation of the ponds as part of the Initial Stewardship Plan and subsequent SBSPRP Phase One actions. A number of BMPs were developed and evaluated to determine if they are sufficient as corrective actions that can be effectively implemented, beginning in 2005 and continuing through 2012, in an attempt to raise dissolved oxygen levels in the ponds. Some of the BMPs appear to be more effective than others, but it is still uncertain if the BMPs consistently improved DO levels. Improved DO may be the result of a combination of factors, both biotic and abiotic, as well as management actions, that are the driving factors in DO dynamics. Based on the results of monitoring and data evaluation, management operations in subsequent years will continue to be modified as appropriate to attempt to determine which methods of operation most improves water quality and best achieves Final Order compliance.

Previously, RWQCB suggested using some of the BMPs implemented by USFWS which appear to be successful in the Alviso Pond Complex, including installation of baffles, which direct water from portions of ponds expected to have higher DO values and block off lower DO waters caused by substantial algal mats, to help improve DO values at the discharge. The Department no longer considers the use of baffles as practical or effective pond operational measures since they were not expected to improve DO levels at discharge ponds. As discussed previously, deep borrow ditches do not generally surround ELER ponds, and the ponds are more consistently shallow than the Alviso Ponds due to operations and maintenance and land-use practices. Improvements that would be more appropriate than baffles at ELER may be implemented as part of future actions, such as changes in pond topography or geometry, could address deficiencies in achieving water quality objectives.

Strong diurnal patterns to DO levels are known to occur at the ELER complex based on previous years' water quality monitoring. Ceasing discharge on a daily basis is not a practicable means to avoid discharge of low DO waters, nor is such pond management/operation likely to improve water quality. Conversely, cessation of daily pond discharges may, in fact, decrease water quality. BMPs such as weekly discharge timing, reduced discharge gate settings and draining system waters to seasonal ponds to increase intake were implemented by the Department at ELER to address low DO values and appear to be sufficiently protective of receiving waters. For Systems E10 and E2, pond water is discharged to the open Bay and quickly disperses. At lower tides the discharge is spread over extensive mudflats. In 2012, discharge gates were generally set to allow increased discharge volumes, similar to the two previous years. This was done to decrease residence time and improve mixing. More continuous operational periods,

rather than intermittent operations, appear to help raise water quality values, at least with respect to salinity, and may be affective for other parameters as well.

The BMP in which large volumes of system pond waters are drained into adjacent seasonal ponds (for systems which have dry ponds to efficiently receive system water) may successfully improve water quality in discharge ponds and within the overall systems. Similarly, muted tidal ponds with modified pond operations for construction would be expected to have similar water quality values to the sloughs and Bay.

Data Collection, Evaluation and Communication

In 2012, sufficient data were collected for monitoring purposes using salinity grab samples and collection of pond water level data, as well as waterbird use number ranges and patterns. In 2012, the Department provided operations and monitoring data to the RWQCB staff electronically, rather than by means of this report. It should be noted that pond operations were monitored as often as possible, given staff limitations. The Department conducted its own, limited monitoring in 2012. One Department biologist conducted pond operations and management, monitoring, review, and interpretation of data. The Department has generally been able to consider and implement operational and management decisions effectively.

Final Order requirements regarding communication of compliance to the RWQCB was considered to be satisfactorily completed by email, telephone and in-person meetings. Additionally, the Department has supported providing data to RWQCB by posting files to its FTP site. This continued dialogue is helpful in addressing concerns conveyed by means of conversations and written communications between the Department and RWQCB staff and is useful in determining appropriate pond management operations.

Summary and Implementation Schedule for Phase 1 Actions and Requests for Revisions to SMP:

SBSPRP Phase One actions at ELER include tidal salt marsh habitat restoration, managed pond reconfiguration, and recreation/public access actions, as well as monitoring activities and applied studies. SBSPRP Phase One actions will restore a mosaic of habitats, including tidal salt marsh, tidal mudflat, salt panne, subtidal flats and channels, sloughs, ponds, marsh ecotones/upland transition zones, and open water habitats (managed ponds), to support populations of fish and wildlife, special-status species, migratory waterfowl, shorebirds, and anadromous and resident fishes. Full tidal action in ponds E9, E8A and E8X was initiated in Fall, 2011, following completion of construction activities which included excavation of pilot channels, levee lowering, installation of borrow ditch blocks and levee breaching. Development of tidal salt marsh habitat in ponds E9, E8A and E8X is expected to begin within two to five years, with more complex habitat being developed in the decades thereafter over the 50 year project planning period and encompassing 630 acres of restored ponds.

Also included in Phase One at ELER is reconfiguration of Ponds E12 and 13, which commenced in January, 2013. Ponds E12 and E13 will be reconfigured and managed as a small-scale salt pond system to create 230 acres of high quality shallow water foraging areas at varying salinities and 6 constructed nesting islands. This action will include the replacement of an existing pump, installation of three new water control structures for intake and discharge, development of an internal water circulation system using a series of berms and ditches and weirs, and the construction of nesting islands. Reconfiguration of Ponds E12 and E13 will create shallow water foraging habitat for resident and migratory shorebirds, with a range of salinities, and a limited number of islands for nesting bird habitat. Activities at Ponds E12 and E13 will test the extent to which focused management of shallow water habitats can increase migratory shorebird densities and the importance of salinity on the density of foraging shorebirds and their prey. Monitoring activities at these ponds will also evaluate techniques for water and salinity management. Ostensibly, Pond E14 has been reconfigured, since the levees surrounding this pond abut the levees constructed for tidal restoration (E9/8A/8X) and the reconfigured managed ponds (E12/13), but E14 operations are expected to remain similar to previous years as a seasonal pond for WSP management activities. Reconfiguration of ponds E12 and E13 is anticipated to require two construction seasons, completed in late 2014, and full operations beginning in 2015.

Evaluation of pond management and operations, along with monitoring data collected since 2004 continues to inform the design of Ponds E12 and E13 such that minor modifications to the topography of the reconfigured managed ponds, along with sufficient capacity of new water control structures, is intended to improve water quality and shorebird habitat values.

Planning for SBSPRP Phase Two actions has begun, and the Department is formulating potential restoration actions along with other partner agencies on the SBSP Project Management Team. Until ponds E12 and E13 are reconfigured and operational, no new data collection is proposed to provide a framework for developing a site-specific objective for dissolved oxygen in managed ponds.

Operations and Maintenance activities in 2012 were appropriately covered under the Final Order for the SBSPRP. The Department will continue to review the SBSPRP Final Order with respect to the proposed 2013 operations and monitoring results, and will make requests for alterations to the new Final Order as appropriate in future reports.

The Department proposes continued modified pond operations, such that Table 3 “Water Quality Monitoring For Eden Landing Ponds” only require type “A” monitoring activities. Type “B” and “C” monitoring, during discharge periods of greater than 25% of WCS capacity, does not appear necessary. Sustained, higher-volume discharges and corresponding reduced residence time of pond water is expected to improve overall DO levels; therefore, allowing discharges at greater than 25% provides for increased circulation and mixing. This is particularly important in System E6A ponds, which require lower water surface elevations in order to maintain WSP nesting habitat.

Maintaining low salinity in continuous circulation operations within borrow ditches is also important in order to meet the objective of providing for multi-season, multi-species management of the ponds, including winter operations for diving duck management.

ATTACHMENT:

2013 Pond Operations Plans