ALTERNATIVES DEVELOPMENT, SCREENING, AND ANALYSIS

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Table of Contents

Tables

Figures

Acronyms

2007 EIS/R	2007 South Bay Salt Pond Restoration Project Programmatic EIS/R
AAC	All-American Canal
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
EIS/R	Phase 2 Environmental Impact Statement/Environmental Impact Report
MHHW	mean higher-high water
NEPA	National Environmental Policy Act
PG&E	Pacific Gas and Electric Company
PMT	Project Management Team
Refuge	Don Edwards San Francisco Bay National Wildlife Refuge
Reserve	Eden Landing State Ecological Reserve
SBSP	South Bay Salt Pond
SLR	sea-level rise
USFWS	United States Fish and Wildlife Service

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1. INTRODUCTION

1.1 Overview

Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project involves the development and selection of alternatives, restoration design, environmental clearance, permitting, and construction activities at several former salt evaporation ponds that had been owned and operated by the Cargill Inc. Those salt ponds are now under the ownership and management of the United States Fish and Wildlife Service (USFWS) or the California Department of Fish and Wildlife (CDFW), depending on whether they lie within the boundaries of the Don Edwards San Francisco Bay National Wildlife Refuge (Refuge), which is owned by USFWS, or the Eden Landing State Ecological Reserve (Reserve), which is owned by CDFW.

Within those two large areas are many individual salt ponds, and several groups or "clusters" of these ponds are being analyzed for inclusion in the SBSP Restoration Project's Phase 2 actions. Phase 2 of the SBSP Restoration Project involves three pond clusters in the Refuge. One of the pond clusters is in the Ravenswood portion of the Refuge; the Phase 2 ponds include Ponds R3, R4, R5, and S5. The other two clusters are in the Alviso portion of the Refuge. One consists of Ponds A19, A20, and A21, which are together referred to as the "Island Ponds." The other consists of Ponds A1 and A2W, which are together referred to as the "Mountain View Ponds." The Mountain View pond cluster may eventually include the adjacent Charleston Slough, which is owned by the City of Mountain View and is not technically part of the SBSP Restoration Project. The possible inclusion of Charleston Slough is discussed in more detail in Section 2. [1]

Phase 2 also includes the southern half of the Eden Landing Reserve, but for a variety of reasons, the selection and design of restoration actions in the Reserve will be performed separate from and subsequent to the selection and design of restoration actions in the Refuge. Thus, the Eden Landing Ponds are not included in this part of the project planning or in this analysis.

This document presents the purpose, methods, and results of creating alternatives for the SBSP Restoration Project, developing screening criteria for those alternatives, and applying those criteria to select specific alternatives for inclusion in the project's Phase 2 Environmental Impact Statement/Report (EIS/R). The organization of the document is as follows:

- Section 1 discusses the document structure and the purpose of the alternatives development and screening process and places this work in the context of the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), and the SBSP Restoration Project's three primary goals of habitat restoration, improved recreation and public access, and flood risk protection.
- Section 2 presents the alternatives developed for each of the three pond clusters that are the focus of this portion of Phase 2. Section 2 discusses the individual component actions, the variations on

[1] A fourth cluster of ponds was added to the Phase 2 planning and conceptual design, but that addition did not occur until after the alternatives development and screening discussed here. The ponds are Alviso A8 and A8S, which were part of the Phase 1 actions in the Alviso pond complex. For Phase 2, the only action component considered for those ponds was to use available upland fill material from off-site construction sites to construct upland transition zones in the southern corners of Pond A8S. There was no need to include that single action in a formal alternatives analysis. That cluster and its no action and action alternatives are being included in the Phase 2 Draft EIS/R.

those component actions, and their combinations to form different "bundles" that constitute the alternatives.

- Section 3 presents the screening criteria that were devised for the SBSP Restoration Project. Specifically, this section discusses the scoring system and defines the scores behind each of the criteria.
- Section 4 presents the methods used to apply the screening criteria to the alternatives and the results of that application. It lists the alternatives that were selected for inclusion in the EIS/R, and it explains the others that were removed from further development and consideration.

1.2 Purpose

This document is intended to present the methods, process, and results of the SBSP Project's alternatives development and screening.

The alternatives themselves are developed in compliance with NEPA and CEQA. NEPA requires development and consideration of a range of "reasonable alternatives." CEQA requires alternatives that would "minimize significant impacts." The alternatives considered must also meet the project's stated purpose, need, and objectives. The SBSP Project has three primary goals: habitat restoration, provision of recreation and public access, and maintenance or improvement of current levels of flood protection.

Previously, as part of NEPA and CEQA compliance, the project lead agencies completed the 2007 South Bay Salt Pond Restoration Project Programmatic EIS/R (2007 EIS/R) for the project as a whole. The 2007 EIS/R developed long-term, end-project "target" habitat designations for each of the ponds in the project for each of two action scenarios:

- A split of 50 percent (by acreage) restoration to tidal marsh and 50 percent managed ponds; and
- A split of 90 percent restoration to tidal marsh and 10 percent managed ponds.

These two scenarios were the Programmatic Alternative B and Programmatic Alternative C, respectively. Programmatic Alternative C was selected. However, the adaptive management approach to the project allows some flexibility in the decision about whether to stop tidal marsh restoration at one of these two endpoints or somewhere in between them. A decision will be made in a future project phase, when the total acreages of tidal marsh restoration would be approaching 50 percent. At that time, there would be a decision about whether to cease restoration to tidal marsh or continue to work toward the 90 percent target. Because the intent of project proponents is that the Phase 2 projects tier from the 2007 EIS/R, the alternatives considered were those that worked toward the end-project target habitat designation in the 50 percent-50 percent (50-50) scenario presented in the 2007 EIS/R. Future project phases may or may not proceed toward a higher proportion of tidal marsh.

This document demonstrates the SBSP Project's successful meeting of the requirements to develop and consider a broad range of Project and No Project Alternatives. (These are the CEQA terms. They are referred to under NEPA as the Action and No Action Alternatives; this document uses the CEQA terms for each of the groups of ponds considered under Phase 2.)

2. ALTERNATIVES

This section presents the alternatives developed for each of the three pond clusters in this part of Phase 2 of the SBSP Restoration Project. Each cluster is discussed separately. The order of discussion is Alviso-Island Ponds, Alviso-Mountain View Ponds, and Ravenswood Ponds.

The discussion for each cluster begins with a statement target habitat for each pond (its "destination") as defined in the 2007 EIS/R, lists the major recreation and public access goals at that cluster, and notes any flood control management issues. The discussion then lists and explains the individual components, their variations, and what they are intended to achieve. The discussion then lists and explains the bundling of different components into complete alternatives. As noted in Section 1, the alternatives need to encompass the full range of actions that may eventually be implemented as part of Phase 2. Subsequently, the EIS/R must analyze the full range of alternative actions. Section 2 includes map figures to illustrate each of the alternatives and matrices to summarize each alternative's component parts and to easily compare and contrast an alternative with others at that pond cluster.

2.1 Alviso-Island Ponds

Ponds A19, A20, and A21, the Island Ponds, are arranged from east to west between Mud Slough to the north and Coyote Creek to the south. In the 2007 EIS/R, they are designated as tidal marsh habitat. The southern sides of these ponds were breached in 2006 as part of the Initial Stewardship Plan. Since then, their progress toward tidal marsh has been somewhat uneven. Pond A21, the westernmost and closest to the bay, has been accreting sediment quite rapidly, and vegetation is taking hold there. By contrast, Pond A19 is not accreting much sediment, and there is little new vegetation there. Pond A20 is somewhat between these two extremes.

2.1.1 Goals

The main purpose of Phase 2 actions at the Island Ponds is to improve the rate of accretion in Ponds A19 and A20 and improve the overall ecological condition of the habitat. A related issue is to ensure that the rate of sediment accretion and marsh development keeps pace with expected future sea-level rise (SLR). There are no flood management or flood control opportunities at the Island Ponds, and because of their relatively inaccessible location, they are not good recreation destinations. The 2007 EIS/R laid out no recreation or flood control goals for these ponds.

2.1.2 Components and Variations

There are six components under consideration for the Island Ponds. These components and their purposes are described below.

- Breach the levee on the north side of Pond A19 in one or two places. This component would allow tidal flows from Mud Slough to enter the pond, and these flows are expected to increase the sediment accretion rate in the pond.
- Lower (or remove) much of the Pond A19 levee. In the basic implementation of this component, the existing levees on the northern, western, and southern sides of Pond A19 would be lowered to below mean higher-high water (MHHW) between the existing breach on the southern levee and a proposed breach location on the northern levee. This lowering would increase the tidal prism in Pond A19 and further speed sediment accretion by creating a tidal sill that is expected to help

retain sediment. In a variation of this component, these portions of the levees would be removed all the way down to the surrounding marsh plain elevation. This levee removal would further speed sedimentation but could also reduce the quality of the pond as habitat for juvenile fish and other aquatic species.

- Lower (or remove) much of the Pond A20 levee. Similar to the analogous component at Pond A19, this component would either lower or remove the existing levees around much of Pond A20. The difference is that the levee alterations would extend from the center point of the northern levee, along the eastern levee, and to the existing breach on the southern levee.
- Breach the north-side levees of Ponds A19, A20, and A21. By breaching the north sides of all three Island Ponds, restoration is expected to be sped up at all three ponds. Although speeding restoration at Pond A21 is not a primary goal, the sooner this pond reaches its sediment equilibrium, the sooner additional sediment will be available for the other two ponds, which is expected to speed their accretion.
- Connect Pond A19 with Pond A20. This component would remove most of the levees that currently separate these two ponds by lowering them to the elevation of the narrow strip of marsh that runs between them. The effect would be to improve the quality of the aquatic habitat there. Eventually, these ponds would be tidal marsh anyway, but in the time it takes to fill in, the ecological function of the ponds as fish nurseries would be improved by their connectedness and greater hydrological circulation. It would be possible to implement this component while only lowering portions of the northern and southern levees of Ponds A19 and A20.
- Add pilot channels in Pond A19. What sediment is reaching Pond A19 through its southern breaches tends to be deposited just inside the breaches and not be distributed more widely throughout the pond. Adding pilot channels from the breaches into the more distant parts of the pond would allow a more even delivery of sediment from Coyote Creek.
- Widen the southern breaches of Pond A19. Increasing the width of the southern breaches in Pond A19 would increase the tidal flux and would be expected to increase sediment delivery to the pond. Generally, an undersized breach will scour as the tide flows through it; however, in this case, because of the relatively low flow volumes and velocities, the scouring may be too slow to be useful. This action would speed that process while limiting the possible adverse impacts from modifying the breaches on the northern side of Pond A19.

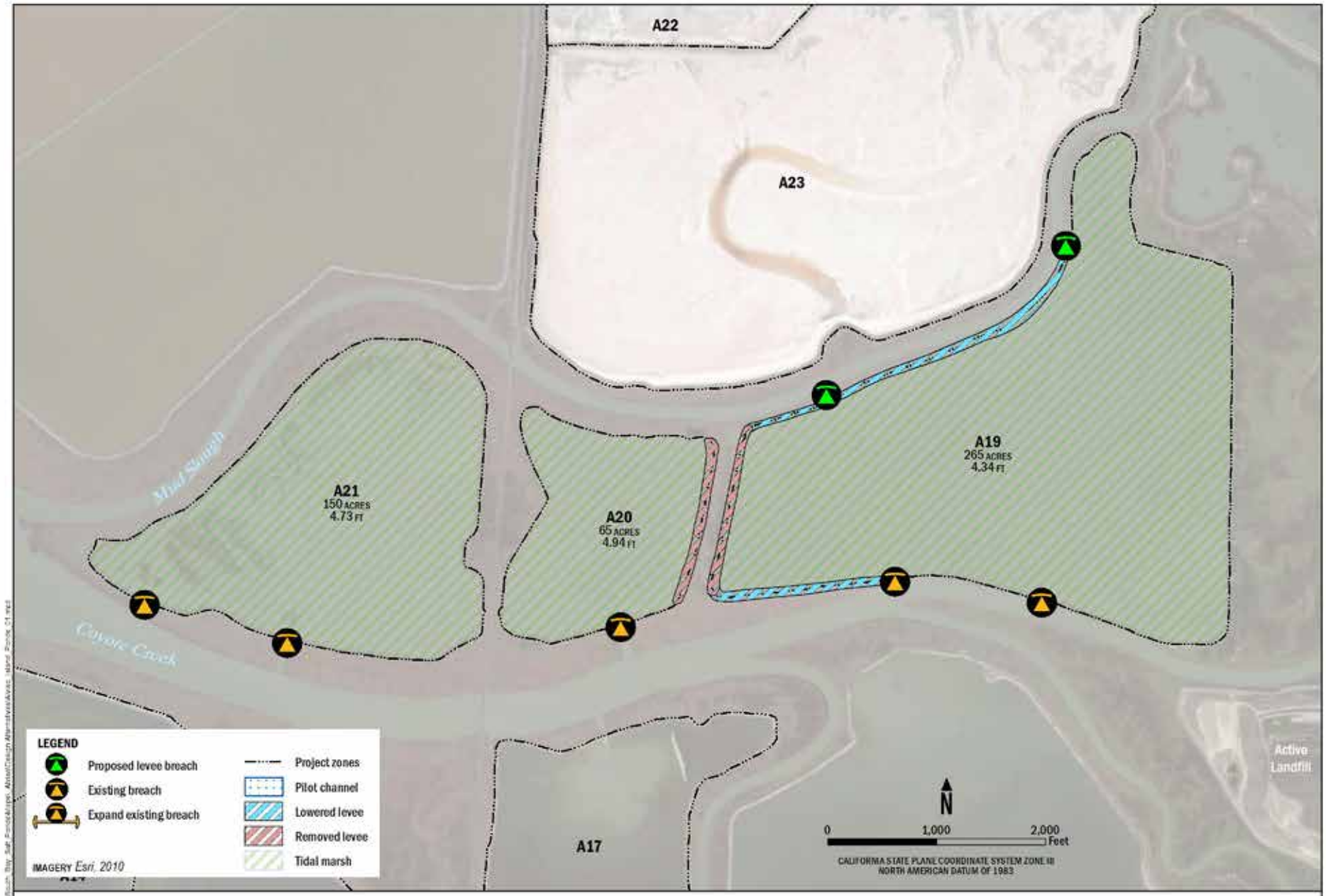
One other component was considered for the Island Ponds but removed. Augmenting these ponds with fill material was found to be unnecessary at this location. Further, because of the relatively high cost and difficulty of pumping or otherwise delivering dredge spoils or upland fill material to the Island Ponds, it was omitted as a component of alternatives at this cluster.

2.1.3 Alternatives

Table 1 shows the combination of the above components into five Project Alternatives and a No Project Alternative. The names and numbers of the alternatives are intended to provide an indexing system and a brief description of their overall intent or effect. They are a form of shorthand to use in referring to them and do not convey any order of preference or priority. Maps of these alternatives are presented on Figures 1 through 6.

Table 1 Alternatives for the Island Ponds

ALTERNATIVE NUMBER AND NAME		COMPONENTS						
		BREACH N SIDE OF POND A19	LOWER OR REMOVE MUCH OF POND A19 LEVEE	BREACH N SIDE OF ALL 3 PONDS	LOWER OR REMOVE MUCH OF POND A20 LEVEE	CONNECT POND A19 WITH POND A20	ADD PILOT CHANNELS IN POND A19	WIDEN POND A19 SOUTHERN BREACHES
I1	**Pond A19 Focus**	Yes	Yes	No	No	Yes	No	No
I2	**Speed All Ponds**	Yes	Yes	Yes	Yes	No	No	No
I3	**Fastest Pond A19**	Yes	Yes	No	No	No	Yes	Yes
I4	**South-Side Pond A19 Only**	No	No	No	No	No	Yes	Yes
I5	**Do Everything**	Yes	Yes	Yes	Yes	Yes	Yes	Yes
I6	**No Action**	No	No	No	No	No	No	No



URS

SOUTH BAY SALT PONDS
ALVISO: ISLAND PONDS
SANTA CLARA COUNTY, CA

DATE OF PREPARATION: JANUARY 2013
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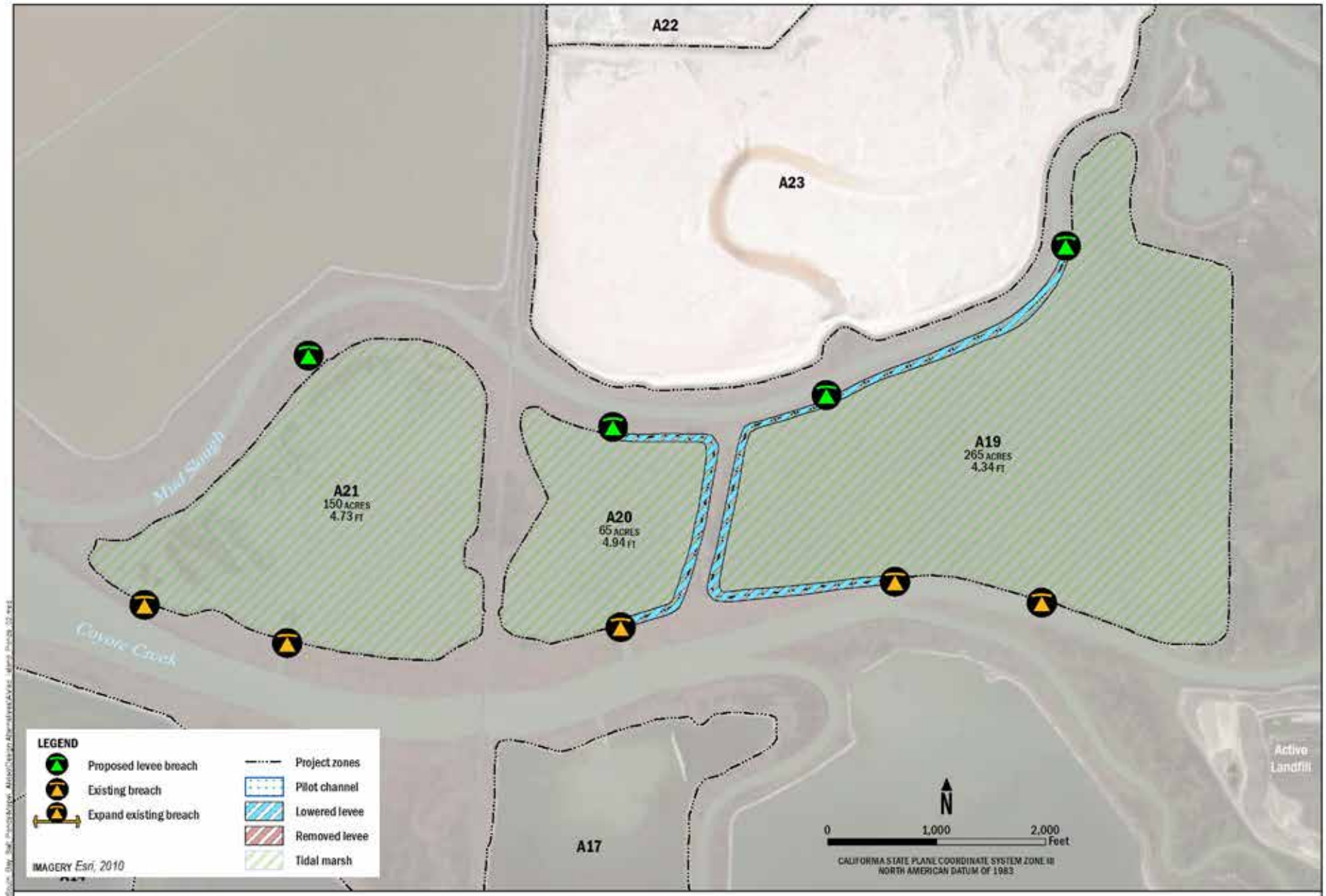
Alternative I1
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 1



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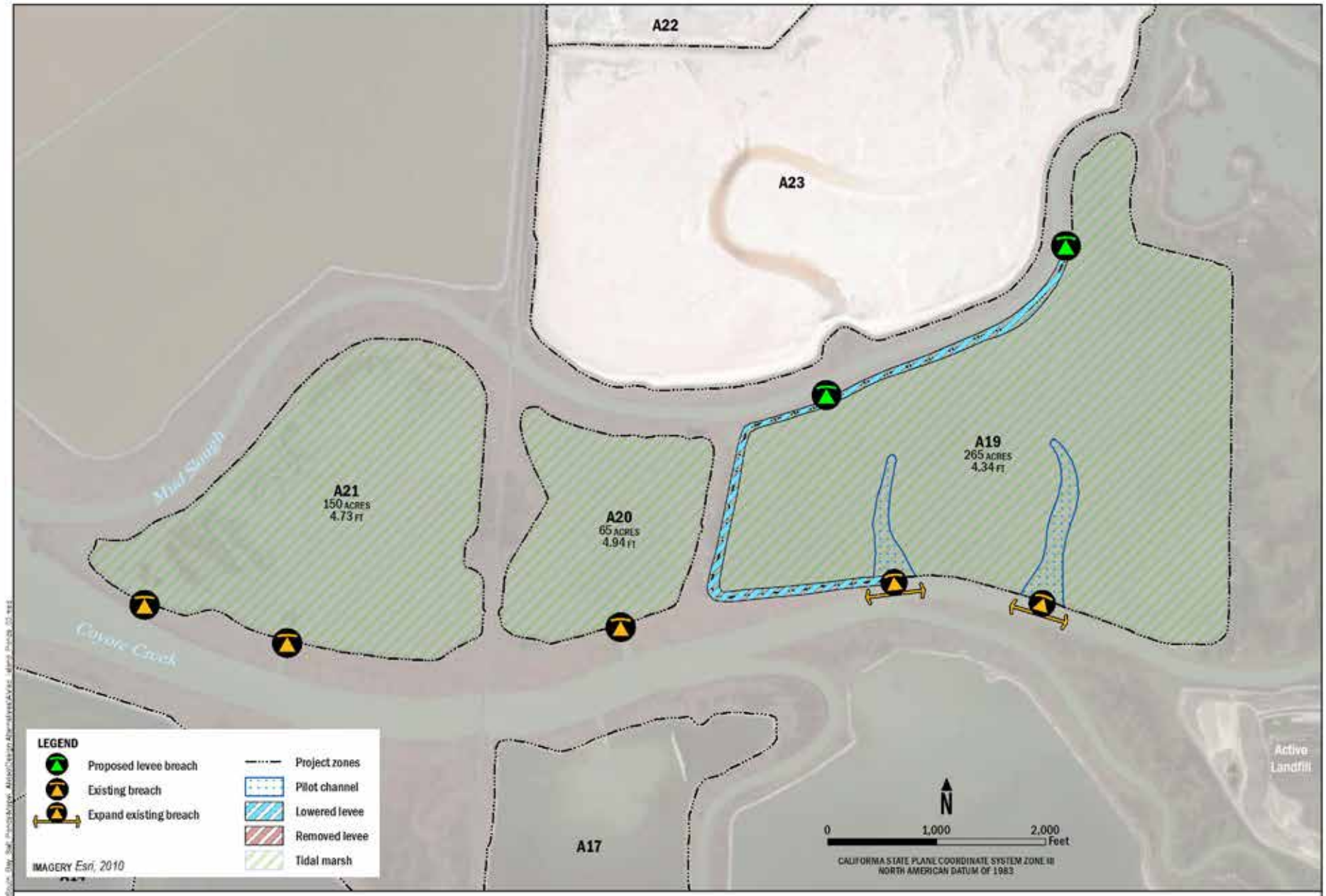
Alternative I2
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 2



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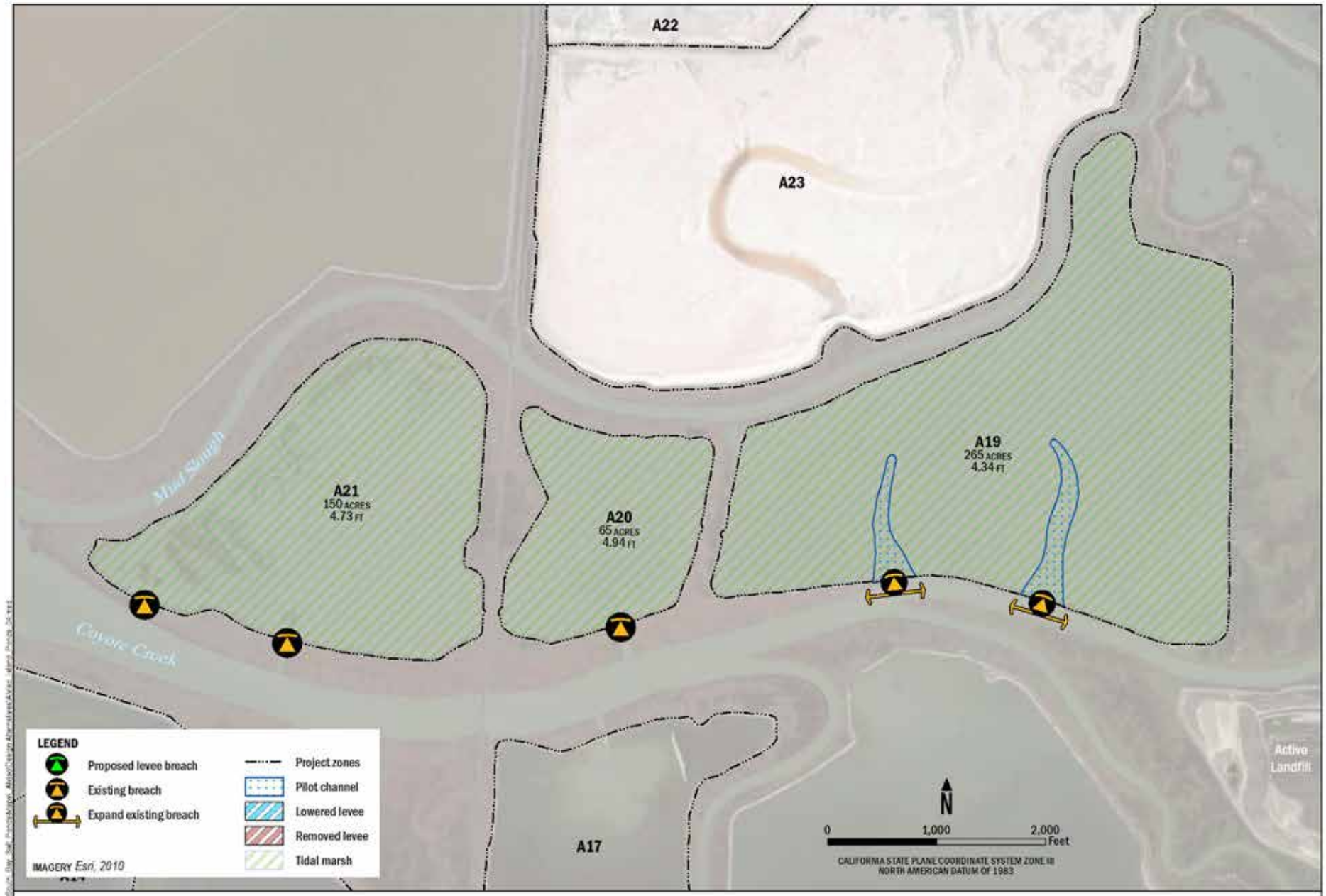
Alternative I3
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 3



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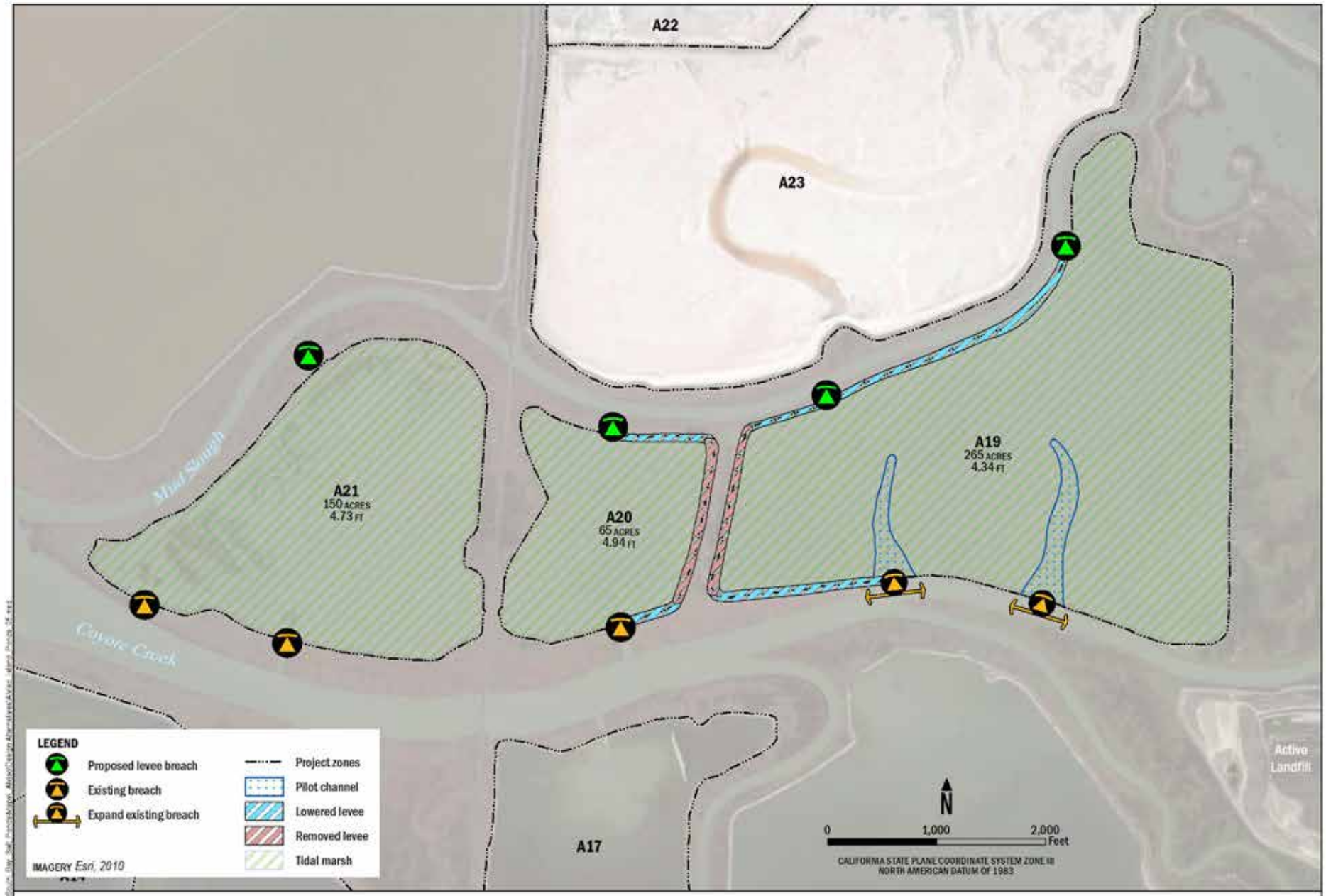
Alternative I4
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 4



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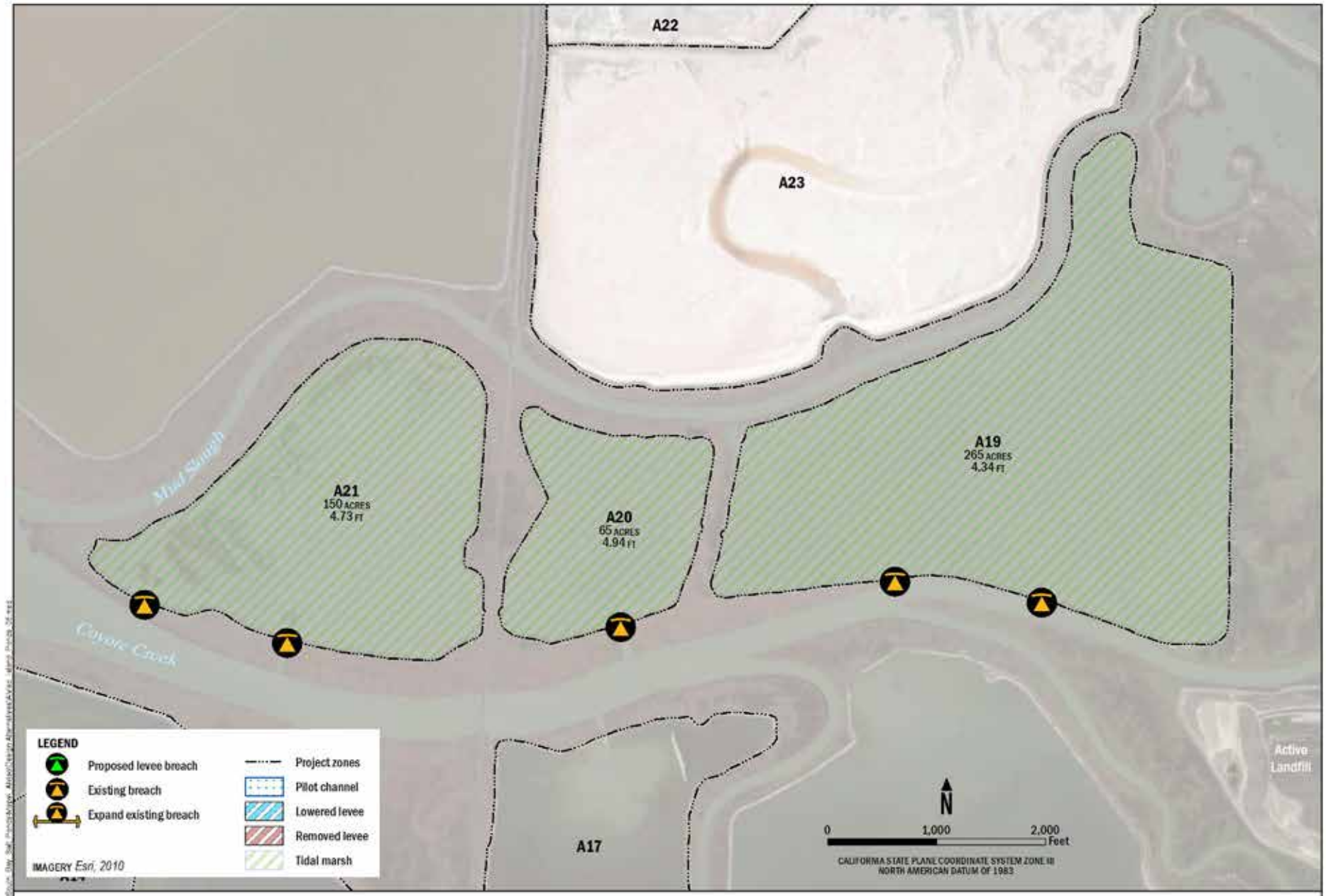
Alternative I5
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 5



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Alternative I6
ALVISO POND COMPLEX-
ISLAND PONDS

Figure 6

2.2 Alviso-Mountain View Ponds

The Mountain View Ponds are Ponds A1 and A2W, at the westernmost end of the Refuge. These ponds are immediately north of the City of Mountain View's Shoreline Park, which includes a sailing lake supplied with water taken in from Charleston Slough, to the west, and released into Mountain View Slough, which is between Pond A1 and Pond A2W.

While Ponds A1 and A2W formally constitute the Mountain View pond cluster, the Phase 2 actions under consideration also include Charleston Slough, which is owned by the City of Mountain View and is directly to the west of Pond A1. Because the City of Mountain View is under a Bay Conservation and Development Commission permit requirement to restore 53 acres of tidal marsh in Charleston Slough, the SBSP Restoration Project and the City of Mountain View are investigating ways to combine these two adjacent and similar restoration projects. For the purposes of Phase 2 planning, Charleston Slough, while neither a pond nor formally part of the USFWS's Refuge, is considered a part of the Mountain View Ponds.

Although there were Phase 1 actions in the Alviso pond complex, they were at ponds in the center of the Refuge, to the east and quite removed from Ponds A1 and A2W.

2.2.1 Goals

The main purpose of Phase 2 actions at the Mountain View Ponds is to restore Ponds A1 and A2W to tidal marsh, which is how they were designated in the 2007 EIS/R. A second primary purpose is to protect those portions of the City of Mountain View and the City of Palo Alto that border the ponds or the sloughs between and around them. The 2007 EIS/R noted a need for flood control infrastructure improvements along the western side of Pond A1 and along the southern border of Pond A1 and Charleston Slough. Any changes to the ponds that would raise the flood risk or severity would be unacceptable and not within the purpose and need stated in the 2007 EIS/R. The only recreation/public access action involving Ponds A1 or A2W listed in the 2007 EIS/R was a trail to a wildlife viewpoint along the eastern side of Pond A2W.

An associated purpose, if feasible, permissible, and cost-effective, is to collaborate with the City of Mountain View to achieve tidal marsh restoration in at least 53 acres of Charleston Slough in a way that avoids the unnecessary costs and undesirable ecological consequences of conducting two separate-yet-contiguous tidal marsh restoration projects. All of these individual elements are included in the alternative set described below.

2.2.2 Components and Variations

Nine components are under consideration for the Mountain View Ponds. They, their purposes, and their variations are presented below. Several of the components and their variations could be added to any of the alternatives, but others would be contraindicated by the definitive components of an alternative or inconsistent with its purpose. An example is that the "Habitat complexity options" component should not be implemented with the alternative called "Simplest habitat restoration."

- Breach Pond A1. This component would bring tidal flows to Pond A1 and allow it to accrete sediment until vegetation could take hold. Specific locations of these breaches would be determined later, but the general plan would be to place them at the locations of historical slough traces. Variations of this component are as follows:

- An extensive implementation to include two breaches on the western levee and a third on the eastern levee; and
- A more limited implementation that would be limited to one breach on the western levee, outside of the Charleston Slough tide gate.

- Breach Pond A2W. As above, this would bring tidal flows into Pond A2W. Implementation variations include:
  - Two breaches on the western levee and one on the eastern levee;
  - One breach on the western levee only;
  - One breach on each levee, the western one and the eastern one; and
  - Two breaches each on the western and eastern levees.
- Habitat complexity options. This component includes several independent options for adding complexity and diversity to the restoration by including one or more of the following variations in the alternatives. The purpose is to provide higher-quality habitats for the special-status species that make use of these ponds and their surroundings.
  - Constructed islands in Ponds A1 and A2W. This variation would provide habitat for avocets and diving/dabbling birds. The islands would also be places where tidal flows would be slowed and where sediment deposition might be centered.
  - Construct a habitat transition zone, also referred to as an ecotone, in Pond A1. A habitat transition zone would provide upland transition habitat for salt marsh harvest mouse (*Reithrodontomys raviventris*) and other terrestrial species and foraging habitat for a variety of shorebirds. Constructed properly, it would improve the wildlife viewing opportunities from the existing trails along Pond A1's southern shore while not harming the landfill cells below and behind it.
  - Construct a habitat transition zone in Pond A2W. The purpose of this variation would be as described for Pond A1. This habitat transition zone could extend all the way across the southern border of the pond or end near its eastern end to allow for future hydrologic connections with the Stevens Creek Marsh immediately behind it. The extent of the habitat transition zone would vary depending on which alternative is selected.
- Connect to Stevens Creek Marsh. This component would provide a culverted connection between the existing brackish-marsh mitigation area called Stevens Creek Marsh and the Phase 2 tidal marsh restoration in Pond A2W. This component would increase habitat connectivity and diversity and prevent adjacent restoration projects from being separated from each other. It would necessitate the smaller (or at least the less wide) version of the habitat transition zone option described above.
- Provide recreation and public access options. There are four items on the list of options to increase or improve recreation and public access at the Mountain View Ponds. (A fifth option—an elevated boardwalk into Pond A1—had been considered but was removed as being redundant

and infeasible.) In various combinations, the alternatives for the Mountain View Ponds select from the following menu:

- Add an interpretive feature along the trail on the southern border of Pond A1 near the eastern end;
- Add a spur trail and an interpretive feature at Charleston Slough from the existing trail on the west side of the slough;
- Add a trail along the Pond A2W eastern levee to the end of the Pacific Gas and Electric Company (PG&E) access road; this trail would include a bridge over any levee breaches on this eastern levee; and
- Add a trail (or a boardwalk and a viewing platform) along the western levee of Pond A1 to the landward levee breach or levee-lowering point; in the alternatives that do not include Charleston Slough, the levee would be improved enough to support a trail; in the alternatives that include Charleston Slough, a boardwalk would be necessary.

- Connect to Charleston Slough. As discussed in Section 2.2.1, there is an opportunity to integrate—or at least not physically separate—two adjacent marsh restoration projects. Integration by allowing Charleston Slough to connect to Pond A1 would require several other actions to be implemented: (1) remove the existing tide gate near the bay side of Charleston Slough to allow vegetation to move in and colonize what is currently tidal mud flat; (2) raise or improve the western levee along the slough that separates Charleston Slough from the Palo Alto Flood Basin; (3) add or improve flood protection along the southern end of Charleston Slough; and (4) modify the water intake system for the Shoreline Park sailing lake. These measures are not independent alternatives to each other or even complementary. Rather, all of these actions are necessary for Charleston Slough to be integrated with the SBSP Restoration Project's Phase 2 actions; they would be implemented as a package.

- Raise Pond A1's western levee. This component would be required for flood protection if Charleston Slough and the associated improvements (above) are not included in the larger project design. It would be possible but undesirable to implement this component if Charleston Slough is included.

- Lower Pond A1's western levee. For the alternatives that do include Charleston Slough and its associated flood protections measures, the western levee of Pond A1 (which separates the pond from the slough) could be lowered in addition to whatever breaches are opened. This component would increase the tidal flux and provide material to raise the elevation of the pond bottom, both of which would be expected to speed sediment accretion and vegetation establishment. This component would also increase habitat connectivity, which is beneficial for many species.

- Augment with fill material. This component would use dredged material and/or appropriate upland material to be spread throughout Ponds A1 and A2W to raise their bottom elevations. These ponds are currently subsided and several feet deep. Although it is uncertain whether this augmentation is absolutely necessary for successful marsh restoration, it is clear that such enhancement would accelerate marsh formation: the ponds are currently so deep that it would take decades for enough sediment accretion to occur that marsh plants could grow there.

Nevertheless, this component is listed as a "yes/no" choice on the matrix below but not illustrated on the maps.

2.2.3 Alternatives

Table 2 shows the combination of the above components into six Project Alternatives and a No Project Alternative. The names and numbers of the alternatives are intended to provide an indexing system and a brief description of their overall intent or effect. They are a form of shorthand to use in referring to the alternatives and do not convey any order of preference or priority. Maps of these alternatives are presented on Figures 7 through 13.

2.3 Ravenswood Ponds

The Ravenswood pond complex is at the western end of the Dumbarton Bridge, adjacent to State Route 84 as it passes through Menlo Park and a corner of Redwood City. The Phase 2 ponds at the Ravenswood portion of the Refuge formally include Ponds R4, R5, and S5. Pond R4 is large (almost 300 acres) and is dry salt panne much of the year; however, winter rains do fill it for a time. Ponds R5 and S5 are much smaller (30 acres each) and are also rainfall-fed seasonal ponds. A minor improvement to allow active management of Pond R3 (270 acres) was recently added to the consideration of Phase 2 actions at the Ravenswood Ponds.

A small triangular pond west of Pond S5 on some maps is labeled as being part of Pond S5, on others is an unlabeled pond and is not symbolized as a pond at all. To clarify and simplify the discussion here, this pond will be included as part of Pond S5 unless additional clarification is warranted.

Phase 1 actions at the Ravenswood pond complex included managed pond improvements to Pond SF2 (including construction of habitat islands) and the addition of trails and interpretive features. No flood control measures were undertaken at the Ravenswood Ponds in Phase 1.

2.3.1 Goals

The main purpose of the Phase 2 actions at the Ravenswood Ponds is to restore Pond R4 to tidal marsh and to convert the Ponds R5/S5 group from seasonal ponds to pond habitat that is managed year-round. These were the goals listed for these ponds in the 2007 EIS/R. The 2007 EIS/R also included several recreational trails and interpretive features and viewpoints around the ponds that would eventually be included in Phase 2.

In addition to these primary purposes, an action to improve the current condition of the western snowy plover (*Charadrius alexandrinus nivosus*) habitat in Pond R3 was added to consideration under Phase 2 to offset for the planned loss of plover habitat that would be caused by the restoration of Pond R4 to tidal marsh. This option would be consistent with eventual restoration of Pond R3 to a fully managed pond, but would not in itself achieve that goal.

2.3.2 Components and Variations

There are eleven components under consideration for the Ravenswood Ponds. They, their purposes, and their variations are presented below. As was discussed for the Mountain View Ponds, several of the components and their variations could be added to any of the alternatives, but others would be contraindicated by the certain components of an alternative.

- Breach Pond R4. This component would open Pond R4 to tidal flows. The primary breach location is along the eastern levee at a historic slough trace; this location is included in all of the alternatives below. A variation includes a second breach into Pond R4 at the northwestern corner near the narrow waterway separating Pond R4 from Greco Island.

Table 2 Alternatives for the Mountain View Ponds

NO	ALTERNATIVE NAME	COMPONENTS								
		BREACH POND A1 (1 = TWO ON WEST SIDE, ONE ON EAST SIDE; 2 = ONE ON WEST SIDE)	CONNECT TO CHARLESTON SLOUGH (DETAILS OF CONNECTING TO CHARLESTON SLOUGH ARE LISTED AT BOTTOM OF TABLE) [A]	LOWER POND A1 WESTERN LEVEE (YES/NO)	RAISE POND A1 WEST LEVEE (YES/NO)	BREACH POND A2W (1 = TWO ON WEST, ONE ON EAST SIDE; 2 = ONE ON WEST SIDE; 3 = ONE ON WEST, ONE ON EAST SIDE; 4 = TWO ON WEST, TWO ON EAST)	ADDITIONAL HABITAT FEATURES (1 = ISLANDS IN PONDS A1 & A2W; 2 = HTZ ON SOUTH END OF POND A1; 3 = HTZ ON SOUTH END OF POND A2W) [B]	CONNECT TO STEVENS CREEK MARSH (YES/NO)	RECREATION & PUBLIC ACCESS (DETAILS OF 1–4 ARE LISTED AT BOTTOM OF TABLE) [C]	AUGMENT WITH FILL MATERIAL (YES/NO)
M1	Balanced Approach & Charleston Slough	1	Yes	Yes	No	1	1, 2, and partial 3	Yes	1, 2, 3, and 4	Yes
M2	No Charleston Slough and Less Recreation	2	No	No	Yes	4	1, 2, and 3	No	1 and 4	Yes
M3	More Tidal Action and More Recreation	1	Yes	Yes	No	4	1, 2, and partial 3	Yes	1, 2, 3, and 4	No
M4	Simplest Habitat Restoration	2	No	No	Yes	2	None	No	1, 3, and 4	No
M5	Maximize Habitat Transition Zone	1	Yes	Yes	No	1	2 and 3	No	1, 3, and 4	No
M6	Minimize Breaches	2	Yes	Yes	No	2	2 and 3	No	1, 3, and 4	Yes
M7	No Project	No	No	No	No	No	No	No	No	No

[A] Connecting to Charleston Slough requires the following set of actions: removing existing tide gate, raising the western levee and adding a southern levee on Charleston Slough, and modifying the Shoreline Lake water supply.

[B] HTZ (habitat transition zone) in Pond A2W may extend fully across the pond's southern end or, if listed as "partial," may end some distance from its eastern side to allow hydrologic connection with Stevens Creek Marsh.

[C] Key to codes for recreation and public access components:

1 = Interpretive feature along Pond A1 southern border near eastern end.

2 = Trail & interpretive feature into Charleston Slough.

3 = Trail along Pond A2W eastern levee to end of PG&E access (with bridge over breach).

4 = Trail or boardwalk and viewing platform along Pond A1 western levee to breach.

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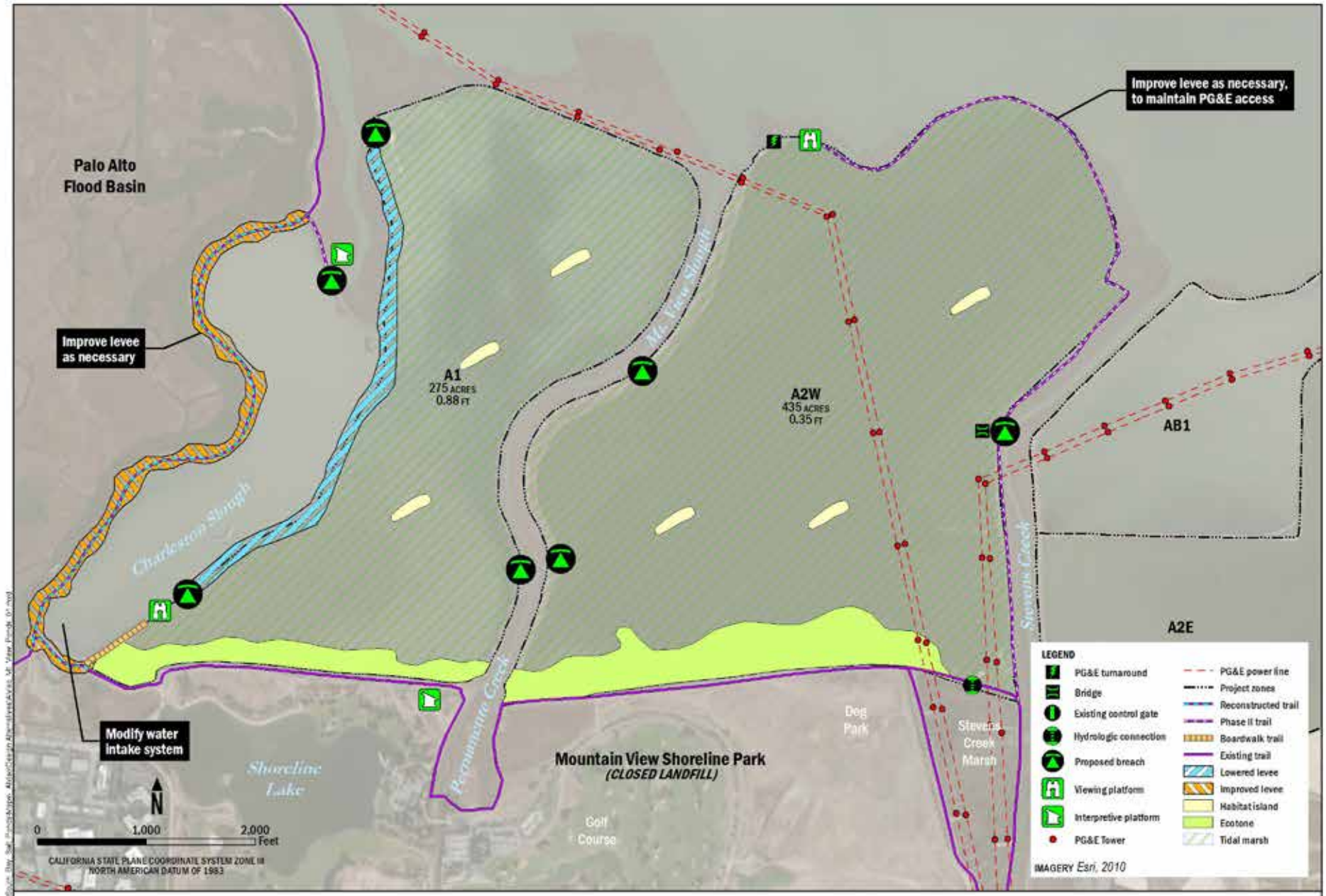

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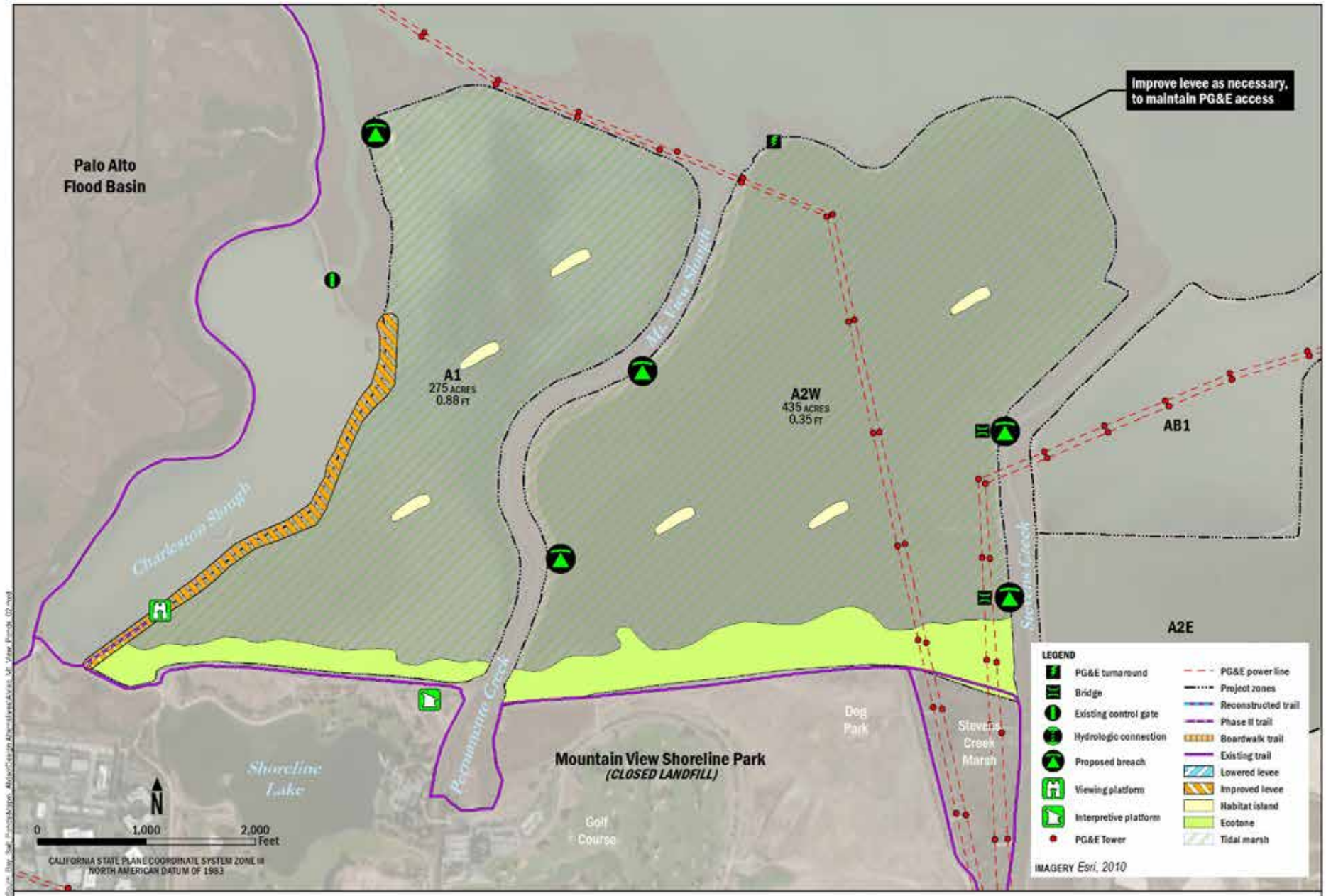
Alternative M1
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 7



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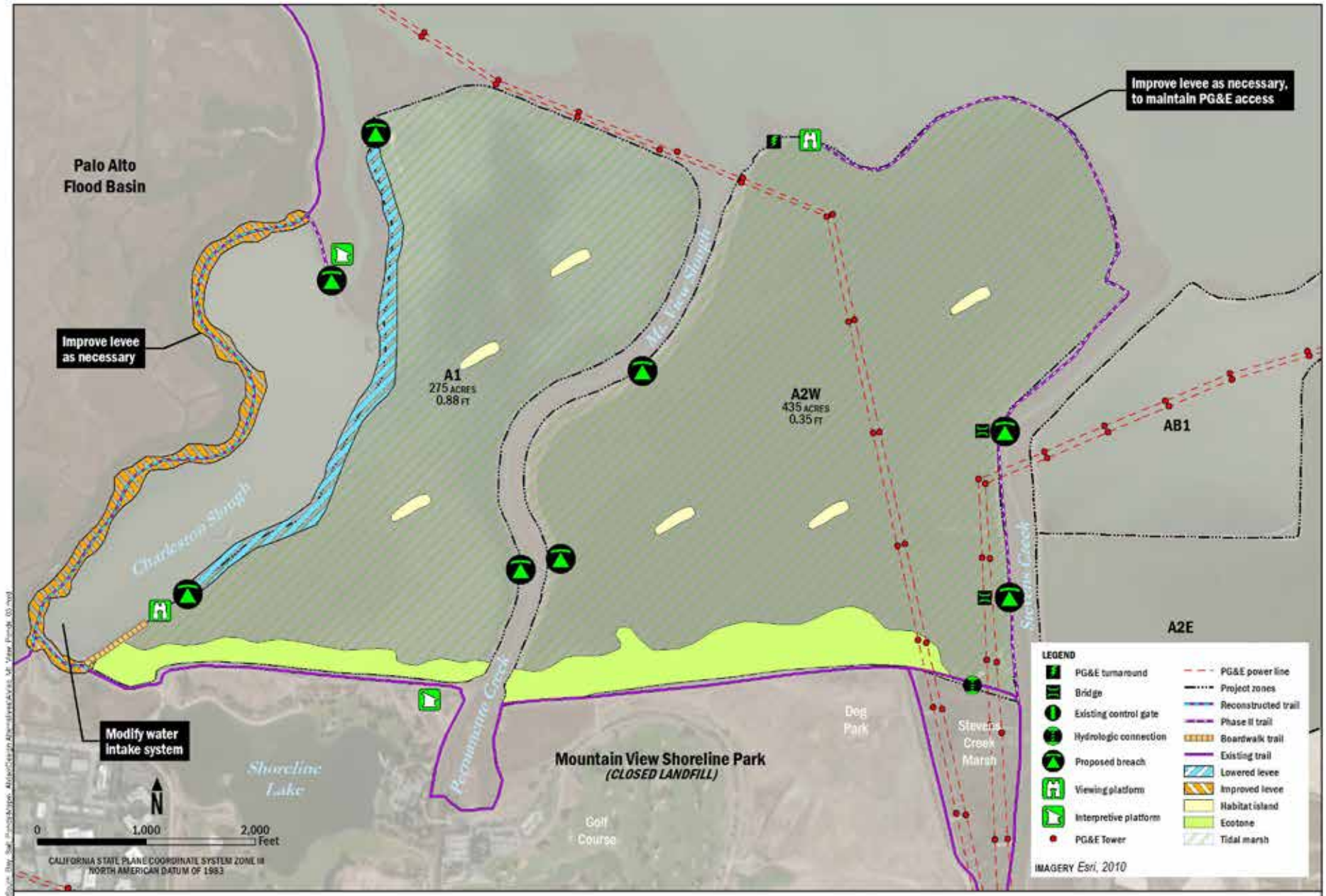
Alternative M2
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 8



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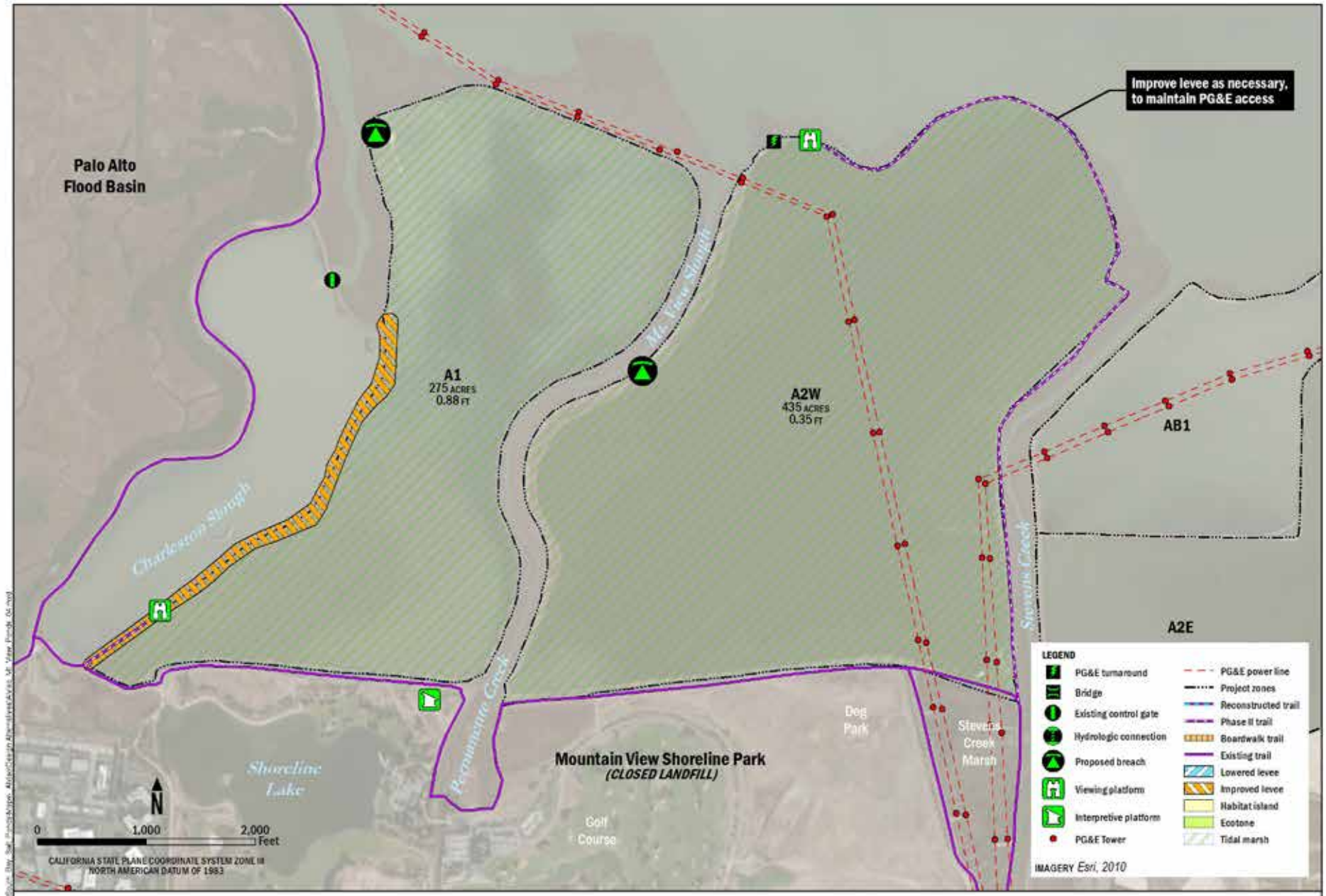
Alternative M3
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 9



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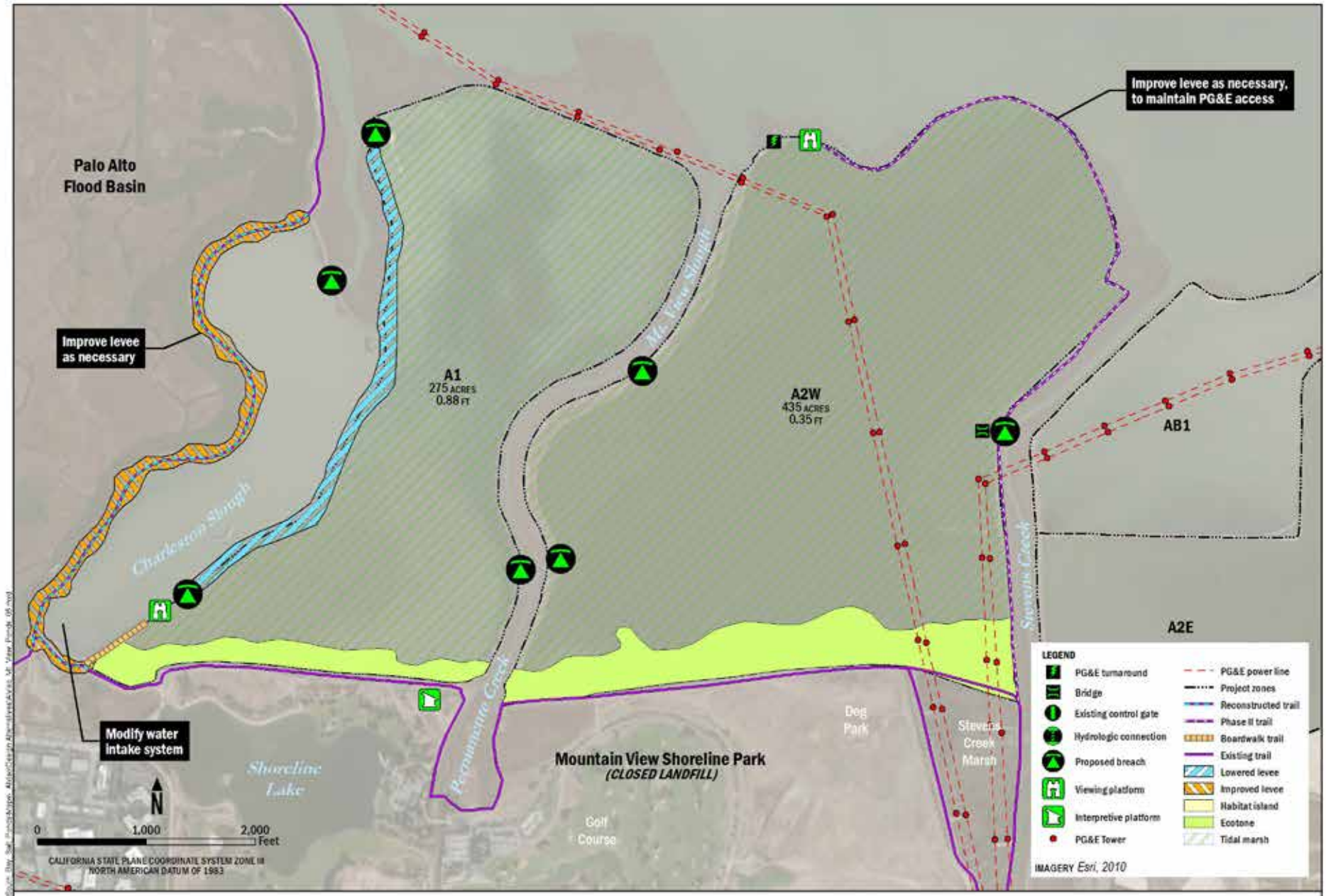
Alternative M4
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 10



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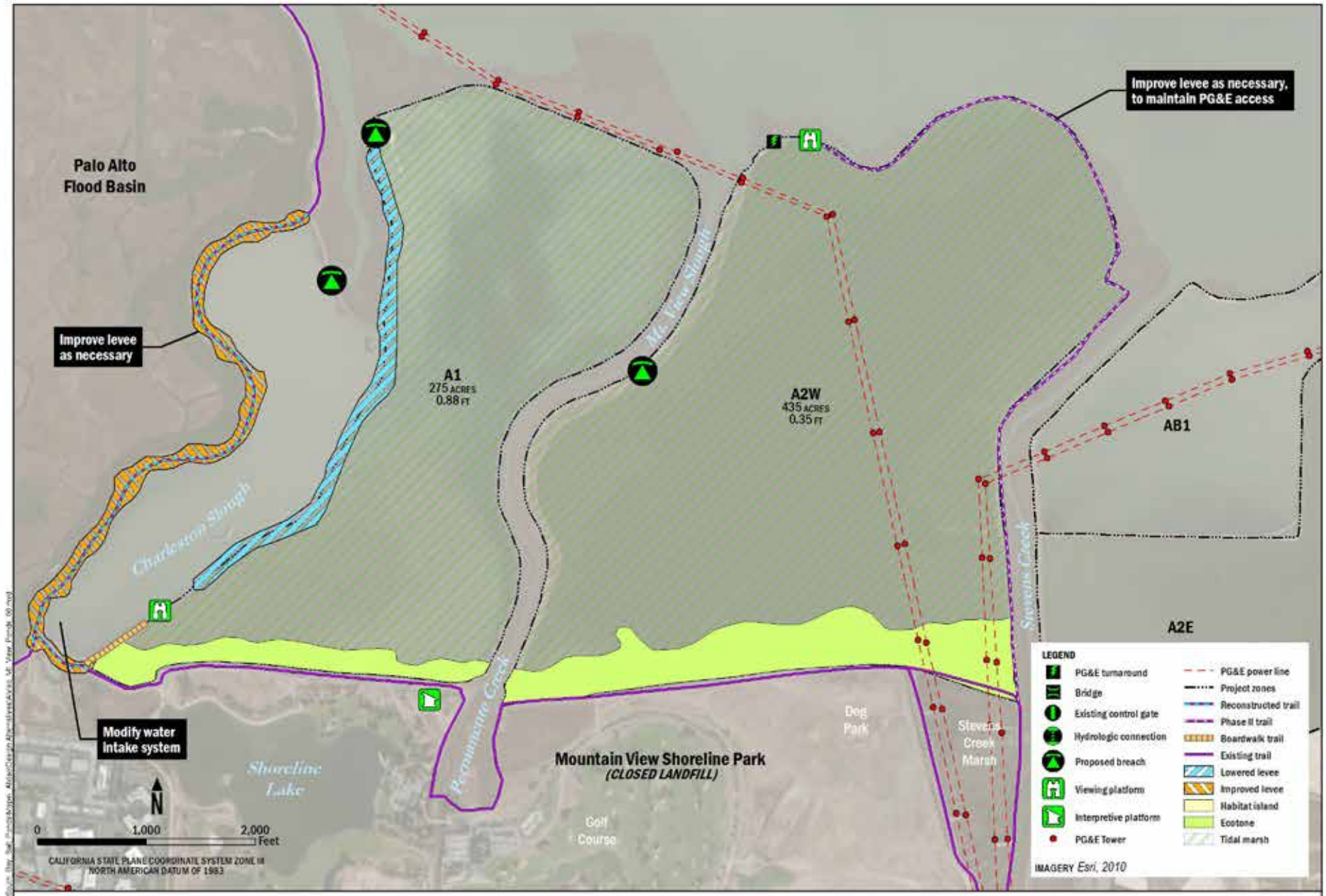
Alternative M5
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 11



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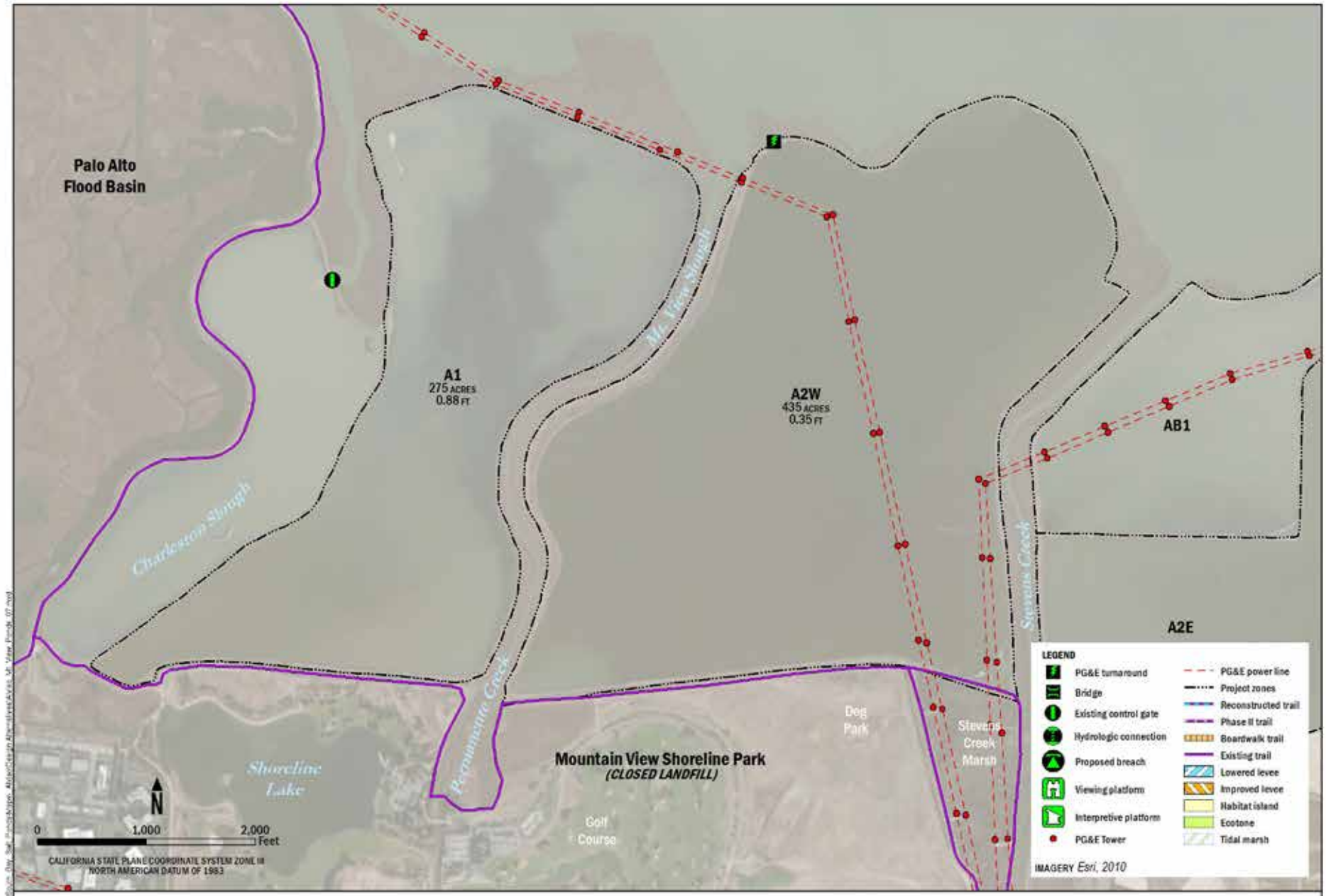
Alternative M6
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 12



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Alternative M7
ALVISO POND COMPLEX-MT. VIEW PONDS

Figure 13

- Improve and raise the All-American Canal (AAC) levees. This component would replace the flood protection currently provided by the presence of the outboard levees on Pond R4 by enhancing the level of protection provided by the internal barrier levees between it and Pond R3. Currently, a narrow channel called the AAC runs between these two ponds in a ditch separated from the ponds themselves by small levees on either side. These two internal levees would be raised, widened, and strengthened to provide additional flood protection to State Route 84 and the businesses and communities behind it. The AAC itself would be filled as part of this action. This measure is necessary because San Francisco Bay will effectively be much closer after Pond R4 is opened to tidal action. Either this component or the next one (but certainly not both) are required for Pond R4 to become tidal marsh.

- Improve and raise the southern levee of Pond R3. This component is included as an alternative to the previous one. If the AAC levees cannot be raised or improved enough to provide the required flood protection (because of either technical infeasibility or permitting/regulatory hurdles), then the next-best option to maintain or reduce current levels of flood risk is to improve the southern levee of Pond R3 that backs up against State Route 84.

- Build habitat transition zones in Pond R4. This component includes two different primary habitat transition zone variations to provide upland transition zone habitat in Pond R4. Some alternatives include both of the habitat transition zones. The first variation would extend northward into Pond R4 from the improved AAC levee. The second variation is a habitat transition zone that begins in the northwestern corner of Pond R4 and extends down the internal western edge of the pond. A modification of this variation is required in the case where the northwestern levee of Pond R4 is breached or lowered as part of another component. In these cases, the habitat transition zone would be smaller and would not extend as far to the north.

- Lower Pond R4 levee at northwestern corner. Although a levee breach in this location is a variation on an earlier component, this choice would instead lower a long section of the northwestern levee to provide habitat connectivity between Pond R4 and Greco Island, high-tide refugia for salt marsh harvest mouse and other species, and allow the highest tides to spill over in to Pond R4 and thus speed the sediment accretion.

- Modify historic slough trace in Pond R4. This component would involve modifying the existing former slough traces to allow greater tidal flows into the center of the pond after it is breached. Similar pond-bottom modifications could include filling borrow ditches and/or adding ditch blocks to direct tidal flows and speed revegetation.

- Ponds R5/S5 function. This component is essentially a three-way choice for what type of managed pond or other habitat type the Ponds R5/S5 group would be. Depending on which is selected, the next component—Ponds R5/S5 modifications—has different requirements and possibilities. The three choices are as follows:

    - Ponds managed to maintain the pond bottom at a subtidal elevation. This choice would target this pond for diving and dabbling ducks and other birds. This was the primary variation discussed in the 2007 EIS/R, and it is the clearest form of managed pond under consideration. It would involve water control structures or tide gates at Pond R5's border with Pond R4 and at the Pond S5 border (technically, the triangular pond's border) with Flood Slough, to the

west. This choice would allow year-round control of the water levels and some control of the salinities of the ponds.

- Pond modification to create a willow sausal. This choice would involve breaking up the existing internal levees of the Ponds R5/S5 group and also adding other fill material to raise the ponds' bottom elevations above the tidal flows. In combination with the diversion of stormwater runoff from the Redwood City (described below), this choice would allow the design and planting of freshwater willow sausal. The water would eventually drain into Pond R4. This novel form of restoration was not included in the 2007 EIS/R, but it would increase the diversity of habitats and incorporate other project goals.

- Ponds managed to maintain the pond bottom at an intertidal elevation. This choice would target these ponds to form tidal mud flats for shorebirds instead of diving or dabbling birds. This choice would involve removal of the internal levees and addition of other fill to create a relatively flat area that would receive regular tidal flows via a water control structure at the boundary with Pond R4 and/or at the Pond S5–Flood Slough border.

- Ponds R5/S5 modifications. This component is included to provide specification and refinement to the general "uses" for the Ponds R5/S5 group described above. This component includes three possible variants. Some of these variants must be implemented together in certain alternatives, some may be implemented, and others cannot be implemented together.

  - Water control structure to connect Pond R4 to Pond R5. This action would allow for control of water levels in Pond R5 to work toward the target habitat in the Ponds R5/S5 group or to allow flow into Pond R4 as needed for flood control or other management purposes.

  - Water control structure at western end of Pond S5. This action would allow for connection to Redwood City's stormwater outflow system and/or to Flood Slough. A two-way structure here would allow peak runoff from Redwood City to be temporarily diverted into Ponds R5 and S5 and then back into Flood Slough when the tide is low enough to accept the water. The water control structure would also provide more management flexibility for either the managed pond or the tidal mud flat choices at these ponds, though not necessarily for use in Redwood City stormwater detention.

  - Remove or modify some or all of the internal levees in the Ponds R5/S5 group. There are currently barriers between Pond R5 and Pond S5 and between Pond S5 and the small triangular pond. Depending on the choices selected above, it may be necessary or advantageous to modify or remove these levees partly or entirely. For example, to maximize stormwater detention capacity, it would be best to completely remove these levees. However, to provide habitat diversity and complexity in the pure managed pond alternatives, portions of these levees could be maintained as habitat islands.

- Pond R3 water control gate. This simple yes/no component would install one water control structure on the eastern levee of Pond R3 at its historic slough trace and another on its levee border with Pond S5. This component would allow direct control over water levels in the pond, which is desirable as an improvement to the western snowy plover habitat that Pond R3 currently provides.

- Provide recreation and public access options. There are three items on the list of Phase 2 options to increase or improve the recreation and public access at the Ravenswood pond complex. A fourth option—a spur trail on the raised and improved AAC levees—was viewed as not feasible and removed before screening. In various combinations, the alternatives are selected from this menu:
  - Add a trail along the eastern levees of Ponds R5/S5 to form a loop around these ponds.
  - Add or improve the environmental education opportunities on the loop trail around Ponds R5 and S5 to make full use of these ponds as "habitat for people." These ponds are small and relatively close to a high-use public park (Menlo Park's Bedwell Bayfront Park) that is not under USFWS control. These ponds are not ideal habitat for any particular species or guild. So providing some general restoration and emphasizing the environmental education and recreation/access features of these ponds may be their highest use.
  - Add a spur trail and viewing platform at the northwestern corner of Pond R4. The trail would begin at the corner of Bedwell Bayfront Park and extend to the northeast either along the unmodified levee (in alternatives that do not modify it) or on a boardwalk above it (in alternatives that either lower or breach this levee).
- Augment Pond R4 with fill material. As in Section 2.2.2 concerning the Mountain View Ponds, this component would use dredged material and/or appropriate upland material to spread into Ponds R4, R5, and/or S5 to raise their bottom elevations. Although this modification is probably not necessary for successful marsh restoration in Pond R4, it could speed it. Depending on the intended use and habitat function selected for Ponds R5 and S5, the use of fill may be required or contraindicated. This component is listed as a yes/no choice on the matrix in Table 3, but is not illustrated on the maps.

2.3.3 Alternatives

Table 3 shows the combination of the above components into seven Project Alternatives and a No Project Alternative. The names and numbers of the alternatives are intended to provide an indexing system and a brief description of their overall intent or effect. They are a form of shorthand to use in referring to them and do not convey any order of preference or priority. Maps of these alternatives are presented on Figures 14 through 21.

Table 3 Alternatives for the Ravenswood Ponds

NO.	NAME	COMPONENTS										
		BREACH POND R4: (1 = AT EASTERN SLOUGH TRACE; 2 = AT NW CORNER)	IMPROVE LEVEES ALONG AAC (YES/NO)	RAISE POND R3 SOUTHERN LEVEE (YES/NO)	POND R4 HABITAT TRANSITION ZONE (1 = EXTENDS FROM THE W-NW CORNER LEVEE; 2 = EXTENDS NORTH FROM AAC LEVEE) [A]	MODIFY HISTORIC SLOUGH TRACE IN POND R4 (YES/NO)	LOWER POND R4 LEVEE NEAR GRECO ISLAND (YES/NO)	PONDS R5/S5 FUNCTION (1 = MANAGED PONDS; 2 = WILLOW SAUSAL; 3 = TIDAL MUD FLATS)	PONDS R5/S5 MODIFICATIONS: (1 = CONNECTION TO POND R4; 2 = REDWOOD CITY STORMWATER CONNECTION; 3 = REMOVE ALL INTERNAL LEVEES; 4 = REMOVE SOME INTERNAL LEVEES)	POND R3 WATER CONTROL GATE (YES/NO)	RECREATION & PUBLIC ACCESS: (DETAILS OF 1 THROUGH 3 ARE LISTED AT BOTTOM OF TABLE) [B]	AUGMENT POND R4 WITH FILL MATERIAL (YES/NO)
R1	**Pond R4 Tidal, Ponds R5/S5 Managed Ponds**	1	Yes	No	1 and 2	No	No	1	1 and 4	Yes	1, 2, and 3	Yes
R2	**Ponds R5/S5 Willow Sausal**	1	Yes	No	2	No	No	2	2 and 3	No	1, 2, and 3	Yes
R3	**Ponds R5/S5 for Redwood City Stormwater Capacity**	1	Yes	No	1 and 2	No	No	1	1, 2, and 3	Yes	1, 2, and 3	No
R4	**Ponds R5/S5 Mud Flats / Shorebird Habitat**	1 and 2	Yes	No	1 and 2	Yes	Yes	3	1 and 3	Yes	1, 2, and 3	No
R5	**No AAC Levee Improvements or Interior Pond R4 Modification**	1	No	Yes	No	No	No	1	1 and 4	No	1 and 2	No
R6	**Maximum Tidal Flow in Pond R4 and Maximum Recreation**	1 and 2	Yes	No	1 and 2	Yes	Yes	1	1 and 4	No	1, 2, and 3	No
R7	**Less Recreation**	1	Yes	No	1	Yes	Yes	1	1 and 4	No	2	Yes
R8	**No Action**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

[A] Shape of a habitat transition zone from the W-NW corner of Pond R4 is dependent on whether a portion of the levee adjacent to it is also lowered. Approximations of these constraints are illustrated on the figures.

[B] Key to codes for recreation and public access components:

1 = Trail on eastern edge of Ponds R5/S5.

2 = Add/improve environmental education exhibits around Ponds R5/S5.

3 = Boardwalk or trail to viewpoint at NW Pond R4; boardwalk required if the Pond R4 levee near Greco Island is lowered; otherwise, it would be a trail.

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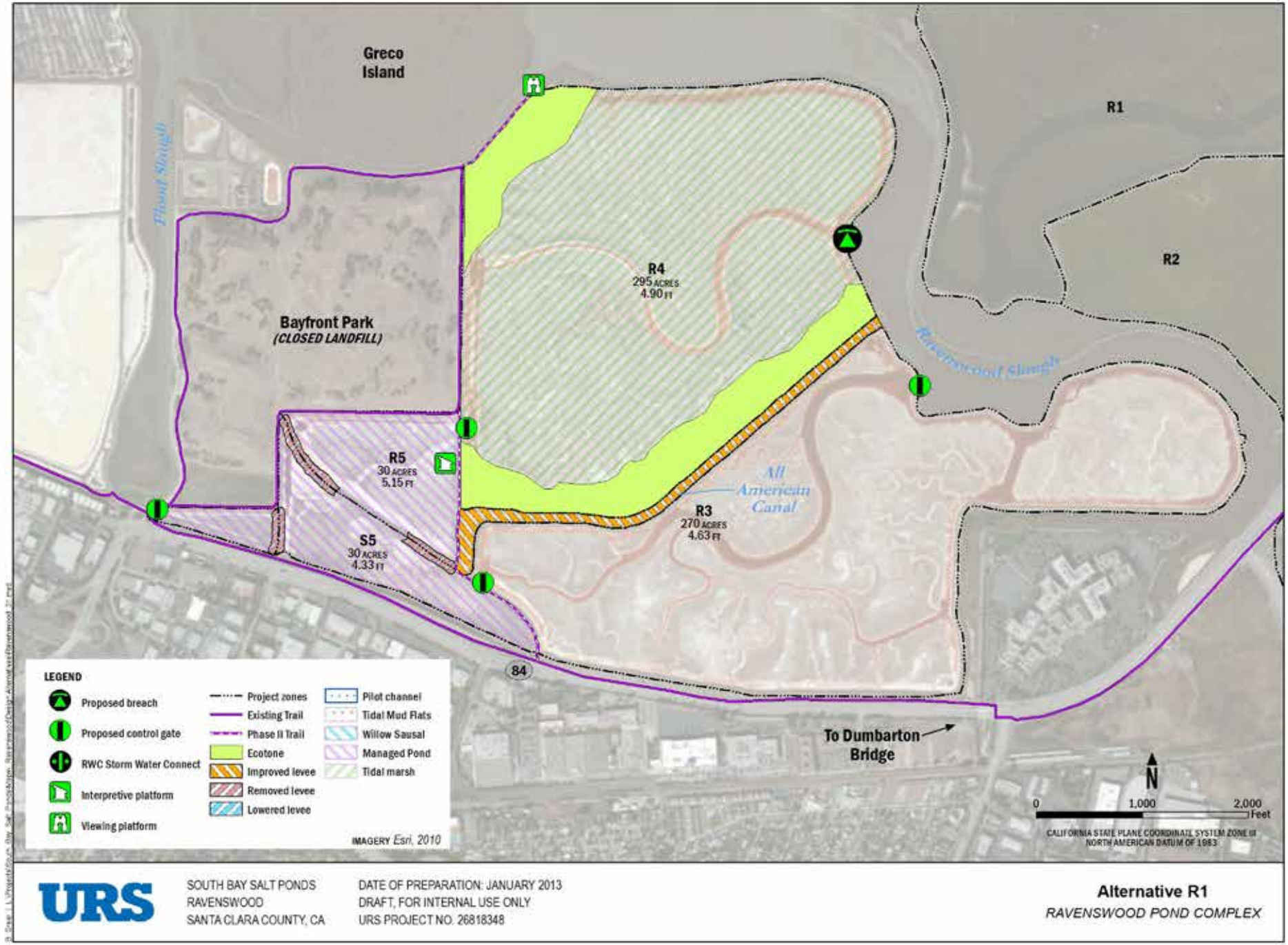

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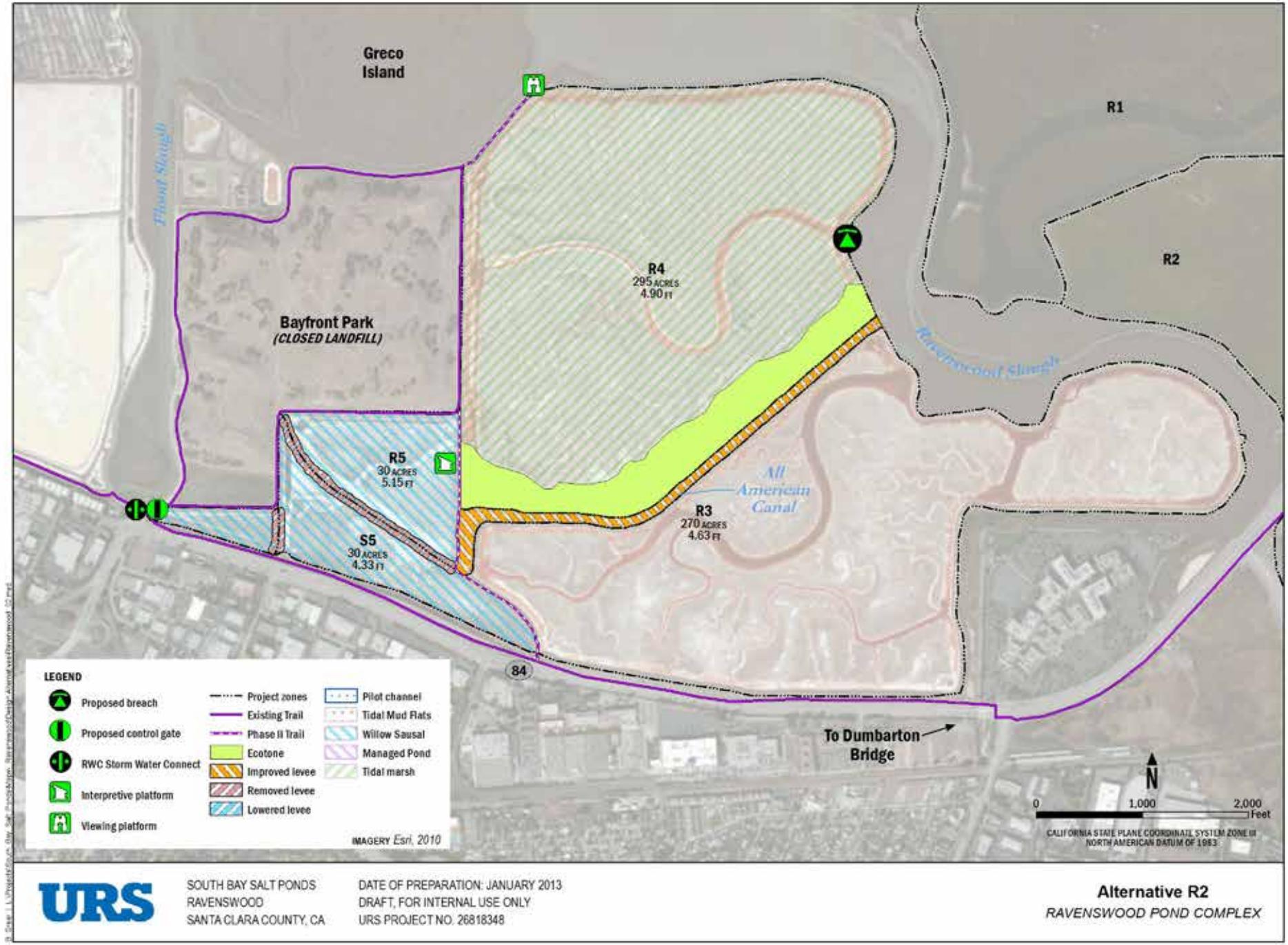
Alternative R1
RAVENSWOOD POND COMPLEX

Figure 14



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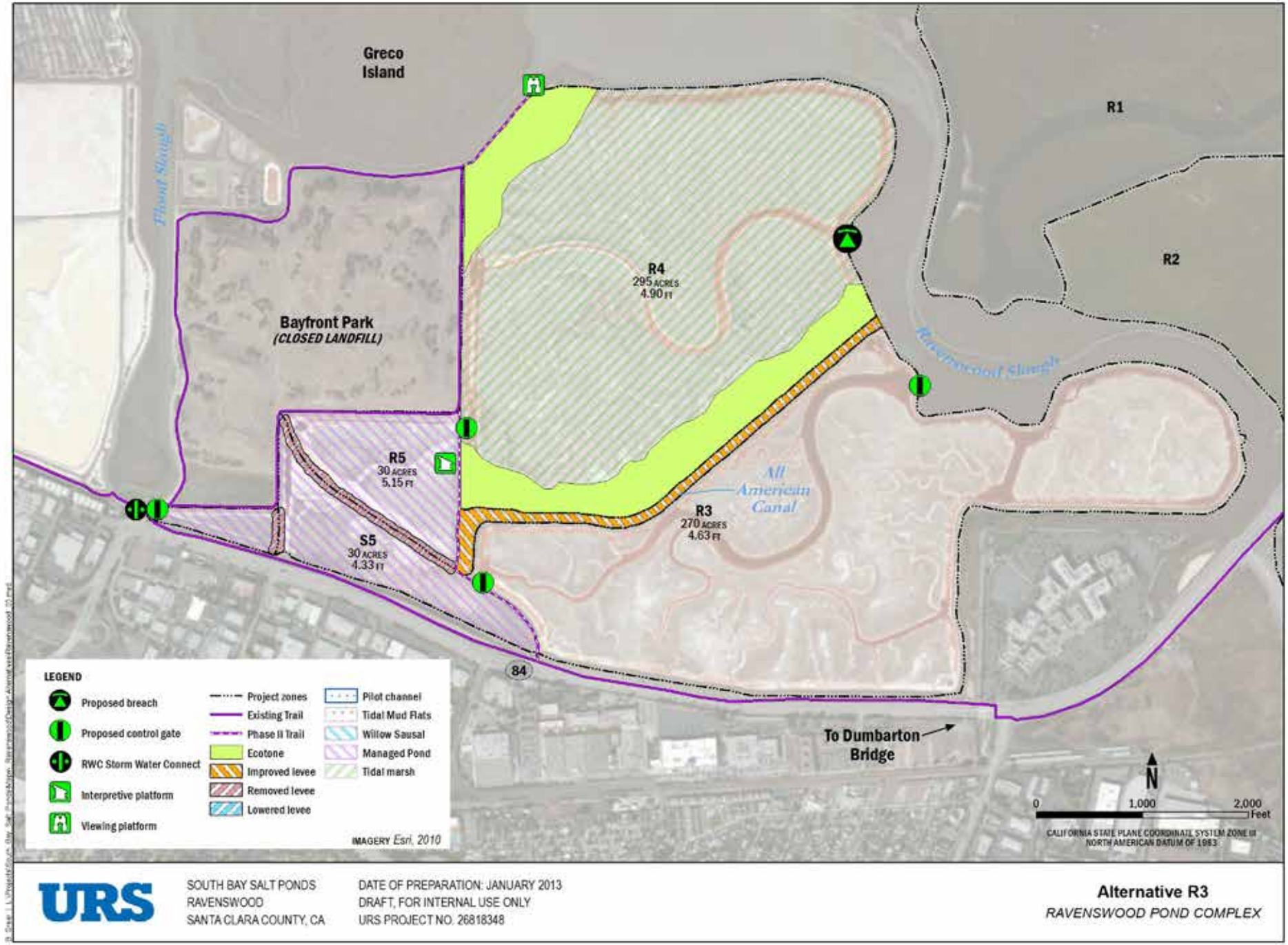
Alternative R2
RAVENSWOOD POND COMPLEX

Figure 15



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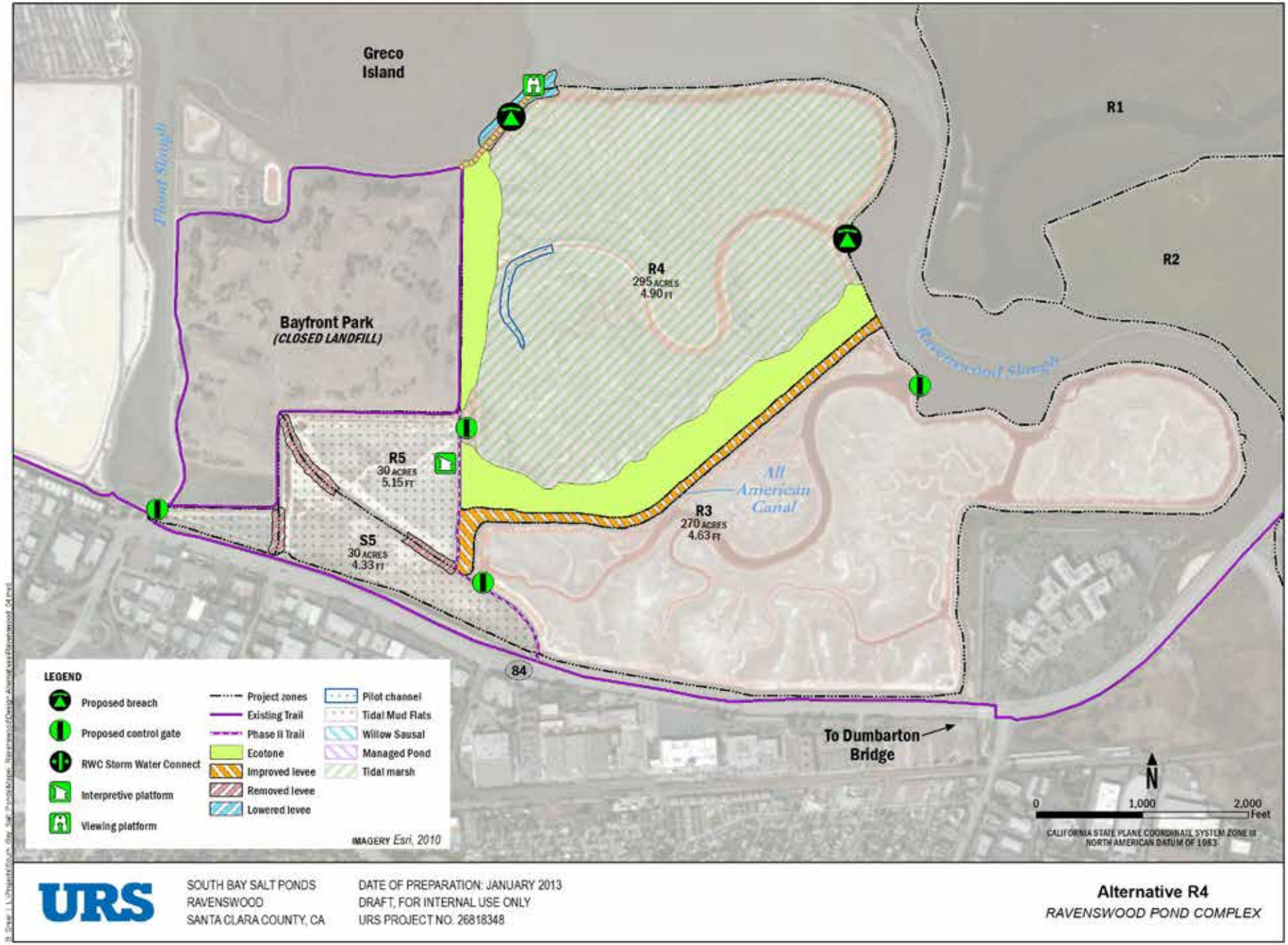
Alternative R3
RAVENSWOOD POND COMPLEX

Figure 16



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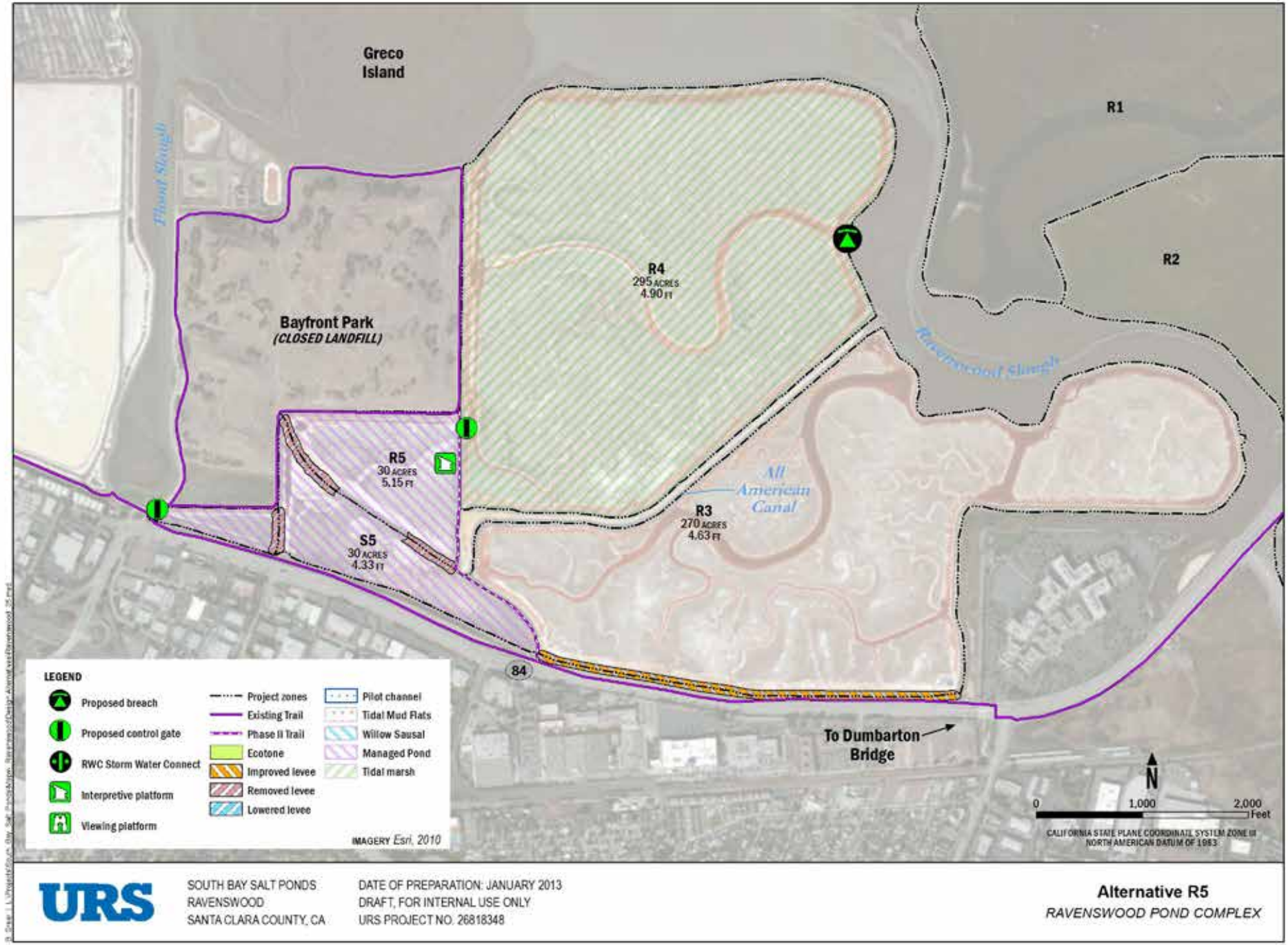
Alternative R4
RAVENSWOOD POND COMPLEX

Figure 17



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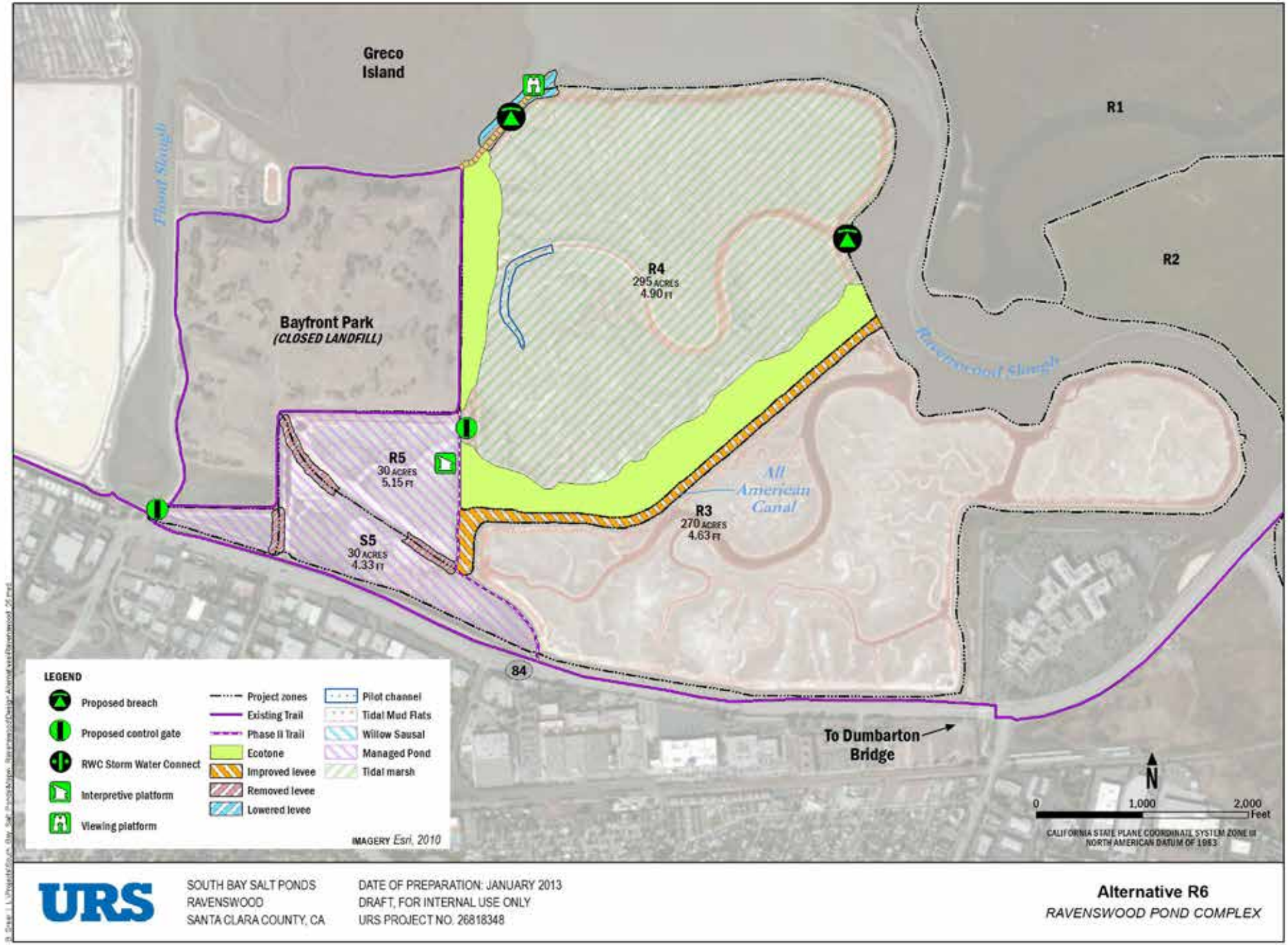
Alternative R5
RAVENSWOOD POND COMPLEX

Figure 18



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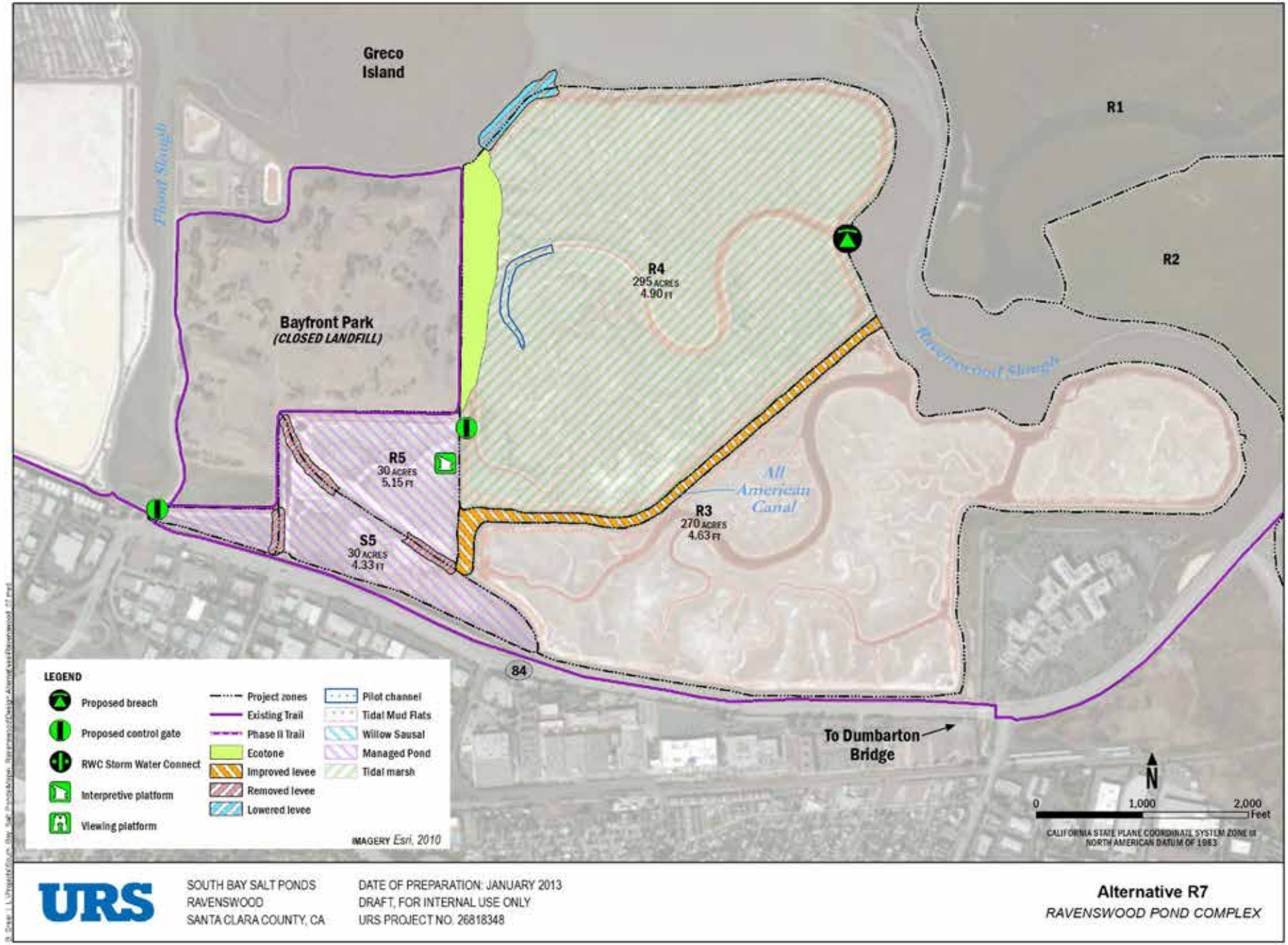
Alternative R6
RAVENSWOOD POND COMPLEX

Figure 19



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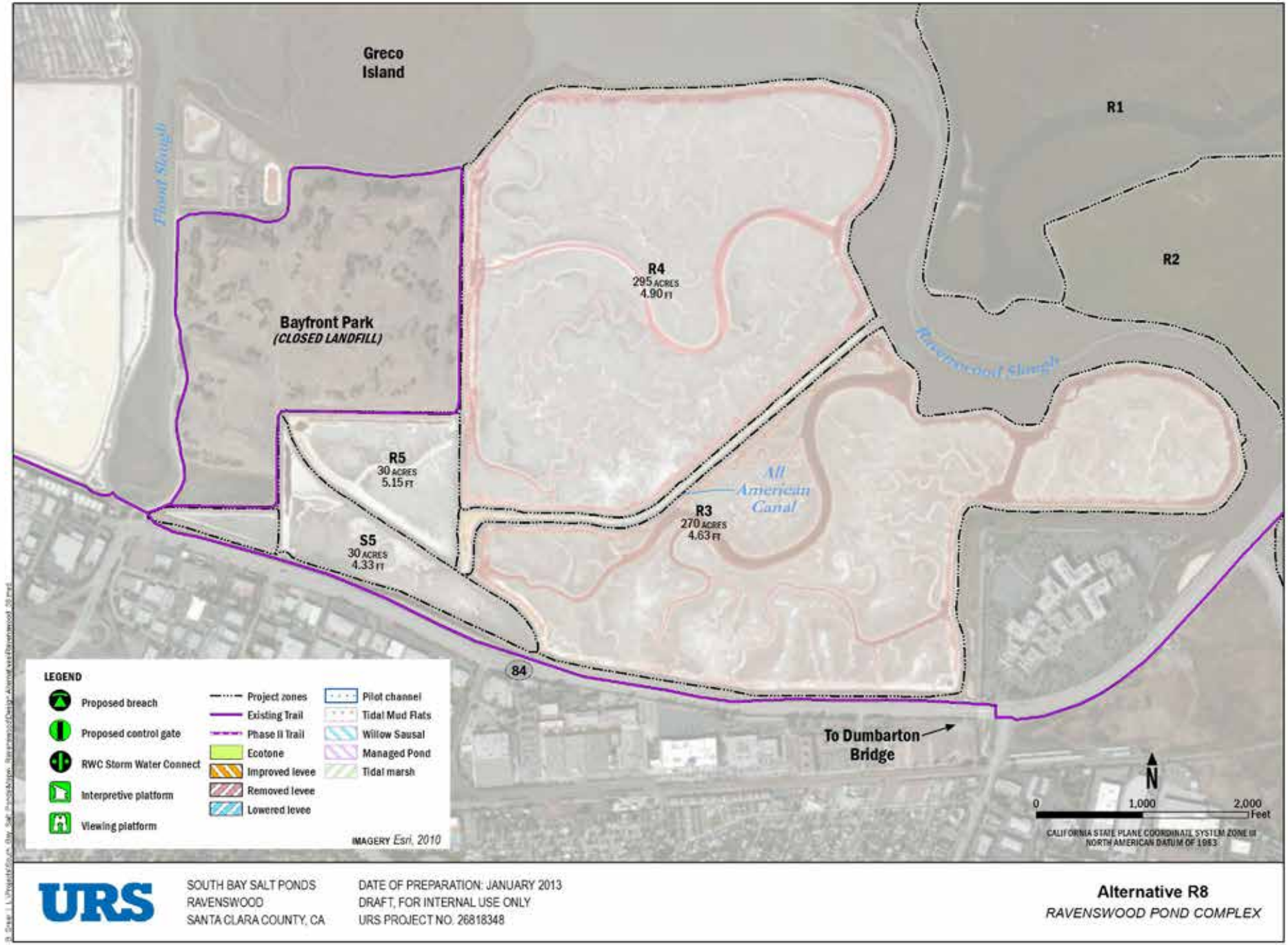
Alternative R7
RAVENSWOOD POND COMPLEX

Figure 20



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Alternative R8
RAVENSWOOD POND COMPLEX

Figure 21

3. SCREENING CRITERIA

This section describes the criteria used to screen the alternatives for the NEPA/CEQA document, select a reasonable range of alternatives to carry forward into more detailed analyses, and eventually form part of the selection of a preferred alternative for full design and implementation.

The criteria include some that speak directly to the SBSP Project's three primary goals (habitat restoration, flood risk management, recreation and public access) and others that speak to other relevant factors like cost, constructability, and so on. The presentation order of the criteria below has no relation to their relative importance to the Project Management Team (PMT) or stakeholders. All criteria are considered equally; no weighting or rankings are used.

The criteria are broken into three brackets: a score of A generally describes a more desirable outcome; a score of C a generally less desirable outcome; and a score of B is somewhere in the middle. These letters are descriptive, not prescriptive. Thus, the alternative with the most A's is not necessarily the "best" alternative to select.

3.1 Habitat Diversity and Complexity

The habitat diversity and complexity criterion was based on the number of near-term habitat types (first 10 years) generated by or associated with the alternative's features within each project action area. Habitat types of interest were subtidal channels, intertidal flats, emergent marsh, islands, habitat transition zones, uplands, and freshwater inputs.

- A: the alternative incorporates the full spectrum of habitat types
- B: the alternative has an average number of habitat types relative to the other alternatives
- C: the alternative has a narrow range of habitat types relative to the other alternatives

3.2 Habitat Connectivity

The habitat connectivity criterion was based on the relative connectivity of the alternative to adjacent native habitats. The criterion assessed whether the alternative maximizes synergies with adjacent lands (e.g., breaches connecting to salmonid streams, habitat that complements the life stage requirements of occupying or target special-status species such as the salt marsh harvest mouse [*Reithrodontomys raviventris*] and nesting for western snowy plovers [*Charadrius nivosus*], location of nearby propagules).

- A: the alternative maximizes synergy with adjacent habitat.
- B: the alternative has a moderate number of habitat connectivity features.
- C: the alternative has minimal features resulting in habitat synergy.

3.3 Flood Protection Infrastructure

The flood protection infrastructure criterion was based on the relative cost and regulatory complexity of continuing the current flood protection level with the project.

- A: the alternative will continue current flood protection levels without requiring specific flood protection features.
- B: the alternative will need some flood protection features of moderate cost and normal regulatory constraints.
- C: the alternative will need expensive or complex flood protection features.

3.4 Flood Protection Benefits/Improvements

The flood protection benefits criterion was based on the relative flood benefits of the alternative that are expected once restoration is complete and habitats have established. In coastal systems, wetlands primarily provide flood benefits by protecting and stabilizing shorelines. Tidal wetlands have the ability to reduce the speed and height of waves, thus protecting shorelines from erosion. Managed ponds bring flood protection benefits by allowing flows to be diverted there in certain conditions.

- A: the alternative would reduce wave heights more than the other alternatives.
- B: the alternative would reduce wave heights about average compared with the other alternatives.
- C: the alternative would reduce wave heights less than the other alternatives.

3.5 Recreation, Public Access, and Environmental Education

The recreation, public access, and environmental education criterion was based on the relative level of wildlife-compatible recreation, public access, and environmental education components provided by the alternative using, for example, the length of trails and the number of new features (such as viewing platforms, boardwalks, overlooks, and interpretive facilities).

- A: the alternative has a high level of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.
- B: the alternative has a moderate level of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.
- C: the alternative has a low level of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.

3.6 Quality of Recreation, Public Access, and Environmental Education

The quality of recreation, public access, and environmental education criterion was based on the relative quality of wildlife-compatible recreation, public access, and environmental education components provided by the alternative using, for example, the synergy with existing features such as kiosks, signs, parking lots, or restrooms; the variety of recreation and education opportunities; integration with the Bay Trail; connectivity of trails; and the general quality of the public experience.

- A: the alternative has a high quality of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.

- B: the alternative has a moderate quality of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.
- C: the alternative has a low quality of wildlife-compatible recreation, public access, and environmental education relative to the other alternatives.

3.7 Time to Achieve Target Habitat Goals

The time to achieve target habitat goals criterion represented approximately how much time the alternative will need to achieve the range of target habitats in that alternative. Because most alternatives in Phase 2 projects are primarily tidal marsh restoration, this criterion largely reflects the time required to reach marsh plain elevation. The time was calculated using a simple spreadsheet model that integrates turbidity data and future tidal prism for a proposed breach size and number of breaches. In alternatives that contain managed ponds or other restoration options, differences in times required to reach those habitats were also considered.

- A: the alternative will achieve marsh plain elevation within less than approximately 10 years.
- B: the alternative will achieve marsh plain elevation within approximately 10 to 30 years.
- C: the alternative will achieve marsh plain elevation within greater than approximately 30 years.

3.8 Resilience to Sea-Level Rise

An alternative's resilience to sea-level rise was based on whether the alternative is likely to accumulate sediment apace with sea-level rise and whether it incorporates features that adapt to sea-level rise (e.g., habitat transition zones). Sediment accumulation rates were based on a simplified spreadsheet model that uses tidal prism, suspended sediment data, and settling velocity to allow relative comparison between alternatives.

- A: the alternative is more resilient to sea-level rise (accumulates sediment apace with the highest sea-level rise estimates and has adaptive features).
- B: the alternative is moderately resilient to sea-level rise (accumulates sediment apace with moderate sea-level rise estimates and has adaptive features).
- C: the alternative is less resilient to sea-level rise (does not accumulate sediment as fast as sea-level rise).

3.9 Costs

The costs criterion was based on rough order of magnitude costs for construction of each component of the alternatives. Specific cost ranges were set during the evaluation.

- A: the alternative is in the low range of costs relative to the other alternatives at the complex.
- B: the alternative is in the middle range of costs relative to the other alternatives at the complex.
- C: the alternative is in the high range of costs relative to the other alternatives at the complex.

3.10 Operations and Maintenance Complexity

The operations and maintenance complexity criterion was based on the relative operational complexity and the number of actively managed versus passively managed features included in the alternative using, for example, the number of water control structures and the length of maintained levees. (The criterion does not include catastrophic events.)

- A: the alternative has low operational complexity and few or no actively managed or maintained features.
- B: the alternative has moderate operational complexity and some actively managed and maintained features.
- C: the alternative has high operational complexity and many actively managed or high-maintenance features.

3.11 Infrastructure Constraints

The infrastructure constraints criterion was based on the number and complexity of utilities, easements, landowners, and partners that would be affected or involved in the alternative.

- A: the alternative has a relatively small number or low complexity of constraints.
- B: the alternative has a relatively average number or moderate complexity of constraints.
- C: the alternative has a relatively large number or high complexity of constraints.

3.12 Supports Partner or Stakeholder (Non-Project) Goals

The supports partner or stakeholder goals criterion was based on how compatible the alternative is with achieving the goals of off-site projects. Such projects include Redwood City flood management improvements, Mountain View mitigation requirements at Charleston Slough, Shoreline Park sailing lake water quality improvements, and steelhead and salmonid nursery habitat improvements on Stevens Creek.

- A: the alternative incorporates features that could help achieve non-project goals.
- B: the alternative neither helps or hinders achieving non-project goals.
- C: the alternative incorporates features that could hinder achieving non-project goals.

3.13 Augmentation with Fill Material

This criterion relates the successful implementation of the alternatives to the availability and use of fill material. The fill material may be from upland sources, or it may be dredged material from work in San Francisco Bay or channels around it. Some ponds or pond clusters have capacity to accept such material to create habitat transition zones, raise or improve existing levees, fill borrow ditches, or raise the bottom elevation of ponds to speed their conversion to tidal marsh. In other cases, using material to raise the elevations of pond bottoms is essential because the ponds are subsided and too deep to ever convert to marsh on their own.

- A: the alternative depends on fill material to achieve its habitat restoration goals.
- B: the alternative may accept fill material but does not depend on it.
- C: the alternative is too remote or inaccessible to feasibly accept fill material, even if such material is available, or such material would not be useful at those ponds.

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4. METHODS

This section presents the methods and process of the application of the screening criteria listed in Section 3 to the initial alternatives listed in Section 2. The end product is a set of alternatives for each pond cluster that is being carried forward for full analysis in the project-level Draft EIS/R.

Following the screening analysis, the alternatives were renamed and renumbered to improve clarity in the Phase 2 EIS/R. This was necessary because several of the alternatives were screened out, but not necessarily in numerical order. Table 4 presents a crosswalk to link the referencing system for the original alternatives before the screening process with the smaller sets of alternatives for inclusion in the Phase 2 EIS/R. The strikeout text indicates the alternatives that were not carried forward for further analysis.

The initial draft screening criteria were developed and reviewed by outside experts. The criteria were modified to include those inputs and then presented to the SBSP PMT at a regular meeting. There was discussion and a subsequent comment period, after which the draft criteria were finalized and delivered as completed work product to the PMT.

Table 4 Crosswalk between Alternative Names

ORIGINAL NAME AND NUMBER		NEW NAME AND NUMBER
Alviso –Island Ponds		
I1	Pond A19 Focus	Alternative Island B
~~I2~~	~~Speed All Ponds~~	~~Island D~~
~~I3~~	~~Fastest Pond A19~~	~~Island E~~
~~I4~~	~~South Side Pond A19 Only~~	~~Island F~~
I5	Maximize Tidal Flows in All Ponds	Alternative Island C
I6	No Project	Alternative Island A
Alviso-Mountain View Ponds		
~~M1~~	~~Balanced Approach; Include Charleston Slough~~	~~Mountain View D~~
M2	Least Recreation; Charleston Slough Not Included	Alternative Mountain View B
M3	Increased Tidal Flows; Increased Recreation	Alternative Mountain View C
~~M4~~	~~Simplest Habitat Restoration~~	~~Mountain View E~~
~~M5~~	~~Maximize Habitat Transition Zones~~	~~Mountain View F~~
~~M6~~	~~Minimize Breaches~~	~~Mountain View G~~
M7	No Project	Alternative Mountain View A
Ravenswood Pond Complex		
~~R1~~	~~Pond R4 Tidal; Ponds R5/S5 Managed Ponds~~	~~Ravenswood E~~
~~R2~~	~~Pond R4 Tidal; Ponds R5/S5 Willow Sausal~~	~~Ravenswood F~~
R3	Pond R4 Tidal; Ponds R5/S5 Managed. Ponds w/ Redwood City Stormwater Capacity	Alternative Ravenswood D
R4	Pond R4 Tidal; Ponds R5/S5 Mud Flats	Alternative Ravenswood C

Table 4 Crosswalk between Alternative Names

ORIGINAL NAME AND NUMBER		NEW NAME AND NUMBER
~~R5~~	~~No Improvements to All-American Canal Levees~~	~~Ravenswood G~~
~~R6~~	~~Maximize Tidal Flow in Pond R4; Increased Recreation~~	~~Ravenswood H~~
R7	Least Recreation	Alternative Ravenswood B
R8	No Project	Alternative Ravenswood A

The alternatives themselves were developed in parallel with the criteria and followed a similar process: independent subject matter experts on the project team reviewed an initial set of alternatives, after which changes were made to create a draft set that was presented to the PMT. Following a comment period, the feedback and inputs on the draft alternatives were incorporated into a final set to be used in the screening analysis. The alternatives described in Section 2 are the final set analyzed in the screening process.

To apply the criteria to the screening set, a panel composed of PMT representatives and the consultant project team was formed. The individual members of the panel were provided with the definitions of the criteria and the quantitative metrics for those criteria that had them. These metrics and the methods used to develop them are described in Attachment A. Panel members were also provided with maps, summary matrices, and full text-based descriptions of the alternatives and their components. With these preparatory materials in place, the screening panel members were invited to a half-day workshop to actually conduct the screening.

At the screening workshop, the panel received printed map books of the alternatives sets for each of the clusters of ponds. The map books also included summaries of the individual components that made up each of the alternatives, a list of the criteria and the definitions of their scores, and blank matrices to use as worksheets in the screening.

The screening was conducted through facilitated discussions of each alternative design against each of the criteria. The discussions focused on one pond cluster at a time. For most of the criteria, there was general agreement about whether an alternative should receive an A, a B, or a C. Where there was disagreement, there was some modification of the details of that particular component to maintain the intent and the features of the alternative in question but to allow a consensus opinion on the scoring to be reached.

Prior to the screening workshop, the Phase 2 consultant team had completed draft applications of several of the screening criteria—those included in Attachment A. Specifically, this pre-workshop screening was done for those criteria for which objective or quantifiable estimates could be made. For example, the URS-provided construction cost estimates were completed prior to the workshop, so the screening matrices could be "pre-loaded" with the scores (i.e., 1, 2, or 3) that compared those alternatives. In addition to cost, the other quantifiable criteria included the level of new recreation, public access, and environmental education features criterion and the time to achieve target habitat criterion. The former included counts of miles of new trails; however, at the workshop, it was noted that an equally valid system for quantifying recreation and public access might only count the number of new features, and every new trail could count the same as every other new trail, regardless of length.

There were a number of criteria for which panel members raised these sorts of reasonably different approaches to the use of the pre-loaded screening values. Thus, the URS-provided pre-loaded scores were

only rarely used. Instead, the pre-loaded scores were used as a "jumping-off point" for the facilitated discussion about the criteria and their eventual application to the alternatives themselves.

As the screening of each pond cluster's alternatives drew to completion, the panel gradually settled on two to three design alternatives for each cluster, in addition to the No Project Alternative, to carry forward to the Draft EIS/R. A back-check process was carried out to make sure that these alternatives included all the components that might be constructed, even if not all were included in the same alternative. By the conclusion of the workshop, the panel had achieved consensus on the alternatives to include in the Draft EIS/R. These alternatives are presented in Section 5, Results.

After the workshop, final revisions to the alternative maps were made, and a proposed final set of alternatives was established for each cluster of ponds. At a subsequent PMT meeting, these final sets of alternatives were presented to the full PMT so that the work of the representatives who participated in the panel could be shared. There was significant discussion and clarification of the alternatives and the screening process itself, but no actual changes to the alternative sets were made.

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5. RESULTS

This section presents the results of the screening and the final sets of alternatives for each of the Phase 2 pond clusters.

5.1 Alviso-Island Ponds

The results of the screening process for the alternatives at the Island Ponds are presented in Table 5. For the Island Ponds, the EIS/R will contain full analysis of two design alternatives and the No Project Alternative. These are summarized in Table 6 and illustrated on Figures 22 through 24.

5.2 Alviso-Mountain View Ponds

The results of the screening process for the alternatives at the Mountain View Ponds are presented in Table 7. For the Mountain View Ponds, the EIS/R will contain full analysis of two design alternatives and the No Project Alternative. These are summarized in Table 8 and illustrated on Figures 25 through 27.

5.3 Ravenswood Ponds

The results of the screening process for the alternatives at the Ravenswood Ponds are presented in Table 9. For the Ravenswood Ponds, the EIS/R will contain full analysis of three design alternatives and the No Project Alternative. These are summarized in Table 10 and illustrated on Figures 28 through 31.

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Table 5 Screening Results for Alviso-Island Ponds

ALVISO-ISLAND PONDS		SCREENING CRITERIA RESULTS												
		HABITAT DIVERSITY AND COMPLEXITY	HABITAT CONNECTIVITY	FLOOD PROTECTION INFRASTRUCTURE	FLOOD PROTECTION BENEFITS/ IMPROVEMENTS	RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	QUALITY OF RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	TIME TO ACHIEVE TARGET HABITAT GOALS	RESILIENCE TO SEA-LEVEL RISE	COSTS	OPERATIONS AND MAINTENANCE COMPLEXITY	INFRA-STRUCTURE CONSTRAINTS	SUPPORTS NON-PROJECT GOALS	AUGMENT WITH FILL MATERIAL
I1	Pond A19 Focus	A	B	A	C	N/A	N/A	A	A	B	A	B	B	C
I2	Speed All Ponds	B	A	A	B	N/A	N/A	A	A	B	A	B	B	C
I3	Fastest Pond A19	A	B	A	C	N/A	N/A	A	A	B	A	B	B	C
I4	South-Side Only	C	C	A	C	N/A	N/A	C	C	A	A	A	B	C
I5	Do Everything	B	A	A	B	N/A	N/A	A	A	C	A	B	B	C
I6	No Project	C	C	A	C	N/A	N/A	C	C	N/A	N/A	A	B	C

Table 6 Selected Alternatives for Alviso-Island Ponds

ISLAND POND ALTERNATIVES*	COMPONENTS						
	BREACH N SIDE OF POND A19	LOWER (OR REMOVE) MUCH OF POND A19 LEVEE	LOWER (OR REMOVE) MUCH OF POND A20 LEVEE	BREACH N SIDES OF PONDS A19, A20, & A21	CONNECT POND A19 WITH POND A20	ADD PILOT CHANNELS IN POND A19	EXPAND POND A19 SOUTHERN BREACHES
Alternative Island A (I6)	No	No	No	No	No	No	No
Alternative Island B (I1)	Yes	Yes	No	No	Yes	No	No
Alternative Island C (I5)	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Alternative Island A is the No Project Alternative. The others are Project Alternatives.

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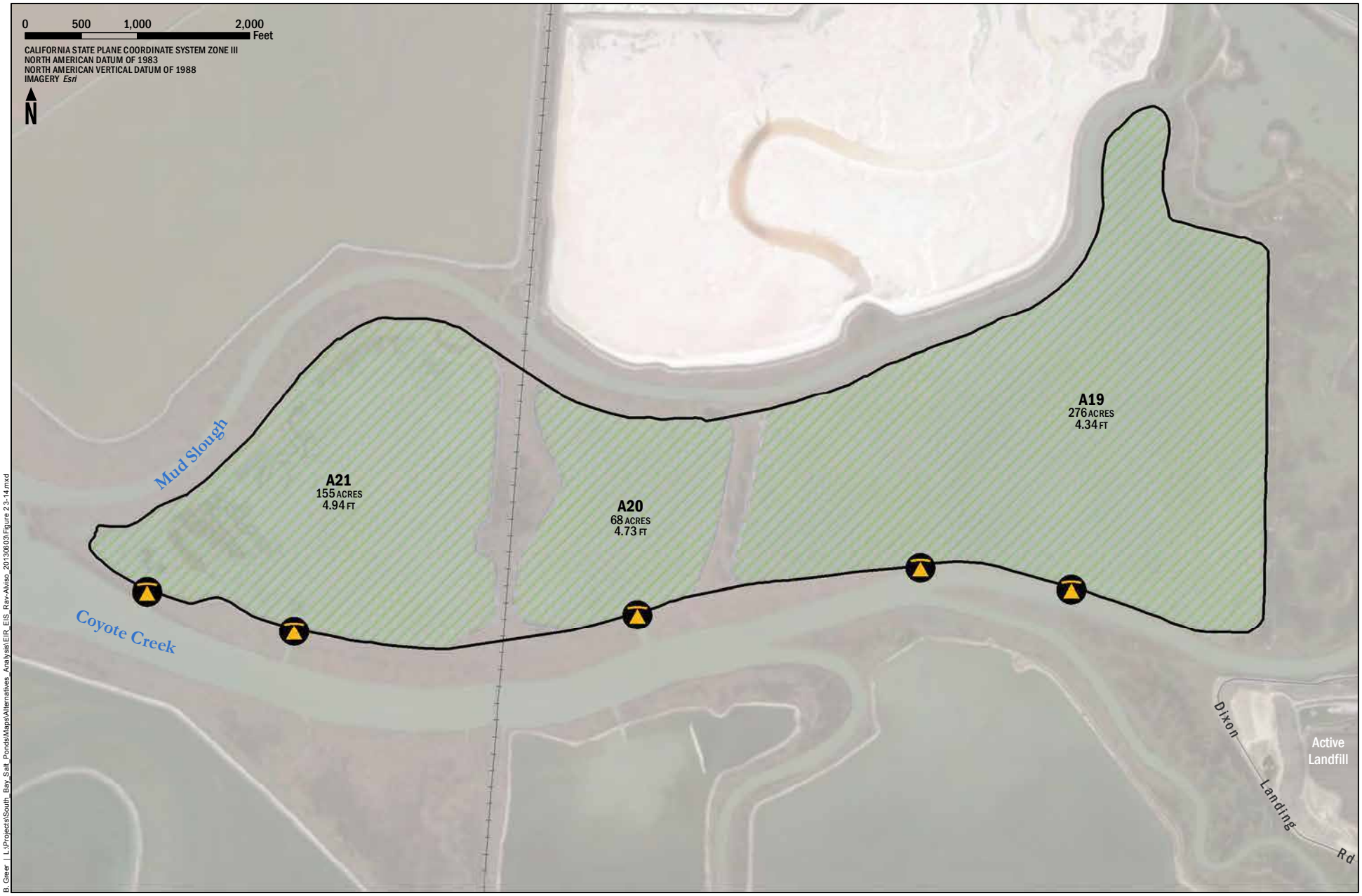

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LEGEND

Existing breach

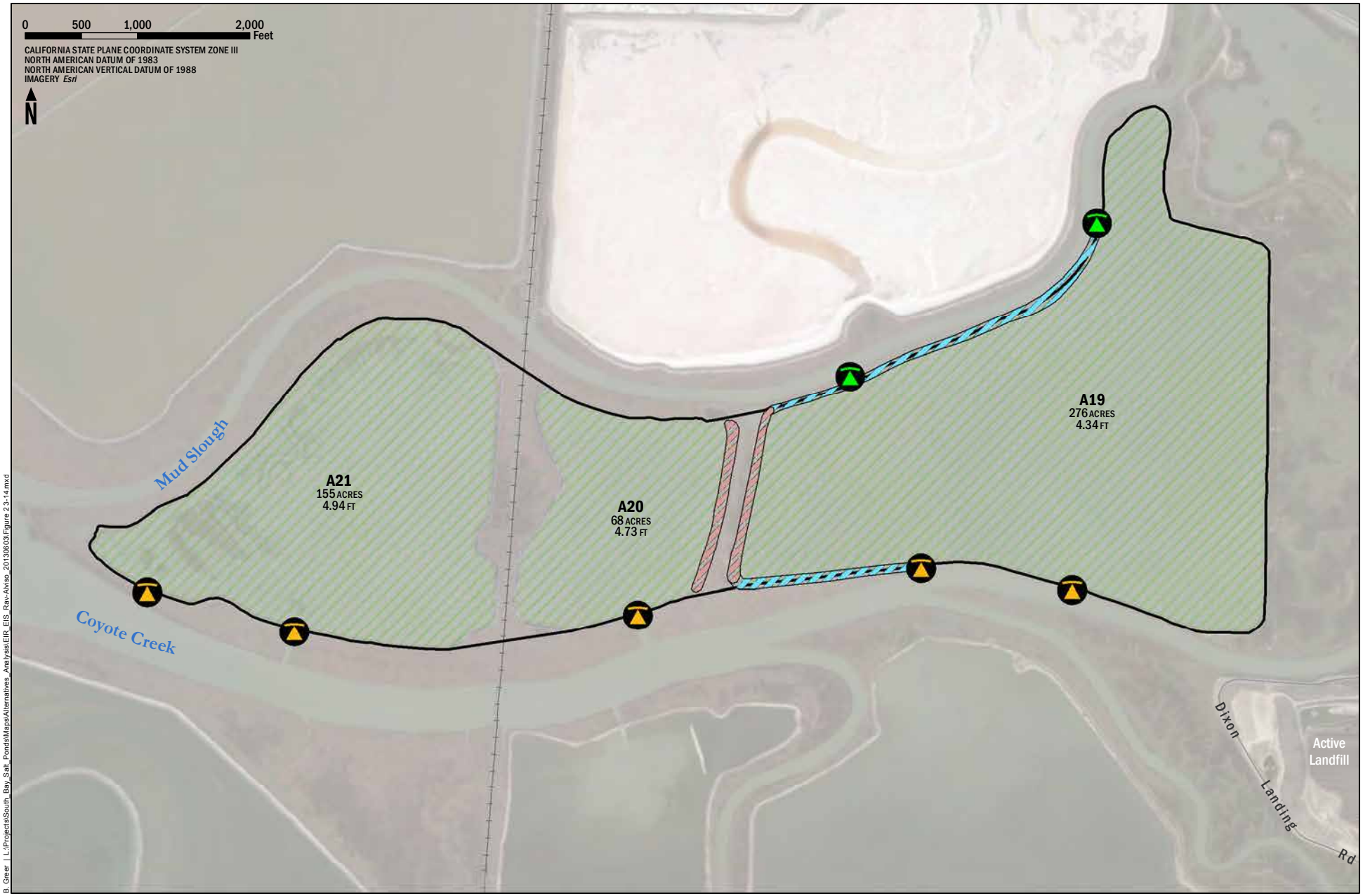
Tidal marsh

Pond boundary

URS

Figure 22

Alternative: Island A



B. Greer | L:\Projects\South_Bay_Salt_Ponds\Maps\Alternatives_Analysis\EIR_EIS_Rav-Alviso_20130603\Figure 2-3-14.mxd

LEGEND

Proposed breach

Existing breach

Removed levee

Lowered levee

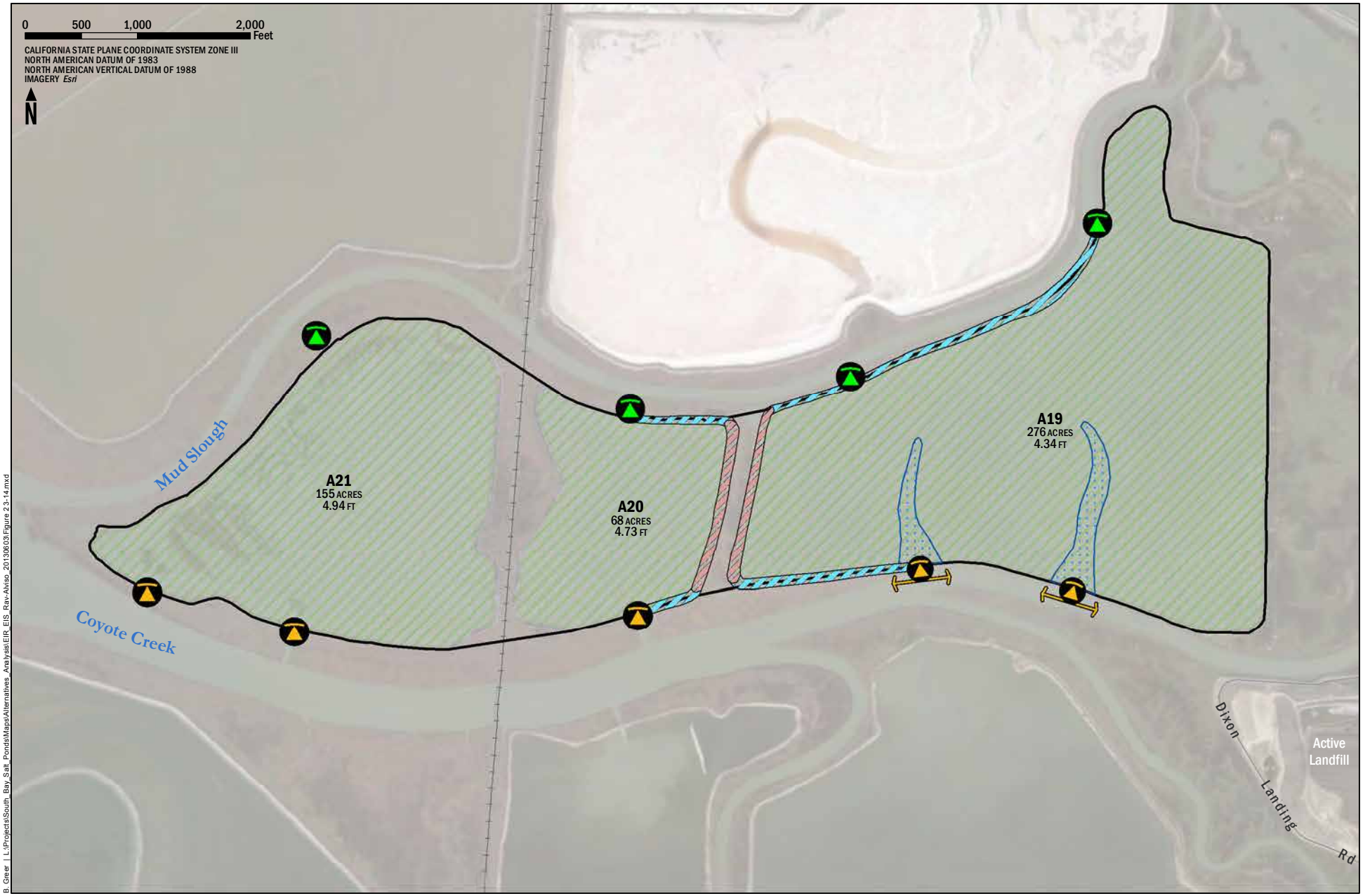
Tidal marsh

Pond boundary

URS

Figure 23

Alternative: Island B



LEGEND

Proposed breach

Existing Breach

Expand Existing Breach

Removed levee

Lowered levee

Pilot channel

Tidal marsh

Pond boundary

URS

Figure 24

Alternative: Island C

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Table 7 Screening Results for Alviso-Mountain View Ponds

ALVISO-MOUNTAIN VIEW PONDS		SCREENING CRITERIA AND CODES												
		HABITAT DIVERSITY AND COMPLEXITY	HABITAT CONNECTIVITY	FLOOD PROTECTION INFRASTRUCTURE	FLOOD PROTECTION BENEFITS/ IMPROVEMENTS	RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	QUALITY OF RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	TIME TO ACHIEVE TARGET HABITAT GOALS	RESILIENCE TO SEA-LEVEL RISE	COSTS	OPERATIONS AND MAINTENANCE COMPLEXITY	INFRA-STRUCTURE CONSTRAINTS	SUPPORTS NON-PROJECT GOALS	AUGMENT WITH FILL MATERIAL
M1	Balanced Approach & Charleston Slough	A	A	B	B	A	A	B	A	C	C	C	A	B
M2	No Connection to Charleston Slough and Less Recreation	A	C	C	B	C	C	C	B	A	A	C	A	B
M3	More Tidal Action and More Recreation	A	A	B	B	A	A	B	A	C	C	C	A	B
M4	Simplest Habitat Restoration	C	C	C	C	B	B	C	C	A	A	B	B	B
M5	Maximize Habitat Transition Zone	B	B	B	B	B	B	B	A	C	B	C	A	B
M6	Minimize Breaches	B	C	B	B	B	B	C	B	C	A	C	A	B
M7	No Project	C	C	A	C	C	C	C	C	A	A	A	C	B

Table 8 Selected Alternatives for Alviso-Mountain View Ponds

MOUNTAIN VIEW ALTERNATIVES*	COMPONENTS							
	BREACH POND A1: (1) 2 ON WEST AND 1 ON EAST SIDE, (2) 1 ON WEST SIDE ONLY	CONNECT TO CHARLESTON SLOUGH (REMOVE EXISTING TIDE GATE, RAISE W. LEVEE AND ADD SOUTH LEVEE ON CHAR SLOUGH; MODIFY SHORELINE LAKE WATER SUPPLY)	LOWER POND A1 WESTERN LEVEE	RAISE POND A1 WEST LEVEE	BREACH POND A2W: (1) 2 ON WEST AND 1 ON EAST SIDE, (2) 1 ON WEST SIDE ONLY, (3) 1 ON WEST AND 1 ON EAST SIDE, (4) 2 ON WEST AND 2 ON EAST	HABITAT COMPLEXITY: (1) ISLANDS IN PONDS A1 AND A2W, (2) HABITAT TRANSITION ZONE ON SOUTH EDGE OF POND A1, (3) HABITAT TRANSITION ZONE ON SOUTH EDGE OF POND A2W	CONNECT TO STEVENS CREEK MARSH	RECREATION & ACCESS: (1) INTERPRETIVE FEATURE ALONG TRAIL ON SOUTHERN POND A1 TRAIL, (2) TRAIL & INTERPRETIVE FEATURE INTO CHAR SLOUGH, (3) TRAIL ALONG POND A2W EAST LEVEE TO END OF PG&E ACCESS (BRIDGE OVER BREACH), (4) TRAIL (OR BOARDWALK) AND VIEWING PLATFORM ALONG POND A1 WEST LEVEE TO BREACH
Alternative Mountain View A (M7)	No	No	No	No	No	None	No	No
Alternative Mountain View B (M2)	2	No	No	Yes	4	1, 2, 3	No	1 and 4
Alternative Mountain View C (M3)	1	Yes	Yes	No	4	1, 2, and partial 3	Yes	1, 2, 3, and 4

*Alternative Mountain View A is the No Project Alternative. The others are Project Alternatives.

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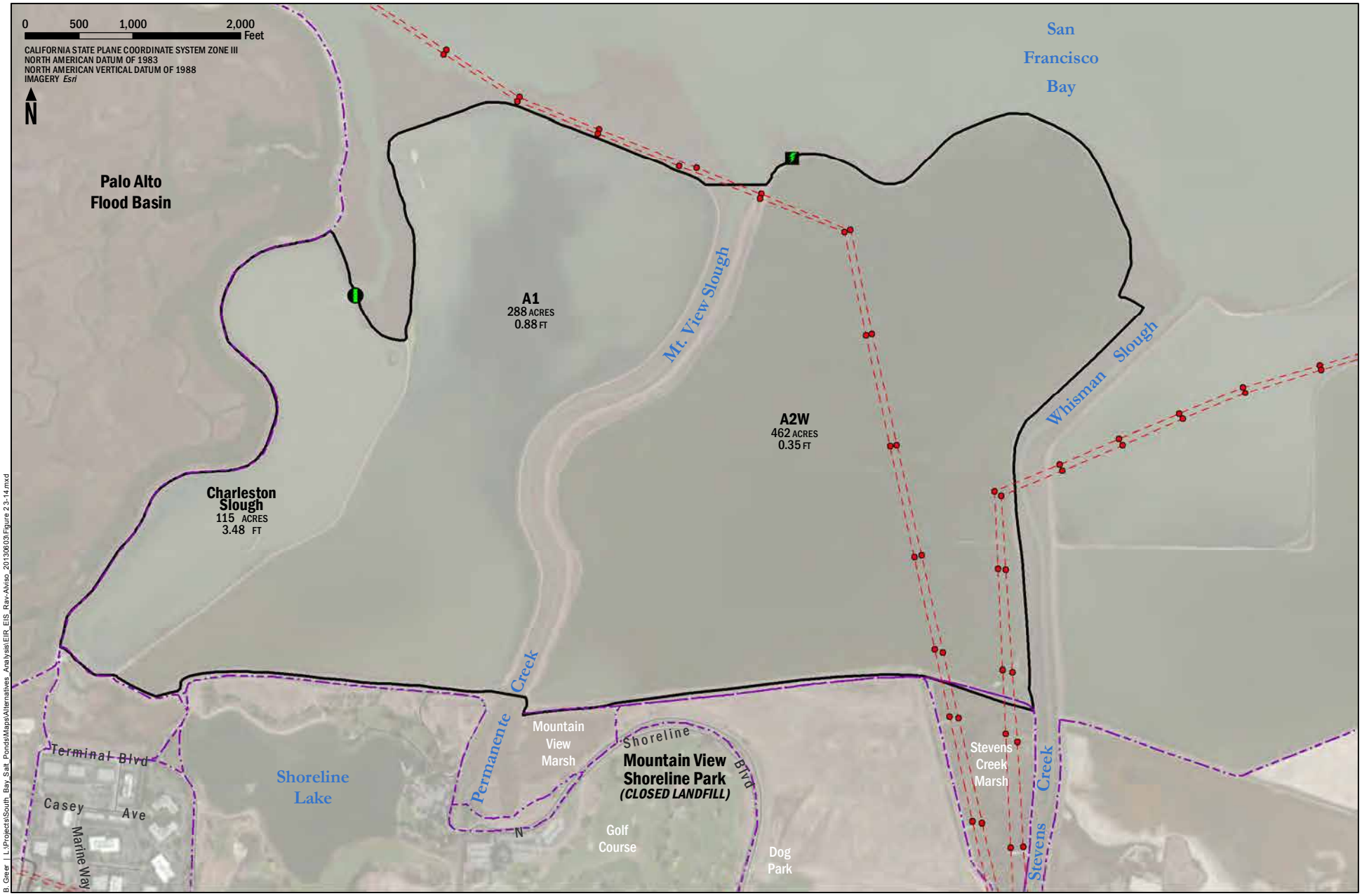


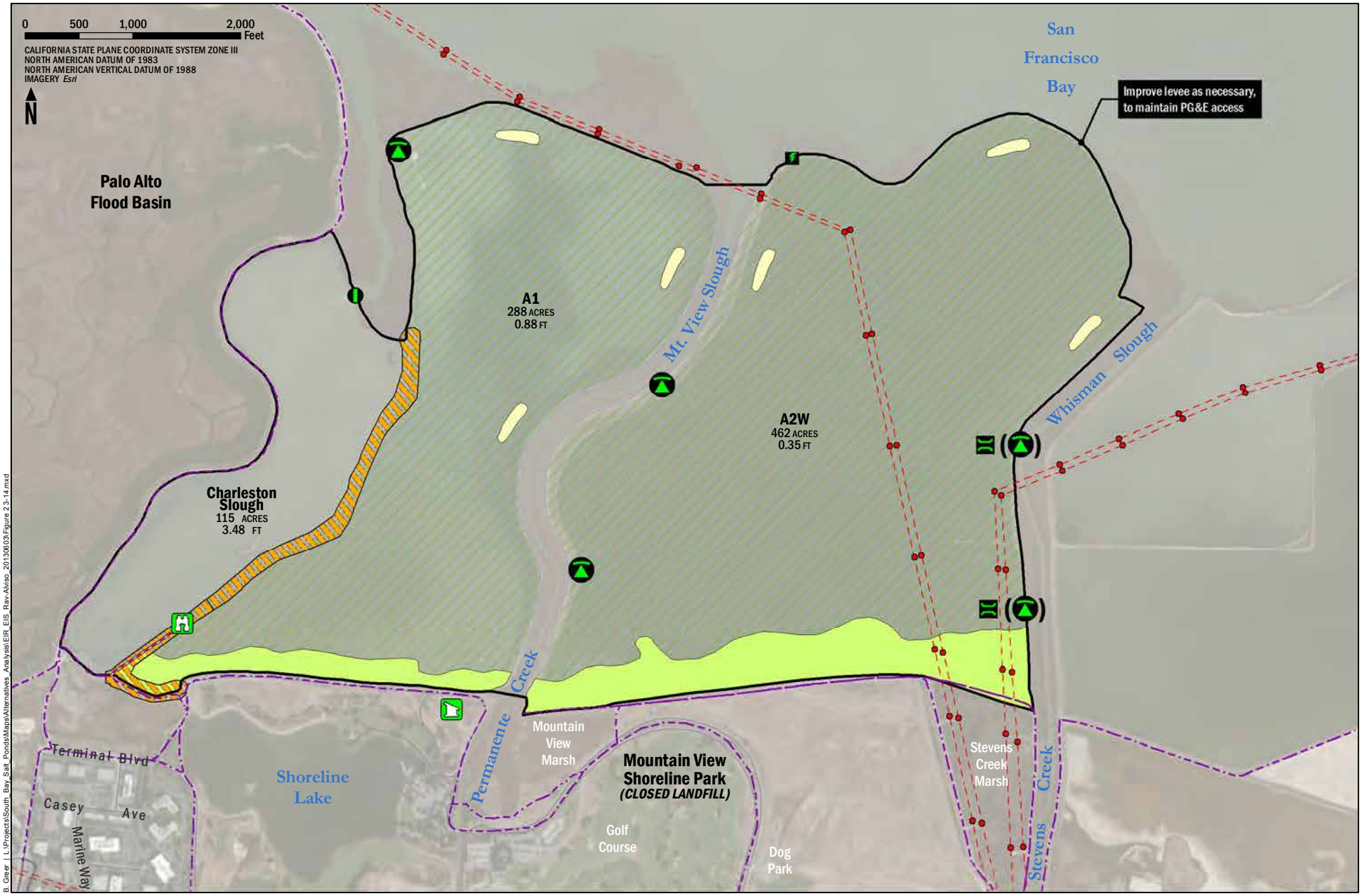
LEGEND

- Existing control gate
- PG&E turnaround
- PG&E tower
- PG&E power line
- Existing trail
- Pond boundary

URS

Figure 25

Alternative: Mountain View A



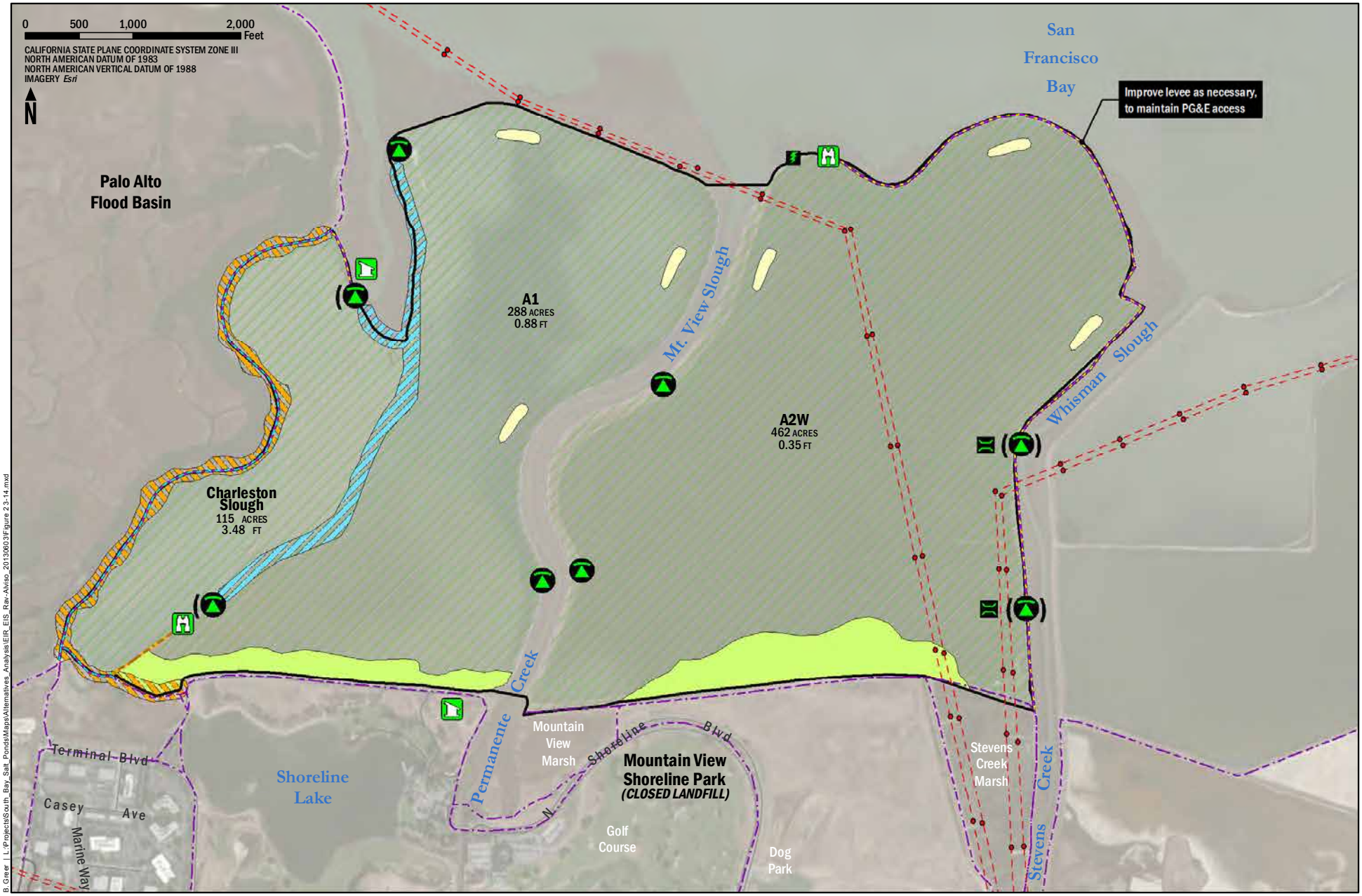
LEGEND

- Existing control gate
- Proposed breach
- Proposed armored breach (two sides)
- Footbridge
- PG&E turnaround
- Viewing platform
- Interpretive platform
- PG&E tower
- PG&E power line
- Existing trail
- Phase II trail
- Raised levee
- Habitat island
- Upland Transition Zone
- Tidal marsh
- Pond boundary

URS

Figure 26

Alternative: Mountain View B



URS

Figure 27

Alternative: Mountain View C

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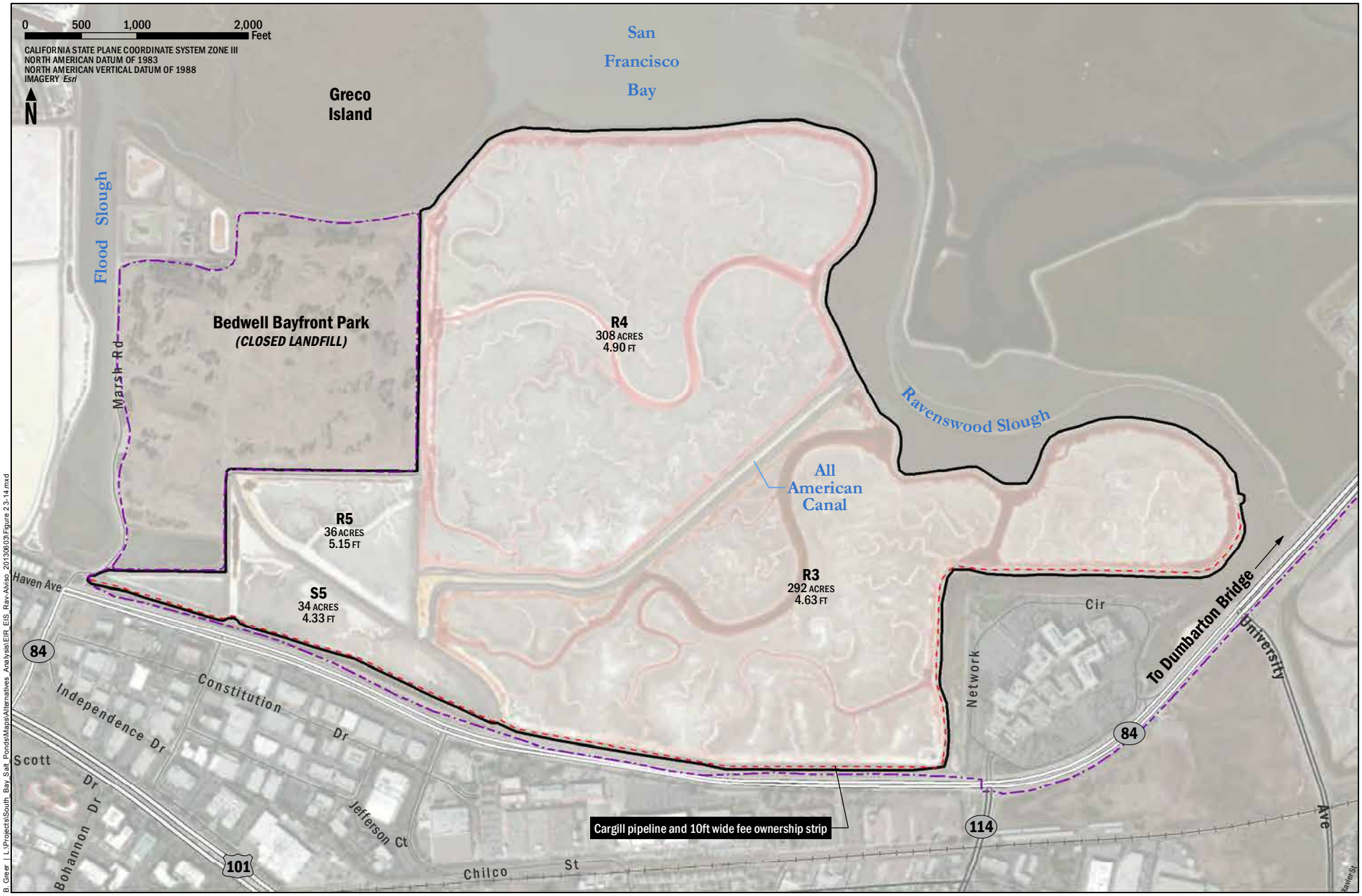
Table 9 Screening Results for Ravenswood Ponds

RAVENSWOOD PONDS		SCREENING CRITERIA AND CODES												
		HABITAT DIVERSITY AND COMPLEXITY	HABITAT CONNECTIVITY	FLOOD PROTECTION INFRASTRUCTURE	FLOOD PROTECTION BENEFITS/ IMPROVEMENTS	RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	QUALITY OF RECREATION, PUBLIC ACCESS, & ENV'TL EDUCATION	TIME TO ACHIEVE TARGET HABITAT GOALS	RESILIENCE TO SEA-LEVEL RISE	COSTS	OPERATIONS AND MAINTENANCE COMPLEXITY	INFRASTRUCTURE CONSTRAINTS	SUPPORTS NON-PROJECT GOALS	AUGMENT WITH FILL MATERIAL
R1	Pond R4 Tidal, Ponds R5/S5 Managed Ponds	B	B	B	C	B	B	A	A	C	B	B	B	C
R2	Ponds R5/S5 Willow Sausal	Not ecologically feasible. Eliminated												
R3	Ponds R5/S5 for Redwood City Stormwater Capacity; Max Tidal Flow in Pond R4	A	A	B	C	A	A	A	A	C	C	C	A	C
R4	Ponds R5/S5 Mud Flats / Shorebird Habitat	A	A	B	C	A	A	A	A	C	B	B	A	C
R5	No AAC Levee Improvements or Interior Pond R4 Modification	Does not meet project Purpose and Need. Eliminated.												
R6	Maximum Tidal Flow in Pond R4 and Maximum Recreation	A	A	B	C	A	A	A	A	C	A	B	B	C
R7	Less Recreation	A	A	B	C	C	C	A	B	B	B	B	B	C
R8	No Project	C	C	A	C	C	C	C	C	A	A	A	B	C

Table 10 Selected Alternatives for Ravenswood Ponds

RAVENSWOOD ALTERNATIVES*	COMPONENTS									
	BREACH R4: (1) EASTERN SLOUGH TRACE, (2) NW CORNER	IMPROVE LEVEES ALONG AAC	RAISE R3 SOUTH LEVEE	R4 HABITAT TRANSITION ZONE: (1) FROM W-NW LEVEE, (2) FROM AAC LEVEE	MODIFY HISTORIC SLOUGH TRACE IN R4	LOWER R4 LEVEE NEAR GRECO	R5/S5 FUNCTION: (1) MANAGED PONDS, (2) WILLOW SAUSAL, (3) TIDAL MUD FLATS	R5/S5 MODIFICATIONS: (1) CONNECT TO R4, (2) REDWOOD CITY STORM WATER CONNECT, (3) REMOVE ALL INTERNAL LEVEES, (4) REMOVE SOME INTERNAL LEVEES TO FORM ISLAND	R3 WATER CONTROL GATES	RECREATION & ACCESS: (1) TRAIL ON EASTERN EDGE OF R5/S5, (2) ADD/ IMPROVE ENV'TL. EDUC. EXHIBITS AROUND R5/S5, (3) BOARDWALK (OR TRAIL) AND VIEWPOINT AT NW R4
Alternative Ravenswood A (R8)	No	No	No	No	No	No	No	No	No	No
Alternative Ravenswood B (R7)	1	Yes	No	1	Yes	Yes	1	1 and 4	No	2
Alternative Ravenswood C (R4)	1 and 2	Yes	No	1 and 2	Yes	Yes	3	1 and 4	Yes	1, 2, and 3
Alternative Ravenswood D (R3)	1	Yes	No	1 and 2	No	No	1	1, 2, and 3	Yes	1, 2, and 3

*Alternative Ravenswood A is the No Project Alternative. The others are Project Alternatives.



LEGEND

Existing trail

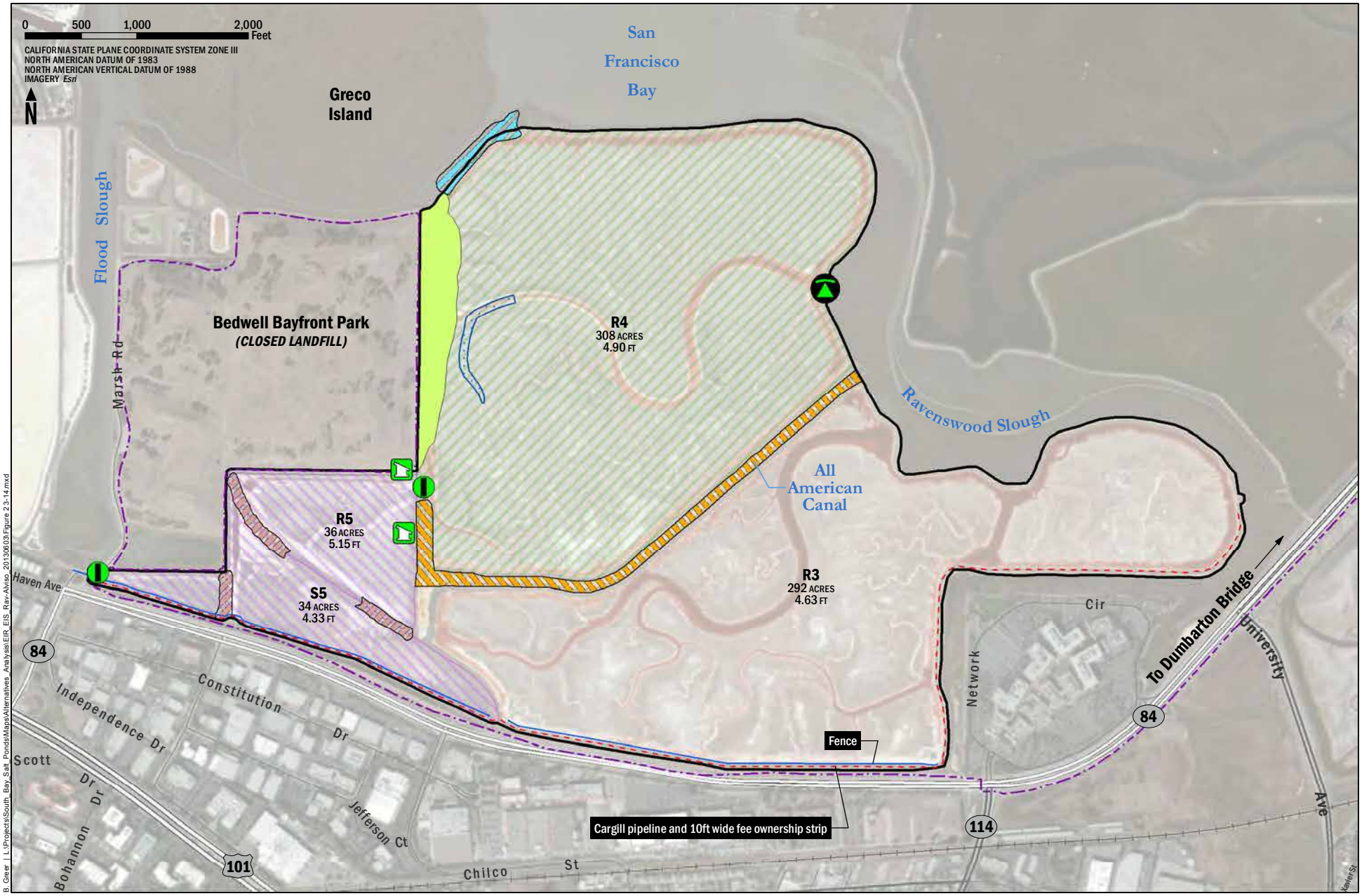
Cargill pipeline

Pond boundary

URS

Figure 28

Alternative: Ravenswood A



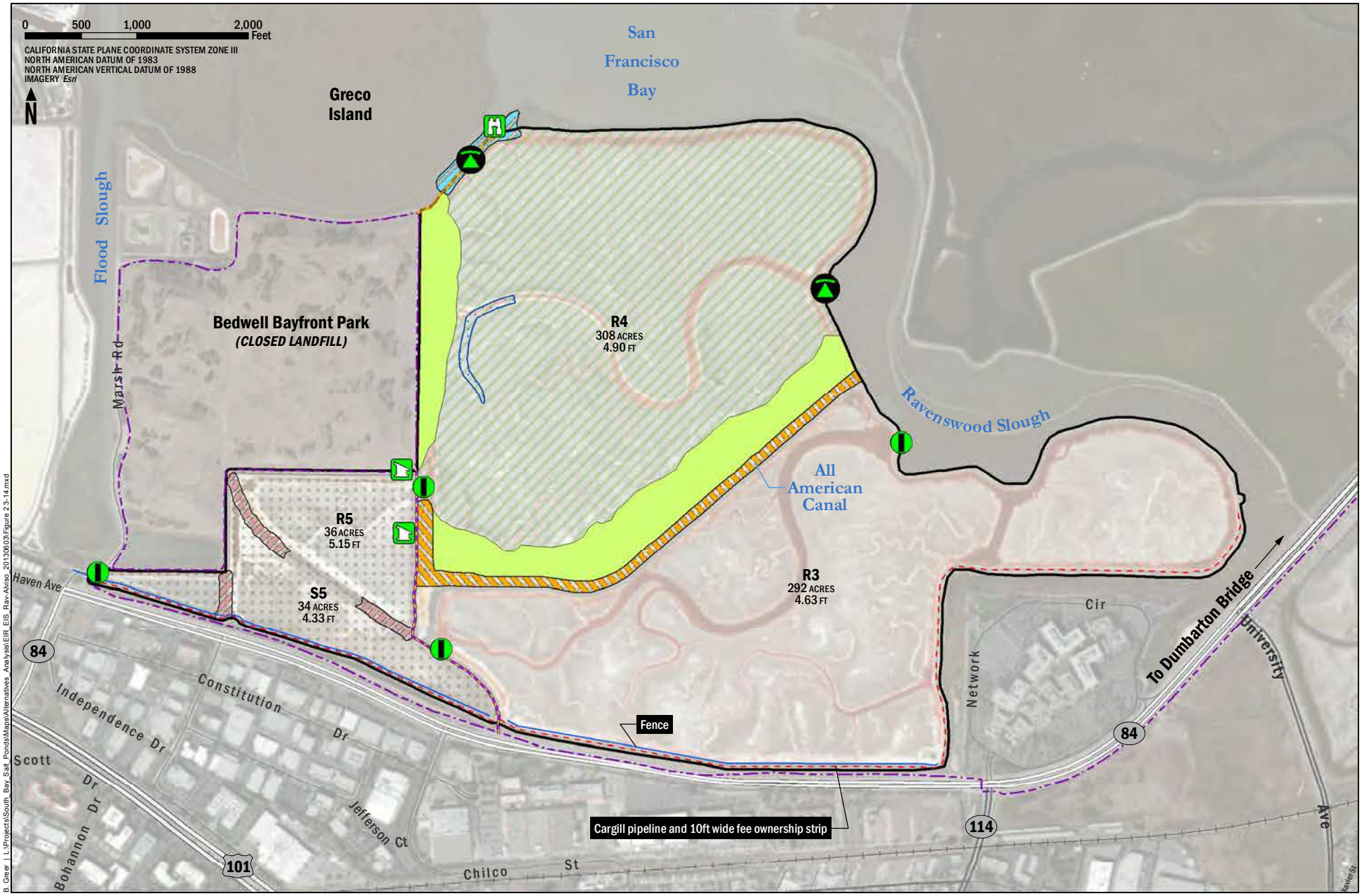
LEGEND

- Proposed breach
- Proposed control gate
- Interpretive platform
- Existing trail
- Cargill pipeline
- Fence
- Lowered levee
- Removed levee
- Improved levee
- Pilot channel (optional)
- Upland Transition Zone
- Tidal marsh
- Managed Pond
- Pond boundary

URS

Figure 29

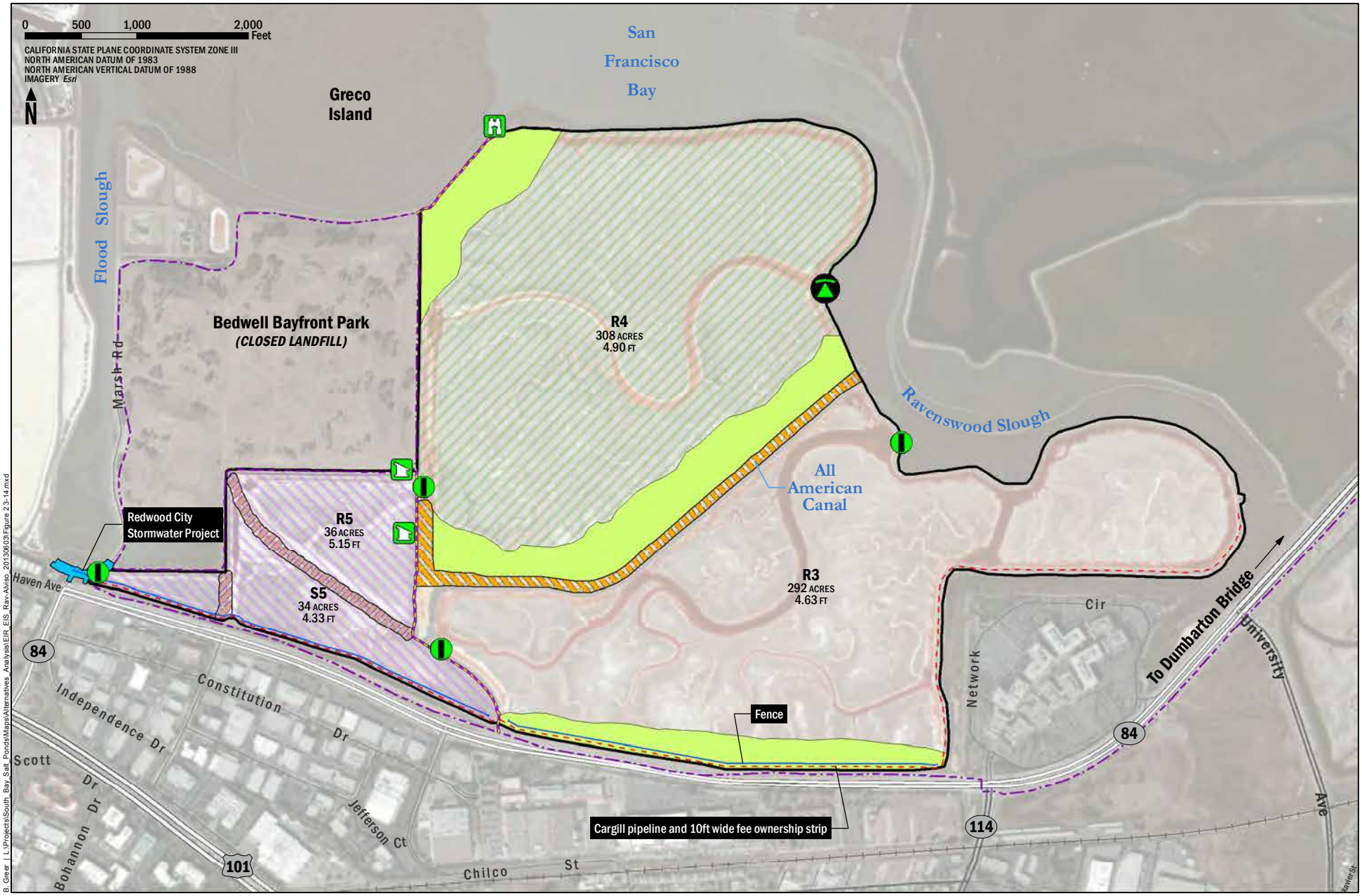
Alternative: Ravenswood B



URS

Figure 30

Alternative: Ravenswood C



LEGEND

- Proposed breach
- Proposed control gate
- Viewing platform
- Interpretive platform
- Existing trail
- Phase II trail
- Cargill pipeline
- Fence
- RWC Stormwater Project*
- Removed levee
- Improved levee
- Upland Transition Zone
- Tidal marsh
- Managed Pond
- Pond boundary

*Pending property rights/easements

URS

Figure 31

Alternative: Ravenswood D