



RANA The Cohabitat Co.
27875 Berwick Dr.
Carmel, CA 93923
T: 831.659.3820
F: 831.646.2106
www.ranacohabitat.com

July 1, 2021

Kira Stoll
Office of Sustainability
615H University Hall
Berkeley, CA 94720

RE: Richmond Field Station Solar Project: Botanical Survey Report

Dear Ms. Stoll,

We are pleased to submit the Botanical Survey Report for the Richmond Field Station Solar Project. This report addresses the Long-Range Development Plan mitigation measure BIO-5.

I certify that, to the best of my knowledge and belief, the information provided here is true and correct. Should you have any questions, feel free to contact me at (831) 659-3820 x119 or rashbach@ranacreekdesign.com.

Sincerely,

A handwritten signature in cursive script, appearing to read "R. Ashbach", with a long horizontal flourish extending to the right.

Rose Ashbach
Rana Creek Habitat Restoration

Encl: Botanical Survey Report

BOTANICAL SURVEY REPORT

**PROPOSED SOLAR PV ARRAYS
UNIVERSITY OF CALIFORNIA, BERKELEY (RICHMOND BAY CAMPUS)
RICHMOND FIELD STATION
RICHMOND, CA**



July 1, 2021

Prepared for:

Ms. Kira Stoll, Planner
UC Berkeley
Office of Sustainability

Prepared by:

RANA
27875 Berwick Drive
Carmel, CA 93924

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 SITE AND SURVEY LOCATION.....	1
2.0 METHODS	2
2.1 SURVEY DATE AND PERSONNEL	2
2.2 QUALITATIVE ASSESSMENT AND MAPPING.....	2
3.0 FINDINGS	2
3.1 PLANT SPECIES OBSERVED	2
3.1.1 Big Meadow (Site 2).....	2
3.1.2 Northeast Meadow (Site 4)	3
3.2 BOUNDARY OF COASTAL PRAIRIE	3
4.0 IMPACT ASSESSMENT	3
5.0 AVOIDANCE AND MINIMIZATION RECOMMENDATIONS	3
5.1 EXCLUSION FENCING	3
5.2 EROSION AND SEDIMENT CONTROL	4
6.0 REFERENCES	4

MAPS

Map 1 – Vicinity Map

Map 2 – Sensitive Resources and Impact Areas

Map 3 – Initial Field Survey Locations

APPENDICES

Appendix A: List of Plant Species Observed

Appendix B: Site Photographs

1.0 INTRODUCTION

The Office of Sustainability at the University of California Berkeley is currently in the planning and design phase for a series of solar photo-voltaic (PV) arrays at the Richmond Field Station (RFS). The proposed solar PV arrays addressed by this report are planned at two locations at the RFS that are identified for development in the Long-Range Development Plan (LRDP) EIR (Tetra Tech 2014). The RFS property has a long history of industrial use, but also contains valuable natural resources; perhaps the most prominent being multiple occurrences of remnant coastal terrace prairie.

Previous botanical work performed at Big Meadow by Wildlife Research Associates (2014) and URS (2007) identified grassland vegetation alliances at the RFS as primarily California oatgrass prairie or purple needlegrass grassland. These alliances are listed within the California Natural Diversity Database (CNDDDB) maintained by the California Department of Fish & Wildlife (CDFW). The California oatgrass series is defined by dominance of California oatgrass, with a variety of other grasses and herbaceous plants being present, including purple needlegrass. This series is associated with wetland environments as well as coastal terraces, slopes, and ridges (Sawyer and others, 2009). Coastal prairie is recognized by the LRDP EIR as an important natural resource and standards for its protection, management, and restoration are detailed in The Richmond Bay Campus (e.g. RFS) Coastal Terrace Prairie Management Plan (Management Plan) (Stromberg 2014).¹

The purpose of mapping and assessing the extent of coastal terrace prairie at the proposed solar PV array locations is to comply with pre-development biological survey requirements outlined in mitigation measure BIO-5 of the LRDP, document the location of sensitive coastal prairie resources at and adjacent to the proposed development locations, provide documentation in support of the CEQA process, quantify impacts to the sensitive resource caused by development, and recommend a mitigation strategy consistent with the Management Plan (Stromberg 2014) to offset project impacts.

1.1 Site and Survey Location

The RFS is located immediately south and east of Regatta Boulevard and south and west of Highway 580 in Richmond, Contra Costa County, California (**Map 1**). Tidal marsh and the edge of San Francisco Bay lie approximately 0.6 kilometers towards the south. The proposed solar PV array locations evaluated by this report are located at the northern end of Big Meadow (Site 1) and Northeast Meadow (Site 2) (**Map 2**). Two other alternate sites, Northwest Meadow (Site 3) and Central Meadow (Site 4), were evaluated during initial field surveys, but are not included in the impact assessment and mitigation strategy (**Map 3**). The botanical survey evaluated the area within the footprint of the proposed solar PV array developments as well as a surrounding area of at least 50 feet to capture conditions in adjacent areas and cover the 25-foot buffer around the project footprint required by the LRDP EIR (Tetra Tech 2014).

¹ Note that previous studies and the 2014 Long Range Development Plan (LRDP) and Environmental Impact Report (EIR), which are still applicable to the site, use the name Richmond Bay Campus.

2.0 METHODS

2.1 Survey Date and Personnel

The botanical survey was completed on April 16 and April 30, 2021 by John Wandke of RANA. The survey was performed during spring to allow identification of as many species as possible during their flowering stage and enable accurate identification of the boundary of coastal prairie occurrences.

2.2 Qualitative Assessment and Mapping

The proposed solar PV array locations and the surrounding areas were traversed on foot and evaluated for the presence of several key coastal prairie indicator species, California oat grass (*Danthonia californica*) and purple needlegrass (*Stipa pulchra*), as well as other native grasses and forbs typical of the coastal prairie plant community. The LRDP requires an assessment of impacts both within the development footprint as well as a 25-foot-wide buffer zone. Therefore, the survey included both the development footprint and the surrounding areas to fully evaluate potential impacts to coastal prairie (**Map 2**).

The edge of the coastal prairie was visually located based on an approximate coverage of California oatgrass and/or purple needlegrass of 25 percent or greater. The approximate edge of coastal prairie was mapped as a polyline using a handheld Trimble GeoXH resource grade GPS. The GPS data was post-processed in the office and exported to the project GIS dataset in the California State Plane, Zone III, NAD83 coordinate system to an accuracy of approximately one meter or less. In addition, we compiled a list native and non-native plant species observed during the surveys (**Appendix A**).

The UC has designated areas of development (Research, Education and Support (RES) areas) and areas protected from development (Natural Opens Space (NOS) areas). The RES layer was added to the map to ensure that the proposed solar PV arrays are located completely within developable land use areas (**Map 2**).

3.0 FINDINGS

3.1 Plant Species Observed

At the time of the April 16 and 30, 2021 survey dates, many of the native and non-native perennial species within Big Meadow and adjacent meadow areas were at the peak of growth and flowering. Northeast meadow, which is primarily vegetated with non-native European grasses had been recently mowed. Specific observations for both Big Meadow (Site 1) and Northeast Meadow (Site 2) are provided below.

3.1.1 Big Meadow (Site 1)

The northern edge of Big Meadow at the location of solar PV array Site 1 is dominated by harding grass (*Phalaris aquatica*), a non-native invasive perennial grass. Harding grass is especially aggressive in moist settings like the RFS and outcompetes native grassland species. Patches of coastal prairie are found immediately south of the proposed Site 1 development and are dominated by California oatgrass and purple needlegrass with other native species typical of coastal prairie including blue-eyed grass (*Sisyrinchium bellum*), meadow barley (*Hordeum brachyantherum*), and narrow mule's ear (*Wyethia angustifolia*). Non-native plant species are also present within the coastal prairie areas and typically include rat-tail fescue (*Festuca myuros*), Italian ryegrass (*Festuca perennis*) and bristly ox-tongue (*Helminthotheca echioides*). Additional

large patches of coastal prairie occur in Big Meadow beyond the southern extent of the survey area and are not shown on Map 2 due to their distance from the proposed project location.

3.1.2 Northeast Meadow (Site 2)

Northeast Meadow is an area of non-native annual grassland surrounded by roads, buildings, and paved areas. Coastal prairie does not occur at Northeast Meadow. The most common plant species are non-native annual grasses including lepor barley (*Hordeum murinum*), slender wild oat (*Avena barbata*), rat-tail fescue (*Festuca myuros*), and soft chess brome (*Bromus hordaceus*). Occasional California oatgrass and purple needlegrass plants were found at Northeast Meadow but do not constitute a coastal prairie occurrence because they are few in number, occur as isolated individuals, and do not form contiguous patches.

3.2 Boundary of Coastal Prairie

Visual and GPS mapping of the approximate boundary of coastal prairie found 0.88 acres of coastal prairie within the area surveyed at Big Meadow (site 1) and no coastal prairie at Northeast Meadow (site 2) (**Map 2**). Northwest Meadow (site 3) and Central Meadow (site 4) were mapped but are not currently part of the solar PV array project. Northwest Meadow has extensive and highly diverse coastal prairie (1.4 acres) along most of its length while Central Meadow has a patch of coastal prairie (0.2 acres) in its center that is dominated by purple needlegrass. Like previous surveys performed at Big Meadow (Rana Creek 2017), we found that the boundary between coastal prairie and Harding grass or other ruderal vegetation is relatively distinctive and can be mapped effectively using visual GPS methods.

4.0 IMPACT ASSESSMENT

Based on the findings of the May 2021 coastal prairie survey, the proposed development footprint of the solar PV arrays and a 25-foot buffer around the outer edges of the development footprint, no coastal prairie will be impacted at Big Meadow (Site 1) or at Northeast Meadow (Site 2). The coastal prairie around Site 1 lies outside of the 25-foot buffer and the solar PV array footprint. Due to the proximity of coastal prairie to the 25 ft buffer, it is probable that these patches of coastal prairie be subjected to indirect impacts from construction such as trampling by workers and equipment and altered surface water runoff. However, impacts can be avoided by implementing several measures included in the avoidance and minimization recommendations section.

Any subsequent modifications to the design and layout of the solar PV arrays would require a revised impact assessment and mitigation approach based on the existing coastal prairie mapping. The areas for potential impact outside of the 25 ft buffer are relatively small, however any future expansion of the facility in a westward or southerly direction would begin to cause additional substantial impacts on the coastal prairie resource.

5.0 AVOIDANCE AND MINIMIZATION RECOMMENDATIONS

This section presents avoidance and minimization measures designed to reduce impacts to coastal prairie around solar PV array sites.

5.1 Exclusion Fencing

Temporary exclusion fencing installed at Big Meadow (site 1) along the 25-foot buffer will guarantee that all impacts within the construction zone stay within the allowed buffer. Exclusion

fencing should be installed before construction activities begin and be removed once the installation is complete.

5.2 Erosion and Sediment Control

The installation of temporary erosion and sediment control devices along the perimeter of exclusion fence closest to the coastal prairie at Big Meadow (site 1) will ensure that soil and surface water runoff does not infiltrate into the coastal prairie areas. Temporary erosion and sediment control barriers include:

- Silt fence
- Straw wattles

Temporary erosion control devices that are damaged should be repaired or replaced during construction.

6.0 REFERENCES

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Prepared for Lawrence Berkeley National Laboratory.

MAPS

MAP 1 VICINITY MAP

MAP 2 SITE PLAN AND SURVEY RESULTS

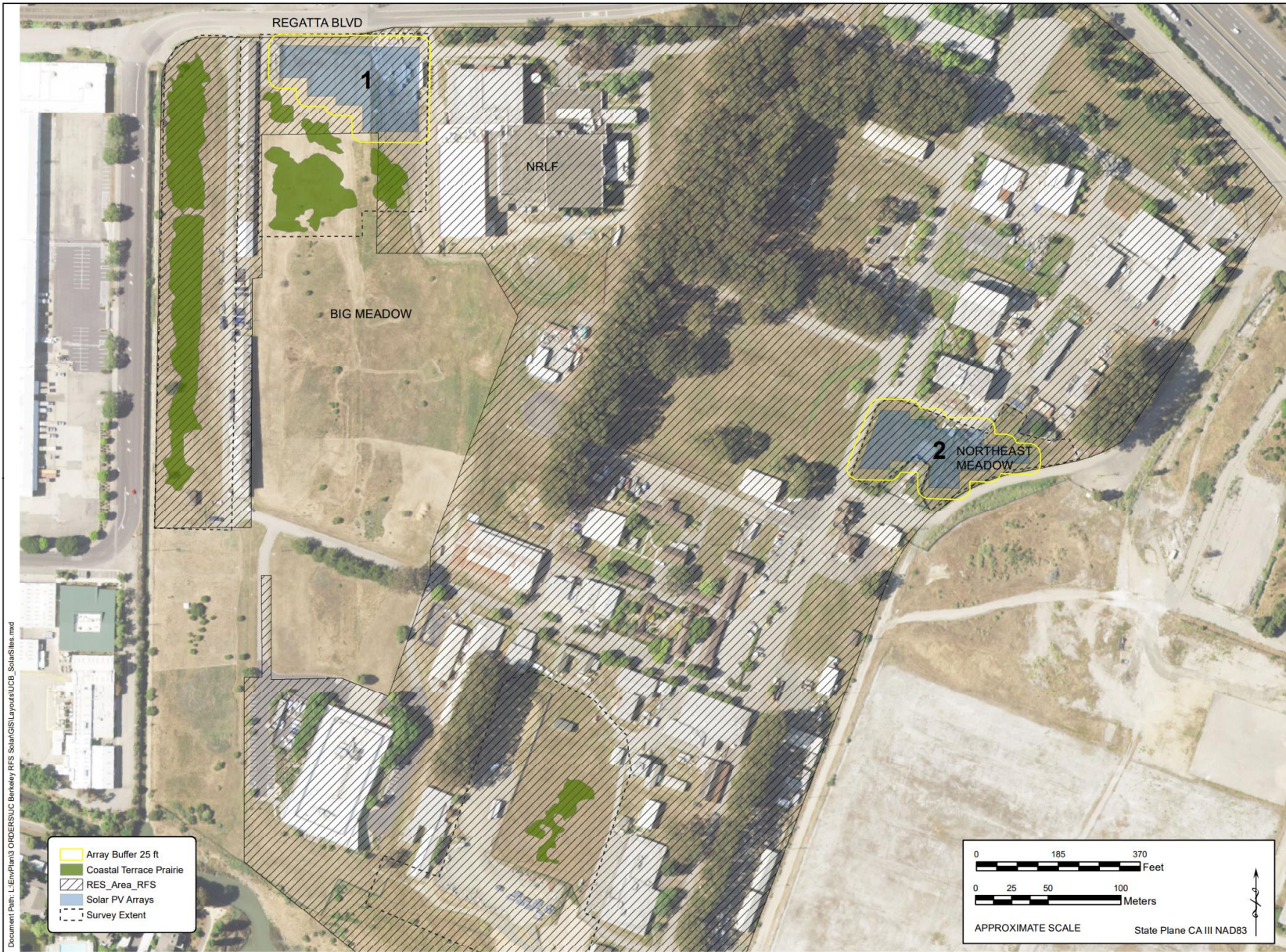
MAP 3 INITIAL FIELD SURVEY LOCATIONS



UC BERKELEY
 RICHMOND FIELD STATION
 SOLAR PV ARRAY

MAY 2021
 PREPARED BY: RANA

MAP 1
VICINITY MAP



CONSULTANTS:

PROJECT TITLE:

UC BERKELEY
RICHMOND FIELD STATION
SOLAR PV ARRAY

LOCATION:

RICHMOND
CONTRA COSTA COUNTY, CA

SHEET TITLE:

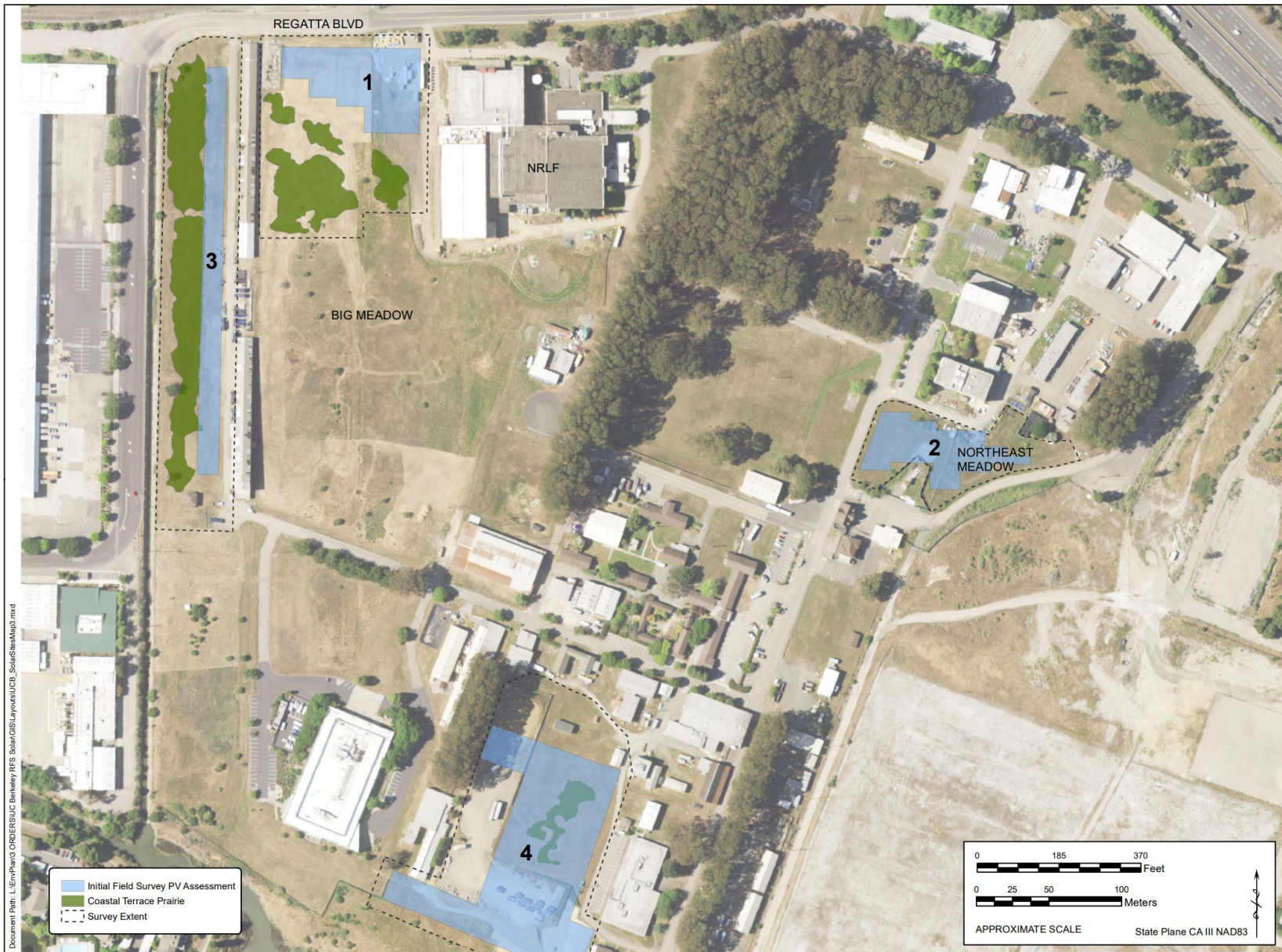
MAP 2
SENSITIVE RESOURCES
&
IMPACT AREAS

Imagery: May 2020
NAIP

DATE: 2021.4.30

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CONSULTANTS:

PROJECT TITLE:
UC BERKELEY
RICHMOND FIELD STATION
SOLAR PV ARRAY

LOCATION:
RICHMOND
CONTRA COSTA COUNTY, CA

SHEET TITLE:
MAP 3
Initial Field
Survey Locations

Imagery: May 2020
NAIP

DATE: 2021.4.30
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APPENDIX A

LIST OF PLANT SPECIES OBSERVED

U.C. Berkeley, Richmond Field Station
Plant Species List - Solar PV Array Sites 1 and 2
April 16 & 30, 2021

Species Name	Common Name	Native	Site 2	Site 3
<i>Amsinckia menziesii</i> var. <i>intermedia</i>	common fiddleneck	y		x
<i>Anagallis arvensis</i>	scarlet pimpernel	n	x	x
<i>Avena barbata</i>	slender wild oats	n	x	x
<i>Brassica nigra</i>	black mustard	n	x	x
<i>Bromus catharticus</i>	rescue grass	n	x	
<i>Bromus diandrus</i>	ripgut brome	n	x	x
<i>Bromus hordeaceus</i>	soft chess brome	n	x	x
<i>Carduus pycnocephala</i>	Italian thistle	n		x
<i>Convolvulus arvensis</i>	bindweed	n	x	x
<i>Danthonia californica</i> var. <i>californica</i>	California oatgrass	y	x	x
<i>Echium candicans</i>	pride of Madeira	n		x
<i>Erodium botrys</i>	long-beaked filaree	n		x
<i>Erodium cicutarium</i>	red-stemmed filaree	n	x	x
<i>Eschscholzia californica</i>	California poppy	y		x
<i>Euphorbia peplus</i>	petty spurge	n		x
<i>Festuca myuros</i>	rat tail fescue	n	x	x
<i>Foeniculum vulgare</i>	sweet fennel	n	x	x
<i>Geranium dissectum</i>	cut-leaf geranium	n	x	x
<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley	n		x
<i>Melilotus indica</i>	sour clover	n		x
<i>Phalaris aquatica</i>	Harding grass	n	x	x
<i>Picris echioides</i>	bristly ox-tongue	n	x	x
<i>Plantago lanceolata</i>	English plantain	n	x	x
<i>Raphanus sativus</i>	wild radish	n	x	x
<i>Rubus discolor</i>	Himalayan blackberry	n	x	x
<i>Rumex acetosella</i>	sheep sorrel	n	x	
<i>Senecio vulgaris</i>	common groundsel	n	x	
<i>Sisyrinchium bellum</i>	blue-eyed grass	y	x	
<i>Sonchus oleraceus</i>	common sow thistle	n	x	
<i>Stipa pulchra</i>	purple needlegrass	y	x	
<i>Wyethia angustifolia</i>	narrow mule's ear	y	x	

APPENDIX B – SITE PHOTOGRAPHS



Photo 1. Mowed harding grass at Site 2 development location, view southeast



Photo 2. Mowed harding grass at Site 2, view southwest.



Photo 3. Coastal prairie immediately south of Site 2.



Photo 4. Blue-eyed grass and California oatgrass